

**FAUNA
OF
MELGHAT TIGER RESERVE**



Conservation Area Series, 24

FAUNA OF MELGHAT TIGER RESERVE

*Edited by
The Director, Zoological Survey of India, Kolkata*



**Zoological Survey of India
Kolkata**

CITATION

Editor-Director, 2005. *Fauna of Melghat Tiger Reserve, Conservation Area Series*, **24** : 1-500 + 8pp plates (Published by the Director, Zool. Surv. India, Kolkata)

Published : September, 2005

ISBN 81-8171-080-0

Project co-ordinator
Dr. Anil Mahabal
Scientist E, WRS, Pune

© Govt. of India, 2005

ALL RIGHTS RESERVED

- No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.
- This book is sold subject to the condition that it shall not, by way of trade, be lent, re-sold hired out or otherwise disposed of without the publisher's consent, in any form of binding or cover other than that in which it is published.
- The correct price of this publication is the price printed on this page. Any revised price indicated by a rubber stamp or by a sticker or by any other means is incorrect and should be unacceptable.

PRICE

India Rs. 1000.00

Foreign \$ 70; £ 50

Published at the Publication Division by the Director, Zoological Survey of India, 234/4, AJC Bose Road, 2nd MSO Building, (13th Floor), Nizam Palace, Kolkata-700 020 and printed at Calcutta Repro Graphics, Kolkata-700 006.

CONSERVATION AREA SERIES
FAUNA OF MELGHAT TIGER RESERVE

No. 24	2005	1-500

CONTENTS

AN OVERVIEW	1-10
Anil Mahabal	
MAMMALIA	11-113
M.S. Pradhan	
AVES	115-163
Anil Mahabal	
REPTILIA	165-221
M.S. Pradhan	
AMPHIBIANS	223-230
Satish S. Kamble	
PISCES	231-296
B.E. Yadav	
INSECTA : ODONATA	297-316
P.P. Kulkarni and M. Prasad	
INSECTA : ORTHOPTERA	317-240
P.P. Kulkarni and M.S. Shishodia	
INSECTA : HEMIPTERA (Aquatic and Semi Aquatic)	341-357
G. Thirumalai and R.M. Sharma	
INSECTA : HOMOPTERA : APHIDOIDEA : APHIDS	359-368
P.P. Kulkarni	
INSECTA : DIPTERA : CECIDOMYIIDAE (Gallmidges)	369-375
R.M. Sharma	

INSECTA : LEPIDOPTERA (Rhopalocera and Grypocera)	377-400
R.M. Sharma and C. Radhakrishnan	
CHILOPODA : SCOLOPENDRIDAE	401-410
B.E. yadav	
ARACHNIDA : SCORPIONIDA AND SOLIFUGAE	411-419
D.B. Bastawade	
ARACHNIDA : ARANEAE (SPIDERS)	421-435
D.B. Bastawade	
FRESHWATER MOLLUSCA	437-449
S.G. Patil	
CLADOCERA : CRUSTACEA	451-500
P. D. Rane	

AN OVERVIEW

ANIL MAHABAL

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

LOCATION AND AREA

The area of Melghat Tiger Reserve falls under Dist. Amravati of Maharashtra State. Amravati district lies between 20°32' and 21°46' North latitude and 76°37' and 78°27' East longitude and occupies an area of 1,21,497 sq. kms. This district is situated in the centre of the Northern border of Maharashtra State, bounded in the North by districts of Madhya Pradesh, in the east by Nagpur and Wardha; in the South and South West by the Yeotmal, Akola and Buldhana districts of Maharashtra State.

Tiger reserves in India were established in phases : 9 in 1973-74; 2 in 1979; 4 in 1983 and one each in 1987; 1988 and 1990. Melghat Tiger Reserve was one of those established initially in the year 1973. It was the only Tiger Reserve in the State of Maharashtra. The Melghat Tiger Reserve comprises an area of 1618 sq. kms. with core area of 448 sq. kms. The office of the Tiger Project is situated at Paratwada, which can be reached by road, rail and air as shown below :

Transport	Route	Nearest Station	Distance
(Road)	Paratwada–Amravati N.H. 6	Amravati	60 kms.
(Rail)	Mumbai–Howrah and	Badnera	70 kms.
	Amravati–Badnera	Amravati	60 kms.
(Air)		Nagpur	210 kms.

TOPOGRAPHY

Melghat area consists of succession of hills and valleys, which are extensions of the main Satpura Range. In this tract, the main ridge of Gawilgarh hills runs East and West. The highest point of this ridge is Vairat, 1178 m above mean sea level.

Number of spurs branch off from this ridge towards North. The ridges have abrupt

spread slopes and forming narrow valleys below, thus deriving the name Melghat meaning congregation of ridges.

The Gawilgarh hills are so named from the fortress, Gavilgad, situated on one of the southern spurs, near the confluence of the rivers Purna and Tapi. Chikhaldara is a hill station in this area, well known attraction for tourists.

DRAINAGE

The area of Melghat is drained by Khandu; Khapra; Sipna; Gadga and Dolar rivers which are tributaries of Tapi river. The main ridge of Gavilgarh hills forms a water divide between Tapi and Purna rivers. The northern enclave encompasses the tiger reserve, which forms catchment area of Tapi river. The tributaries of Tapi mentioned above are fed by numerous hard-bedded fast flowing hill streams. The rainwater quickly drains off the hill slopes. As monsoon recedes, the hill streams soon become dry and water is retained only in depressions. A small hilly portion in North-East near Jarida in Melghat Tiger Reserve forms a part of South-East flowing Wardha river basin.

GEOLOGY

Geologically Melghat is a part of Deccan trap. The foremost lava flows are found in horizontal position with a gentle tilt to West and North West up to about 2°. These deccan lava flows crystallized into hard compact rock beds are without porosity of its own. Due to weathering by rain, heat and wind, shallow and narrow patches of limestone and basalt are formed and are covered by a second non porous layer of lava. The steep hydraulic gradient causes the underground water leak through fissures causing considerable water scarcity on high hills. The rock units are seen to be formed by a variety of geo-activities and those can be attributed to Archaeans; Gondwana, Lameta, Deccan Basalts (Traps); laterites and Alluvium. Thus soil formation also varies with rocky, clayey, lacustrine sediments with porous, pitted, clay like rocks to alluvium calcarious, black cotton soil covering extensive areas.

CLIMATE

The climate of the region is tropical. December is the coldest month with 13°C as minimum and 22°C as maximum temperature. Cold waves from North India in winter months affect this area when night temperature may go down to 5°C. From the month of February, temperature rises rapidly till May, which becomes hottest month of the year. In May it reaches to 45°C with minimum mean daily temperature of 23°C. The heat in the summer is severe during the day, while the nights are comparatively cooler. With the arrival of the southwest monsoon by about mid June, the temperature drops considerably making the weather pleasant. At the end of September, temperature increases slightly and has secondary maximum temperature record in October.

Except during the monsoon season, when humidity is high, the air is generally dry. In summer the humidity averages to 25-35%. Winds are generally light to moderate with some increase in speed in the later part of summer till the onset of north west monsoon.

RAINFALL

Annual rainfall amounts to 2250 mm, which gradually decreases towards North where it is recorded to 1000 mm. only. During June to September it amounts to 85% of the total annual rainfall. Thus, though the rainfall on an average may seem adequate, its period being confined to few days in a year, dry weather prevails in rest of the year.

SOIL

Decomposition of Deccan traps has given rise to either deep brown or rich red or black cotton soil (regur). The regur is rich in plant nutrients. It is porous and swells considerably by addition of water and cracks on losing moisture. The soil depth and drainage varies greatly. The soil types are (i) bouldery soil in major portions, (ii) clayey soil in depressions and (iii) the lateritic loam on the hill tops and plateaus.

FORESTS

The forests of Melghat spread over the hilly region of Satpura ranges are designated as "Southern Tropical Dry Deciduous Forest" and are included in sub group 5A of Group 5 as per classification of Forest types by Champion and Seth (1968). The most dominant floral element of the forest is Teak (*Tectona grandis*). The teak dominant forest areas are identified in Kuapati, Pipalpapda, Koktu, Makhla, Harisal, Chaurakund, Hatru, Semadoh, etc. The major forest produce includes Timber, Bamboo, Fodder grass, Tendu leaves, Gum, Fire wood and Flowers of Moha (*Madhuca latifolia*). Teak wood is used to make best quality furniture, building frames and industrial products. Major plant species and the economic usage of their produce is listed below :

TIMBER

Teak (*Tectona grandis*) : Buildings, industries, furniture, etc.

Shisham (*Delbergia latifolia*) : The rose wood, used in Cabinet and furniture making.

Tiwas (*Ougenia dalbergioides*) : Yields valuable Hard wood of great strength and toughness. It is used in manufacture of carts, ploughs and shafts.

Bija (*Pterocarpus marsupium*) : Yields reddish coloured timber for buildings, furniture making and agriculture equipments. Gum of reddish colour oozes from this tree.

Haldu (*Adina cordifolia*) : This yields timber of yellowish colour used in house buildings & manufacture of boxes.

Saj (*Terminalia tomentosa*) : This tree yields hard timber used in building houses and truck decks. The bark of this tree yields tannin.

Dhawda (*Anogeissus latifolia*) : Yields hard wood used for cart axles, ploughs and tool handles. It gives good gum and excellent quality charcoal.

Dhaman (*Grewia tiliacfolia*) : Timber of this tree is used for making agricultural implements, tool handles and shafts.

Semal (*Bombax malabaricum*) : (Silk cotton tree). This softwood is used in making matchboxes and toys. Cotton is used for stuffing pillows and mattresses of soft feel.

Other species useful for timber are Kusum (*Schleichera trijuga*); Siwan (*Gmelina arborea*); Kalam (*Stephegyne parvifolia*); Kahu (*Terminalia arjuna*); Landia (*Lagerstroemia parviflora*); Harra (*Terminalia chebula*); Bhormal (*Hymenodictyon excelsum*); Salai (*Boswellia serrata*); Moyen (*Odina oider*); Kekdal (*Garuga pinnata*); Maharukh (*Ailanthus excelsa*).

OTHER PRODUCE

Moha (*Madhuca latifolia*) – Flowers are consumed raw by human, also used as cattle feed and for making country liquor; **Tendu** (*Diospyros melanoxylon*) – the leaves are used in Bidi industry. The fruits are eaten. Timber is used as poles or shafts. **Achar** (*Buchanania lanzan*) – The seeds are used as dry fruits and have great value. **Amla** (*Emblica officinalis*) – the fruit **Aonla** (Amla) has a great medicinal value in various Ayurvedic preparations. **Beheda** (*Terminalia belerica*), the fruits are used for medicinal purpose; **Bhilawa** (*Semicarpus anacardium*) – the marking nut tree oil is extracted and used in certain medicines. **Bor** (*Zizyphus jujuba*) – fruits of this tree are edible; **Amba** (*Mangifera indica*) yields mangoes and its wood is useful for house building and making packing boxes. **Palas** (*Butea frondosa*) is commonly known as flame of forest due to its fiery red flowers. Leaves are used to make leaf-plates and it is an important host for lac insects. **Babul** (*Acacia arabica*) yields good quality charcoal and gum of commercial value. **Khair** (*Acacia catechu*) – The heart-wood of this tree yields **Katha** which is used in betel leaf and areca nut preparations. **Anjan** (*Hardwickia binata*); **Jamun** (*Eugenia jambolana*); **Apta-Bhosa** (*Bauhinia racemosa*); **Rohan** (*Soyimida febrifuga*); **Bel** (*Aegle marmelos*); **Gular** (*Ficus* sp.); **Hiwar** (*Acacia leucophloca*); **Kulu** (*Sterculia urens*); **Pangra** (*Erythrina indica*); **Bamboos** (*Dendrocalamus strictus*) are major trees species with varying degree of economic values. Weeds like **Tarota** (*Cassia tora*); **Burrs** (*Achyranthus aspera*); **Bantulsi** (*Plactranthus linoifolius*); **Lantana** (*Lantana camera*) form thick undergrowth and are partly detrimental to teak trees and their regeneration. Large number of wild climbers is also found in the forests. Fodder grasses and thatching grasses also grow in plenty.

FLORA

Work on Flora of Melghat Tiger Project dates back to 1855, when commissioner of North Berar reported the exsistance of teak in this region to Govt. of India. Gazetteers for

the Amravati District (revised), (P. Setu Madhav Rao, ed. 1968) give classified account of flora of Melghat forests as useful forest trees, roadside trees, field trees, fiber plants, hedge plants, weeds, wild climbing plants, grasses and exotics. A note on the use of various plants is also added, which includes usage in production of gum, timber, agricultural equipments, charcoal, pencil manufacture, fuel packing cases and so on.

Recently, Dhore and Joshi (1988) enumerated a total of 648 plant species from Melghat Tiger Project, with appendix of about 68 cultivated plants. Later, Bhogaonkar and Devarkar (1999) provided update to Dhore and Joshi (1988) and added 67 plant species. Thus, Melghat Forests are known to inhabit a total of 715 plant species.

Ethnobotanical account from Melghat Tiger Reserve area is provided by Khaire and Giri (1992) which contains information on as much as 175 plants being used as medicine by local people. These plant species contain 64 trees, 27 shrubs, 29 climbers, 2 sedges, 1 bamboo and 2 grasses.

Some of the important medicinal plants are given below :

Sl. No.	Scientific Name	Local Name	Habit	Ethnomedicouse sp.
1.	<i>Abrus precatorius</i>	Gunj	Climber	Roots–Cough–Sunstroke
2.	<i>Acacia farnesiana</i>	Guababul	Shrub	Leaves–sperm concentration Bark–Black magic
3.	<i>Celastrus peniculata</i>	Malkangani	Climber	Seeds–Brain Tonic paralysis– rhumitism, Leaves–Manstrual Disorder, Root–Snake bite
4.	<i>Gloriosa superba</i>	Kal lawi	Climber	Root–Activate Delivery, seed cancer, Leaves–Lice control
5.	<i>Holorrhena pubescens</i>	Kalakuda	Tree	Bark–Dysentrey, Stomachache Piles, Chest ache, etc.
6.	<i>Hymenodictylon excelsum</i>	Bhavorsal	Tree	Innerbark–Antipyretic– Discongestant, Apetiser, etc.
7.	<i>Litsea glutinosa</i>	Maidalakadi	Small Tree	Leaves–Nutritious Diabetes, Kidney stone, seed oil extract– Sprains
8.	<i>Radermachera xylocarpa</i>	Khadshinga	Tree	Oil–Dermothereptic, seed– black magic against snake bite
9.	<i>Terminalia chebula</i>	Hirda	Tree	Fruits–improved digestion teeth strengthening

Sl. No.	Scientific Name	Local Name	Habit	Ethnomedicouse sp.
10.	<i>Adhatoda vasica</i>	Adulsa	Shrub	Leaves–Rhubratism, leaves–flower–Asthema
11.	<i>Aegle marmelos</i>	Bel	Tree	Whole plant – fever, fruit Acidity, Diahorrea
12.	<i>Aloe indica</i>	Korfad	Shrub	Leaves–indigestion, Blood purification
13.	<i>Asparagus racemosa</i>	Shatavari	Climber	Root–Weaning, Anti-Rabies, Blood purification, Acidity
14.	<i>Carvi callosa</i>	Karvi	Shrub	Leave–to improve milk in cattles
15.	<i>Cassine glauca</i>	Aaran	Tree	Leaves–Female hysteria, Roots swelling & anti venom.

FAUNA

The area of Melghat being thickly forested and less populated, harbors myriad of faunal components. There have been records of wild animal from this area especially of big games or other prominent categories like rodents, reptiles and pisces. Systematic exploration of faunal components of this reserve was much wanting. The fauna listed so far from Melghat Tiger reserve is given below, followed by their local names in Marathi language :

The Common Langoor (*Semnopithecus entellus*) Vanar; Rhesus monkey (*Macaca mulata*) Makad; Gaur (*Bos gaurus*) Gawa; Tiger (*Panthera tigris*) Wagh; The Panther (*Panthera pardus*) Bibtya Vagh; Jungle cat (*Felis chaus*) Ran Manjar; Hyaena (*Hyaena hyaena*) Taras; Jackal (*Canis aureus*) Kotha; Fox (*Vulpus bengalensis*) Khokad; Wild dogs (*Cuon alpinus*) Rankutra, Dhol; Sloth Bear (*Ursus melursus ursinus*) Aswal; Badgar or Ratel (*Mellivora capensis*) Chandi Aswal; Wild pig (*Sus sacrofa*) Ran dukkar; Hare (*Lepus nigricollis*) Sasa; Porcupine (*Hystrix indica*) Sayal; Mongoose (*Herpestes edwardsi*) Mungus; The Otter (*Lutra perspicillata*) Pan kutra or Pan Manjar.

Among the horned game Indian Gaur (*Bos gaurus*); Sambar (*Cervus unicolour*); Chital (*Axis axis*); Barking deer (*Muntiacus muntjac*) Bhekar; Blue bull (*Boselephas tragocamelus*) Nilgai; Black Buck (*Antilope cervicapra*) Kalvit; Four horned Antilope (*Tetracoros quadricornis*) is common in Melghat forests. Among reptiles, lizards, snakes and freshwater turtles, crocodile, etc. are found here. Variety of birds are also on record, of which Red-throated Flycatcher (*Ficedula parva*); Tickll's Blue Flycatcher (*Cyornis tickelliae*) and *Myiophonus horsfieldii* Malabar Whistling Thrush are worth to mention. Altogether 24 species of pisces are recorded by Gogte *et.al.* (1992). Information on census of Mammals in Melghat Tiger Reserve was made available by the Conservator of Forests and Field Director, Project Tiger, Melghat for the years 1995 to 2003, which is presented next page :

Information on census of Mammals in Melghat Tiger Reserve

Sl. No.	Name of the species	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
01	Tiger	Census exercise not carried out	71	72	73	68	Census exercise not carried out	Exercise not carried out	74	74	74
02	Leopard		72	67	79	72			75	78	78
03	Gaur		2138	1512	1755	3349			1771	956	1120
04	Sambar		2703	2504	1718	3589			2171	913	1416
05	Nilgai		132	285	232	131			07	97	59
06	Chital		644	612	315	1163			352	242	325
09	Barking Deer		1627	1191	1302	2132			1601	699	1032
10	Wild pig		3350	2278	1966	3803			3229	1816	2976
11	Langur		3089	7950	3780	7084			5752	3764	3909
12	Sloth Beer		145	200	187	211			296	187	108
13	Wild dog		–	–	–	121			292	222	239
									435		

Source : Conservator of Forests & Field Director, Project Tiger Melghat, Amravati

REVIEW OF PUBLICATIONS ON FAUNA OF MELGHAT TIGER RESERVE

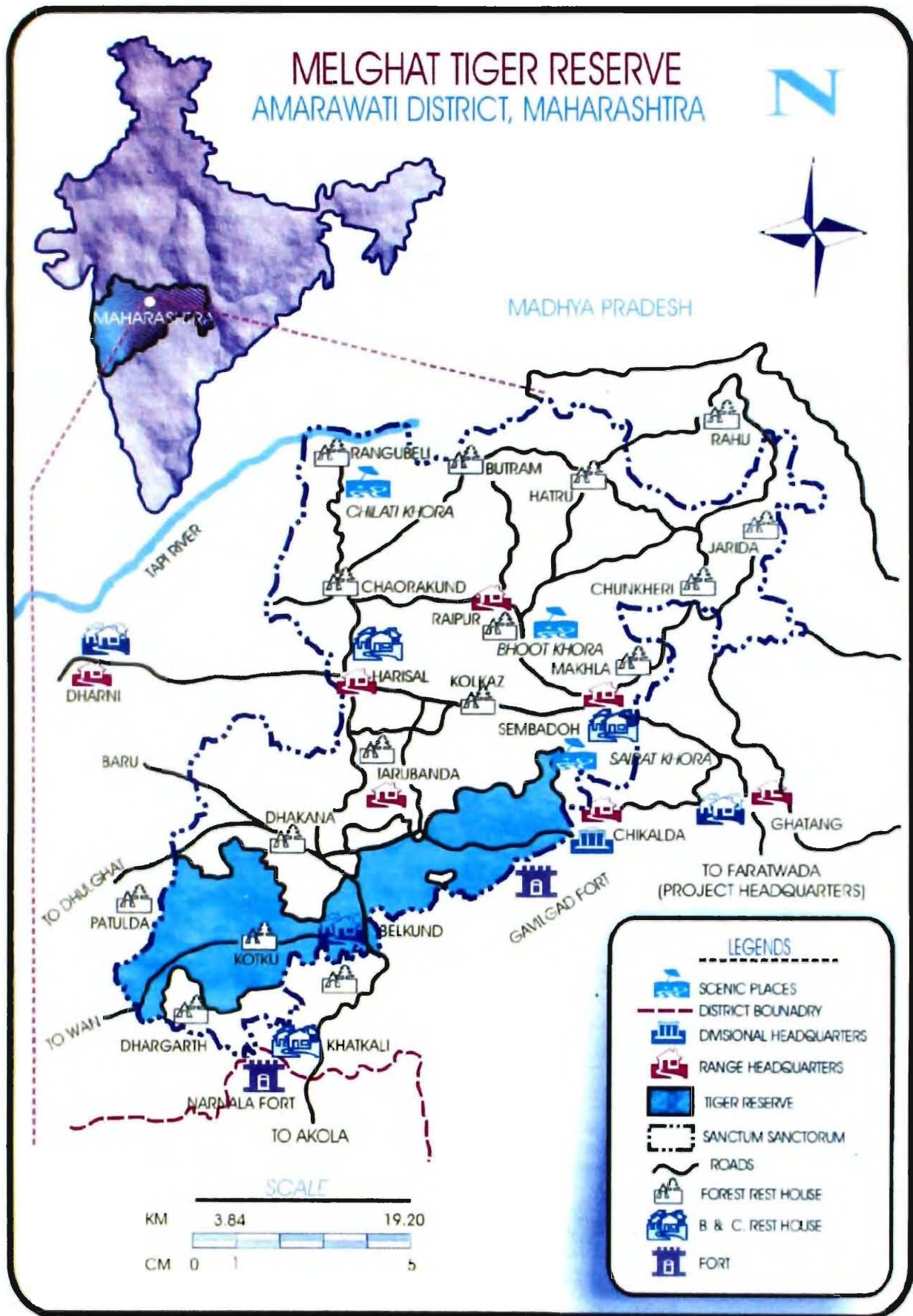
Authentic consolidated list of fauna of Melghat Tiger Reserve in particular is available in State Gazetteer of District Amravati (1968). In the section on wild animals, description of availability of as many as 21 big games along with a list of 20 species of fishes. As many as 14 types of snakes are described with their common names and brief characters. However, animal groups and smaller creatures like insects, spiders, scorpions and other invertebrates do not feature in this compilation.

Over a period of time several published articles, reports, reviews and committee reports were published on fauna of Melghat Tiger Reserve. The publications like An Annotated bibliography on Tigers (Gogte and Mahajan, 1989); Fauna of Tiger Reserves : An overview (Director, Z.S.I., 1993); Two Decades of Project Tiger, Melghat : Past, Present, Future (Gogte *et al.*, 1992); Assessment Report Project Tiger, Melghat : 1974-1994 (Kirpekar, 1994) are noteworthy. However, information remained limited to prominent mammals, aves, reptiles and fishes.

The present compilation embodies papers, which are based on the faunal samples and observations on wild animals that could be identified in the field, during the 9 surveys conducted by the Western Regional Station of Z.S.I. during 1991–1996. All the faunal samples now form part of the National Zoological Collection and are duly registered in the Western Regional Station of Zoological Survey of India, Pune.

Faunal diversity of Melghat Tiger Project at a Glance

Group	Order	Family	Subfamily	Genera	Species	Endemic	Endan- gered	New
1. Mammalia	9	28	25	53	80	Nil	26	Nil
2. Aves	21	57	9	160	263	1	2	Nil
3. Reptilia	3	16	–	36	54	Nil	9	Nil
4. Amphibia	1	4	–	7	8	Nil	4	Nil
5. Pisces	6	17	11	50	96	Nil	21	Nil
6. Mollusca	4	9	4	11	23	Nil	2	Nil
7. Crustacea (Cladocera)	1	5	2	19	29	1 (new subspecies)	–	1 (new subspecies)
8. Scorpion	1	3	4	6	8	8	–	–
9. Solifugi	1	1	–	1	1	1	–	–
10. Spider (Araneae)	1	16	–	23	25	–	–	1 (new species proposed)
11. Myriopoda (Centipede)	1	2	2	5	15	Nil	2	Nil
Class INSECTA								
12. Orthoptera	1	6	16	35	37	–	–	New Records 13
13. Odonata	1	6	11	17	24	–	–	–
14. Aphids (Homoptera) Aphididae	1	1	1	5	8	–	–	–
15. Diptera (Gallmidge)	1	1	1	8	15	–	–	–
16. Hemiptera (Aquatic)	1	6	12	14	20	–	–	–
17. Lepidoptera (Butterflies)	1	8	13	36	45	–	–	–



Map showing the location of Melghat Tiger Reserve



Fig. 14. Common giant flying squirrel *Petaurista philipensis philipensis* (Elliot)



Fig. 15. Tiger–*Panthera bengalensis*



Fig. 16. Tiger kill (Barking Deer *Muntiacus muntjack*)



Fig. 17. Spotted Deer *Axis axis* ♂



Fig. 18. Sambar-*Cervus unicolor* ♂



Fig. 19. Bat-Painted bat



Fig. 20. Rhesus Macaque-*Macaca mullata*

It will not be out of place to mention that these species could be identified with the available expertise in this station and in collaboration with the scientists from other regional stations as well as from some other institutes. Still some groups remain to be attended. It is hoped that these specimens may find place in future publications.

ACKNOWLEDGEMENTS

I am grateful to Dr. J.R.B. Alfred, Director, Zoological Survey of India for facilities and encouragement to carry out this work. Thanks are due to the then Officer-in-Charge of the station, Dr. G.M. Yazdani and Dr. M.S. Pradhan, who coordinated the project work during their tenure.

I am grateful to the Chief Wild Life Warden and Chief Conservator of Forests, Govt. of Maharashtra for cooperation in providing the special purpose permits for conducting surveys and facilities to collect the faunal samples. The then Conservator of Forests & Field Director, Project Tiger Shri M.G. Gogate, Melghat, Paratwada took keen interest to provide facilities and all staff members of the Project Tiger cooperated in collection of faunal samples.

I extend my sincere thanks to all my colleagues at W.R.S., Pune and all the contributors for their help in compiling this document.

REFERENCES

- BHOGAONKAR, P.Y and DARVEKAR, V.D. 1999. Additions to the flora of Melghat (Some rare and uncommon plants). *Tech. Bull. No. VII, The Directorate, Project Tiger Melghat, Amravati, Maharashtra* : 1-67 + Bibliography.
- CHAMPION, H.G. and SETH, S.K. 1968 A revised survey of forest types of India, Manager of Publications, Delhi, 6 : xxv+1-404 pl. 103+7 maps.
- DHORE, M.A. and JOSHI, P.A. 1988. Flora of Melghat Tiger Project. *Directorate, Project Tiger, Melghat, Paratwada, Dist. Amravati, Maharashtra* : 1-246.
- Director, Zoological Survey of India (ed.) : 1993. Fauna of Tiger Reserves : An overview. *Zoological Survey of India, Kolkata* : 1-31 + 5 Tables.
- GOGATE, M.G. & MAHAJAN, A.G. 1989. An annotated bibliography on Tigers. *Directorate Project Tiger, Melghat, Paratwada* : 1-192.
- GOGATE, M.G.; THOSARE, P.J. and BHAMBAKODE, S.B. (edited) : 1992. Two decades of Project Tiger, Melghat : Past, Present and Future. *Publicity & Information Officer Forest, Maharashtra State* : 1-192.

- KHAIRE, B.R. and GIRI, R.B. 1992. Melghat Ethnobotany in Two decades of Project Tiger Melghat, Papers and Proceedings. *Publicity and Information Officer, Forest, Maharashtra State, Pune* : 111–114.
- KIRPEKAR, C.S. 1994. Assessment Report Project Tiger, Melghat. *Vidarbha Natural History Society, Nagpur* : 1–84+3 plates.
- P. SETU MADHAVA RAO (ed.), 1968. Gazetteer of India : Maharashtra State Gazetteers : Amravati District (Revised Ed. of the Gazetteer of 1911) : *Govt. of Maharashtra, Directorate of Govt. Printing, Stationary and publications* : 1–834 + 6 plates + xxiii.

MAMMALIA

M.S. PRADHAN

Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044

INTRODUCTION

Melghat exhibits rich floral and faunal diversity. It is practically impossible to cover all the groups in one communication. Hence, it has been decided to focus on Mammals only in the present article. Present account is based on the material collected & species sighted during the project period and also on the bibliographic records (Ellerman and Morrison-Scott, 1951, Ellerman, 1961, Prater, 1980, Khajuria and Ghosal, 1981, Tikader, 1983, Bates *et al.*, 1997, Agrawal *et al.*, 1992, Corbet and Hill, 1992, Wilson and Reeder, 1993, Gogate *et al.*, 1993 and many others which have been mentioned at relevant places).

SYSTEMATIC LIST

(*Asterisk indicate species actually collected and/or sighted during project period)

Phylum	CHORDATA
Class	MAMMALIA
Order	INSECTIVORA
Family	SORICIDAE
Subfamily	CROCIDURINAE

*1. *Suncus etruscus* (Savi)

*2. *Suncus murinus murinus* (Lin.)

3. *Suncus stoliczkanus* (Anderson)

Order	SCANDENTIA
Family	TUPAIIDAE
Subfamily	TUPAIINAE

*4. *Anathana ellioti ellioti* (Waterhouse)

Order CHIROPTERA

Suborder MEGACHIROPTERA

Family PTEROPODIDAE

Subfamily PTEROPODINAE

5. *Rousettus l. leschenaulti* (Desmarest)

*6. *Pteropus giganteus giganteus* (Brunnich)

*7. *Cynopterus sphinx sphinx* (Vahl)

Family RHINOPOMATIDAE

8. *Rhinopoma hardwickei* Gray

Family EMBALLONURIDAE

*9. *Taphozous m. melanopogon* Temminck

10. *Taphozous l. longimanus* Hardwicke

11. *Taphozous (Liponycteris) nudiventris* Cretzschmar

12. *Saccolaimus saccolaimus* (Temminck)

Family MEGADERMATIDAE

*13. *Megaderma spasma horsfieldii* Blyth

14. *Megaderma l. lyra* Geoffroy

Family RHINOLOPHIDAE

15. *Rhinolophus luctus* Temminck

16. *Rhinolophus rouxii rouxii* Temminck

Family HIPPOSIDERIDAE

17. *Hipposideros ater ater* Templeton

18. *Hipposideros fulvus fulvus* Gray

19. *Hipposideros galeritus brachyotus* (Dobson)

20. *Hipposideros lankadiva indus* (Andersen)

21. *Hipposideros speoris speoris* (Schneider)

Family VESPERTILIONIDAE

Subfamily VESPERTILIONINAE

*22. *Scotophilus kuhlii kuhlii* Leach

*23. *Scotophilus heathi heathi* (Horsfield)

24. *Pipistrellus ceylonicus indicus* (Dobson)

25. *Pipistrellus coromandra coromandra* (Gray)

26. *Pipistrellus tenuis mimus* Wroughton

27. *Pipistrellus d. dormeri* (Dobson)

Subfamily MINIOPTERINAE

28. *Miniopterus schreibersi fuliginosus* (Hodgson)

Family MOLOSSIDAE

29. *Tadarida (Chaerephon) plicata plicata* (Buchannan)30. *Tadarida aegyptiaca thomasi* Wroughton

Order PRIMATES

Family CERCOPITHECIDAE

Subfamily CERCOPITHICINAE

*31. *Macaca mulatta mulatta* (Zimmermann)

Subfamily COLOBINAE

*32. *Semnopithecus entellus entellus* (Dufresne)

Order PHOLIDOTA

Family MANIDAE

33. *Manis crassicaudata* Gray

Order CARNIVORA

Family CANIDAE

34. *Canis lupus pallipes* Sykes*35. *Canis aureus* Linn*36. *Cuon alpinus* (Pallas)*37. *Vulpes bengalensis* (Shaw)

Family URSIDAE

Subfamily URSINAE

*38. *Melursus ursinus* (Shaw)

Family MUSTELIDAE

Subfamily MELLIVORINAE

*39. *Mellivora capensis* (Schreber)

Subfamily LUTRINAE

*40. *Lutragale perspicillata* (Geoffroy)

Family VIVERRIDAE

Subfamily VIVERRINAE

*41. *Viverricula indica indica* (Desmarest)

Subfamily PARADOXURINAE

*42. *Paradoxurus h. hermaphroditus* (Pallas)

	Family	HERPESTIDAE
	Subfamily	HERPESTINAE
*43. <i>Herpestes edwardsii edwardsii</i> (Geoffroy)		
44. <i>Herpestes smithii smithii</i> Gray		
	Family	HYAENIDAE
	Subfamily	HYAENINAE
*45. <i>Hyaena hyaena hyaena</i> (Linn.)		
	Family	FELIDAE
	Subfamily	FELINAE
46. <i>Felis silvestris ornata</i> Gray		
*47. <i>Felis chaus affinis</i> Gray		
48. <i>Felis caracal bengalensis</i> Fischer		
49. <i>Prionailurus bengalensis bengalensis</i> (Kerr)		
	Subfamily	PANTHERINAE
*50. <i>Panthera pardus fusca</i> (Meyer)		
*51. <i>Panthera tigris tigris</i> (Linn.)		
	Order	ARTIODACTYLA
	Family	SUIDAE
	Subfamily	SUINAE
*52. <i>Sus scrofa cristatus</i> Wagner		
	Family	TRAGULIDAE
53. <i>Moschiola meminna</i> (Erxleben)		
	Family	CERVIDAE
	Subfamily	CERVINAE
*54. <i>Axis axis axis</i> (Erxleben)		
*55. <i>Cervus unicolor niger</i> Blainville		
	Subfamily	MUNTIACINAE
*56. <i>Muntiacus muntjak aureus</i> (H. Smith)		
	Family	BOVIDAE
	Subfamily	BOVINAE
*57. <i>Bos gaurus</i> Smith		
*58. <i>Boselaphus tragocamelus</i> (Pallas)		
*59. <i>Tetracerus quadricornis</i> (Blainville)		

Subfamily ANTILOPINAE

*60. *Antilope cervicapra cervicapra* (Linn.)61. *Gazella bennettii* (Sykes)

Order RODENTIA

Suborder SCIUROGNATHI

Family SCIURIDAE

Subfamily RATUFINAE

62. *Ratufa indica centralis* Ryley

Subfamily FUNAMBULINAE

*63. *Funambulus palmarum robertsoni* Wroughton*64. *Funambulus pennanti* Wroughton

Family PTEROMYIDAE

*65. *Petaurista philippensis philippensis* (Elliot)

Family MURIDAE

Subfamily MURINAE

*66. *Mus musculus castaneus* Waterhouse*67. *Mus musculus homourus* Hodgson*68. *Mus booduga booduga* (Gray)*69. *Mus phillipsi* Wroughton*70. *Vandeleuria oleracea oleracea* (Bennett)*71. *Rattus rattus rufescens* (Gray)72. *Rattus rattus narbadae* Hinton73. *Millardia meltada meltada* (Gray)*74. *Cremnomys blanfordi* (Thomas)75. *Golunda ellioti ellioti* Gray*76. *Bandicota bengalensis bengalensis* (Gray)77. *Bandicota indica indica* (Bechstein)

Subfamily GERBILLINAE

78. *Tatera indica indica* (Hardwicke)

Suborder HYSTRICOGNATHI

Family HYSTRICIDAE

*79. *Hystrix indica* Kerr

Order LAGOMORPHA
Family LEPORIDAE

*80. *Lepus nigricollis nigricollis* Cuvier

SYSTEMATIC ACCOUNT

Phylum CHORDATA
Class MAMMALIA
Order INSECTIVORA
Family SORICIDAE
Subfamily CROCIDURINAE

*1. *Suncus etruscus* (Savi)

1822. *Sorex etruscus* Savi, *Nuovo Giorn. de Letterati, Pisa*, 1 : 60.
1951. *Suncus etruscus etruscus* (Savi), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 68.
1992. *Suncus etruscus* (Savi), Corbet and Hill, *The Mammals of the Indomalayan region* : 38.
1993. *Suncus etruscus* (Savi) By Rainer Hutterer In : Wilson & Reeder, *Mammal Species of the World* : 102.

Common Name : English : Savi's Pygmy Shrew, Marathi : Chichundri.

Diagnostic Characters : Head and Body length less than 55 mm. Hindfeet in the range between 7.0-9.5 mm. Fur very short, vibrissae on tail present, 18 teeth present in upper jaw, zygomatic arches absent, bullae imperfect, dorsum medium to dark brown in colour.

Locality : Pilli Village and Dharni near Kolkaz and agricultural fields near Semadoh.

Material Examined/Sightings : Collected and examined one male and two female specimens.

Distribution : Throughout India.

Habitat : Fossorial in habit preferring to live in multiparous habitats on plains and high altitudes, present collection was made from cultivated fields, forests, and moist soil along the riverbanks.

Status : Not uncommon locally.

Conservation Status : IUCN : Lower Risk-Least Concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998) *Indian Wildlife (Protection) Act (1972, as amended upto 1991)*
Schedule : Nil.

Remarks : Perhaps the smallest of all the Indian terrestrial mammals in size.

*2. *Suncus murinus murinus* (Lin.)

1766. *Sorex murinus* Linnaeus, *Syst. Nat.*, 12th ed., 1 : 74.
1951. *Suncus murinus murinus* Linnaeus, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 65-66.
1992. *Suncus murinus murinus* (Linnaeus) Corbet and Hill. *The Mammals of the Indomalayan region* : 36-37.
1993. *Suncus murinus murinus* (Linnaeus) By Rainer Hutterer In : Wilson & Reeder, *Mammal Species of the World* : 102.

Common Name : English : House shrew, Marathi : Chichundri.

Diagnostic Characters : Head and Body length in the range between 100-160 mm. Hind feet in the range between 17-26 mm. Fur very short, less than 5 mm in length, vibrissae on tail present, tail very thick, 18 teeth present in upper jaw, zygomatic arches absent, bulla imperfect, dorsum pale grey to dark brown in colour.

Locality : Chikhaldara, Semadoh and Raipur.

Material Examined / Sightings : Sighted live specimens in the gardens near rest houses in the above mentioned localities.

Distribution : Throughout India;

Habitat : Fossorial in habit preferring to live in multiparous habitats particularly near human dwellings.

Status : Common locally.

Conservation Status : IUCN : Lower Risk-Least Concern(Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Nil.

Remarks : Large-sized Indian house shrew. Being insectivorous in habit, shrew is considered to be farmer's friend.

3. *Suncus stoliczkanus* (Anderson)

1877. *Crocidura (Pachyura) stoliczkana* Anderson, *J. Asiat. Soc. Beng.*, **46** : 270.
1951. *Suncus stoliczkana* Anderson, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 65-66.
1992. *Suncus stoliczkana* (Anderson), Corbet and Hill. *The Mammals of the Indomalayan region* : 38.
1993. *Suncus stoliczkanus* (Anderson) By Rainer Hutterer. In : Wilson & Reeder, *Mammal Species of the World* : 103.

Common Name : English : Anderson's shrew, Marathi : Chichundri.

Diagnostic Characters : A medium-sized shrew with Head and Body length in the range between 60-90 mm, Hindfoot in the range between 11-14 mm. Fur short, less than 5 mm in length, dense and soft, vibrissae on tail present, tail thick and ears large. 18 teeth present in upper jaw, zygomatic arches absent, bulla imperfect, dorsum dull brown to reddish brown in colour, venter glossy grey.

Locality : Melghat Tiger Reserve.

Material Examined/Sightings : None.

Distribution : Peninsular India (Corbet and Hill, 1992).

Habitat : Fossorial in habit preferring to live in gardens and grassy & scrubland habitats particularly near human dwellings and forest fringes.

Status : Uncommon locally; *Conservation Status* : IUCN : Lower Risk-Least Concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : Medium-sized shrew. Being insectivorous in habit, the shrew is considered to be farmer's friend.

Order	SCANDENTIA
Family	TUPAIIDAE
Subfamily	TUPAIINAE

*4. *Anathana ellioti ellioti* (Waterhouse)

1850. *Tupaia ellioti* Waterhouse, P.Z.S. 1849 : 107, pl. Mamm. 13.

1951. *Anathana ellioti pallida* Lyon, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 13.

1992. *Anathana ellioti ellioti* (Waterhouse), Corbet and Hill. *The Mammals of the Indomalayan region* : 52.

1993. *Anathana ellioti* (Waterhouse) By Don E. Wilson. In : Wilson & Reeder, *Mammal Species of the World* : 131.

Common Name : English : Indian/Madras Tree Shrew, Marathi : Zad Chichundri.

Diagnostic Characters : In appearance a tree shrew is a combination of shrew, squirrel and mongoose. Local tribals call it as a young one of a mongoose. Its long snout is like a shrew, but its rounded ears, limbs and bushy tail suggest like a squirrel. Its feet are like squirrel's feet, well fitted for climbing, claws sharp and moderately curved. However its movements on the ground are like a mongoose. Dorsum reddish brown in colour, underparts buffy or nearly white.

Locality : Chikhaldara, Semadoh and Raipur.

Material Examined/Sightings : Sighted live specimens in the above mentioned localities by Forest Dept. authorities and ZSI survey parties.

Distribution : Endemic to Southern peninsular India south of Ganges.

Habitat : Terrestrial, arboreal and diurnal in habit preferring to move on the forest floor among fallen leaves searching for food. Though expert climber, it takes to trees mainly as a means of shelter. Prefers to live in scrub jungle, dry and moist deciduous forests and shola forests.

Status : Not very uncommon locally.

Conservation Status : IUCN : Lower Risk-Near Threatened (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)*, Schedule : Nil.

Remarks : Always mistaken as a stripeless squirrel or a young one of a mongoose. A most interesting species belonging to a primitive order, Scandentia, showing affinities with four different mammalian orders viz : Insectivora, Carnivora, Rodentia and Primates. Attempts were even made to place tree shrew in Primates (Roonwal and Mohnot, 1977). A good example of a connecting link in evolutionary studies. Hence, detailed studies covering various aspects are strongly recommended.

Order	CHIROPTERA
Suborder	MEGACHIROPTERA
Family	PTEROPODIDAE
Subfamily	PTEROPODINAE

5. *Rousettus l. leschenaulti* (Desmarest)

1820. *Pteropus leschenaulti* Desmarest, *Encycl. Meth. Mammal.*, 1 : 110.
1951. *Rousettus l. leschenaulti* (Desmarest), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 93.
1992. *Rousettus l. leschenaulti* (Desmarest), Corbet and Hill. *The Mammals of the Indomalayan region* : 67.
1997. *Rousettus l. leschenaulti* (Desmarest) Bates & Harrison, *Bats of the Indian Subcontinent* : 6-9.

Common Name : English : Fulvous fruit bat, Marathi : Watwaghul.

Diagnostic Characters : A medium-sized fruit bat with forearm length in the range of 75 to 86 mm, muzzle longish and eyes large with brilliant look, tail present, reduced and rod like, tragus and nose-leaf absent, ears with a notch at the lower edge, condylobasal length less than 37mm, five upper and six lower cheek-teeth, last lower molar elliptical, dentition small and more delicate, cheekteeth narrow, Dorsal side uniformly light brown with rufescent tinge in colour, older specimens sparsely haired on back of neck and shoulders.

Locality : Chikalda, Maharashtra State (Brosset, 1962a).

Material Examined/Sightings : None.

Distribution : Throughout India.

Habitat : It is a colonial species that lives in caves, man-made constructions like buildings, wells, tunnels, old ruins etc. The species has wide habitat tolerance. It ranges from arid areas of Rajasthan to hot humid forests of Sri Lanka (Bates and Harrison, 1997). The colonies are gregarious and noisy comprising 10 to 2000 individuals. There is also movement between the roosting sites depending upon the availability of food in the surrounding. The bats have an odor like that of fermented fruit. They have very good sense of smell and a good memory for the location and fruiting time of the trees.

Status : Fairly common locally.

Conservation Status : IUCN : Lower Risk- Least Concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998) *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Schedule V.

Remarks : Bates and Harrison (1997) reports widespread distribution of the species in Asia.

***6. *Pteropus giganteus giganteus* (Brunnich)**

1782. *Vespertilio gigantea* Brunnich, *Dyrenes Historie*, 1 : 45.

1951. *Pteropus g. giganteus* (Brunnich), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 97.

1992. *Pteropus g. giganteus* (Brunnich) Corbet and Hill. *The Mammals of the Indomalayan region* : 63.

1997. *Pteropus g. giganteus* (Brunnich) Bates & Harrison, *Bats of the Indian Subcontinent* : 9-13

Common Name : English : Indian flying fox, Marathi : Watwaghul.

Diagnostic Characters : Very large-sized fruit bat with forearm length in the range of 152 to 183 mm makes it unmistakable. It exceeds in size all other species of the Indian peninsula. Snout long and hairy and without any tragus or noseleaf, ears long and pointed. The pelage is rich chestnut brown on the crown of head while it varies from light yellow to deep chestnut brown on the nape. However the pelage on the shoulders and mid-dorsal region is short and black in colour. Wings black.

Locality : Semadoh, Jerida and Dhakna.

Material Examined/Sightings : Sighted roosts of this species at the above mentioned localities by ZSI survey parties during the project period.

Distribution : Throughout India.

Habitat : The largest of Indian bats seen flying with slow wing beats at dusk. It is a

colonial species that lives in large diurnal roosts which may comprise hundreds of noisy Individuals on fully grown trees. The species is arboreal in habit. The bats usually leave the roost within half an hour after sunset flying the same route regularly. They have an excellent memory for the location and fruiting time of the trees. They are very destructive in orchards.

Status : Not very uncommon locally.

Conservation Status : IUCN : Lower Risk-Near Threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Schedule V; CITES Appendix : Appendix II.

Remarks : Flying fox in some places in India is considered to be a pest by farmers. Taxonomically *P. giganteus* may prove to be conspecific with *P. vampyrus* (Corbet & Hill, 1992). If accepted, *vampyrus* is the prior name and may attract attention of law of priority.

***7. *Cynopterus sphinx sphinx* (Vahl)**

1797. *Vespertilio sphinx* Vahl, *Skr. Nat. Selsk Copenhagen*, 4 (1) : 123.

1951. *Cynopterus sphinx sphinx* (Vahl), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 98.

1992. *Cynopterus s. sphinx* (Vahl) Corbet and Hill. *The Mammals of the Indomalayan region* : 71.

1997. *Cynopterus s. sphinx* (Vahl) Bates & Harrison, *Bats of the Indian Subcontinent* : 18-22.

Common Name : English : Short-nosed fruit bat, Marathi : Watwaghul.

Diagnostic Characters : A medium-sized fruit bat with forearm length in the range of 64 to 79 mm, muzzle short and relatively broader with projecting and divergent nostrils having deep inter-narial groove, reduced and rod-like tail and calcar present, tragus and nose-leaf absent, ears large (17-24 mm) with the pale anterior and posterior borders well developed, condylobasal length less than 34mm, two pairs of incisors in both the jaws, four upper and five lower cheek-teeth which are robust, m-2 absent, dorsal side with varying tints of brown.

Locality : Dhakna and Semadoh.

Material Examined/Sightings : Collected and studied four male and five female specimens netted from the above mentioned localities.

Distribution : Throughout India.

Habitat : It is a colonial and arboreal species that prefers to roost in fruit bearing trees or other vegetation. It lives singly or in small groups among palm leaves, aerial roots of banyan trees, tree hollows and similar situations. These bats also have a very good sense of smell and a good memory for the location and fruiting time of the trees often flies off with ripe fruit to roost and eat at leisure.

Status : A common species locally.

Conservation Status : IUCN : Lower Risk-Least Concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule V.*

Remarks : Prater (1980) reports that its usefulness as a cross-pollinator and seed dispersal agent is perhaps offset by its destructiveness in orchards.

Family RHINOPOMATIDAE

8. *Rhinopoma hardwickei* Gray

1831. *Rhinopoma hardwickei* Gray, Zool. Misc., : 37.
 1951. *Rhinopoma hardwickei hardwickei* Gray, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 102.
 1992. *Rhinopoma hardwickei* Gray, Corbet and Hill. *The Mammals of the Indomalayan region* : 82.
 1997. *Rhinopoma hardwickei* Gray, Bates & Harrison, *Bats of the Indian Subcontinent* : 35-37.

Common Name : English : Mouse-tailed bat, Marathi : Watwaghul.

Diagnostic Characters : A medium-sized mouse-tailed bat with forearm length in the range of 53 to 64 mm. Tragus present. The species is characterized by the presence of exceptionally long and slender tail (56-78 mm) exceeding forearm length. The tail originates from the edge of the uropatagium, muzzle with thick and prominent narial swelling, dorsal side grayish brown with the belly essentially gray.

Locality : Melghat Tiger Reserve area.

Material Examined/Sightings : None.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : It is a colonial species that prefers to roost in caves, old ruins, tunnels in forests. It is adapted for life in drier conditions, it often lives in crevices, if disturbed it creeps up in a crab-like fashion. The colonies are sexually segregated.

Status : Not a very common species locally; **Conservation Status :** IUCN : Lower Risk-Near Threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Nil.*

Remarks : Corbet and Hill (1992) report that Qumsiyeh & Jones (1986) have reviewed the taxonomic status of *Rhinopoma hardwickei*.

Family EMBALLONURIDAE

*9. *Taphozous m. melanopogon* Temminck

1841. *Taphozous melanopogon* Temminck, *Monographies de mammalogie...tome, 2* : 287.

1951. *Taphozous melanopogon melanopogon* Temminck, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 105.
1992. *Taphozous melanopogon melanopogon* Temminck, Corbet and Hill. *The Mammals of the Indomalayan region* : 86.
1997. *Taphozous melanopogon* Temminck Bates & Harrison, *Bats of the Indian Subcontinent* : 42-44.

Common Name : English : Black-bearded tomb bat, Marathi : Watwaghul.

Diagnostic Characters : A medium-sized bat species with comparatively longer forearm (range : 60-68 mm) than that of *T. longimanus*. Tail with its terminal portion protruding from the dorsal surface of the interfemoral membrane. The tail emerges from the upper half of the broad membrane near mid-point. Second finger without phalanges, third metacarpal relatively short (range 84-92.7% of the forearm length), gular sac absent in both the sexes, chin and throat are always hairy, black beard on chin present in male, tragus present in ears, condylobasal length less than 22 mm, upper incisors 1 : 1 while lower incisors 2 : 2, pelage colour is variable ranging from russet brown to almost black on the back, while the belly is usually paler.

Locality : Chikhaldara.

Material Examined/Sightings : Collected & studied six specimens netted from Gavilgad Fort in Chikhaldara.

Distribution : Throughout India.

Habitat : It is a colonial species that prefers to roost in hilly and forested areas with freshwater lakes, pond, river etc. in vicinity. It has been collected at different altitudes. It is a gregarious species living in diurnal roosts that are usually located in ruins, temples caves etc. Colony size varies at different places. Males and females are segregated, either living in separate colonies or spatially separated within the same colony (Brosset, 1962 d), it is an extremely alert and agile species which can scuttle in a crab-like manner across vertical walls.

Status : A common species locally.

Conservation Status : IUCN : Lower Risk-Near Threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : Bates *et al.* (1994 b) report Champba Baoli at Mandu as super roost where they could notice thousands of individuals.

10. *Taphozous l. longimanus* Hardwicke

1821. *Taphozous longimanus* Hardwicke, *Trans. Linn. Soc. Lond.*, 14 : 525.
1951. *Taphozous longimanus longimanus* Hardwicke, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 104-105.

1992. *Taphozous longimanus longimanus* Hardwicke, Corbet and Hill. *The Mammals of the Indomalayan region* : 86.

1997. *Taphozous l. longimanus* Hardwicke, Bates & Harrison, *Bats of the Indian Subcontinent* : 39-42.

Common Name : English : Long-winged tomb bat/Long-armed Sheath-tailed Bat;
Marathi : Watwaghul.

Diagnostic Characters : A small species of *Taphozous* with comparatively a short forearm (range : 55-62 mm) and broad club - shaped tragus. Muzzle simple and without noseleaf. Gular sac present in males, but rudimentary in females. Tail with its terminal portion protruding from the dorsal surface of the interfemoral membrane. The tail emerges from the upper half of the broad membrane near mid-point, second finger without phalanges, third metacarpal relatively long (range 96–109.4 % of the forearm length), chin and throat are normally naked, condylobasal length less than 22 mm, upper incisors 1 : 1 (minute or sometimes absent) while lower incisors 2 : 2, pelage colour dark brown dorsally and light brown ventrally.

Locality : Amaravati Dist. (Bates and Harrison, 1998).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : It is a colonial species that prefers to roost in small colonies and has a wide habitat tolerance. It is found in divergent climatic regions ranging from arid areas in Gujarat to humid climatic zones of the south. Its diurnal roosts includes ruins, temples caves, old buildings wells, hollow banyan or peepal tree branches (Bates and Harrison, 1997) etc. Males and females segregate during non-breeding season.

Status : Bates and Harrison (1997) have listed many localities from India, the species appears to be common.

Conservation Status : IUCN : Lower Risk-Least Concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : Bates and Harrison (1997) report that *T. longimanus* appears to be unable to compete with the other members of the genus such as *T. melanopogon* and/or *T. perforatus* and is not found in the same diurnal roosts.

11. *Taphozous (Liponycteris) nudiventris* Cretzschmar

1830-31. *Taphozous nudiventris* Cretzschmar J. *Saugethiere In Atlas zu der Reise im nordlichen Afrika von Edouard Ruppell* : 70.

1951. *Taphozous (Liponycteris) nudiventris* Cretzschmar, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 105-106.

1992. *Taphozous (Liponycteris) nudiventris* Cretzschmar, Corbet and Hill. *The Mammals of the Indomalayan region* : 87.
1997. *Taphozous (Liponycteris) nudiventris* Cretzschmar, Bates & Harrison, *Bats of the Indian Subcontinent* : 46-48.

Common Name : English : Naked-rumped tomb bat; Marathi : Watwaghul.

Diagnostic Characters : A medium-sized species of *Taphozous* with comparatively long forearm (range : 71-80 mm) and a club-shaped with flat top tragus. The species is characterised by its naked rump, especially in the post-monsoon season. Muzzle simple and without noseleaf. Prominent Gular sac present in males, additionally there is a deep circular gland in the upper part of the chest. In females the gular sac is less visible and the gland is absent. Tail with its terminal portion protruding from the dorsal surface of the interfemoral membrane. The tail emerges from the upper half of the broad membrane near mid-point, second finger without phalanges, chin and throat are essentially naked radio-metacarpal pouch is moderately developed on the wings, band of hairs close to the pouch is seen, the skull is robust with average condylobasal length of 23.4 mm, upper incisors 1 : 1 while lower incisors 2 : 2 pelage colour dark brown dorsally and light brown ventrally.

Locality : Melghat Tiger Reserve, Amaravati Dist.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : It is a colonial species that prefers to roost in small colonies. It is generally found in less rainfall regions. Its diurnal roost includes ruins, temples, caves, old buildings, tombs, barns, houses, crevices in rocks, wells, underground tunnels etc. (Bates and Harrison, 1997).

Status : Bates and Harrison (1997) have listed many localities from India, the species appears to be fairly common in some regions.

Conservation Status : IUCN : Lower Risk-Near Threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Nil.

Remarks : Bates and Harrison (1997) report that *T (Liponycteris) nudiventris* appears to associate with *Rousettus leschenaulti* and *Hipposideros speoris*. The flight of the species is strong, fast and straight.

12. *Saccolaimus saccolaimus* (Temminck)

1838. *Taphozous saccolaimus* Temminck, *Tijdschrift Natuurl. Gesch. Physiol.*, 5 : 14.
1951. *Taphozous (Saccolaimus)saccolaimus* Temminck, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 106.

1992. *Taphozous (Saccolaimus) saccolaimus* Temminck, Corbet and Hill, *The Mammals of the Indomalayan region* : 87.
1993. *Saccolaimus saccolaimus* (Temminck) By Karl F. Koopman. In : Wilson & Reeder, *Mammal Species of the World* : 159.

Common Name : English : Pouch bearing bat; Marathi : Watwaghul.

Diagnostic Characters : A medium-sized bat species with forearm in the range : 63-68mm with no radio-metacarpal Pouch on the wings. Tragus present. Muzzle simple and without noseleaf. Prominent Gular sac present in males, while in females it is less prominent. Tail with its terminal portion protruding from the dorsal surface of the interfemoral membrane. The tail emerges from the upper half of the broad membrane near mid-point. The chin and sides of the gular sac are covered with very short hairs. The lower lip has a deep narrow groove and ears are comparatively small. The feet are devoid of conspicuous long hairs like those seen in *nudiventrus*. the skull is large with average condylobasal length of 22.6 mm. The dentition is robust with an average upper toothrow length of 10.3mm and fairly large first upper premolar. Pelage colour dark brown or black dorsally and greyish brown ventrally.

Locality : Melghat Tiger Reserve, Amaravati Dist.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : It is a colonial species that prefers to roost in small colonies with both the sexes sharing same roost. It is generally found in forested areas. The favoured diurnal roost includes hollow trees, roofs of the old buildings, rock crevices, ruins, caves etc. (Bates and Harrison, 1997). It always squeaks as it flies; **Status** : Bates and Harrison (1997) have listed number of localities from India, the species appears to be fairly common in some regions.

Conservation Status : IUCN : Data Deficient (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act(1972, as amended upto 1991) Schedule* : Nil.

Remarks : Bates and Harrison (1997) and Corbet and Hill (1992) preferred to retain *Saccolaimus* as a subgenus of Genus *Taphozous*. However, Wilson and Reeder (1993), on the basis of the observations made by Barghorn (1977), treated *Saccolaimus* as a separate genus.

Family MEGADERMATIDAE

*13. *Megaderma spasma horsfieldii* Blyth

1863. *Megaderma horsfieldii* Blyth, *Cat. Mamm. Mus. Asiat. Soc., Bengal* : 23.
1951. *Megaderma spasma horsfieldi* Blyth, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 108.

1992. *Megaderma spasma horsfieldi* Blyth, Corbet and Hill. *The Mammals of the Indomalayan region* : 90.

1997. *Megaderma spasma horsfieldi* Blyth, Bates & Harrison *Bats of the Indian Subcontinent* : 54-55.

Common Name : English : Lesser false vampire bat; Marathi : Watwaghul.

Diagnostic Characters : A medium-sized bat species with forearm in the range : 54-62 mm and large ears attached to each other near their bases at about 10-15% of the height of the inner margin. Bifid tragus and long, erect and vertical noseleaf, both, present in the family. Tail absent, but interfemoral membrane broad. Noseleaf short (6.5 mm) with convex sides, a longitudinal ridge and a distinct heart-shaped base. The skull small with average condylobasal length of 22.7 mm. Pelage colour deep grey dorsally and pale grey ventrally.

Locality : Tarubanda Rest House in Kolkaz area, Melghat Tiger Reserve.

Material Examined/Sightings : Collected five specimens from the above mentioned locality during the project period.

Distribution : Throughout peninsular India.

Habitat : It is a colonial species that prefers to roost in small colonies with both the sexes sharing same roost. It is generally confined to the humid and forested biomes. The favoured diurnal roost includes roofs of the old buildings, ruins, caves, man made sites, temples, wells etc. (Bates and Harrison, 1997).

Status : Bates and Harrison (1997) have listed number of localities from India, the species appears to be a bit uncommon in some regions.

Conservation Status : IUCN : Data Deficient (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : Bates and Harrison (1997) have not offered any comments on the subspecific status of the nominate subspecies. The Subspecific status of *M. spasma* has been retained here on the basis of the observations made by Corbet and Hill (1992). Bates and Harrison (1997) report that the species is widespread but probably never abundant. *M. spasma* is a secretive species the population of which is fairly stable but vulnerable due to destruction of its forest habitat.

14. *Megaderma l. lyra* Geoffroy

1810. *Megaderma lyra*, Geoffroy E., *Ann. Mag. Hist. Nat. Paris*, 15 :190.

1951. *Megaderma (Lyroderma) lyra, lyra* Geoffroy E, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 108.

1992. *Megaderma l. lyra*, Geoffroy E., Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 58-59 (Published : Director, Zool. Surv. India).

1997. *Megaderma l. lyra*, Geoffroy E., Bates & Harrison, *Bats of the Indian Subcontinent* : 51-54..

Common Name : English : Indian false vampire bat; Marathi : Watwaghul.

Diagnostic Characters : A larger and robust bat species with forearm in the range : 56-71.5 mm (Average : 66.4 mm) and large and oval ears which have a fringe of white hairs on their inner margins. The ears are attached to each other medially for between one third and half length. Bifid tragus and long, erect and vertical noseleaf, both, present in the family. Tail absent, but interfemoral membrane broad. Noseleaf tall (about 10 mm) and straight-sided longitudinal ridge and a simple rounded horizontal base. The skull comparatively larger with average condylobasal length of 25.4 mm. Pelage colour slaty grey dorsally and pale grey ventrally.

Locality : Melghat Tiger Reserve.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : It is a colonial species with both the sexes many a times sharing same roost. The species is widely distributed and it is found in different habitats. Favoured diurnal roost includes roofs of the old buildings, ruins, caves, man made sites, temples, forts, underground tunnels, wells etc. (Bates and Harrison, 1997). Gopalkrishnan and Badwaik (1989) collected the specimens from cow-sheds and grain godowns.

Status : Bates and Harrison (1997) have listed number of localities from India, the species appears to be fairly common in the distributional range.

Conservation Status : IUCN : Lower risk-Least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Nil.

Remarks : *Megaderma l. lyra* has been kept here under genus *Megaderma* on the basis of the observations made by Wilson and Reeder (1993), Bates and Harrison (1997) and Agrawal *et al.* (1992).

Family RHINOLOPHIDAE

15. *Rhinolophus luctus* Temminck

1834. *Rhinolophus luctus* Temminck, *Tijdschrift Natuurl. Gesch. Physiol.*, 1 : 23.

1951. *Rhinolophus luctus luctus* Temminck, Ellerman and Morrison - Scott, *Checklist of Palaearctic and Indian Mammals* : 121.

1992. *Rhinolophus luctus* Temminck, Corbet and Hill. *The Mammals of the Indomalayan region* : 92.

1997. *Rhinolophus luctus* Temminck, Bates & Harrison, *Bats of the Indian Subcontinent* : 73-74.

Common Name : English : Wooly or Great Eastern Horseshoe bat; Marathi : Watwaghul.

Diagnostic Characters : A largest species of *Rhinolophus* group of insect eating bat species with most complex noseleaf on the muzzle. Noseleaf with erect posterior lancet, a lower horizontal horseshoe surrounding the nostrils and a perpendicular median sella present. Pronounced basal lappets are present on the sides of the sella (Bates and Harrison, 1997). The horse-shoe is very broad and the forearm large in the range of 70-80.5 mm (Average : 74.8 mm). The ears are pointed, each with well developed antitragal lobe but no tragus. The skull comparatively larger with average condylo-canine length of 28 mm. Pelage is dark, long and wooly in texture.

Locality : Melghat Tiger Reserve Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : It is not a colonial species, but it prefers to live in pairs. It is a forest dweller which is mainly confined to mountainous regions. Its diurnal roost includes caves, hollow trees, outhouses etc. (Bates and Harrison, 1997).

Status : Though Corbet and Hill (1992) have reported the distribution of the species throughout India, Bates and Harrison (1997) have listed very few collection localities from India. The population status of the species appears to be unclear.

Conservation Status : IUCN : Data Deficient (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : Though worldwide in distribution, the species appears to be secretive in nature.

16. *Rhinolophus r. rouxii* Temminck

1835. *Rhinolophus rouxii* Temminck, *Monogr. Mammal.*, 2 : 30b.

1951. *Rhinolophus rouxii rouxii* Temminck, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 114.

1992. *Rhinolophus rouxii* Temminck, Corbet and Hill, *The Mammals of the Indomalayan region* : 103-104.

1997. *Rhinolophus rouxii* Temminck, Bates & Harrison, *Bats of the Indian Subcontinent* : 61-64.

Common Name : English : Rufous/Roux's Horseshoe bat; Marathi : Watwaghul.

Diagnostic Characters : A species of the monogeneric family, *Rhinolophidae*. An insect eating nominate bat species with most complex noseleaf on the muzzle. Noseleaf is broader with an erect posterior lancet of varying height, sometimes triangular in shape with straight sides, sometimes with a well developed tip and concave margins below. A lower horizontal horseshoe surrounding the nostrils and a perpendicular median sella present.

(Bates and Harrison, 1997). The tail is well developed and included in the interfemoral membrane. The forearm short and in the range of 46-52mm (Average : 49.3 mm). The ears are pointed, each has a well developed antitragal lobe, but has no tragus. The skull size varies considerably with condylo-canine length ranging from 17.4 to 21.0 mm. Pelage is soft and silky varying in colours from orange to brown to grey.

Locality : Melghat Tiger Reserve Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : It is a colonial species, size varying from few individuals to several hundreds (Bates and Harrison, 1997). It is a forest dweller which is mainly confined to mountainous regions. Its diurnal roost includes caves, hollow trees, outhouses wells, temples barns etc. (Bates and Harrison, 1997).

Status : Though Corbet and Hill (1992) have reported the distribution of the species throughout India, Bates and Harrison (1997) have listed isolated collection localities from India excluding central part. According to them the population status of the species appears to be fairly common.

Conservation Status : IUCN : Lower risk-Near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Nil.

Remarks : According to Brosset (1962b), there is vigorous sexual segregation for at least part of the year with the males living alone or in small groups, while females living in large colonies. Sreenivasan *et al.* (1973) suggest that males are excluded from the colonies during the period of parturition and lactation.

Family HIPPOSIDERIDAE

17. *Hipposideros ater ater* Templeton

1848. *Hipposideros ater ater* Templeton, In Blyth, *Journal Asiat. Soc. Bengal.*, 17 : 252
1951. *Hipposideros bicolor ater* Templeton, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 127.
1992. *Hipposideros ater ater* Templeton, Corbet and Hill, *The Mammals of the Indomalayan region* : 108.
1997. *Hipposideros ater ater* Templeton, Bates & Harrison, *Bats of the Indian Subcontinent* : 81-84.

Common Name : English : Dusky Leaf-nosed bat; Marathi : Watwaghul.

Diagnostic Characters : The Leaf-nosed bats are a large family of insect eating bat species which are closely related to Rhinolophidae. Noseleaf on the muzzle in this family is simpler than that of Rhinolophid bat species. Noseleaf has a different form and shape. It consists of a horizontal horseshoe with an intermediate leaf and a simple posterior leaf

(comprising four cells and three septa but without vertical processes) The anterior leaf is without supplementary alar leaflets or a median emargination (Bates and Harrison, 1997). Sella and connecting process are absent in this family. *H. ater* is a small species of *Hipposideros*. The forearm is significantly short and in the range of 35-38 mm (Average : 36.3 mm). The tail is well developed, relatively long and enclosed in the interfemoral membrane except for the extreme tip. The ears are small, each has a well developed antitragal lobe, but has no tragus. The skull size small with condylo-canine length ranging from 13.2 to 14.2 mm. (Average 13.6 mm). The feet are small. In the wings, fourth metacarpel exceeds the fifth in length while the third is shortest. There are four nasal inflations on slightly rounded rostrum. Pelage is variable in colours from dull yellow to dark brown to pale grey.

Locality : Melghat Tiger Reserve Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : It is a colonial species living in small colonies. It favours the wet lowland regions where it is found roosting in lofts of village houses, old dwellings, abandoned mines, low dark culverts, deep wells, deep hollows in walls etc. (Bates and Harrison, 1997).

Status : Though Corbet and Hill (1992) have reported the distribution of the species throughout India, Bates and Harrison (1997) have listed isolated collection localities from India. According to them the populations are geographically very widespread and not threatened.

Conservation Status : IUCN : Lower risk-Near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Nil.

Remarks : According to Bates and Harrison (1997) the colonies consist of the individuals of both the sexes.

18. *Hipposideros fulvus fulvus* Gray

1838. *Hipposideros fulvus* Gray, Mag. Zool. Bot., 2 : 492.

1951. *Hipposideros bicolor fulvus* Gray, Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 127.

1992. *Hipposideros fulvus fulvus* Gray, Agrawal, V. C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 64-65 (Published : Director, Zool. Surv. India).

1997. *Hipposideros fulvus fulvus* Gray, Bates & Harrison, *Bats of the Indian Subcontinent* : 86-88.

Common Name : English : Fulvous Leaf-nosed bat; Marathi : Watwaghul.

Diagnostic Characters : This is a medium-sized species of *Hipposideros* with

characteristically very large ears. Tips of the ears are broadly rounded off. Noseleaf is almost similar to that of *H. ater* in general morphology and its greatest width is about 5 mm. Internarial septum narrow, not inflated, and narrowed between the nostrils. The forearm is more than that of *H. ater* and in the range of 38-44 mm (Average : 40.4 mm). The skull size comparatively larger with condylo-canine length ranging from 15.0 to 16.4 mm. With an average of 15.6 mm. Pelage is variable in colours ranging from dull yellow, to pale grey and golden-orange.

Locality : Chikhalda, Dist. Amaravati, Maharashtra State (Bates and Harrison, 1997).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : It is a colonial species living in small colonies. Its favoured diurnal roosts include old dwellings, caves, tunnels, cellars, dilapidated buildings, wells, and cool and damp places in the proximity of water and shades (Bates and Harrison, 1997).

Status : Bates and Harrison (1997) have listed number of isolated collection localities from India. The populations are geographically widespread and common but not threatened.

Conservation Status : IUCN : Lower risk-Near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972) (as amended upto 1991) Schedule* : Nil.

Remarks : According to Bates and Harrison (1997) the species is endemic to the Indian subcontinent except for a marginal population in Eastern Afghanistan.

19. *Hipposideros galeritus brachyotus* (Dobson)

1874c. *Phyllorhina brachyota* Dobson, *Journal Asiat.. Soc. Bengal.*, 43(2) : 237-238.

1951. *Hipposideros galeritus brachyotus* (Dobson), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 129.

1992. *Hipposideros galeritus brachyotus* (Dobson), Corbet and Hill, *The Mammals of the Indomalayan region* : 110.

1997. *Hipposideros galeritus brachyotus* (Dobson), Bates & Harrison, *Bats of the Indian Subcontinent* : 92-93.

Common Name : English : Cantor's Leaf-nosed bat; Marathi : Watwaghul.

Diagnostic Characters : This is a medium-sized species of *Hipposideros* with fifth metacarpal significantly shorter than the fourth and third. Ears are broad at the base, triangular in shape and possess concavity below the narrowly rounded-off tips on the posterior border. They are distinctly smaller than those of *H. fulvus*. Noseleaf is simple and almost similar to that of *H. ater*, broader & differing in the presence of two pairs of well developed supplementary lateral leaflets. Internarial septum is small, triangular

shaped and with a narrow base. The forearm is fairly long and more than that of *H. ater* (range : 45-51.3 mm and average : 47.2 mm). The skull size comparatively smaller with condylo-canine length ranging from 14.6 to 15.8 mm. with an average of 15.0 mm. Pelage is variable in different shades of brown colour.

Locality : Chikhalda, Dist. Amaravati, Maharashtra State (Bates and Harrison, 1997).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : It is a very widespread species which is common in at least part of its range. Only isolated individuals or small colonies of a very few individuals have been observed in India (Brosset, 1962b). Its favoured diurnal roost include old dwellings, artificial caves and tunnels, dilapidated buildings etc. Specimens were also collected from fort and temple in Chikhalda (Brosset, 1962b).

Status : Bates and Harrison (1997) have listed number of isolated collection localities from India. The populations appears to be geographically widespread but with a relatively low population density. Khajuria, (1980) considers it to be a rare species in India.

Conservation Status : IUCN : Data Deficient (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : *H. galeritus* specimens collected from Indian localities have been referred to as *Hipposideros galeritus brachyotus* by Corbet and Hill (1992) and Bates and Harrison (1997).

20. *Hipposideros lankadiva indus* (Andersen)

1918. *Hipposideros indus* Andersen, *Annals. Mag. Nat. Hist.*, 2 : 382

1951. *Hipposideros lankadiva indus* (Andersen), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 125.

1992. *Hipposideros lankadiva indus* (Andersen), Corbet and Hill, *The Mammals of the Indomalayan region* : 113.

1997. *Hipposideros lankadiva indus* (Andersen), Bates & Harrison, *Bats of the Indian Subcontinent* : 99-100.

Common Name : English : Kelaart's Leaf-nosed bat; Marathi : Watwaghul.

Diagnostic Characters : This is a large species of *Hipposideros* with forearm length in the range of 75-99 mm (Average 86.3 mm). Ears are large and acutely pointed at the tip. Noseleaf possesses four supplementary leaflets bordering the horseshoe. However, the fourth is much reduced or sometimes absent. The anterior leaf is without a median emargination. Internarial septum is not inflated, but the narial lappets are well developed. The skull size comparatively robust with condylo-canine length ranging from 24.8 to 31.5

mm. with an average of 28.6 mm. Pelage is variable in colour ranging from pale cream to orange or even bright red.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State (Corbet and Hill, 1992).

Material Examined/Sightings : Nil.

Distribution : Central India (Corbet and Hill, 1992).

Habitat : The subspecies is only known from a relatively few colonies in Central India. However size of the each colony is very large. Its favoured diurnal roost includes old dwellings, caves and tunnels, dilapidated buildings, temples etc.

Status : Bates and Harrison (1997) have listed limited number of isolated but large colonies in India. Possible threats includes human disturbance of roosts.

Conservation Status : IUCN : Vulnerable (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Nil.

Remarks : *Hipposideros lankadiva indus* is a high flyer and may be seen in the early evening in the company of *Pipistrellus* spp. It is also known to share the roost with *Taphozous melanopogon* and *Megaderma lyra* (Khajuria, 1984).

21. *Hipposideros speoris speoris* (Schneider)

1800. *Vespertilio speoris* Schneider, In Schreber, J. C. D. *Die Säugethiere* : 59 b.

1951. *Hipposideros speoris speoris* (Schneider), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 124.

1992. *Hipposideros speoris speoris* (Schneider), Corbet and Hill, *The Mammals of the Indomalayan region* : 113.

1997. *Hipposideros speoris speoris* (Schneider), Bates & Harrison, *Bats of the Indian Subcontinent* : 93-96.

Common Name : English : Schneider's Leaf-nosed bat; Marathi : Watwaghul.

Diagnostic Characters : This is a large species of *Hipposideros* with markedly small ears. Noseleaf possesses three supplementary leaflets bordering the horseshoe. However, the outer one is distinctly smaller than the other two. The anterior leaf is without a median emargination and measures about 5.0 mm at its widest part excluding leaflets. The posterior leaf is divided into four cells by three vertical septa. A frontal sac is present in males and in females, it is represented by tuft of hairs. The forearm length averages 50.7 mm (45.6-54 mm). The narial lappets are well developed. The skull size comparatively larger than that of *H. galeritus* with condylo-canine length ranging from 15.9 to 17.5 mm with an average of 16.6 mm. Pelage is variable in colour ranging from pale grey to orange brown.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State (Corbet and Hill, 1992).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The subspecies is known to occur in a variety of biotopes ranging from dry, flat country to forested hills. It has been collected from the altitude around 4500 Ft. (1385 Mts.). Its favoured diurnal roost includes crevices in hills, caves, caverns, tunnels, dilapidated buildings, temples etc. (Bates and Harrison, 1997). A colonial species with colony size ranging from a few individuals to thousands of individuals.

Status : Bates and Harrison (1997) have listed number of isolated but large colonies in India. **Conservation Status** : IUCN : Lower risk-Near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : *Hipposideros speoris speoris* (Schneider) is a low flyer close to ground with skilled slow flights. It is also known to share the roost with *H. fulvus* and *Megaderma lyra* (Bates and Harrison, 1997)

Family VESPERTILIONIDAE

Subfamily VESPERTILIONINAE

***22. *Scotophilus kuhlii kuhlii* Leach**

1822. *Scotophilus kuhlii* Leach, *Trans. Linn. Soc. Lond.*, 13 : 72.

1992. *Scotophilus kuhlii kuhlii* Leach, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 81-82 (Published : Director, Zool. Surv. India).

1992. *Scotophilus kuhlii kuhlii* Leach Corbet and Hill, *The Mammals of the Indomalayan region* : 129.

Common Name : English : Asiatic Lesser Yellow House bat; Marathi : Watwaghul.

Diagnostic Characters : This is a species of a family which has almost world-wide distribution with the exception of polar regions. Muzzle simple and without any complex structure of noseleaf. Ears relatively small, rounded at the tip, tragus semilunar, markedly convex on posterior border. Its tip projecting forward. Tip of the tail free. Smaller in all respects than *S. heathii*. Average forearm length tends to be at 49.00 mm (44.00-56.4 mm). Fur short and dense. Pelage often chestnut/tawny brown above, yellow/buff below. The skull size comparatively smaller than that of *S. heathii* with condylo-canine length ranging from 16.3 to 18.00 mm with an average of 17.3 mm.

Locality : Sipna river near Semadoh Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Collected three specimens from the above mentioned locality during the project period.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The subspecies is known to occur at different altitudes ranging from sea level to 1111 metres in Western Ghats. It is frequently found in association with man in towns and villages. Its favoured diurnal roost includes roofs and crevices in houses, caves, tunnels, dilapidated buildings, temples, holes in walls dry leaves of trees etc. (Bates and Harrison, 1997). A colonial species colony size ranging from a few individuals to hundreds of individuals. Both sexes live together.

Status : Bates and Harrison (1997) have listed number of collection localities in India. According to them the distribution is worldwide and status fairly common.

Conservation Status : IUCN : Lower risk- Near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Nil.

Remarks : *Scotophilus kuhlii kuhlii* Leach is one of the first bats to appear in the evening with slow and steady flights. The colonies are characterised by their unpleasant smell.

***23. *Scotophilus heathi heathi* (Horsfield)**

- 1831. *Nycticejus heathi* Horsfield *Proc. Zool. Soc. Lond.*, : 113.
- 1951. *Scotophilus heathi heathi* (Horsfield), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 179.
- 1992. *Scotophilus heathi heathi* Horsfield, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3 (Part-1)* : 82-83 (Published : Director, Zool. Surv. India).
- 1992. *Scotophilus heathi heathi* Horsfield Corbet and Hill, *The Mammals of the Indomalayan region* : 129.
- 1997. *Scotophilus heathi heathi* Horsfield Bates & Harrison, *Bats of the Indian Subcontinent* : 146-149.

Common Name : English : Asiatic Greater Yellow House bat; Marathi : Watwaghul.

Diagnostic Characters : This is a larger and robust species of the family which has fairly wide distribution. Muzzle simple and without any complex structure of noseleaf. It is broad and blunt with swollen sides. Ears relatively small, possessing transverse ridges, tragus is half the height of the pinna and it is crescent in shape. Tail is long but enclosed mostly in the interfemoral membrane and with its terminal projecting free for 2-3 mm. Average forearm length 60.7 mm (55.4-65.8 mm). Fur short and fine. Pelage often chestnut/tawny brown in colour above, while yellow/buff reddish golden yellow below. The skull size comparatively robust than that of *S. kuhlii* with condylo-canine length ranging from 19.0 to 21.3 mm with an average of 20.2 mm.

Locality : Semadoh complex in Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined / Sightings : Collected two specimens from the above mentioned locality during the project period.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : The subspecies is known to occur at different altitudes ranging from sea level to 1400 metres in India. It is frequently found in association with man in towns and villages. Its favoured diurnal roost includes roofs and crevices in old buildings, caves, tunnels, hollows of large trees like banyan and peepal trees etc. (Bates and Harrison, 1997). A colonial species with colony size ranging from one to fifty individuals. There may be several clusters of individuals in the same building. Males and females form separate colonies in non-breeding seasons.

Status : Bates and Harrison (1997) have listed number of collection localities in India. According to them the distribution is fairly wide and status apparently common.

Conservation Status : IUCN : Lower risk-least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : *Scotophilus kuhlii kuhlii* Leach and *Scotophilus heathi heathi* (Horsfield) possess overlapping distribution.

24. *Pipistrellus ceylonicus indicus* (Dobson)

1878. *Vesperugo indicus* Dobson, *Cat. Chiroptera Br. Mus.* : 222.

1951. *Pipistrellus ceylonicus indicus* (Dobson), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 167.

1992. *Pipistrellus ceylonicus indicus* (Dobson), Agrawal V.C. *et al.*, *Fauna of West Bengal, State Fauna Series, 3 (Part-1)* : 76 (Published : Director, Zool. Surv. India).

1997. *Pipistrellus ceylonicus indicus* (Dobson), Bates & Harrison, *Bats of the Indian Subcontinent* : 177-179.

Common Name : English : Pipistrelle bat; Marathi : Pakoli.

Diagnostic Characters : These are the small Vespertilionid insectivorous bats of the subcontinent. Vespertilionidae is the largest family of bats (Corbet and Hill, 1992) with wide distribution. Muzzle simple and without any complex structure of noseleaf. Nostrils are directed antero-laterally and there is a distinct narial groove. The parahinal glandular swellings on the muzzle are well marked and naked. Ears tend to be short and broad. Tragus is half the height of the pinna. Tail is enclosed in the interfemoral membrane and with its extreme tip projecting free. This is a relatively large *Pipistrellus* species with average forearm length of 37.2 mm (33.0– 42.0 mm). Fur short. Pelage often uniform dark brown in colour above particularly the ears, naked areas of the face, wings and interfemoral membrane. The baculum is relatively small with slender upwardly curving shaft and a

bifid tip. Well-developed basal lobes deflected ventrally. The skull size robust with condylo-canine length ranging from 13.1 to 14.3 mm with an average of 13.7 mm. Inner upper incisor ($\frac{1}{2}$) usually bicuspid, outer large and similar in crown area to the inner.

Locality : Chikhaldia in Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State (Brosset, 1962c).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Bates and Harrison, 1997).

Habitat : This is an eclectic species which ranges from thorny forests of Pakistan to the highlands of Central Sri Lanka where it is known to occur at an altitude of 7000 Feet. It is frequently found in association with man in towns and villages. Its favoured diurnal roost includes roofs and crevices in old buildings, caves, tunnels, well, temples, hollows of large trees etc. (Bates and Harrison, 1997). A colonial species with colony size ranging from one to 200 individuals. The individuals do not suspend but cling to the surface. When on the ground, it can not fly but walks in a cumbersome manner.

Status : Bates and Harrison(1997) have listed number of collection localities in India. According to them the distribution is fairly wide and status apparently common.

Conservation Status : IUCN : Lower risk- least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Nil.

Remarks : Lal's (1984) view of treating Indian *Pipistrellus ceylonicus* populations as *Pipistrellus ceylonicus indicus* has been upheld by Corbet and Hill (1992) and Bates and Harrison (1997).

25. *Pipistrellus coromandra coromandra* (Gray)

1838. *Scotophilus coromandra* Gray, Mag. Zool. Bot., 2 : 498.

1951. *Pipistrellus coromandra coromandra* (Gray), Ellerman and Morrison-Scott, Checklist of Palearctic and Indian Mammals : 166.

1992. *Pipistrellus coromandra coromandra* (Gray), Agrawal, V.C. et al., Fauna of West Bengal, State Fauna Series, 3 (Part-1) : 73-74 (Published : Director, Zool. Surv. India).

1997. *Pipistrellus coromandra coromandra* (Gray) Bates & Harrison, Bats of the Indian Subcontinent : 172-174.

Common Name : English : Coromandel Pipistrelle, Indian Pipistrelle, Little Indian bat; Marathi : Pakoli.

Diagnostic Characters : These are small vespertilionid insectivorous bats of the subcontinent with average forearm length of 30.0 mm (25.5–34.3 mm). Externally it is difficult to separate *Pipistrellus coromandra* from *P. tenuis*. Muzzle simple and without any complex structure of noseleaf. In general *P. coromandra* appears to be comparatively larger,

but there are significant overlappings in the external measurements. Even the pelage colour is varying between the individuals. Fur short. Pelage often uniformly brown in colour above with shades varying from chestnut to dark clove brown, while the ventral surface is conspicuously paler. Tail is enclosed in the interfemoral membrane with its extreme tip projecting free. The baculum has a straight shaft with a distinctly bifid tip. The basal lobes deflected ventrally. The skull with condylo-canine length ranging from 10.6 to 11.9 mm with an average of 11.2 mm. is comparatively larger than that of *P. tenuis*. Shape of upper incisors like previous species, since it is a subgeneric character.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : Very little is known about the habit and habitat of this species. Its recorded diurnal roost includes roofs and crevices in old buildings, caves, large trees etc. (Bates and Harrison, 1997). A colonial species with colony size ranging from 8 to 25 individuals. An early flyer, emerging out of the roost within minutes before sunset.

Status : Bates and Harrison (1997) have listed number of collection localities in India. According to them the distribution is fairly wide and status apparently common in India.

Conservation Status : IUCN : Lower risk- near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : The flight of *P. coromandra* is rather slow, fluttering and erratic. It hunts around big trees and flies amongst the foliage.

26. *Pipistrellus tenuis mimus* Wroughton

1899. *Pipistrellus mimus* Wroughton. *J. Bombay nat. Hist. Soc.*, 12 : 722.

1992. *ipistrellus mimus* Wroughton Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 74-76 (Published : Director, Zool. Surv. India).

1992. *Pipistrellus tenuis* (Temminck), Corbet and Hill, *The Mammals of the Indomalayan region* : 136-137.

1997. *Pipistrellus tenuis mimus* Wroughton, Bates and Harrison, *Bats of the Indian Subcontinent* : 174-177.

Common Name : English : Least Pipistrelle, Indian Pygmy Pipistrelle, Indian Pygmy bat; Marathi : Pakoli.

Diagnostic Characters : These are the smallest pipistrelle of the subcontinent with average forearm length of 27.7 mm (25.0–32.2 mm). However externally it is very difficult to separate younger individuals of *Pipistrellus coromandra* from *P. tenuis mimus*. Muzzle simple and without any complex structure of noseleaf. In general *P. tenuis mimus* appears to be

comparatively smaller. Fur dense and short. Pelage often uniformly bistre brown in colour above, while the ventral surface is conspicuously paler. Base of hairs almost black. Face, ears and wing membranes almost black in colour. Ears small and scarcely triangular. Tragus short and curved forward. Post-calcarial lobe present. Wings start from base of the toes. Tail is enclosed in the interfemoral membrane with its extreme tip projecting free. Baculum has a long thin shaft with a distinctly bifid tip. The basal lobes deflected ventrally. The skull with condylo-canine length ranging from 9.3 to 10.7 mm with an average of 10.2 mm is comparatively smaller than that of *P. coromandra*. The palate is noticeably narrower (4.9 mm). The post orbital constriction is relatively broad, but the braincase is small. The subgeneric character of shape of upper incisors is well represented in this species also.

Locality : Chikhald, Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State (Bates and Harrison. 1997).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The species is known to occur in wooded country and towns (Brosset, 1962c). The recorded diurnal roost includes roofs of bungalows, holes and crevices in walls of the old buildings, caves, large trees etc. (Bates and Harrison, 1997). A colonial species with colony size ranging from 6 to 20 individuals. The roosts are located 10-20 feet above the ground. An early flyer, emerging out of the roost within minutes before sunset. The emergence appears to be directly governed by the time of sunset.

Status : Bates and Harrison (1997) have listed number of collection localities in Indian subcontinent. According to them the distribution is fairly wide and status apparently common in India.

Conservation Status : IUCN : Lower risk- least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : The specimens from India are referred to *P. tenuis mimus* as suggested by Sinha (1980), Corbet and Hill (1992) and Bates and Harrison (1997).

27. *Pipistrellus d. dormeri* (Dobson)

1875. *Scotozous dormeri* Dobson. *Proc. Zool. Soc. Lond.*, : 373.

1992. *Scotozous dormeri* Dobson. Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 77-78 (Published : Director, Zool. Surv. India).

1992. *Scotozous dormeri* Dobson Corbet and Hill, *The Mammals of the Indomalayan region* : 142.

1997. *Pipistrellus d.dormeri* Dobson Bates & Harrison, *Bats of the Indian Subcontinent* : 185-187.

Common Name : English : Dormer's bat; Marathi : Pakoli.

Diagnostic Characters : This is a medium sized pipistrelle of the subcontinent with average forearm length of 34.4 mm (32.7-36.3mm). Muzzle simple and without any complex structure of noseleaf. The tail is considerably shorter than the head and body length. Fur dense and short. Pelage is uniformly grey brown in colour above, while the ventral surface is contrastingly paler. Base of hairs almost black. Face, ears and wing membranes almost mid-brown in colour. The baculum has a long, narrow and slightly sinuous shaft with a broad and weak bifid tip. The skull with condylo-canine length with an average of 13.3 mm (12.3 to 13.6 mm) is robust. Second upper incisor (i3) is absent or very minute. When present barely reaching the cingulum of the first upper incisor. The second upper incisor, when present, is closely adjacent to, or sometimes in contact with, the upper canine. Palate is concave and parallel sided.

Locality : Chikhalda, Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State (Bates and Harrison, 1997).

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The species is known to occur in close vicinity or in the midst of human habitation and also in remote villages (Brosset, 1962c). The recorded diurnal roosts of this gregarious species include roofs of bungalows, holes and crevices in walls of the old buildings, caves, monuments, old temples, tombs etc. (Bates and Harrison, 1997). A colonial species with colony size ranging from 2 to 24 individuals. Not a very early flyer with varying emerging time as per the season..

Status : Bates and Harrison (1997) have listed number of collection localities in Indian subcontinent. According to them the distribution is fairly wide and status apparently common in India..

Conservation Status : IUCN : Lower risk-Near Threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : The individuals of this species fly with the rapid wing beats with steady, glides. They hunt close to its roost.

Subfamily MINIOPTERINAE

28. *Miniopterus schreibersi fuliginosus* (Hodgson)

1835. *Vespertilio fuligenosa* Hodgson J. *Asiat. Soc. Beng.*, 4 : 700.

1992. *Miniopterus schreibersi fuliginosus* (Hodgson) Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 83-84 (Published : Director, Zool. Surv. India).

1992. *Miniopterus schreibersi fuliginosus* (Hodgson) Corbet and Hill, *The Mammals of the Indomalayan region* : 146.

1997. *Miniopterus schreibersi fuligenosus* (Hodgson) Bates & Harrison, *Bats of the Indian Subcontinent* : 198-201.

Common Name : English : Schreiber's Long-fingered bat; Marathi : Watwaghul.

Diagnostic Characters : This is a medium sized vespertilionid bat of the subcontinent with average forearm length of 47.0 mm (44.7–49.6 mm). Ears are small, tragus is tall, slender and slightly curved forward at the tip. It is half the height of pinna. The tail, interfemoral membrane and hind limbs are considerably longer. Each wing is characterised by a highly developed second phalanx of the third finger. The third finger (38.1 mm, 36.0 – 40.1 mm) is approximately three times the length of first phalanx. Fur is soft, silky and dark. Dorsal surface is in various shades of brown, while ventral side is slightly paler. Cheeks are naked below the eyes. The body is usually infected with numerous ectoparasites, especially Nycteribiids. The skull with condylo-canine length with an average of 14.1 mm. (13.6 to 14.8 mm) is marked by the inflation of the braincase anteriorly. The rostrum is low and flattened. The second upper incisor (i3) is flattened. Its cingulum forming a minute postero-external cusp. Upper canine is tall and slender exceeding the second upper premolar in height. The palate is slightly concave.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The species is known to occur in hilly and forested country. The colonies are large and situated in caves, caverns and crevices in rocks (Brosset, 1962c). Colony includes thousands of individuals. Brosset (1962c) suggested that there are two types of colonies. However, there only few large colonies in India.

Status : Bates and Harrison (1997) have reported the species as a common species throughout its extensive range.

Conservation Status : IUCN : Lower risk- Least Concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991)* Schedule : Nil.

Remarks : The individuals of this species are strong and fast flyers and leave their roosts soon after sunset. They do not stay near the roosts but fly directly away in different directions.

Family MOLOSSIDAE

29. *Tadarida (Chaerephon) plicata plicata* (Buchanan)

1800. *Vespertilio plicatus* Buchanan *Trans. Linn. Soc. Lond.*, 5 : 261, pl. 13.

1992. *Tadarida plicata plicata* (Buchanan) Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 68 (Published : Director, Zool. Surv. India).

1992. *Tadarida (Chaerephon) plicata plicata* (Buchannan) Corbet and Hill, *The Mammals of the Indomalayan region* : 159.
1997. *Tadarida (Chaerephon) plicata plicata* (Buchannan) Bates & Harrison, *Bats of the Indian Subcontinent* : 112-114.

Common Name : English : Wrinkle-lipped Free-tailed bat; Marathi : Watwaghul.

Diagnostic Characters : This is an insectivorous Molossid bat with a stout tail that projects conspicuously beyond the narrow interfemoral membrane. Muzzle broad and thick. Upper lip overhanging the lower, marked by pronounced verticle wrinkles. Ears large, thick and rounded, joined in front of the orbits by a band of skin. Tragus is rudimentary, while antitragus is usually large and well-defined. Tuft of hairs present on the dorsal side of the feet. Average forearm length 46.3 mm (43.1–50.2 mm). Fur soft, dense and very short. Dorsal surface dark clove brown, while the ventral parts paler. Skull with condylo-canine length with an average of 16.6 mm (15.9 to 17.1 mm) is marked by the fusion of the premaxillae and isolation of the two palatal foramina.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The species has been reported to roost in the caves and deserted stone buildings during day time. A colonial species with size of the colonies varying between 200 to 500 individuals Bates and Harrison (1997). The bats select warmer parts of the habitats for diurnal roost.

Status : Bates and Harrison (1997) have reported the distribution of the species world-wide, though very little is known about its population status in India. Moreover, number of the colonies located in India are very limited.

Conservation Status : IUCN : Data Deficient (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : The individuals of this species are strong, swift and high flyers. They fly with their ears facing downwardly.

30. *Tadarida aegyptiaca thomasi* Wroughton

1919. *Tadarida thomasi* Wroughton J. *Bombay nat. Hist. Soc.*, **26** : 732.
1992. *Tadarida aegyptiaca thomasi* Wroughton Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, **3** (Part-1) : 67-68 (Published : Director, Zool. Surv. India).
1992. *Tadarida aegyptiaca* (Geoffroy) Corbet and Hill, *The Mammals of the Indomalayan region* : 157-158.
1997. *Tadarida aegyptiaca thomasi* Wroughton Bates & Harrison, *Bats of the Indian Subcontinent* : 110-112.

Common Name : English : Egyptian Free-tailed bat; Marathi : Watwaghul.

Diagnostic Characters : This is a small-sized molossid bat with average forearm length of 48.2 mm. (46.0–52.3 mm). Tail stout projecting conspicuously beyond the narrow interfemoral membrane. Muzzle broad and thick. Upper lip is often wrinkled. Ears large, thick rounded and separated on the forehead. Tragus is small, while antitragus is usually large and well developed. Tuft of hairs present on the dorsal side of the feet. Fur is soft, dense and short. The dorsal surface is dark buffy brown to clove brown, while the ventral parts are paler. The skull with an average condylo-canine length of 17.9 mm. (17.1 to 18.8 mm) is marked by the presence of the unfused premaxillae leaving a larger palatal emargination extending posteriorly beyond incisor roots. Two pairs of lower incisors present.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Throughout India (Corbet and Hill, 1992).

Habitat : The species has been reported to roost in the crevices/cracks in caves, cliff faces, rocks, boulders, walls and deserted stone buildings etc. A colonial species with size of the colonies varying between single individual to more than thousand individuals (Bates and Harrison (1997).

Status : Bates and Harrison (1997) have reported the distribution of the species as worldwide with number of colonies in India. As per these authors the status of the species is common and widespread.

Conservation Status : IUCN : Lower risk–Near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Nil.

Remarks : The individuals of this species are strong, swift and high flyers. They fly with their ears facing downwards. They emerge out of their roosts about half an hour after the sunset. They hunt far away from the roosting sites at the height of 31 metres to 77 metres (Bates and Harrison (1997).

Order PRIMATES

Family CERCOPITHECIDAE

Subfamily CERCOPITHICINAE

***31. *Macaca mulatta mulatta* (Zimmermann)**

1780. *Cercopithecus mulatta* Zimmerman, *Geogr. Gesch. Mensch.*, 2 : 195.

1951. *Macaca mulatta mulatta* (Zimmerman), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 197.

1977. *Macaca mulatta* Pocock Roonwal and Mohnot, *Primates of South Asia*, Harward Univ. Press, London : 97.
1992. *Macaca mulatta* (Zimmerman), Corbet and Hill, *The Mammals of the Indomalayan region* :169-170.
1992. *Macaca mulatta mulatta* (Zimmerman), Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 89 (Published : Director, Zool. Surv. India).

Common Name : English : Rhesus Macaque; Marathi : Makad/Lal Makad.

Diagnostic Characters : Mammalian species under Order Primates are identified by combination of characters rather by one or two or unique characters. Most of the species are arboreal and characterized by presence of prehensile hands, feet and tail. There are five digits possessing flat nails each on hands and feet. Thumb opposable to other digits. Snout reduced with face almost flattened. Both eyes are situated on the same side and have developed stereoscopic vision. Brain comparatively more developed. Stance more upright which helped in evolution of bipedalism. Dentition more simpler than that in other mammalian orders. Rhesus Macaque is a medium sized monkey with rather short tail (usually about half the Head and Body Length). Crown hairs grow backwards from brows, without a part, whorl or cap. Bare face light pink, while upper back olive in colour. Loins, rump and base of the tail are orange red in colour which is a characteristic feature of Rhesus macaque and distinguishes it from any other Indian monkey.

Locality : Chikhaldara plateau Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Sighted troops on Chikhaldara plateau by number ZSI Survey parties.

Distribution : India North of Godavari river (Fooden *et al.*, 1981).

Habitat : The species is semi-arboreal, preferring to live in forested, mangrove swampy, as well as semi-desert, urban/semi-urban areas. Captive or wild, Rhesus is the common monkey of North India. Large troops live near or in villages/towns and in groves round tanks and temples. In jungles, they usually keep to the outskirts rarely entering into the deep forests. It's a common sight to see these monkeys mingling with the human element. They are bold and aggressive and raid the fields, gardens, establishments etc. The social organization of the Rhesus troops is based on male dominance.

Status : Roonwal and Mohnot (1977) and Prater (1980) have reported the status of the species as common and widespread in North India.

Conservation Status : IUCN : Lower risk- least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act* (1972, as amended upto 1991) *Schedule* : II, Part : I, *CITES* : Appendix : II.

Remarks : The species is involved in domestic as well as international trade for pharmaceutical purpose. There is an alarming increase in number of cases resulting in capture and export of live monkeys for experimental purposes also.

Subfamily COLOBINAE

*32. *Semnopithecus entellus entellus* (Dufresne)

1797. *Simia entellus* Dufresne, *Bull. Soc. Philom. Paris*, 1 (7) : 49.
1951. *Presbytis entellus entellus* (Dufresne) Ellerman J.R. & Morrison-Scott T.C.S. *Checklist of Palearctic and Indian Mammals* British Museum (Natural History) London : 204-205.
1977. *Presbytis entellus entellus* (Dufresne) Roonwal and Mohnot, *Primates of South Asia*, Harward Univ. Press, London : 236.
1989. *Semnopithecus entellus entellus* (Dufresne), Groves C.P. *A Theory of Human and Primate Evolution* Oxford Univ. Press N.Y., 375. In : *Mammal Species of the World* By Wilson D. R. and Reeder 1993 Ed. Smithsonian Institute Press Washington : 273.

Common Name : English : Common or Hanuman Langur; Marathi : Vanar.

Diagnostic Characters : As stated in the previous species, Order Primates is identified by combination of characters. Langur species are arboreal and characterized by presence of long limbs and tail which is longer than head and body length. There are five digits possessing flat nails each on hands and feet. Thumb opposable to other digits. Snout reduced with face almost flattened. Both eyes are situated on the same side and have developed stereoscopic vision. Brain comparatively more developed. Stance more upright which helped in evolution of bipedalism. They are black faced gray-bodied langurs with well developed eyebrows. Dentition more simpler than that in other mammalian orders. Adults have hairs behind the brows radiating from a frontal whorl. Body silvery gray with hands and feet black in colour.

Locality : Chikhaldara plateau, Semadoh, Dharni, Kolkazand Dhakna areas of Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Sighted number of troops at different times in the above mentioned localities by ZSI Survey parties during the project period.

Distribution : Practically whole of India.

Habitat : The species is more arboreal in habit than macaques. It lives in a variety of habitats ranging from plains to 3660 m altitude in the Himalayas and from relatively dry tropical forests to open forests, scrub jungles, and arid rocky areas with xerophytic vegetation. It is basically a deciduous forest animal not entering dense evergreen forests. It is quite at home among trees, jumping fearlessly from tree to tree, however, it also spends a good amount of time on ground as well. Though inquisitive in nature, it is shy and timid in wild. Captive or wild, langurs have shown association with man. Large troops live near or in villages/towns and in grooves round tanks and temples. In jungles, they usually keep to the outskirts rarely entering into deep forests. It's a common sight to see these monkeys mingling with the human element. Sometimes the langurs raid and damage the fields, gardens, orchards, establishments etc. Like *Rhesus* the social organization of the troops is based on male dominance.

Status : Roonwal and Mohnot (1977) and Prater (1980) have reported the status of the species as common and widespread in peninsular India.

Conservation Status : IUCN : Lower risk-least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act* (1972, as amended upto 1991) *Schedule : II, Part : I, CITES : Appendix : I.*

Remarks : The species is known to be worshipped by Hindus. Napier (1985) reviewed the taxonomy of the species under Subfamily *Colobinae* and separated previously known *Presbytis entellus* as *Semnopithecus entellus* on the basis Head and Body and Tail length and colour of Neonatal coat.

Order PHOLIDOTA

Family MANIDAE

33. *Manis crassicaudata* Gray

1827. *Manis crassicaudata* Gray, in Griffith's *Cuvier Animal. Kingd.*, 5 : 282.

1992. *Manis crassicaudata* Gray, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 91, (Published : Director, Zool. Surv. India).

1992. *Manis crassicaudata* Gray, Corbet and Hill, *The Mammals of the Indomalayan region* : 18-19.

1993. *Manis crassicaudata* Gray By Duane A. Schlitter. In : Wilson & Reeder, *Mammal Species of the World* : 415.

Common Name : English : Indian Pangolin; Marathi : Khavalya Manjar.

Diagnostic Characters : Body covered with integument of 11-13 longitudinal rows of overlapping large and horny scales. The scales may be regarded as hairs or rather as spines enormously enlarged and flattened. Coarse bristle-like hairs scantily cloathe the underparts of the body and a few grow between the scales. Tail tip without any naked glandular area. Teeth are completely absent. Pangolin possesses long tounge.

Locality : Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : Peninsular India.

Habitat : A rare animal preferring to live in forests, but can also live in open dry country. As it is a nocturnal animal, it is seldom seen. The animal spends the day curled up in a burrow dug by itself, or it takes shelter among rocks and boulders. It sleeps with its head between the forelegs and its tail firmly folded over all. A dug up burrow may measure upto 8Ft. in length ending in about five feet underground circular chamber. The depth may vary between 5 to 20 or more Ft. depending on the nature of soil. The entrance to the burrow is generally closed when the animal is in. Pangolin feeds entirely on ants and termites.

Status : Agrawal *et al.* (1992) have reported the status of the species as rare in peninsular India.

Conservation Status : IUCN : Lower risk–near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : I, Part : I, CITES : Appendix : II, Red Data Book (National, 1994) : Vulnerable.*

Remarks : The species is known to be hunted for domestic trade of body parts for medicinal and other usages.

Order CARNIVORA

Family CANIDAE

34. *Canis lupus pallipes* Sykes

1827. *Canis lupus pallipes* Sykes, *Proc. Zool. Soc. Lond.*, : 101.
 1992. *Canis lupus pallipes* Sykes, Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 93 (Published : Director, *Zool. Surv. India*).
 1992. *Canis lupus pallipes* Sykes, Corbet and Hill, *The Mammals of the Indomalayan region* : 186-188.

Common Name : English : Indian Wolf; Marathi : Landga.

Diagnostic Characters : Possession of strong claws on the digits, well developed canines, and strong jaws makes the perfect mammalian order of beasts of prey, Carnivora. The claws and jaws are specially adapted to strike and hold the struggling prey and teeth are designed to bite into, cut up and tear the flesh of the prey. Wolf, jackal, fox and dog are included in Family Canidae. Large size of body and skull and peculiar shape of teeth distinguishes wolf from the rest of the species in the family. Body size (Length : 90–105 cm) is about the size of an Alsatian Dog. Height at shoulder in the range between 65–75 cm. Dorsally the wolf is greyish fulvous or reddish in colour, with a brownish tinge, sometimes mixed with black. Limbs and face reddish. Forehead remarkably elevated and brows arched.

Locality : Outskirts of Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Nil.

Distribution : South of Himalayas through the desert zone to the dry open country in peninsular India.

Habitat : Wolf is basically a terrestrial and nocturnal animal preferring to live in bare, open and dry country. However, it is also found along the periphery of forest (Johnsingh and Yoganand, 2000). The animal prefers to find its refuge in crevices in rocks, caves burrows etc. It prefers to prey upon animals like antelope, fox, sheep, goat, hare, rodents etc. Instances of lifting children by the wolf are also known.

Status : CAMP Report (1998) has reported that though number of wolf populations

have been reported from many localities, there is a general decline in its actual population in the country. Agrawal *et al.* (1992) have reported the status of the species as rare in peninsular India.

Conservation Status : Red Data Book (National, 1994) : Vulnerable, *IUCN* : Lower risk-near threatened (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : I, Part : I, CITES : Appendix : I.*

Remarks : The species is known to be hunted for trade of fur and body parts in domestic as well as international markets. It is also being killed by the farmers to protect their live stock from predation.

***35. *Canis aureus* Linn.**

1758. *Canis aureus* Linnaeus, *Systema naturae* Vol. 1 st, 10th ed. Holmia : 40.

1916. *Canis indicus kola* Wroughton, *J. Bom. nat. Hist. Soc.*, **24** : 651.

1951. *Canis aureus aureus* Linnaeus, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 220.

1992. *Canis aureus* Linnaeus, Corbet and Hill, *The Mammals of the Indomalayan region* : 188.

Common Name : English : Asiatic Jackal, Golden Jackal, Jackal ; Marathi : Kolha.

Diagnostic Characters : Possession of strong claws on the digits, well developed canines, and strong jaws makes the perfect mammalian order of beasts of prey, Carnivora. The claws and jaws are specially adapted to strike and hold the struggling prey and teeth are designed to bite into, cut up and tear the flesh of the prey. Wolf, jackal, fox and dog are included in Family Canidae. Medium sized canids with Head and Body length in the range of 60-75 cm. Males at the shoulders 38-43 cm high, while skull is in the range of 13-16.5 cm. First upper molar with a prominent outer cingulum. Body size is definitely smaller than wolf and lacks arching brows and elevated forehead. Tail pendant and not curled like dog. Coat variable in colour with season and locality. However the jackal is typically a mixture of black and white washed with buff about the shoulders, ears and legs.

Locality : Semadoh, Dhakna and Dharni areas of Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Sighted number of individuals at different times in the above mentioned localities by ZSI survey parties during the project period.

Distribution : Practically whole of India.

Habitat : Jackal is basically a terrestrial animal preferring to live in almost any environment including humid forest country or dry open plains or desert to urban and semi-urban areas. They have also been reported at the altitude around 12000 Ft. However

larger populations live in the lowlands. Jackals are more often heard than seen. Its long-drawn, eerie howling at dusk or dawn is quite familiar. The animal prefers to find its refuge in rock crevices, caves, burrows, holes in ground, dense grass, scrubs etc. Jackals mostly go about alone for hunting, or a small group of two or more individuals may hunt together. Sometimes they move in packs. They do good work in the clearance of carcasses and offal with vultures. A natural sanitary service arranged by the mother nature. It also takes to prey poultry birds, lambs, sickly sheep, goat, hare, rodents etc. Instances of attacking children by jackal are also known.

Status : CAMP Report (1998) has reported that though number of jackal populations have been reported from many localities, there is a general decline in its actual population in the country due to threat from hunting, poisoning and trade for parts.

Conservation Status : IUCN : Lower risk-least concern (Nationally) and Data Deficient (Globally) (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : II Part : II CITES : Appendix : III.*

Remarks : The species is known to be hunted for trade of fur and body parts in domestic as well as international markets. It is also being killed by the farmers to protect their live stock from predation

***36. *Cuon alpinus* (Pallas)**

1811. *Canis alpinus* Pallas, *zoogr. Ross. Asiat.*, 1 : 34.

1831. *Canis dukhunensis* Sykes, *P.Z.S.* : 100.

1951. *Cuon alpinus dukhunensis* (Sykes), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 233.

1992. *Cuon alpinus* (Pallas), Corbet and Hill, *The Mammals of the Indomalayan region* : 190.

1993. *Cuon alpinus* (Pallas), By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 282.

Common Name : English : Indian Wild Dog, Dhole; Marathi : Kolsum, Dhole.

Diagnostic Characters : Wild Dog is a typical carnivore belonging to the family *Canidae*. A medium sized canid with Head and Body length $\pm$ 90 cm and height at shoulder in the range of 43–55 cm. Appearance almost like a domestic dog except that wild dog possesses a straight tail and its dorsum is reddish in colour. Short in legs and muzzle. Ears rounded and tail tip bushy. First upper molar with a prominent outer cingulum. Six molar teeth. Body size is definitely smaller than wolf and lacks arching brows and elevated forehead.

Locality : Semadoh, Dhakna, Koktu and Dharni areas of Melghat Tiger Reserve, Dist. Amaravati, Maharashtra State.

Material Examined/Sightings : Sighted number of small packs at different times in the above mentioned localities by ZSI survey parties during the project period.

Distribution : Practically whole of India.

Habitat : Wild dog is basically a terrestrial animal preferring to live in different types of dense forests interspersed with open land, prey species and water (Johnsingh and Yoganand, 2000). They have also been found at an altitude of around 12000 Ft. However larger populations live in the lowlands. Wild dogs are more social animals and they live and hunt in packs. The packs are generally formed possibly due to prolonged association between parents and young ones. They hunt by day. Their prey is trailed by scent and pursued at sight. The pursuit is generally silent with no violent outburst. Union of larger packs increases chances of killing large sized prey like sheep, sambar, wild boar, gaur, buffalo etc. Wild dogs communicate with each other through a peculiar repeated “whistling” cry. Instances of pack of wild dogs attacking tiger and panther are also known.

Status : CAMP Report (1998) has reported that though number of wild dog populations have been reported from many localities, there is a general decline in its actual population in the country due to threat from declining population of prey species and loss of habitats.

Conservation Status : IUCN : Lower risk- near threatened (CAMP Report, 1998), *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : II Part : I CITES : Appendix : II.*

Remarks : Nil.

*37. *Vulpes bengalensis* (Shaw)

1800. *Canis bengalensis* Shaw, *Genl. Zool.*, 1, 2 : 300.

1951. *Vulpes bengalensis* (Shaw), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 230.

1992. *Vulpes bengalensis* (Shaw), Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3 (Part-1)* : 94-95 (Published : Director, Zool. Surv. India).

1992. *Vulpes bengalensis* (Shaw), Corbet and Hill, *The Mammals of the Indomalayan region* : 189-190.

Common Name : English : Bengal Fox Marathi : Khokad.

Diagnostic Characters : Fox under order *Carnivora* possesses typical Canid family characters. However frontal sinus is absent; post-orbital process concave above; tail clearly more than half the length of head and body with dorsum greyish in colour. A grey coloured fox having slender limbs with head and body length in the range of 40–65 cms; back of ears sandy brown and bushy tail tip black in colour.

Locality : Reported from Dhakna and Semadoh areas of Melghat Tiger Reserve.

Material Examined/Sightings : Sighted number of individuals at different times in the above mentioned localities by ZSI survey parties during the project period.

Habitat : Terrestrial, sometimes fossorial living in upper country, open fields etc., adjacent to the human habitations rarely enters in forest. It is more common in waste and scrub

lands. It prefers to live in burrow during day time and comes out at dusk to hunt small animals, reptiles, insects and birds.

Distribution : Throughout India.

Status : The species has been reported from number of localities in India, however the populations are fragmented; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (Nationally), Data Deficient (Globally); *Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule* : Schedule : II Part II, CITES : Appendix III.

Remarks : The species faces threat for its survival from illegal trade for its fur, from hunting, from fragmentation of populations and habitat destructions.

Family URSIDAE

Subfamily URSINAE

***38. *Melursus ursinus* (Shaw)**

1792. *Bradypus ursinus* Shaw, *Nat. Misc.*, 2 (unpaged), pls. 58–59.

1951. *Melursus ursinus*(Shaw), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 241.

1992. *Melursus ursinus* (Shaw), Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 96 (Published : Director, Zool. Surv. India).

1992. *Ursus ursinus* (Shaw), Corbet and Hill, *The Mammals of the Indomalayan region* : 192-193.

1993. *Melursus ursinus*(Shaw), By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 337.

Common Name : English : Sloth bear; Marathi : Aswal.

Diagnostic Characters : Large-sized bear with head and body length 140–170 cm, with a short tail and pads of digits forming a weak curved line, planter pads very wide. Legs having ivory white claws are relatively short and thick, plantigrade or semi-plantigrade. First digit of the forefoot present close to second and not raised above the plantar pad. Coat rough and black with or without white crescent on chest. Muzzle and tips of the feet dirty white and yellowish. Three lower molars on each side. Ethmo-turbinals excluded from the anterior orifice of nasal chamber by large maxillo-turbinals, auditory bulla composed of a single bone; cowper's gland present. Baculum not deeply channeled below.

Locality : Reported from Semadoh, Koktu and Dhakna areas of Melghat Tiger Reserve Territory.

Habitat : Terrestrial and arboreal preferring to live in forests, grasslands etc. They live in a place where there is sufficient forest to provide food and favour places where rocks and boulders offer them shelter during hot weather and rains. They come out shortly

before sunset and hunt for food whole night and retire in the morning. They are found to feed equally on fruits and insects, especially termites.

Distribution : Throughout India.

Status : The species has been reported from many localities in India, however, the populations are fragmented; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (Nationally), Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : Appendix : I.

Remarks : For generic taxonomic status see remarks of Corbet and Hill (1992) and Wilson and Reeder (1993) under Family Ursidae. There is a considerable disagreement over the relationship at generic level and the taxonomic placements of the species in the *Ursidae* genera. Illegal wildlife trade of the body parts is a recent and serious threat in addition to the threat due to loss of habitat and fragmentary populations. In Meghat Tiger Reserve sloth bears are aggressive and instances of attacks on human beings in forests are quite well known. As per 1993 census, the approximate population of sloth bear in Melghat Tiger Reserve area is 145 + (Gogate, *et al.*, 1993).

Family MUSTELIDAE

Subfamily MELLIVORINAE

*39. *Mellivora capensis* (Schreber)

1776. *Viverra capensis* Schreber, *Saugeth*, pl. 125.
1951. *Mellivora capensis indica* (Kerr), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 268.
1992. *Mellivora capensis indica* (Kerr), Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 99 (Published : Director, Zool. Surv. India).
1992. *Mellivora capensis* (Schreber) Corbet and Hill, *The Mammals of the Indomalayan region* : 198.
1993. *Mellivora capensis* (Schreber) By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 315.

Common Name : English : Ratel or Honey Badger; Marathi : Chandi Aswal.

Diagnostic Characters : A Ratel is a typical carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. Small-sized bear-like animal with squat body. Body length $\pm$ 60 cm. Coat silvery grey above and black below. It possesses moderately long tail and relatively short and thick legs which are plantigrade or semi-plantigrade. First digit of the forefoot present close to second and not raised above the plantar pad. Pads of digits forming a strongly curved line. Carpal and metatarsal pads confluent and in contact with the planter pads. Feet broad and are armed with great non-retractile claws. Two lower molars present on each side. Ethmo-turbinals excluded from the anterior orifice of nasal chamber by large maxillo-turbinals. Auditory bulla composed

of a single bone. Cowper's gland present. Penis with long baculum but not deeply channeled below. Prepuce distant from scrotum. Soles of feet not entirely covered with hairs. Snout not Hog-like. Pinna reduced to a thickened rim.

Locality : Reported from Semadoh, Vairat, Raipur and Hatru areas of Melghat Tiger Reserve. Forest Dept. authorities have reported sightings of ratel in number of areas including the above mentioned areas in Melghat Tiger Reserve. (Shri. R. K. Wankhede, D.C.F., M.T.P. Paratwada, *Per. Comm.*) One specimen collected from this area has been displayed in Semadoh Museum.

Habitat : Terrestrial, fossorial and nocturnal preferring to live in desert as well in dry and moist deciduous forests, but avoiding regions of heavy rainfalls. Big claws are used essentially for digging in the ground. Though ratels are omnivorous, they are essentially flesh eaters.

Distribution : Throughout India.

Status : Though the distribution is wide, the species has been reported from limited localities in India due to its secretive habits, preferential habitats and nocturnal behaviour. Moreover, the populations are fragmented; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally), Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : Appendix : Nil; Red Data Book (National, 1994) : Insufficiently Known

Remarks : Weasels, Badgers and Otters differ so much from each other in appearance that it is difficult to believe that there is any relationship between them. However certain similarities in skull and molar structures show resemblance and common affinity between them.

Subfamily LUTRINAE

*40. *Lutragale perspicillata* (Geoffroy)

- 1826. *Lutra perspicillata* I. Geoffroy, *Dict. Class Hist. Nat.*, 9 : 519.
- 1951. *Lutra (Lutragale) perspicillata* Geoffroy, Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 277-278.
- 1992. *Lutra perspicillata perspicillata* I. Geoffroy, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 101 (Published : Director, Zool. Surv. India).
- 1992. *Lutragale perspicillata* Geoffroy, Corbet and Hill, *The Mammals of the Indian Malayan region* : 198.
- 1993. *Lutragale perspicillata* Geoffroy By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 313.

Common Name : English : Smooth-coated Indian Otter/Smooth Indian Otter; Marathi : Pan Manjar.

Diagnostic Characters : An otter is a typical carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. They possess streamlined, almost cylindrical body and a muscular moderately long tail well adapted for aquatic habits. Body length in the range between 65–75 cm. A close coat of waterproof fur, a thick muscular tail, paddle like feet, the hind always larger than the fore and a bristling array of rigid whiskers are the typical characters of otters which show how admirably their structures fit them for the aquatic mode of life. The sleek coat, heavily lined with waterproof under-fur, is a protection from the cold weather. Fur short and adpressed. The coat is generally silvery grey above and black below. They possess relatively short and thick legs with shorter hind feet which are plantigrade or semi-plantigrade. First digit of the forefoot present close to second and not raised above the plantar pad. Pads of digits forming a strongly curved line. Carpal and metatarsal pads confluent and in contact with the planter pads. Paws relatively large and broad, digits extensively webbed and are armed with great non-retractile claws. Two lower molars present on each side. Ethmo-trubinals excluded from the anterior orifice of nasal chamber by large maxillo-turbinals. Auditory bulla composed of a single bone. Cowper's glant present. Penis with long baculum but not deeply channeled below. Prepuce distant from scrotum. Soles of feet not entirely covered with hairs. Pinna reduced to a thickened rim.

Locality : Otters and their scats have been sighted in Rangubeli region of Melghat Tiger Reserve area close to Tapi river by the Forest Dept. as well as Wildlife Institute of India authorities. Moreover one pelt of an freshly killed otter was shown to the ZSI survey party at Dharni in Feb. 1991.

Habitat : Aquatic and semiaquatic in habit preferring to live by the margins of lakes, reservoirs, large rivers and tanks in low altitude. Though they are excellent swimmers, they are equally perfect at home and active on land and can travel long distances on land in search of water and food. Fish is their main food but can also eat anything whatever they capture and kill. They can readily adapt to the changed conditions.

Distribution : Throughout India.

Status : Though the distribution is wide, the populations are fragmented. Once very common in distribution, but now its population has greatly reduced due to the destruction of its habitat. IUCN Criteria proposed as per the CAMP Report (1998) : Not Evaluated (Nationally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule II Part II, CITES : Appendix : II.

Remarks : Same as those given under Ratel species. Otter scats reported to have also been collected from the banks of the Pedhi river, a tributary of Purna river of Wardha river system, near Walgaon in Amaravati Dist. (Shri. R.K. Wankhede, D.C.F., M.T.P. Paratwada, *Per. Comm.*). Walgaon region is close to Melghat Tiger Reserve area.

Family VIVERRIDAE

Subfamily VIVERRINAE

***41. *Viverricula indica indica* (Desmarest)**

1817. *Viverra indica* Desmarest, *Nouv. Dict. Hist. Nat.*, Paris, 7 : 170.
 1907. *Viverricula hanensis* Matschie, *Wiss. Ergebn. Filchner Exped. To China*, 10, 1 : 196.
 1951. *Viverricula indica indica* Desmarest, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 282.
 1992. *Viverricula indica indica* Desmarest Corbet and Hill, *The Mammals of the Indomalayan region* : 206.

Common Name : English : Small Indian civet; Marathi : Jowadi Manjar.

Diagnostic Characters : A Small Indian civet is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. A civet is long in body and short in limbs. Body length $\pm$ 90 cm. It has an elongated head and pointed but short and weak muzzle. A tawny grey or greyish brown animal, lined and streaked on back. Body pattern consists of small spots on the fore quarters, larger spots tending to run into longitudinal lines on the flanks and form six to eight stripes down the back. There are usually some transverse white and black bands on the neck and throat region. No dorsal crest of long hairs on the back. Tail with alternate dark and pale bands. Ethmo-turbinals very large, covering greater part of nasal chambers, extending anteriorly to the anterior orifice; Cowper's gland absent. Feet compact with short claws unprotected by sheaths of skins. Feet terrestrial and digitigrade with single carpal pad and no metatarsal pads. Four or five toes in fore and hind feet and not dog-like in structure. The first digit on the fore and hindfoot, set well above the other toes, is functionless. Ears moderate in size having well-developed bursa on the margin, and simple supratragus, but devoid of a valvular flap over it, auditory bulla distinctly grooved; jaws and teeth not powerful. Teeth not specialised like cats or reduced in number; molars are built for both cutting up meat and grinding vegetable substances. Anus not enclosed in a glandular sac. Scent gland present in both sexes, in males between scrotum and prepuce, while in females it's behind or encircling vulva. Scent glands open into highly specialised pouches. Posterior palatal foramina located in front of the maxillo-palatine suture; inter-ramal tuft of vibrissae present; Soles of feet not entirely covered with hairs.

Locality : Small Indian civet was sighted in Semadoh region in Melghat Tiger Reserve by the ZSI Survey parties during the project period.

Habitat : Terrestrial, semi-arboreal and nocturnal. Prefers to live in all types of forests and also close to human dwellings. However they are not to be seen in deserts and at high altitudes. They take shelter in holes, treeholes, under rocks, under bushes or in tall grasses etc. Some may find refuge in drains and outhouses. They prefer to hunt in night. Though they are arboreal/semi-arboreal, they prey on the ground, preying on rats, squirrels,

small birds, lizards, insects, fruits, roots, and other vegetable matters. Given opportunity, they can prey upon poultry as well. They can readily adapt to the changed conditions.

Distribution : Throughout India excluding deserts.

Status : Though the distribution is wide and the populations are many, they are fragmented. Once very common in distribution, now its population is declining due to the destruction of its habitat, hunting for medicine and local illegal trade for body parts; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally).; Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule II Part II, CITES : Appendix : III.

Remarks : The care of the young ones is left entirely to the mother. The civets can easily be tamed. Some are kept under domestication for the regular extraction of the secretion from the scent glands.

Subfamily PARADOXURINAE

*42. *Paradoxurus h. hermaphroditus* (Pallas)

1777. *Viverra hermaphrodita* Pallas, In Schreber, *Die Saugethiere*, 3 : 426.
1951. *Paradoxurus hermaphroditus hermaphroditus* Pallas, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 286.
1992. *Paradoxurus hermaphroditus hermaphroditus* (Pallas), Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 103 (Published : Director, Zool. Surv. India).
1992. *Paradoxurus hermaphroditus hermaphroditus* (Pallas), Corbet and Hill, *The Mammals of the Indomalayan region* : 207-208.

Common Name : English : Common Palm civet or Toddy cat; Marathi : Ud Manjar.

Diagnostic Characters : A Common Palm civet or Toddy cat is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. A civet is long in body and short in limbs. Body length $\pm$ 60 cm. It has an elongated head and pointed but short and weak muzzle. A black and blackish-brown civet with long coarse hair. Underwool, when present whitish or buff or sometimes even yellow hidden in heavy winter coat. The new coat shows a definite pattern of dorsal stripes and lateral spots. Pattern of longitudinal stripes on the back and spots on the flanks, shoulders and thighs is present in the new coat. The limbs are always black or dark brown. Facial markings variable, the most common pattern is white patch or spot below the eye. Some times one spot above the eye and one on each side of the nose are also present. Tail uniform in colour and without any alternate dark and pale bands. Ethmo-turbinals very large, covering greater part of nasal chambers, extending anteriorly to the anterior orifice; Cowper's gland absent. Feet compact with short claws unprotected by sheaths of skins. Soles of feet not entirely covered with hairs. Feet scansorial and semiplantigrade with double carpal and metatarsal pads. Four or five toes in fore and hind feet and not dog-

like in structure. The first digit on the fore and hindfoot, set well above the other toes, is functionless. Ears moderate in size having well-developed bursa on the margin, and simple supratragus, but devoid of a valvular flap over it, auditory bulla distinctly grooved; jaws and teeth not powerful. Teeth not specialised like cats or reduced in number; molars are built for both cutting up meat and grinding vegetable substances. Anus not enclosed in a glandular sac. Scent gland present in both sexes, in males between scrotum and prepuce, while in females it's behind or encircling vulva. The scent glands open in less specialised pouches. Posterior palatal foramina located in front of the maxillo-palatine suture; inter-ramal tuft of vibrissae present.

Locality : Common Palm civet or Toddy cat was sighted in Semadoh, Tarubanda and Kuvapati regions in Melghat Tiger Reserve by the ZSI Survey parties during the project period.

Habitat : Terrestrial, more arboreal and nocturnal. Prefers to live in all types of forests and also close to human dwellings. They live much on trees lying curled up by day among the branches. But many have adapted themselves to a life in human settlements, even in the heart of the crowded cities, selecting a roof, an outhouse, or even drain as a place of hiding. They take shelter in holes, treeholes, under rocks, under bushes or in tall grasses etc. They prefer to hunt in night. Though they are arboreal/semi-arboreal, they prey on the ground, preying on rats, squirrels, small birds, lizards, insects, fruits, roots, and other vegetable matters. Given opportunity, they can prey upon poultry as well. They can readily adapt to the changed conditions.

Distribution : Throughout India excluding deserts.

Status : Though the distribution is wide and the populations are many, they are fragmented. Though they are fairly common in distribution, but now its population is declining due to the destruction of its habitat, hunting for medicine and local illegal trade for body parts (Pradhan, 1997); IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule II Part II, CITES : Nil; Red Data Book (International, 1996) : Vulnerable.

Remarks : The young ones are born in all seasons and are usually offered shelter in tree holes or under a rock. The civets can easily be tamed. Some are kept under domestication for the regular extraction of the secretion from the scent glands.

Family HERPESTIDAE

Subfamily HERPESTINAE

***43. *Herpestes edwardsii edwardsii* (Geoffroy)**

1818. *Ichneumon edwardsii* E. Geoffroy, *Descr. Egypte*, 2 : 139.

1921. *Herpestes edwardsii* (E. Geoffroy) Wroughton, J. J. *Bombay nat. Hist. Soc.*, 27 : 547 for use of *edwardsii* instead of *mungo*.

1951. *Herpestes edwardsii edwardsii* (E. Geoffroy), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 296.
1993. *Herpestes edwardsii edwardsii* (E. Geoffroy), By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 305

Common Name : English : Indian Grey Mongoose; Marathi : Mungus.

Diagnostic Characters : Indian Grey Mongoose is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. A mongoose is a long bodied and short limbed animal with bright beady eyes and long bushy tail. Body length $\pm$ 90 cm. It is frequently exhibited by snake charmers. It has an elongated head and pointed but short and weak muzzle. A tawny yellowish-grey coloured mongoose with no stripes on the sides of its neck. The alternate light and dark rings on its hairs gives its coat a grizzled "pepper and salt" tinge. The tail which is as long as body is bushy all along and tipped with white or yellowish-red and never black colour. Ethmo-turbinals very large, covering greater part of nasal chambers, extending anteriorly to the anterior orifice. Cowper's gland absent. Ears small and semicircular with vestigial bursa, supratragus and a valvular flap over it. Structure of the ear is very complicated. It is made up of series of folds which can shut down over one another so as to completely close the ear openings. A well-developed bony tube to the auditory orifice. Feet with free digits and fossorial long claws; anus enclosed in a glandular pouch; jaws and teeth not powerful. Teeth not specialised like cats or reduced in number. However they are built for cutting up meat rather than for grinding vegetable substances. Posterior palatal foramina located in front of the maxillo-palatine suture; inter-ramal tuft of vibrissae present.

Locality : Indian grey mongoose was sighted at number of places like Semadoh, Dharni, Dhakna, Kolkaz, Tarubanda etc. at different times in Melghat Tiger Reserve by the ZSI Survey parties during the project period.

Habitat : Terrestrial, diurnal/nocturnal; Prefers to live in scrubs, bushes, thickets, cultivations, rocky patches etc. They also prefer to live close to forest edges and human dwellings. Basically they are not creatures of forest. They generally live in holes and/or deep borrows made by themselves. However they can also take shelter in roofs, rafters, drains etc. in towns, villages and even in the heart of the crowded cities. Mongooses though take vegetable food, they have strong preference for meat since they possess compressed, sharp-bladed and meat cutting teeth. They are bold and hunt directly with open and headlong attack. They follow prey's scent and can even trail it in its burrow digging its victim out. They hunt singly or in pairs. Their prey species are snakes, including venomous snakes, rats, small birds, lizards, frogs, scorpions, centipedes, insects etc. Given opportunity they can feed upon carrion and are frequently seen taking a share of the kills of large animals. They are also considered to be the poultry thieves. They can readily adapt to the changed conditions.

Distribution : Throughout India.

Status : Distribution of mongoose is wide and populations are many. Fairly common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule IV, CITES : Appendix : III.

Remarks : The mongoose can easily be tamed. However threat to its population due to hunting for medicine, trophies and food and also for local illegal trade for body parts can not be ruled out (Pradhan, 1997).

44. *Herpestes smithii smithii* Gray

1818. *Herpestes smithii* Gray, *Charlesw. Mag. N. H.*, 1 : 578.

1951. *Herpestes smithii smithii* Gray Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 296-297.

1993. *Herpestes smithii smithii* Gray, By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 306.

Common Name : English : Indian ruddy mongoose; Marathi : Mungus.

Diagnostic Characters : Indian ruddy mongoose is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. A mongoose is a long bodied, short limbed animal with bright beady eyes and long bushy tail. It has an elongated head and pointed but short and weak muzzle. A tawny yellowish-grey coloured, or rather more greyish, mongoose with no stripes on the side its neck. The alternate light and dark rings on its hairs gives its coat a grizzled "pepper and salt" tinge. The tail which is as long as body is bushy all along and tipped always in black colour. Legs darker than dorsum. Ethmo-turbinals very large, covering greater part of nasal chambers, extending anteriorly to the anterior orifice; Cowper's gland absent. Ears small and semicircular with vestigial bursa, supratragus with a valvular flap over it. Structure of the ear is very complicated. It is made up of series of folds which can shut down over one another so as to completely close the ear openings. A well-developed bony tube to the auditory orifice. Feet with free digits and fossorial long claws. Anus enclosed in a glandular pouch. Jaws and teeth not powerful. Teeth not specialised like cats or reduced in number. However they are built for cutting up meat rather than for grinding vegetable substances. Posterior palatal foramina located in front of the maxillo-palatine suture. Posterior chamber of bulla greatly inflated. Inter-ramal tuft of vibrissae present.

Locality : Melghat Tiger Reserve.

Habitat : Terrestrial, diurnal/nocturnal; Prefers to live chiefly inside the forest. Basically they are creatures of forest hence less commonly seen. They generally live in holes and /or deep borrows made by themselves. Mongooses though take vegetable food, they have strong preference for meat since they possess compressed, sharp-bladed and meat cutting teeth. Their habit, habitat and food are much the same as common mongoose. Their prey species consist of snakes, including venomous snakes, rats, small birds, lizards,

frogs, scorpions, centipedes and insects. Given opportunity they can also feed upon carrion and are frequently seen taking a share of the kills of large animals.

Distribution : Throughout the forested areas of Central and Southern India.

Status : Distribution of mongoose is wide and populations are many. Being a forest dwelling species, ruddy mongoose is rarely seen; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule IV, CITES : Appendix : III.

Remarks : Ruddy mongoose is also killed for body parts for local and domestic trade.

Family HYAENIDAE

Subfamily HYAENINAE

***45. *Hyaena hyaena hyaena* (Linnaeus)**

1758. *Canis hyaena* Linnaeus, *Syst. Nat.* : 10th Ed., 1 : 40.

1951. *Hyaena hyaena hyaena* (Lin.), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 299.

1992. *Hyaena hyaena hyaena* (Lin.), Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 107 (Published : Director, Zool. Surv. India).

Common Name : English : Striped Hyaena; Marathi : Taras.

Diagnostic Characters : Striped Hyaena is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines. The build and general appearance of a hyaena suggests its closeness to the dog family. Body length $\pm$ 150 cm, while shoulder height $\pm$ 90 cm. Its legs and feet are typically those of dog; but the structure of the skull, teeth and the anatomy of the animal shows a distinct closeness to the cat family. Hyaena is ungainly in build and carries a broad head with large upstanding ears. The jaws are massive with strong teeth. The deep and massive body with sturdy and long forelimbs ends in weak drooping hindquarters supported on short and weak hindlegs. Inter-ramal tuft of vibrissae present. Animal possesses vertical dark stripes on the body and transverse bars on the upper portion of the legs. A long crest of mane extending from the head to the root of the tail also present. Ethmo-turbinals very large, covering greater part of nasal chambers, extending anteriorly to the anterior orifice; Posterior palatal foramina located in front of the maxillo-palatine suture; teeth not specialised or reduced in number. Feet with short, non-retractile, unsheathed and blunt claws; Cowper's gland absent in hyaena, while anal gland enclosed in a large sac hung above the anus present. In general, the body structure is fit to feed on prey killed by other animals. Basically they are scavengers.

Locality : Sighting of hyaena in Dhakna, Semadoh and Raipur areas of Melghat Tiger Reserve has been recorded by the ZSI survey parties during the project period.

Habitat : Terrestrial and nocturnal in habit; Prefers to live chiefly in the open, dry, thorny and scrubby country and forest fringes. Basically they are not creatures of dense forest. In general they live in holes and may lie concealed by day in high grass, under bushes, or in tall fields. They may hide themselves in caves amongst the rocks, or in a hole dug in the side of a hill or ravine. They may prefer to live in porcupine's borrows also. Though scavengers by habit, they some times attack such animals as sheep, dogs, goats, calves, rodents, etc. Usually they feed upon the animals which have died of diseases or those which have been killed by other animals. Its share of food is coarser remains, especially bones, left or rejected by others. They can break or crush the bones with ease with the help of powerful jaws and teeth. Sometimes they come close to human settlements in search of food.

Distribution : Throughout India.

Status : Not very uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule III, CITES : Appendix : No.

Remarks : Hyaena is killed for fur and body parts for local, domestic and international trade. Pradhan (1997) has reported illegal trade of hyaena's fur. Inclusion of hyaena in CITES Appendix is strongly recommended.

Family FELIDAE

Subfamily FELINAE

46. *Felis silvestris ornata* Gray

1777. *Felis ornata* Gray, *Illustr. Ind. Zool.*, 1 : pl. 2.

1951. *Felis libyca ornata* Gray, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 304.

1992. *Felis silvestris ornata* Gray, Corbet and Hill, *The Mammals of the Indomalayan region* : 220.

1993. *Felis silvestris ornata* Gray, By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 290.

Common Name : English : India Desert Cat; Marathi : Jangli Manjar.

Diagnostic Characters : Desert cat is a carnivore with six small, equal-sized incisors and a pair of fairly large and conical canines. House cat, tiger, lion, wild cats, great or small in size, belong to the cat family which contains beasts of preys. The Desert cats are larger than the domestic cats and are easily distinguished by their spots. Body length $\pm$ 60 cm. They possess pale yellowish fur more or less fused with grey and marked with numerous black spots. The terminal half of its tail is ringed with black. They possess two horizontal stripes on its cheeks, numerous dark cross lines on the outside of the limbs and the usual

two distinct black bars on the inner side of each forearm. The chin, throat and breast are spotlessly white. Colour of the ears like dorsum. Contracted pupils vertical. Skull possessing long and well developed postorbital process. Teeth sectorial and reduced in number and are specialised in nature suited to the diet of meat. Claws especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh. Canines relatively short and postcanine space normal. Ethmo-turbinals very large, covering the greater part of the nasal chambers, extending anteriorly to the anterior orifice; auditory bulla composed of two bones; Cowper's gland absent. Posterior palatal foramina set far back on the maxillo-palatine suture; Inter-ramal tuft of vibrissae absent.

Locality : Melghat Tiger Reserve.

Habitat : Largely terrestrial and nocturnal in habit; Prefers to live chiefly in the low lying forests and semi-arid scrubby habitats. The prey species mostly include small rodents and birds.

Distribution : Throughout India.

Status : Rare in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I (Desert Cat : *Felis libyca* = *Felis silvestris ornata*), CITES : Appendix : II; Red Data Book (National, 1994) : Endangered.

Remarks : Desert cat is also hunted for fur and body parts for local and domestic trade (Pradhan, 1997). *Felis libyca* has been merged in *Felis silvestris*.

*47. *Felis chaus affinis* Gray

1830. *Felis affinis* Gray, *Illustr. Ind. Zool.*, 1 : pl. 3.

1951. *Felis chaus affinis* Gray, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 306.

1992. *Felis chaus* Guldensteadt, Corbet and Hill, *The Mammals of the Indomalayan region* : 221.

1992. *Felis chaus affinis* Gray, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 107 (Published : Director, Zool. Surv. India).

1993. *Felis chaus affinis* Gray, By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 289-290

Common Name : English : India Jungle Cat; Marathi : Ran Manjar, Baul.

Diagnostic Characters : Jungle cat is a carnivore with six small, equal-sized incisors and a pair of comparatively short and conical canines with postcanine space normal. Being member of the cat family which contains beasts of preys, jungle cat shows all typical characters of the order Carnivora and family Felidae. The jungle cats are larger than the domestic cats. Body length $\pm$ 60 cm. They possess long limbs and short tail. The colour

of the fur varies from sandy grey to yellowish grey with no stripes, patterns and spots on dorsum or near the eyes. However black horizontal stripes on the innerside of the forelimbs present. Back of the ears orange-brown with black tips and inconspicuous hair tufts. The terminal end of its tail is ringed with black which ends in black tip. Its pale green eyes gives it a cold cruel expressions. Underparts may be faintly spotted. Contracted pupils vertical. Skull possessing long and well developed postorbital process. Ethmo-turbinals very large, covering the greater part of the nasal chambers, extending anteriorly to the anterior orifice; auditory bulla composed of two bones. Outer chamber of auditory bulla is relatively large. Nasal branch of premaxilla fairly broad. Posterior palatal foramina set far back on the maxillo-palatine suture. Teeth sectorial and reduced in number and are specialised in nature suited to the diet of meat. Claws especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh. Cowper's gland absent. Inter-ramal tuft of vibrissae absent.

Locality : Jungle cat has been sighted in Semadoh, Ghatang, Kuwapati, Chaddupati, Chikhalam areas of Melghat Tiger Reserve by ZSI survey parties and Forest Dept. authorities during the project period.

Habitat : Largely terrestrial, crepuscular and nocturnal in habit; Prefers to live chiefly in the open, dry deciduous and evergreen forests, grasslands, scrubs etc. The prey species mostly include small rodents, birds and sometimes poultry when near village.

Distribution : Throughout India.

Status : Not uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Near threatened (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule II Part II, CITES : Appendix : II.

Remarks : Jungle cat is also killed for fur and body parts for local and domestic trade. Some tribals kill them for food. Corbet and Hill (1992) disagreed with the proposal of number of subspecies in *Felis chaus*. He has synonymised *Felis chaus affinis* in *Felis chuas*. However, Agrawal *et al.* (1992) and Wilson and Reeder (1993) retained subspecific status of *Felis chaus affinis*. Though the status of *Felis chaus affinis* has been retained in the present studies on the basis of these observations, revisionary taxonomic studies of the species is strongly recommended to sort out proper placement of the subspecies.

48. *Felis caracal bengalensis* Fischer

1829. *Felis caracal bengalensis* Fischer, Syn. Mamm. 210.

1951. *Felis caracal schmitzi* Matschie, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 310.

1992. *Felis caracal bengalensis* Fischer, Corbet and Hill, *The Mammals of the Indomalayan region* : 222.

Common Name : English : Caracal; Marathi : Ran Manjar.

Diagnostic Characters : Caracal is a carnivore with six small, equal-sized incisors and a pair of comparatively short and conical canines with postcanine space normal. Being member of the cat family which contains beasts of preys, caracal shows all typical characters of the order Carnivora and family Felidae. Caracal is definitely larger than the domestic cat. Body length $\pm$ 60 cm. It possesses long limbs and short tail. The caracal has broad head with characteristic triangular black coloured tufted ears set fairly close together. The tuft of black coloured hairs on the ear is fairly long and erect. The tail and legs are not banded and are of uniform colour. Second premolar absent in caracal. The colour of the fur varies from uniform reddish grey above to buff or white below with no stripes, patterns and spots on dorsum or near the eyes. Its coat, though not dense, is yet thick and soft. Underparts and sometimes back may be very faintly spotted. Contracted pupils vertical. Skull possessing long and well developed postorbital process. Its skull bears a general resemblance to that of lynx. Teeth sectorial and reduced in number and are specialised in nature suited to the diet of meat. Claws especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh. Cowper's gland absent. Inter-ramal tuft of vibrissae absent.

Locality : Previous sighting record of caracal in Melghat Tiger Reserve area by the Forests Dept. authorities could not be confirmed during the project period by the ZSI survey parties.

Habitat : Largely terrestrial, crepuscular and nocturnal in habit; Prefers to live chiefly in the arid, semiarid areas, generally found among the bushes, grass, scattered forests, low scrubby rocky and sandy country. The prey species mostly include small rodents, birds and sometimes poultry when near village. It may knock down even larger animals like antelope.

Distribution : Caracal is found in Central and Northwestern India.

Status : Rare, if occurring, in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Near threatened (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : Appendix : I; Red Data Book (National, 1994) : Endangered.

Remarks : Caracal is also killed for fur and body parts for local, domestic and international commercial trade. Wilson and Reeder (1993) has placed caracal in the monotypic genus, *Caracal*. However Corbet and Hill's (1992) observations of retaining caracal in *Felis caracal* is based on more recent observations and hence accepted in the present work. However, revisionary taxonomic studies of the species is strongly recommended to sort out proper placement of the species.

49. *Prionailurus bengalensis bengalensis* (Kerr)

1792. *Felis bengalensis* Kerr, *Anim. Kingd.*, : 151.

1951. *Felis bengalensis bengalensis* Kerr, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 312.

1992. *Felis bengalensis bengalensis* Kerr, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 110 (Published : Director, Zool. Surv. India).
1992. *Prionailurus bengalensis bengalensis* Kerr, Corbet and Hill, *The Mammals of the Indomalayan region* : 222.

Common Name : English : Leopard Cat; Marathi : Wagati.

Diagnostic Characters : Leopard cat is a carnivore with six small, equal-sized incisors and a pair of comparatively short and conical canines with postcanine space normal. Being member of the cat family which contains beasts of preys, leopard cat shows all typical characters of the order Carnivora and family Felidae. Leopard cat is a relatively small cat with long limbs; head and body length 61-66 cm; tail more than half of head and body length (Approx. 60%) and pelage with beautifully ornamented leopard like blackish brown spots. In colour and markings the leopard cat looks like a panther in miniature. The colour of the body is yellowish above and white below. Back of the ears black with round whitish spot in the centre. Among other markings are four more or less distinct black bands running from the crown over the neck and break up into short bars and elongated spots on the shoulders. There is a pair of horizontal cheek stripes, the lower one joining the black bar across the throat. There are two black bars on the inside of the forearm. The spots on the tail form cross bars towards its end. Hairs on nape normal while reversed on throat. Contracted pupils vertical. Skull possessing long, well developed and complete postorbital process. Ethmo-turbinals very large, covering greater part of the nasal chambers, extending anteriorly to the anterior orifice; auditory bulla composed of two bones. Teeth sectorial and reduced in number and are specialised in nature suited to the diet of meat. Claws retractile and especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh. Cowper's gland absent. Inter-ramal tuft of vibrissae absent.

Locality : Melghat Tiger Reserve Dist. Amaravati.

Habitat : Largely terrestrial, semiarboreal and nocturnal in habit and, hence, seldom seen; Prefers to live chiefly in thick dry/moist deciduous and evergreen forests, grasslands, scrubs etc. The prey species mostly include small animals and birds.

Distribution : Throughout India.

Status : Rare atleast in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Near threatened (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : Appendix : I; Red Data Book (National, 1994) : Vulnerable.

Remarks : Leopard cat is also killed for fur and body parts for local and domestic trade. Some tribals kill them for preparation of trophies. These beautiful cats are also trapped live for commercial trade (Pradhan, 1997). Earlier *Prionailurus* was synonymised in Genus *Felis*. However most of the taxonomists have chosen to emphasize their distinctiveness by placing them in monotypic genus.

Subfamily PANTHERINAE

***50. *Panthera pardus fusca* (Meyer)**

1794. *Felis fusca* Meyer, *Zool. Ann.*, 1 : 394.
1951. *Panthera (Panthera) pardus fusca* Meyer Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 315-316.
1992. *Panthera pardus fusca* Meyer, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 111, (Published : Director, *Zool. Surv. India*).
1993. *Panthera pardus fusca* Meyer, By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 298.

Common Name : English : Leopard/Panther; Marathi : Bibtya Wagh.

Diagnostic Characters : Leopard/Panther is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines with postcanine space normal. Being member of the cat family which contains beasts of preys, leopard shows all typical characters of the order Carnivora and family Felidae. Leopard/panther is a relatively large cat with long limbs; total length including tail 170-215 cm with height at shoulder 60 cm; tail more than half of head and body length (Approx. 60%) and pelage with beautifully ornamented close-set black spots arranged in rosettes on the short haired coat. The ground colour of the body is yellow above and white below with black rosettes all around. Dorsal ground colour may vary from pale yellow to warm grey, rich tawny to rufous fawn. The tail is also covered with spots except at the tip which is ringed. Hairs on nape and throat reversed. Ears not tufted. Contracted pupils round. Skull with anterior nasal tip level with anterior edge of the canines. Postorbital process not complete. Ethmo-turbinals very large, covering the greater part of the nasal chambers, extending anteriorly to the anterior orifice; auditory bulla composed of two bones. Teeth sectorial and reduced in number and are specialised in nature suited to the diet of meat. Claws retractile and especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh. Cowper's gland absent. Inter-ramal tuft of vibrissae absent.

Locality : Leopard has been sighted in Semadoh, Ghatang, Kuwapati, Chaddupati, Chikhalam, Chikhaldara, Kolkaz, Dhakna and Koktu areas of Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : Largely terrestrial, semiarboreal and nocturnal in habit and seldom seen; They are able to live and thrive anywhere. They can live in a variety of habitats like the hills, plains, thick dry/moist deciduous and evergreen forests, grasslands, scrubs etc. Away from or near human habitations. Leopard is a most bold animal in behaviour. Though leopard is medium sized animal, it is very strong and may kill animals larger in size than its own size like bull, cow, bullock, deer antelope etc. In forests it lives on deer, pig, antelope, hare, monkey, peafowl and other small birds. The prey species also include poultry, goat, sheep, dog and even human being on the village border

Distribution : Throughout India.

Status : Not uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : Appendix : I; Red Data Book (National, 1994) : Vulnerable.

Remarks : Largest number of leopard skins in the catskin trade is involved in the illegal trade. Leopard is killed for fur and body parts trade in local, domestic and international market for various reasons (Pradhan, 1997). These beautiful cats are also trapped live for commercial trade. As per the leopard census conducted in 1993 in Melghat Tiger Reserve, the leopard population was around 68 (Gogate *et al.*, 1993).

***51. *Panthera tigris tigris* (Linn.)**

1758. *Felis tigris* Linnaeus, *Syst. Nat.*, 10th Ed. : 41.

1951. *Panthera (Tigris) tigris tigris* Linnaeus Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 315 & 318-319.

1992. *Panthera tigris tigris* Linnaeus, Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 112 (Published : Director, Zool. Surv. India).

1993. *Panthera tigris tigris* Linnaeus, By Wozencraft. In : Wilson & Reeder, *Mammal Species of the World* : 298.

Common Name : English : Royal Bengal Tiger/Tiger; Marathi : Dhanya Wagh/Pateri Wagh.

Diagnostic Characters : Tiger is a carnivore with six small, equal-sized incisors and a pair of comparatively large and conical canines with postcanine space normal. Being member of the cat family which contains beasts of preys, tiger shows all typical characters of the order Carnivora and family Felidae. The tiger is a large cat with graceful built and long limbs; total length including tail 260-290 cm with black ringed tail more than half of head and body length (Approx. 60%); pelage with beautifully ornamented black coloured stripes on the short haired coat. The ground colour of the body varies from reddish yellow to orange rufous above and white below with black prominent stripes all over the body. Hairs on nape and throat reversed. Ears not tufted but are black on the outer side with a prominent white spot in the middle. Contracted pupils round. Skull with anterior nasal tip level with anterior edge of the canines. Postorbital bar usually not complete. Ethmo-tubinals very large, covering the greater part of the nasal chambers, extending anteriorly to the anterior orifice; auditory bulla composed of two bones. Teeth sectorial and reduced in number and are specialised in nature suited to the diet of meat. Claws retractile and especially adapted to strike and hold struggling prey and teeth specially designed to bite into, cut up and tear flesh. Cowper's gland absent. Inter-ramal tuft of vibrissae absent.

Locality : Tiger has been sighted in Koktu, Dhakna, and Dolar areas of Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period. Sightings of pugmarks, droppings and kills during project period were recorded from Kuwapati, Chaddupati, Harisal, Raipur, Chikhaldara, Kolkaz etc. areas also.

Habitat : Largely terrestrial and nocturnal in habit and, hence, seldom seen; They can live in a variety of habitats like the hills, plains, thick dry/moist deciduous and evergreen forests, grasslands, scrubs, mangroves swamps etc. Comparatively tiger is shy animal in behaviour. Tiger is a very good swimmer and enormously powerful animal which can easily kill animals larger in size than its own size like bull, cow, bullock etc. In forests it lives on deer, sambar, nilgai, pig, antelope, hare, monkey, peafowl and other small birds. The prey species also include poultry, goat, sheep, dog and even human being on the village border. Tiger hunts between sunset and dawn and covers long distances in the course of night in search of food. Like any large cat it also shows territorial behaviour.

Distribution : Throughout India except the North-Western region.

Status : Not uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Endangered (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : Appendix : I; Red Data Book (National, 1994) : Vulnerable.

Remarks : Large number of tiger skins in the cat skin trade is involved in the illegal trade. Tiger is also killed for fur and body parts trade in domestic and international market for various reasons (Pradhan, 1997). These beautiful cats are also trapped live for commercial trade. As per the tiger census conducted in 1993 in Melghat Tiger Reserve, the tiger population was around 75 (Gogate *et al.*, 1993).

Order ARTIODACTYLA

Family SUIDAE

Subfamily SUINAE

*52. *Sus scrofa cristatus* Wagner

1839. *Sus cristatus* Wagner, *Munch. Gelehrt. Anz.*, 9 : 435.

1951. *Sus scrofa cristatus* Wagner Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 345.

1992. *Sus scrofa cristatus* Wagner, Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 114 (Published : Director, Zool. Surv. India).

1993. *Sus scrofa cristatus* Wagner, By Peter Grubb In Wilson & Reeder, *Mammal Species of the World* : 379.

Common Name : English : Indian Wild Boar; Marathi : Randukkar.

Diagnostic Characters : Indian Wild Boar has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passes between third and fourth toes. Wild Boar also possesses tail which is fairly long extending nearly to hocks, four toes of the feet with bones complete, metacarpals of the second and fifth digits complete, stomach simple and divided into two chambers only and upper canines (C1) in males well developed and curved upwards and outwards porjecting from the mouth. Upper incisors present. Head devoid of any horns and antlers. *Sus scrofa cristatus* is a large boar with height at shoulders in the range between 76-102 cms. Further, it possesses a distinctive sparser coat with a crest of black bristles present from nape to the back. The colour of the animal is black mixed with grey, rusty brown and white hairs.

Locality : Wild Boar has been sighted in Tarubanda, Raipur, Kuvapati, Koktu and Dhakna areas of Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : Largely terrestrial and diurnal preferring to live in all types of forests, bush jungles, grasses and even in cultivations. Wild Boar is an omnivorous animal living on roots, tubers, crops, insects, snakes, offal and carrion. It is intelligent and few animals show greater courage and determination like Wild Boar. Sense of smell is acute while those for eyesight and hearing moderate.

Distribution : Throughout India.

Status : Not uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule III, CITES : No.

Remarks : Wild Boar is a great destructor of the standing crops and other cultivated areas. It is prolific breeder and breeds round the year. Since Wild Boar is believed to be a destructor of the standing crops, it is considered as agricultural pests by the agriculturists and farmers. Therefore they kill wild boars by various methods to save the crops. It is also killed for its meat and body parts for various purposes. As per the 1993 census of some wildlife species conducted in Melghat Tiger Reserve, Wild Boar population was around 3350 (Gogate *et al.*, 1993).

Family TRAGULIDAE

53. *Moschiola meminna* (Erxleben)

1777. *Moschus meminna* Erxleben, Syst. Regn. Anim., Mamm. : 322.

1951. *Tragulus (Moschiola) meminna* (Erxleben) Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals : 349-350.

1992. *Moschiola meminna* (Erxleben) Corbet and Hill, The Mammals of the Indomalayan region : 252.

1993. *Moschiola meminna* (Erxleben), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 379.

Common Name : English : Indian Chevrotain or Mouse Deer, Marathi : Pisor Harin.

Diagnostic Characters : Indian Chevrotain or mouse deer is a tiny little creature with very slender limb and high hindquarters. It has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passes between third and fourth toes. Tail comparatively short in tragulid species. Permanent horns, antlers and upper incisors are absent in mouse deer; while upper canines (C1) in males are well developed in a form of tusks. Teeth hypsodont. Long diastema between incisors and cheek-teeth present. Stomach simple and divided into three chambers only. Four toes of the feet with bones complete and well developed. Bones of side toes also complete and not imperfect or wanting. Mouse deer stands at shoulders in the range between 25-30 cms. Because of its small size, shy habits and protective colouring pattern it easily escapes observation. Its coat is olive-brown minutely speckled with yellow. The flanks and rump are marked with white spots and longitudinal stripes. 5-7 white lines present on throat. Underparts white. Scrotum hairy.

Locality : Melghat Tiger Reserve.

Habitat : Largely terrestrial and diurnal preferring to live in all types of forests and jungles. It may take shelter in grass-covered rocky hill-sides or under large boulders or in rocky crevices. The male leads solitary life except during breeding season.

Distribution : Throughout India.

Status : Uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-near threatened (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES : No; Red Data Book (National, 1994) : Vulnerable.

Remarks : Mouse deer is a timid and gentle creature and can easily be tamed. They are hunted for its meat for food and body parts for various purposes.

Family CERVIDAE

Subfamily CERVINAE

*54. *Axis axis axis* (Erxleben)

1777. *Cervus axis* Erxleben, *Syst. Regn. Anim., Mamm.* : 312.

1951. *Axis (Axis) axis* (Erxleben) Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 360.

1992. *Axis axis axis* (Erxleben), Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series, 3* (Part-1) : 116 (Published : Director, Zool. Surv. India).

1992. *Axis axis axis* (Erxleben) Corbet and Hill, *The Mammals of the Indomalayan region* : 257-258.

1993. *Axis axis axis* (Erxleben), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 379.

Common Name : English : Spotted Deer, Chital, Marathi : Chital.

Diagnostic Characters : Spotted deer or Chital is perhaps the most beautiful of all the deers. Its coat is a bright rufous-fawn spotted profusely with white at all ages. The old bucks are more brownish and darker in colour. The lower series of spots are arranged in longitudinal rows. Deciduous antlers are present (Max. length 90 cm), while upper incisors are absent in spotted deer. The graceful antlers have three tines. Brow line is set nearly at right angle to the beam and two branched tines at the top of the beam. The outer tine which is a continuation of the main beam is always longer. Spotted deer has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passes between third and fourth toes. A well built deer stands in the range of 65 to 100 cms. at shoulders. Long diastema between incisors and cheek-teeth present. Stomach complex and divided into four chambers. Pre-orbital glands with hair tuft near eye and pedal glands on hind feet present. Metacarpals of 2nd and 5th digits rudimentary. Teeth hypsodont. C1 present and normal in size. The underparts white.

Locality : Herds of spotted deers have been sighted in Kolkaz, Dolar, Raipur, Bori, Semadoh, Dharni and Dhakna areas of Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : Largely terrestrial and diurnal preferring to live in all types of forests and jungles. It may take shelter in grassy forest glades and shaded streams. Spotted deers are seen in herds of ten to thirty which may contain 2-3 stags. However assemblages of hundreds of deers have been sighted at other places also. They are known to live in association with some forest animals including monkeys.

Distribution : Throughout India.

Status : Fairly common in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule IV, CITES : No.

Remarks : Spotted deer is a prolific breeder and new families can be seen at the interval of six months. They are hunted for its meat for food and body parts for various purposes including for making trophies. As per the 1993 census of some wildlife species conducted in Melghat Tiger Reserve, the Spotted Deer population was around 644 (Gogate *et al.*, 1993).

*55. *Cervus unicolor niger* Blainville

1816. *Cervus niger* Blainville, Bull. Soc. Philom. : 76.

1951. *Cervus unicolor niger* Blainville, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 362.

1992. *Cervus unicolor niger* Blainville, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 117 (Published : Director, Zool. Surv. India).
1992. *Cervus unicolor* Kerr, Corbet and Hill, *The Mammals of the Indomalayan region* : 256.
1993. *Cervus unicolor* Kerr, By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 387.

Common Name : English : Sambar, Marathi : Sambar.

Diagnostic Characters : Sambar is perhaps the largest of all the Indian deers. Its coat is coarse and shaggy. In stags or males it forms a mane around the neck and throat. The old bucks tend to become darker, almost black in colour. Deciduous antlers are present, while upper incisors are absent in sambar. The stout and rugged antlers have three tines. Brow line is set nearly at acute angle to the beam. At its summit, the beam is forked into two almost equal sized tines. The outer tine which is a continuation of the main beam may or may not be equal to inner tine in length. Sambar has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passes between third and fourth toes. A well built sambar stands in the range of 65 to 160 cms at shoulders. Tail is long and bushy. Ears large and broad. Long diastema between incisors and cheek-teeth present. Stomach complex and divided into four chambers. Pre-orbital glands near eye present. Metacarpals of 2nd and 5th digits rudimentary. Teeth hypsodont. C1 present and normal in size. The general colour is brown with a yellowish or greyish tinge. The underparts paler. In hot weather much of the hair is shed.

Locality : Herds of sambar were sighted in Kolkaz, Dolar, Raipur, Bori, Semadoh, Dharni and Dhakna areas and number of other places in Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : A typical forest deer species of South-East Asia. Largely terrestrial preferring to live in all types of forests and jungles. Forested hillsides, sometimes near cultivations, are the favourite haunt of sambar. It may take shelter in grassy forest glades and shaded streams. They feed mainly at night and retire into heavy cover at daybreak and do not usually come out till dusk. Sambars are seen in small herds consisting of 4/5 to 12 individuals. The capacity of so heavy deer to move silently through dense and thick forests is amazing. Sambar take to water readily and swim with the body submerged, only the face and antlers showing above the surface.

Distribution : Throughout India.

Status : Fairly common in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule III, CITES : No.

Remarks : Sambar is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic as well as international commercial trade.

Shed sambar antlers are also involved in the commercial trade. Sambar is a favourite prey species of tiger and wild dogs. As per 1993 census of some wildlife species conducted in Melghat Tiger Reserve, the sambar population was around 2700 + (Gogate *et al.*, 1993).

Subfamily MONTIACINAE

*56. *Muntiacus muntjak aureus* (H. Smith)

1872. *Cervus aureus* H. Smith, *Griffith's Cuvier Anim. Kingd.*, 4. : pl. Opposite p. 148.
1951. *Muntiacus muntjak aureus* (H. Smith), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 356.
1992. *Muntiacus muntjak muntjak* (Zimmermann), Corbet and Hill, *The Mammals of the Indomalayan region* : 260.
1993. *Muntiacus muntjak aureus* (H. Smith), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 389.

Common Name : English : Indian Muntjac or Barking Deer, Marathi : Bhekar.

Diagnostic Characters : Barking deer has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passing between third and fourth toes. Indian Muntjak is a little deer with only males possessing comparatively small antlers (rarely larger than 7cms.) having two branches. The deciduous antlers are formed on a elongated hair covered bony pedicles (Length between 7.5 to 10 cms.) which further extend down the front of the face in bony ridges. Hence Barking deer is also known as Ribfaced Deer. Skull possesses lachrymal pits for preorbital glands near eyes. Upper incisors are absent in both sexes, while tusk-like canines in males are present in barking deer. Male possesses glands below the chin. Teeth hypsodont. A fully grown adult stands in the range of 40 to 60 cms at shoulders. Tail is long and bushy. The short dainty legs make this little deer look rather heavy bodied. Ears large and broad. Long diastema between incisors and cheek-teeth present. Metacarpals of 2nd and 5th digits rudimentary. The dorsum is bright and glossy yellowish-red or chestnut, while underparts whitish in color. Stomach complex and divided into four chambers. In hot weather much of the hair is shed.

Locality : Barking Deer has been sighted in Chaddupati, Semadoh, Dharni and Dhakna areas in Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : A typical thickly wooded hill is the favourite haunts of Barking Deer. Largely terrestrial preferring to live in all types of forests and jungles. They are fairly diurnal in habit. They are seen singly or in pairs or in small family parties. They keep to more or less thick jungle and come out to graze in the glades or outskirts of the forest. When alarmed and in flight these deers give out a series of short barks, hence name : Barking Deer.

Distribution : Central India for the subspecies.

Status : Fairly common in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-least concern (Nationally) and Data Deficient (Globally); Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule III, CITES : No.

Remarks : Agrawal *et al.* (1992) mentioned occurrence of three subspecies of *Muntiacus muntjak* in India. Out of these, *Muntiacus muntjak vaginalis* (Boddaert) has been reported from Bengal by them. *Cervulus tamulicus* reported from Deccan has been synonymised in *Muntiacus muntjak aureus* by Ellerman and Morrison-Scott (1952). Since Wilson and Reeder (1993) still considers *Muntiacus muntjak aureus* a valid name for this subspecies and since the name is still in usage, *Muntiacus muntjak aureus* has been tentatively retained here also. However revisionary studies of the *Muntiacus muntjak* subspecies are recommended. Barking deer is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic as well as international commercial trade. As per the 1993 census of some wildlife species conducted in Melghat Tiger Reserve, the barking deer population was around 1650 + (Gogate *et al.*, 1993).

Family BOVIDAE

Subfamily BOVINAE

*57. *Bos gaurus* Smith

1827. *Bos gaurus* H. Smith, *Griffith's Cuvier Anim. Kingd.*, 4 : pl. Opposite p. 399.

1951. *Bos gaurus gaurus* H. Smith, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 381.

1992. *Bos gaurus* H. Smith, Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 118 (Published : Director, Zool. Surv. India).

1992. *Bos gaurus* H. Smith, Corbet and Hill, *The Mammals of the Indomalayan region* : 264.

Common Name : English : Indian Gaur, Marathi : Gava.

Diagnostic Characters : Indian Gaur has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passing between third and fourth toes. Gaur is a robust animal with height at shoulders, in males, in the range of 175-196 cms, and possessing permanent horns in both sexes. Gaur horn bases are wide apart and cross section of the horn is always round or oval. The horns consist of unbranched bone cores with sheaths of horns. It possesses huge head, deep massive body and sturdy limbs. Ears large and broad. A prominent muscular dorsal ridge present on the shoulders which slopes down to the middle of the back where it ends in an abrupt dip. Metacarpals of 2nd and 5th digits rudimentary. Being a member of the

bovid family upper incisors absent, teeth hypsodont and diastema between incisors and cheek-teeth long. Tail with terminal tuft of hairs. The general colour of body coffee or reddish brown or jet black in old bulls; ashy forehead; yellowish or whitish stockings. Calves always light in colour, while adult female blackish brown in colour. Stomach complex and divided into four chambers. In hot weather much of the hair is shed.

Locality : Herds of gaur have been sighted in Raipur, Harisal, Dolar and Koktu areas in Melghat Tiger Reserve by ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : A typical thickly wooded hills are the favourite haunts of Gaur in India. Largely terrestrial preferring to live in all types of forests and jungles. They can go even beyond the altitude of 6000 Ft. They are fairly diurnal in habit. They are seen generally in herds. They keep to more or less thick jungle and come out to graze in open or outskirts of the forest. Gaur is by nature shy and timid animal.

Distribution : Peninsular India.

Status : Fairly common in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable (Nationally) and Data Deficient (Globally), Red Data Book, National (1994) : Vulnerable, Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES Appendix : I.

Remarks : Peter Grubb in Wilson and Reeder (1993) has included *Bos gaurus* in *Bos frontalis*. However *Bos gaurus* has been retained here based on the comments given in Corbet and Hill (1992). Gaur is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic as well as international commercial trade. As per the 1993 census of some wildlife species conducted in Melghat Tiger Reserve, the gaur population was around 2130 (Gogate *et al.*, 1993).

***58. *Boselaphus tragocamelus* (Pallas)**

1766. *Antilope tragocamelus* Pallas, Misc. Zool. : 5.

1951. *Boselaphus tragocamelus* (Pallas), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 379.

1992. *Boselaphus tragocamelus* (Pallas), Corbet and Hill, *The Mammals of the Indomalayan region* : 267.

1993. *Boselaphus tragocamelus* (Pallas), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 401.

Common Name : English : Blue Bull, Marathi : Nilgai.

Diagnostic Characters : Blue Bull has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passing between third and fourth toes. Blue Bull or Nilgai is somewhat horse-like in build with

height at shoulders, in males, in the range of 130-140 cms. Bulls or males possess stout, conical and short horns in males. The horns consist of unbranched bone cores with sheaths of horns. Sheaths distinctly keeled. The males wear distinctive tuft of stiff long black hairs on the throat. Both sexes possess mane. Metacarpals of 2nd and 5th digits rudimentary. Being a member of the bovid family upper incisors absent, teeth hypsodont and diastema between incisors and cheek-teeth long. Shallow preorbital glands present. A pair of white rings present near hooves. Lips, chin, throat, inside of the ears and the undersurface of the tail are white. In males there are two white spots on the cheek. The adult bull has a coarse iron-grey coat with bluish tinge. Hence the name Blue Bull. Females and the subadults are tawny or reddish tan in colour. Nostrils set in naked moist rhinarium. Stomach complex and divided into four chambers. In hot weather much of the hair is shed.

Locality : Nilgai has been sighted in Harisal, Chaddupati and Dhakna areas in Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : Largely terrestrial animal preferring to live in dry deciduous and thorn forest. However they avoid dense forests and move around in hills sparsely dotted with trees, or on undulating or level plains covered with grass and patches of scrub. They freely enter in crop fields and are source of damage to the standing crops. Though Blue Bulls are social in habit, they do not regularly congregate in large herds. Nilgai can survive without water for long periods.

Distribution : Peninsular India.

Status : Not uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule III, CITES Appendix : No.

Remarks : Prater (1980) has kept Nilgai alongwith four horned antelope in Subfamily Boselaphine on the grounds that Nilgai and four horned antelope cannot be classified either with the oxen or with deer or true antelope or sheep/goat due to number of distinguishing characters. However *Boselaphus tragocamelus* has been retained here under Bovinae following Wilson and Reeder (1993). Nilgai is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic as well as international commercial trade. As per the 1993 census of some wildlife species conducted in Melghat Tiger Reserve the Nilgai population was around 132 (Gogate *et al.*, 1993).

***59. *Tetracerus quadricornis* (Blainville)**

1816. *Cerophorus (Cervicapra) quadricornis* Blainville, *Bull.Soc. Philom. Paris* : 75 & 78.

1951. *Tetracerus quadricornis* (Blainville), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 378.

1992. *Tetracerus quadricornis* (Blainville), Corbet and Hill, *The Mammals of the Indomalayan region* : 268.
1993. *Tetracerus quadricornis* (Blainville), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 403.

Common Name : English : Four Horned Antelope, Marathi : Chousinga.

Diagnostic Characters : Four Horned Antelope has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passing between third and fourth toes. Four Horned Antelope or Chousinga, as the name suggests, possesses four horns on the head. It is the only representative of the family in this subcontinent which possesses four smooth horns. Of these the front pair between the eyes on the forehead is always shorter (about 2-3 cm). However females are without any horns. The posterior pair is longer (8-10 cm) and is situated on the top of the head. Height of four horned antelope at shoulders, in males, is around 60+cms. Another striking character in chousinga is the presence of a pair of well developed glands (Pedal glands) between the false hooves of the hindlegs in both the sexes. Metacarpals of 2nd and 5th digits rudimentary. Being a member of the bovid family upper incisors absent, teeth hypsodont and diastema between incisors and cheek-teeth long. Preorbital glands present. Fur is thin, harsh and short. Its coat colour varies from brown to rufous brown above and white below. A dark stripe runs down the front of each leg. The stripe is broader and more defined on the forelegs. Stomach complex and divided into four chambers.

Locality : Chousinga has been sighted in Chaddupati and Dhakna areas in Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period.

Habitat : Largely terrestrial animal preferring to live in well wooded, watered, undulating dry deciduous forests and transition zone between scrub and forests. Never seen in dense forests. It is a nocturnal and shy animal found singly or in pair. They have the habit of defecating in one place.

Distribution : Throughout India except in North-East India.

Status : Not uncommon in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES Appendix : No, Red Data Book, National (1994) : Vulnerable.

Remarks : Prater (1980) has kept four horned antelope in Subfamily Boselaphine on the grounds that it cannot be classified either with the oxen or with deer or true antelope or sheep/goat due to number of distinguishing characters. However *Tetracerus quadricornis* has been retained here under Bovinae following Wilson and Reeder (1993). Four horned antelope is hunted for its meat for food and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions,

human interference and domestic commercial trade. As per the 1993 census of some wildlife species conducted in Melghat Tiger Reserve the four horned antelope population was around 111 (Gogate *et al.*, 1993).

Subfamily ANTILOPINAE

*60. *Antilope cervicapra cervicapra* (Linn.)

1758. *Capra cervicapra* Linnaeus, *Syst. Nat.* 10th ed., I : 69.
1951. *Antilope cervicapra cervicapra* (Linnaeus), Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 387.
1992. *Antilope cervicapra cervicapra* (Linnaeus), Corbet and Hill, *The Mammals of the Indian subcontinent* : 268-269.
1993. *Antilope cervicapra cervicapra* (Linnaeus), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 395.

Common Name : English : Blackbuck or Indian Antelope, Marathi : Kalvit.

Diagnostic Characters : Blackbuck or Indian Antelope has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passing between third and fourth toes. Blackbuck is small to medium sized antelope with slender legs and graceful built. Its striking colour, beautiful spiralled horns, which may reach even the shoulder height, and marvellous built give it an rare elegance. Its height at shoulders, in males, is around 80cms. The spiralled horns (upto 50cms), which may or may not be present in females, are generally long, more or less cylindrical, and often lyre-shaped. The horns are commonly marked with prominent and annulated rings. The bony cores of the horns are nearly solid throughout. Another striking character in Indian Antelope is the presence of a pair of well- developed and large Preorbital glands under the eyes. These swollen glands attract the attention. Large inguinal glands are also present. These glands appear to be means of communication. Metacarpals of 2nd and 5th digits rudimentary. Being a member of the bovid family upper incisors absent, teeth hypsodont and diastema between incisors and cheek-teeth long. Pronounced sexual dimorphism is seen in the colour pattern of the Blackbuck. Adult male patterned black dorsally and bright white on throat and ventrum. Females and sub-adults (Fawns) reddish or yellowish fawn in colour dorsally. A faint white line is seen along the abdomen in females and sub-adults. Small tuft of hairs is usually seen on the knee. Muzzle hairy right upto the edge of the nostrils. Stomach complex and divided into four chambers.

Locality : A small herd of about 10 antilopes was seen in the region between Dharni and Rangubeli in Melghat Tiger Reserve by the ZSI survey parties and Forests Dept. authorities during the project period. Sightings of small herds of antilopes on Paratwada Road outside Melghat Tiger Reserve area have also been recorded during survey periods.

Habitat : Largely terrestrial, gregarious and social animal preferring to live in open

plains covered with scrub or cultivations. They may enter open forests which contain vast expanses of grass. It is a diurnal and silent animal found in a herd of 20-30 individuals.

Distribution : Throughout the drier parts of peninsular India except in North-East India.

Status : Not common in Melghat Tiger Reserve; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern(Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES Appendix : III (Nepal), Red Data Book, National (1994) : Vulnerable.

Remarks : Blackbuck is hunted for its meat for food and skin and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic commercial trade (Pradhan, 1997).

61. *Gazella bennettii* (Sykes)

1831. *Antelope bennettii* Sykes, P.Z.S. 1830-31 : 104.

1951. *Gazella gazella bennetti* (Sykes), Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 392.

1983. *Gazella dorcas* (Linnaeus), Tikader, *Threatened Animals of India* : 117.

1992. *Gazella bennettii* (Sykes), Corbet and Hill, *The Mammals of the Indomalayan region* : 270.

1993. *Gazella bennettii* (Sykes), By Peter Grubb. In : Wilson & Reeder, *Mammal Species of the World* : 396.

Common Name : English : Indian Gazelle or Chinkara, Marathi : Chinkara.

Diagnostic Characters : Indian gazelle or Chinkara has been included in the mammalian order Artiodactyla since it possesses digits with thickened even toed hooves with axis of the foot passing between third and fourth toes. Chinkara is a small sized gazelle with slender legs and graceful built. Its beautiful spiralled short horns and marvellous built give it an rare elegance. Its height at shoulders, in males, is around 65 cm. The horns (25-30cm), which may or may not be present in females, more or less appear almost straight when seen from the front; in profile they take a slightly S-shaped curve. The horns are commonly marked with prominent and annulated rings (15-20 in number). Horns of does or females, if present, are short (10-13cm) and smooth. The bony cores of the horns are nearly solid throughout. Preorbital glands under the eyes present but they are not large like those of Blackbuck. Inguinal glands are also present. These glands appear to be means of communication. Metacarpals of 2nd and 5th digits rudimentary. Being a member of the bovid family upper incisors absent, teeth hypsodont and diastema between incisors and cheek-teeth long. A prominent tuft of hairs are usually seen on the knees. Muzzle hairy right upto the edge of the nostrils. Gazelles are characterised by their sandy to light chestnut colour above, a distinctive white streak on each side of the face and a dusky

patch above the nose. The underparts and the buttocks are pure white in colour. Stomach complex and divided into four chambers.

Locality : Bushy forested or scrubby jungle areas in Amaravati Dist. adjacent to Melghat Tiger Reserve.

Habitat : Gazelle is largely a terrestrial, gregarious and social animal preferring to live in open plains covered with scrub, bushes or cultivations. They may enter open thin forests which contain wide expanses of grass. Its favoured haunts also include ravines, broken country, rocky area and scrub covered hills. It is a diurnal and shy animal found in small herds of 3-25 individuals. Males are territorial and the boundaries are demarcated by faecal stations used repeatedly by males.

Distribution : North-Western and Central India.

Status : Not yet sighted inside the Melghat Tiger Reserve area; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule I Part I, CITES Appendix : No, Red Data Book, National (1994) : Vulnerable.

Remarks : Gazelle is hunted for its meat for food and skin and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions, human interference and domestic commercial trade.

Order	RODENTIA
Suborder	SCIUROGNATHI
Family	SCIURIDAE
Subfamily	RATUFINAE

62. *Ratufa indica centralis* Ryley

1913. *Ratufa indica centralis* Ryley, J. Bombay nat. Hist. Soc., 22 (3) : 436.
1951. *Ratufa indica centralis* Ryley, Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 498.
1961. *Ratufa indica centralis* Ryley, Ellerman, *Fauna of British India, Mammalia*, vol. III (Part I) : 260.
1981. *Ratufa indica centralis* Ryley, Khajuria and Ghosal, *Rec. zool. Surv. India*, 79 : 235-257.
1992. *Ratufa indica centralis* Ryley, Corbet and Hill, *The Mammals of the Indomalayan region* : 276-277.
1993. *Ratufa indica centralis* Ryley, Wilson & Reeder, *Mammal Species of the World* : 437.

Common Name : English : Indian Giant squirrel, Marathi : Shekru.

Diagnostic Characters : Indian giant squirrel has been included in the mammalian order *Rodentia*, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a

distinct diastema between incisors and cheekteeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Squirrels, marmots, rats, mice, porcupines and their close relatives are grouped under Rodentia, the rodents or gnawing mammals. Body size large over 280 mm in head and body length (Max. 470 mm), molars four in number and tail usually long and bushy (Around 600 mm). Infraorbital foramen scarcely open for muscle transmission. Dorsum reddish brown, while venter light buff or yellowish in colour. Tail black with pale tip. Ears red with small tuft of hairs. Forelegs black in colour. Transverse pale band present on nape. Three pairs of mammary teats present.

Locality : Thick forested areas in Melghat Tiger Reserve. Type locality, Hoshangabad in Madhya Pradesh, is not very far, hence its occurrence in the project area is not ruled out.

Habitat : Giant squirrels live only in thick forests of different types and, hence, is considered as indicator species. It is an arboreal species. They keep to the canopies and seldom come on the ground. They move from tree top to tree top taking amazing leaps with limbs outspread, covering as much as twenty feet in a single flight. They are in habit of constructing number of nests on the tree tops. They are shy and wary animals and not so easy to locate. Despite its brilliant colouring they are sooner heard than seen.

Distribution : Thick forested areas of central India including Melghat Tiger Reserve.

Status : Not yet sighted inside the Melghat Tiger Reserve area; IUCN Criteria proposed as per the CAMP Report (1998) : Vulnerable, Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule II, CITES Appendix : I, Red Data Book, National (1994) : No.

Remarks : Hoffman Robert S., Anderson C. G., Thorington, R. W. And Heaney, L. R. in Wilson and Reeder (1993) have placed Genus *Ratufa* in the Subfamily *Sciurinae*. However it has been kept under *Ratufinae* here following the comments given in Corbet and Hill (1992). Indian giant squirrel is hunted for its meat for food and skin and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions and habitat isolation restricting to few individuals near sacred springs and riverine forests, human interference and domestic as well as international commercial trade.

Subfamily SCIURINAE

*63. *Funambulus palmarum robertsoni* Wroughton

1916. *Funambulus robertsoni* Wroughton, J. Bombay nat. Hist. Soc., 24 : 647.

1951. *Funambulus palmarum robertsoni* Wroughton, Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals : 495.

1961. *Funambulus palmarum robertsoni* Wroughton, Ellerman, Fauna of British India, Mammalia, vol. III (Part I) : 239.

1981. *Funambulus palmarum robertsoni* Wroughton, Khajuria and Ghosal, *Rec. zool. Surv. India*, **79** : 235-257.
1992. *Funambulus palmarum* (Linn.), Corbet and Hill, *The Mammals of the Indomalayan region* : 280-281.
1993. *Funambulus palmarum robertsoni* Wroughton, Wilson & Reeder, *Mammal Species of the World* : 426.

Common Name : English : Indian three striped palm squirrel, Marathi : Pateri Khar.

Diagnostic Characters : Indian three striped palm squirrel has been included in the mammalian order Rodentia, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheekteeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Squirrels, marmots, rats, mice, porcupines and their close relatives are grouped under Rodentia, the rodents or gnawing mammals. Head and Body length not over 200 mm, molars four in number and tail always long and bushy (Range 140-160 mm). Infraorbital foramen scarcely open for muscle transmission. Tooth row less than 7mm. The back has three light stripes on the dorsal surface with underparts usually white or whitish or buff coloured. Underside of the tail has a red or reddish line running down the centre for a greater extent. Dorsum brownish or greyish. The stripes are long and mid-dorsal stripe light but prominent. Two pairs of mammary teats present.

Locality : Small groups were sighted in Semadoh and Kolkaz in Melghat Tiger Reserve during project period by ZSI survey parties.

Habitat : Arboreal and diurnal preferring to live in forests. Though arboreal, they come quite frequently on ground. They are in habit of constructing nests in tree holes. They are shy animals.

Distribution : Central India.

Status : Not very uncommon in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : No, CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : Corbet and Hill (1992) synonymised *Funambulus palmarum robertsoni* Wroughton in *Funambulus palmarum* (Lin.) under Subfamily *Funambulinae* without any comments on key characters. However *Funambulus palmarum robertsoni* Wroughton has been retained here under Subfamily *Sciurinae* following the comments of Hoffman Robert S., Anderson C. G., Thorington, R. W. And Heaney, L. R. in Wilson and Reeder (1993). Indian squirrel is hunted for its meat for food and skin and body parts for various purposes including making trophies. Threats to the survival of the species are also due to habitat destructions and isolation, human interference and domestic commercial trade.

***64. *Funambulus pennanti* Wroughton**

1905. *Funambulus pennanti* Wroughton, J. Bombay nat. Hist. Soc., 16 : 411.
1961. *Funambulus pennanti* Wroughton, Ellerman, *Fauna of British India, Mammalia*, vol. III (Part I) : 208-219.
1982. *Funambulus pennanti pennanti* Wroughton, Khajuria and Ghosal, *Rec. zool. Surv. India*, 79 : 235-257.
1992. *Funambulus pennantii* Wroughton, Corbet and Hill, *The Mammals of the Indomalayan region* : 281-282.
1992. *Funambulus pennanti* Wroughton, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 128-129 (Published : Director, Zool. Surv. India).

Common Name : English : Indian five striped northern palm squirrel, Marathi : Pateri Khar.

Diagnostic Characters : Indian five striped palm squirrel has been included in the mammalian order *Rodentia*, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheekteeth (Molars) and the clawed digits. *Rodentia* is by far the largest mammalian order. Squirrels, marmots, rats, mice, porcupines and their close relatives are grouped under *Rodentia*, the rodents or gnawing mammals. Head and Body length not over 200 mm, molars four in number and tail always long and bushy (Range 130-180 mm). Infraorbital foramen scarcely open for muscle transmission. Tooth row less than 7mm. The back has five bold light coloured stripes on the dorsal surface with underparts usually white or whitish or buff coloured. There are three median pale stripes and one pale stripe on the flanks on each side. Underside of the tail without red or reddish line running down the centre. Dorsum brownish or greyish. The stripes are long and mid-dorsal stripe light but prominent. Baculum simple and not bifurcated. Two pairs of mammary teats present.

Locality : Small groups were sighted in Semadoh, Dhakna and Kuvapati areas in Melghat Tiger Reserve during the project period.

Habitat : Arboreal and diurnal preferring to live close to the human habitations in forests. Five striped squirrel is more commensal species than the three striped species. Five striped squirrel is more common in North India. Though arboreal, they come quite frequently on ground. They are in habit of constructing nests in tree holes.

Distribution : Peninsular India south of Himalaya.

Status : Not very uncommon in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : IV, CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : Number of subspecies have been described on the basis of pelage colour

variations seen in the species by some authors. However *Funambulus pennanti* Wroughton has been described here as a single species on the basis of Ellerman (1961), Corbet and Hill (1992) and Agrawal *et al.* (1992). Indian squirrel is hunted for its meat for food and skin and body parts for various purposes including making small trophies and some other articles like brushes etc. Threats to the survival of the species are also due to habitat destructions and isolation, human interference and domestic commercial trade.

Family PTEROMYIDAE

*65. *Petaurista philippensis philippensis* (Elliot)

1839. *Pteromys philippensis* Elliot, *Madras J. Litt. Sci.*, 10 : 217.
1951. *Petaurista petaurista philippensis* (Elliot), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 462.
1961. *Petaurista petaurista philippensis* (Elliot), Ellerman, *Fauna of British India, Mammalia*, vol. III (Part I) : 48-50.
1992. *Petaurista petaurista philippensis* (Elliot), Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 124-125 (Published : Director, Zool. Surv. India).
1992. *Petaurista philippensis philippensis* (Elliot), Corbet and Hill, *The Mammals of the Indomalayan region* : 310-312.
1993. *Petaurista philippensis philippensis* (Elliot), Wilson & Reeder, *Mammal Species of the World* : 463.

Common Name : English : Common giant flying squirrel, Marathi : Udnari Khar.

Diagnostic Characters : Common giant flying squirrel has been included in the mammalian order Rodentia, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheekteeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Squirrels, marmots, rats, mice, porcupines and their close relatives are grouped under Rodentia, the rodents or gnawing mammals. Flying squirrel is distinctive in possessing gliding membrane on each flank from wrist to ankle. Possession of gliding membrane is the characteristic feature of the family Pteromyidae amongst all rodents. Head and Body length of adult specimen in the range between 350-470 mm, tail always longer than Head & Body (Range 400-530 mm) and bushy, Hind feet moderately long (60-80 mm) and molars four in number. Occipitonasal length between 65-81 mm. Infraorbital foramen scarcely open for muscle transmission. Tooth row in the range between 15-17.4 mm. Dorsally the giant flying squirrel, as a rule, is dark brownish grey or tending to be more grey but without any reddish tinge and with underparts usually whitish grey or buff coloured. Greater part of the tail black. Two pairs of mammary teats present.

Locality : Common giant flying squirrel was sighted in Semadoh, Dhakna, Kolkaz, Chikhaldara and Kuvapati areas in Melghat Tiger Reserve during the project period.

Habitat : Arboreal and nocturnal in habit preferring to live in tropical and temperate forests on plains to those on high altitudes. Contrary to the common name, the flying squirrel does not fly but glides from tree to tree in the air. When the animal leaps into the air the outspread limbs expands the gliding membrane between the limbs to the fullest extent. Supported by the membrane the squirrel glides smoothly and swiftly downwards. A glide of 100 feet by the flying squirrel was observed during evening hours (around 6.30 p.m.) near Dhakna Rest House by the ZSI Survey party. It emerges from shelter at dusk and retire before dawn. Usual roost is a hole in a tree. Flying squirrel can easily be tamed but they are delicate animals and do not live long in confinements.

Distribution : Peninsular India south of Himalaya.

Status : Uncommon in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Near threatened (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : II Part II, CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : *Petaurista philippensis* was earlier considered to be a subspecies of *Petaurista petaurista*. However *Petaurista philippensis* has been considered as a separate species by Corbet and Hill (1992) and upheld by Hoffman *et al.* in Wilson and Reeder(1993). The flying squirrel is hunted for its meat for food. Threats to the survival of the species are also due to habitat destructions, fragmentation, human interference and domestic trade.

Family MURIDAE

Subfamily MURINAE

***66. *Mus musculus castaneus* Waterhouse**

1843. *Mus castaneus* Waterhouse, *Ann. Mag. nat. Hist.*, 12 : 134.
1951. *Mus musculus castaneus* Waterhouse, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 606.
1961. *Mus musculus castaneus* Waterhouse, Ellerman, *Fauna of British India, Mammalia*, vol. III (Part II) : 743.
1992. *Mus musculus castaneus* Waterhouse, Agrawal, V.C. *et al.*, *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 143 (Published : Director, Zool. Surv. India).
2000. *Mus musculus castaneus* Waterhouse, Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 122.

Common Name : English : House Mouse, Marathi : Gharatil Undir.

Diagnostic Characters : House mouse has been included in the mammalian order Rodentia, or the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots

and their close relatives have been grouped under Family Muridae. A small house mouse with Head and Body length in the range of 55-80 mm, molars three in number and tail always long and short haired (Range 68-88 mm). It may be mostly longer than Head and Body. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Upper molar row less than 4 mm but highly specialised. First upper molar over half the length of the entire molar tooth-row, while third molar extremely reduced. Anterointernal cusp of the first molar heavily distorted on the inner side. Palatal foramina long extending posteriorly between the toothrow and more than 20% of the occipitonasal length. Diastema short and less than 25% of occipitonasal length which is always less than 23 mm. Anterior of zygomatic plate strongly convex. Dorsum generally dark brown, while venter always dark grey or ochraceous brown, but never white, and hindfeet brown in colour. Tail uniform in colour. Five pairs of mammary glands present.

Locality : Sighting in the residential premises in Semadoh, Chikhaldara and Dhakna areas in Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, fossorial and found in all habitats since it is a commensal species. A common house mouse causing extensive damage to the properties. The species is considered to be the indoor species and rarely seen outdoor.

Distribution : Throughout India.

Status : Common in residential premises; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermins), CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : The species is a prolific breeder and considered to be a pest species since it causes damage to the foodgrains stored in godowns. It is also responsible to cause extensive damage to the public as well as private properties and articles of merchandise due to its habit of gnawing by its evergrowing chisel-shaped incisors.

*67. *Mus musculus homourus* Hodgson

- 1845. *Mus homourus* Hodgson, *Ann. Mag. nat. Hist.*, [1] 15 : 268.
- 1951. *Mus musculus homourus* Hodgson, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 607.
- 1961. *Mus musculus homourus* Hodgson, Ellerman, *Fauna of British India, Mammalia*, vol. III (Part II) : 742.
- 1992. *Mus musculus homourus* Hodgson, Agrawal, V.C. et al., *Fauna of West Bengal, State Fauna Series*, 3 (Part-1) : 143-144 (Published : Director, Zool. Surv. India).
- 2000. *Mus musculus homourus* Hodgson, Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 121-122.

Common Name : English : House Mouse, Marathi : Gharatil Undir.

Diagnostic Characters : *M. m. homourus* has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under family Muridae. A house mouse with Head and Body length in the range of 63-94 mm, molars three in number and tail short haired and bicoloured (Pale below). Tail length in the range of 68-92 mm. It is variable in the subspecies and may or may not be equal to Head and Body length. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Upper molar row less than 4 mm but highly specialised. First upper molar over half the entire length of molar tooth-row, while third molar extremely reduced. Anterointernal cusp of the first molar heavily distorted on the inner side. Palatal foramina long extending posteriorly between the toothrow and more than 20% of the occipitonasal length. Diastema short and less than 25% of occipitonasal length which is always less than 23 mm. Anterior edge of the zygomatic plate always straight. Dorsum dark brown and venter always whitish with grey bases. Hindfeet brown in colour. Five pairs of mammary glands present.

Locality : Collected four specimens from the residential premises in Semadoh and Kolkaz areas in Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, fossorial and found in all habitats since it is a commensal species. A common house mouse causing extensive damage to the properties. The species is considered to be the outdoor species and rarely seen indoor.

Distribution : Throughout India.

Status : Not uncommon; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermins), CITES Appendix : No, Red Data Book.; National (1994) : No.

Remarks : Same as those for *Mus musculus castaneus*.

***68. *Mus booduga booduga* (Gray)**

- 1837. *Leggada booduga* Gray, Charlesworth's Mag. Nat. Hist., 1 : 586.
- 1851. *Mus terricolor* Blyth, J. Asiat. Soc. Bengal, 20 : 172.
- 1912. *Leggada dunni* Wroughton, J. Bombay nat. Hist. Soc., 21 : 339.
- 1951. *Mus booduga booduga* (Gray), Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals : 609.
- 1961. *Mus booduga booduga* (Gray), Ellerman, Fauna of British India, Mammalia, vol. III (Part II) : 753.
- 2000. *Mus booduga booduga* (Gray), Agrawal, V.C., Rec. zool. Surv. India, Occ. Paper No. 180 : 122-126.

Common Name : English : Little Indian Field Mouse, Marathi : Shettil Undir.

Diagnostic Characters : *M. b. booduga* has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under Family Muridae. A commonly seen small field mouse possessing Head and Body length in the range of 50-88 mm, molars three in number and tail short haired and bicoloured (Pale below). Tail length in the range of 50-72 mm. It may or may not be equal to Head and Body length. Hindfeet smaller and in the range between 14-16 mm. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Upper molar row less than 4 mm but highly specialised. First upper molar bearing anterior accessory cusp extends over half the length of molar tooth-row, while third molar extremely reduced. Anterointernal cusp of the first molar heavily distorted on the inner side. Anterior palatal foramina long extending posteriorly between the toothrow and more than 20% of the occipitonasal length. Diastema long and more than 25% of occipitonasal length which is always less than 21 mm. Upper incisors opisthodont or orthodont. Fur smooth. Dorsum varies from light to dark reddish or rusty brown and underparts perfectly white, whitish, grey or, sometimes even dull grey in colour. But apparently both, white and grey bellied forms, occur together in many localities and it is very difficult to divide this species into subspecies on the basis of the colour of the underparts (Agrawal, 2000). Hindfeet whitish or paler. Five pairs of mammary glands present.

Locality : Collected eight specimens from the agricultural fields and similar habitats in Chourakund, Raipur, Dhakna and Paturda areas of Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, fossorial and nocturnal in habit and generally found in agricultural crop field areas. Inhabits burrows in the field or on the edges of the cultivations. A common field mouse causing extensive damage to the crops. The species is an outdoor species.

Distribution : Throughout India.

Status : common in the fields; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermin), CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : Marshall (1977), Corbet and Hill (1992) and Agrawal *et al.* (1992) separated *Mus booduga*, *Mus terricolor* and *Mus dunni* on the basis of variations in the underparts colour and also in the chromosomal studies conducted by Sen & Sharma (1983) and Aswathanarayana & Manjunatha (1981a). However recently Agrawal (2000) has pointed out number of anomalies in the taxonomy of *booduga* complex and rightly concluded that

till the confusions were removed, *Mus dunni*, *Mus terricolor* and *Mus booduga* should be treated as synonyms of *Mus booduga* as was done earlier by Ellerman (1961) due to lack of proper demarcation between the populations under study. In the present studies both the forms were collected from the same locality (Dhakna) during the project period. Hence *Mus dunni*, here also, has been treated as synonym of *Mus booduga* on the basis of comments given by Agrawal (2000). The species is a prolific breeder and considered to be a pest species since it causes damage to the crops. It is also responsible to cause extensive damage to the public as well as private properties due to its habit of gnawing by its evergrowing chisel-shaped incisors.

69. *Mus phillipsi* Wroughton

- 1912. *Mus phillipsi* Wroughton, J. Bombay nat. Hist. Soc., 21 : 772.
- 1951. *Mus cervicolor phillipsi* Wroughton, Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals : 610.
- 1961. *Mus cervicolor phillipsi* Wroughton, Ellerman, Fauna of British India, Mammalia, vol. III (Part II) : 763.
- 1977. *Mus phillipsi* Wroughton, Marshall, J. T., A synopsis of Asian species of *Mus* (Rodentia : Muridae). Bull. Amer. Mus. Nat. Hist., 158 :
- 1992. *Mus phillipsi* Wroughton, Corbet and Hill, The Mammals of the Indomalayan region : 331.
- 2000. *Mus phillipsi* Wroughton, Agrawal, V.C., Rec. zool. Surv. India, Occ. Paper No. : 180 : 127-129.

Common Name : English : Wroughton's small spiny Mouse, Marathi : Undir.

Diagnostic Characters : *M. phillipsi* has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under Family Muridae. A small field mouse possessing Head and Body length in the range of 70-89 mm, molars three in number and tail short haired and bicoloured (Pale below). Tail length in the range of 54-67 mm (about 80% of Head and Body). It is always shorter than Head and Body length. Hindfeet smaller and in the range between 14-18 mm. Occipitonasal length in the range of 20-23 mm. Skull with well-developed supraorbital ridges. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Upper molar row less than 4 mm but highly specialised. First upper molar extends over half the length of tooth-row, while third molar extremely reduced. Anterointernal cusp of the first molar heavily distorted on the inner side. Anterior palatal foramina long extending posteriorly between the toothrow and more than 20% of the occipitonasal length. Diastema long and more than 25% of occipitonasal length which is always less than 21 mm. Upper incisors opisthodont. Fur generally spiny. Dorsum brown to buff, while underparts perfectly white in colour. Hindfeet whitish or paler. Five pairs of mammary glands present.

Locality : Chikhaldara areas of Melghat Tiger Reserve.

Habitat : Terrestrial, fossorial and nocturnal in habit and generally found in rocky habitat. The species is a basically an outdoor species.

Distribution : Throughout India.

Status : Endemic species not common in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Data Deficient (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermins), CITES Appendix : No; Red Data Book : National (1994) : No.

Remarks : Ellerman (1961) thought this form as a subspecies of *Mus cervicolor*. However Marshall (1977) rightly treated it as a separate species on the basis of spiny fur, white venter and well-developed supraorbital ridges on the skull.

***70. *Vandeleuria oleracea oleracea* (Bennett)**

1832. *Mus oleracea* Bennett, *Proc. Zool. Soc. Lond.*, 1832 : 121.

1914. *Vandeleuria wroughtoni* Ryley, *J. Bombay nat. Hist. Soc.*, 22 : 658.

1951. *Vandeleuria oleracea oleracea* (Bennett), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 560.

1961. *Vandeleuria oleracea oleracea* (Bennett), Ellerman, *Fauna of British India, Mammalia*, vol.. III (Part II) : 521-522.

2000. *Vandeleuria oleracea oleracea* (Bennett), Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 62-65.

Common Name : English : Indian Long-tailed Tree Mouse, Marathi : Undir.

Diagnostic Characters : Indian Long-tailed Tree Mouse has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under Family Muridae. Genus *Vandeleuria* is characterised by possession of clawless hallux, 5th finger and toe. A beautiful soft furred field mouse possessing Head and Body length in the range of 60-95 mm, molars three in number and the tail, as name suggest, long, poorly haired, unicoloured and dark. Tail length in the range of 95-130mm (about 117%-178% of Head and Body). It is always longer than Head and Body length. Hindfeet smaller and in the range between 14-20 mm. Occipitonasal length in the range of 19-24 mm. Skull with relatively narrow frontals. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Upper molar row less than 4 mm. Postero-internal cusp of the first and second upper molar retained throughout the life. Anterior palatal foramina quite long (16-18% of the occipitonasal length). Diastema long. Upper incisors narrow, yellow and

plain. Fur always soft and smooth. Dorsum in various shades of brown with reddish tinge, while underparts perfectly white in colour. Hindfeet whitish or paler. Four pairs of mammary glands present.

Locality : Collected one specimen from thin forest patch near Chunkhadi village in Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, arboreal and nocturnal in habit. Trees and shrubs in forest are its natural haunt. Females build globular large nests in the tree hollows, bamboo thickets, thatched roofs of village houses, Baya nests or even in the empty junction boxes fixed on the electric poles. The species is a basically an outdoor species.

Distribution : Throughout peninsular India.

Status : Not very common in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk–Least concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermins), CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : Female Indian Long-tailed Tree Mouse can build a nest in any place which is about a few feet above the ground. A specimen was caught from below a dry bark of the tree by the author during one of the faunistic surveys of Tadoba National Park in Maharashtra. Some chromosome studies have been carried out in India (Agrawal, 2000).

*71. *Rattus rattus rufescens* (Gray)

1837 *Mus rufescens* Gray, *Ann. Mag. Nat. Hist.*, 1 : 585.

1951. *Rattus rattus rufescens* (Gray), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 582.

1961. *Rattus rattus rufescens* (Gray), Ellerman, *Fauna of British India, Mammalia*, vol. III (Part II) : 575-576.

1992. *Rattus rattus rufescens* (Gray), Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 135.

Common Name : English : House Rat, Marathi : Undir.

Diagnostic Characters : House Rat has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under family Muridae. The genus *Rattus* is the largest mammalian genus with more than sixty valid species in Asia and Australia alone and well over five hundred named forms. It is characterised by possession of clawed hallux and long tail (more than 120% of the Head and Body length). Head and Body length in the range between 140-200 mm. *Rattus* species also possess elongated anterior palatal foramina (more than 7.0 mm in length) & extending between maxillary tooth row. Upper

molar tooth row normal and more than 5.0 mm (5.5-6.6 mm), palate long and more than one-half of the occipitonasal length and bulla long and more than 15% of the occipitonasal length. Molars three in number. Tail is always longer than Head and Body length. Hindfeet moderate and in the range between 26-36 mm. Occipitonasal length in the range of 36-46.5 mm. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Postero-internal cusp of the first and second upper molar retained throughout the life. Diastema long. Upper incisors narrow, yellow and plain. Dorsum dark and rufous brown, while underparts dull in colour. Fur with some broad and flat spines in the dorsal pelage. Tail unicoloured and dark. Hindfeet usually dark in colour. Five pairs of mammary glands present.

Locality : Collected 15 specimens from the isolated settlements in Kolkaz, Semadoh and Koktu areas in Melghat Tiger Reserve during the project period.

Habitat : Commensal rodent species found all over the globe. Terrestrial and nocturnal in habit. The species is generally seen close to the human habitations and found in houses, huts, godowns, shops and residential complexes.

Distribution : Throughout India.

Status : Common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermis), CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : The species is a prolific breeder and considered to be a pest species since it causes damage to the foodgrains stored in godowns. It is also responsible to cause extensive damage to the public as well as private properties and articles of merchandise due to its habit of gnawing by its evergrowing chisel-shaped incisors. The species is also known to be responsible for causing number of diseases, including rat bite fever, plague, leptospirosis etc.

72. *Rattus rattus narbadae* Hinton

1918. *Rattus rattus narbadae* Hinton, J. *Bombay nat. Hist. Soc.*, **26** : 77.

1951. *Rattus rattus narbadae* Hinton, Ellerman and Morrison-Scott, *Checklist of Palearctic and Indian Mammals* : 585.

1961. *Rattus rattus narbadae* Hinton, Ellerman, *Fauna of British India, Mammalia*, vol. **III** (Part II) : 580-581.

1983. *Rattus rattus narbadae* Hinton, Khajuria and Ghosal, *Rec. zool. Surv. India*, **79** : 251-252.

1992. *Rattus rattus narbadae* Hinton, Corbet and Hill, *The Mammals of the Indomalayan region* : 337.

Common Name : English : White-bellied House Rat, Marathi : Undir.

Diagnostic Characters : White-bellied House Rat has been included in the mammalian

order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under family Muridae. The genus *Rattus* is the largest mammalian genus with more than sixty valid species in Asia and Australia alone and well over five hundred named forms. It is characterised by possession of clawed hallux and long tail (170-210 mm : mostly more than 130% of the Head and Body length). Head and Body length in the range between 144-210 mm. *Rattus* species also possess elongated anterior palatal foramina (6.6-7.7 mm in length) & extending between maxillary tooth row. Upper molar tooth row normal and more than 5.5 mm (5.6-6.6mm), palate long and more than one-half of the occipitonasal length and bulla long and more than 15% of the occipitonasal length. Molars three in number. Tail is always longer than Head and Body length. Hindfeet moderate and in the range between 30-33 mm. Occipitonasal length in the range of 36.9-41.3 mm. Infraorbital foramen large and open for muscle transmission. Fibula reduced and fused with tibia. Postero-internal cusp of the first and second upper molar retained throughout the life. Diastema long. Upper incisors narrow, yellow and plain. Dorsum dark and rufous brown, while underparts white in colour. Fur with some broad and flat spines in the dorsal pelage. Tail unicoloured and dark. Hindfeet usually dark in colour. Five pairs of mammary glands present.

Locality : Isolated human settlements in forested areas in Melghat Tiger Reserve. Type locality, Hoshangabad in Madhya Pradesh, is not very far, hence its occurrence in Melghat Tiger Reserve is not ruled out.

Habitat : Commensal and endemic rodent subspecies found in Central India. Terrestrial and nocturnal in habit. The species is generally seen close to the human habitations and found in houses, huts, godowns, shops and residential complexes.

Distribution : Throughout Central India.

Status : Uncommon; IUCN Criteria proposed as per the CAMP Report (1998) : No, Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermin), CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : The species is a prolific breeder.

73. *Millardia meltada meltada* (Gray)

1837. *Golunda meltada* Gray, Mag. Nat. Hist., 1 : 586.

1951. *Millardia meltada meltada* (Gray), Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals : 577.

1961. *Rattus* (*Millardia*) *meltada meltada* (Gray), Ellerman, Fauna of British India, Mammalia, vol. III (Part II) : 689-697.

1992. *Millardia meltada meltada* (Gray), Corbet and Hill, The Mammals of the Indomalayan region : 348.

2001. *Millardia meltada* (Gray), Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 110-112.

Common Name : English : Soft-furred Metad, Marathi : Undir.

Diagnostic Characters : Indian soft furred-metad has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives like metads are grouped under family Muridae. Genus *Millardia* is characterised by possession of tail shorter than Head and Body length, ears rounded and shorter than hindfoot length. Five planter pads on each foot. A rather small and a beautiful soft furred field mouse possessing Head and Body length in the range of 97-156 mm, molars three in number and the tail poorly haired & bicoloured. Tail length in the range of 92-145mm. Hindfeet smaller and in the range between 14-20 mm. Occipitonasal length in the range of 21-29 mm. Skull with well-developed supraorbital ridges and long palate, more than one-half of occipitonasal length. Anterior palatal foramina quite long (more than one-fifth of or more than 22% of the occipitonasal length). Nasals long and tend to be narrower behind. Infraorbital foramen large and open for muscle transmission. Bullae large and well inflated. Fibula reduced and fused with tibia. Upper molar row always more than 4 mm and less than 6.5 mm (5.0-6.2 mm). Upper incisors narrow, yellow and plain. M¹ having 8 cusps, M² with 7 cusps (t₃ very small) and M³ with 6 cusps and small. Antero-internal cusps in M¹ not distorted inwards. Postero-internal cusps of the first and second upper molar retained throughout the life. Diastema long. Fur always soft and smooth. Dorsum in various shades of brown with reddish tinge, while underparts perfectly white in colour. Hindfeet whitish or paler. Four pairs of mammary glands present.

Locality : Recorded locality, Hoshangabad in Madhya Pradesh, is not very far, hence its occurrence in Melghat Tiger Reserve is not ruled out.

Habitat : Terrestrial, fossorial and nocturnal in habit preferring to live near cultivations. However they may also be found in the heavy shrubs surrounded by forest, or living among rocks and in the tumbled down walls of the deserted houses. Favoured haunt is black cotton soil in Deccan region for making burrows. They live in pairs or in small colonies. The species is essentially an outdoor species.

Distribution : Throughout peninsular India.

Status : Not uncommon in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk–Least concern(Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermis), CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : Earlier Ellerman (1961) considered *Millardia* as a subgenus of *Rattus*. However latter revisionary taxonomic studies confirmed its generic status. While doing so *Millardia meltada* was divided in three subspecies which was accepted by Corbet and Hill (1992).

But recently Agrwal (2000) synonymised all the three subspecies in *Millardia meltada*. However Pradhan *et al.* (Comm.) do not agree with the merger and held the view that *Milliardia meltada* distinctly consists of three subspecies viz : *meltada*, *pallidior* and *singuri*. Same views have been adopted here. The species is a prolific breeder and considered to be an agricultural pest species since it causes damage to the standing crops.

***74. *Cremnomys blanfordi* (Thomas)**

1881. *Mus blanfordi* Thomas, *Ann.Mag. nat. Hist.*, (5) 7 : 24.
1951. *Rattus blanfordi* (Thomas), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 580-581.
1961. *Rattus blanfordi* (Thomas), Ellerman, *Fauna of British India, Mammalia*, vol. III (Part II) : 605-609.
1992. *Cremnomys blanfordi* (Thomas), Corbet and Hill, *Mammals of the Indomalayan region* : 349-350.
2000. *Cremnomys blanfordi* (Thomas), Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 107-108.

Common Name : English : Blanford's Rat, Marathi : Undir.

Diagnostic Characters : Blanford's rat has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under family Muridae. The genus *Cremnomys* is characterised by possession of bicoloured tail longer than Head and Body length, fifth hind toe rather long and not very short of central three toes, and six planter pads on each foot. A comparatively large sized *Cremnomys* species with Head and Body length in the range of 150-195 mm, molars three in number and the tail well-haired & bicoloured. The tail is characteristically wholly dark proximally, while wholly white distally. Tail length in the range of 185-208 mm. Hindfeet large and in the range between 32-37 mm. Occipitonasal length in the range of 21-29 mm. Skull with well-developed supraorbital ridges and long palate, more than one-half of occipitonasal length. Anterior palatal foramina quite long (more than one-fifth of or more than 22% of the occipitonasal length). Nasals long and tend to be narrower behind. Infraorbital foramen large and open for muscle transmission. Bullae large and well inflated. Fibula reduced and fused with tibia. Upper molar row always more than 4 mm and less than 6.5 mm (5.0-6.2 mm). Upper incisors narrow, yellow and plain. M¹ having 8 cusps, M² with 7 cusps (t₃ very small) and M³ with 6 cusps and small. Antero-internal cusps in M¹ not distorted inwards. Postero-internal cusps of the first and second upper molar retained throughout the life. Diastema long. Fur always soft and smooth. Dorsum in various shades of brown with reddish tinge, while underparts white in colour. Hindfeet whitish or paler. Four pairs of mammary glands present.

Locality : Sighted one putrified specimen near Koktu Rest House during the project period. Other localities reported for this species from the region in past are Kolkaz, Sipna and Pili in Melghat Tiger Reserve.

Habitat : Terrestrial, fossorial and nocturnal in habit preferring to live in all types of forests including dry deciduous forest, jungle etc. They live among rocks and boulders and even in the burrows made in soft soils. They live in pairs or in small colonies. The species is essentially an outdoor species.

Distribution : Throughout peninsular India.

Status : Not uncommon in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Near Threatened (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : V (Vermis), CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : *Cremnomys blanfordi* was originally placed under *Mus*, subsequently in *Rattus* and finally in *Cremnomys* (Corbet and Hill, 1992 and Agrawal, 2000). These rats can also live in open scrub jungles and/or on bare hill-sides. In forest it can change its habit from fossorial to arboreal. It makes untidy and large nests in a hole, crevices or in trees.

75. *Golunda ellioti ellioti* Gray

1837. *Golunda ellioti* Gray, Charlesworth's Mag. nat. Hist., (1)7 : 586.

1951. *Golunda ellioti ellioti* Gray, Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals : 613-614.

1961. *Golunda ellioti ellioti* Gray, Ellerman, Fauna of British India, Mammalia, vol. III (Part II) : 795-806.

1992. *Golunda ellioti ellioti* Gray, Corbet and Hill, The Mammals of the Indomalayan region : 349-350.

2000. *Golunda ellioti ellioti* Gray, Agrawal, V.C., Rec. zool. Surv. India, Occ. Paper No. 180 : 139-142.

Common Name : English : Indian Bush Rat, Marathi : Undir.

Diagnostic Characters : Indian Bush Rat has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors & cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives like bush rats are grouped under family Muridae. The genus *Golunda* is characterised by possession of highly unusual dentition, bicoloured tail shorter than Head and Body length and outer digit of hindfoot and 5th finger shortened. A medium-sized bush rat with Head and Body length in the range of 102-170 mm, molars three in number and a distinctly bicoloured tail with short, thick and coarse hairs. The tail is characteristically dark brown to black above, while pale below. Tail length in the range of 86-131 mm. Hindfeet medium and in the range between 22-28 mm. Occipitonasal

length in the range of 28-35.4 mm. Skull with well-developed supraorbital ridges and long palate, more than one-half of occipitonasal length. Anterior palatal foramina long but less than one-fifth of or less than 22% of the occipitonasal length. Nasals long and tend to be narrower behind. Infraorbital foramen large and open for muscle transmission. Palate approximates to half the occipitonasal length and narrow. Bullae large and well inflated. Fibula reduced and fused with tibia. Upper incisors distinctly grooved on the front surface & red in colour. Molars heavily cuspidate. Upper molar row always more than 4 mm but less than 7.0 mm (5.8-6.8 mm). Cusps of upper molars abnormally enlarged (grape shaped), particularly in the middle and inner rows; third upper molar large, lacks the outer row of the cusps and with wear tends to look like the largest tooth in the row. M¹ having 8 cusps, M² with 7 cusps (t₂ & t₇ absent) and M³ with 4 functional cusps. Lower molars (Maxillary teeth) biserially cuspidate. Antero-internal cusps in M¹ not distorted inwards. Diastema long. Fur always thick, long and soft, sometimes with growing age tends to become spiny. Dorsum varying in the range between greyish brown to blackish, while underparts in the range between white to bluish grey in colour. Hindfeet whitish or paler. Four pairs of mammary glands present.

Locality : Reported localities for this species from the region in past are Kolkaz and Chikhalda in Melghat Tiger Reserve.

Habitat : Terrestrial, fossorial and nocturnal in habit preferring to live in all types of forests including dry deciduous forest, jungle etc. However they may also be seen in the cultivated fields and/or orchards close to the forests. A favourite habitat is bush and scrub jungle. It builds a densely woven nest of stalks, grass and fibres in bushes. It's a small moving creature. They live in pairs or in small colonies. The species is essentially an outdoor species.

Distribution : Throughout India.

Status : Not uncommon in the region; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least Concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : V (Vermis), CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : The species is a prolific breeder and considered to be an agricultural pest species since it causes damage to the plantations. Earlier it was causing extensive damage to the coffee plantation in Sri Lanka.

***76. *Bandicota bengalensis bengalensis* (Gray)**

1835. *Arvicola bengalensis* Gray, *Illust. Ind. Zool.*, 2 : pl 21.

1951. *Bandicota bengalensis bengalensis* (Gray), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 617.

1961. *Bandicota bengalensis bengalensis* (Gray), Ellerman, *Fauna of British India, Mammalia*, vol. III (Part II) : 817-832.

1993. *Bandicota bengalensis bengalensis* (Gray), Pradhan, M.S. et al., *Rec. zool. Surv. India*, No. 93 (1, 2) : 175-200.
2000. *Bandicota bengalensis bengalensis* (Gray), Agrawal, V.C., *Rec. zool. Surv. India*, Occ. Paper No. 180 : 146-148.

Common Name : English : Indian Mole Rat, Marathi : Ghus.

Diagnostic Characters : Indian Mole Rat has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under family Muridae. Genus *Bandicota* is characterised by possession of clawed hallux, proodont upper incisors, long anterior palatal foramina, more than 7.0 mm, extending between the tooth row and molars three in number. Condylbasal length always exceeds occipitonasal length in the species. Large and robust species with Head and Body more than 130mm and occipitonasal length in the range between 34-48 mm. It possess rounded head, ear and short & broad muzzle. Head and Body length in the range between 140-220 mm. Tail (99.0-202.0 mm) always shorter than Head and Body. Infraorbital foramen large and open for muscle transmission. Supraorbital ridges well-developed. Nasals short and less than one third of the occipitonasal length. Palate long and more than 60% of the occipitonasal length and bulla long and more than 15% of the occipitonasal length. Upper molar tooth row normal and more than 5.0 mm (5.9-8.0mm). Molars with 9 cusps (7 present). Hindfeet moderate and in the range between 26-36 mm. Fibula reduced and fused with tibia. Postero-internal cusp of the first and second upper molar retained throughout the life. Diastema long. Upper incisors broad and orange to lemon yellow in colour. Dorsum greyish brown to blackish occasionally with reddish tinge, while underparts light to dark grey in colour. Fur with some broad and flat spines mixed with some short and harsh hairs in the dorsal pelage. Tail unicoloured and dark. Hindfeet (29-39 mm) usually brownish in colour. 6 to 9 pairs of mammary glands present.

Locality : Collected 4 specimens from the isolated settlements in Pili and Raipur villages in Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, fossorial and nocturnal rodent species found throughout India. The species is basically a field rat and generally lives in cultivated plains, gardens, pasture land, crop fields, waste lands, forests. However, sometimes in cities like Mumbai, Kolkata and Chennai, it enters houses also. Its presence is always made known by a pile of fresh soil resembling mole hill, hence its name 'Mole Rat' It has a habit of erecting pile of hairs and grunting when excited. It makes complex burrows with number of openings covering large areas.

Distribution : Throughout India.

Status : Common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower

risk- Least concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermins), CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : *B. bengalensis* is considered to be an agricultural pest No. 1 or, rather, 'enemy' pest No. 1, since it causes damage on large scale not only to the foodgrains stored in godowns but also to the standing crops. Its gnawing habit to keep the evergrowing incisors in shape and its habit of making complex burrow systems for not only living but also for hoarding the food stuff make it a nuisance for the human life. It is responsible to cause extensive damage to the public as well as private properties and articles of merchandise due to these habits. Overall loss from agricultural point of view due to the activities of this species is roughly around 20-25%. The species is a prolific breeder. One pair of bandicoot rat can produce approximately 200+ young ones in a year. The species is also known to be a vector for number of diseases, including rat bite fever, plague, leptospirosis etc. However, Chakraborty (1985) (as cited in Agrawal *et al.* (1992) has reported it to be playing an important role in biological control of several pestiferous species of molluscs and crabs in West Bengal.

77. *Bandicota indica indica* (Bechstein)

1800. *Mus indicus* Bechstein, *Veber Vierf. Thiere.*, 2 : 497.
1951. *Bandicota indica indica* (Behcstein), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 618.
1961. *Bandicota indica indica* (Behcstein), Ellerman, *Fauna of British India, Mammalia*, vol. III (Part II) : 834-843.
1993. *Bandicota indica indica* (Behcstein), Pradhan, M.S. *et al.*, *Rec. zool. Surv. India*, 93 (1, 2) : 175-200.
2000. *Bandicota indica indica* (Behcstein), Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 148-151.

Common Name : English : Large Bandicoot Rat, Marathi : Ghus.

Diagnostic Characters : Large Bandicoot Rat has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Mice, rats, bandicoots and their close relatives are grouped under family Muridae. Genus *Bandicota* is characterised by possession of clawed hallux, proodont upper incisors, long anterior palatal foramina, more than 7.0 mm, extending between the tooth row and molars three in number. Condylbasal length always exceeds occipitonasal length in the species. Large and robust species with Head and Body more than 200 mm and occipitonasal length in the range between 52.7-60.5 mm. It possesses more or less squarish head, round ear and longish muzzle. Head and Body length of adult specimen in the range between 245-305 mm. Tail

(245-315mm) may be equal to or more than Head and Body length. Infraorbital foramen large and open for muscle transmission. Supraorbital ridges well-developed. Nasals short and less than one third of the occipitonasal length. Palate long but less than 60% of the occipitonasal length and bulla long and more than 15% of the occipitonasal length. Upper molar tooth row normal and more than 7.0 mm (7.8-11.4 mm). Molars with 9 cusps (t7 present). Hindfeet long and in the range between 45-60 mm. Fibula reduced and fused with tibia. Postero-internal cusp of the first and second upper molar retained throughout the life. Diastema long. Upper incisors thick and powerful and usually brown or yellow but rarely white in colour. Dorsum blackish brown to black occasionally intermixed with whitish hairs, while underparts light to dark grey in colour. Some colour variant forms with white patch on thoracic and/or inguinal regions and part of the tail wholly white at the terminal end have been reported from other Indian localities (Pradhan and Mithel, 1981). Fur with some broad, long and flat spines mixed with some short and harsh hairs in the dorsal pelage. Many long hairs may be present on the back. Tail unicoloured and dark. Hindfeet dark in colour. 6 pairs of mammary glands present.

Locality : Recorded localities, reported in past, like Chanda (Chandrapur), Hoshangabad and Balaghat with similar habitats are not very far, hence occurrence of the species in Melghat Tiger Reserve is not ruled out.

Habitat : Terrestrial, fossorial and nocturnal rodent species found throughout India. The species is a basically field rat and generally lives in cultivated plains, gardens, pasture land, crop fields, waste lands, forests and, sometimes but rarely in cities like Mumbai, Kolkata and Chennai, it enters houses also. Its presence is always made known by a pile of fresh soil resembling mole hill. It has a habit of erecting pile of hairs and grunting when excited. It makes most complex burrows with number of openings covering large areas for the purpose of living, hoarding the food stuff, reproduction and family care. A single burrow system may have separate living chamber, storing chamber, chamber for female and young one etc..

Distribution : Throughout India.

Status : common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermis), CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : *B. indica indica* is considered to be an agricultural pest or, rather, 'enemy' pest of highest order, since it causes damage on large scale not only to the foodgrains stored in godowns but also to the standing crops. Its gnawing habit to keep the evergrowing incisors in shape and its habit of making complex burrow systems for not only living but also for hoarding the food stuff make it a nuisance for the human life. It is responsible to cause extensive damage to the public as well as private properties and articles of merchandise due to these habits. The species is a prolific breeder. One pair of bandicoot

rat can produce approximately 100+ young ones in a year. The species is also known to be a vector for number of diseases, including rat bite fever, plague, leptospirosis etc.

Subfamily GERBILLINAE

78. *Tatera indica indica* (Hardwicke)

1807. *Dipus indicus* Hardwicke, *Trans Linn. Soc. Lond.*, 8 : 279.
1951. *Tatera indica indica* (Hardwicke), Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 636.
1961. *Tatera indica indica* (Hardwicke), Ellerman, *Fauna of British India, Mammalia*, vol. III (Part I) : 393-411
2000. *Tatera indica indica* (Hardwicke), Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 27-31.

Common Name : English : Indian Antelope Rat, Marathi : 'Gondedar sheputlwala undir'.

Diagnostic Characters : Indian Antelope Rat has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. Rats, mice, bandicoots, gerbils and their close relatives have been grouped under family Muridae. However, Indian murid genera *Gerbillus* and *Tatera* have been included in the subfamily : Gerbillinae. Further, *Tatera* is known to occur throughout India, while *Gerbillus* is restricted to Rajasthan and Gujrat States only. Genus *Tatera* is characterised by possession of clawed hallux, opisthodont yellow and distinctly grooved upper incisors, long anterior palatal foramina, more than 15.0 mm, extending between the tooth row and molars three in number. Tail longer than Head and Body length and ends in terminal tuft of hairs. Large and soft-furred antelope rat species with Head and Body more than 120 mm and occipitonasal length in the range between 39.8-47.7 mm. Head and Body length of adult specimen in the range between 145-203 mm. The tufted haired Tail (157-218 mm) always more than Head and Body. Hindfeet long and in the range between 40-47 mm. Soles naked upto heel. Infraorbital foramen large and open for muscle transmission. Nasals unusually long and more than 40% of the occipitonasal length. Palate and inflated bulla long. Zygomatic plate strongly thrown forward. Upper molar tooth row characteristic with biserially arranged longitudinal cusps. Fibula reduced and fused with tibia. Upper incisors distinctly grooved and usually yellow in colour. Dorsum sandy brown to reddish brown, while underparts white in colour. Tail dark above and below and pale on the sides. Hindfeet white in colour. 4 pairs of mammary glands present.

Locality : Recorded localities, reported in past, like Chanda (Chandrapur) in Maharashtra State and Hoshangabad in Madhya Pradesh with similar habitats are not very far, hence occurrence of the species in Melghat Tiger Reserve is not ruled out.

Habitat : Terrestrial, fussorial and nocturnal rodent species found throughout India. The species is a basically field rat and generally lives in cultivated plains, gardens, orchards pasture land, crop fields, waste lands and forests. Amongst the Indian gerbils, this species appears to be the most adapted ecologically. It makes complex burrows with number of openings covering large areas for the purpose of living, hoarding the food stuff, reproduction and family care. A single burrow system may have separate living chamber, storing chamber, chamber for female and young one etc.

Distribution : Throughout India.

Status : common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk-Least concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : V (Vermins), CITES Appendix : No, Red Data Book, National (1994) : No.

Remarks : *Tatera indica* is considered to be an agricultural pest or, rather, 'enemy' pest of highest order, since it causes damage on large scale not only to the stored foodgrains in the field but also to the standing crops. Its gnawing habit to keep the evergrowing incisors in shape and its habit of making complex burrow systems for not only living but also for hoarding the food stuff make it a nuisance for the human life. The species is a prolific breeder. The species is also known to be a natural vector for number of diseases including the dreaded disease like plague.

Suborder HYSTRICOGNATHI

Family HYSTRICIDAE

*79. *Hystrix indica* Kerr

1792. *Hystrix cristata* var *indica* Kerr, *Anim. Kingd.*, : 213.

1951. *Hystrix indica indica* Kerr, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 519-520.

1961. *Hystrix indica indica* Kerr, Ellerman, *Fauna of British India, Mammalia*, vol. III (Part I) : 306-313.

2000. *Hystrix indica* Kerr, Agrawal, V.C., *Rec. zool. Surv. India, Occ. Paper No. 180* : 160-162.

Common Name : English : Indian crested porcupine, Marathi : 'Salu or Salindar'

Diagnostic Characters : Indian crested porcupine has been included in the mammalian order Rodentia, the gnawing mammals, since it possesses a pair of chisel-shaped ever growing incisors in each jaw, a distinct diastema between incisors and cheek teeth (Molars) and the clawed digits. Rodentia is by far the largest mammalian order. All porcupines have been grouped under family Hystricidae. Porcupines are characterised by their fur being modified into true quills or spines, angular process of mandible strongly distorted outwards, infraorbital foramen large and cheekteeth 4/4 in number and flat crowned.

Genus *Hystrix* is characterised by possession of short tail, less than one-fourth of Head and Body length, possessing hollow quills at its tip. Molars hypsodont and rootless. A prominent crest present on crown and neck. Quills bear more than one brown bands. Head and Body more than 400 mm and in the range between 400-900 mm. Tail length always less than 20% of Head and Body length. Hands and Hindfeet 1 broad and bear 5/5 fingers. Hallux clawed and well-developed. Skull large with occipitonasal length in the range of 139-163 mm. Infraorbital foramen large and open for muscle transmission. Nasals though long and more than 50% of the occipitonasal length, yet shorter than in allied species *Hystrix cristata*. Palate long. Anterior palatal foramina very small, situated just behind upper incisors. Upper molar tooth hypsodont and flat crowned. Upper incisors thick and usually yellow in colour. Anterior half of the body including head dark brown, posterior part more white due to exposure of white tip of the quills. Each quill is ornamented with deep brown or black and white bands. The white quilla on tail are large and well open. A narrow band of white-tipped spines form a collar. Undersurface of same colour as back. 3 pairs of mammary glands present.

Locality : Indian crested porcupine was sighted in Chikhalda, Kolkaz and Raipur areas in Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, fossorial and nocturnal rodent species found throughout India. The species is an out door species and generally lives in cultivated plains, gardens, orchards pasture land, crop fields, waste lands and forests. This species appears to be the most ecologically adapted species.

Distribution : Throughout India.

Status : Common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Least concern (Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : IV, CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : *Hystrix indica* is considered to be an agricultural pest or, rather, 'enemy' pest of highest order, since it causes damage on large scale to the standing crops. Its gnawing habit to keep the evergrowing incisors in make it a nuisance for the human life. It has a curious habit of gnawing bones, horns and antlers (Agrawal, 2000). The species is a prolific breeder. Agrawal (2000) concludes that there are no subspecies in *Hystrix indica*.

Order LAGOMORPHA

Family LEPORIDAE

***80. *Lepus nigricollis nigricollis* Cuvier**

1823b. *Lepus nigricollis* Cuvier, F. *Dictionnaire des sciences naturelle*, Strasbourg & Paris, 26 : 299-316.

1951. *Lepus nigricollis simcoxi* Wroughton, Ellerman and Morrison-Scott, *Checklist of Palaearctic and Indian Mammals* : 437-438.

1983. *Lepus nigricollis nigricollis* Cuvier, F., Khajuria and Ghosal, *Rec. zool. Surv. India*, 79 : 248-249.
1992. *Lepus nigricollis nigricollis* Cuvier, F., Corbet and Hill, *The Mammals of the Indomalayan region* : 413-415.

Common Name : English : Indian black-naped hare or Indian Hare, Marathi : 'Sasa'

Diagnostic Characters : Rabbits, hares and pikas have been included in the mammalian order Lagomorpha. Main distinguishing features of order Lagomorpha are clawed digits, soft and smooth pelage, very short and bushy tail (0-15% of Head and Body length), long diastema in front of cheek-teeth, canines absent, four incisors in the upper jaw and functional digits on fore/hindlimbs 5/4. Rabbits and hares have been grouped under family Leporidae. Genus *Lepus* is characterised by its hind legs much longer than fore legs, hindfeet more than 60 mm (85-115 mm) and ears elongate and more than 30mm (80-120 mm). Pelage always smooth and soft but never harsh. Ears long, plain and not black-tipped. Head and Body length in the range 330-530 mm. Greatest skull length 80-100mm. 'Y'-shaped groove on I¹. Bony palate less than 9% of the skull length. The blacknaped Hare is distinctive in having a dark greyish black or black patch on the back of its neck from the ears to the shoulder. Tail black above, while white on sides and undersurface.

Locality : Indian blacknaped hare was sighted in Chikhalda, Kolkaz, Dhakna Koktu and Raipur areas in Melghat Tiger Reserve during the project period.

Habitat : Terrestrial, fossorial and nocturnal species found throughout India. The species is an out door species and generally lives in all types of habitats except at very high altitudes. Where the habitat is suitable for living, hares are numerous. This species appears to be the most adapted ecologically.

Distribution : Throughout India.

Status : common; IUCN Criteria proposed as per the CAMP Report (1998) : Lower risk- Least concern(Nationally) and Not Evaluated (Globally), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : IV, CITES Appendix : No; Red Data Book, National (1994) : No.

Remarks : *Lepus nigricollis* is considered to be causing damage to the agricultural fields, orchards etc. The species is a prolific breeder.

RESULTS AND DISCUSSION

The systematic list of mammalian species given above reports the occurrence of 80 mammalian species/subspecies in Melghat Tiger Project. Out of these, 44 species (55%) were actually collected and/or sighted during the project period between 1991-1996, while 36 species (45%) were included in the list on the basis of the literature consulted (Fig. 1). The list clearly indicates that Melghat Tiger Project area possesses fairly good mammalian species diversity.

If the species are sorted out in various categories given in Table 1, it will be seen that 80 species/subspecies of 53 genera belonging to 25 sub-families under 28 families grouped in nine mammalian orders have been reported from this region. The table further shows a broad spectral diversity at all the levels at every stage. It has been expressed very well particularly in orders like Chiroptera, Carnivora, Artiodactyla and Rodentia.

Table 1 : Mammalian Diversity in Melghat Tiger Reserve

Sl. No.	Orders	Families	Subfamilies	Genera	Species	Subspecies
1.	INSECTIVORA	1	1	1	3	1
2.	SCANDENTIA	1	1	1	1	1
3.	CHIROPTERA	8	3	12	26	22
4.	PRIMATES	1	2	2	2	2
5.	PHOLIDATA	1	-	1	1	-
6.	CARNIVORA	7	9	13	18	12
7.	ARTIODACTYLA	4	5	10	10	5
8.	RODENTIA	4	4	12	16	15
9.	LAGOMORPHA	1	-	1	1	1
TOTAL Nine Orders		28	25	53	78	59

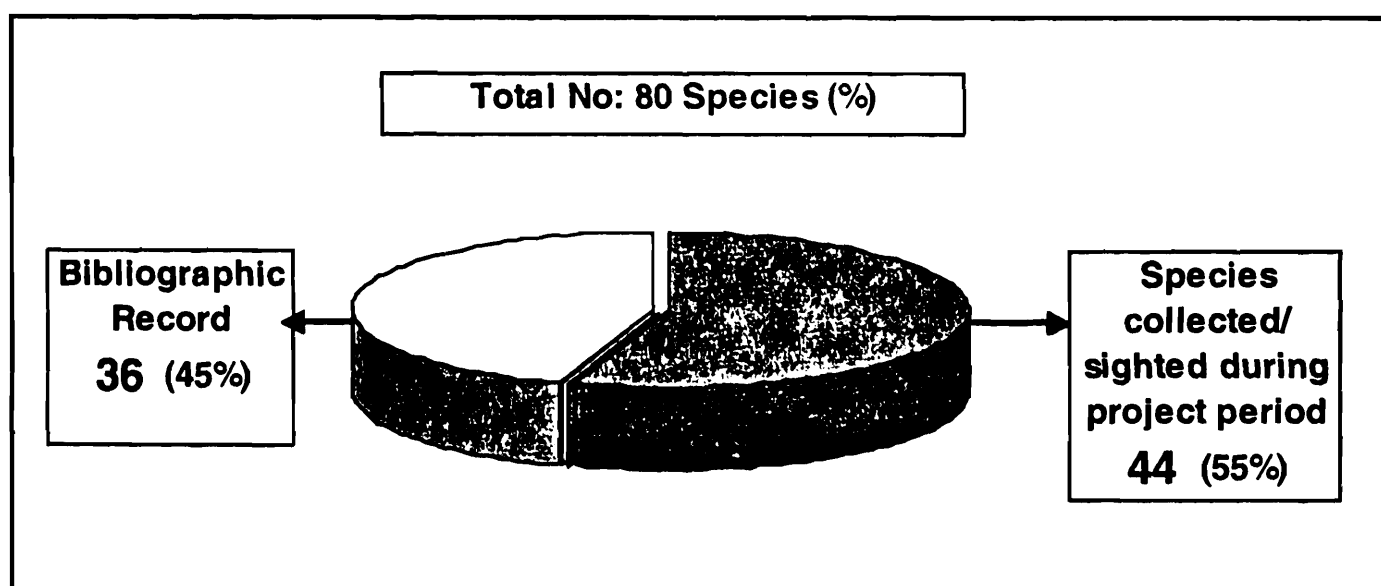


Fig. 1 : Mammalian species record of Melgha Tiger Project

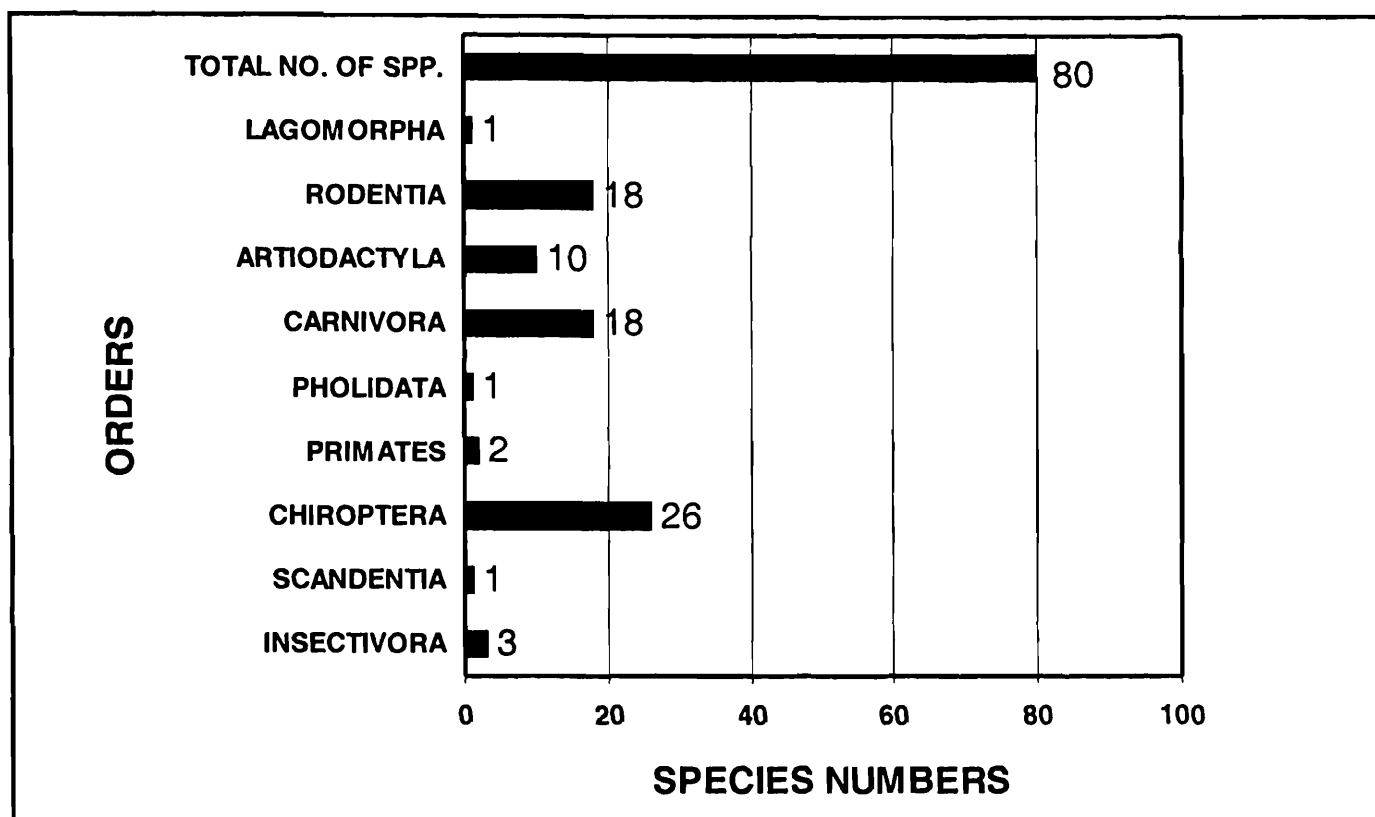


Fig. 2 : Order-wise representation of Mammalian species

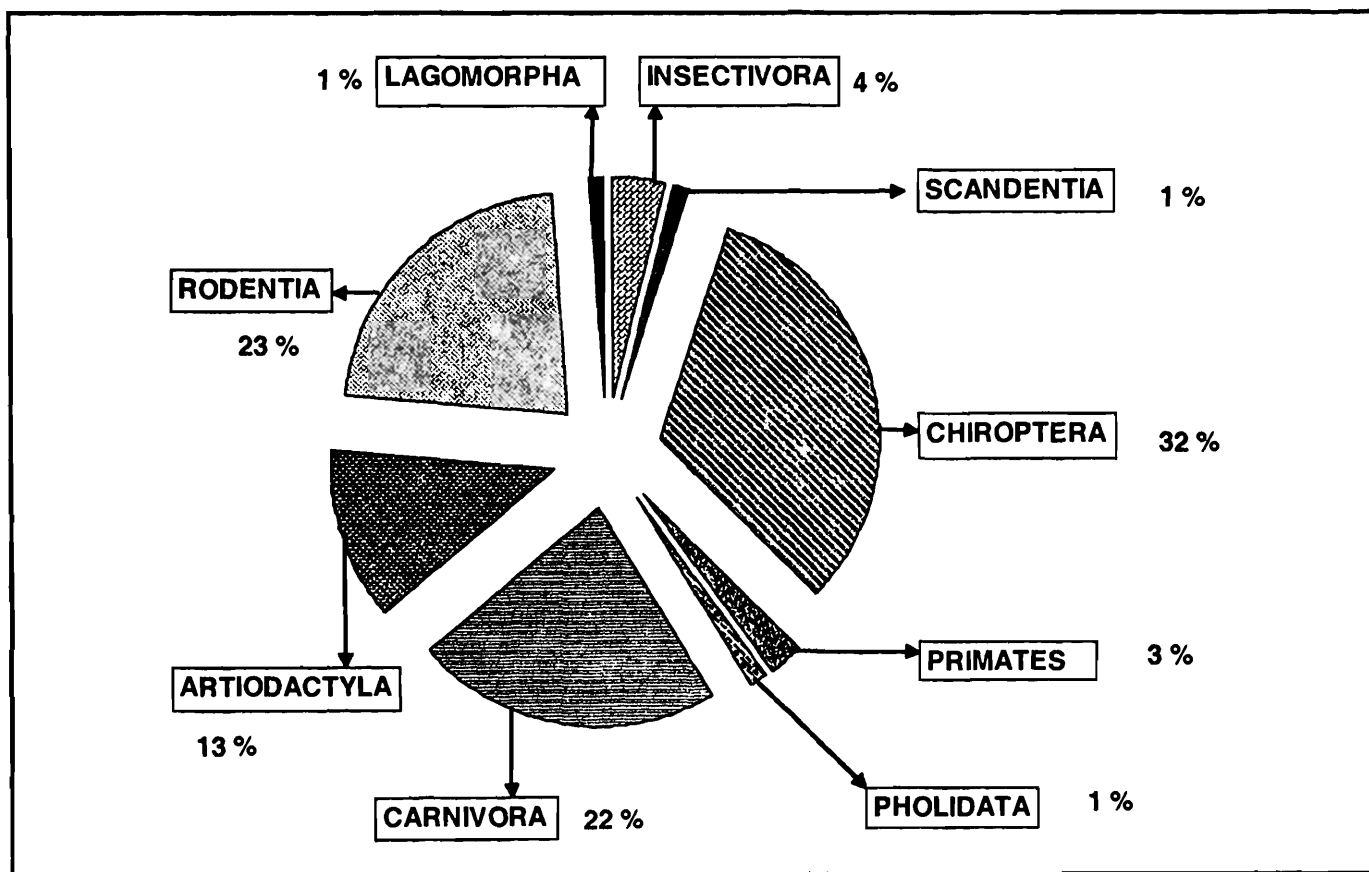


Fig. 3 : Order-wise representation of Mammalian species in Melghat Tiger Reserve

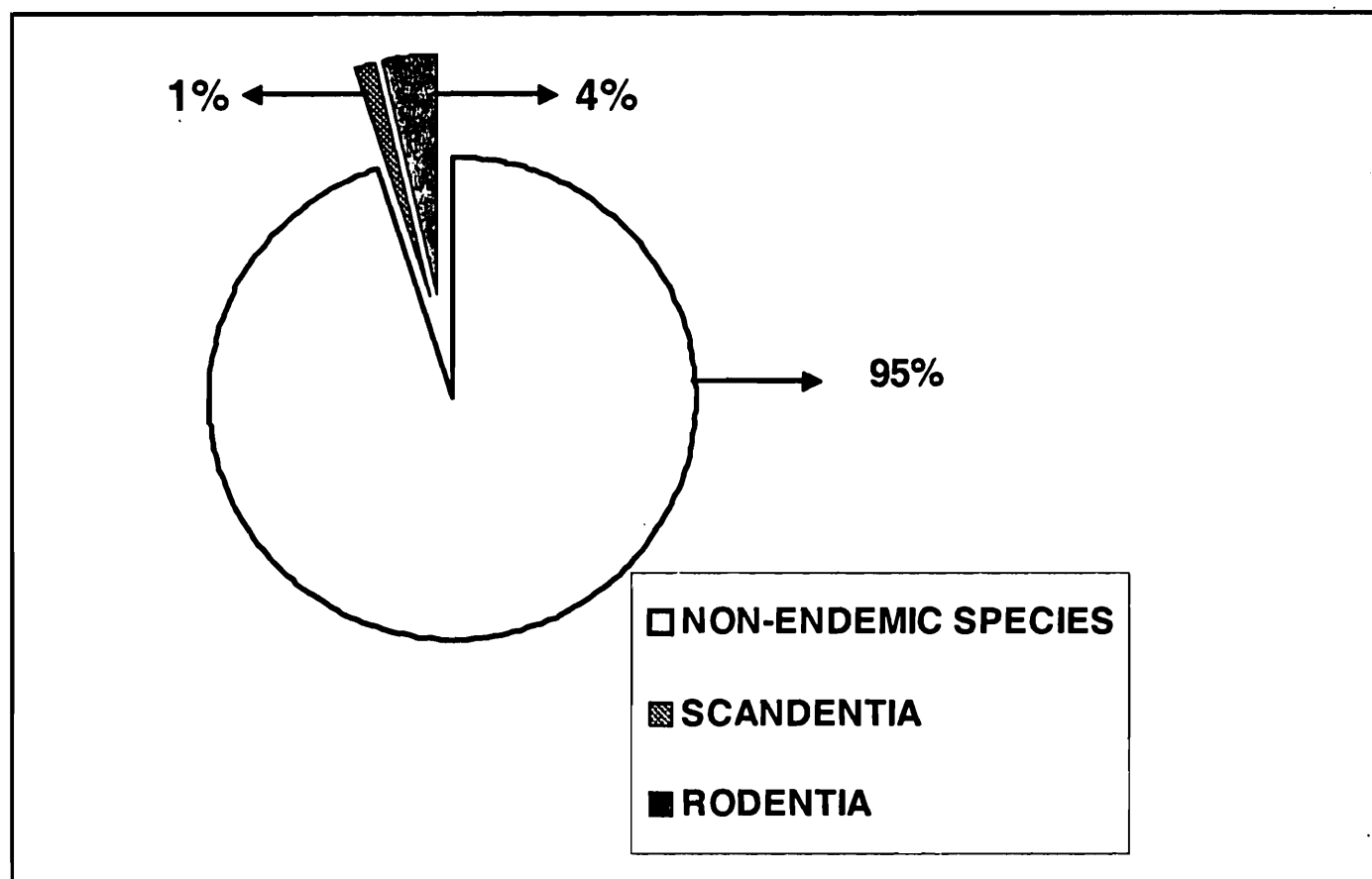


Fig. 4 : Mammalian species endemism in Melghat Tiger Reserve (Total 80 species)

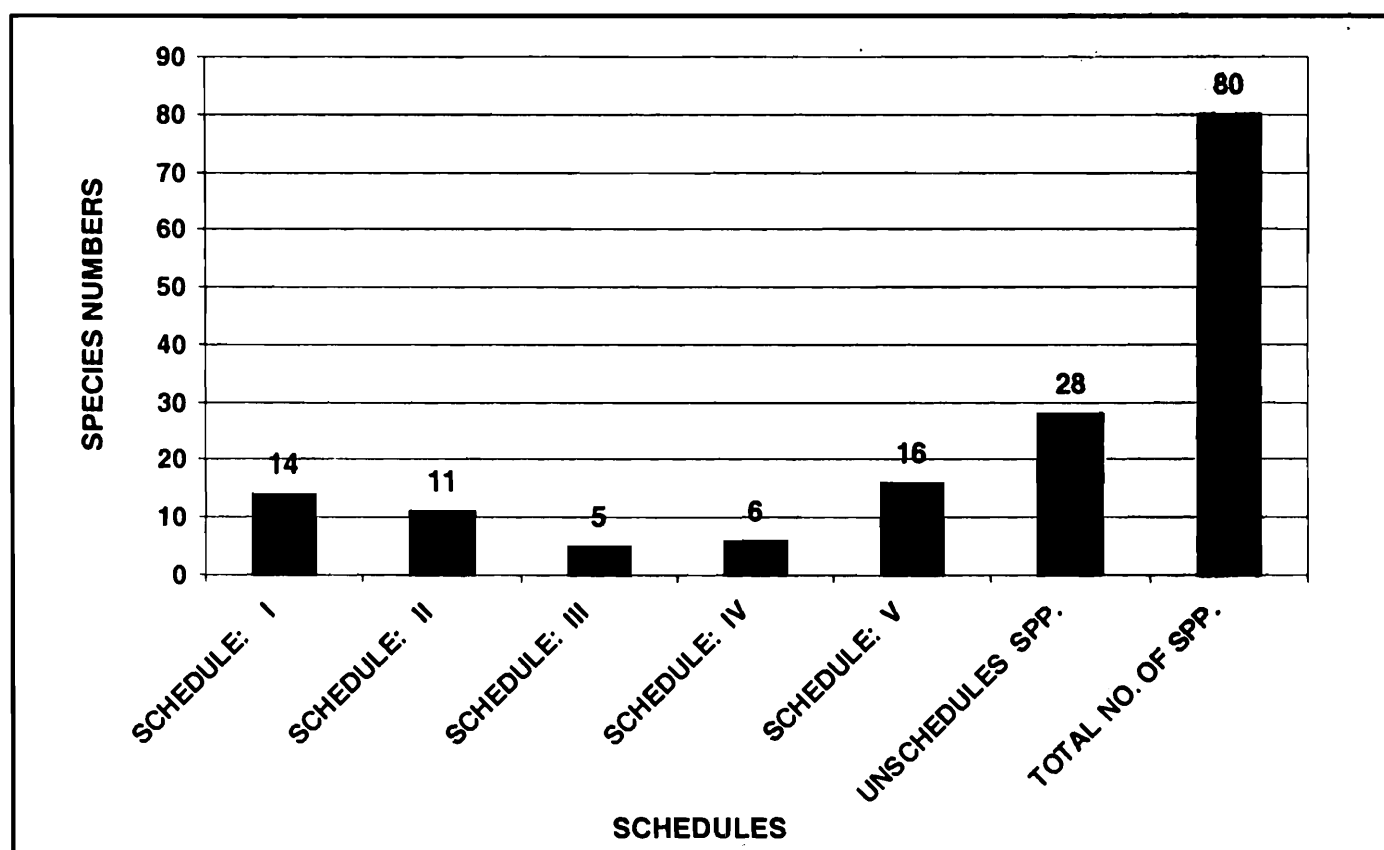


Fig. 5 : Mammalian species under Indian Wildlife (Protection) Act 1972 (1991)

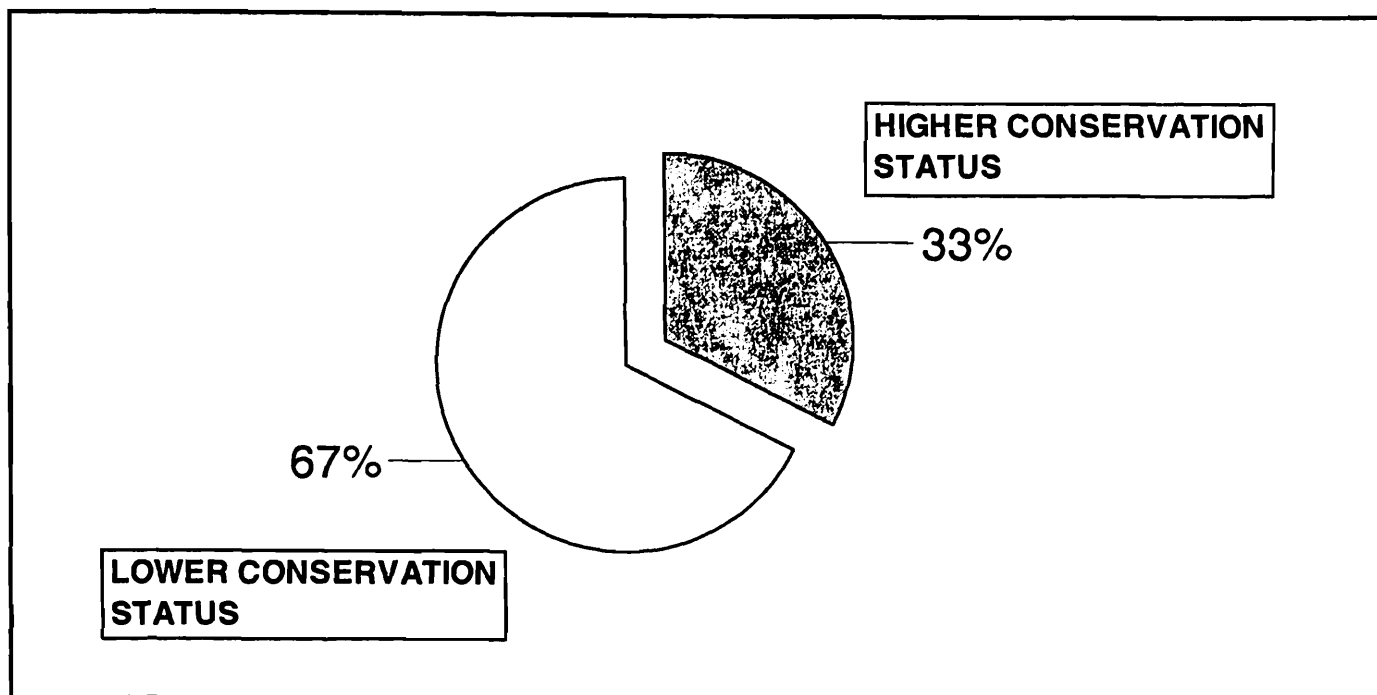


Fig. 6 : Species with conservation status

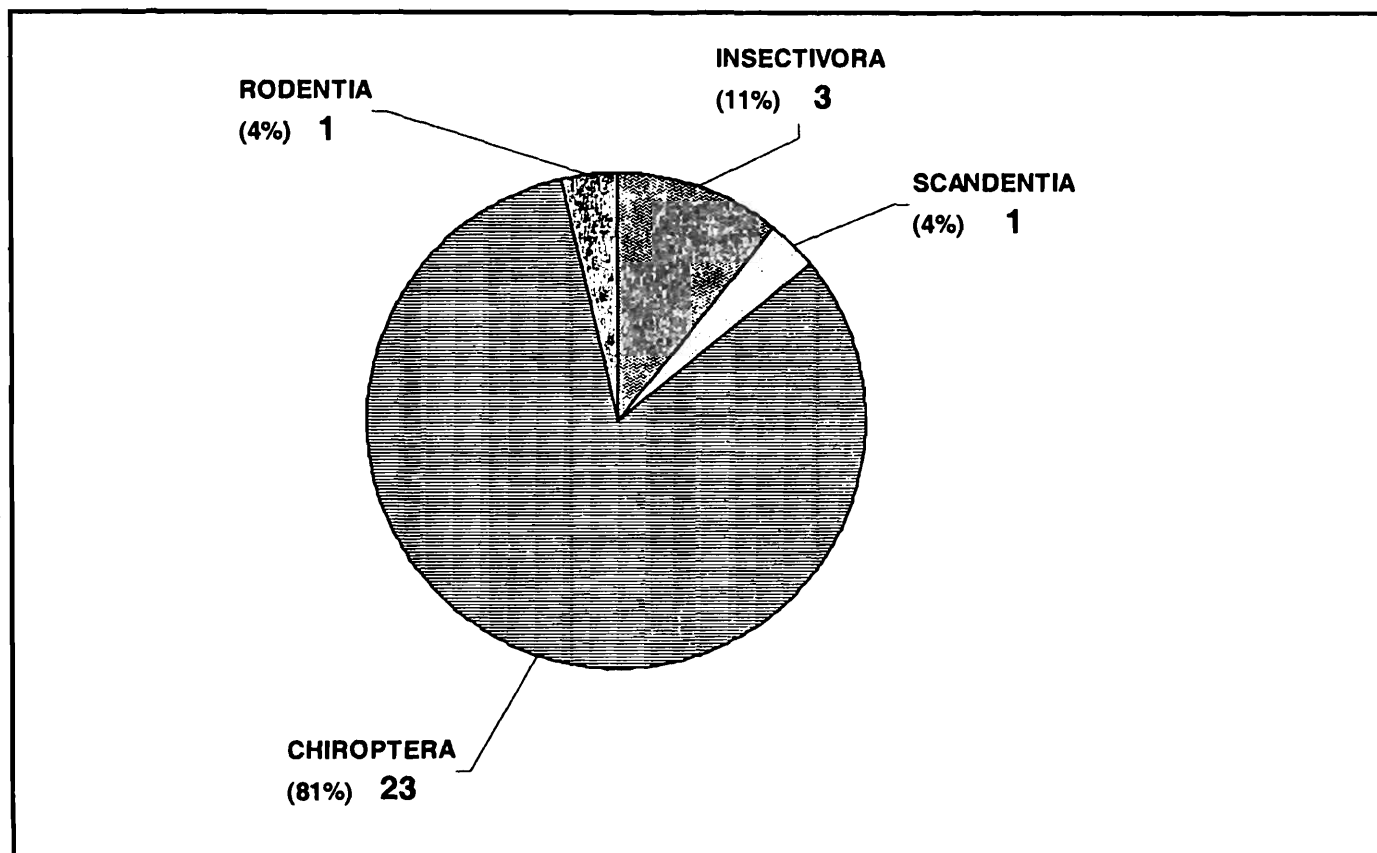


Fig. 7 : Unscheduled Mammalian species

Class Mammalia is represented by nine orders with predominance of Chiroptera, Carnivora and Rodentia followed by Artiodactyla (Fig. 3). It will be seen that more than 75% mammalian species belong to the orders Chiroptera, Carnivora and Rodentia. Incidentally Chiropteran representation is very well in the region (Total 26 spp.).

Some of the most interesting species thriving in the region are : *Anathana ellioti ellioti*, *Rhinopoma hardwickei*, *Scotophilus spp.*, *Tadarida spp.*, *Rhinolophus spp.*, *Manis crassicaudata*, *Cuon alpinus*, *Panthera pardus fusca*, *Panthera tigris tigris*, *Mellivora capensis*, *Lutragale perspicillata*, *Viverricula indica*, *Felis silvestris ornata*, *Bos gaurus*, *Tetracerus quadricornis*, *Boselaphus tragocamelus*, *Ratufa indica centralis*, *Petaurista philippensis philippensis*, *Cremnomys blanfordi*, *Hystrix indica* etc.

When the Indian endemic status of the mammalian species/subspecies reported from Melghat was studied (Fig. 4), it was surprisingly noticed that there were only 4 Indian endemic species (5% of total 80 mammalian species) belonging to orders *Scandentia* (1) and *Rodentia* (3). Therefore, though mammalian species diversity is rich, the Indian endemism in this region is, however, poor.

Order SCANDENTIA

1. *Anathana ellioti ellioti* (Waterhouse)

Order RODENTIA

1. *Ratufa indica centralis* Ryley
2. *Mus phillipsi* Wroughton
3. *Rattus rattus narbadae* Hinton

Conservation status of the mammalian species under Indian Wildlife (Protection) Act 1972 (1991) was also studied. It was found that 52 out of 80 mammalian species have been included in all the five schedules of the Act (Fig. 5). Further, of these 80 species 26 species (33%) are under higher conservation status (Indian Wildlife Act Schedule I and II, CITES Appendix I & II and IUCN Categories from Endangered to Vulnerable)(Fig. 6). However, on the other hand, there are about 28 mammalian species, mostly microchiropteran bat species, which have not been listed under any of the wildlife Act schedules (Fig. 7).

Finally, following conclusions can be drawn on the basis of above observations :

1. Melghat Tiger Project can boast of a rich mammalian species diversity, quantitatively as well as qualitatively. However, Indian endemic representation of the mammalian species in Melghat region is remarkably poor.
2. Some of the most interesting mammalian species other than *Panthera tigris tigris* and *Panthera pardus fusca* which can attract attention are *Anathana ellioti ellioti*, *Mellivora capensis*, *Lutragale perspicillata*, *Ratufa indica centralis*, *Petaurista philippensis philippensis*, *Felis silvestris ornata*, *Rattus rattus narbadae* etc.

3. Fairly large number of mammalian species (26 : 33%) with higher conservation status of Schedule I and Schedule II of Wildlife (Protection) Act, 1972 (1991), CITES Appendix I & II and IUCN categories from Endangered to Vulnerable could be recorded, while about 33% of the total mammal species dominated by microchiropteran bats with no status under Wildlife (Protection) Act have also been reported from this region.

REFERENCES

- AGRAWAL, V. C.; DAS, P.K., CHAKRABORTY, S., GHOSE, R.K., MANDAL, A. K., CHAKRABORTY, T. K. PODDAR, A.K., LAL, J.P., BHATTACHARYYA, T. P. AND GHOSH, M. K. 1992. Mammalia In : *Fauna of West Bengal, State Fauna Series, 3* (Part 1) : (Publ. by Director, Zool. Surv. India, Calcutta) : 27–100.
- AGRAWAL, V. C. 2000. Taxonomic studies on Indian *Muridae* and *Hystriidae* (Mammalia : Rodentia) *Rec. zool. Surv. India, Occasional Paper No. 180* : 1-180.
- ANNONYMUS, 1998. *Camp Report : Mammals of India*, Zoo Outreach Organisation/CBSG, India, Coimbatore : 176 pp.
- ANNONYMUS, 1991. *The Wildlife (Protection) Act, 1972 (As amended upto 1991)* Natraj Publishers, Dehra Dun, In Technical Association With WWF, Traffic India : 138 pp.
- ASWATHANARAYANA, N. V and MANJUNATHA, K.R. 1981. Studies on the chromosomes of the genus *Tatera*. *Mammal. Chrom. Newsl.*, **22** : 55–56.
- BATES, PAUL J. J. and HARRISON, DAVID L. 1997. *Bats of the Indian Subcontinent*. Harrison Zoological Museum Publication, Sevenoaks, Kent.
- BATES, PAUL J. J., HARRISON D. L. and MUNI M. 1994b. The Bats of Western India. Part 2 : *Journal Bombay nat. Hist. Soc.*, **91** (2) : 224–240.
- BROSSET, A. 1962a. The bats of central and western India. Part I. *Journal Bombay nat. Hist. Soc.*, **59** : 1–57.
- BROSSET, A. 1962b. The bats of central and western India. Part II. *Journal Bombay nat. Hist. Soc.*, **59** : 583–624.
- BROSSET, A. 1962c. The bats of central and western India. Part III. *Journal Bombay nat. Hist. Soc.*, **59** : 707–746.
- BROSSET, A. 1963. The bats of central and western India. Part IV. *Journal Bombay nat. Hist. Soc.*, **60** : 337–355.
- CORBET, G. B. AND HILL, J. E. 1992. *The mammals of the Indomalayan Region : A systematic review*. Oxford U. K. (Natural History Museum Publications and Oxford University Press) : 488 pp.

- ELLERMAN, J. R. 1961. Fauna of British India : Mammalia Vol. III Parts I & II : 1-884+lii. Publ. : Manager of Publication, Govt. of India, New Delhi
- ELLERMAN, J. R. and Morrison-Scott, T.C.S. 1951. *Checklist of Palaearctic and Indian Mammals*. Birtish Museum (Natural History) London : 1-810.
- GHOSH, A. K. 1994. The Red Data Book on Indian Animals : Part 1 : Vertebrata, Publ. By Director, Zoological Survey of India, Calcutta : 1-534.
- GOGATE, M. G., THOSARE, P. J. and BANUBAKODE, S. B. 1993. *Two Decades of Project Tiger, Melghat (1973-1993)*. Melghat Project Tiger, Paratwada, 444805, India.
- JOHNSINGH, A. J. T. and YOGANAND, K. 2000. Range overlap in dhole *Cuon alpinus* Pallas and wolf *Canis lupus* Linn. (Family: Canidae) in India. *Journal Bombay nat. Hist. Soc.* 97(3) : 418-419.
- KHAJURIA, H. and GHOSAL, D. K. 1981. Studies on wildlife of Narbada valley, Part IV. Mammalia. *Rec. zool. Surv. India*, 79 : 235-257.
- KHAJURIA, H. 1984. Notes on some central Indian bats. *Journal zool. Soc. India*, 36 (1-2) : 125-126.
- LAL J. P. 1984. Taxonomic status of the subspecies of the Kelaart's pipistrelle, *Pipistrellus ceylonicus* Kelaart (Chiroptera : Vespertilionidae). *Bulletin zool. Surv. India*, 6 (1-3) : 159-161.
- MARSHALL, J. T. (Jr.). 1977. A synopsis of Asian species of *Mus* (Rodentia : Muridae) *Bull. Amer. Mus. Nat. Hist.*, 158 : 173-200.
- NAPIER, P. H. 1985. *Catalogue of Primates in the British Museum (Natural History)* Parts 2 & 3. London : British Museum (Nat. Hist.) 203, 111pp. In Corbet, G. B. & Hill, J. E. 1992. *The mammals of the Indomalayan Region : A systematic review*. Oxford U.K. (Natural History Museum Publications and Oxford University Press).
- PRATER, S. H. 1980. *The Book of Indian Animals* Bombay Natural History Society and Oxford University Press, Mumbai. 324 pp.
- PRADHAN, M. S. and MITHEL, M. 1981. White patch and its genetic control in some of the Indian rodent species. *Journal Bombay nat. Hist. Soc.*, 78 (1) : 164-165.
- PRADHAN, M.S. 1997. Illicit trade in Wildlife species, products and derivatives in Maharashtra State. *Rec. zool. Surv. India*. 96 (1-4) : 195-210.
- PRADHAN, M. S., AJOY KUMAR MONDAL & BHAGWAT, A. M. (Comm.) On taxonomic status of *Bandicota bengalensis lordi* (Wroughton), *Bandicota maxima* (Pradhan, et al.) and subspecies of *Millardia meltada* (Gray) : Subfamily : Murinae; Family : Muridae; Order : Rodentia. In : *Rec. zool. Surv. India*, Kolkata.
- ROBERTS, T. J. 1997. *The Mammals of Pakistan* Oxford University Press, Oxford : 1-525.

- ROONWAL, M. L. and MOHNOT, S. M., 1977. *Primates of South Asia: Ecology, Sociobiology and Behavior*. Harward University Press, Cambridge, London. U.K. : 1-421.
- SEN, S. and Sharma, T. 1983. Role of constitutive hetero-chromatin in evolutionary divergence in *Mus musculus*, *Mus booduga* and *Mus dunni*. *Evolution*, Lawrence, 37 : 628-636.
- SINHA, Y P. 1980. The bats of Rajasthan: taxonomy and zoogeography. *Rec. Zool. Surv. India*, 76 (1-4) : 7-63.
- SREENIVASAN, M.A, BHAT, H.R. and GEEVARGHESE G. 1973. Breeding cycle of *Rhinolophus rouxi* Temminck, 1835 (Chiroptera:Rhinolophidae), in India. *Journal Mammal*, 54 (4) : 1013-1017.
- TIKADER, B. K. 1983. *Threatened Animals of India*, Publ. By Director, Zoological Survey of India, Calcutta : 1-307.
- WILSON, DON E. and REEDER, DEEANN M. 1993. *Mammal species of the world A taxonomic and geographic reference*. 2nd ed. Washington and London (Smithsonian Institution Press in association with the American Society of Mammalogists) : 1-1207.

AVES

ANIL MAHABAL

Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044

INTRODUCTION

Study of birds in India received a great impetus with the publication of Jerdon's (1862-64) Birds of India. A large number of workers thereafter started studying the avifauna of their respective regions. Some of these gave emphasis in Deccan plateau particularly Davidson & Wenden (1878), Davidson (1882, 1895) and Ali (1933-34). After a gap of about forty years a check list of birds of Maharashtra (Abdulali 1973) was published. In Vidarbha region of Maharashtra, in earlier years birds of Nagpur area (Blanford 1867, Mc Master 1871), and birds of Chilkalda (Nelson, 1925) have been published. In recent years birds of Nagpur (Armous 1978, Garde 1980), Wardha River Basin (Pradhan 1997) and birds of Amravati University Campus (Wadalkar 2001) have been studied. Further, checklist of birds of Melghat area (Sawarkar 1988, Anon 1992) with additions to the birds of Melghat Tiger Project have also been published (Rithe, 2002, Kasambe 2003).

It is interesting to note here that 113 years after the last genuine record, the Forest Owlet *Athene* (= *Heteroglaux*) *blewitti* has been rediscovered in forested areas of Shahada Dist. Dhulia, Maharashtra (King & Rasmussen 1998) and these owlets were also observed in Melghat area (Rithe 2002 and 2003).

The vegetation of the area is of Southern Tropical Dry Deciduous Forest. The most dominant element of this forest is Teak. Climbers and herbaceous flora is also very rich in this forest community. This has supported the insect fauna of this reserve and in turn the avian community. The inventory of birds of this area comprise 263 species of which about 60% species have been mainly observed by the author during the survey period (16.2.97 to 4.3.97), whereas the rest of the species have been compiled on the basis of published and unpublished literature. Birds were observed with the help of 7 x 50 pair of binoculars. The identification of birds and its account (residential status, food habits

and distribution) in tabular form is based on Ali & Ripley (1968-74, 1995-96), Woodcock (1984) and Grimmett *et al.* (2000).

In the systematic list of birds in tabular form (Table 1) the common names, scientific names and family sequence have been followed as per standardised common and scientific names of the birds by Manakadan & Pittie (2001).

OBSERVATIONS AND RESULTS

The inventory of birds of the Melghat Tiger Project area comprise 263 species (Table 1) which can be classified into various categories as shown in Table 2. It shows that these species belonging to 167 genera under 57 families are grouped into 16 avian orders. This clearly indicates that this reserve possess a fairly good bird diversity as compared to the avian diversity of Indian subcontinent. Further, it can be pointed out that at generic and species level, orders like Ciconiiformes, Falconiformes, Cuculiformes and Passeriformes are well represented in forested areas of Melghat.

In order of food preference histogram has been plotted for birds of Melghat (Fig.1). The figure indicates that about 42.0% are insectivorous followed by 14.4% graminivorous and 11.6% carnivorous bird species. Percentage of nectar eater and scavenger bird species is very less in the area. Residential status of birds of this reserve has been plotted in Fig.2.

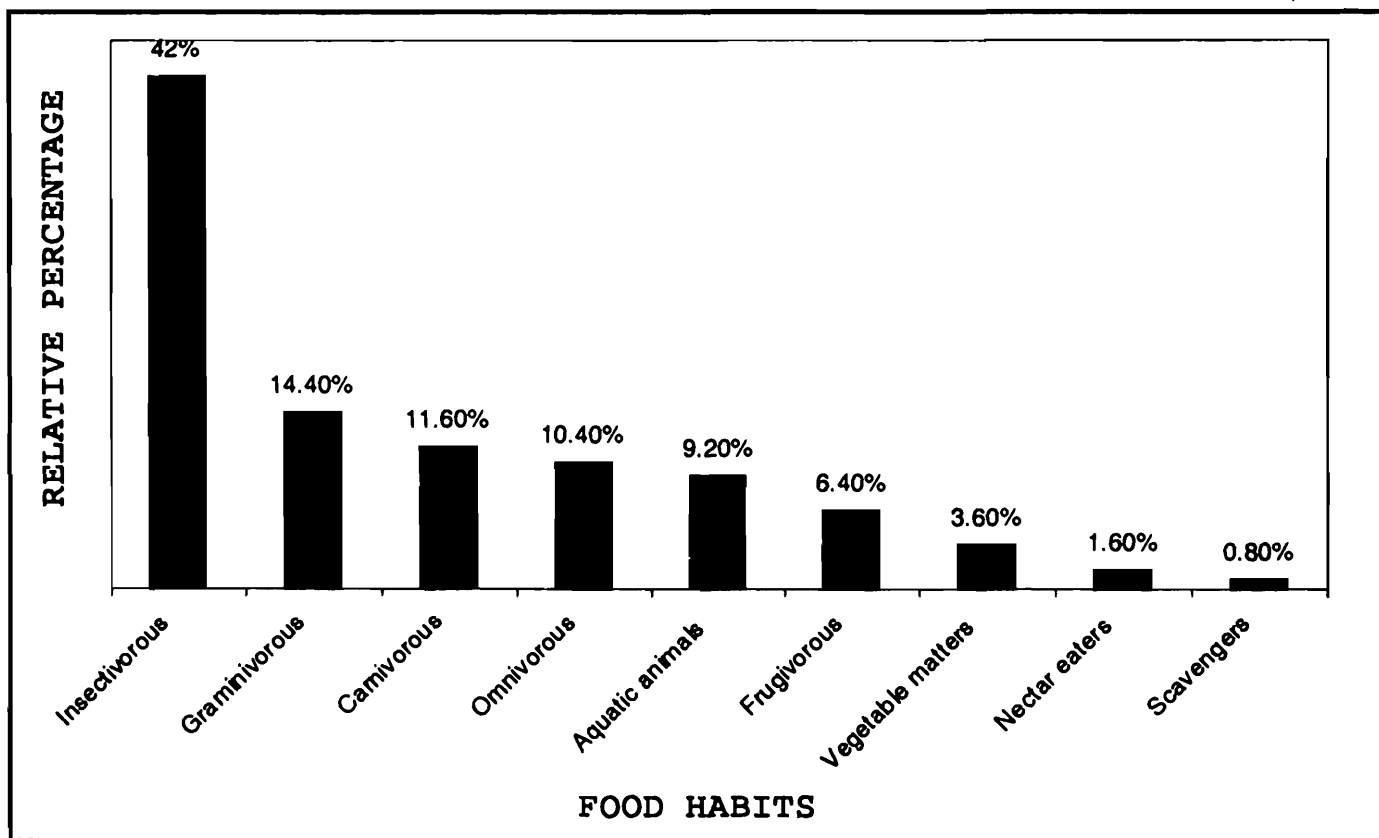


Fig. 1 : Food habits of Birds of MTP

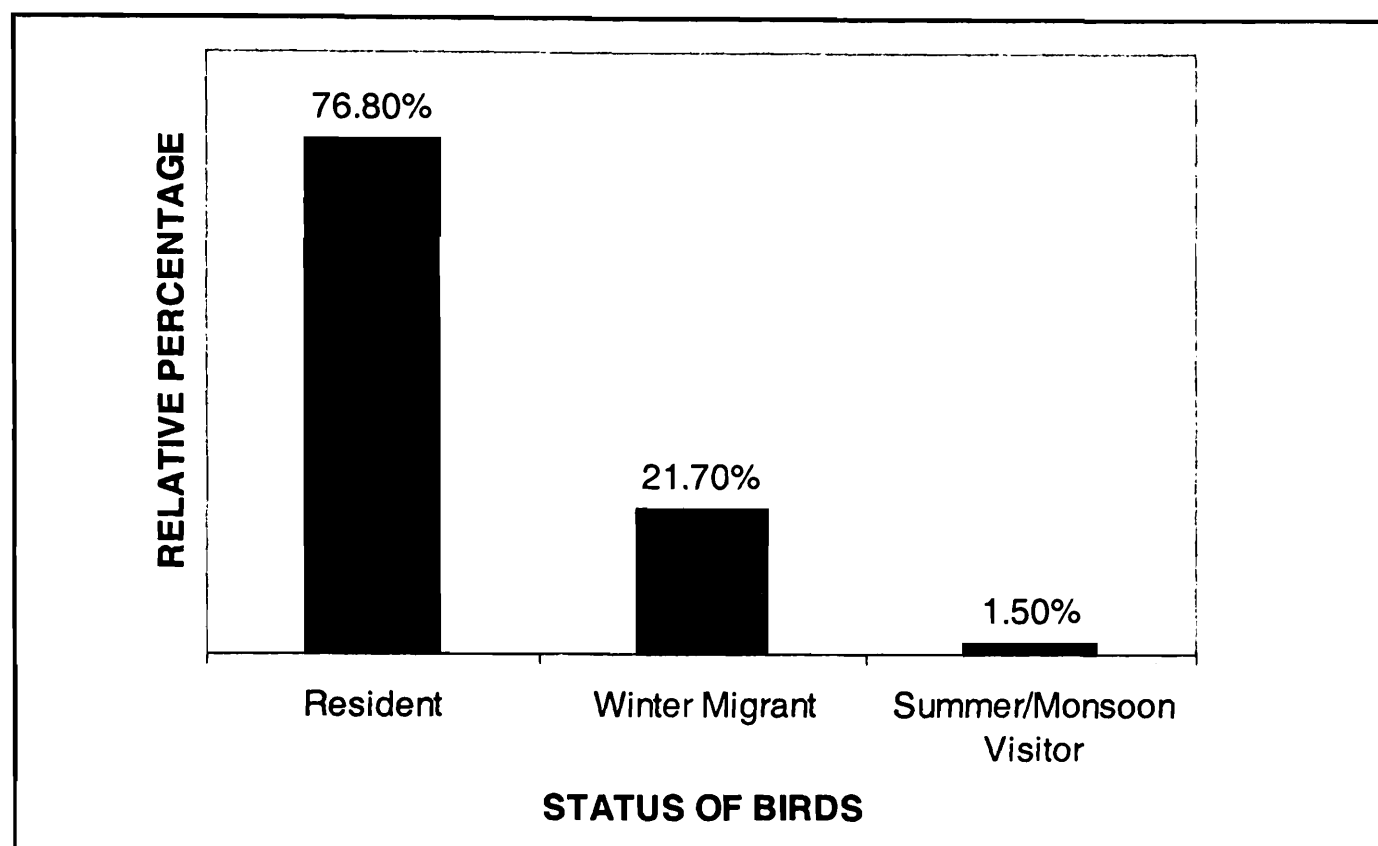


Fig. 2 : Status of Birds of MTP

It shows that 76.8% bird species are resident bird showing some local and seasonal movements depending upon availability of food, ripening of fruits, seasonal migration in hilly areas and or water conditions. About 21.7% bird species are winter visitors during September/October to March and the remaining 1.5% are either summer or rainy season migrants. This study is based on the account given in Ali & Ripley (1968-74).

When the endemism of these avian species of Melghat is considered, then there is only one bird species Green Munia *Amandava formosa* (Latham) (Family : Estrildidae) endemic to Central India which also includes this Tiger Reserve.

CONSERVATION STATUS

The conservation status of the birds of Melghat is considered, then the birds included in Schedule I, Part III (Birds); Schedule II, Part II of Indian Wildlife (Protection) Act, 1972 (as amended upto 2002) has been compiled in Table 3. The table also indicates the birds included in IUCN Red List of Threatened Species IUCN 2002 alongwith their Threat Categories and the birds included in Biome 11 : Indo-Malayan Tropical Dry Zone as per The Important Bird Areas Programme in India - *Buceros*, Vol. 6(2) : 31-32, 2001. Further under this IBA Programme, the Melghat Wildlife Sanctuary area has also been included in Appendix VIII – a statewise list of Important Bird Areas.

REFERENCES

- ABDULALI, H. 1973. Checklist of the Birds of Maharashtra. *Bombay nat. History Society*, Bombay.
- ALI, SALIM, 1933-34. Hyderabad State Ornithological Survey 5. Parts. *J. Bombay nat. Hist. Soc.*, Vols. 36-37.
- ALI, SALIM & S. DILLON RIPLEY, 1968-1974. *Handbook of the Birds of India and Pakistan* Vols. 1 to 10. Oxford University Press, Bombay.
- ALI, SALIM & S. DILLON RIPLEY, 1995. *A Pictorial Guide to the Birds of the Indian Subcontinent*. (2nd Edition, Reprint with corrections 1996). Bombay Natural History Society and Oxford University Press, Mumbai.
- ANONYMOUS, 1992. Birds of Melghat In : Two Decades of Project Tiger Melghat 1973-1993. Past-Present-Future, *Eds. : Gogate, M.G., P.J. Thosare and S.B. Banubakode* Publ : Publicity & Information Officer, Forest Dept., Maharashtra, Pune : 47-55.
- ARMOUS, JAY, 1978. Birding in Nagpur. *Newsletter For Birdwatchers* 18(9) : 4-5.
- BLANFORD, W.T. 1867. Letter about various species collected at Chanda and Nagpur. *Ibis*, 2(3) : 461-464.
- DAVIDSON, C.S. & C.E. WENDON, 1878. A contribution to the avifauna of the Deccan. *Stray Feathers*, 7 : 68-95.
- DAVIDSON, J. 1882. Rough list of the Birds of Western Khandesh. *Stray Feathers*, 10 : 279-326.
- DAVIDSON, J. 1895. The birds of the Bombay Presidency. *J. Bombay nat. Hist. Soc.*, 9 : 488-489.
- GARDE, PRAKASH, 1980. Birdwatching at Nagpur. *Newsletter for Bird watchers*, 20(10) : 7-8.
- GRIMMETT, R, C. INSKIPP and T. INSKIPP, 2000. *Pocket Guide to the Birds of Indian Subcontinent* (Reprinted). Oxford University Press, New York.
- JERDON, T.C. 1862-64. The birds of India 1 & 11. Military Orphan Press. Calcutta.
- KASAMBE, R.M. 2003. Additions to the birds of Melghat Tiger Reserve, Maharashtra. *Zoo's. Print Journal*, 18(3) : 1050.
- KING, B.F. and RASMUSSEN, P.C. 1998. The rediscovery of the Forest Owlet *Athene (Heteroglaux) blewitti*. *Forktail*, 14 : 51-53.
- MANAKADAN, RANJIT & AASHEESH PITTE, 2001. Standardised common and scientific names of the Birds of the Indian Subcontinent. *Buceros*, 6(1) : 1-37.

- Mc MASTER, A.C. 1871. Notes on birds observed in Nagpur and Kamptee. *J. Asiatic Soc. of Bengal*, **40**(2) : 207-215.
- NELSON, A.E. 1925. *A Guide to Chikalda*; Govt. Press, Nagpur.
- PRADHAN, M.S. 1997. Qualitative analysis of major vertebrate fauna from Wardha River Basin (Maharashtra). *J. Bombay nat. Hist. Soc.*, **94**(1) : 71-103.
- RITHE, KISHOR, 2002. New bird species recorded from Melghat. *18th National Symposium on Recent Trends in Life Sciences*, November 2002 : 28-29.
- RITHE, KISHORE, 2003. Savings the Forest Owlet. *Sanctuary Asia*; Feb. 2003 : 30-33.
- SAWARKAR, V.B. 1988. Bird survey of Melghat Tiger Project. *Cheetal*, **29**(1) : 4-27.
- WADALKAR, J.S. 2001. Checklist of birds from Amaravati University Campus, Maharashtra. *Zoo's Print Journal*, **16**(5) : 497-499.
- WOODCOCK, MARTIN 1984. *Collins Handguide to the Birds of the Indian Subcontinent* (Reprinted 1984). William Collins Sons & Co. Ltd. London : 1-176.

Table 1 : Birds of Melghat Tiger Reserve showing Residential Status, Food habits and Distribution

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
1.	5	Order PODICIPEDIFORMES Family PODICIPEDIDAE <i>Tachybaptus ruficollis</i> (Pallas)	Little Grebe or Dabchick	R, UnC	AqA&I	Semadoh, Sidu Kund, Dhakna	Throughout Indian subcontinent & Assam
2.	49	Order CICONIIFORMES Family ARDEIDAE <i>Egretta garzetta</i> (Linnaeus)	Little Egret	R, C	AqA&I	Bori, Semadoh	Throughout the subcontinent
3.	36	<i>Ardea cinerea</i> Linnaeus	Grey Heron	R, UnC	Aq A	MTP	All India, Andaman & Nicobars
4.	46	<i>Casmerodius albus</i> (Linnaeus)	Eastern Large Egret	R, UnC	AqA&I	Sidu Kund, Semadoh, Dhakna	Throughout the subcontinent
5.	47	<i>Mesophayx intermedia</i> (Wagler)	Smaller or Median Egret	R, UnC	AqA&I	Semadoh, Bori	Throughout the subcontinent
6.	44	<i>Bubulcus ibis</i> (Linnaeus)	Cattle Egret	R, C	Aq A	Sidu Kund, Dhakna, Semadoh	Throughout the subcontinent
7.	42	<i>Ardeola grayii</i> (Sykes)	Indian Pond Heron or Paddy bird	R, C	AqA&I	Semadoh, Dhakna, Sidu Kund, Emali Pada	Throughout the subcontinent

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
8.	38	<i>Butorides striatus</i> (Linnaeus)	Little Green Heron	R, UnC	AqA&I	Sipna River Semadoh Bhimkund valley near Chikhaldara (Rithe 2002, Kasambe 2003)	Throughout the subcontinent
9.	52	<i>Nycticorax nycticorax</i> (Linnaeus)	Black-Crowned Night-Heron	R, UnC	AqA&I	Sipna Basin (Kasambe, 2003)	- do -
10.	57	<i>Ixobrychus sinensis</i> (Gmelin)	Yellow Bittern	R, UnC	AqA&I	MTP	- do -
11.	56	<i>Ixobrychus cinnamomeus</i> (Gmelin)	Chestnut Bittern	R, UnC	AqA&I	MTP	- do -
Family CICONIDAE							
12.	60	<i>Mycteria leucocephala</i> Pennant	Painted Stork	R, UnC	AqA & I	MTP	Throughout plains of India
13.	65	<i>Ciconia nigra</i> (Linnaeus)	Black Stork	WV, O	AQA&I	MTP	Wintering upto 18° N latitude
14.	62	<i>Ciconia episcopus</i> (Boddaert)	White-necked Stork	R,O	AqA&I	Semadoh	Throughout the well watered parts of India
15.	63	<i>Ciconia ciconia</i> (Linnaeus)	White Stork	WV, UnC	AqA & I	Rangubeli (Rithe, 2002)	Northern India, decreasingly south upto Karnataka

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
16.	69	Family THRESKIORNITHIDAE <i>Threskiornis melanocephalus</i> (Latham)	Oriental White Ibis	R, UnC	AqA&I	Semadoh	All India
17.	70	<i>Pseudibis papillosa</i> (Temminck)	Indian Black Ibis	R, UnC	AqA&I	MTP	Central and peninsular India south to Karnataka
18.	88	Order ANSERIFORMES Family ANATIDAE <i>Dendrocygna javanica</i> (Horsfield)	Lesser Whistling Duck	R, UnC	Aq A	Semadoh	All India
19.	90	<i>Tadorna ferruginea</i> (Pallas)	Brahminy Shelduck	WV, UnC	Om	MTP	All India (rare in south)
20.	101	<i>Anas strepera</i> Linnaeus	Gadwall	WV, UnC	Vg	MTP	All India less southward
21.	97	<i>Anas poecilorhyncha</i> J.R. Forester	Spot-billed Duck	R, UnC	Vg	Semadoh	Throughout the Indian subcontinent
22.	105	<i>Anas clypeata</i> Linnaeus	Northern Shoveller	WV, UnC	AqA&I	MTP	All India
23.	93	<i>Anas acuta</i> Linnaeus	Northern Pintail	WV, C	Vg	MTP	All India
24.	104	<i>Anas querquedula</i> Linnaeus	Garganey or Blue-winged Teal	WV, UnC	Vg	MTP	All India
25.	94	<i>Anas crecca</i> Linnaeus	Common Teal	WV, UnC	Vg	MTP	All over India

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
26.	130	Order FALCONIFORMES Family ACCIPITRIDAE <i>Pernis ptilorhynchus</i> (Temminck)	Oriental Honey-Buzzard	R, C	Cr & N	Semadoh, Dhakna	All India
27.	124	<i>Elanus caeruleus</i> (Desfontaines)	Black-shouldered Kite	R, UnC	Cr	Semadoh Dhakna	All over India
28.	133	<i>Milvus migrans</i> (Boddaert)	Black Kite	R, UnC	Om	Semadoh Dhakna	All over India
29.	135	<i>Haliastur indus</i> (Boddaert)	Brahminy Kite	R, UnC	Cr.	Bori	Throughout India
30.	187	<i>Neophron percnopterus</i> (Linnaeus)	Indian Scavenger Vulture	R, C	Sc	Semadoh, Dhakna, Sidu Kund	All India
31.	185	<i>Gyps bengalensis</i> (Gmelin)	Indian White-backed Vulture	R, C	Sc	Semadoh Dhakna	All over India
32.	182	<i>Gyps indicus</i> (Scopoli)	Indian Long-billed Vulture	R, UnC	Sc	Dhakna	Northern India south of Gangetic
33.	178	<i>Sarcogyps calvus</i> (Scopoli)	Red-headed Vulture	R, UnC	Sc	MTP	Throughout India
34.	195	<i>Circaetus gallicus</i> (Gmelin)	Short-toed Snake Eagle	R, UnC	Cr	MTP	Throughout Indian Union except Assam
35.	197	<i>Spilornis cheela</i> (Latham)	Lesser or Peninsular Crested Serpent-Eagle	R, C	Cr	Semadoh	Northern India from Kashmir to Assam, Gangetic plain

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
36.	190	<i>Circus macrourus</i> (S.G. Gmelin)	Pale Harrier	WV, C	Cr	MTP	Entire Indian Union
37.	144	<i>Accipiter trivirgatus indicus</i> (Temminck)	North Indian Crested Goshawk	R, UnC	Cr	MTP	Northern India from Garhwal to Assam
38.	138	<i>Accipiter badius dussumieri</i> (Gmelin)	Indian Shikra	R, C	Cr	Semadoh, Dhakna	All India except Kerala and Assam
39.	147	<i>Accipiter nisus</i> (Linnaeus)	Eurasian Sparrow-Hawk	WV, UnC	Cr	MTP	All India
40.	157	<i>Butastur teesa</i> (Franklin)	White-eyed Buzzard-Eagle	R, C	Cr	Semadoh, Dhakna, Koktu	Throughout India
41.	172	<i>Ictinaetus malayensis</i> (Temminck)	Black Eagle	R, O	Cr	MTP	From Punjab to Kanyakumari
42.	168	<i>Aquila rapax</i> (Temminck)	Tawny Eagle	R, UnC	Cr	MTP	Entire Indian Union, except Kerala, Assam
43.	163	<i>Hieraaetus fasciatus</i> (Vieillot)	Bonelli's or Slender Hawk-Eagle	R, UnC	Cr	Koktu	India from Kashmir, south to Kanyakumari
44.	161	<i>Spizaetus cirrhatus</i> (Gmelin)	Changeable Hawk-Eagle	R, C	Cr	Semadoh, Dhakna, Koktu, Sidu Kund	Throughout peninsular India, northern limit from Mt. Abu to Kolkata

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
45.	203	Family PANDIONIDAE <i>Pandion haliaetus</i> (Linnaeus)	Osprey	WV, UnC	Fish only	MTP	Throughout the subcontinent
46.	221	Family FALCONIDAE <i>Falco naumanni</i> Fleischer	Lesser Kestrel	WV, UnC	I	MTP	Sight records from Ambala to Manipur, Ahmednagar, Nilgiris
47.	222	<i>Falco tinnunculus</i> Linnaeus	Common Kestrel	WV, C	Cr	Dhakna, Semadoh, Koktu	All over India
48.	219	<i>Falco chicquera</i> Daudin	Red-headed Merlin	R, UnC	Cr	Dhakna	Throughout the subcontinent
49.	212	<i>Falco subbuteo</i> Linnaeus	Eurasian Hobby	R/WV, UnC (partly)	I, & Cr	MTP	Himalayan foothills, to occurs in Kerala
50.	208	<i>Falco jugger</i> J.E. Gray	Laggar Falcon (Laggar)	R, UnC	Cr	MTP	Throughout subcontinent
51.	209	<i>Falco peregrinus</i> Tunstall	Peregrine Falcon	WV, UnC	Cr	MTP	- do -
52.	211	<i>Falco peregrinus peregrinator</i> Sundevall	Peregrine Falcon	R, UnC	Cr	MTP	- do -
53.	241	Order GALLIFORMES Family PHASIANIDAE <i>Francolinus pictus</i> (Jardine & Selby)	Painted Francolin	R, UnC	Gr	MTP	The peninsular north 20° N and southwards, except Kerala

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
54.	245	<i>Francolinus pondicerianus</i> (Gmelin)	Grey Francolin	R, UnC	Gr	Semadoh, Dhakna, Emalipada	Northern India to W. Bengal, south to a line from Pune to Kakinada
55.	250	<i>Coturnix coturnix</i> (Linnaeus)	Common Quail	R/WV, UnC	Gr	Semadoh, Dhakna, Sidu-kund	All India
56.	252	<i>Coturnix coromandelica</i> (Gmelin)	Black breasted or Rain Quail	R, UnC	Gr	MTP	All India
57.	255	<i>Perdica asiatica</i> (Latham)	Jungle Bush-Quail	R, C	Gr	Semadoh, Dhakna, Sidukund	Gujarat, Madhya Pradesh, Bihar, South to Tamil Nadu
58.	260	<i>Perdica argoondah</i> (Sykes)	Deccan Rock Bush-Quail	R, C	Gr	MTP	Peninsular India through Deccan to Tamil Nadu
59.	263	<i>Perdica erythrorhyncha</i> (Skyles)	Northern Painted Bush Quail	R, C	Gr	MTP	Eastern Maharashtra, eastern M.P. to W. Bengal
60.	275	<i>Galloperdix spadicea</i> (Gmelin)	Red Spurfowl	R, C	Gr	MTP	Peninsular India, M.P. to Orissa south to Kerala
61.	278	<i>Galloperdix lunulata</i> (Valenciennes)	Painted Spurfowl	R, UnC	Gr	MTP	Continental and peninsular India south of Gangetic Plain

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
62.	301	<i>Gallus sonneratii</i> Temminck	Grey Junglefowl	R, C	Gr	Semadoh Dhakna	Peninsular India upto extreme south
63.	311	<i>Pavo cristatus</i> (Linnaeus)	Indian Peafowl	R, C	Om	Bori, Koktu	Throughout the subcontinent
		Order GRUIFORMES Family TURNICIDAE					
64.	313	<i>Turnix sylvatica</i> (Desfontaines)	Small Buttonquail	R, UnC	Gr & Vg	MTP	Outer Himalayas southwards through peninsu- la to Kerala
65.	314	<i>Turnix tanki</i> Blyth	Yellow Legged Buttonquail	R, UnC	Vg	MTP	- do -
66.	318	<i>Turnix suscitator</i> (Gmelin)	Common Buttonquail	R, UnC	Vg & Gr	Dhakna	Continental and peninsular India South of 23°N
		Family GRUIDAE					
67.	320	<i>Grus virgo</i> (Linnaeus)	Demoiselle Crane	WV, UnC	Gr	MTP	In north western, west central subcontinent
		Family RALLIDAE					
68.	343	<i>Amaurornis phoenicurus</i> (Pennant)	White-breasted Waterhen	R, C	I & Vg	Semadoh, Koktu	In northern India south latitude 20°N parallel

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
69.	380	Order CHARADRIIFORMES Family CHARADRIIDAE <i>Charadrius dubius</i> Scopoli	Little Ringed Plover	R, UnC	I	MTP	Throughout the subcontinent
70.	370	<i>Vanellus malabaricus</i> (Boddaert)	Yellow-wattled Lapwing	R, UnC	I	Koktu	North India, south through Peninsula
71.	369	<i>Vanellus duvaucelii</i> (Lesson)	River Lapwing	R, UnC	I & AqA	MTP	Eastern and Central India, Bihar, Orissa
72.	366	<i>Vanellus indicus</i> (Boddaert)	Red-wattled Lapwing	R, C	I & Vg	Semadoh Dhakna, Emali pada	All India
73.	406	Family SCOLOPACIDAE <i>Gallinago stenura</i> (Bonaparte)	Pintail Snipe	WV, C	Aq A	MTP	All India including Andaman & Nicobar Islands and Maldiv Islands
74.	409	<i>Gallinago gallinago</i> (Linnaeus)	Common or Fantail Snipe	WV, A	Aq A	MTP	- do -
75.	394	<i>Tringa totanus</i> (Linnaeus)	Common Redshank	WV, UnC	Aq A	MTP	- do -
76.	396	<i>Tringa nebularia</i> (Gunner)	Common Greenshank	WV, UnC	Aq A	MTP	- do -
77.	397	<i>Tringa ochropus</i> Linnaeus	Green Sandpiper	WV, C	Aq A	MTP	- do -

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
78.	398	<i>Tringa glareola</i> Linnaeus	Wood or Spotted Sandpiper	WV, C	Aq A	MTP	- do -
79.	401	<i>Actitis hypoleucos</i> Linnaeus Family RECURVIROSTRIDAE	Common Sandpiper	WV, C	Aq A	MTP	- do -
80.	430	<i>Himantopus himantopus</i> (Linnaeus) Family BURHINIDAE	Black-winged Stilt	R/WV, C	Aq A	Sipra and Gadga river	Throughout Indian Union
81.	436	<i>Burhinus oedicephalus</i> (Linnaeus)	Indian Stone-Curlew	R, UnC	I	MTP	All India including Himalayan and Peninsular hills upto 1000m
82.	437	<i>Esacus recurvirostris</i> (Cuvier) Family GLARIOLIDAE	Great Stone-Plover	R, UnC	AqA&I	MTP	All India including Assam and Manipur
83.	444	<i>Glareola lactea</i> Temminck Order COLUMBIFORMES Family PTEROCLIDIDAE	Small Pratincole or Swallow-Plover	R, UnC	I	MTP	All India including Kashmir and Assam
84.	487	<i>Pterocles exustus</i> Temminck	Chestnut-bellied Sandgrouse	R, C	Gr & Vg	Bori, Koktu	Throughout the Peninsular India

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
85.	492	<i>Pterocles indicus</i> (Gmelin)	Painted Sandgrouse	R, UnC	Gr, Vg	MTP	Peninsular India, absent in Gangetic plain, W. Bengal
86.	517	Family COLUMBIDAE <i>Columba livia</i> Gmelin	Blue Rock Pigeon	R, A	Gr	Semadoh, Dhakna, Dharni	Throughout Indian Union
87.	532	<i>Streptopelia orientalis</i> (Latham)	Oriental Turtle-Dove	WV, C	Gr	MTP	Southern peninsular India; chiefly on eastern side also Nagaland, Manipur
88.	541	<i>Streptopelia senegalensis</i> (Linnaeus)	Little Brown Dove or Senegal Dove	R, C	Gr	Dhakna, Semadoh, Emali pada	Throughout India
89.	537	<i>Streptopelia chinensis</i> (Scopoli)	Indian Spotted Dove	R, C/A	Gr	Pipal pada, Koktu, Bori, Gadaga river, Dhanka	In India east to Assam south through peninsular India upto Kany-akumari
90.	535	<i>Streptopelia tranquebarica</i> (Hermann)	Red Collared-Dove	R, C	Gr	Bori, Koktu, Emli pada	U.P., Bihar, south through peninsula upto Tamil Nadu

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
91.	534	<i>Streptopelia decaocta</i> (Frivaldszky)	Eurasian Collared-Dove	R, C	Gr	Bori, Koktu, Geru Amb, Emali pada, Sidu kund	Entire Indian Union also in Andaman, Nicobar Is.
92.	504	<i>Treron phoenicoptera</i> (Latham)	Yellow-legged Green-Pigeon	R, C / A	Fr	Koktu, Dhakna	All peninsular India
		Order PSITTACIFORMES Family PSITTACIDAE					
93.	545	<i>Psittacula eupatria</i> (Linnaeus)	Alexandrine Parakeet	R, C	Fr	Sidu Kund, Semadoh, Dhakna	Himalayan foot hills, upto about 18°N latitude
94.	550	<i>Psittacula krameri</i> (Scopoli)	Rose-ringed Parakeet	R, A	Fr	Semadoh, Emali pada, Bori	Peninsular India south of latitude 20°N
95.	558	<i>Psittacula cyanocephala</i> (Linnaeus)	Plum-headed Parakeet	R, C	Fr & Gr	Semadoh, Dhakna, Koktu	All peninsular India south of latitude 20°N
		Order CUCULIFORMES Family CUCULIDAE					
96.	570	<i>Clamator jacobinus</i> (Boddaert)	Pied Crested Cuckoo	MV, C	Fr & I	MTP	Northern India, to Assam, south to 18°N latitude

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
97.	573	<i>Hierococcyx varius</i> (Vahl)	Common Hawk-Cuckoo or Brain-fever Bird	R, C	I & Fr	Semadoh, Dhakna, Geru Amb	Entire subcontinent
98.	576	<i>Cuculus micropterus</i> Gould	Indian Cuckoo	R, UnC	I	Dhakna, Geru Amb	Throughout the subcontinent, Andaman & Nicobar Islands
99.	578	<i>Cuculus canorus</i> Linnaeus	Common Cuckoo	R, UnC	I	MTP	- do -
100.	581	<i>Cuculus poliocephalus</i> Latham	Lesser Cuckoo	R, C	I	Dhakna, Emali pada, Koktu	Himalayas, eastward Nagaland, Peninsula south to Kerala
101.	582	<i>Cacomantis sonneratti</i> (Latham)	Banded Bay Cuckoo	MV/R, UnC	I	MTP	Throughout India
102.	584	<i>Cacomantis passerinus</i> (Vahl)	Indian Plaintive Cuckoo	R, UnC	I	Geru Amb	All India
103.	588	<i>Surniculus lugubris</i> (Horsfield)	Indian Drongo-Cuckoo	MV/R, UnC	I	MTP	Lower Himalayas to Assam, Peninsula to Kerala
104.	590	<i>Eudynamys scolopacea</i> (Linnaeus)	Asian Koel	R, C	Fr & I	Dhakna, Semadoh, Geru Amb	Throughout the subcontinent except Assam
105.	595	<i>Phaenicophaeus viridirostris</i> (Jerdon)	Small Green-billed Malkoha	R, C	I	MTP	Peninsular India roughly north to 20° N latitude

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
106.	596	<i>Phaenicophaeus leschenaultii</i> (Lesson)	Sirkeer Malkoha	R, UnC	I	MTP	Eastern Maharashtra south peninsula upto 18°N latitude
107.	602	<i>Centropus sinensis</i> (Stephens)	Greater Coucal	R, C	Om	Semadoh, Dhakna, Emali pada	Peninsular India Gujarat, M.P. south upto Kerala.
108.	606	Order STRIGIFORMES Family TYTONIDAE <i>Tyto alba</i> (Scopoli)	Indian Barn Owl	R, C	Cr	Dhakna, Semadoh, Koktu	All India
109.	617	Family STRIGIDAE <i>Otus sunia</i> (Hodgson)	Oriental Scops-Owl	R, UnC	I & Cr	MTP	Peninsular India south upto 21° N latitude
110.	622	<i>Otus bakkamoena</i> Pennant	Collared Scops-Owl	R, C	I & Cr	MTP	From Surat Dangs M.P. to W. Bengal
111.	627	<i>Bubo bubo</i> (Linnaeus)	Eurasian Eagle Owl	R, C	Cr	Dhakna	Himalayas to Assam, south to Kerala
112.	630	<i>Bubo coromandus</i> (Latham)	Dusky Eagle-Owl	R, UnC	Cr	MTP	Throughout the sub-continent, upto Nilgiris

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
113.	631	<i>Ketupa zeylonensis</i> (Gmelin)	Brown Fish-Owl	R, UnC	Fish & Cr	MTP	Entire Indian Union
114.	657	<i>Strix ocellata</i> (Lesson)	Mottled Wood-Owl	R, C	Cr	MTP	Throughout the Peninsula, M.P. to southern Kerala
115.	659	<i>Strix leptogrammica</i> Temminck	Brown Wood-Owl	R, UnC	Cr	MTP	In Peninsular India, Eastern and Western Ghats upto 18°N latitude in west and 20°N in the east
116.	636	<i>Glauoidium radiatum</i> (Tickell)	Jungle Owlet	R, UnC	I & Cr	Semadoh	Himalayas south upto 16°N latitude
117.	650	<i>Athene brama</i> (Temminck)	Spotted Owlet	R, C	I & Cr	Dhakna, Semadoh, Geru Amb	Himalayan submontane tracts south upto 20°N latitude
118.	657	<i>Athene</i> (= <i>Heteroglaux</i>) <i>blewitti</i> Hume	Forest Owlet	R, UnC	I & Cr	Raipur, Malur (Rithe, 2002)	Satpara Mountain from Dangs to West Khandesh, eastern M.P. to Orissa
119.	642	<i>Ninox scutulata</i> (Raffles)	Indian Brown Hawk-Owl	R, UnC	I & Cr	MTP	Outer Himalayas, east to W. Bengal, south upto 19°N latitude

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
120.	664	<i>Asio flammeus</i> (Pontoppidan)	Short-eared Owl	WV, UnC	Cr	MTP	Practically throughout the subcontinent
		Order CAPRIMULGIFORMES Family CAPRIMULGIDAE					
121.	671	<i>Caprimulgus indicus</i> Latham	Indian Jungle Nightjar	R, C	I	Semadoh, Dhakna, Bori	All India south of Himalayas to Kerala
122.	680	<i>Caprimulgus asiaticus</i> Latham	Common Indian Nightjar	R, C	I	MTP	Entire Indian Union
123.	682	<i>Caprimulgus affinis</i> Horsfield	Franklin's or Allied Nightjar	R, C	I	MTP	Himalayas to Assam, Rajasthan, south upto Kerala
		Order AP0DIFORMES Family APODIDAE					
124.	692	<i>Zoonavena sylvatica</i> (Tickell)	White-rumped Needletail-Swift	R, UnC	I	MTP	Lower Himalayas to Western Ghats and western side of S. India
125.	694	<i>Tachymarptis melba</i> (Linnaeus)	Indian Alpine Swift	R, C	I	Bori	Himalayas to Assam, to south India
126.	703	<i>Apus affinis</i> (J.E. Gray)	Indian House Swift	R, C	I	Semadoh, Dhakna, Bori	All India except Kerala

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
127.	709	Family HEMIPROCNIDAE <i>Hemiprocne coronata</i> (Tickell)	Crested Tree-Swift	R, UnC	I	Emali pada, Dhakna, Semadoh	Throughout the Indian Union except Punjab, Rajasthan and Kutch
128.	723	Order CORACIIFORMES Family ALCEDINIDAE <i>Alcedo atthis</i> (Linnaeus)	Indian Small Blue Kingfisher	R, C	Aq A	Semadoh, Sidu Kund, Dhakna, Emali pada	N. subcontinent east to Manipur, south upto an arbitrary boundary 20°N latitude
129.	730	<i>Halcyon capensis</i> (Linnaeus)	Stork-billed Kingfisher	R, C	Aq, A	Kokklas (Rithe, 2002)	All India. From Lower Himalayas east to Manipur south to Kerala
130.	736	<i>Halcyon smyrnensis</i> (Linnaeus)	Indian White-brested Kingfisher	R, C	Aq, A & I	Dhakna, Semadoh, Emali pada, Sidukund	All India from sub-Himalayan tracts, to south through the Peninsula
131.	739	<i>Halcyon pileata</i> (Boddaert)	Black-capped Kingfisher	R, O	Aq, A & I	MTP (Rithe, 2002)	Penninsula, south-ward to Mumbai, east-ward to Sunderbans

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
132.	719	<i>Ceryle rudis</i> (Linnaeus)	Lesser Pied King-fisher	R, UnC	Fish, Aq A	Semadoh, Geru Amb	Indian Union except in Kerala
		Family MEROPIDAE					
133.	753	<i>Nyctyornis athertoni</i> (Jerdine & Selby)	Blue-beared Bee-eater	R, UnC	I	MTP (Rithe, 2002)	Lower Himalayas to Manipur, Khandesh south to Kerala, east to W. Bengal
134.	750	<i>Merops orientalis</i> Latham	Small Bee-eater	R, C	I	Semadoh, Dhakna, Bori Geru Amb	Throughout the Indian subregion
135.	748	<i>Merops philippinus</i> Linnaeus	Blue-tailed Bee-eater	R, UnC	I	MTP	Northern India, to W. Bengal and Assam; patchily throughout the Peninsula
		Family CORACIIDAE					
136.	755	<i>Coracias benghalensis</i> (Linnaeus)	Indian Roller or Blue Jay	R, C	I & Cr	Semadoh, Bodi, Gadga river near Dhakna	All continental India south upto boundary at 20°N latitude
		Family UPUPIDAE					
137.	765	<i>Upupa epops</i> Linnaeus	Common Hoopoe	WV, C	I	Semadoh, Gadga river (Dhakna)	Lower Himalayas to south through central India, upto Kerala

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
138.	767	Family BUCEROTIDAE <i>Ocyrceros birostris</i> (Scopoli)	Indian Grey-Hornbill	R, C	F & I	Semadoh	Himalayas eastward to W. Bengal, southward upto Kerala
139.	780	Order PICIFORMES Family CAPITONIDAE <i>Megalaima zeylanica</i> (Gmelin)	Brown-headed Barbet	R, C	F	Semadoh, Dhakna, Gadge river	Lower Himalayas Northern Maharashtra to W. Bengal
140.	792	<i>Megalaima haemacephala</i> (P.L.S. Muller)	Crimson breasted Barbet or Coppersmith	R,C	F	Geru Amb, Bori, Dhakna	Practically throughout Indian Union
141.	852	Family PICIDAE <i>Dendrocopos nanus</i> (Vigors)	Browncapped Pigmy Woodpecker	R, C	I.& Fr.	Semadoh, Koktu, Bori	All Peninsular India upto Karnataka
142.	847	<i>Dendrocopos mahrattensis</i> (Latham)	Yellow-fronted Pied or Mahratta Wood-pecker	R, C	I.& Fr	Semadoh, Koktu, Dhakna	Base of Himalayas eastward to Assam. Southwards upto Kerala

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
143.	830	<i>Dryocopus javensis</i> (Horsfield)	Great Black Wood-pecker	R, O	I	MTP	Western Ghat complex from Kerala northward to eastern M.P.
144.	808	<i>Picus xanthopygaeus</i> (J.E. Gray & G.R. Gray)	Little Scaly-bellied Green Wood-pecker	R, UnC	I	Koktu	Throughout the Peninsula; Himalayan foothills to Assam
145.	819	<i>Dinopium beghalense</i> (Linnaeus)	Lesser Golden-backed Woodpecker	R, C	I & F	Semadoh Dhakna	Whole of subcontinent, Rajasthan to A.P.
146.	858	<i>Chrysocolaptes festivus</i> (Boddaert)	Black shouldered Woodpecker	R, UnC	I	MTP	Practically all Peninsular India, south of latitude 28°N
147.	856	<i>Hemicircus canente</i> (Lesson)	Heart-spotted Woodpecker	R, O	I	MTP	Western Ghat complex from Kerala northward upto M.P., eastward to Assam
148.	867	Order PASSERIFORMES Family PITTIDAE <i>Pitta brachyura</i> (Linnaeus)	Indian Pitta	WV, UnC	I	MTP	Entire sub-continent

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
149.	877	Family ALAUDIDAE <i>Mirafra erythroptera</i> Blyth	Red-winged Bush-Lark	R, UnC	Gr	MTP	Northern and southern India (except Kerala)
150.	878	<i>Eremopterix grisea</i> (Scopoli)	Ashy-Crowned Sparrow-Lark	R, C	Gr	Bori, Semadoh, Dhakna	Himalayan foothills South upto Kanyakumari
151.	883	<i>Ammomanes phoenicurus</i> (Franklin)	Southern Rufous-tailed Finch-Lark	R, UnC	I & Gr	Bori	Northwest India in Kutch to M.P.
152.	886	<i>Calandrella brachydactyla</i> (Leisler)	Greater Short-toed Lark	WV, UnC	Gr	MTP	Himalayan, foothills south to Kerala
153.	902	<i>Galerida deva</i> (Skyles)	Deccan or Skyles's Crested Lark	R, UnC	Gr & I	Dhakna	By and large Central plateau country
154.	907	<i>Alauda gulgula</i> Franklin	Indian Small Skylark	R, C	Gr & I	Bori, Dhakna	Peninsular India south to Tamil Nadu, east to Assam
155.	913	Family HIRUNDINIDAE <i>Hirundo rupestris</i> Scopoli	Eurasian Crag Martin	WV, C	I	MTP	Western Ghats, Satpuras, and other peninsular hills to Tamil Nadu

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
156.	914	<i>Hirundo concolor</i> Skyes	Dusky Crag-Martin	R, C	I	Semadoh, Dhakna, Geru Amb	Entire Peninsula south to Tamil Nadu and east to W. Bengal
157.	916	<i>Hirundo rustica</i> Linnaeus	Common Swallow	WV, C	I	MTP	More or less throughout the country
158.	921	<i>Hirundo smithii</i> Leach	Wire-tailed Swallow	R, C	I	Dhakna, Semadoh	Northern India, J&K, Punjab to Maharashtra
159.	925	<i>Hirundo daurica</i> Linnaeus	Red-rumped Swallow	WV, C	I	MTP	Peninsula from U.P. to Kerala and from Gujarat to Orissa
160.	922	<i>Hirundo fluviicola</i> Blyth	Streak-throated Swallow	R, C	I	Dhakna, Semadoh, Koktu	J. & K. to 11°N, latitude and east to W. Bengal and Assam
161.	1885	Family MOTACILLIDAE <i>Motacilla alba</i> Linnaeus	Indian White Wagtail	WV, C	I	Koktu, Bori, Emali pada, Dhakna	The Himalayan foot-hills south upto Karnataka and A. P.
162.	1891	<i>Motacilla maderaspatensis</i> Gmelin	Large Pied Wagtail	R, C	I	Semadoh Camp, Bori, Dhakna	Himalayan foothills south to Kanyakumari and lower Bengal

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
163.	1883	<i>Motacilla citreola</i> Pallas	Citrine Wagtail	WV, C	I	Semadoh, Dhakna, Gadga river	N. India south to Kutch, M.P. and east to Assam
164.	1884	<i>Motacilla cinerea</i> Tunstall	Grey Wagtail	WV, C	I	Semadoh, Dhakna, Koktu, Bori	Indian Peninsula, Assam; Andaman and Nicobar islands
165.	1859	<i>Anthus rufulus</i> Vieillot	Paddyfield pipit	R, C	I	Sidu Kund, Dhakna, Semadoh	Peninsular India Assam except Kerala
166.	1852	<i>Anthus hodgsoni</i> Richmond	Oriental Tree Pipit	WV, UnC	I	MTP	Himalayan foothills and entire Indian Peninsula
167.	1072	Family CAMPEPHAGIDAE <i>Coracina macei</i> (Lesson)	Indian Large Cuckoo Shrike	R, UnC	I	Semadoh, Dhakna	The entire Peninsula roughly south of a line from Kutch east to M.P. to West Bengal
168.	1079	<i>Coracina melanoptera</i> (Ruppell)	Peninsular Black-headed Cuckoo-Shrike	R, UnC	I, & Fr	Koktu	Indian Peninsula Kutch to W. Bengal, south upto Kerala

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
169.	1093	<i>Pericrocotus cinnamomeus</i> (Linnaeus)	Southern Small Minivet	R, A	I	Semadoh	From Saurashtra to Orissa, south through Peninsula to Tamil Nadu
170.	1096	<i>Pericrocotus erythropygius</i> (Jerdon)	White-bellied Minivet	R, UnC	I	MTP	Peninsular and central India south and east to Belgaum, Hyderabad
171.	1081	<i>Pericrocotus flammeus</i> (Forster)	Peninsular Indian Scarlet (or Orange) Minivet	R, C	I	Semadoh, Dhakna, Koktu	Tapti river in Gujarat south upto Kerala
172.	1065	<i>Hemipus picatus</i> (Skyes)	Black-backed Pied Flycatcher-Shrike	R, C	I	MTP (Rithe, 2002)	Central and Peninsular India from Narmada river to south except Kerala
173.	1070	<i>Tephrodornis pondicerianus</i> (Gmelin) Family PYCNONOTIDAE	Indian Wood Shrike	R, C	I	Bori	Deccan
174.	1120	<i>Pycnonotus jocosus</i> (Linnaeus)	Southern Red-whiskered Bulbul	R, C	Fr & I	Semadoh, Emali pada Dhakna	Western India from Tapti river and M.P. south to A.P. & Kerala

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
175.	1128	<i>Pycnonotus cafer</i> (Linnaeus)	Red-vented Bulbul	R, C	Fr & N	Pipal pada, Bori Koktu	South India north to Godavari river in the east, Maharashtra in the west
176.	1138	<i>Pycnonotus luteolus</i> (Lesson)	White-browed Bulbul	R, UnC	Fr & N	MTP	E. Peninsula, Gujarat M.P. to Western Ghat except Kerala
177.	1099	Family IRENIDAE <i>Aegithina tiphia</i> (Linnaeus)	Central Common Iora	R, C	I	Koktu, Dhakna	The Himalayan foot-hills, U. P. east to Assam, south to lat. 20°N
178.	1107	<i>Chloropsis cochinchinensis</i> (Gmelin)	Jerdon's Chloropsis	R, C	I	Pipalpada, Semadoh, Bori	Gulf of Cambay to central U.P., to W. Bengal, southern Peninsula
179.	949	Family LANIIDAE <i>Lanius cristatus</i> , Linnaeus	Brown Shrike	WV, UnC	I	MTP	All India south of line from Ahmednagar, Surat, Mhow, Lucknow, and N.E. India

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
180.	940	<i>Lanius vittatus</i> Vilenciennes	Bay-backed Shrike	R, UnC	I	MTP	Throughout Peninsula to Kanyakumari, east-ward to W. Bengal
181.	946	<i>Lanius schach</i> Linnaeus	Rufous-backed Shrike	WV, C	I	Bori, Semadoh, Dhakna	Western Himalayas, U. P. southward to N. Karnataka
182.	933	<i>Lanius meridionalis</i> Temminck	Southern Grey Shrike	R, C	Cr & I	Bori, Geru Amb, Semadoh	Punjab, Rajasthan, M. P. south to Karnataka east to W. Bengal
183.	1723	Family MUSCICAPIDAE Sub-Family TURDINAE <i>Monticola cinclorhynchus</i> (Vigors)	Blue-headed Rock-Thrush	WV, UnC	I	Jooda Padav (Rithe, 2002)	W. Ghats from Dangs to Tamil Nadu, M.P.
184.	1726	<i>Monticola solitarius</i> (Linnaeus)	Indian Blue Rock-Thrush	WV, C	I & Cr	MTP	Himalayan foothills to Arunachal, south throughout India
185.	1728	<i>Myiophonus horsfieldii</i> (Vigors)	Malabar Whistling-Thrush	R, C	Om	MTP	W. Gujarat, Satpura range to Orissa. Western Ghat complex to Tamil Nadu

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
186.	1734	<i>Zoothera citrina</i> (Latham)	Orange-headed Thrush	R, C	I & Fr	MTP	Peninsular India from M.P., Orissa south to Kerala, Tamil Nadu
187.	1753	<i>Turdus merula</i> Linnaeus	Eurasian Blackbird	R, UnC	I & Fr	Dhakna, Bori, Pipal pada	S. Rajasthan, along the Satpura and the W. Ghat to Belgaum
188.	1645	<i>Luscinia sevecica</i> (Linnaeus)	Turkestan Bluethroat	WV/PM, UnC	I	MTP	All India south to Mumbai, Londa, east to W. Bengal
189.	1661	<i>Copsychus saularis</i> (Linnaeus)	Oriental Magpie Robin	R, C	I & N	Koktu, Dhakna, Semadoh	Himalayan foothills to W. Bengal, Pensula and south to Cauvery river
190.	1719	<i>Saxicoloides fulicata</i> (Linnaeus)	Deccan Black Robin	R, C	I	Bori, Semadoh, Sidu Kund	Central India from the Tapi river, south to Krishna river
191.	1672	<i>Phoenicurus ochruros</i> (Gmelin)	Eastern Black Redstart	WV, C	I	Sidukund, Emali pada Semadoh	Summer visitor to Northern Himalayas Winters in Peninsula upto Tamil Nadu

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
192.	1697	<i>Saxicola torquata</i> (Linnaeus)	Common Stone Chat	WV, C	I	Gadga river at Dhakna, Pipal pada and Koktu	Himalayas east to Arunachal Pradesh; through the Peninsula to S. Karnataka
193.	1701	<i>Saxicola caprata</i> (Linnaeus)	Burmese Pied Bushchat	R, C	I & Vg	Sidukund, Gadga river at Dhakna, Bori	Gujarat south to Tamil Nadu, east through M.P. to Assam
194.	1154	Sub-Family TIMALIINAE <i>Pellorneum ruficeps</i> Swainson	Peninsular Spotted Babbler	R, C	I	MTP	Hills of the Indian Peninsula-Satpuras, hill tracts of Bihar, Orissa, Western and Eastern Ghats
195.	1173	<i>Pomatorhinus horsefieldii</i> Skyes	Deccan Scimitar-Babbler	R, C	I & N	MTP	Tapti river south in the Western Ghats to N. Karnataka, Eastern Ghat complex to the Krishna river

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
196.	1222	<i>Dumetia hyperythra</i> (Franklin)	Rufous-bellied Babbler	R, C	I & N	MTP	Himalayan foothills to U.P., W. Bengal south to the Krishna river and west to a line Hyderabad-Jalna-Mhow-Jhansi
197.	1231	<i>Chrysomma sinense</i> (Gmelin)	Yellow-eyed Babbler	R, C	I	Geru, Sidukund, Dhakna, Semadoh	South and east of a line Nashik-Indor-Gorakhpur, south to the Nilgiris east through Assam
198.	1254	<i>Turdoides caudatus</i> (Dumont)	Common Babbler	R, C	I	Bori, Emali pada, Semadoh	N.W.F.P. to Dehradun to E. Bihar and M. P. South to Cape Comorin
199.	1258	<i>Turdoides malcolmi</i> (Skyes)	Large Grey Babbler	R, C	I	Geru Amb, Semadoh, Sidukund	Punjab to U.P., south through the Peninsula to Tamil Nadu
200.	1262	<i>Turdoides striatus</i> (Dumont)	Peninsular Jungle Babbler	R, C	I	Pipal pada, Semadoh, Bori, Koktu, Sidukund	Gujarat and Western M. P. south through the Peninsula to the Nilgiris

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
201.	1389	<i>Alcippe poioicephala</i> (Jerdon)	Quaker Tit-Babbler	R, C	I	Bori, Koktu	Hills of the Indian Peninsula, south to Kathiawar and Mt. Abu across Southern M.P.
202.	1498	Sub-Family SYLVIINAE <i>Cisticola juncidis</i> (Rafinesque)	Streaked Fantail-Warbler	R, C	I	MTP	Himalayan foothills south to the Kanyakumari
203.	1506	<i>Prinia buchanani</i> Blyth	Rufous-fronted Prinia	R, C	I	MTP	Western and Central India south to A. P., Maharashtra
204.	1503	<i>Prinia hodgsonii</i> Blyth	Franklin's Prinia	R, C	I	Bori	Throughout the Indian Peninsula
205.	1521	<i>Prinia sylvatica</i> Jerdon	Jungle Prinia	R, C	I	Pipal pada, Dhakna, Bori	Indian Peninsula from Northern M.P. south to Kanyakumari
206.	1517	<i>Prinia socialis</i> Skyes	Ashy Prinia	R, C	I	Koktu, Semadoh, Dhakna	The entire Peninsula south of the Narmada river and S. Bihar.
207.	1511	<i>Prinia inornata</i> Skyes	Plain Prinia	R, C	I	Bori, Godga river	Central India, Bihar, Bengal south through Tamil Nadu

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
208.	1535	<i>Orthotomus sutorius</i> (Pennant)	Indian Tailor Bird	R, C	I	Emali pada, Koktu, Pipal pada	Himalayan foothills, south to Kanyakumari
209.	1579	<i>Phylloscopus affinis</i> (Tickell)	Tickell's Warbler	WV, UnC	I	MTP	Himalayan foothills south through the Peninsula
210.	1614	<i>Seicercus whistleri</i> Ticehurst	Whistler's Flycatcher-Warbler	WV, UnC	I	MTP	Western Himalayas, in the Peninsula N. Maharashtra to A.P.
211.	1548	<i>Megalurus palustris</i> Horsfield	Striated Marsh-Warbler	R, UnC	I	MTP	Punjab east to Assam south in Peninsula to W. Kahdesh, Tapi & Mahanadi River
212.	1565	<i>Sylvia hortensis</i> (Gmelin)	Eastern Orphean Warbler	WV & PM UnC	I & N	MTP	Punjab to southern Bihar, south through Deccan to Tamil Nadu
213.	1411	Sub Family MUSCICAPINAE <i>Ficedula parva</i> (Bechstein)	Red-throated Flycatcher	WV/PM, C	I	MTP	Western Himalayan foothills, south U.P. to Karnataka

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
214.	1421	<i>Ficedula superciliaris</i> (Jerdon)	Ultramarine Flycatcher	WV, UnC	I	MTP	Central India from Delhi south to N. Maharashtra east to West Bengal
215.	1445	<i>Eumyias thalassina</i> (Swainson)	Verditer Flycatcher	WV, C	I	MTP	Whole Indian Peninsula and Assam
216.	1442	<i>Cyornis tickelliae</i> Blyth	Tickell's Blue-Flycatcher	R, C	I	Dhakna, Koktu, Semadoh	Indian Peninsula from U. P. to Assam, south to the Cardamom hills
217.	1448	<i>Culicicapa ceylonensis</i> (Swainson)	Northern Grey-headed Flycatcher	WV, C	I	Dhakna, Semadoh, Emali pada	Winters in Central India, Central Satpuras upto 18°N latitude
218.	1461	Sub Family MONARCHINAE <i>Terpsiphone paradisi</i> (Linnaeus)	Asian Paradise Flycatcher	R, C	I	Koktu, Dhakna, Semadoh, Bori	Indian Peninsula from W. Rajasthan, south Kerala east to W. Bengal
219.	1465	<i>Hypothymis azurea</i> (Boddaert)	Indian Black-naped Monarch-Flycatcher	R, UnC	I	Emali pada, Bori, Semadoh	Gulf of Kutch to Gorakhpur; south to Kerala, east to Manipur

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
220.	1458	Sub Family RHIPIDURINAE <i>Rhipidura albicollis</i> (Vieillot)	White-throated Fantail-Flycatcher	R, C	I	Dhakna	Indian Peninsula from Mt.Abu south-ward to Kerala, Eastern Ghats
221.	1451	<i>Rhipidura aureola</i> Lesson	Northern White-browed Fantail-Flycatcher	R, C	I	Gadga river at Dhakna, Bori, Semadoh	Himalayan foothills to W. Bengal, Gujarat eastward to Orissa
222.	1815	Family REMIZIDAE <i>Cephalopyrus flammiceps</i> (Burton)	Fire-capped Tit	WV, UnC	I	Jamoda Padav (Rithe, 2002)	Central India, Raipur, to Ambala, E. Rajasthan
223.	1794	Family PARIDAE <i>Parus major</i> Linnaeus	Great Tit	R, C	I & Fr	Semadoh, Dhakna	Peninsular India from Gujarat east to Orissa and south to Tamil Nadu
224.	1810	<i>Parus xanthogenys</i> Vigors	Black-lored Yellow Tit	R, C	I & Fr	MTP	Peninsula India hills of Rajasthan to Orissa. E. Ghats to Krishna river and W. Ghats to Mahabaleshwar

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
225.	1830	Family SITTIDAE <i>Sitta castanea</i> Lesson	Peninsular Chestnut-bellied Nuthatch	R, C	I	MTP	Throughout the Peninsula to Kerala
226.	1838	<i>Sitta frontalis</i> Swainson	Velvet-fronted Nuthatch	R, C	I	Koktu	Himalayan foothills to Manipur, Southward throughout the Peninsula
227.	1841	Family CERTHIIDAE <i>Salpornis spilonotus</i> (Franklin)	Spotted Creeper	R, UnC	I	MTP	Central Peninsula south to M. P. west to Khandesh
228.	1892	Family DICAIEIDAE <i>Dicaeum agile</i> (Tickell)	Indian Thick-billed Flower pecker	R, C	Fr	MTP	Indian Peninsula from Himalayas, south to Kerala and eastward to Bengal
229.	1899	<i>Dicaeum erythrorhynchos</i> Latham	Tickell's Flower-pecker	R, C	Fr	Bori, Sidu kund, Semadoh	Himalayan foothills, to Assam, south to the Indian Peninsula

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
230	1907	Family NECTARINIIDAE <i>Nectarinia zeylonica</i> (Linnaeus)	Indian Purplerumped Sunbird	R, C	N & Fr	Dhakna, Koktu, Semadoh, Bori	Peninsular India south of a line from N. Maharashtra and M. P. to Bengal
231.	1917	<i>Nectarinia asiatica</i> (Latham)	Indian Purple Sunbird	R, C	N & I	Semadoh, Bori, Emali pada, Kumari	Himalayan foot- hills to Kanya- Sidukund
232.	1933	Family ZOSTEROPIDAE <i>Zosterops palpebrosa</i> (Temminck)	Oriental White-eye	R, C	I & N	Koktu, Pipal pada, Sidukund	Himalayan foot- hills to Arunachal Pradesh, south to Karnataka on E. & W. Peninsula
233.	2060	Family EMBERIZIDAE Sub Family EMBERIZINAE <i>Melophus lathami</i> (Gray)	Crested Bunting	R, UnC	Gr	Malur, Dhakna, Semadoh & Buralghat Chakurkund	Himalayan foot- hills, to east Gujarat, SW Maharashtra, M.P., to Bihar

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
234.	2050	<i>Emberiza buchanani</i> (Blyth)	Grey-necked Bunting	WV, UnC	Gr	MTP	Western and Central India to Karnataka
235.	2043	<i>Emberiza melanocephala</i> Scopoli	Black-headed Bunting	WV, C	Gr	MTP	Western and Central India to Karnataka
236.	2044	<i>Emberiza bruniceps</i> Brandt	Red-headed Bunting	WV, C	Gr	MTP	Indian Peninsula, from Harayana to E. Maharashtra to Tamil Nadu
		Family FRINGILLIDAE					
237.	2013	<i>Carpodacus erythrurus</i> (Pallas)	Common Rosefinch or Scarlet Grosbeak	WV, C	Gr & Fr	MTP	Indian Peninsula and the western Himalay- an foothills
		Family ESTRILDIDAE					
238.	1964	<i>Amandava amandava</i> (Linnaeus)	Red Munia or Avadavat	R, UnC	Gr	MTP	Throughout the Indian Peninsula, east to Assam
239.	1965	<i>Amandava formosa</i> (Latham)	Green Munia	R, C	Gr	Bori	Central India from Mt Abu, Jhansi, south to Mahabaleshwar, east to A.P.

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
240.	1966	<i>Lonchura malabarica</i> (Linnaeus)	White-throated Munia	R, C	Gr	Chaturkund (Rithe, 2002)	All India
241.	1968	<i>Lonchura striata</i> (Linnaeus)	White-rumped Munia	R, UnC	Gr	MTP	Peninsula from S. Bihar, M. P., Gujarat, south through Kerala
242.	1974	<i>Lonchura punctulata</i> (Linnaeus)	Indian Spotted Munia	R, C	Gr	Semadoh, Dhakna, Sidukund	The whole of India
		Family PASSERIDAE Sub Family PASSERINAE					
243.	1938	<i>Passer domesticus</i> (Linnaeus)	Indian House Sparrow	R, A	Om	Semadoh Koktu, Dhakna	The whole of India
244.	1949	<i>Petronia xanthocollis</i> (Burton)	Indian Yellow-throated Sparrow	R, C	Om	MTP	The whole Indian Peninsula to Kerala
		Sub Family PLOCEINAE					
245.	1962	<i>Ploceus manyar</i> (Horsfield)	Indian Streaked Weaver Bird	R, UnC	Gr	MTP	Throughout the Indian Peninsula to Kerala
246.	1957	<i>Ploceus philippinus</i> (Linnaeus)	Baya Weaver	R, UnC	Gr	Koktu, Pipal pada, Semadoh	Whole of India

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
247.	987	Family STURNIDAE <i>Sturnus malabaricus</i> (Gmelin)	Grey-headed Starling	R, UnC	Fr & I	MTP	Throughout Indian Union
248.	994	<i>Sturnus pagodarum</i> (Gmelin)	Brahminy Starling	R, C	Fr & N	Bori, Semadoh,	All India
249.	996	<i>Sturnus roseus</i> (Linnaeus)	Rosy Starling or Rosy Pastor	WV, UnC	Om	MTP	All India , E. to Assam southward throughout the Peninsula
250.	1002	<i>Sturnus contra</i> Linnaeus	Asian Pied Starling	R, UnC	Om	MTP	Northern and eastern India
251.	1006	<i>Acridotheres tristis</i> (Linnaeus)	Common Myna	R, C	Om	Semadoh, Koktu, Bori	All India, Andaman & Nicobar Is.
252.	1008	<i>Acridotheres ginginianus</i> (Latham)	Bank Myna	R, UnC	Om	Semadoh, Bori	Plains of northern and C. India, Mumbai to W. Bengal
253.	1010	<i>Acridotheres fuscus</i> (Wagler)	Southern Jungle Myna	R, C	Om	Bori, Semadoh, Dhakna	Western side of Peninsula from Saurashtra along Sahyadri tract to Kerala, M.P., Orissa

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
254	953	Family ORIOLIDAE <i>Oriolus oriolus</i> (Linnaeus)	Eurasian Golden Oriole	SV, C	Fr & N	Dhakna, Semadoh, Sidukund	Throughout Peninsula
255.	959	<i>Oriolus xanthornus</i> (Linnaeus)	Black-headed Oriole	R, C	Fr & N	Semadoh, Dhakna	Peninsular India south of Gangetic Plain to Bihar, A.P., W. Ghats
256.	963	Family DICRURIDAE <i>Dicrurus macrocercus</i> Vieillot	Black Drongo	R, A	I & Cr	Semadoh, Dhakna, Bori, Gadga river	Throughout Peninsular India Kutch eastward to M.P. to W. Bengal
257.	965	<i>Dicrurus leucophaeus</i> Vieillot	Indian Grey or Ashy Drongo	WV, UnC	I	MTP	Northern Plains and Peninsula, east to W. Bengal, south through to Kerala
258.	967	<i>Dicrurus caerulescens</i> (Linnaeus)	Indian White-bellied Drongo	R, UnC	I	Semadoh, Dhakna	All India south and east from Kutch to Simla thence to W. Bengal

Table 1 Contd.

Sl. No.	Handbook No.	Name of the species	Common Name	Residential Status	Food habits	Locality	Distribution
259.	976	<i>Dicrurus paradiseus</i> (Linnaeus)	Greater Racket-tailed Drongo	R, UnC	I	Semadoh	The lower Himalayas, Northern India, Gujarat to southeast A.P.
260.	982	Family ARTAMIDAE <i>Artamus fuscus</i> Vieillot	Ashy Woodswallow	R, UnC	I	MTP	Gujarat, H. P. and throughout peninsular India, south to Kerala
261.	1031	Family CORVIDAE <i>Dendrocitta vagabunda</i> (Latham)	Western Tree Pie	R, C	Om	Pipal pada, Semadoh, Bori, Emali pada,	Lower of Himalayas, southward to Gujarat, M.P. and Maharashtra
262.	1049	<i>Corvus splendens</i> Vieillot	Indian House Crow	R, UnC	Om	Emali pada, Koktu, Semadoh, Bori	All India except Kerala
263.	1056	<i>Corvus macrorhynchos</i> Wagler	Indian Jungle Crow	R, C	Om	Dhakna, Emali pada, Geru Amb	All Peninsular India south to Kanyakumari

ABBREVIATIONS USED IN TABLE

Residential Status :

R – Resident with local and seasonal movements (depending upon availability of food, ripening of fruits, seasonal migration in hills and or water conditions)

WV – Winter Visitor (PM - Passage Migrant)

MV – Monsoon Visitor

SV – Summer Visitor

Population Status :

A – Abundant, C – Common, UnC – Uncommon, O – Occasional

Food Habits :

I – Insectivorous, AqA – Aquatic Animals, Vg – Vegetable Matters, Gr – Graminivorous, Cr – Carnivorous, Fr – Frugivorous, Om – Omnivorous, SC – Scavenger, N – Nectar eater.

States :

H.P. – Himachal Pradesh, U.P. – Uttar Pradesh, M.P. – Madhya Pradesh, A.P. – Andhra Pradesh

MTP – Melghat Tiger Project

Handbook No. – As per Ali & Ripley (1968–1974).

Table 2 : Avian Diversity in Melghat Tiger Reserve

Orders	Families	Sub Families	Genera	Species
1. PODICIPEDIFORMES	1	–	1	1
2. CICONIIFORMES	3	–	13	16
3. ANSERIFORMES	1	–	3	8
4. FALCONIFORMES	3	–	18	26
5. GALLIFORMES	1	–	6	11
6. GRUIFORMES	3	–	3	5
7. CHARDRIIFORMES	5	–	9	15
8. COLUMBIFORMES	2	–	4	9
9. PSITTACIFORMES	1	–	1	3
10. CUCULIFORMES	1	–	9	12
11. STRIGIFORMES	2	–	9	13
12. CAPRIMULGIFORMES	1	–	1	3
13. APODIFORMES	2	–	4	4
14. CORACIIFORMES	5	–	8	11
15. PICIFORMES	2	–	8	9
16. PASSERIFORMES	24	9	70	117
Total – 16 Orders	57	9	167	263
*(21)	(88)	(11)	(423)	(1342)

*(Bird diversity in Indian Subcontinent is given in paranthesis)

Table 3 : Birds of Melghat Tiger Reserve falling under different conservation status

Scientific Name	English Name
I. A) WLP Act Schedule I, Part III (Birds)	
1. <i>Gyps bengalensis</i> (Gmelin)	Indian White -backed Vulture
2. <i>Gyps indicus</i> (Scopoli)	Indian Long-billed Vulture
3. <i>Pandion haliaetus</i> (Linnaeus)	Osprey
4. <i>Pavo cristatus</i> Linnaeus	Indian Peafowl
5. <i>Athene (=Heteroglaux) blewitti</i> Hume	Forest Owlet
B) Schedule II, Part II	
1. <i>Gallus sonnerati</i> Temminck	Grey Jungle Fowl
II. IUCN 2002 : IUCN Red List of Threatened Species	
1. <i>Mycteria leucocephala</i> Pennant	Painted Stock – LR
2. <i>Threskiornis melanocephalus</i> (Latham)	Oriental White Ibis – LR
3. <i>Gyps indicus</i> (Scopoli)	Indian Long-billed Vulture – CR
4. <i>Sarcogyps calvus</i> (Scopoli)	Red-headed Vulture – LR
5. <i>Circus macrourus</i> (S.G. Gmelin)	Pale Harrier – LR
6. <i>Athene (= Heteroglaux) blewitti</i> Hume	Forest Owlet – CR
[LR – Lower Risk, CR – Critically Endangered]	
III. BIOME 11 : Indo-Malayan Troipical Dry Zone	
Scientific Name	English Name
1. <i>Pseudibis papillosa</i> (Temminck)	Black Ibis
2. <i>Gyps bengalensis</i> (Gmelin)	Indian White-backed Vulture
3. <i>Gyps indicus</i> (Scopoli)	Long-billed Vulture
4. <i>Sarcogyps calvus</i> (Scopoli)	Red-headed Vulture
5. <i>Butastur teesa</i> (Franklin)	White-eyed Buzzard
6. <i>Falco chicquera</i> Daudin	Red-headed Falcon
7. <i>Francolinus pictus</i> (Jardine & Selby)	Painted Francolin
8. <i>Coturnix coromandelica</i> (Gmelin)	Rain Quail
9. <i>Perdicula asiatica</i> (Latham)	Jungle Bush-Quail
10. <i>Perdicula argoondah</i> (Sykes)	Rock Bush-Quail
11. <i>Perdicula erythrorhyncha</i> (Sykes)	Painted Bush-Quail
12. <i>Galloperdix lunulata</i> (Valenciennes)	Painted Spurfowl

Table 3 Contd.

Scientific Name	English Name
13. <i>Pavo cristatus</i> (Linnaeus)	Indian Peafowl
14. <i>Vanellus malabaricus</i> (Boddaert)	Yellow-wattled Lapwing
15. <i>Treron phoenicoptera</i> (Latham)	Yellow-legged Green-Pigeon
16. <i>Psittacula cyanocephala</i> (Linnaeus)	Plum-headed Parakeet
17. <i>Phaenicophaeus leschenaultii</i> (Lesson)	Sirkeer Malkoha
18. <i>Bubo coromandus</i> (Latham)	Dusky Eagle-Owl
19. <i>Strix ocellata</i> (Lesson)	Mottled Wood-Owl
20. <i>Caprimulgus asiaticus</i> Latham	Common Indian Nightjar
21. <i>Ocyrceros birostris</i> (Scopoli)	Indian Grey-Hornbill
22. <i>Megalaima zeylanica</i> (Gmelin)	Brown-headed Barbet
23. <i>Dendrocopos mahrattensis</i> (Latham)	Yellow-fronted Pied Woodpecker
24. <i>Dinopium benghalenses</i> (Linnaeus)	Lesser Golden-backed Woodpecker
25. <i>Chrysocolaptes festivus</i> (Boddaert)	Black-shouldered Woodpecker
26. <i>Mirafra erythroptera</i> Blyth	Red-winged Bush Lark
27. <i>Eremopterix grisea</i> (Scopoli)	Ashy-crowned Sparrow-lark
28. <i>Galerida deva</i> (Sykes)	Sykes's Crested Lark
29. <i>Coracina melanoptera</i> (Ruppell)	Black-headed Cuckoo-shrike
30. <i>Pericrocotus cinnamomeus</i> (Linnaeus)	Small Minivet
31. <i>Pericrocotus erythropygius</i> (Jerdon)	White-bellied Minivet
32. <i>Tephrodornis pondicerianus</i> (Gmelin)	Common Woodshrike
33. <i>Pycnonotus luteolus</i> (Lesson)	White-browed Bulbul
34. <i>Saxicoloides fulicata</i> (Linnaeus)	Indian Robin
35. <i>Dumetia hyperythra</i> (Franklin)	Rufous-bellied Babbler
36. <i>Turdoides malcolmi</i> (Sykes)	Large Grey Babbler
37. <i>Turdoides striatus</i> (Dumont)	Jungle Babbler
38. <i>Prinia buchanani</i> Blyth	Rufous-fronted Prinia
39. <i>Prinia sylvatica</i> Jerdon	Jungle Prinia
40. <i>Prinia socialis</i> Sykes	Ashy Prinia
41. <i>Rhipidura aureola</i> Lesson	White-browed Fantail Flycatcher
42. <i>Amandava formosa</i> (Latham)	Green Munia
43. <i>Sturnus malabaricus</i> (Gmelin)	Grey-headed Starling
44. <i>Sturnus pagodarum</i> (Gmelin)	Brahminy Starling
45. <i>Acridotheres ginginianus</i> (Latham)	Bank Myna
46. <i>Dicrurus caerulescens</i> (Linnaeus)	White-bellied Drongo
47. <i>Artamus fuscus</i> Vieillot	Ashy Woodswallow

REPTILIA

M.S. PRADHAN

Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044

INTRODUCTION

Melghat is a home to tigers, leopards, wild dogs, gaurs, sambar and wide range of faunal elements. The habitat is equally ideal for other diversified groups of animals like reptiles. However, tragically, no consolidated account on the reptilian diversity from this region is available. Hence, an attempt has been made in the present article to report an updated information on the reptilian species and subspecies. Present account is based on the material collected, material displayed in Chikhaldara and Semadoh museums and species sighted during the project period. While preparing the account bibliographic records were also consulted (Smith, 1931, 1935, 1943, Daniel, 1983, Murthy, 1985, Tikader and Sharma, 1985 and 1992, Ahmed and Dasgupta, 1992, Gayen, 1999, Sharma, 1998 and 2000 and many others which have been mentioned at relevant places).

SYSTEMATIC LIST

(*Asterics indicate species actually collected and/or sighted during project period)

Phylum	CHORDATA
Class	REPTILIA
Order	LORICATA (CROCODILIA)
Family	CROCODILIDAE

*1. *Crocodylus palustris* Lesson

Order	TESTUDINES (CHELONIA)
Suborder	CRYPTODIRA
Family	EMYDIDAE

*2. *Melanochelys trijuga trijuga* (Schweigger)

Family TESTUDINIDAE

*3. *Geochelone elegans* (Schoepff)

Family TRIONYCHIDAE

*4. *Lissemys punctata granosa* (Schoepff)

*5. *Trionyx leithi* Gray

Order SQUAMATA

Suborder SAURIA (LACERTILIA)

Family GEKKONIDAE

*6. *Hemidactylus brooki* Gray

7. *Hemidactylus gracilis* Blanford

*8. *Hemidactylus reticulatus* Beddome

9. *Hemidactylus frenatus* Schlegel

10. *Hemidactylus leschenaulti* Dum. & Bibr.

*11. *Hemidactylus maculatus* (Dum. & Bibr.)

*12. *Hemidactylus flaviviridis* Ruppell

Family EUBLEPHARIDAE

13. *Eublepharis macularius* (Blyth)

Family AGAMIDAE

*14. *Sitana ponticeriana* Cuvier

*15. *Calotes versicolor* (Daudin)

*16. *Calotes rouxi* Dum. & Bibr.

*17. *Psammophilus blanfordianus* (Stoliczka)

Family LACERTIDAE

*18. *Ophisop jerdoni* (Blyth)

Family CHAMAELEONIDAE

*19. *Chamaeleo zeylanicus* Laurenti

Family SCINCIDAE

*20. *Mabuya innotata* (Blanford)

21. *Mabuya macularia* (Blyth)

*22. *Mabuya carinata* (Schneider)

23. *Mabuya beddomii* (Jerdon)

24. *Mabuya trivittata* (Hardwicke & Gray)

*25. *Riopa punctata* (Linnaeus)

*26. *Riopa guentheri* (Peters)

Family VARANIDAE

*27. *Varanus bengalensis* (Daudin)

Suborder SERPENTES (OPHIDIA)

Family TYPHLOPIDAE

*28. *Ramphotyphlops braminus* (Daudin)= *Typhlops braminus* (Daudin)*29. *Typhlops diardi* Schlegel30. *Typhlops acutus* (Dum.& Bibr.)

Family BOIDAE

*31. *Python molurus molurus* (Linnaeus)32. *Eryx johani johani* (Russell)*33. *Eryx conicus* (Schneider)

Family COLUBRIDAE

34. *Elaphe helena* (Daudin)*35. *Ptyas mucosus* (Linnaeus)*36. *Argyrogena fasciolatus* (Shaw)*37. *Ahaetulla nasutus* Lacep.38. *Oligodon taeniolatus* (Jerdon)*39. *Oligodon arnensis* (Shaw)40. *Lycodon flavomaculatus* (Wall)41. *Lycodon aulicus* (Linnaeus)*42. *Lycodon striatus* (Shaw)*43. *Macropisthodon plumbicolor* (Cantor)*44. *Xenochrophis piscator* (Schneider)45. *Amphiesma stolata* (Linnaeus)46. *Boiga trigonata* (Schneider)47. *Psammophis condanarus* (Merrem)48. *Psammophis longifrons* Boulenger

Family ELAPIDAE

*49. *Bungarus caeruleus* (Schneider)*50. *Callophis melanurus* (Shaw)*51. *Naja naja naja* (Linnaeus)

Family VIPERIDAE

*52. *Vipera russelli* (Shaw)*53. *Echis carinatus* (Schneider)54. *Trimeresurus gramineus* (Shaw)

SYSTEMATIC ACCOUNT

Phylum CHORDATA
 Class REPTILIA
 Order LORICATA (CROCODYLIA)
 Family CROCODYLIDAE

***1. *Crocodylus palustris* Lesson**

1763. *Crocodylus palustris* Lesson, in *Belong. Voy. Ind. or. zool.* : 305.
 1890. *Crocodylus palustris* Lesson, Boulenger, *Fauna of British India* : 5.
 1931. *Crocodylus palustris* Lesson, Smith, *Fauna of British India, Reptilia and Amphibia, Vol I. Loricata* : 42, 47-48.
 2000. *Crocodylus palustris* Lesson, Sharma, In : *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 257.

Common Name : English : Marsh Crocodile, Marathi : Mugger.

Diagnostic Characters : Crocodiles are the largest modern living reptiles. They are closely related with dinosaurs. Crocodiles are characterized by lizard like characters *viz.* long body and tail with short limbs. The back is covered with thick rectangular horny, partially ossified plates known as scutes or scales. They are sharply raised and arranged in 16-17 transverse and 4-6 longitudinal rows. Ventral plates are smaller in size. The broad snout is elongated with number of teeth inside. Fourth tooth of the lower jaw is laid into a notch in the upper jaw. The area is open at the sides so that the fourth tooth of the lower jaw is visible when the snout is closed. The skin over the snout is firmly fused to the skull. The valved nostrils are placed on the upper surface of the snout. Crocodiles are the exceptional reptiles for possessing flapped external ears. Tongue is entirely attached to the floor of the mouth and can barely be moved. Eyes with third transparent eyelid, (Nictitating membrane) permitting limited underwater vision. The pupil is vertical. The tail is compressed with two series of flattened vertical scales merging and continuing as a single row to the tip. There are four distinct post-orbital plates just behind the head. Forelegs with five fingers and hindlegs with four webbed toes. Body rarely reaches upto 5 m in length and 1.6 m. in girth. Crocodiles are dorsally olive with specklings of black in colour which is more evident in young ones. They are white or yellowish white below.

Locality : Crocodiles were sighted in Tapi river near Rangubeli and Gadga river (a tributary of Tapi river) near Dhakna areas of Melghat Tiger Reserve by the ZSI survey parties and Forest Dept. authorities during the project period. As per the Forest Dept. records seven live crocodile specimens brought from Tadoba Crocodile Breeding centre were released in Gadga river near Dhakna.

Distribution : Practically throughout India.

Habitat : Crocodiles are true amphibious in behaviour and show structural adaptations for a successful aquatic life. They are excellent swimmers and they inhabit rivers, lakes and other large water bodies in the plains and upto 600 m in Indian subcontinent. They are now well spread in the Indian river systems. They are true carnivorous in feeding habits. Though crocodiles swim in water by using tail as propellant, they can also perform "high walk" on land with the raised body well above the ground. They are oviparous and lay oval and hard shelled eggs buried in the soil for incubation.

Status : IUCN : Vulnerable (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 1991).

Schedule : Schedule : I Part : II; CITES Appendix : I, RBD (1994) : Endangered.

Remarks : A crocodile breeding center has been successfully set up in Tadoba National Park, Dist. Chandrapur, M.S. The species is known to be hunted for trade for skin and body parts in domestic as well as international markets (Pradhan, 1997). Sometimes even the live specimens are traded illegally.

Order TESTUDINES (CHELONIA)

Suborder CRYPTODIRA

Family EMYDIDAE

***2. *Melanochelys trijuga trijuga* (Schweigger)**

1814. *Emys trijuga* Schweigger, *Prodr. Mong. Chel.*, 41.
1933. *Geomyda trijuga* (Schweigger), Smith, *Fauna of British India, Reptilia and Amphibia*, Vol. I. Loricata Testudines : 96-98.
1985. *Melanochelys trijuga trijuga* (Schweigger), Murthy, Classification and distribution of the Reptiles of India : *The snake*, 17 : 49.
1985. *Melanochelys trijuga trijuga* (Schweigger), Tikader and Sharma, *Handbook Indian Testudines* : 92-95.
2000. *Melanochelys trijuga trijuga* (Schweigger), Sharma. In : *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 251.

Common Name : English : Indian snail eating turtle, Marathi : Kasav.

Diagnostic Characters : Order Chelonia or Testudines includes marine turtles, freshwater turtles, terrapins and tortoises. Turtles and tortoises are easily recognised from all other animals by their characteristic bony shell consisting of two parts : the carapace above and the plastron below. Both are joined by a suture along the flanks between the fore and hindlimbs. The shell has regularly arranged horny shields above, while bony plates on inner side. Indian snail eating turtle is moderate in size (23 cm+). Head is somewhat small, snout shorter than the orbit, digits of the fingers completely webbed, limbs paddle shaped but more or less flattened, 4-5 claws, head covered with smooth skin which is

divided into large shields on top, carapace covered with horny shields. Vertebral shields hexagonal and short sided posteriorly. Bony temporal arch and squamosal bone present, upper jaw feebly notched at the middle. Snout slightly projecting beyond the lower jaw. Carapace is moderately depressed, tricarinate with lateral margins slightly reverted. Tail very short. Dorsum light brown in juveniles, while dark brown to blackish in colour in adults. Plastron has a yellow margin which reduces in width at the advancement of the age. Head is greyish or olivaceous with yellow or pink reticulations which are more prominent on sides. The markings become obscure in later age.

Locality : Two specimens collected by forest Department authorities from Melghat Tiger Reserve region have been displayed in a Museum at Chikhaldara.

Distribution : Tikader and Sharma (1985) and Sharma (2000) have recorded the distribution of the subspecies from Goa, Karnataka, Kerala, Maharashtra and Tamil Nadu. It inhabits central part of Indian peninsula.

Habitat : Indian snail eating turtle is mainly aquatic and vegetarian in habit. It is a commonest widely distributed terrapin preferring to live in slow flowing or sedentary water. Young ones are more thoroughly aquatic than the adults. They are seen basking on rocks and logs. Several individuals may live together in a safe hideout under rocks or in holes near banks. They are also seen in the trunks of submerged trees. They swim in a manner in which each limb paddles independently.

Status : The subspecies is endemic within Indian limits. Sharma (2000) reports its status as Indeterminate or possibly vulnerable, while CAMP Report (1998) records its status as Lower risk-least concern.

Remarks : Though Gayen (1999) has reported the species under Family Bataguridae, *Melanochelys trijuga trijuga* (Schweigger) has been retained in Family Emydidae following Sharma (2000). Sharma (2000) reports that main threat to the survival of the subspecies is due to large scale exploitation of eggs and adults for food and habitat destruction.

Family TESTUDINIDAE

*3. *Geochelone elegans* (Schoepff)

- 1792. *Testudo elegans* Schoepff, *Hist. Tes.*, p. 111 pl. xxv.
- 1931. *Testudo elegans* Schoepff, Smith, *Fauna of British India, Reptilia and Amphibia*, Vol. I. Loricata Testudines : 138-140.
- 1985. *Geochelone elegans* (Schoepff), Murthy, *Classification and distribution of Reptiles of India : The Snake*, 17 : 50.
- 1985. *Geochelone elegans* (Schoepff), Sharma, *Handbook of Indian Testudines* : 102-106.
- 2000. *Geochelone elegans* (Schoepff), Sharma, In : *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 253-254.

Common Name : English : Star Tortoise or Indian starred Tortoise, Marathi : Chandani Kasav.

Diagnostic Characters : It is a small tortoise in which the length of a largest female reaches upto 25 cm.. Carapace length reaches 280 mm. Males are much smaller. Carapace is elongated and highly domed shaped and possesses conspicuous humps. Head with small irregular shields. Nuchal shield absent. Vertebral shields five in number. First vertebral longer than broad. Four costals. Plastron is large truncate or notched anteriorly. Hind limbs cylindrical and club-shaped possessing five claws. Tail moderately long and ends in spur like scute. Shell is black above. Colour pattern is distinctive. Each vertebral shield has a yellow coloured central areola with yellow streaks radiating over from areola giving a *star-like* appearance. The plastron has black rays on a yellow background. However the markings become obscure in later age; Head and limbs yellowish with darker markings.

Locality : One specimen collected by Forest Dept. authorities from Melghat Tiger Reserve has been displayed in Museum at Chikhaldara.

Distribution : Tikader and Sharma (1985) and Sharma (2000) have reported the distribution of starred tortoise from Peninsular India.

Habitat : The species, a land tortoise, prefers to live in varied habitats ranging from sandy tracts to rocky and grassy areas with plenty of vegetations. It is also found along coastal scrublands and desert tracts of India. The species is largely crepuscular in habit, spending rest of the time under cover. It remains dormant during cold season; while its activity is at its peak during monsoon season. Though omnivorous in habit, but also inclined to be vegetarian.

Status : Daniel (1983) reported the status of starred tortoise as not uncommon species in its distributional range, while Sharma (2000) considers its status as indeterminate. CAMP Report (1998) has recorded its status as vulnerable; Indian Wildlife (Protection) Act (1972, as amended upto 1991). Schedule : Schedule : IV; CITES Appendix : Appendix II.

Remarks : Sharma (2000) reports that the threat to the survival of the species can be due to habitat loss.

Family TRIONYCHIDAE

*4. *Lissemys punctata granosa* (Schoepff)

1792. *Testudo granosa* Schoepff, *Hist. Tes.* p. 127, pl. xxx A & B.

1931. *Lissemys punctata granosa*, (Schoepff), Smith, *Fauna of British India, Reptilia and Amphibia*, Vol. I. *Loricata Testudines* : 158-159.

1997. *Lissemys punctata granosa* (Schoepff), Tikader and Sharma, *Handbook of Indian Testudines* : 120-122.

2000. *Lissemys punctata granosa* (Schoepff), Sharma, In : *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 255.

Common Name : English : Southern flap-shelled turtle, Marathi : Kasav.

Diagnostic Characters : Family Trionychidae comprises soft-shelled freshwater or mud turtles in which entire head and neck region is retractile. Though carapace and plastron are devoid of any epidermal shields, they are covered by a continuous layer of soft skin. The sides of hinder portion of carapace is flexible. Neck exceedingly long but flexible. Forelimbs fully webbed and semi paddle shaped with only tree claws on each foot. Elongated phalanges, plastron with soft, semicircular flaps which enable the turtle to conceal completely the retracted hind feet. Marginal bones present. First marginal bone smaller than second. Carapace without any definite pattern, yellow spots absent. Snout comparatively short. Carapace brown or blackish, head with black longitudinal lines which are most prominent in juveniles. Size of carapace can grow upto 230 mm in length and 170 mm. in breadth. Entoplastral callasity on plastron is very large in the adult individuals and in certain specimens it is in contact with the hyo-hypo-plastral callosities.

Locality : Sighting of a small sized live specimen near Semadoh by one of the ZSI Survey parties during project period.

Distribution : Peninsular India.

Habitat : The southern flap-shelled turtle prefers to live in ponds and tanks with muddy bottoms and embankments. They may or may not be connected with any river system. The species is carnivorous in habit and likes to feed on fish, frogs, snails etc. It is very ferocious in nature and can bite instantly even on gentle handling.

Status : Daniel (1983) reports status of southern flap-shelled turtle as common, while Sharma (2000) states that its status is suspected to be threatened on account of large scale killing for flesh and eggs and also due to habitat distructions. Indian Wildlife (Protection) Act, 1972 (as amended upto 1991), Schedule : Schedule : I Part II (*Lissemys punctata*).

Remarks : Sharma (2000) suspects threat to thre survival of the species due to urbanisation on nesting sites also. Though Das (1995) has considered *L. punctata punctata* (Lacep.) as a subspecies from southern peninsular India, the southern Indian flap-shelled turtle has been retained here as *L. punctata granosa* (Schoepff) as per Tikader and Sharma (1985) and Sharma (2000).

*5. *Trionyx leithi* Gray

1872. *Trionyx leithi*, Gray, *Ann. Mag. Nat. Hist.*, (4) X : 334..
1873. *Trionyx gangeticus*, Gray, *Proc. zool. Soc.* pl. viii.
1985. *Trionyx leithi* Gray, Tikader and Sharma, *Handbook of Indian Testudines*, Publ. Director, Zoological Survey of India, Koklata : 130-132.

2000. *Trionyx leithi* Gray, Sharma, In : *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 256-257.

Common Name : English : Peninsular or Deccan Soft-shelled turtle, Marathi : Kasav.

Diagnostic Characters : A large sized soft-shelled turtle reaching slightly above 50 cm. in length. This species is quite similar to *Trionyx gangeticus* except that *Trionyx leithi* possesses a bony snout longer than the orbit diameter, flat alveolar surface of upper jaw, flat mandibular symphysis etc. Carapace olive-green in colour with lighter vermiculations. Head greenish. Black longitudinal streaks from between eyes to nape with side streaks often present. They may be entire or broken up. The young ones possess four eye-spots or ocelli on the disc. Ventrums whitish.

Locality : One specimen has been collected from Chaurakund range by ZSI survey party in 1992, while another specimen has been displayed in Chikhaldara museum.

Distribution : Sharma (2000) has reported the distribution of the species from Ganga and all other river systems of peninsular India upto Chennai. He has also recorded the species from south eastern districts of Gujarat.

Habitat : A perfectly aquatic species which can also be seen basking on sandy banks or resting in shallow water with its head projecting out of water surface. It inhabits deep turbid rivers, canals, marshes, ponds and lakes. The species is a scavenger and also omnivorous in behaviour.

Status : The species is endemic within Indian limits. Sharma (2000) suspects the status of *Trionyx leithi* as endangered on account of excessive killings of adult specimens for flesh and eggs for food. Indian Wildlife (Protection) Act, 1972 (as amended upto 1991). Schedule : Schedule : IV, IUCN Category as per CAMP Report (1998) : vulnerable (for *Aspideretes leithii* = *Trionyx leithii*).

Remarks : Though Das (1995) and Gayen (1999) have reported merger of *Trionyx* in Genus *Aspideretes*, Genus *Trionyx* has been retained in the present communication following Tikader and Sharma (1985) and Sharma (2000).

Order SQUAMATA

Suborder SAURIA (LACERTILIA)

Family GEKKONIDAE

* 6. *Hemidactylus brooki* Gray

1845. *Hemidactylus brooki* Gray, Cat. Liz. Brit. Mus., : 153

1935. *Hemidactylus brooki* Gray, Fauna of British India : Reptilia and Amphibia Vol. II-Sauria : 89-91.

1992. *Hemidactylus brooki* Gray, Tikader and Sharma, Handbook of Indian Lizards : 53-54.

2000. *Hemidactylus brooki* Gray, Sharma, In : *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 259-260.

Common Name : English : Spotted House Gecko, Marathi : Pal.

Diagnostic Characters : Suborder Sauria (lizards) under order Squamata can be defined as the reptiles with well developed limbs and girdles. Some species might have lost their limbs and acquired long bodies, but they possess vestiges of pectoral and pelvic girdles. Majority of them are covered with horny epidermal scales and possess eyes with movable eyelids. The species under family Gekkonidae are characterized by possession of strongly dilated pentadactyle digits (adhesive digital pads). The pads help in increase in efficiency of climbing and/or resting on vertical surfaces. Body dorsoventrally flat, covered with large number of strongly keeled tubercles or granule like imbricate scales with no symmetrical shields on top of the head. Dorsum with large trihedral tubercles which are conical in shape arranged in regular series. Tongue broad, fleshy, short, protrusible with villose papillae. Skull with temporal and postorbital arcades. Head large ovate and prominent, eyes moderately large with a vertical pupil. Ear opening oval. Male with 6-16 preanal-femoral pores, 8-10 lamellae under the fourth toe. Dorsum with small dark spots or blotches. Ground colour brown or grey above, while whitish below. Sometimes there is a dark streak along the sides of the head. Head and body length : 14-60 mm, Tail length : 17-75 mm., hindlimbs not reaching upto axila.

Locality : Specimens have been collected from Mangiya, Semadoh, Chikhaldara, Raipur, Sipanapada, Perkheda, Makhala and Koktu localities by different ZSI parties during the project period.

Distribution : Widely distributed in whole of India and other parts of the world.

Habitat : *H. brooki* is the common house gecko preferring to live under the stones, beneath the wooden logs, seen in rocky areas in dense forest and even in buildings in urban areas. Mostly insectivorous in habit but can grab gastropods, isopods and even seeds of some wild plants.

Status : Sharma (2000) reports status of the species as very common in its wide range of distribution; IUCN Category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

***7. *Hemidactylus gracilis* Blanford**

1870. *Hemidactylus gracilis* Blanford, J. Asiat. Soc. Beng, : xxxix : 362 p + pl. xvi + figs. 4-6.

1935. *Hemidactylus gracilis* Blanford, Smith, Fauna of British India : Reptilia and Amphibia Vol. II, Sauria : 94.

1985. *Hemidactylus gracilis* Blanford, Murthy, The Snake, 17 : 48-71.

1992. *Hemidactylus gracilis* Blanford, Tikader and Sharma, Handbook of Indian Lizards : 56.

Common Name : English : Square spotted Gecko, Marathi : Pal.

Diagnostic Characters : Suborder Sauria (lizards) under order Squamata is generally

recognized by possession of Characters like well developed limbs, girdles, scales, moveable eyelids, etc., mentioned for the previous species. The family and generic characters like possession of adhesive dialated pads or the pentadactyle digits for climbing and resting on vertical surface, body dorsoventrally flat covered with small scales are seen in this species also. The spotted gecko is small and slender gecko with greyish dorsum covered with dark brown squarish spots arranged in two longitudinal rows on either side of a thin dark vertebral line. There is another more prominent line along the side of head and body. Ventrums white generally, with dark brown longitudinal lines. Head narrow and quite long. Ear opening small and subcircular. Dorsum with 10-12 longitudinal rows of strongly keeled tubercles. Hindlimbs not reaching the axilla. Digits free, moderately dialated with 5 lamellae under the first toe and with 8-9 lamellae under the fourth toe. Only anterior lamellae are divided. Tail is longer than Head and Body. Males with an angular series of six pre-anal pores. Head and Body length : 22-37 mm. Tail length : 26-43 mm.

Locality : Smith (1933) and Tikader and Sharma (1992) reported occurrence of this species from Berar region (now Vidharba in Maharashtra State).

Distribution : Tikader and Sharma (1992) reported occurrence of this species from Poona Dist. to Raipur Dist. in M.P. through Vidharbha in Maharashtra state and Nalgonda Dist. in Andhra Pradesh region.

Habitat : Insectivorous and nocturnal.

Status : Endemic species within Indian limits, Indeterminate (Tikader and Sharma, 1992); IUCN Category as per CAMP Report (1998) : Vulnerable.

Remarks : Nil.

***8. *Hemidactylus reticulatus* Beddome**

1870. *Hemidactylus reticulatus* Beddome, *Madras Month. J. Med. Sci.*, i : p. 33.

1935. *Hemidactylus reticulatus* Beddome Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II-*Sauria* : 94-95.

1992. *Hemidactylus reticulatus* Beddome, Tikader and Sharma, *Handbook of Indian Lizards* : 56-58.

Common Name : English : Reticulated Gecko, Marathi : Pal.

Diagnostic Characters : Reticulated Gecko is a brown gecko possessing a network of brownish-blue lines on its dorsum. *Hemidactylus reticulatus* possesses all the characters mentioned earlier for the Suborder *Sauria* and Family Gekkonidae. However, most of the dorsal tubercles in *H. reticulatus* are white, while throat possesses brown markings and ventrum white. Head small and bulged, while snout rounded with small and sub-circular ear-openings. Upper labials 9-10, while lower 7-8 in number. Dorsum with small keeled scales mixed with large, sharply pointed keeled tubercles. Ventrums with smooth and round imbricate scales. The hind limbs just reach the axilla, digits short, free and moderately dilated. Free distal phalange of innermost digit quite short. Lamellae under digits are in

semi-transverse series. 4-6 lamellae under the first and 8-10 lamellae under the fourth toe. Tail verticillate and slightly longer than Head and Body in length. Male with an angular series of 6-12 pre-anal pores. Head and Body length : 21-60 mm; Tail : 30-65 mm.

Locality : Five specimens have been collected from Jawaharkund and Viarat regions by the ZSI survey parties during the project period.

Distribution : Andhra Pradesh, Karnataka and further southwards in South India.

Habitat : Not much is known about the habitat of *H. reticulatus* except that they are found under stones in rocky areas or from in rocky crevices. The species is nocturnal and insectivorous.

Status : Endemic species within Indian limits. Tikader and Sharma (1992) report status of *H. reticulatus* as indeterminate in the distribution range; IUCN category as per CAMP report (1998) : Lower risk-near threatened.

Remarks : Collection of the specimens belonging to *H. reticulatus* is probably the first collection record from Maharashtra State and thus reports extension of range of distribution of this species in northern India.

9. *Hemidactylus frenatus* Schlegel

1836. *Hemidactylus frenatus* Schlegel, *Erp. Gen.*, 3 : 366.

1935. *Hemidactylus frenatus* Schlegel, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II - *Sauria* : 95-96.

1992. *Hemidactylus frenatus* Schlegel, Tikader and Sharma, *Handbook of Indian Lizards* : 58-59.

Common Name : English : Ticticky House Gecko, Marathi : Pal.

Diagnostic Characters : A small gecko with different shades of brown with grey colour on dorsal side. Some may possess very faint brown longitudinal stripes on dorsum. A dark streak emerges generally from near the eyes and extend down upto groin. Belly whitish or light yellow, while tail may be reddish in colour. Head quite large covered above with small granular scales which become large on snout. Ear-opening sub-circular. Upper labials 10-12 and lower labials 8-10 in number. Mental shield large and with two pairs of post mental shields of equal size. Dorsum with small granular scales usually intermixed with scattered, rounded faintly keeled tubercles. Ventrums with smooth rounded imbricate scales. Hindlimbs not reaching the axilla. Digits free and moderately dilated. First digit smallest. Oblique lamellae under the first toe 4-5 and 9-10 under fourth toe. Tail slightly longer than Head and Body, feebly depressed, verticillate, covered above with small scales and series of six enlarged pointed tubercles. Under side of the tail with a median series of transversely enlarged scales with continuous series of 26-36 preanofemoral pores. Head and body length : 40-60 mm, Tail length : 39-65 mm.

Locality : Smith (1935) and Tikader and Sharma (1992) reported the extent of distribution of this species throughout peninsular India.

Distribution : Peninsular India, West Bengal, Andaman and Nicobar Islands.

Habitat : The species is terrestrial, insectivorous and nocturnal preferring to live in the crevices of tree trunks, deserted houses, gardens and many other various types of habitats.

Status : Ahmed and Dasgupta (1992) and Tikader and Sharma (1992) reported the status of *H. frenatus* as abundant and widely distributed species; IUCN category as per CAMP report (1998) : Lower risk-least concern.

Remarks : Nil.

*10. *Hemidactylus leschenaulti* Dumeril & Bibron

1836. *Hemidactylus leschenaulti* Dumeril & Bibron *Erp. Gen.*, iii : 364.

1935. *Hemidactylus leschenaulti* Dumeril & Bibron, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II, *Sauria* : 97-98.

1992. *Hemidactylus leschenaulti* Dumeril & Bibron, Tikader and Sharma, *Handbook of Indian Lizards* : 58-59.

Common Name : English : Common Bark Gecko, Marathi : Pal.

Diagnostic Characters : A large ashy grey coloured gecko with undulating cross-bars or rhomboidal spots on the dorsal side. A black stripe emerges from behind the eye and extends upto the flanks. Belly whitish in colour. Head large with a broad snout. Head covered with small granular scales which becomes quite large near the snout. Ear opening subcircular. Upper labials 10-10 in number. Mental shield quite large and subtriangular in shape. Two pairs of post-mantles, inner pair larger than the outer pairs. Nostril is situated between rostrals. Dorsum is covered with small granular scales intermixed with few larger, rounded and feebly keeled tubercles. Ventrums covered with smooth, round and subimbricate scales. Hindlimbs hardly reach the axilla. Digits are free moderately dilated with slightly oblique or more transverse lamellae. 6-7 lamellae under the first toe, while 9-11 under the fourth toe. Tail almost equal to Head and Body, but strongly depressed and swollen at the base in adults. It is verticillate and flat beneath. It is covered above with small scales and series of 6 enlarged pointed tubercles. Male with 10-17 femoral pores on each side. Head and Body length : 32-83 mm; Tail length : 31-83 mm.

Locality : Smith (1935), Tikader and Sharma (1992) and Ahmed and Dasgupta (1992) reported the extent of the distribution of this species throughout peninsular India;

Distribution : Peninsular India and West Bengal in Eastern India.

Habitat : The species is arboreal, nocturnal and insectivorous. Its favourable abodes are under barks of large trees of banyan, tamarind, mango etc. During day time they hide under the bark and crevices of these trees.

Status : Abundant (Tikader and Sharma, 1992), Common (Daniel, 1983); IUCN Category as per CAMP Report (1998). Lower risk-least concern.

Remarks : Daniel (1983) reports that the dark grey colour of this gecko with wary bands on the back merges with the colour of the tree bark and hence becomes difficult to locate it.

***11. *Hemidactylus maculatus* Dumeril & Bibron**

1836. *Hemidactylus maculatus* Dumeril & Bibron *Erp. Gen.*, iii : 358.

1933. *Hemidactylus maculatus* Dumeril & Bibron, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : Sauria :85-86.

1992. *Hemidactylus maculatus* (Dum. & Bib.), Tikader and Sharma, *Handbook of Indian Lizards* : 51-53.

2000. *Hemidactylus maculatus* Dum. & Bib., Sharma. In : *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 259.

Common Name : English : Rock Gecko or Dark spotted Giant Gecko. Marathi : Pal.

Diagnostic Characters : Easily distinguishing gecko by its large size and colouration patterns. Dorsum of the dark spotted giant gecko is brown with dark-brown spots, undulating transverse bars and streaks. Tail banded alternately with dark and white bands. Belly dirty white. Sub-adults brilliantly coloured. Head large and prominent with a bulging on the tip of the snout. Eyes moderately large with vertical pupil. Small ear opening. Head covered with small granular scales intermixed with large conical tubercles. Upper labials 10-12, while lower labials 9-10 in number. Mental shield sub-triangular, broader than the rostral shield. Post mental shields well-developed in two pairs. Inner pair elongated and larger than the outer pairs. Hind limbs just reaches axilla. Digits are free and moderately dilated. Digital transverse lamellae straight and smooth; 9-10 under first toe, while 10-13 under the fourth toe. Tail clearly longer than head and body, slightly depressed and verticillate. Male with 19-25 femoral pores on each side. Head and Body length : 83-122 mm, Tail length : 90-130 mm.

Locality : One specimen collected from Chikhaldara by Forest Dept. authorities has been displayed in the museum. Shri Sanjay Thakur from Talegaon, Pune has informed that the species was sighted by him in Chikhaldara, Semadoh and Makhala areas of Melghat Tiger Project (Per. Comm.).

Distribution : Peninsular India south of Surat/Dangs Dists. in Gujarat (Daniel, 1983).

Habitat : Usually associated with rock formations and rock-cut caves. Occasionally seen on the rough outer walls of the buildings and on trees. A carnivorous species feeding on variety of arthropods, small lizards, geckkos, worm snakes and earthworms.

Status : Endemic species within Indian limits. Sharma (2000) reports status of *Hemidactylus maculatus* as common in the distribution range. IUCN category as per CAMP report (1998) : Lower-risk least concern.

Remarks : Collection and sighting of *Hemidactylus maculatus* is a new collection record from Vidharbha region of Maharashtra State.

***12. *Hemidactylus flaviviridis* Ruppell**

1935. *Hemidactylus flaviviridis* Ruppell, *Neue Wirb. Faun. Abyss.*, : 18 pl. vi fig. 2.
1933. *Hemidactylus flaviviridis* Ruppell, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 98.
2000. *Hemidactylus flaviviridis* Ruppell, Sharma. *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 260.

Common Name : English : Yellow bellied house Gecko. Marathi : Pal.

Diagnostic characters : A large sized and robust gecko with a pale-grey or greenish-grey to olive coloured dorsum. There are wavy and dark cross bands on the dorsal side. Belly yellowish. Head is large with a broad snout. Ear-opening subcircular. There are minute granules on the head, but they are more prominent and large on the snout. Upper labials 12-15 and lower labials 10-12. Mental shield large and subtriangular. Rostral broad. Dorsum covered with small granular scales intermixed with very few large, round and feebly keeled tubercles. Ventrums with smooth imbricate scales. Hindlimbs just reach the axilla. Digits are free moderately dilated with oblique lamellae. 7-10 lamellae under the first toe (This character separates *H. flaviviridis* from the remaining *Hemidactylus* species). 11-14 lamellae under the fourth toe. Tail length is almost equal to the head and body length. Tail strongly depressed and swollen at the base, flat beneath and verticillate. Male with 5-7 femoral pores on each side. Head and Body length : 42-90 mm, Tail length : 38-90 mm.

Locality : One specimen was collected from Semadoh region by ZSI Survey party during the project period.

Distribution : Whole of India.

Habitat : A commensal species usually seen on the inside walls of houses and buildings. Most agile, pugnacious, excellent climber and normally a nocturnal and an insectivorous species. Makes voice like a chirp of a small bird.

Status : Most common (Tikader and Sharma, 1992), IUCN category as per CAMP report (1998) : Lower-risk-least concern.

Remarks : Widely distributed in North India above 20° N.

Family EUBLEPHARIDAE

13. *Eublepharis macularius* (Blyth)

1854. *Cyrtodactylus macularius* Blyth, *J. Asiat. Soc. Beng.*, xxiii : 737-738.
1933. *Eublepharis macularius*, (Blyth) Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 127-129.
1983. *Eublepharis macularius* (Blyth), Daniel, *Handbook of Indian Reptiles* : 38.

1992. *Eublepharis macularius* (Blyth), Tikader and Sharma, *Handbook of Indian Lizards* : 78

Common Name : English : Desert Fat tailed Gecko. Marathi : Pal.

Diagnostic characters : Fat tailed gecko is distinguished from all other Indian geckos by the presence of movable eyelids. It is also separated from other gecko species by presence of non-dilated digits. Hence, Genus *Eublepharis* has been kept in a separate family, Eublepharidae (Gayen, 1999). The gecko is robust in built with distinctive swollen tail. The young one are banded with yellow and white crossbands on a brown background. Adults are with spotted or reticulated pattern in yellow or bluish grey in colour. A milky band from nape extends to the ear through lips. Tail with 4-6 transverse white bands. Head is large, high and bulged. Snout obtusely pointed. Pupil vertical. Ear opening sub-circular. Upper and lower labials 9-10 in number on either side. Mental scale large and pentagonal. Dorsum with small irregular scales intermixed with smaller, rounded oval or subconical or keeled tubercles. Ventrums with round imbricate scales. Limbs quite short. Digits short and cylindrical with transverse lamellae. Tail shorter than head and body. Males with angular series of 9-14 pre-anal pores. Head and Body length : 120 mm., Tail length : 90 mm.

Locality : Daniel (1983) and Tikader and Sharma (1992) recorded the distribution of *E. macularius* in northern parts of Maharashtra State. The distribution is fairly wide spread, hence it has been included in the list. However, its occurrence in Melghat region needs confirmation.

Distribution : Punjab, Rajasthan, Madhya Pradesh and Maharashtra State.

Habitat : Basically fat-tailed gecko is a semi arid species. Nocturnal and insectivorous in habit. Generally seen moving in rocky areas. They are very pugnacious in behaviour and produces a squeaky mechanical noise.

Status : Indeterminate (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : The species is said to be quite indifferent to the sting of scorpion.

Family AGAMIDAE

*14. *Sitana ponticeriana* Cuvier

1844. *Sitana ponticeriana* Cuvier. *Guerin. Icon. Reg. Anim. Rept.*, : pl. X, fig. 2.

1933. *Sitana ponticeriana* Cuvier Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 144-146.

2000. *Sitana ponticeriana* Cuvier, Sharma, *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 261.

Common Name : English : Indian fan throated lizard. Marathi : Sargota.

Diagnostic characters : All members of the family Agamidae are characterised by possession of digits of the feet without any adhesive pads, eyes with movable eyelids, body dorsoventrally or laterally compressed and covered with imbricate scales. Tongue broad and short but not protrusible. Skull with temporal and postorbital arcades. Genus *Sitana* under Family Agamidae is recognized by possession of four toes only, by absence of femoral pores, ribs normal and not extended and finally body normal and not depressed. Possession of four toes, on each foot separates *Sitana* from all other agamid lizard species which possess five toes on each foot. *Sitana ponticeriana* is a small agamid lizard, brown above with a series of dark brown black margined, rhomboidal, vertebral spots on the back. The throat fan in male is brilliantly coloured in red, blue and black. Belly whitish. Body compressed with no dorsal crest. Head scales unequal in size. Scales strongly keeled. Limbs long with strongly keeled scales. Fourth toe longest, while fifth toe absent. Tail is extremely longer than the head and body. Males with a low nuchal crest and a large folding gular appendage. Head and Body length : 40-80 mm, tail length : 60-170 mm.

Locality : Five specimens have been collected from Dhakna and Hatida areas of Melghat Tiger Reserve by ZSI Survey parties during the project period.

Distribution : Whole of India excluding region east of Ganges in Eastern India.

Habitat : Fan throated lizard inhabits practically all biotopes except perhaps the heavy rainfall forests and the deserts. Preferred habitat is scrub and sandy country. Terrestrial, ground dwelling and diurnal agamid lizard feeding mainly on ants and small insects. A fast and graceful runner.

Status : Very common (Daniel, 1983 and Tikader and Sharma, 1992); IUCN category as per CAMP report (1998) : Lower risk-least concern.

Remarks : Nil.

*15. *Calotes versicolor* (Daudin)

1802. *Agama versicolor* Daudin, *Hist. Nat. Rept.*, iii : 395 pl. XLIV.

1933. *Agama versicolor* (Daudin), Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : Sauria : 189-193.

1992. *Agama versicolor* (Daudin), Tikader and Sharma, *Handbook of Indian lizards* : 97-98.

2000. *Agama versicolor* (Daudin), Sharma, *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 262.

Common Name : English : Indian garden lizard. Marathi : Girgit or Rang Badalnara Sarda.

Diagnostic characters : These agamid lizards are with compressed body, five toes, exposed tympanum, and equal-sized dorsal scales, which are arranged regularly. Dorsal crest present. Tail comparatively long and slender, in males swollen at the base. Femoral and

preanal pores are absent. No fold or pit in front of the shoulder. Two erect and separated spines above the tympanum. Long snout. Dorsal colour lightly-brown greyish, transverse spots on back and sides. Dark streak from eyes. Males with gular sac. Limbs long and well-developed. Digits long, slender and strongly clawed. 10-13 upper labials, while 11-14 lower labials. Body scales keeled and imbricate with pointed tips. Scales in 37-47 rows at mid-body. Head and Body length : 86-129 mm; tail length : 300-350 mm.

Locality : Specimens were collected from Chourakund, Tarubanda, Semadoh, Bandar Koi and Dolar areas of Melghat Tiger Reserve by ZSI Survey parties during the project period.

Distribution : Practically whole of India.

Habitat : Arboreal species in true sense. Diurnal and insectivorous lizard of the gardens, hedges, scrub land and forests. Most plentiful in the vicinity of streams, river sides, desert oases etc. These lizards are excellent climbers. Their prehensile toes and long tail help them in balancing the body for such arboreal life.

Status : Most common species throughout its range (Daniel, 1983, Sharma, 2000), IUCN category as per CAMP report (1998) : Lower risk-near threatened in Central India. (for *Calotes versicolor versicolor* (Daudin)).

Remarks : Nil.

*16. *Calotes rouxi* Dum. & Bibr.

1837. *Calotes rouxi* Dumeril and Bibron, *Erp. Gen.*, iv : 407.

1933. *Calotes rouxi* Dumeril and Bibron, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 206-207.

2000. *Calotes rouxi* Dumeril and Bibron, Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 262.

Common Name : English : Forest Calotes or Matheran olive-Brown calotes, Marathi : Girgit or Rang Badalnara Sarda.

Diagnostic characters : The body of the forest calotes species is comparatively smaller than *versicolor*. *C. rouxi* can be distinguished by the presence of a distinct dark fold across the neck in front of the shoulder and by presence of two slender spines on each side of the back of the head. Normally brown in colour with patterns on the back. It is easily confused with young *versicolor*. Head, nape and gular pouch red. Side of head and neck banded with brown. Dark brown lines radiate from the eye. During the breeding season the head and a narrow strip along the mid back of the male turn bright brick red contrasting distinctly with that of the rest of the body. Head scales unequal in size and strongly keeled. 9-10 labials on both the sides. Limbs are moderately developed, slender in size with fourth toe longer than the third toe. Hind limbs reaches the temple. Tail slender but long and slightly compressed. Dorsal body scales keeled, the upper rows pointing upwards

and backwards, while the lower rows pointing backwards and downwards. Ventral scales strongly keeled. 50-60 rows of scales in the middle of the body. Head and Body length : 29-77 mm.; Tail length : 49-170 mm.

Locality : Specimens collected from Dhakna and Jawaharkund area of Melghat Tiger Project region by ZSI Survey parties during the project period.

Distribution : Peninsular India (Daniel, 1983).

Habitat : Forest dwelling arboreal species. Insectivorous and diurnal in habit.

Status : Though widely distributed, the species is vulnerable on account of habitat destruction (Sharma, 2000). The species is, however, endemic within Indian limits. IUCN category as per CAMP report (1998) : Low ever risk-near threatened.

Remarks : Nil.

***17. *Psammophilus blanfordanus* (Stoliczka)**

1871. *Charasia blanfordana* Stoliczka, P. Asiat. Soc. Beng., 1871 : 194.

1933. *Psammophilus blanfordanus* Stoliczka, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 210.

1992. *Psammophilus blanfordanus* Stoliczka, Tikader and Sharma, *Handbook of Indian Lizards* : 106.

Common Name : English : Common Indian rock lizard.

Diagnostic characters : Body of Indian rock agamid lizard is always depressed with tympanum exposed and throat with transverse fold. Preanal scales are absent in males. Gular sac and dorsal crest absent. Body covered with uniform comparatively large and keeled scales. Scales in the middle of the body 80-100. *P. blanfordanus* is olive-bronze or dark-brown in dorsal colouration, spotted profusely with brown. Boat shaped dark-brown spots with light brown or pale centres on the entire back and tail. Hind-limb reaches the orbit or a little beyond. Head and Body length : 100 mm; Tail length : 200 mm.

Locality : Two specimens were collected from Dharni area by the ZSI Survey party in Sept. 1996 during the project period.

Distribution : Bihar, Madhya Pradesh, Orissa, Eastern and Western Ghats in Peninsular India.

Habitat : Absolutely rock dwelling, living in the crevices and holes in rocks upto 800 metres. Insectivorous and diurnal. Most agile in habit. In breeding season males assume a brilliant red colour.

Status : In abundance (Tikader and Sharma, 1992).

Remarks : This is first collection record from Melghat Tiger Reserve region in Maharashtra State.

Family LACERTIDAE

***18. *Ophisops jerdoni* Blyth**

1853. *Ophiops jerdoni* Blyth, J. Asiat. Soc. Beng., *xxii* : 653.
1933. *Ophisops jerdoni* Blyth, 'Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 376-377.
1983. *Ophisops jerdoni* Blyth, Daniel, *The Book of Indian Reptiles* : 56.
1992. *Ophisops jerdoni* Blyth, Tikader and Sharma, *Handbook of Indian Lizards* : 174.
2000. *Ophisops jerdoni* Blyth, Sharma, *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 268.

Common Name : English : Punjab snake eyed lacerta, Jerdon's snake eye.

Diagnostic characters : Body dorsoventrally flat covered with scales. There are osteoderms on the head. They are fused with top of the skull. Legs well developed. Teeth are pleurodent. Tongue long and forked anteriorly covered with scales like papilla. Temporal and post orbital arcades present. Dorsal scales are pointed, strongly keeled and overlapping. No distinct collar is present. A fold is present in front of the shoulder. Lower eyelid with a large semitransparent disc completely fused with the upper eyelid (which is extremely small or vestigial) Nostril is located between 2-4 nasals. Upper head-shields are keeled and striated. Only one fronto-nasal is present. 28-35 scales round the middle of the body. Dorsum is olive-brown, golden or greyish with a golden fringe with two golden lateral stripes. Upper stripe extends from supraciliary margin to the tail, while lower stripe borders the upper lip and extends along the flanks to the base of the hindlimb. The space between the two stripes is densely spotted with black. Belly yellowish white. Large preanal plate present. Digits with sharply keeled scales beneath. Hind limb reaches the anthumeral fold or in males between the fold and ear. 6-12 femoral pores on each side. Head and Body length : 45 mm; Tail length : 90 mm.

Locality : Two specimens were collected from Dhakna and Hatida lake areas of Melghat Tiger Project region by the ZSI survey parties during the project period.

Distribution : Rajasthan, Gujarat, Maharashtra, Andhra Pradesh, Madhya Pradesh, Tamil Nadu.

Habitat : Terrestrial diurnal and generally seen burrowing in soft soil. Insectivorous in habit.

Status : Commonly seen in various localities of species range (Tikader and Sharma, 1992), IUCN Category as per CAMP Report (1998) : Data Deficient.

Remarks : Nil.

Family CHAMAELEONIDAE

*19. *Chamaeleo zeylanicus* Laurenti

1768. *Chamaeleo zeylanicus* Laurenti, *Syn. Rept.*, : 46.
1933. *Chamaeleo zeylanicus* Laurenti, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II II : Sauria : 251-253.
1983. *Chamaeleo zeylanicus* Laurenti, Daniel, *The Book of Indian Reptiles* : 51-52.
1999. *Chamaeleo zeylanicus* Laurenti, Gayen, *Hamadryad* : 24 (1) : 9.
2000. *Chamaeleo zeylanicus* Laurenti, Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 263-264.

Common Name : English : Indian chameleon, Marathi : Girgit or Rang badalnara sarda.

Diagnostic characters : Chamaeleon family includes highly specialized arboreal, insectivorous and diurnal lizards. The body is laterally compressed. There is a caque on top of the head. Anterodorsal crest is most prominent, which bends slightly on posterior side. Dorsal crest low serrated. The skin is granular suitable for quick and extensive changes in colour. Teeth compressed, small, triangular, tricuspid, uniform and acrodont. The tongue is club shaped, sticky at the tip and can quickly extend to a distance upto 15-20 cms. for catching insect preys. The feet are with digits permanently opposed in groups of two and three for grasping. Claws simple. The tail is long and prehensile. Eye are large and move independently. Both the eyelids are fused and form a complete ring around the eye leaving a small opening at the centre. Ears devoid of tympanum and tympanic cavity. Basic colour is green but can change rapidly and camouflage with the surrounding. Male with a spur like process. Head and Body length : 175 mm; Tail length : 200 mm.

Locality : One specimen was collected from Dhakna, while another specimen was sighted in Koktu areas of Melghat Tiger Project region by ZSI survey parties during the project period.

Distribution : Peninsular India.

Habitat : Strictly arboreal, diurnal and insectivorous. Perfectly adapted for an arboreal existence and also for its feeding habits. Its movements are deliberate and slow. Chamaeleon prefers thick forested areas but is uncommon in very heavy rainfall regions. In semi-desert regions it is found in hedges and shrubs.

Status : Endangered in India on account of habitat loss (Sharma, 2000), Wildlife (Protection) Act 1972 (as amended upto 1991) Schedule : Schedule : II (*Chameleo calauratus***); IUCN category as per CAMP Report (1998) : Vulnerable, Red Date Book (1994) : Nil. CITES Appendix : Appendix II.

Remarks : The chameleon can increase its striking range by supporting itself on its

***Chameleo calcaratus* has been synonymised with *Chamaeleo zeylanicus* Laurenti (Smith, 1933).

hindlimbs and tail independently and reaching out with the body. On the ground its walk is slow and stilted, each leg being waved in a curious action before being set on the ground. The whole effort looks like a walk of sick patient.

Family SCINCIDAE

*20. *Mabuya innotata* (Blanford)

1870. *Euprepes innotatus* Blanford, J. Asiat. Soc. Beng., XXXIX : 354.

1933. *Mabuya innotata* (Blanford), Smith, Fauna of British India : Reptilia and Amphibia Vol. II : Sauria : 263-264.

1992. *Mabuya innotata* (Blanford), Tikader and Sharma, Handbook of Indian Lizards : 123-124.

Common Name : English : Bronzy-olive skink, Marathi : Sapsurali.

Diagnostic characters : Species under family Scincidae possess subcylindrical and almost circular elongated body which is covered with cycloid overlapping scales. There is no marked distinction between the head and body. They are continuous without any evidence of neck. Body, limbs and tail are protected with osteoderms. Head covered with semitransparent disc. 32-34 scales round the middle of the body. Dorsal scales feebly keeled. Union of palatine bones takes place at the midline of the palate, while pterygoid bones are not touching one another. Supranasals present. Limbs short but strongly developed. Bronzy-olive skink is dark brown laterally, with belly whitish. Each half of the dorsum is covered with light brownish black edged lines. Throat is spotted profusely with brown. Prefrontals separate rarely touches one another. Ear opening almost circular. Digits with 17-18 feebly keeled lamellae beneath the fourth toe. Legs reach the wrist. Standard Head and Body length 55 mm; Tail length : 100 mm.

Locality : Three specimens have been collected from Bhopala nallah and Makhala areas of Melghat Tiger Project region by the ZSI survey parties during the project period.

Distribution : Madhya Pradesh and Vidharbha region of Maharashtra State in India.

Habitat : Terrestrial, diurnal and insectivorous generally seen in rocky open areas in wooded country.

Status : *Mabuya innotata* is an endemic species in India. Rare or Indeterminate (Tikader and Sharma, 1992), IUCN category as per CAMP report (1998) : Data Deficient.

Remarks : Nil.

*21. *Mabuya macularia* (Blyth)

1853. *Euprepes macularius* Blyth, J. Asiat. Soc. Beng., xxii : 652.

1933. *Mabuya macularia* (Blyth), Smith, Fauna of British India : Reptilia and Amphibia Vol. II : Sauria : 264 265.

1983. *Mabuya macularia* (Blyth), Daniel, *The Book of Indian Reptiles* : 54.
 1999. *Mabuya macularia* (Blyth), Gayen, *Hamadryad*, **24** : 9-10.
 2000. *Mabuya macularia* (Blyth), Sharma, *Fauna of Gujarat, State Fauna Series*, **8** (Part I) (Vertebrates) : 265.

Common Name : English : Little skink, Bronzy Grass skink; Marathi : Sapsurali.

Diagnostic characters : Little skink possesses all the characters mentioned for the family Scincidae and Genus Mabuya. In addition it possesses scaly lower eyelids. There are 28-30 scales round the middle of the body. Dorsal scales with 5-9 strong keels. 12-17 lamellae under the fourth toe. Snout to vent length not exceeding 75 mm. The colour pattern of this widely distributed species varies greatly. However, the general body colour is brown with or without longitudinally arranged spots. Sometimes the skink is brown olive or bronzy in colour. Light dorsolateral stripe is always present. Standard Head and Body length : 60-75 mm; Tail length : 110-140 mm.

Locality : Daniel (1983), Tikader and Sharma (1992) and Gayen (1999) reported occurrence of this species throughout the peninsular India.

Distribution : Peninsular India.

Habitat : Forested areas of India. Basically terrestrial, diurnal, insectivorous and oviparous skink.

Status : Very common (Daniel, 1983, and Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

*22. *Mabuya carinata* (Schneider)

1801. *Scincus carinatus* Schneider, *Hist. Amphib.*, ii : 183.
 1933. *Mabuya carinata* (Schneider), Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 266-268.
 1992. *Mabuya carinata* (Schneider), Tikader and Sharma, *Handbook of Indian Lizards* : 127-128.
 1999. *Mabuya carinata* (Schneider), Gayen, *Hamadryad* : **24** (1) : 9.

Common Name : English : Common Indian skink, Common skink, Brahminy skink; Marathi : Sapsurali.

Diagnostic characters : Common skink possesses all the characters of Family Scincidae and Genus Mabuya. In addition it possesses scaly lower eyelids. Dorsal scales moderately keeled with only 5-7 keels on each scale. 30-34 scales round the middle of the body. 14-18 lamellae under the toe. Common skink is olivaceous brown or shining bronze in colour dorsally. Back and anterodorsal portion of the tail is with dark-brown to black spots or longitudinal lines along the lateral margin of the scales. Laterally the skink is dark brown.

Two somewhat lighter dorsolateral stripes present. Limbs very well developed. Supranasal shields on the head just touching or separated from one another. Frontonasal broader than long. Prefrontals in contact with each other. Ear opening circular. Standard Head and Body length : 125 mm, Tail length : 165 mm.

Locality : Six specimens were collected from Pilli Village, Chitamandeo point, Kuwapati and Sipna areas of Melghat Tiger Reserve region by ZSI survey parties during the project period.

Distribution : Peninsular India.

Habitat : Terrestrial, diurnal, insectivorous and oviparous. One of the commensal species. Almost at home in semi-urban and forest areas. Primarily ground dweller. Actively searches through ground litter for prey. It is more often heard than seen.

Status : Very common (Daniel, 1983, Tikader and Sharma, 1992 and Sharma, 2000), IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Nil.

23. *Mabuya beddomii* (Jerdon)

1870. *Euprepes beddomii*, Jerdon, *P. Asiat. Soc. Beng.*, : p. 73.

1933. *Mabuya beddomii* (Jerdon), Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 274-275.

1992. *Mabuya beddomii* (Jerdon), Tikader and Sharma, *Handbook of Indian Lizards* : 131.

Common Name : English : Beddom's South Indian skink, Common skink, Brahminy skink; Marathi : Sapsurali.

Diagnostic characters : Beddom's South Indian Skink possesses characters of the Family Scincidae and Genus *Mabuya*. In addition it possesses scaly lower eyelids. Further, it has 30-32 scales round the middle of the body, dorsal scales with 3-5 feeble keels, 12-15 strongly keeled lamellae under the fourth toe and back with 4 dark brown longitudinal stripes running all along the body length upto the base of the tail. A broad stripe is present on the lateral side of the head. Belly whitish. Supranasals and prefrontals are in contact with each other. Ear opening circular. Digits moderately long. Hind limbs can reach upto the wrist. Standard Head and Body length : 55 mm. Tail length : 115 mm.

Locality : Smith (1933) and Tikader and Sharma (1992) have reported occurrence of this species in Vidharbha region including Melghat Tiger Reserve and also in North Eastern part of Maharashtra State.

Distribution : Peninsular India.

Habitat : Terrestrial, diurnal and insectivorous. Not much is known about its habit and habitat.

Status : Rare due to habitat loss (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

24. *Mabuya trivittata* (Hardwicke & Gray)

1827. *Tiliqua trivittata* Hardwicke & Gray, *Zool. Jour.*, iii : 227.

1933. *Mabuya trivittata* (Hardwicke & Gray), Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 275.

1992. *Mabuya trivittata* (Hardwicke & Gray), Tikader and Sharma, *Handbook of Indian Lizards* : 132.

Common Name : English : Five striped skink, Marathi : Sapsurali.

Diagnostic characters : Five striped skink possesses all the characters of Family Scincidae and Genus *Mabuya* mentioned earlier. In addition it possesses scaly lower eyelids. 34–36 scales round middle of the body. Dorsal scales with 5–7 moderate keels. 13–14 lamelle under the fourth toe. Back with five broad black edged yellowish white longitudinal stripes. The stripes extends the whole length of the body upto the base of the tail. Vertebral and dorso-lateral stripes most prominent. Supranasals and prefrontals in contact with one another. Ear-opening is almost circular. The hind limbs reach to the wrist. Standard Head and Body length : 80 mm; Tail length : 80 mm.

Locality : Smith (1933) and Tikader and Sharma (1992) reported wide occurrence of this species from Central and South India and consider it as endemic to these region only.

Distribution : Central and Southern peninsular India.

Habitat : Terrestrial, ground dwelling reported from forested as well as urban areas. Insectivorous and diurnal species.

Status : Endemic to Central and Southern India, Indeterminate (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

*25. *Riopa punctata* (Linnaeus)

1766. *Lacerta punctata* Linnaeus, *Syst. Nat.*, p. 369.

1966. *Riopa punctata* (Linnaeus), Minton, *Bull. Amer. Mus. Nat. Hist.*, 134 : 104.

1992. *Riopa punctata* (Linnaeus) Tikader and Sharma, *Handbook of Indian Lizards* : 147.

1999. *Lygosoma punctata* (Gmelin) Gayen, *Hamadryad*, 24 : 11.

2000. *Riopa punctata* (Linnaeus), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 266.

Common Name : English : Dotted Garden skink, Snake skink, Marathi : Sapsurali or Sapachi Mavashi.

Diagnostic characters : Dotted Garden skink or snake skink possesses all the characters of Family Scincidae mentioned earlier. However, in Genus *Riopa* the palatine bones are united in the middle of the palate, pterygoid bones in contact, limbs short and weak and body snake like. Lower eyelid with semitransparent disc. *R. punctata* possesses five fingers and five toes; 24–28 scales round the body, 62–76 rows of scales down middle of back between the parietals and hindlimbs. The dorsum is brown with each scale having dark basal spot forming longitudinal series. In Juveniles and subadults the spots are confluent into 4–6 lines down the back. A yellow dorsolateral stripe start from the snout. Tail in subadults red in colour. Snout obtusely pointed. Small ear openings. 7 upper labials, body scales smooth and digits long with fourth toe longer than the third. 11–14 keeled lamellae under the fourth toe. Tail swollen at the base and slightly longer than head and body. Standard Head and Body length : 86 mm.; and Tail length : 92 mm.

Locality : Two specimens were collected from Jawaharkund and Kolkaz areas of Melghat Tiger Reserve region by ZSI survey parties during the project period.

Distribution : Almost whole of India.

Habitat : Generally ground dwelling, insectivorous and oviparous. It lives in damp soil and under fallen leaves or logs.

Status : Most common (Sharma, 2000) IUCN category as per CAMP Report (1998) : Lower risk least concern. (*Lygosoma punctatus* (Gmelin) = *Riopa punctatus* (Linnaeus)).

Remarks : Though Gayen (1999) and some others have considered to keep dark spotted garden skink in *Lygosoma punctata* (Gmelin), it has been retained here in *Riopa punctata* (Linnaeus) only following keys and observations reported by Daniel (1983), Tikader and Sharma (1992), Ahmed and Dasgupta (1992) and Sharma (2000).

***26. *Riopa guentheri* (Peters)**

1879. *Eumeces guentheri* Peters, *Sistz. Ges. Nat. Berlin* : 36.

1933. *Riopa guentheri* (Peters), Smith, *Fauna of British India : Reptilia and Amphibia*, Vol. II : *Sauria* : 319–320.

1992. *Riopa guentheri* (Peters) Tikader and Sharma, *Handbook of Indian Lizards* : 147–148.

Common Name : English : Malabar dotted skink, Marathi : Sapsurali or sapachi mavashi.

Diagnostic characters : Malabar dotted skink possesses all the characters mentioned earlier for Family Scincidae and Genus *Riopa*. Most of the characters of *Ruiopa punctata* are seen in *Riopa guentheri* except that there are 87–100 rows of scales down middle of back between the parietals and hindlimbs and body more elongated. Frontal length is equal to the combined length of fronto-parietals and interparietal. Digits shorter with fourth toe slightly longer than the third. Standard length : 110 mm.

Locality : Three specimens were collected from Makhala, Jawaharkund and Chikhaldara areas of Melghat Tiger Project region by ZSI survey parties during the project period.

Distribution : Western India. However, collection of this species from Melghat Tiger Project region is the first record from this area as well as extension of range of distribution in India.

Habitat : Terrestrial, ground dwelling, subterrenian diurnal, insectivorous and oviparous. Generally seen in dry and moist deciduous as well as evergreen forests.

Status : Endemic species. Not common (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Some authors have considered to treat this species as *Lygosoma guentheri* (Peters) (CAMP REPORT, 1998), However, malabar dotted skink has been treated here as *Riopa guntheri* (Peters) based on keys and observations reported for the Genus *Riopa* by Daniel (1983), Tikader and Sharma (1992) and Sharma (2000). The species appears to be endemic to Western and Central India.

Family VARANIDAE

*27. *Varanus bengalensis* (Daudin)

1802. *Tupinambis bengalensis* Daudin, *Hist. nat. Rept.*, 3 : 67.

1933. *Varanus monitor* (Linnaeus), Smith, *Fauna of British India : Reptilia and Amphibia* Vol. II : *Sauria* : 402 403..

1983. *Varanus belgalensis* (Schneider) Daniel. *The book of Indian Reptiles*, 58-59.

1992. *Varanus bengalensis* (Daudin), Ahmed and Dasgupta : *Fauna of West Bengal, State Fauna Series*, 3 (Part-2) : 28-31.

1999. *Varanus bengalensis* (Daudin), Gayen, *Hamadryad*, 24(1) : 12-13.

Common Name : English : Common Indian monitor, Monitor lizard, Indian monitor; Marathi name : Ghorpad.

Diagnostic characters : Monitor lizards are distinguished by their long and flattened body, long and laterally compressed tail, long neck and extremely elongated, slender and forked tongue. Tongue smooth and retractile like that of a snake. All monitors show a uniformity in structure which is not seen in other orders of lizards. Body stout, covered with small scales and without osteoderms. Teeth large, pointed, acute, recurved and pleurodont. Ventral scales arranged in regular rows. Limbs well developed and digits armed with very strong claws. The colour of the Indian monitor is dark brown. The young ones possess pale ring spots and blackish cross bars. Crown scales characteristically large. The snout is convex terminally, nostrils are placed as oblique slits midway between the eyes and the end of the muzzle. Preanal pores present. Head and Body length : 72-75 cms. and Tail length : 90-100 cms.

Locality : Sighting of a live specimen in Semadoh region by the Forest Dept. authorities during the project period.

Distribution : Whole of India.

Habitat : The Indian monitor is widely distributed and lives in all biotopes from evergreen forests to the fringes of desert. It is terrestrial and ground dwelling. Diurnal and fossorial in habit. It occupies burrows, dense clump of vegetation, hollows of trees, cracks and crevices. Graceful in movement, good climber and swimmer.

Status : The population is alarmingly dwindling throughout the country due to excessive exploitation of the adults for meat and skin (Tikader and Sharma, 1992), Indian Wildlife (Protection) Act 1972 (as amended upto 1991) : Schedule II Part II, CITES : Appendix I, Red Data Book (1994) : Endangered, IUCN category as per CAMP Report (1998) : Vulnerable.

Remarks : As per Central Zoo Authority records live specimens of this species are present in 26 Indian zoos. The species is involved in illegal trade at national as well as international level (Pradhan, 1997).

Suborder SERPENTES (OPHIDIA)

Family TYPHLOPIDAE

***28. *Ramphotyphlops braminus* (Daudin)**

1803. *Eryx braminus* Daudin, *Hist. nat. Rept.*, 7 : 279.

1943. *Typhlops braminus* (Daudin), Smith, *Fauna of British India : Reptilia and Amphibia* Vol. III : *Serpentes* : 46-48.

1983. *Typhlina bramina* (Daudin), Daniel. *The book of Indian Reptiles* : 64.

1992. *Ramphotyphlops braminus* (Daudin), Ahmed and Dasgupta : *Fauna of West Bengal, State Fauna Series*, 3 (Part-2) : 37-38.

1999. *Ramphotyphlops braminus* (Daudin), Gayen, *Hamadryad* : 24 (1) : 13.

Common Name : English : Common Blind snake, Worm snake Marathi name : Vala.

Diagnostic characters : Order Squamata has two Suborders, Serpentes (Ophidia) or Snakes and Sauria (Lacertilia) or lizards. Snakes can be distinguished from lizards by a combination of characters. Absence of limbs and girdles, eyelids and external ear openings are some of these characters. Body elongated snake like. There is an absence of fusion between the two halves of lower jaw but are united by ligaments only. They can move independently. The body is covered with ungranulated overlapping imbricate scales. Nictitating membrane and a transparent spectacle are well developed over the eyes. Tongue retractile and acts as an olfactory organ. It conjugates with Jacobson's organ. Teeth are pointed, sharp and recurved. Most of the skull bones except those in palatal region are flexible. Left lung is either rudimentary or absent. Locomotion is effected by lateral undulation of dorsal musculature. Vestiges of pelvis are present in Family Typhlopidae. Prefrontal and nasal bones are in articulation in the family. Coronoid bone present. Maxillary bone loosely attached and bear teeth. Typhlopoid snakes are worm like

cylindrical bodied snakes covered uniformly with cycloid scales. Eyes minute but distinct, covered by enlarged ocular shield like scales. Mouth small and ventrally situated. Mandibles (lower jaws) devoid of teeth. *Typhlops* is a annelid worm like burrowing snake whose head is not differentiated from the tubular body. Tail quite short and bears terminal spinous hook which helps in locomotion. 4 supra labials in all the species. Nasal bones not in contact with each other behind the rostral. Nostrils are in lateral position. 20 scales round the body. Dorsal colouration varies from brown to black. While ventrum is light brown. Snout, anal portion and tail tips are somewhat whitish. Standard total length 100–138 mm.

Locality : Three specimens were collected from Kolkaz, Chaurakund and Chitamandeo point areas of Melghat Tiger Project region by the ZSI survey parties during the project period.

Distribution : Whole of India.

Habitat : Usually leads solitary life, but occasionally seen in aggregations in rotting wood. Prefers to live beneath soil, stones, debris, barks of rotten wood. An active burrower but slow mover above the ground. Often seen inside houses. Preyed upon by other snake spp.

Status : Abundant in the distributional range (Sharma, 2000 for *Typhlops braminus* = *Ramphotyphlops braminus*). Indian Wildlife (Protection) Act 1972 (as amended upto 1991), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Though Sharma (2000) retained this species in *Typhlops braminus* (Daudin), it has been considered here as *Ramphotyphlops braminus* (Daudin) following keys and observations made by Murthy (1985), Ahmed and Dasgupta (1992) and Gayen (1999).

*29. *Typhlops diardi* Schlegel

1839. *Typhlops diardi* Schlegel, *Abbild. Amphib.*, 39.

1943. *Typhlops diardi* Schlegel, Smith, *Fauna of British India : Reptilia and Amphibia* Vol. III : *Serpentes* : 51-52.

1983. *Typhlina diardi* (Schlegel), Daniel. *The book of Indian Reptiles* : 65.

1992. *Typhlops diardi* Schlegel, Ahmed and Dasgupta : *Fauna of West Bengal, State Fauna Series*, 3 (Part-2) : 38.

Common Name : English : Diard's Blind snake; Marathi name : Vala.

Diagnostic characters : Diard's blind snake possesses all the characters mentioned earlier for Family Tiphlopidae and Genus *Typhlops*. However, in contrast to *R. braminus*, there are 24-26 scales round the body and nasal bones are completely divided in *T. diardi*. Diard's blind snake is much larger than *R. braminus* and can grow upto 430 mm. in total length. In colour it is black or blackish above, while paler below. Standard Total length : 252 mm-430 mm.

Locality : One specimen collected from Melghat Tiger Project region and identified by the Forest Dept. authorities was displayed in Chikhaldara Museum during the project period. This is first authentic collection record for *T. diardi* in Maharashtra.

Distribution : North-East India; **Habitat** : In habit and habitat it resembles the common blind snake (*R. braminus*).

Status : Not common (Ahmed and Dasgupta, 1992), Indian Wildlife (Protection) Act 1972 (as amended upto 1991) : Schedule : Schedule : IV, IUCN category as per CAMP Report (1998) : Data Deficient.

Remarks : First collection record from Maharashtra State.

30. *Typhlops acutus* (Dum. & Bibr.)

1844. *Onychocephalus acutus* Dumeril & Bibron, *Erp. Gen.*, 6 : 333.

1943. *Typhlops acutus* Dumeril & Bibron Smith, *Fauna of British India : Reptilia and Amphibia* Vol. III : *Serpentes* : 56 - 57.

1992. *Typhlops acutus* (Dum. & Bibr.), Ahmed and Dasgupta : *Fauna of West Bengal, State Fauna Series*, 3 (Part-2) : 37.

1998. *Typhlops acutus* (Dum. & Bibr.), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 271.

Common Name : English : Beaked Blind snake; Marathi name : Vala.

Diagnostic characters : Beaked blind snake possesses all the characters of Family Typhlopidae and Genus *Typhlops*. However beaked blind snake has nasal bones in contact with one another behind rostral which is very large covering large part of the head. Moreover snout is strongly pointed, hooked and projecting strongly with sharp horizontal edge. Nostrils inferior. 26–28 scales round the body. Tail ending in a small spine. Colouration brown above while pale below. This is the largest of all the blind snakes. Total length between 450 mm to 600 mm.

Locality : Smith (1943), Daniel (1983) and Ahmed and Dasgupta (1992) have reported wide occurrence of this species in the region south of Ganges in peninsular India above 16° Latitude. The species is endemic to the peninsular Indian region.

Distribution : Endemic to peninsular India from Gangetic plains to 16° Latitude.

Habitat : Habit and habitat similar to that of *Rhamphotyphlops braminus*. However, beaked blind snake are believed to feed on worms also.

Status : Uncommon in its range of distribution (Sharma, 2000), Indian Wildlife (Protection) Act 1972 (as amended upto 1991) Schedule : Schedule : IV.

Remarks : The species appears to be rarer south of Latitude 16°N.

Family BOIDAE

*31. *Python molurus* (Linnaeus)

1758. *Coluber molurus* Linnaeus, *Syst. Nat.* 10th Ed. : 225.
1943. *Python molurus* (Linnaeus), Smith, *Fauna of British India, Reptilia and Amphibia* Vol. III : *Serpentes* : 106-109.
1983. *Python molurus* (Linnaeus), Daniel, *The Book of Indian Reptiles* : 71-73.
2000. *Python molurus* (Linnaeus), Sharma, *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 272-273.

Common Name : English : Indian rock python; Marathi name : Ajgar.

Diagnostic characters : Indian rock python possesses all the characters mentioned earlier for the Suborder Serpentes. All snakes in the Family Boidae possess teeth in both the jaws, prominent eyes and vestiges of hindlimbs. This family comprises the largest living snakes, the pythons and boas. Some of them reach to a length of about 10 metres. The snake species of this family are easy to identify due their large size and presence of typical colouration pattern. The sensory pits on the rostral and first two labials distinguishes python from all other Indian snake. It's maximum length is 7 m and weight 85 kg. The head is quite distinct from the neck and possesses symmetrical shields on top coastrals are smooth and arranged in 60–75 rows, centrals (Large transversely enlarged plates) 245-270 and caudals in 60–72 pairs. Comparatively small eyes with vertical pupils. The body is covered with small, smooth scales. The skull is with ectopterygoid, supratemporal and other palatal bones. Supratemporal articulates with the cranium like a scale. Quadrate bones fully suspending. Ground colour greyish, whitish or yellowish in adults. A dark streak from eye to nostril found in young one may be retained in adult forms. On the back of the head and the nape is a large lance-shaped mark with a pale centre. The body with a series of large, roughly quadrate patches from neck to tail dorsally. The patches are centrally of the same colour as the general body colour and are broadly outlined with black. Two smaller rows of markings occur to the side of the median row. In freshly moulded specimen the dorsal patches are highly iridescent giving bluish and amenthystine hues in certain lights.

Locality : One live specimen collected by Forest Dept. authorities from Chikhaldara forest patch was kept in Chikhaldara Zoo during the project period.

Distribution : Peninsular India.

Habitat : Normally a forest dweller occurring in dense as well as in open forests with rock outcrops. Python is a terrestrial, arboreal and carnivorous snake. Feeds on mammals, bird and reptilian species. Sometimes animals of larger size are killed by coiling and constrictions resulting in suffocation.

Status : Vulnerable Sharma (2000) and not uncommon (Daniel, 1983). IUCN category

as per CAMP Report (1998) : Lower risk-near threatened, Indian Wildlife (Protection) Act (1972) (as amended upto 1991) Schedule : Schedule : I Part : II, Red Data Book (1994) : Endangered.

Remarks : The survival of the species is in danger due to illegal trade for skin, body parts and live animals at national and international level (Pradhan, 1997).

32. *Eryx johni johni* (Russell)

1801. *Boa johnii* Russell, *Ind. Serp.*, ii : 18 & 20.

1943. *Eryx johni johni* (Russell), Smith, *Fauna of British India, Reptilia and Amphibia*, Vol. III. *Serpentes* : 113-114.

1985. *Eryx johni johni* (Russell), Murthy : *The Snake*, 17 : 60.

2000. *Eryx johni johni* (Russell), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 273.

Common Name : English : Indian Sand Bao, John's sand boa, Red Sand bao, Black Earth boa, Stump-tailed sand boa; Marathi name : Dutondya.

Diagnostic characters : Indian sand Bao or John's sand bao possesses all the characters mentioned earlier for Family Boidae. However, supraorbital bone is absent, teeth are absent on premaxillary bone, head covered with small scale like shields and labial scales are normal and not with pits in John's sand Bao. The body of the snake is cylindrical and robust which suddenly tapers immediately after vent. Tail ends abruptly into blunt shield. Head not distinct from neck. Snout broad, nostril opening like a slit. Eyes distinct small and with vertically elliptical pupil. Ventral scales do not cover the whole width of the ventrum. Subcaudals not divided. Mental groove present. Genials absent in Genus *Eryx*. Adults uniform light brown, or dark olivaceous brown in colour with or without fine dark reticulations arranged to form crossbars. Markings when present conspicuous posteriorly. Ventral side lighter. Young ones are brick-red or sandy red in colour. Back with dark blotches or ruddy-brown cross-bars. Adults approximately 1 metre in length (Males : 980 mm, Females : 1080 mm). Scales rows on middle of the body 51-67 (Scales feebly keeled), ventrals in males 193-212 and in females 198-215; anal shield is small and undivided, caudals in males 28-40 and in females 29-34.

Locality : Smith (1943), Daniel (1983), Murthy (1985) and Sharma (2000) have reported wide occurrence of this species in plains of Indian subcontinent.

Distribution : Whole of India.

Habitat : Burrowing snakes preferring to live in and around croplands, scrub lands and different types of forests. The snake possesses gentler temperament with inoffensive behavior. It is a speedy burrower. Feeds mainly on small rodents killing them by constriction.

Status : Common in distributional range (Daniel, 1983, Sharma 2000), Indian Wildlife (Protection) Act (1972) (as amended upto 1991) : Schedule : Schedule : IV, IUCN category as per CAMP Workshop(1998) : Lower risk-least concern.

Remarks : Sometimes the live snake is used in street-shows by snake charmers (Pradhan, 1997).

***33. *Eryx conicus* (Schneider)**

1801. *Boa conica* Schneider, *Hist. Amphibia*, ii : 268

1943. *Eryx conicus* (Schneider), Smith, *Fauna of British India, Reptilia and Amphibia*, : Vol. III. *Serpentes* : 112-113.

1985. *Eryx conicus* (Schneider), Murthy : *The Snake*, 17 : 60.

2000. *Eryx conicus* (Schneider), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 273.

Common Name : English : Russell's sand Bao, Russell's Earth Bao; Marathi name : Durkiya ghonas.

Diagnostic characters : Russell's sand/Earth Bao possesses all the characters mentioned for suborder : Serpentes, Family Boidae and Genus *Eryx*. However, mental groove is absent and tail end is pointed in Russell's sand/Earth Bao. Moreover, Head is slightly distinct from neck. Rostral about two times broader than head. All scales except nasals and internasals on head are small. A markedly stout snake. Body short and heavy. Tail short and tapering so rapidly that it is conical in shape. Total length not exceeding 950 mm; Body scales are 40-55, ventral scales 161-196 and subcaudals 16-24. Anal is small and undivided. Hemipenis is not forked. Dorsal colouration is yellowish, brownish or grayish mixed with a dorsal series of dark brown black-edged spots. Flanks mottled brown varying in shades. Just above vent on each side is a small curved claw-like process directed backwards in the female which indicates the termination of the rudimentary hindlimb. It is well developed in males. The skin is rough on the back owing to the keeled scales.

Locality : Two specimens have been collected from Sipna river near Pili village and Khatkali chek post on Harisal-Akot Road, in Melghat Tiger Reserve area by ZSI survey parties during the project period.

Distribution : Whole of India.

Habitat : Terrestrial and arboreal. Generally considered as a snake of arid areas, but is also found in multiparous habitats. It is marginally commensal as well. *Eryx conicus* is a dull creature but with uncertain temperament. It is also speedy burrower. However, its life is not fully subterranean. Feeds on small rodents, birds and frogs. It kills its victim by constriction.

Status : common in the distributional range (Daniel, 1983 and Sharma, 2000), Indian

Wildlife (Protection) Act (1972) (as amended upto 1991) Schedule : Schedule : IV, IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : The species is traded illegally for body parts and live individuals at domestic level (Pradhan, 1997). As per CAMP Workshop Report (1998) there is threat to the survival of the species due to loss of habitat, human interference and illegal trade.

Family COLUBRIDAE

*34. *Elaphe helena* (Daudin)

1803. *Coluber helena* Daudin, *Hist. nat. Rept.*, iv : 277.

1943. *Elaphe helena* (Daudin), Smith, *Fauna of British India, Reptilia and Amphibia* : Vol. III : *Serpentes* : 149-150.

1983. *Elaphe helena* (Daudin), Daniel, *The Book of Indian Reptiles*, : 74.

1984. *Elaphe helena* (Daudin), Murthy : *The Snake*, 17 : 64.

2000. *Elaphe helena* (Daudin), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 276.

Common Name : English : Trinket Snake, Common Trinket Snake; Marathi name : Taskar Sap.

Diagnostic characters : Since trinket snake is a snake, it possesses all the characters mentioned earlier for Suborder Serpentes. Prominent eyes normal teeth in both the jaws, maxillary teeth present and absence of poisonous fang are typical characters of Family Colubridae. This is a large family comprising roughly more than 2500 species and subspecies of arboreal, burrowing terrestrial and aquatic snakes distributed over 250 genera. They exhibit extreme diversity in size, shape and colour. Nostrils not valvular, usually lateral. Scales imbricate. A mental groove present. Ventral shields distinct. All teeth solid and not grooved. Hypapophyses absent on the posterior dorsal vertebrae. Posterior maxillary teeth not longest and all submaxillary teeth subequal. Pupil round. Scales in 19 to 27 rows with apical pits. *Elaphe helena* is with elongated and cylindrical body and also with head quite distinct from the neck. Dorsal colour brown of varying degree of intensity. An oblique streak from eye to lip. Forebody for some length ornamented with ocellated crossbars of a pattern peculiar to this snake. The patterns gradually disappears at distal end. There is usually a 'V' shaped conspicuous mark on nape. Finally broad dark coloured stripes on sides replaces crossbars on the body and extend upto tip of the tail. Total length never exceeds 1700 mm in length. Posterior body scales keeled. Ventrals 217-265, subcaudals 73-100 and anal single.

Locality : One live specimen was sighted in the forested area of Kolkaz by ZSI survey party in Feb., 1992.

Distribution : Peninsular India.

Habitat : Usually found in or at the periphery of forest. Sometimes seen in human habitats also. It is a snake which becomes aggressive when disturbed. Prefers diet of mammalian lizard and even snake species when hungry. Though the snake coils round the prey, it does not constrict.

Status : Common in the altitudinal range of 500m–2000m in its area of occurrence (Daniel, 1983 and Sharma, 2000). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule : IV; IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Trinket snake has been collected from the urban areas also (WRS, ZSI, Collection).

*35. *Ptyas mucosus* (Linnaeus)

1758. *Coluber mucosus* Linnaeus, *Mus. Ad. Frid.*, 1 : 37.

1943. *Ptyas mucosus* (Linnaeus), Smith, Smith, *Fauna of British India, Reptilia and Amphibia*, : Vol. III : *Serpentes* : 159-162.

1985. *Ptyas mucosus* (Linnaeus), Murthy : *The Snake*, 17 : 64.

2000. *Ptyas mucosus* (Linnaeus), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 276.

Common Name : English : Indian rat snake, Dhaman; Marathi name : Dhaman.

Diagnostic characters : Rat snake or dhaman, being a snake possesses all the key characters mentioned for the Suborder Serpentes and Family Colubridae. However, the characteristic features of Genus *Ptyas* is no marked development of hypophyses on the posterior dorsal vertebrae. Posterior maxillary teeth longest and not grooved. Maxillary teeth 28 or less. They enlarge gradually and form continuous series. Dorsal scales in 15–17 rows and slightly keeled. Head shields entire. Head distinct from the neck. Genus *Ptyas* includes long, cylindrical and slender snakes with most agile body. Eyes large with round pupil. Snout obtusely pointed. Dorsal colouration is olivaceous brown, sometimes as dark as sepia or light mustard yellow. Scales on the posterior part are irregularly margined with black colour forming reticulate pattern. There is a tendency of formation of black crossbars. Lip scales margined with black. Belly greyish white or dirty white or yellowish in colour.

Locality : Sighting of live specimens in Koktu, Kolkaz and Raipur areas of Melghat Tiger Reserve by ZSI survey parties during the project period.

Habitat : Terrestrial, semi arboreal, semi aquatic snake essentially seen on plains but recorded upto the altitude of 1800 m. Diurnal in habit, living in variety of habitats. Eclectic in diet. Rat is not a staple diet of the snake as suggested by its popular name. It's preferred diet includes frogs, toads, lizards, birds and small vertebrates including rats and mice.

Status : Though common in its range of distribution, the rat snake is subjected to the commercial exploitation on account of its large scale killing for skin and meat (Daniel, 1983 and Sharma, 2000). Indian Wildlife (Protection) Act (1972 as emended upto 1991) Schedule : Schedule II (Part II), CITES Appendix : Appendix II, IUCN category as per CAMP report (1998) : Lower risk-near threatened.

Remarks : Killing of rat snakes on large scales for its skin is real threat to the survival of the sub-species. Rat snake skin is involved in illegal local, domestic and international trade (Pradhan, 1997). The snake is eaten by some communities in different parts of the country. There is a persistent erraneous belief amongst illiterates that rat snake is the male of the Cobra. 4An unusual behavior seen in rat snake is a "Combat Dance" between the two males which twine around each other on the ground as well as when half erect. The "act" appears to be a part of mating behavior.

***36. *Argyrogena fasciolatus* (Shaw)**

1802. *Coluber fasciolatus* Shaw, (based on Russell, 1796 p. 26, pl. 21).

1985. *Argyrogena fasciolatus* (Shaw), Murthy : *The Snake*, 17 : 64.

2000. *Argyrogena fasciolatgus* (Shaw), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 277.

Common Name : English : Banded racer, Fasciolated rat snake; Marathi name : Nagin.

Diagnostic characters : Banded racer or fasciolated rat snake possesses all the characters mentioned for the Suborder Serpentes and Family Colubridae. However, hypapophyses not developed on the posterior dorsal vertebrae. Posterior maxillary teeth long but not grooved. Maxillary teeth 19 or less. Subocular one or more. Scales in 19-23 rows smooth and with apical bits. Head shields entire. Head distinct from the neck. Ventral shields enlarged and rounded, 185-234 in number. The snakes of this genus are elongated and cylindrical. Eyes large with round pupil. Many specimens with a lateral keel. Tail moderately long. Banded racer is a diurnal snake reaching to a length of 1350 mm. Anal shield divided. Hemipenis is devoid of spines. Dorsal colouration brown, cinnamon to greyish brown. Posterior part of the body with faint cross-bars or spots which gradually disappears towards the tail. Head is beautifully coloured with light and dark olive and two white spots on parietal shields on either side of the interparietal suture. Ventrums are whitish or yellowish.

Locality : One specimen was collected from Semadoh area of Melghat Tiger Reserve by the ZSI survey party during the project period.

Distribution : Peninsular India, north to Himalaya and east to West Bengal.

Habitat : Terrestrial preferring to live in scrub jungle, arid grassland, open forest tracts and urban areas. A plucky and aggressive snake when disturbed. Becomes tame in captivity. Feeds on small mammals and amphibians.

Status : Common in the range of distribution (Daniel, 1983 and Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report 1998 : Lower risk-near threatened.

Remarks : When disturbed, it raises its body and tries to flatten the neck like a cobra.

***37. *Ahaetulla nasutus* Lacep.**

1789. *Coluber nasutus* Lacepede, *Hist. Nat. Serp.*, i P. 100 and ii 277 pl. 4, fig. 2.
1943. *Dryophis nasutus* Anderson, Smith, *Fauna of British India : Reptilia and Amphibia*, : Vol. III : *Serpentes* : 376-378.
1985. *Ahaetulla nasuta* (Lacepede), Murthy, *The Snake* : 17-66.
1992. *Ahaetulla nasuta* (Lacepede), Ahmed and Dasgupta, *Fauna of West Bengal, State Fauna Series*, 3 (Part-2) : 40.
2000. *Ahaetulla nasutus* (Lacepede), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 285.

Common Name : English : Common green whip snake, Common vine snake; Marathi name : Haran Tol.

Diagnostic characters : Common green whip snake or common vine snake possesses all the characters mentioned for the suborder Serpentes and Family Colubridae. However, genus *Ahaetulla* possesses subequal maxillary teeth, horizontal pupil, obliquely placed scales in 13-15 rows and enlarged vertebrae. The snakes are very long with compressed body. Head is elongated and distinct from neck. Canthus rostralis quite long. Concave loreals, quite large eyes and long tail. Snout long acuminate terminating in a dermal beak shaped appendage. Body scales smooth in 15 : 15 : 11 rows. Vertebral rows larger than other dorsal rows. Ventral shields 166-207, laterally notched, while sub-caudal shields 156-180 in males and 135-152 in females. Anal shield divided. Dorsal colouration verdant green, while ventral side is pale with greenish tinge. The interstitial skin is black and white in colour forming oblique lines which are most distinct on the anterior half of the body. Whip snake reaches 1855 mm. length in males, while 2600 mm in females.

Locality : One specimen was collected from Chitamandeo Point area of Melghat Tiger Reserve by the ZSI survey party during the project period.

Distribution : Peninsular India.

Habitat : Common green whip snake prefers to live in scrub jungle, dry deciduous, mixed deciduous and evergreen forest also. The snake is arboreal and diurnal in habit. One escapes its sight due to its camouflaging colouration. An elegant snake with wonderful speedy movements. Though gentle in behavior, it could be fierce when caught. When alarmed, it rears its head and forebody and the dilation of the forebody brings into prominence the black and white chequering skin. Feeds on small mammals, birds, lizards and occasionally other snakes and frogs.

Status : Common in the range of distribution (Daniel, 1983), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule : IV, IUCN category as per CAMP Report, 1998 : Lower risk-near threatened.

Remarks : Sharma (2000) feel that the status of the species is vulnerable due to habitat loss. The whip snake is mildly poisonous. The symptoms are like that of Cobra bite. Even though there is no effect of poison in man, it may occasionally cause swelling and numbness around the bitten area. Common green ship snake closely resembles green or bamboo pit viper in colouration.

38. *Oligodon taeniolatus* (Jerdon)

1853. *Coronella taeniolata* Jerdon, J.A.S. Bengal, xxii : 528.

1943. *Oligodon taeniolatus* (Jerdon), Smith, Fauna of British India : Reptilia and Amphibia, : Vol. III : Serpentes : 223-225.

1985. *Oligodon taeniolatus* (Jerdon), Murthy, The Snake, : 17-61.

2000. *Oligodon taeniolatus* (Jerdon), Sharma, Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates) : 278.

Common Name : English : Streaked kukri snake, Russell's or variegated kukri snake; Marathi name : Gargar.

Diagnostic characters : Streaked kukri snake possesses all the characters mentioned for the suborder Serpentes and Family Colubridae. However, in Genus *Oligodon* all teeth are solid and not grooved, hypapophyses on posterior dorsal vertebrae not developed. Hemipenis forked. Kukri snakes are short bodied but are stout with cylindrical shape. Head not distinguished from neck. Snout short, blunt and obtusely rounded with much enlarged rostral. Eye distinct with round pupil. Maxillary teeth 6-7. Body scale smooth and devoid of any pits. Ventral shields round. Length of the body never exceeds 650 mm. Diameter uniform from neck to vent. Scales at mid-body in 15 rows. Ventral shields 158-218, subcaudal 29-56 and anal shield divided. Hemipenis forked and spinose extending upto 11th caudal plate. Dorsal colour variable from light brown to blackish-brown to buff with narrow cross bars or transverse spots which may be rounded or elongated. Ventrums yellowish or grayish. A dark band across the head at the level of eyes is present. Nape with W-shaped dark collar. Variegation, if present, confined to flanks. Name kukri has been suggested due to presence of broad blade-like and peculiar shaped posterior maxillary teeth. Variegated kukri snake is the only snake species found on plains of Indian peninsular which has 15 scales rows throughout the length of the body and which possesses divided anal shield.

Locality : Smith (1943), Daniel (1983), Gayen (1999) and Sharma (2000) have reported wide occurrence of this species in plains of India including Deccan.

Distribution : Whole of India.

Habitat : Though the species is a hill form, it is not uncommon near human habitation. Largely diurnal snake of variety of forests. Fond of basking in sun, on rock or grass. Feeds mainly on eggs of other reptiles and frogs spawn.

Status : Common snake species in its distributional range Daniel, (1983) and Sharma (2000); Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-near threatened (for *Oligodon taeniolatus fasciatus* (Gunther) which has been merged in *Oligodon taeniolatus*).

Remarks : As per CAMP Workshop Report (1998) there is a threat to the survival of species due to loss of habitat and human interference.

*39. *Oligodon arnensis* (Shaw)

1802. *Coluber arnensis* Shaw, *Gen. Zool.*, iii : 526.

1943. *Oligodon arnensis* Shaw, Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 225-227.

1983. *Oligodon arnensis* Shaw, Daniel, *The Book of Indian Reptiles* : 82-83.

2000. *Oligodon arnensis* Shaw, Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 278.

Common Name : English : Russel's kukri snake, common kukri snake; Marathi name : Gargar.

Diagnostic characters : Common Kukri snake possesses all the characters mentioned for Suborder Serpentes, Family Colubridae and Genus *Oligodon*. Like variegated Kukri Snake, common kukri snake never exceeds 650 mm in total length including tail length. Hemipenis is not forked but spinose and extends upto the 8th caudal plate only. Maxillary teeth in the range of 8-11 in number. Snout short and blunt. Nostril present in elongated nasal partly separating internasal. Rostral large. Scales in 17 : 17 : 15 rows. Head depressed. 4-5 infralabials. Body short, smooth and cylindrical. Colour reddish or greyish brown with series of black bands. Ventrums whitish, sometimes with faint spots. Head with chevron shaped mark. Common kukri snake differs from other kukri snakes by presence of divided anal shield, presence of loreal, 7 supralabials and more than 40 caudals. Back with black bars narrow but distinctly outlined with whitish or pale yellow colouration. Black bands breaks on the flanks into streaks. No. of bands vary.

Locality : One specimen was collected from Raipur area of Melghat Tiger Reserve by ZSI survey party during project period.

Distribution : Peninsular India.

Habitat : Chiefly snake of plain, however may be seen upto altitude 1620 m. Terrestrial and diurnal in behavior preferring to live in variety of forests. Generally seen in rainy season. Not uncommon in the vicinity of human habitation, where it is seen in masonry

of the old walls of the building. It can easily climb. Feeds chiefly on reptile eggs but also likes mice and other small mammalian species.

Status : Not uncommon and available throughout its range (Daniel, 1983 and Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : When alarmed, it inflates its body to a remarkable degree and some specimens also flatten the posterior part of the head making the head more broader than usual.

40. *Lycodon flavomaculatus* Wall

1907. *Lycodon flavomaculatus* Wall, J. Bombay Nat. Hist. Soc., xvii : 612.

1943. *Lycodon flavomaculatus* Wall, Smith, Fauna of British India : Reptilia and Amphibia : Vol. III : Serpentes : 262-263.

1985. *Lycodon flavomaculatus* Wall. Murty, The Snake, 17 : 61.

2000. *Lycodon flavomaculatus* Wall, Sharma, Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates) : 280.

Common Name : English : Wall's yellow-spotted wolf snake; Marathi name : Kandya saap.

Diagnostic characters : Yellow spotted wolf snake possesses all the characters mentioned for the Suborder Serpentes and Family Colubridae. The snake species under Genus *Lycodon* are small to medium in size with elongated body and flat head. Nostrils situated between two nasals. All the teeth are solid and not grooved. Some of the anterior maxillary teeth are enlarged and fang like. Pupil vertically elliptical. Maxillary bone strongly arched. Subcaudals divided. Scales in 15-17 rows and they are smooth or feebly keeled. Total length is about 480 mm. Snout projects beyond the lower jaw. Dorsal body scale smooth and they are in 17 : 17 : 15 rows. Ventral shields 170-183. Anal shield divided. Hemipenis extends upto 15th subcaudal plate. Dorsal colluration is blackish with a series of round or triangular yellowish vertebral spots, opposite of which bars of same colour descend and broaden to form a reticulation on the flanks.

Locality : Smith (1943) and Sharma (2000) have recorded Berar or Deccan as the locality for this species and Melghat Tiger Reserve falls within the jurisdiction of Deccan.

Distribution : Gujarat, Western Maharashtra and Central India.

Habitat : Not much is known about habit and habitat of this species, though all the wolf snakes, in general, seem to have profited by the human environment. They are often met within the houses and hide in masonry or beneath stones or any convenient hide out.

Status : Rare and secretive snake (Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Vulnerable.

Remarks : Nil.

41. *Lycodon aulicus* (Linn.)

1754. *Coluber aulicus* Linnaeus, *Mus. Adolph. Frider.*, 1 : 29, pl. 12. Fig. 2.
1943. *Lycodon aulicus* (Linn.), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 263-266.
1983. *Lycodon aulicus* (Linn.), Daniel, *The Book of Indian Reptiles* : 89-90.
2000. *Lycodon aulicus* (Linn.), Sharma, *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 280.

Common Name : English : Common wolf snake; Marathi name : Kandya saap.

Diagnostic characters : Common Wolf snake possesses all the characters mentioned earlier for Suborder Serpentes, Family Colubridae and Genus *Lycodon*. Common wolf snake, *Lycodon aulicus* possesses 17 scale rows at mid body, loreal touching internasal, nasal touching 1st and 2nd labial and nine supralabials. Body scales are smooth and in 17 : 17 : 15 rows with strongly angulated ventral shields which are 172-224 in number. Subcaudals 56-80 in number. Total length does not exceed 950 mm. The snout spatulate and well beyond lower jaw. Anal shield mostly divided rarely single. Hemipenis extends upto 10th caudal plate. Dorsal ground colouration brown or grayish with white or yellow crossbars, ventrum whitish and upper lip white with or without brown spots. Colouration and markings in wolf snakes in general, variable. There is usually a collar or two blotches of white or yellow colour on occiput. Sometimes specimens without any markings and uniform brown colour may also occur.

Locality : Smith (1943), Daniel (1983), Gayen (1999) and Sharma (2000) have reported wide distribution with most common occurrence status of this species throughout the Indian plains. Hence, its occurrence in Melghat Tiger Reserve also has been assumed here.

Habitat : As stated earlier for *Lycodon flavomaculatus* this species also prefers to live in and around human habitations. They are also excellent climbers capable of going up almost smooth vertical surface. Common wolf snake prefers lizards of Gecko family but can consume small animals including mice and skinks also.

Status : Most common snake throughout its range (Daniel, 1983, Gayen, 1999 and Sharma, 2000). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report : Lower risk-least concern.

Remarks : A lively snake, ready to strike instantly when provoked. But it can soon get accustomed to being handled in captivity. The readiness with which it bites and its habit of living in houses make this snake responsible for a large number of snake bite cases.

***42. *Lycodon striatus* (Shaw)**

1802. *Coluber striatus* Shaw, *Genl. Zool.* iii : 527.
1943. *Lycodon striatus* Shaw, Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 261-262.

1983. *Lycodon striatus* Shaw, Daniel, *The Book of Indian Reptiles* : 90-91.

2000. *Lycodon striatus* Shaw, Sharma, *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 280.

Common Name : English : Shaw's wolf snake, Northern Wolf snake, Barred wolf snake; Marathi name : Kandyaa saap.

Diagnostic characters : Barred or shaw's wolf snake possesses all the characters mentioned earlier for the Suborder Serpentes, Family Colubridae and Genus *Lycodon*. *Lycodon striatus* resembles very closely the common wolf snake in body characters and habits. It is a small snake 430 mm in length and is distinguished from *L. aulicus* by the presence of 8 supralabials and less number of ventral shields 154-195 and caudals 35-58. Ventral shields are not angulated laterally. Rostral much broader than high. Colour dark brown or black above with 11-18 white or yellowish crossbars on body which divide on sides to enclose triangular spots of ground colour on body. Belly and upper lip white.

Locality : Two specimens were collected from near Pilli village and Makhala areas of Melghat Tiger Project by ZSI survey parties during project period.

Distribution : Peninsular India.

Habitat : It's habit and habitat are similar like those of common wolf snake or rather any wolf snake. However, it is a timid snake which hides its head beneath its coil, if disturbed.

Status : Not common (Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule : IV; IUCN Category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Nil.

***43. *Macrophisthodon plumbicolor* (Cantor)**

1839. *Tropidonotus plumbicolour* Cantor, *Proc. Zool. Soc. London* : 54.

1943. *Macrophisthodon plumbicolor*, (Cantor), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 314-316.

2000. *Macrophisthodon plumbicolor* (Cantor), Sharma, *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 282.

Common Name : English : Green keelback snake; Marathi name : Hara saap, Gavathia, Gavtya saap.

Diagnostic characters : Green keelback snake possesses all the characters mentioned earlier for the Suborder Serpentes and Family Colubridae. It is a stout bodied snake reaching to a maximum length of 580 mm in males and 775 mm in females. Head distinct from the neck. Eye moderately large with round pupil. Tail short. Frontal shield in contact with six surrounding shields. The shields on the head distinguish it immediately from the green pit viper and presence of round pupil from green whip snakes. Body scales in

21-27 rows strongly keeled. Ventral shields 144-162, subcaudal shields divided in males (34-48 in Number). Anal shield divided. Hemipenis reaches upto the 15th caudal plate. Dorsal colouration greenish with yellow tinge or olive green with faint irregular black cross lines. Dorsal aspect of head is with two black inverted V-shaped marks. Ventrums are whitish gray or dark gray with black spots. Juveniles may have very well defined black chevron on the nape with its angle pointed forward. Following the chevron is a broad gorget of bright yellow or orange. A black streak from eye to gape present.

Locality : One specimen was collected from Chikhaldara region of Melghat Tiger Reserve area by ZSI survey party during the project period.

Distribution : Throughout India except Ganges Valley.

Habitat : A hill species frequenting grass and low vegetation. Found in green as well as open deciduous forest. Terrestrial, diurnal and carnivorous in habit. A singularly gentle and inoffensive snake. Feeds more or less exclusively on the common toad but occasionally takes other amphibians and lizards. Secretion of large parotid glands is toxic to frogs and toad.

Status : Common throughout its range (Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : When provoked, it erects its forebody and flattens its neck like a cobra, hence it is called as "green cobra" in Tamil.

***44. *Xenochrophis piscator* (Schneider)**

1799. *Hydrus piscator* Schneider, *Hist. Amph.*, : 247.

1943. *Natrix piscator* (Schneider), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 293-295.

1985. *Xenochrophis piscator* (Schneider), Murthy, *The snake*, 17 : 65.

2000. *Xenochrophis piscator* (Schneider) Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 281.

Common Name : English : Checkered keelback snake; Marathi name : Virula, Pan chidda, Dhiwad.

Diagnostic characters : Checkered keelback snake possesses all the characters mentioned for Suborder Serpentes and Family Colubridae. Keelback snake belonging to Genus *Xenochrophis* comprises fresh water snakes with cylindrical body, head quite distinct from the neck, snout long and eyes moderately large with round pupil. Nostril dorsolateral and pierced into a single nasal which is directed outwardly upward. Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. *X. piscator* is

distinguished by a combination of characters like scale round the body at midway in 19 rows. Scales somewhat round but strongly keeled, 4th or 5th supralabials touching eye, presence of a pair of internasals and undivided anal shield. Tail one-third to one fourth of total length. Ventrals 122-158 and subcaudals 60-97. Hemipenis and sulci spermaticus are forked. The colour of the dorsum is much variable, and may be yellowish, olive, light green and grey brown with reddish tinge with five rows of small light black spots, bars which are generally narrower than the interspaces. The arrangement of spots/bars looks like a checker-board pattern, hence the name, checkered keelback. Head olive brown above with two oblique black streaks, one above and one behind the eye. Ventrums white or yellowish.

Locality : One specimen was collected from Chikhaldara region, while another was sighted in Rangubeli area by ZSI survey parties during the project period.

Distribution : Throughout India.

Habitat : Semi-aquatic preferring to live in the vicinity of fresh water bodies. Frequents tanks, paddy fields, pools and rivers.

Status : Commonest snake of India (Daniel, 1983 and Sharma, 2000). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule II Part II, CITES : Appendix III, IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Most active and vicious amongst Indian snakes. Strikes rapidly and with great determination holding on tenaciously. However, its temperament varies depending upon the situations. The secretion of the large parotid glands is fatal to small mammals, birds, lizards and frogs, but has no effect on man and large mammals.

*45. *Amphiesma stolata* (Linnaeus)

1758. *Coluber stolatus* Linnaeus, *Syst. Nat.*, : 219.

1943. *Natrix stolata* (Linnaeus), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 303-305.

1985. *Amphiesma stolata* (Linnaeus), Murthy, *The snake*, 17 : 63.

2000. *Amphiesma stolata* (Linnaeus), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 281-282.

Common Name : English : Striped keelback, buff striped keelback, Marathi : Naneti.

Diagnostic characters : Striped keelback is a slender bodied, elongated snake with head quite distinct from the neck. It possesses all the Characters mentioned for the Suborder Serpentes and Family Colubridae. Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. Maxillary teeth are unequal 21-24 in number with last two enlarged. Nostrils lateral, scales in 19 rows. Striped keelback is also

distinguished by the nasals not touching the 2nd supralabial, rostral touching 6 shields and single anterior temporal. The buff stripes along the sides are also distinct. Eyes large with round pupil flecked with gold. Tongue, dull orange, black tipped. The striped keelback reaches to a length of about 550 mm. Ventral shields in the range of 118-158; while subcaudals in 50-89 shields. Anal shield divided. Hemipenis simple and extends upto the 8th caudal plate. Dorsal colouration is olivaceous or olive brown or somewhat greenish with a pair of pale yellow stripes which sometimes break up into spots in the anterior region of the body. Belly white with some scattered black spots. There is a black V shaped mark on the neck. Black streaks present in front of and below the eye.

Locality : Smith (1943), Daniel (1983) and Sharma (2000) have reported wide distribution with most common occurrence status of this species throughout India. Hence, its occurrence in Melghat Tiger Reserve area also has been assumed here.

Distribution : Throughout India.

Habitat : Terrestrial and semi-aquatic preferring to live in fields, grassy and cultivated areas of open country during the rains. It's choice of habitat is directly related with its food. Often hides in holes in the ground or in masonry of drains and culverts. Essentially diurnal. It feeds mainly on frogs and toads.

Status : Most common snake in its range. (Daniel, 1983 and Sharma 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Two distinct colour varieties occur in India. The typical form occurs throughout India (Daniel, 1983).

***46. *Boiga trigonata* (Schneider)**

1802. *Coluber trigonatus* Schneider, *Bechst. transl. Lacep*, iv : 256 pl. XI fig. 1.

1943. *Boiga trigonata* (Schneider), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : Serpentes : 349-350.

1983. *Boiga trigonata* (Schneider), Daniel, *The Book of Indian Reptiles*, : 99-101.

2000. *Boiga trigonata* (Schneider), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 282-283.

Common Name : English : Indian Gamma or cat snake, Marathi : Manjra.

Diagnostic characters : Indian Gamma snake possesses all the characters mentioned for Suborder Serpentes and Family Colubridae. Hypapophyses may be present or absent on posterior dorsal vertebrae. Maxillary teeth solid, subequal and 8 -10 in number. Last two-three maxillary teeth grooved. Body scales smooth and arranged in oblique fashion. Genus *Boiga* includes large distinctly triangular headed snakes with laterally compressed body, large eyes with vertical pupils and duplex retina. Tail moderately long, anal shield undivided. Pits and tubercles present on head trunk scales. Scales with apical pits and in

21 : 21 : 15 rows. Subcaudal shields paired. Hemipenis divided but not forked and reaches upto 10, 11, 12th caudal shields. Cat snake reaches to length of about 1000 mm in males and 1200 mm in females. Dorsal colouration grayish brown with two alternating series of large rounded or oval dark brown light edged spots. There are two other series of much smaller spots on lateral sides of the body. Dorsal side of head is with two broad dark brown or black longitudinal stripes diverging posteriorly. Nape with longitudinal mark. Stripe emerging from the eye reaches the angle of the mouth. Ventrums whitish spotted with brown.

Locality : Smith (1943), Daniel (1983) and Sharma (2000) have reported wide distribution with most common occurrence status of this species throughout India. Hence its occurrence in Melghat Tiger Reserve area also has been assumed here.

Distribution : Peninsular India.

Habitat : Essentially arboreal frequenting bushes, scrubs or trees. Usually close to the ground. Also seen in different types of forests, plantations and rural human settlements. Nocturnal in behaviour. Feeds on almost anything it can capture with preference for garden and other lizards. Killing done by constriction.

Status : Common throughout its range (Daniel, 1983 and Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule : IV, IUCN Category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Cat snakes are always ready to act offensively on the least provocation. Its striking poisture is characteristic. Head and forebody are erected well off the ground with remaining body forming a loop of eight. Head poised in the middle. Prior to striking, the erected part is swayed forward and backward. The colour and markings of cat snakes bear close resemblance to those of *Echis carinatus*. But two species can be easily separated by the absence of head shields in viper. The secretion of the parotid gland of cat snake is lethal to lizards and highly toxic to mice.

***47. *Psammophis condanars* (Merrem)**

1820. *Coluber condanurus* Merrem, *Tent. Syst. Amph.*, : 107.

1943. *Psammophis condanurus* (Merrem), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 364-365.

1983. *Psammophis condanurus* (Merrem), Daniel, *The Book of Indian Reptiles* : 98.

2000. *Psammophis condanurus* (Merrem), Sharma, *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 284.

Common Name : English : Indian sand snake, condanarous sand snake.

Diagnostic characters : Sand snakes possess all the characters mentioned for Suborder Serpentes and Family Colubridae. They are slender in shape with cylindrical body. Head

distinct from neck. Eyes large with round pupil. Nostrils situated between the nasals. Maxillary teeth 10-13. Last 2-3 maxillary teeth are enlarged, recurved and grooved. Hypapophyses may be present or absent on the posterior dorsal vertebra. Scales smooth, obliquely arranged in 17 rows. Ventral shields are somewhat round. Tail quite long with divided subcaudal shields. Hemipenis is short and very slender without spines. The sand snake reaches to a maximum length of 1325 mm. Head is long and narrow. Snout bluntly pointed. Ventral shields in the range of 156-179. Caudal shields in males 75-93, divided. Dorsal colouration is pale olive or brassy or buff with 4-5 dark brown longitudinal stripes distinctly edged with black. Head brownish.

Locality : Smith (1943), Daniel (1983) and Sharma (2000) have reported occurrence of sand snake in Berar (Now Vidharbha) region. Hence its occurrence in Melghat Tiger Reserve area has been assumed here.

Distribution : Throughout the peninsular India.

Habitat : Terrestrial preferring to live in grassland and open wooded forests. They are also seen in arid and semi arid areas. A diurnal snake feeding on lizards, frogs and other snakes.

Status : Common or not uncommon in its distributional range (Daniel, 1983 and Sharma, 2000). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : There is a threat to the survival of this species due to loss of habitat and human interference. It's parotid secretion is poisonous fatal enough to kill lizards and other preys.

***48. *Psammophis longifrons* Boulenger**

1896. *Psammophis longifrons* Boulenger, Cat. Sn. Brit. Ind. 3 : 165.

1943. *Psammophis longifrons* Boulenger, Smith, Fauna of British India : Reptilia and Amphibia : Vol. III : Serpentes : 365-366.

2000. *Psammophis longifrons* Boulenger, Sharma, Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates) : 284.

Common Name : English : Sand snake.

Diagnostic characters : *P. longifrons* possesses all the characters mentioned for the Suborder Serpentes Family Colubridae and Genus *Psammophis*. The sand snakes under this species are stout in built reaching to a maximum length of about 1600 mm. Head is distinct from neck, snout quite long and slender. Maxillary teeth 12-13 with two in the middle are very strongly enlarged and separated from other teeth by a wide gap. Dorsal scales arranged in 17 rows at midpoint. Ventrals 166-175, while subcaudals 79-93 in number. Anal shield divided. Hypapophyses may be present or absent on the posterior dorsal vertebrae. Dorsal colouration is grayish in the anterior part. While brownish on the posterior side. Ventrums grayish or yellowish white.

Locality : Smith (1943) and Sharma (2000) have reported this species from Nagpur and Berar. Hence its occurrence has been assumed here also.

Distribution Elsewhere : Maharashtra, Andhra Pradesh, Gujarat and Madhya Pradesh in India.

Habitat : Possibly same as for the previous sand snake species. Terrestrial, arboreal carnivorous preferring to live in dry deciduous and scrub forests. Not much is known about habit and habitat of this species.

Status : Rare snake known by few examples only (Sharma, 2000). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : CAMP Report (1998) records human interference as a threat to the survival of the species.

Family ELAPIDAE

*49. *Bungarus caeruleus* (Schneider)

1801. *Pseudoboa caerulea* Schneider, *Hist. Amphib.* ii : 284.

1943. *Bungarus caeruleus* (Schneider), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 343-345.

1983. *Bungarus caeruleus* (Schneider), Daniel, *The Book of Indian Reptiles* : 107-108.

2000. *Bungarus caeruleus* (Schneider), Sharma, *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 287.

Common Name : English : Common Indian Krait, Marathi : Manyar, Kander.

Diagnostic characters : Common Krait possesses all the characters of Suborder Serpentes. However, snake species under Family Elapidae are poisonous. Anterior most maxillary teeth enlarged recurved and grooved or tubercular. These teeth act as fangs to inject poisonous secretion of modified parotid glands into victim's body. Poison fangs are present in front of the mouth. Maxillary bone is with teeth behind the fangs. Tail cylindrical, loreal absent, pupil round, ventrals almost as broad as the width of the body. *Elapidae* is a family of terrestrial and arboreal deadly poisonous snakes. The family includes kraits, cobras, mambas and coral snakes. Krait's are long and slender snakes with cylindrical body. Tail not quite long but cylindrical and tapering to a point. Head not quite distinct from the neck. Eye small with round pupil. Poison fangs are fixed and followed after a wide gap by 2-3 small teeth. Scales round the body are in 15-17 rows. Ventral shields 194-234 and subcaudals entire and 42-52 in number. Vertebral row of scales enlarged into hexagonal shape. Hemipenis extends upto 6-9th caudal plate. Dorsal colouration is shining jet black to dark brown with a series of 3-9 vertebral spots on neck and anterior most part of the body followed by 38-56 narrow transverse bands or spots, generally in pairs. Upper labials are yellowish or whitish. Ventrums whitish.

Locality : one specimen collected from Melghat Tiger Reserve area by the forest Department authorities has been displayed in Chikhaldara museum.

Distribution : Peninsular India.

Habitat : Kraits inhabits a wide range of biotopes in its range of distribution. They inhabit fields, low scrub jungles and open forest. They are even seen in human habitation seeking shelter in houses. Nocturnal in behaviour placid in temperament. They are also frequently found near or in water. Krait feeds mainly on snakes including other kraits. Young ones feed more or less exclusively on blind snakes. Frogs, lizards and small mammals are also preferred.

Status : Common in the range (Daniel, 1983); Becoming rare on account of habitat loss (Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule Schedule IV, IUCN category as per CAMP Report (1998) Lower risk-near threatened.

Remarks : One of the deadliest among the poisonous snakes, of the world and it can kill adult human being in minutes. The lethal dose for man is considered to be equivalent of 1 mgm of dried poison. Poison is neurotoxic. Basically, shy in nature. It bites only when provoked. Harvest, human interference and trade are some of the threats to the survival of the species. Kraits are killed for skins for illegal trade.

*50. *Callophis melanurus* (Shaw)

1802. *Coluber melanurus* Shaw, *Gen. Zool.*, iii : 552.

1943. *Callophis melanurus* (Shaw), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 420.

1983. *Callophis melanurus* (Shaw), Daniel, *The Book of Indian Reptiles* : 111.

2000. *Callophis melanurus* (Shaw), *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 287.

Common Name : English : Slender coral snake.

Diagnostic characters : Slender coral snake possesses all the characters of Suborder Serpentes and Family Elapidae. All snake species under Genus *Callophis* are poisonous and are popularly known as coral snakes. They possess cylindrical and elongated body with almost same diameter from head to anus. Head not distinct from neck. Head shields normal. Eyes small with round pupil. These small snakes of about 360 mm length have 2 or 3 minute teeth behind the poison fangs. Body scales are in 13 rows. Ventral shields 249-277 in number, subcaudal shields in male 33-37, while in females 24-27. Hemipenis extends upto 6th-8th caudal plate. Dorsal colouration light brown, centre of every scale is speckled with brown and form resultant longitudinal lines on complete dorsum. Ventrums are yellowish with reddish tinge. Slender coral snake is distinguished from other Indian coral snakes by the presence of only six supralabials. Head and neck black above and yellow spotted. A pair of spots on occiput distinct. Tail with 2 black rings, one at base and other at the tip.

Locality : Smith (1943), Daniel, (1983) and Sharma (2000) have reported this species from Nagpur and the then Central Province. Hence, its occurrence has been assumed here also.

Distribution : Peninsular India.

Habitat : Little is known about this species. It seems they prefer to live in hilly forested areas but actually live at lower elevation. They are nocturnal in behaviour. An inoffensive and sluggish species feeding mainly on snakes.

Status : Uncommon (Daniel, 1983) and rare (Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV; IUCN category as per CAMP Report (1998) : Lower risk- near threatened.

Remarks : No information is available on the virulence of its poison. When the snake is disturbed, it curls its tail and exhibits the red under surface.

*51. *Naja naja naja* (Linnaeus)

1758. *Coluber naja* Linnaeus Syst Nat. 10th ed : 221.

1943. *Naja naja naja* (Linnaeus), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 427-428.

1983. *Naja naja naja* (Linnaeus), Daniel, *The Book of Indian Reptiles* : 112-114.

2000. *Naja naja naja* (Linnaeus), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 288.

Common Name : English : Indian Cobra; Marathi name : Naag.

Diagnostic characters : Indian Cobra possesses all the characters mentioned for Suborder Serpentes and Family Elapidae. Genus *Naja*, cobra, includes deadly poisonous snakes with anterior ribs elongated. Neck can be expanded into a hood; a single minute tooth is present on maxilla behind the fangs. Body scales oval, smooth and arranged in an oblique fashion, particularly in the anterior half of the body. Subcaudal shields are divided. Cobras reach to a maximum length of 1211-1515 mm in males and 1294-1515 mm in females. Head is quite wide expanded, heavy and slightly distinct from neck. Eyes moderately large with round pupil. Scales are 25-35 across neck, 21-25 in middle and 15-17 in front of vent. Ventral shields 176-200, while subcaudals are 48-75 in number. Hemipenis forked and reaches upto 10th caudal plate. Dorsal colouration extremely variable with or without any markings on the hood. However, *Naja naja naja* is a spectacled or binocellate species. They are yellowish, brownish or even black (melanistic form) or albinistic in colour. Apart from typical binocellate markings, the hood may also possess one or two black crossbar below the hood. Ventrals are butter yellow to pale gray in colour.

Locality : One specimen has been displayed in Chikhaldara museum. Two live specimens were sighted in Dhakna and Raipur regions of Melghat Tiger Reserve areas by ZSI survey parties during project period.

Distribution : Peninsular India.

Habitat : Eclectic habit. Found almost anywhere except deserts, in heavy forest, cultivated land, populated urban areas etc. White ant nests holes in the ground or the tangle of tree roots are favoured habitats. Frequently found near water, strong swimmer. Usually not aggressive but timid in behaviour. Occasionally fierce and aggressive when disturbed. When alarmed, it adopts popular pose with erect forebody and flat hood. It can raise its 1/3rd body. Makes hissing sound. Sometimes the poison is ejected as a spray for quite a long distance by a forceful thrust (Spitting by Cobra). Nocturnal species, feeding on rats, frogs, toads, birds, lizard and other snakes.

Status : The population has been reduced drastically on account of habitat destructions, killings and trade (Daniel, 1983 and Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule II Part II, CITES Appendix : II IUCN Category as per CAMP Report Lower risk-near threatened.

Remarks : Cobra poison acts mainly as a neurotoxin and also as a blood and cell destroyer. The Cobra bite is not fatal at all times. The effect depends on the quantity of venom injected, natural resistance of victim and various other factors. The lethal dose is 15-17.5 mgm for an adult human being. Two live melanistic forms of cobra were sighted in Raipur - Rangubely areas of Melghat Tiger Reserve by ZSI Survey parties during the project period. Cobras are killed indiscriminately on a very large scale for illegal trade of their skins (Pradhan, 1997).

Family VIPERIDAE

*52. *Vipera russelli* (Shaw)

1797. *Coluber russelli* Shaw, *Nat. Misc.*, : viii : 291.

1943. *Coluber russelli* (Shaw), Smith, *Fauna of British India : Reptilia and Amphibia* : Vol. III : *Serpentes* : 482-483.

1983. *Coluber russelli* (Shaw), Daniel, *The Book of Indian Reptiles* : 121 - 123.

2000. *Coluber russelli* (Shaw), Sharma, *Fauna of Gujarat, State Fauna Series, 8* (Part I) (Vertebrates) : 294.

Common Name : English : Russell's viper; Marathi name : Ghonas.

Diagnostic characters : Viper species under Family Viperidae possess all characters mentioned for the Suborder Serpentes. However, coronoid bone is absent, poison fangs are present in upper jaw, maxillary bone is quite short bearing fangs only, pupil elliptically vertical and ventrals almost as broad as the body in Family Viperidae. Poison fangs are large, erectile and tube like. Anterior skull bones flexible. Head is quite distinct from the neck and covered with small scales. Eyes not in contact with the labials. There is no pit between eye and nostril which is lateral in position in Genus *Vipera*. Dorsal body scales strongly keeled but not serrated in Russell's viper. Subcaudals divided, tail short. Head

rather long and wider than neck. Snout bluntly pointed. Rostral about twice as high as wide. Body stout dorsoventrally flattened. Scales in 25-29 : 27-33 : 21-23 rows, ventral shields 153-180, subcaudals 41 in males and 64 in females. Dorsal ground colour brown of varying shades with three series of large ovate spots, one vertebral and two costal. Spots brown in the centre surrounded successively by black and white or buff. Smaller spots may occur between the dorsal and side spots. Head with distinct dark patch behind. A dark stripe from eye to lip. A conspicuous white, buff or pink line from gape converges to form a V above snout. Belly white, whitish or yellowish with a few dark half moon marks on the margins of the anterior ventral. Maximum length of Russell's viper reaches upto 1500 mm.

Locality : One live specimen was sighted in Semadoh area of Melghat Tiger Reserve by ZSI survey party during the project period.

Distribution : Whole of India.

Habitat : Widely distributed but prefers open country. Russell's viper has been recorded upto 2100 mm. in other parts of the country. Normally sluggish and does not strike readily unless irritated. It bites with great malice. The fangs are movable and can be erected when the mouth is open. Viper's poison apparatus is also called as "Nature's hypodermic syringe" All viper species are viviparous. The poison acts as a depressor of the vasomotor centre and a destroyer of the blood targeting R.B.C. The lethal dose is about 42 mgm for an adult human being.

Status : The species is abundant in some areas, uncommon or rare or even missing in other areas (Daniel, 1983 and Sharma, 2000). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule II, Part II; IUCN Category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Nocturnal in behaviour. Feeds mainly on rodents, but diet also includes small mammals, birds, lizards, amphibians etc. The young are often cannibalistic.

Gayen (1999) considered Russell's viper as a species under another genus *Daboia*. However, the species has been treated here as *Vipera russeli* (Shaw) following Sharma (2000). Russell's viper is being killed indiscriminately on a very large scale for their skins for illegal trade in local, domestic and international market.

*53. *Echis carinatus* (Schneider)

1801. *Pseudoboa carinata* Schneider, *Hist. Amphibia*, ii : 285.

1943. *Echis carinatus*, (Schneider), Smith, *Fauna of British India : Reptilia and Amphibia*, Vol. III : *Serpentes* : 487-490.

1983. *Echis carinatus*, (Schneider), Daniel, *The Book of Indian Reptiles* : 124-125.

2000. *Echis carinatus*, (Schneider), Sharma, *Fauna of Gujarat, State Fauna Series*, 8 (Part I) (Vertebrates) : 294-295.

Common Name : English : Saw-scaled viper; Marathi name : Phoorsa.

Diagnostic characters : Saw-scaled viper possess all characters mentioned earlier for Suborder Serpentes and Family Viperidae. Saw-scaled viper is distinguished from other Indian snakes by the absence of shields on head, broad ventrals covering the whole belly and possession of undivided subcaudals. Body cylindrical, short and stout. Nostrils small and dorsolateral in position directing upwards. Head very distinct from neck. Eyes moderately large with vertical pupil. Maximum length of phoorsa snake is about 760 mm. Scales are small elongated and strongly keeled. Sometimes serrated on the flanks. They are arranged in 25–29 : 27–37 : 21–27 rows. Two outermost rows are largest. Ventral shields 132–185, while subcaudals 23–39 in number. Hemipenis is deeply forked and bears spines all over. Colour and pattern varies considerably. Pale brown, buff or tawny with dark brown or even blackish markings in the form of dark edged spots in a vertebral series connected to a light coloured inverted 'U' or 'V' shaped flank marks enclosing a dark area connected to each other forming a wavy line. Dorsum is with 28–36 spots. There is a cruciform or trident shaped mark on the head. Whitish below, uniform or spotted with brown. Poison fangs of saw-scaled viper are remarkably large for its size. The almond shaped poison glands are placed behind the eyes.

Locality : One specimen was collected from Dhakna area of Melghat Tiger Reserve by ZSI Survey party during the project period.

Distribution : Widely distributed in peninsular India.

Habitat : Terrestrial mainly inhabits arid and open broken scrub country. Fairly common along west coast area. An alert little snake. It is diurnal in habit and a good climber. It readily bites with smallest provocation. The striking posture is characteristic, a double coil in the form of a loop of figure '8' with its head in the centre. The hissing noise is produced due to friction of serrated scales on the flanks. Feeds largely on centipedes, scorpions, larger insects, mice, skinks, geckos and frogs.

Status : Common throughout its range (Daniel, 1983, and Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Poison of saw-scaled viper is supposed to be five times toxic as cobra venom and 16 times toxic of Russell's viper's venom. The lethal dose for man is believed to be 5 mgm. The poison destroys blood cells and lining of blood vessels. It acts as cardiac depressor and also as depressor of nerve cells. Saw-scaled vipers are killed indiscriminately on a very large scale for illegal trade of their skins.

***54. *Trimeresurus gramineus* (Shaw)**

1802. *Coluber gramineus* Shaw, *Genl. zool.*, iii : 420.

1943. *Trimeresurus gramineus* (Shaw), Smith, *Fauna of British India : Reptilia and Amphibia*, Vol. III : *Serpents* : 515–517.

1983. *Trimeresurus gramineus* (Shaw), Daniel, *The Book of Indian Reptiles* : 126.

2000. *Trimeresurus gramineus* (Shaw), Sharma, *Fauna of Gujarat, State Fauna Series, 8 (Part I) (Vertebrates)* : 295.

Common Name : English : Bamboo Pit viper; Marathi name : Hara Ghonas.

Diagnostic characters : Bamboo pit viper possesses all the characters mentioned earlier for Suborder Serpentes and Family Viperidae. Presence of deep pits between the preoculars and the loreal on lateral sides of the face is the characteristic feature of all the pit viper species and separates them from all other groups of snakes. The head is flattened and appears unduly broad owing to constricted neck. Body stout. Tail short tapering and prehensile. The length of bamboo pit viper reaches upto 745 mm. in males and 935 in females. Snout two times as long as the diameter of the eye which is moderately large with vertical pupil Iris golden. Scales of the body are in 21 : 21 : 15 rows and they are smooth or feebly keeled on posterior side. Scales on head are small, subequal, subimbricate and smooth. Ventral shields 145-175 in males and 164-177 in females. Subcaudals 55-71 in males and 57-62 in females. Hemipenis forked extended upto 11th to 12th caudal plate. Dorsal colouration grassy green and uniform or sometimes with small dark brown spots. Ventral side glossy white, yellow or greenish extending upto throat, chin and upper lip. A well defined white, bluish or yellowish line on flank usually present. Black or blackish markings on the head.

Locality : Smith (1943), Daniel (1983) and Sharma (2000) have reported occurrence of this species throughout the peninsular India. Hence, its occurrence has been assumed here also.

Distribution : Peninsular India.

Habitat : Terrestrial, arboreal and nocturnal. It's a snake of hill forests. Frequents low vegetation showing marked preference for bamboo. When provoked, it anchors itself firmly by its tail and hind body to a branch and takes shape of 'S' with rest of the body. Feeds mainly on small mammals, birds and lizards. It's poison's action is feeble but painful. No information is available on lethal dose.

Status : Not uncommon in its range of distribution (Daniel, 1983 and Sharma, 2000), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule : IV, IUCN category as per CAMP Report : Lower risk-near threatened.

Remarks : The threat to the survival of species is due to habitat loss for urbanisation.

There is a record of isolated collection of the North-East Indian species of pit viper (*Trimeresurus albolabris*) from Central Province (Nagpur) reported by Smith in 1943. Since then there is no further updated information available on its collection record from this region. Hence, the species has not been included in the present chapter following observations on its distribution by Murthy (1985).

DISCUSSION

Systematic list of reptilian species given above reports occurrence of 54 reptilian species/subspecies in Melghat Tiger Reserve area. As stated earlier the inventory is based on collection sighting and bibliographic records. 54 species/subspecies belonging to one crocodile family, three freshwater turtle families, seven lizard families and five snake families have been reported. Out of 54, 36 species/subspecies have been actually sighted and/or collected from the study area during the project period between 1991-1996. (About 66%). The inventory lists one species of crocodile, four species of freshwater turtles, twenty two species of lizards and twenty seven species of snakes (including six species of poisonous snakes). The list clearly indicates fairly rich diversity of the reptilian species. The species wise systematic account of the reptilian species reports, surprisingly, a fairly good Indian endemecity in the region. Fifteen Indian endemic species have been reported from Melghat Tiger Reserve. Distributional range have been extended upto this region in case of three species. The details of endemic reptilian species are as follows :

Order TESTUDINES

Family EMYDIDAE

1. Indian snail eating turtle : *Melanochelys trijuga trijuga* (Schweiger)

Family TRIONYCHIDAE

2. Souther flap shelled turtle : *Lissymus punctata granosa* (Schoepff)
3. Deccan soft shelled turtle : *Trionyx leithi* Gray.

Order SQUAMATA

Suborder SAURIA (Lacertilia)

Family GEKKONIDAE

4. Square spotted Gecko : *Hemidactylus gracilis* Blanford.
5. Reticulated Gecko : *Hemidactylus reticulatus* Beddome
(Ist collection record in the region and extension of its distributional range).
6. Dark spotted giant Gecko : *Hemidactylus maculatus* (Dum. & Bir.)
(Ist collection record in the region and extension of its distributional range).

Family AGAMIDAE

7. Forest calotes : *Calotes rouxi* Dum. & Bibr.
8. Common Indian Rock lizard : *Psammophilus blanfordanus* (Stoliczka).

Family SCINCIDAE

9. Bronzy oliv skink : *Mabuya innotata* (Blanford).
10. Five striped skink : *Mabuya trivittata* (Hard & Gray).
11. Malabar dotted skink : *Rjopa guntheri* (Peters)
(Ist collection record in the region and extension of its distributional range).

Suborder SERPENTES

Family TYPHLOPIDAE

12. Beaked blind snake : *Tuyphlops acutus* (Dum. & Bibr.)

Family COLUBRIDAE

13. Sand snake : *Psammophis longifrons* Boulenger.

Family VEPERIDAE

14. Saw-scaled viper : *Echis carinatus* (Schneider)

15. Bamboo pit viper : *Trimeresurus gramineus* (Shaw)

When conservation status of the reptilian species under Indian Wildlife (Protection) Act (1972) (as amended upto 1991) was studied, it was seen that 31 species/subspecies out of 54 (57.4%) have been included in some or other schedules of Indian Wildlife (Protection) Act. The details, in brief, are as follows :

Wildlife Act Schedule	I (II)	II (II)	IV
CROCODYLIA	1	-	-
TESTUDINES	1	-	2
SQUAMATA (SAURIA)	-	2	-
SQUAMATA (SERPENTES)	1	4	20
TOTAL	3	6	22 = 31

Finally following conclusions can be drawn :

1. Melghat Tiger Reserve can boast of rich reptilian species diversity.
2. It can also boast of a fairly good representation of Indian endemic reptilian species.
3. Fairly large number of reptilian species (57.4%) have been included under some or other Wildlife (Protection) Act (1972 as amended upto 1991) Schedules.

ACKNOWLEDGEMENTS

The author is grateful to Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata, for giving him the opportunity to undertake the assignment. Thanks are also due to the Officer-in-Charge, Zoological Survey of India, Western Regional Station, Pune for providing the facilities.

REFERENCES

- AHMED, S. and DASGUPTA, G. 1992. Reptilia, In : *Fauna of West Bengal, State Fauna Series, 3* (Part 2) : 1-65.

- ANNONYMUS, 1991. *The Wildlife (Protection) Act, 1972 (As amended upto 1991)* : Natraj Publishers, Dehra Dun, In : Technical Association with WWF, Traffic India, 1-138.
- ANNONYMUS, 1998. *CAMP REPORT : Reptiles of India*. Publ. by Zoo Outreach Organisation and BSG. India, Coimbatore : 1-175.
- DANIEL, J.C. 1983. *The Book of Indian Reptiles*. Publ. by BNHS and Oxford University Press, Bombay : 1-141.
- DAS, INDRANEIL, 1995. *Turtles and Tortoises of India*. Publ. by WWF for Nature-India/ Oxford Univ. Press, Bombay : 1-176.
- GHOSH, A.K. 1994. *The Red Data Book of Indian Animals : Part 1 : Vertebrata*. Publ. by Director, Zoological Survey of India, Kolkata : 1-534.
- GOGATE, M.G., THOSARE, P.J. and BANUBAKODE, S.B. 1993. *Two Decades of Project Tiger Melghat (1973 -1993)*. Publ. by Melghat Project Tiger, Paratwada, 444805, India.
- MURTHY, T.S.N. 1985. Classification and distribution of the Reptiles of India. *The Snake* 17 : 48-71.
- PRADHAN, M.S. 1997. Illicit trade in Wildlife species, products and derivatives in Maharashtra State. *Rec. zool. Surv. India* : 96 (1-4) : 195-210.
- SHARMA, R.C. 1998. *The Fauna of India and the adjacent countries, Reptilia* : Vol. 1, Publ. by Director, Zoological Survey of India, Kolkata : 196 pp.
- SHARMA, R.C. 2000. Reptilia In : *Fauna of Gujarat, State Fauna Series, 8 (Part 1), Vertebrates* : 243-297.
- SMITH, M.A. 1931. *The fauna of British India including Ceylon and Burma. Reptilia and Amphibia* Vol. 1 : *Loricata and Testudines*. Publ. by Francis and Taylor, London : 1-185.
- SMITH, M.A. 1935. *The fauna of British India including Ceylon and Burma. Reptilia and Amphibia* Vol. 2 : *Sauria* : 1-440. Publ. by Francis and Taylor, London.
- SMITH, M.A. 1943. *The fauna of British India including Ceylon and Burma. Reptilia and Amphibia* Vol. 3 : *Serpentes* : 1-583. Publ. by Francis and Taylor, London.
- TIKADER, B.K. and SHARMA, R.C. 1985. *Handbook of Indian Testudines* Publ. by Zoological Survey of India, Kolkata (Reprint Ed. 1997) : 1-156.
- TIKADER, B.K. and SHARMA, R.C. 1992. *Handbook : Indian lizards*. Publ. by Zoological Survey of India, Kolkata : 1-250.

AMPHIBIANS

SATISH S. KAMBLE

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

Melghat is located in the southern Satpuda ranges and is formed of Hills and valleys of the Gavilgarh Hills. The hills slope down steeply towards Amravati on the South. On the northern side, however, there are steps of hills and valleys with a gradual slope and two prominent plateaus viz. The Chikhaldara and Vairat. These areas on the northern side of the Gavilgarh receive less sunlight as compared to the southern side, due to this more amount of moisture is retained in the soil and the forest stays greener for a longer period of time. There are a number of hill streams draining into the Tapi river. Sipna, Khapra and Gadga are the major tributaries of Tapi flowing through Melghat. These rivers have rocky beds and clear fast flowing waters. The depth varies from about six inches to four feet. There is enough water in them throughout the year and they do not dry up in the summer months. Thus there is ample water for the aquatic fauna as well as the amphibians, who require water bodies for completing their life cycles. The forest has enough moisture during the winter months which is ideal for the survival of the amphibians.

In India the work on amphibians has been started by Boulenger (1890), thereafter a number of workers studied the amphibians in the Indian region viz. Inger & Dutta (1986), Chanda (1994), and Dutta (1997). Daniel (1963 a,b), (1975) and Daniel & Sekar (1989) have given a field guide of Amphibians from Western India in four parts from 1963 to 1989 and have mentioned the occurrence of 29 species of amphibians from state of Maharashtra. Yazdani and Mahabal (1976), Paranjape and Mulherkar (1979) have studied the amphibians from Pune district. Ravichandran and Pillai (1990) have studied amphibians of Maharashtra based on the collections from Zoological Survey of India, Western Regional Station, Pune. Sekar (1999) has given a list of 34 species of amphibians from Maharashtra. Padhye and Ghatge (2002) have listed 43 species of amphibians from Maharashtra.

SYSTEMATIC LIST

Phylum CHORDATA
 Class AMPHIBIA
 Order ANURA
 Family BUFONIDAE

1. **Bufo stomaticus* Lutken.
2. **Bufo melanostictus* Schn.

Family MICROHYLIDAE

3. **Microhyla ornata* (Dum. & Bibr.)

Family RANIDAE

4. **Hoplobatrachus tigerinus* (Daudin)
5. **Euphlyctis cyanophlyctis* (Schn.)
6. **Limnonectes limnocharis* (Gravenhorst.)
7. **Sphaerotheca breviceps* (Schn.)

Family RHACOPHORIDAE

8. **Polypedates maculatus* (Gray.)

SYSTEMATIC ACCOUNT

Class AMPHIBIA
 Order ANURA

Key to the families of ANURA

1. Jaws Toothless 2
- Upper jaw toothed 3
2. Skin rough with well developed warts parotid glands present..... BUFONIDAE
- Skin Smooth, parotid glands absent..... MICROHYLIDAE
3. No intercalary ossification between the penultimate and distal phalanges RANIDAE
- Intercalary ossification between the penultimate and distal phalange present RHACOPHORIDAE

Family BUFONIDAE

Key to the species of the Genus *Bufo*

- Head without bony ridges *stomaticus*
 Head with bony ridges *melanostictus*

1. *Bufo stomaticus* Lutken
(Marbled Toad)

1862. *Bufo stomaticus* Lutken, Vidensk Meddr. Dansk naturh. Foren, 14 : 305
 1920. *Bufo stomaticus peninsularis* Rao, J. Bombay nat. Hist. Soc., 27(1) : 119-127.
 1883. *Bufo andersonii* Boulenger, Ann. Mag. Nat. Hist., 3(12) : 163
 1871. *Bufo pantherinus* Anderson, Proc. Zool. Soc. : 149.

Head without bony ridges, first finger longer than second, Toes 2/3 webbed, two metatarsal tubercles. Skin smooth above with a few tubercles, dorsum greyish brown in colour. Skin Ventrally granular on the belly, chin smooth, and dull white in colour.

Materials examined : Devalghat (Tapi river), 29.11.94, 2exs.

Distribution : Assam, Bihar, Himachal Pradesh, Karnataka, Jammu and Kashmir, Maharashtra, Orissa, and West Bengal.

2. *Bufo melanostictus* Schn.
(Common Indian Toad)

1799. *Bufo melanostictus* Schnieder, Hist. Amph., 1 : 216.
 1803. *Bufo scaber* Daudin, Hist. Rain. : 94.
 1803. *Bufo bengalensis* Daudin, Hist. Rain. : 96.

Head, upper lip, tips of fingers, toes and metatarsal tubercles with prominent bony ridges. Tympanum 2/3 diameter of the eye. First finger usually longer than the second. Skin with spine tipped warts. Colour of the dorsal side varying from greyish to brownish. Venter whitish with black striplings on the chin.

Materials examined : Jawaharkund, 8.2.92, 8exs, 18.11.94, 1ex., 11.9.96, 5ex.; Bori, 5.12.92, 1ex.; Raipur, 6.2.92, 1ex.; Khandukheda, 7.2.92, 1ex.; Pili village, 23.11.92, 1ex.; Makhla, 13.9.96, 2ex.; Pipalpadav, 16.9.96, 1ex.; Chikhaldara, 15.9.96, 3ex.; Surajbandh, 19.11.94, 1ex.; Ambadoh, 18.9.96, 2ex.

Distribution : Throughout the Indian subcontinent and Malaysia.

Family MICROHYLIDAE

3. *Microhyla ornata* (Dumeril and Bibron.)
(Ornate Microhylid)

1841. *Engystoma ornatum* Dumeril and Bibron, Erp. Gén., 8 : 745.
 1858. *Diploelma ornatum* Gunther, Günther Rept. B. I. : 417.
 1882. *Microhyla ornata* Boulenger, Cat. Batr. Sal., 165.

1854. *Engystoma carnaticum* Jerdon, 1854, J. Asiatic Soc. Bengal, 534.

1870. *Diplopelma carnaticum* Stoliczka, J. Asiatic Soc. Bengal, 39 : 154.

Small frogs of about 23 mm snout to vent length. Mouth narrow, Toes feebly webbed, two metatarsal tubercles present. Heels meet when the legs are held at right angle to the body. Coloured characteristically with peculiar shapes on the back giving it an ornate look, belly and underparts white.

Materials examined : Kuwapati, 17.11.94, 2exs.

Distribution : Throughout Southeast Asia.

Family RANIDAE

Key to the genera of RANIDAE

1. Inner metatarsal tubercle enlarged, shovel shaped *Sphaerotheca*
- Inner metatarsal tubercle not shovel shaped 2
2. Toes webbed completely 3
- Toes half webbed *Limnonectes*
3. Skin of back with longitudinal folds *Hoplobatrachus*
- Skin of back with warts *Euphlyctis*

4. *Sphaerotheca breviceps* (Schnieder.)

(Indian Burrowing Frog)

1799. *Rana breviceps* Schneider,

1829. *Rana variegata* Gravenhorst,

1853. *Pyxicephalus fodiens* Jerdon,

1853. *Pyxicephalus pluvialis* Jerdon,

1858. *Sphaerotheca strigata* Gunther,

1858. *Tomopterna delandii* Gunther,

1864. *Tomopterna strigata* Gunther,

1864. *Pyxicephalus breviceps* Gunther,

1985. *Tomopterna breviceps* Frost,

1986. *Tomopterna (Sphaeroteca) breviceps* Dubois,

Medium sized Frogs. Snout short and rounded, tympanum $\frac{3}{5}$ the diameter of the eye, first finger longer than the second, tibiotarsal articulation reaches shoulder, toes $\frac{3}{4}$ webbed, inner metatarsal tubercle large, crescent shaped and equal in length to the

inner toe. Skin smooth or finely granular on the back, coarsely granular on the belly and thighs. Colour grayish above with white marblings. Thighs marbled with yellow ventrally, throat sometimes brownish, rest of the venter white.

Materials examined : Jawaharkund, 8.2.92, 2exs., 15.2.92, 1ex.; Pipal Padav, 5.2.92, 1ex.; Hatru, 3.8.93, 3exs.; Chikalpati, 23.8.93, 2exs.; Dhakna, 27.2.97, 1ex.; Tapi river (Devalghat), 2exs.

Distribution : Throughout the Indian Peninsula, Nepal, Mynmar, Shri Lanka.

5. *Limnonectes limnocharis* (Gravenhorst) (Indian Cricket Frog)

- 1829. *Rana limnocharis* Gravenhorst,
- 1853. *Rana agricola* Jerdon,
- 1904. *Rana limnocharis* Boulenger,
- 1872. *Rana lymnocharis* Stoliczka,
- 1915. *Fejervarya limnocharis* Bolkay,
- 1930. *Rana limnocharis limnocharis* Mortens,
- 1974. *Rana (Dicroglossus) limnocharis* Dubois,
- 1980. *Rana (Euphlictis) limnocharis* Dubois,
- 1984. *Rana (Fejervarya) limnocharis* Dubois,
- 1986. *Limnonectes (Fejervarya) limnocharis* Dubois,
- 1992. *Limnonectes limnocharis* Dutta,

Small sized frogs, toes are only half webbed, first finger longer than the second, tibiotarsal articulation reaches the nostril when the legs are held alongside of the body. Skin warty above, grayish or brownish coloured with darker markings and a dorsal vertebral band.

Materials examined : Turna River, 16.2.92, 2exs.; Rangubeli, 11.2.91, 1ex., 13.2.92, 3exs.; Chikhaldara, 11.2.92, 6exs.; Hatida, 13.2.91, 6exs.; Dhakna, 18.2.92, 3exs., 10.12.92, 2exs., 27.11.94, 2exs., 26.6.96, 5exs.; Pipalpadav, 5.2.92, 5 exs.; Chaurakund, 12.2.92, 1ex.; Gadga, 17.2.92, 1ex, 1.3.97, 8exs.; Khandukheda 7.2.92, 6exs., 10.2.93, 8exs.; Kelpani, 29.3.94, 3exs., 26.11.94, 6exs.; Khedida (Koktu), 28.3.94 1ex.; Chaddu Pada, 4.4.94, 1ex.; Kove village (Raipur), 1.4.94, 12exs.; Gurgi Pati, 27.3.94, 5exs.; Hatru, 31.8.93, 3 exs., 30.8.93, 1ex.; Pir Kheda, 22.8.93, 1ex.; Chamarudhada, 17.11.94, 2exs.; Motha, 14.9.96, 3exs.; Motideo Nullah, 19.2.93, 3exs.; Katang Bamboo, 19.2.97, 4exs.; Paratwada Road, 12.9.96, 1ex.; Dharni Road, 25.2.97, 7exs., 14.9.96, 5exs.; Chipidoh, 18.2.93, 1ex.; Andhar Ban, 22.2.97, 2exs.; Ambadoh, 24.2.97, 1ex.; Kuwapati, 17.11.94, 1ex.

Distribution : Throughout the Indian Union.

6. *Hoplobatrachus tigerinus* (Daudin)
(Indian Bull Frog)

1803. *Rana tigerina* Daudin,
1882. *Rana tigrina* Boulenger,
1834. *Rana brama* Lesson,
1852. *Rana malabarica* Kelaart,
1853. *Rana crassa* Jerdon,
1829. *Rana cancrivora* Gravenhorst,
1835. *Rana vittigera* Weigmann,
1986. *Limnonectes (Hoplobatrachus) tigerinus* Dubois,
1992. *Limnonectes tigerinus* Dutta,
1992. *Hoplobatrachus tigerinus* Dubois,

Large sized amphibians. Skin with longitudinal folds dorsally, ventrally smooth. tympanum equal to the eye in diameter, toes fully webbed, colour Olive green above with a vertebral streak, limbs spotted, ventrally white.

Materials examined : Bori, 5.12.92, 1ex.; Raipur, 20.12.92, 1ex.; Pipal Padav, 16.9.96, 2exs.; Paratwada Road, 12.9.96, 1ex.; Dharni Road, 27.9.96, 6exs.

Distribution : Throughout India, China and Shri Lanka.

7. *Euphlyctis cyanophlyctis* (Schnieder)
(Skipper Frog)

1799. *Rana cyanophlyctis* Schneider,
1852. *Rana bengalensis* Kelaart,
1841. *Rana leschenaultii* Dumeril and Bibron,
1860. *Dicroglossus adolfi* Gunther,
1986. *Occidozyga cyanophlyctis* Dubois,
1992. *Euphlyctis cyanophlyctis* Dubois,

Medium sized frogs, first and second fingers equal, snout rounded, toe tips swollen and rounded, toes fully webbed, a line of porous warts on the flanks, fingerlike metatarsal tubercles, skin warty dorsally, a 'U' shaped line of warts around anus, ventrally smooth. Colour olive green above with darker marblings, ventrally white. Some specimens show dark marblings on the underside.

Materials examined : Jawaharkund, 8.2.92, 2exs., 15.12.92, 8exs., 18.11.94, 2exs., 11.2.93, 10exs.; Turna, 16.2.91, 1ex.; Rangubeli, 11.2.91, 1ex., 14.2.92, 1ex., 13.2.92, 3exs.; Dhakna

18.2.92, 3exs., 13.3.94, 4exs.; Pili, 9.2.92, 1ex., 23.11.94, 3exs., Chaurakund, 13.2.91, 7exs., 31.8.93, 1ex., 15.12.92, 10 exs.; Kolkaz, 5.2.92, 5exs., 10.2.92, 2exs., 13.2.93, 7exs., 22.11.94, 4exs.; Semadoh, 5.2.92, 2exs., 6.2.92, 3exs., 19.2.97, 4exs.; Kuwapati, 9.2.91, 2exs.; Dedra Koda, 8.12.92, 2exs.; Dhargad, 4.12.92, 1ex.; Gullarghat, 7.12.92, 2exs.; Gavilgadh, 19.12.92, 10exs., 22.9.96, 6exs.; Raipur, 6.2.92, 7exs.; Siddukund, 17.2.92, 1ex., 24.2.93, 1ex.; Dhakna, 17.2.91, 1ex.; Belkund, 5.4.94, 2exs.; Koktu, 30.3.94, 4exs., 21.2.93, 4exs., 1.3.97, 1ex.; Bandar Koi, 6.4.94, 3exs.; Churni tank, 3.4.94, 1exs.; Lawada Tank, 6.4.94, 3exs.; Dhakna 13.3.94, 4exs.; Chaurakund, 31.8.93, 1ex.; Chikalpati, 23.8.93, 4exs.; Katunga, 29.11.94, 4exs.; Kund village, 30.11.94, 2exs.; Bhumka Baba temple, 23.11.94, 8exs.; Khandu kheda, 20.11.94, 8exs., 10.2.93, 6exs.; Sedukund, 25.2.97, Gadga, 26.11.94, 2exs., 25.2.93, 4exs.; Gobya Nullah, 19.2.93, 2exs.; Chaurakund, 5.12.92, 10exs.; Motideo Nullah, 19.2.93, 7 exs.; Chadulipuri, 14.2.93 5exs.; Rangubeli, 14.2.92, 1exs.; Talai, 15.2.93, 10exs.; Hatida, 24.11.94. 4exs.; Imlipada, 24.2.97, 6e4xs.; Chipidoh, 8.2.93, 1 ex.; Chikhaldara, 15.9.96, 2exs., 12.2.93, 10exs.; Surajbandh, 19.11.94, 1ex.; Telapari, 17.2.93, 2 exs.; Dolar River, 23.2.93, 6exs.; Salona-Masundi, 20.9.96, 4exs.; Khapra River (Khopda), 30.11.94, 2exs.; Khapra River (Rangubeli), 1.12.94, 3exs.

Distribution : Throughout India, Shri Lanka and Nepal.

Family RHACOPHORIDAE

8. *Polypedates maculatus* (Gray) (Common Tree Frog)

- 1834. *Hyla maculata* Gray,
- 1841. *Polypedates leucomystax* Dumeril and Bibron,
- 1864. *Polypedates maculatus* Gunther,
- 1871. *Polypedates biscutiger* Peters,
- 1882. *Rhacophorus maculatus* Boulenger,
- 1931. *Rhacophorus (Rhacophorus) maculatus* Ahl,
- 1986. *Rhacophorus (Rhacophorus) maculatus biscutiger* Dubois,

Slender frog of a medium size. Vomerine teeth in two equal rows, tympanum $\frac{3}{4}$ th the diameter of the eye. First finger equal to the second, toes $\frac{3}{4}$ th webbed. Tips of the fingertips with discs, inner metatarsal tubercle prominent. Skin smooth above and granular on belly and thighs. Colour yellowish above with darker spots.

Materials examined : R.H. Kolkaz., 13.2.92, 1ex.

Distribution : Throughout India, Except Haryana, Punjab and Rajasthan.

DISCUSSION

There are altogether 8 species commonly found in Melghat Tiger Project area belonging to 7 genera 4 families of the order Anura. *Euphlyctis cyanophlyctis* (Schneider) and *Limnonectes limnocharis* (Gravenhorst) are the most common species found throughout Melghat. *Hoplobatrachus tigerinus* (Daudin) and *Bufo melanostictus* Schneider are fairly common, whereas the rest of the four species have a patchy distribution throughout the park.

REFERENCES

- BOULENGER G. A. 1890. *Fauna of British India including Ceylon and Burma, Reptilia and Batrachia*. London.
- CHANDA S. K. 1994. Hand Book – *Indian Amphibians*. Zoological Survey of India, Kolkata. 1-275
- DANIEL J.C. 1963a. *Field guide to the Amphibians of western India*, Part –I, *J. Bombay nat. Hist. Soc.*, 60(2) : 415-438.
- DANIEL, J.C. 1963b. *Field guide to the Amphibians of western India*, Part II, 60(3) : 690-702.
- DANIEL, J.C. 1975. *Field guide to the Amphibians of western India*, Part III, 72(2) : 506-552.
- DANIEL J.C. & SEKAR A.G. 1989. *Field guide to the Amphibians of western India*, Part IV, Vol., 86 : 194-202.
- DUTTA S.K. 1997. *Amphibians of India and Shri Lanka* (Checklist and bibliography). Odyssey publication house, Bhubaneshwar, Orissa, India, : 1-342.
- INGER R.F. & DUTTA S.K. 1986. *An overview of the Amphibian Fauna of India*. *J. Bombay nat Hist. Soc.*, 83 (Suppl.) : 135-145.
- PADHYE A. D. & GHATE H. V. 2002. *An overview of Amphibian fauna of Maharashtra*. *Zoos'print*, 17(3) : 735-740.
- PARANJAPE S.Y. & MULHERKAR. 1979. On the survey of Amphibian fauna in and around Pune. *Journal of the University of Poona, Science and Technology*, 52 : 423-434.
- RAVICHANDRAN M. S. & PILLAI R. S. 1990. Amphibia of Maharashtra with description of a new species of Torrent Toad Ansonia. *Rec. zool Surv. India*, 86 : 505-513.
- SEKAR A.G. 1999. Four new records and a checklist of Amphibians of Maharashtra. *J. Bombay nat. Hist. Soc.*, 96(1) : 152-157
- YAZDANI G. M. & A. MAHABAL. 1976. Amphibians of Poona. *Newsletter zool. Surv. India*, 2 : 138-139.

PISCES

B.E. YADAV

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

Melghat Tiger Reserve is a wonderful assemblage of various ecosystems, a fully protected forest sustaining piscine fauna. There are many hillstreams, nallas, lakes, rivulets and rivers mostly tributaries of the West flowing river Tapi *e.g.* Khandu, Khapra, Sipna, Gadga, Dollar. The ichthyofauna of Melghat is also bestowed with the tributaries of the East flowing river Godavari *viz.* Wardha, Vainganga etc.

The present study is based on 8 surveys of M.T.P. by various survey parties of Western Regional Station, Zoological Survey of India (1991-1994). The ichthyofauna herein is represented by hillstream fishes like *Noemacheilus* sp., *Garra* sp., primary freshwater fishes *viz.* *Puntius* sp; *Danio* sp; *Barilius* sp; *Rasbora* sp. etc. Surface feeders and major carps Catla column dweller Rohu and bottom dweller Mrigal and snakeheads (*Channa* sp.), spiny eel *Mastacembelus* sp. and various food fishes, game fishes, aquarium fishes and larvivorous fishes inhabit water bodies of Melghat.

The previous work of Gujar (1992) indicates that Garilgarh Ridges of Melghat occupy 24 species of fishes, while comprehensive account by Pradhan (1997) infolds interesting ichthyofauna of Wardha river basin, Chandrapur Dist. comprising 72 species.

The present ichthyofaunal account submits 96 species under 52 genera belonging to 19 families and 8 orders of which 43 species have actually been collected and the remaining 53 are updated from the literature.

For identification of Fishes, Sykes (1841), Day's plate (1875-1878), Day's fauna (1889) and latest books like Jayaram (1981, 1991), Talwar and Jhingran (1991), Menon (1987, 1999), Yazdani (1990) have been consulted.

SYSTEMATIC LIST

(Asterics indicate species actually collected)

Phylum	CHORDATA
Class	PISCES
Subclass	ACTINOPTERYGII
Infra class	TELEOSTEI
Super order	ELOPOMORPHA
order	ANGUILLIFORMES
Suborder	ANGUILLOIDEI
Family	ANGUILLIDAE
1. *Anguilla bengalensis* (Gray)

Super order	CLUPEOMORPHA
Order	CLUPEIFORMES
Family	CLUPEIDAE
Subfamily	DOROSOMATINAE
 2. *Goniolosa manmina* (Ham-Buch.)

Super order	OSTEOGLOSSOMORPHA
Order	OSTEOGLOSSIFORMES
Family	NOTOPTERIDAE
 3. *Chitala Chitala* (Ham-Buch.)
 4. **Notopterus notopterus* (Pallas)

Superorder	OSTARIOPHYSI
Order	CYPRINIFORMES
Family	CYPRINIDAE
Subfamily	CULTRINAE
 5. *Chela dadiburjori* (Menon)
 6. *Chela laubuca* (Ham-Buch.)
 7. *Salmostoma bacaila* (Ham-Buch.)
 8. **Salmostoma boopis* (Day)
 9. **Salmostoma clupeoides* (Bloch)
 10. **Salmostoma novacula* (Valenciennes)
 11. **Salmostoma untrahi* (Day)

Subfamily	RASBORINAE
 12. *Amblypharyngodon mola* (Ham-Buch.)

13. *Aspidoparia morar* (Ham-Buch.)
 14. **Barilius barna* (Ham-Buch.)
 15. **Barilius bendelisis* (Ham-Buch.)
 16. **Barilius gatensis* (Valenciennes)
 17. **Barilius vagra* (Ham-Buch.)
 18. **Danio rerio* (Ham-Buch.)
 19. **Danio aequipinnatus* (McClelland)
 20. **Danio devario* (Ham-Buch.)
 21. *Esomus danricus* (Ham-Buch.)
 22. **Parluciosoma daniconius* (Ham-Buch.)
- Subfamily CYPRININAE
23. *Thynnichthys sandkhol* (Sykes)
 24. **Neolissolcheilus hexagonolepis* (McClelland)
 25. **Tor khudree* (Sykes)
 26. **Tor tor* (Ham-Buch.)
 27. *Osteobrama cotio cotio* (Ham-Buch.)
 28. *Osteobrama vigorsii* (Sykes)
 29. *Puntius amphibius* (Val.)
 30. *Puntius chola* (Ham-Buch.)
 31. **Puntius conchoni* (Ham-Buch.)
 32. **Puntius sophore* (Ham-Buch.)
 33. **Puntius ticto* (Ham-Buch.)
 34. **Barbodes carnaticus* (Jerdon)
 35. *Barbodes sarana sarana* (Ham-Buch.)
 36. *Hypselobarbus curmuca* (Ham-Buch.)
 37. **Catla catla* (Ham-Buch.)
 38. *Cirrhinus cirrhosa* (Bloch).
 39. *Cirrhinus mrigala* (Ham-Buch.)
 40. **Cirrhinus reba* (Ham-Buch.)
 41. *Labeo bata* (Ham-Buch.)
 42. **Labeo boggut* (Sykes)
 43. **Labeo calbasu* (Ham-Buch.)
 44. *Labeo gonius* (Ham-Buch.)
 45. *Labeo potail* (Sykes)

46.	<i>Labeo fimbriatus</i> (Bloch)		
47.	<i>Labeo rohita</i> (Ham-Buch.)		
		Subfamily	GARRINAE
48.	* <i>Garra mullya</i> (Sykes)		
49.	* <i>Garra gotyla gotyla</i> (Gray).		
50.	<i>Crossocheilus latius latius</i> (Ham-Buch.)		
		Family	BALITORIDAE
		Subfamily	NOEMACHEILINAE
51.	* <i>Noemacheilus botia</i> (Ham-Buch.)		
52.	* <i>Noemacheilus d. denisoni</i> Day		
53.	* <i>Noemacheilus elongatus</i> (Hora)		
54.	* <i>Noemacheilus evezardi</i> Day		
55.	* <i>Noemacheilus keralensis</i> (Rita & Nalbant)		
56.	* <i>Noemacheilus multifasciatus</i> Day		
		Family	COBITIDAE
		Subfamily	COBITINAE
57.	* <i>Lepidocephalus guntea</i> (Ham-Buch.)		
58.	<i>Lepidocephalus thermalis</i> (Val.)		
		Order	SILURIFORMES
		Family	BAGRIDAE
59.	<i>Rita pavimentata</i> (Valenciennes)		
60.	<i>Rita chrysea</i> Day		
61.	<i>Aorichthys aor</i> (Ham-Buch.)		
62.	<i>Aorichthys seenghala</i> (Sykes)		
63.	<i>Mystus bleekeri</i> (Day)		
64.	<i>Mystus cavasius</i> (Ham-Buch)		
65.	* <i>Mystus oculatus</i> (Valenciennes)		
66.	<i>Mystus vittatus</i> (Bloch)		
		Family	SILURIDAE
67.	* <i>Ompok bimaculatus</i> (Bloch)		
68.	<i>Wallago attu</i> (Schneider)		
		Family	SCHILBEIDAE
		Subfamily	AILINAE
69.	<i>Ailia coila</i> (Ham-Buch.)		

	Subfamily	SCHILBEINAE
70.	<i>Clupisoma garua</i> (Ham-Buch.)	
71.	<i>Eutropiichthys gongwaree</i> (Sykes)	
72.	<i>Eutropiichthys vacha</i> (Ham-Buch.)	
73.	<i>Proeutropiichthys taakree</i> (Sykes)	
74.	<i>Pseudotropius atherinoides</i> (Bloch)	
75.	<i>Silonia childreni</i> (Sykes)	
76.	<i>Silonia silondia</i> (Ham-Buch.)	
	Family	PANGASIIDAE
77.	<i>Pangasius pangasius</i> (Ham-Buch.)	
	Family	SISORIDAE
78.	* <i>Bagarius bagarius</i> (Ham-Buch.)	
	Family	CLARIIDAE
79.	<i>Clarias batrachus</i> (Linn.)	
	Family	HETEROPNEUSTIDAE
80.	<i>Heteropneustes fossilis</i> (Bloch)	
	Order	ATHERINIFORMES
	Family	BELONIDAE
81.	* <i>Xenentodon cancila</i> (Ham-Buch.)	
	Series	PERCOMORPHA
	Suborder	PERCOIDEI
	Order	PERCIFORMES
	Family	AMBASSIDAE
82.	<i>Chanda nama</i> (Ham-Buch.)	
83.	* <i>Pseudambasis ranga</i> (Ham-Buch.)	
84.	<i>Pseudambasis baculis</i> (Ham. Buch.)	
	Family	NANDIDAE
	Subfamily	NANDINAE
85.	<i>Nandus nandus</i> (Ham-Buch.)	
	Subfamily	BADINAE
86.	* <i>Badis badis</i> (Ham-Buch.)	
	Family	MUGILIDAE
87.	<i>Rhinomugil corsula</i> (Ham-Buch.)	

Suborder GOBIOIDEI

Family GOBIIDAE

88. *Glossogobius giuris* (Ham-Buch.)

Family CHANNIDAE

89. **Channa orientalis* Bloch & Schneider).

90. *Channa punctatus* (Bloch)

91. **Channa striatus* (Bloch.)

92. *Channa marulius* (Ham-Buch.)

93. **Channa stewartii* (Playfair)

Order Synbranchiformes

Family MASTACEMBELIDAE

94. *Macrogathus aral* (Bloch & Schneider)

95. **Mastacembelus a. armatus* (Lacepede)

96. *Mastacembelus pancalus* (Ham-Buch.)

SYSTEMATIC ACCOUNT

Class PISCES

Subclass ACTINOPTERYGII

Infra class TELEOSTEI

Super order ELOPOMORPHA

Order ANGUILIFORMES

Sub order ANGUILLOIDEI

Family ANGUILLIDAE

1. *Anguilla bengalensis* (Gray)

1831. *Muraena bengalensis* Gray, *Ind. zool.*, III. pl. 95, Fig. 5. (Type-locality : The Ganges).

1999. *Anguilla bengalensis* (Gray), Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Indian long finned eel.

Marathi Name : Vam Ahir.

Diagnostic characters : Elongated, cylindrical body, gill openings near the base of pectoral fins. Dorsal fin at midway between gill opening and origin of anal fin, with 220-305 rays, caudal continued round the end of tail, scales rudimentary embebed in the skin. Adult colouration variagated.

Distribution : India.

Elsewhere : Pakistan, Sri Lanka, Myanmar.

Remarks : This species is reported from Wardha river basin, which traverses through Amravati and Chandrapur Dists; confluences with Wainganga to form Pranhita and ultimately meets to the east flowing Godavari river. Occurs in streams, pools, reservoirs and in rivers descending to estuaries and to sea to spawn. Rarely occurs in mountain streams and pools. Its slimy, vascular, almost naked skin functions as accessory organ of breathing.

Superorder CLUPEOMORPHA

Order Clupeiformes

FAMILY CLUPEIDAE

Sub family Dorsomatinae

2. *Goniolosa manmina* (Ham-Buch.)

1832. *Clupanodon manmina* Hamilton, *Fish Ganges* : 247. (Type-locality : The Ganges).

1991. *Goniolosa manmina*, Talwar & Jhingran, *Inland Fishes*, I : 107-108.

Common Name : Gizzard shad.

Diagnostic characters : Moderately to very deep body, belly fully scuted. Upper jaw slender at tip and turned down. Scales small, 51–71 in L. L. Colour : Silver shot with gold, with a dark spot behind gill openings.

Distribution : India (Ganga and other rivers of Orissa, U.P., W. Bengal and Assam) and Bangladesh.

Status : Declining in number.

Remarks : This reverine gizzard shad attains a length of 11.5 cms., inhabits large Himalayan rivers.

Super order OSTEOGLOSSIMORPHA

Order Osteoglossiformes

Family NOTOPTERIDAE

3. *Chitala chitala* (Ham-Buch.)

1822. *Mystus chitala* Hamilton, *Fish Ganges*, Pp. 236, 382. (Type-Localities : Larger freshwater rivers of Bengal)

1999. *Chitala chitala*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 Pp. (Checklist).

Common Name : Humped featherback.

Marathi Name : Chitala.

Diagnostic characters : oblong, laterally compressed body, abdomen with 28 pre-pelvic serrations. Eyes superior, not visible from below, Dorsal fin small inserted near middle of body with 7-8 rays. Anal fin long, ribbon like, with 100 –110 rays, confluent with the caudal. Lateral line with 180 scales, Gape of mouth extending beyond hind edge of orbit.

Distribution : India.

Elsewhere : Pakistan, Bangladesh and Myanmar.

Status : It is declining in number. **Remarks :** The species differs from its congener by having strongly humped back.

4. **Notopterus notopterus* (Pallas)

1769. *Gymnotus notopterus* Pallas, *Spicil Zool.*, 7 : 40, Pl 6, Fig.2. (Type locality : Ponds and rivers of Bengal).

1999. *Notopterus notopterus*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Chalat patre, feather back.

Marathi Name : chalat, patri.

Diagnostic characters : Teeth present on jaws, scales on head, preorbital serrated, Gape of mouth does not extend hind part of orbit. Dorsal profile curved, but not humped.

Material examined : 1 ex., Tapi river, Rangubeli, D.F. Singh, 11-2-1991.

Distribution : India.

Elsewhere : Nepal, Pakistan, Bangladesh, Myanmar, Malaya, Thailand, Indonesia.

Status : Declining in number.

Remarks : This carnivorous fish thrives well in lentic waters. Its soup is good for measles.

Range : 120 mm.

5. *Chela dadiburjori* (Menon).

1952. *Laubuca dadiburjori* Menon, *Rec. Indian Mus.*, 49 : 1. (Type locality : Cochin, Kerala).

1999. *Chela dadiburjori*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Dadio.

Marathi Name : Chilwas.

Diagnostic characters : Short, cylindrical body, abdomen rounded, head large, snout short, eyes large and laterally placed. A knob at the symphysis of lower jaw absent.

Predorsal scales do not extend to inter orbital space. Lateral line incomplete or absent. A broad moniliform dark strip, interrupted, present from opercle to caudal base.

Distribution : India : West Coast : Nagarcoil to Goa. Wardha river (Pradhan, 1997).

Status : Rarely occurring.

Remarks : It is interesting that this species inhabiting waters of Western Ghats, occurred in the Eastern region of Maharashtra.

6. *Chela laubuca* (Ham-Buch.)

1822. *Cyprinus laubuca* Hamilton, *Fish Ganges*, Pp. 260, 384. (Type locality : Ponds in northern part of Bengal).

1999. *Chela laubuca*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Indian glass barb.

Diagnostic characters : Lateral line scales 34-37, large not many on body. Body depth 3.5 to 4.5 in total length.

Distribution : India.

Elsewhere : Pakistan, Bangladesh, Nepal, Myanmar, Thailand, Malaysia, Indonesia.

Status : Threatened.

Remarks : This species breeds freely in ponds and lakes. It is a good larvivorous as well as aquarium fish, can be used as bait for catching other fishes. It is hardy and moves in shoals. Pectorals are large, wing like.

7. *Salmostoma bacaila* (Ham-Buch.)

1822. *Cyprinus bacaila* Hamilton, *Fish Ganges*, Pp. 265, 384. (Type-locality : Gangetic Provinces).

1999. *Salmostoma bacaila*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Large razor belly minnow.

Marathi Name : Dental.

Diagnostic characters : Elongated compressed body. Abdomen keeled from below pectoral fin to anus. Long pointed snout. Mouth oblique, lips thin, lower jaw longer with symphyseal knob. Anal fin with 11-14 branched rays. Number of scales between lateral line and pelvic fin base is 4-6.

Distribution : Northern India, Orissa.

Elsewhere : Pakistan, Nepal and Bangladesh.

Status : Declining in number.

Remarks : This long jawed fish is a surface feeder and larvivorous. Females have greater girth.

8. **Salmostoma boopis* (Day).

1873. *Chela boopis* Day, *Proc. zool. Soc.*, London, 708. (Type locality : South Canara).

1999. *Salmostoma boopis*, Menon. *Freshwater Fishes of India. Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Boopis razor belly minnow.

Marathi Name : Alkut.

Diagnostic characters : Lower lip extended, mouth oblique, large eyes, thick black or silvery lateral band on body, dorsal fin rays iii7, A iii 12–14, Pi 14, vi 8. Scales in lateral line 40.

Material examined : 1 ex. Tapi river, Katurga village; S.S. Kamble, 29-11-1994.

Distribution : Peninsular India.

Status : Rarely occurring.

Remarks : This species is declining in number.

Range : 72 mm.

9. **Salmostoma clupeoides* (Bloch).

1782. *Cyprinus clupeoides* Bloch, *Naturg. Aus. Fische.*, 12 : 49, pl. 409, fig. 2. (Type locality : Tranquebar).

1999. *Salmostoma clupeoides*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Bloch Rezor belly minnow.

Marathi Name : Vadasi.

Diagnostic characters : Lateral line scales 74–112, body without vertical stripes, anal fin with 11–14 branched rays, gill rakers 24–29 and number of scales in lateral line and pelvic fin base 3–4.

Material examined : 2 exs, Sipna river, Kolkaz, M.S. Pradhan, 10-2-1992.

Distribution : India : Tapi river system (Jayaram, 1981), Eastern Ghats (Talwar & Jhingran, 1991), Wardha river basin (Pradhan, 1997); Peninsular India : Gujarat, Maharashtra, Mysore, Tamil Nadu and Madhya Pradesh, (Narmada, Godavari, Krishna and Cauvery).

Status : Common.

Remarks : It is a food fish and attains a length of 15 cms. Range : 35 to 57 mm.

10. **Salmostoma novacula* (Valenciennes)

1842. *Leuciscus novacula* Valenciennes, *Jacq. voy. Ind. Orient.*, Pl. 15, Fig. 2. (Type locality : Madras)

1999. *Salmostoma novacula*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Novacula rezor belly minnow.

Marathi Name : Alkut, Amblya.

Diagnostic characters : Brownish silvery body. Gill rakers 76–94. Anal fin with 14–17 rays.

Material examined : 1 ex. Khapra river, Rangubelli, M.S. Pradhan, 13-2-1992.

Distribution : India : Central India (Day, 1889), Rajmal hills (Hora, 1938), Maharashtra (Godavari and Krishna) and Tamil Nadu.

Status : Rarely occurring

Remarks : Inhabits upper drainages of rivers and reservoirs. Range : 56 mm.

11. **Salmostoma untrahi* (Day).

1868. *Chela untrahi* Day, *Proc. zool. Soc. Lond*; P. 381. (Type locality : Mahanadi River, Orissa).

1999. *Salmostoma untrahi*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366.

Common Name : Mahanadi razor belly minnow.

Diagnostic characters : Ventral profile of body convex, dorsal straight, Lower jaw with strong symphysial knob. Curved lateral line with 59–63 scales. Lateral transverse scale rows 10/ 1-2.

Material examined : 1 ex. Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992.

Distribution : India : Orissa : Mahanadi river.

Status : It is declining in number.

Remarks : This species inhabits lower reaches of rivers.

Range : 40 mm.

Subfamily RASBORINAE

12. *Amblypharyngodon mola* (Ham-Buch.)

1822. *Cyprinus mola*, Hamilton, *Fish Ganges*, p. 334, pl. 38, fig. 92. (Type locality : Ponds and freshwater in Gangetic provinces).

1999. *Amblypharyngodon mola*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Mola carpet.

Diagnostic characters : Body elongated, subcylindrical. Head conical, snout with intugements, obtusely rounded, mouth wide, antero-lateral, not protractile, eyes large, centrally placed, not visible from below. Upper lip, barbels absent. Lateral line incomplete with 65–75 scales. Body depth 4 to 4.25 in TL. 9–10 rays of scales between lateral line and pelvic fin base. A silvery lateral band with dark markings on dorsal, anal and caudal fins present.

Distribution : Pakistan : Indus plain and adjoining hills. India : The foothills of Himalayas and Indo-Gangetic plain; Assam, Bangladesh and Myanmar.

Status : Threatened.

Remarks : Colour in life is golden yellow with broad silvery lateral band on body.

13. *Aspidoparia morar* (Ham-Buch.)

1822. *Cyprinus morar* Hamilton, *Fish Ganges*, 264 Pp., 384, Pl.31, fig. 75. (Type locality : Yamuna and Tista rivers).

1999. *Aspidoparia morar*, Menon, *Freshwater Fishes of India. Rec. zool. Surv. India, Occ. Paper No., 175* : 366. (Checklist).

Common Name : *Aspidoparia*.

Diagnostic characters : Lower jaw without lip and with crescentic bony edge. Barbels absent. Lateral line scales 38–42. Anal fin with 10–12 rays. 2½ to 3½ rows of scales between L.L. and base of pelvic fin.

Distribution : Throughout Northern India.

Elsewhere : Iran, Afghanistan, Pakistan, Nepal, Bangladesh, Myanmar and Thailand.

Status : Locally threatened.

Remarks : It is declining in number.

14. **Barilius barna* (Ham-Buch.)

1822. *Cyprinus barna* Hamilton, *Fish Ganges*, Pp. 268, 384. (Type locality : Yamuna and Brahmaputra).

1999. *Barilius barna*, Menon, *Rec. zool. Surv. India Occ. Paper No., 175* : 366. (Checklist).

Common Name : Barna baril.

Daignostic characters : Body elongated, compressed, subcylindrical, head sharply pointed. Pearl Organs or tubercles large and well developed on snout and lower jaw. Eyes large, superior in the anterior half of head. Lips thin, upper jaw longer than lower. Lower with a knob above the symphysis. Barbels absent, body with two rows of spots, lateral line scales 88–95.

Material examined : 4 exs, Khapra river, near Raipur; S.G. Patil, 1-4-1994. 18 exs, Dolar

river near Dolar village, Dhakna, S.S. Kamble, 27-11-1994, 1 ex M.S. Pradhan, 18-2-1992; 3 exs. Gadga river near Dhakna, S.G. Patil, 31-3-1994; 2 exs, Kolkaz, S.G. Patil, 13-2-1993; 10 exs. Tapi river, Rangubelli, P.P. Kulkarni, 11-2-1992; 24 exs. Sipna river, Semadoh, D.F. Singh, 8-2-1991; 1 ex. Tapi river Rangubelli, D.F. Singh, 11-2-1991; 2 exs. Dolar river near Dhakna, P.P. Kulkarni, 10-12-1992.

Distribution : India : Ganga and Brahmaputra river systems, Mahanadi (Orissa).

Elsewhere : Nepal, Bangladesh, Myanmar.

Status : Common.

Remarks : Voracious little fish restricted to Northern India and some have migrated to Melghat region.

Range : 12–62 mm.

15 **Barilius bendelisis* (Ham-Buch.)

1807. *Cyprinus bendelisis* Hamilton, *Journey Mysore*, 3 : 345. pl. 32. (Type-locality : Vedawati stream, headwaters of Krishna, Mysore).

1999. *Barilius bendelisis*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Hamilton's barila.

Marathi Name : Jhorya.

Diagnostic characters : Two pairs of barbels present, lateral line scales 40-44, anal fin with 9-11 rays, no vertical bars, each scale with a black spot.

Material examined : 10♂♂, 1♀ Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992.

Distribution : India : Gavilgarh ridge, Melghat.

Elsewhere : Pakistan, Nepal and Bangladesh.

Status : Common.

Remarks : Males have tubercles on the snout. Chedra-type specimens of males in breeding season are larger and stout, pectorals are enlarged and fan like, their outer 3 rays are thickened. The base of pectoral fins become muscular, dorsal and anal fins are expanded. Body becomes rough, vertical bands disappear. While females lack all these characters. Thus these fishes show distinct sexual dimorphism.

Range : 85-97 mm.

16. **Barilius gatensis* (Valenciennes).

1844. *Leuciscus gatensis* Valenciennes, *Hist. nat. Poissi.*, 17 : 309, pl. 503. (Type-locality : Peninsula of India).

1999. *Barilius gatensis*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : River carp baril.

Marathi Name : Jodhie.

Diagnostic characters : Barbels absent, body with more than 12 vertical bars, lateral line scales 39-41.

Material examined : 7 exs., Khapra river, Rangubelli, M.S. Pradhan, 13-2-1992; 1 ex., Khapra river near vill. Chopan, Chaurakund, P.P. Kulkarni, 12-12-1992; 3 exs, Tapi river Rangubelli, M.S. Pradhan, 12-2-1992; 3 exs, Chikhaldara, Bir Talav, S.G. Patil, 12-2-1993; 1 ex, Gadga river, 10 kms. from Dhakna-Harisal road, A.S. Mahabal, 25-2-1997.

Distribution : Pininsular India : Western Ghats : South Karnataka, Tamil Nadu (Nilgiri hills) and Kerala.

Status : Declining in number.

Remarks : The fish attains a length of 15 cms. and is active in its movements. It is highly coloured species with vertical bars.

Range : 38-60 mm.

17. **Barilius vagra* (Ham-Buch.)

1822. *Cyprinus vagra* Hamilton, *Fish Ganges*, Pp. 269, 385. (Type-locality : Ganges at Patna).

1999. *Barilius vagra*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Vagra baril.

Diagnostic characters : Two pairs of barbels with 13-17 rays, 10 vertical bars present on body.

Material examined : 1 ex., Sipna river, Semadoh, D.F. Singh, 8-2-1991.

Distribution : India : Himalayan and sub-Himalayan rivers.

Elsewhere : Afghanistan; Pakistan, Nepal; Bangladesh and Sri Lanka.

Status : Threatened.

Remarks : The fish has beautiful combination of different shades, hence it is an attractive aquarium fish.

Range : 50 mm.

18. **Danio rerio* (Ham-Buch.)

1822. *Cyprinus rerio* Hamilton, *Fish Ganges*, Pp. 324, 390. (Type-locality : R. Kosi, Bihar)

1999. *Danio rerio*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Zebra danio.

Marathi Name : Pidtuli.

Diagnostic characters : Two pairs of barbels present. Lateral line incomplete, not extending beyond pectoral fins with 28-30 scales. Elongated, slim, compressed body. Flanks blue with 4 gold stripes from head to caudal fin. Blue-gold stripes present on anal fin. Operculum with golden blotches. Iris golden red, dorsal fin yellow, olive at base.

Material examined : 2 exs, Tapi river, near Deval Ghat, Rangubelli, S.S. Kamble, 29-11-1994.

Distribution : India : Eastern part of from West Bengal to Krishna river system.

Elsewhere : Pakistan, Bangladesh and Nepal.

Status : Rarely occurring.

Remarks : It is an egg layer strives in standing water, especially in rice field. Being hardy inoffensive and disease resistant, it is the most beautiful tropical aquarium fish. It is introduced into Sri Lanka.

Range : 40 mm.

19. **Danio aequipinnatus* (McClelland).

1839. *Perilampus aequipinnatus* McClelland, *Asiat. Res.*, 19 (2) : 393, Pl.60, fig. 1. (Type-locality : Assam).

1999 *Danio aequipinnatus*, Menon, *Rec. zool. surv. India Occ. Paper No.*, 175 : 366. (Checklist.)

Common Name : Giant danio.

Marathi Name : Balooki.

Diagnostic characters : Body elongate, compressed, abdomen rounded. Head blunt, snout obtuse, mouth directed upwards, cleft shallow, not protractile, Eyes large, lower jaw with symphyseal knob. Body coloured with longitudinal bands. No spines along anterior margin of orbit, barbels well developed, lateral line scales 34-36.

Material examined : 1 ex, Hatida lake, S.S. Kamble, 24-11-1994; 1 ex, Bhopala nalla, S.S. Kamble, 24-11-1994; 4 exs, Koktu river, near Koktu, S.G. Patil, 30-3-1994; 3 exs. Gurji Pati, Koktu, S.G. Patil, 27-3-1994; 1 ex. Khapra river, Khopda, S.S. Kamble, 1-12-1994; 1 ex. Kopati river, Semadoh, D.F. Singh, 10-2-1991; 5 exs, Khopra river, Semadoh, M.S. Pradhan, 6-2-1992; 4 exs, Sipna river Jawahar Kund, Semadoh, P.P. Kulkarni, 5-12-1992; 20 exs, Jawahar Kund, Tiger Proj. Border, Paratwada, M.S. Pradhan, 8-2-1992; 1 ex. Chamarudra nalla, Kolkaz, D.F. Singh, 9-2-1991; 3 exs, Gadga river, Koha, Dhakna, M.S. Pradhan, 17-2-1992; 4 exs. Sipna river, Jawahar Kund, Semadoh, P.P. Kulkarni, 15-12-1992; 3 exs. Matakol Forest camp, 636, Harisal Kolkaz, M.S. Pradhan, 14-2-1992; 2 exs, Belkund doh, Akot road, M.S. Pradhan, 5-4-1994; 2 exs, Ambadoh on Chikhaldara road, M.S. Pradhan,

17-2-1992; 9 exs, Bitkaripani, Pipalpadav, Semadoh, M.S. Pradhan, 5-2-1992; 32 exs, Khandu river, Kanaikheda, Semadoh, M.S. Pradhan, 7-2-1992; 3 exs, Gadga river, Koha, Dhakna, M.S. Pradhan, 17-2-1992; 9 exs Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 10 exs, Gadga river, S.G. Patil, 25-2-1993; 1 ex, Khandukheda, 20 kms from Semadoh, S.G. Patil 25-2-93; 1 ex. Khandu river, Raipur, Semadoh, P.P. Kulkarni, 16-12-1992; 2 exs, Kalpani, Koktu, S.G. Patil, 17-2-1993; 1 ex, Motideo nalla, S.G. Patil, 19-2-1993; 6 exs, Chaddu Parit, S.G. Patil, 14-2-1993; 20 exs, Koktu river, S.G. Patil, 21-2-1993; 5 exs, Dedra Khora, Koktu, M.S. Pradhan, 5-12-1992; 9 exs, Koktu river, A.S. Mahabal, 27-2-1997; 3 exs, Gadga river, 10 kms from Dhakna Harisal road, M.S. Pradhan, 1 ex, Bhumka baba, S.S. Kamble, 23-11-1994.

Distribution : Throughout India : Gavilgarh ridge, Melghat; (Gujar, 1992), Wardha river basin, (Pradhan, 1997).

Elsewhere : Nepal, Bangladesh, Myanmar and Thailand.

Status : Common.

Remarks : It is inhabitant of clear streams and foothills. It is a good larvivorous and aquarium fish.

Range : 33-57 mm.

20. **Danio devario* (Ham-Buch.).

1822. *Cyprinus devario* Hamilton, *Fish Ganges*, Pp. 341, 393, pl.6, fig. 94. (Type-locality : rivers and ponds of Bengal).

1999. *Danio devario*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Davario danio.

Diagnostic characters : No spines along the anterior margin of orbit Barbels absent. Lateral line scales 35–38. Body rohomoidal and compressed. Its depth is 2.5 to 3 times in SL. Dorsal fin inserted slightly anterior to anal.

Material examined : 2 exs, Dolar river near Dolar village, S.S. Kamble, 27-11-1994; Khapra river near Ghokad village, S.S. Kamble, 30-11-1994; 2 exs. Tapi river near Deval Ghat, Rangubelli, S.S. Kamble, 29-11-1994; 13 exs, Sipna river, Pili village, Semadoh, M.S. Pradhan, 9-2-1992; 7 exs, Sipna river near Kolkaz, M.S. Pradhan, 10-2-1992.

Distribution : India : Gavilgarh ridges, Melghat (Gujar, 1992), Wardha river basin (Pradhan, 1997), North Eastern India upto Krishna and Godavari river systems in Deccan.

Elsewhere : Pakistan, Nepal and Bangladesh.

Status : Rarely occurring

Remarks : It is a beautiful aquarium fish. One specimen from Tapi river has forwardly directed spine above anterior portion of orbit. Blue and yellow vertical lines present on

body, blue/yellow lines extended upto caudal fin. A pair of blue marks present at the base of caudal.

Range : 35 to 60 mm.

21. *Esomus danricus* (Ham-Buch.)

1822. *Cyprinus danrica* Hamilton, *Fish Ganges*, Pp. 325, 390. pl. 16 fig. 88. (Type-locality : Ponds and ditches of Bengal).

1999. *Esomus danricus*, Menon, *Rec. zool. Surv. India Occ. Paper*, 175 : Pp. 366. (Checklist).

Common Name : Flying barb.

Diagnostic characters : Body elongated, slim, compressed. Two pairs of barbels present. Maxillary very long extended to about middle of body. Pectoral fins long and pointed. Lateral line incomplete with 27–30 scales. Broad dark lateral band present on body. Caudal peduncle having a dark brown triangular blotch.

Distribution : India.

Elsewhere : Pakistan : Punjab and Sind Province; Nepal, Sri Lanka.

Status : Rarely occurring.

Remarks : It is very active, jumper and a good aquarium fish.

22. **Parluciosoma daniconius* (Ham-Buch.)

1822. *Cyprinus daniconius* Hamilton, *Fish Ganges*, p. 327, pl. 15, Fig. 89. (Type-locality : rivers of Southern Bengal).

1999. *Parluciosoma daniconius*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Black line rasbora.

Marathi Name : Danda.

Diagnostic characters : A symphysial knob on lower jaw present. Mouth oblique or directed upwards. Dorsal fin without osseous ray. Cleft of mouth not extending beyond anterior margin of eye. Barbels absent. Curved lateral line with 32–34 scales. Anal fin with 7-8 rays, dorsal fin inserted behind origin of pelvic fin. Thick black median band present from eye to C. fin.

Material examined : 1 ex, Hatida lake, S.S. Kamble, 7 exs, Khandu kheda, S.S. Kamble, 20-11-1994; 1 ex. Gadga river near Dhakna, S.G. Patil, 31-3-1994., 7 exs, Kuwapati, Semadoh, P.P. Kulkarni, 3 exs, Sipna river, Kolkaz, M.S. Pradhan, 10-2-1992; 1 ex., Kovle nalla, near Raipur village, S.G. Patil, 4-9-1998; 4 exs, Belkund Doh, Akot road, M.S. Pradhan, 5-4-1994; 4 exs, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 1 ex, Koktu river, S.G. Patil, 21-2-1993; 4 exs, Dolar river in Core zone, Dhakna, M.S. Pradhan, 18-2-1992; 1 ex, Bhumka baba, S.S. Kamble, 23-11-1994.

Distribution : India : Gavilgarh ridges, Melghat (Gujar, 1992), Wardha river basin (Pradhan, 1997), throughout India.

Elsewhere : Pakistan, Sri Lanka, Bangladesh, Myanmar, Mekong.

Status : Common.

Remarks : It is surface feeder, moves in shoals. 1 ex. from Bhumka baba locality possesses a prominent band (3 mm thick) from the snout to the base of forks of caudal fin.

Range : 17-90 mm.

Subfamily CYPRININAE

23. *Thynnichthys sandkhol* (Sykes).

1841. *Leuciscus sandkhol* Sykes, *Trans. zool. Soc.*, 2 : 363. (Type-locality : Goreh river, Kullumb, Dukkun).

1999. *Thynnichthys sandkholo*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Sandkhol carp.

Marathi Name : Sandkhol.

Diagnostic characters : Body elongated, tail compressed, head broad, mouth wide, terminal, Dorsal fin with 9 branched rays and no spines, situated anterior to pelvic. Anal fin with 5 branched rays. Scales very small, lateral line with 120 scales.

Distribution : India : Wardha river (Pradhan, 1997), Mahanadi, Krishna and Godavari river systems.

Status : Threatened.

Remarks : This southeast Asian cyprinid shows remarkable superficial resemblance with the grass carp. Only one species found in India. It can be cultured in tanks. It is recognised by its tunny like shape, Silvery sheen, minute scales and deficient upper lips.

24. **Neolissocheilus hexagonolepis* (McClelland).

1839. *Barbus hexagonolepis* McClelland, *Asiat. Res.*, 19 : 270, 271, 336, pl. 41, fig. 3. (Type-locality : Upper Assam).

1999. *Neolissocheilus hexagonolepis*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Katil.

Diagnostic characters : Body deep, elongated, eyes in upper half of head, cheeks with numerous tubercles. Two pairs of barbels present. Dorsal fin equidistant, with its last unbranched ray osseous and strong. Scales large, lateral line with 28-32 scales.

Distribution : India : Eastern Himalaya, Assam.

Elsewhere : Bangladesh, Nepal, Myanmar, Thailand, Malaysia, Sumatra and China.

Status : Threatened.

Remarks : It is North Indian food fish, colour greenish coppery. It breeds from April to October, male matures at early stage at the size of 9 cms.

25. **Tor khudree* (Sykes).

1838. *Barbus khudree* Sykes, *Proc. Zool. Soc. Lond.*, p. 159. (Mota-Mota river Poona).

1991. *Tor khudree*, Talwar & Jhingran, *Inland Fish*, 1 : 303, fig. 106.

Common Name : Deccan mahseer.

Marathi Name : Khadshi.

Diagnostic characters : Elongated body, abdomen rounded, mouth inferior, arched, eyes large far forward, lips fleshy, continuous at angle of mouth. Two pairs of barbels, lower lip ventrally has horse shoe like structure. Dorsal fin with 12-13 rays (8-9 branched), strong, stout with smooth spine, anal with 7-8 (5 branched) rays. A scaly sheath present at the base of dorsal fin. Scales large, lateral line scales 26-27.

Material examined : 12 exs, Khapra river near Ghokad village, S. S. Kamble, 30-11-1994; 1 ex, Tapi river near Katurga village, S.S. Kamble, 29-11-1994; 12 exs, Khapra river, near Khopda, S.S. Kamble, 1-12-1994; 1 ex, Sipna river near Semadoh, D.F. Singh, 8-2-1991; 2 exs, Khapra river near village Chopan, Chaurakund, P.P. Kulkarni, 12-12-1992; 1 ex, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 1 ex, Tapi river, Rangubelli, D.F. Singh, 11-2-1991; 1 ex, Hatida Talav, S.G. Patil, 22-2-1993.

Distribution : Peninsular India.

Elsewhere : Sri Lanka.

Status : Endangered.

Remarks : It is a hillstream gamefish prefers rocky bottom and does not breed in confined water, goes at upper reaches to spawn. Tata Elec. Co., Lonawala saved the vanishing mahseer by culture, breeding and sending seeds all over the country and abroad. Colour dorsally greyish, while lower portion is silvery.

Range : 80-105 mm.

26. **Tor tor* (Ham-Buch.).

1822. *Cyprinus tor*, Hamilton, *Fish Ganges*, Pp. 305, 308. (Type-locality : River Mahananda).

1999. *Tor tor*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Tor, mahseer.

Marathi Name : Mahseer, Mhaslya, Kadchi.

Diagnostic characters : Length of head shorter or equal to body depth. $2\frac{1}{2}$ rows of scales between lateral line and base of pelvic fins. Ventral profile more arched than dorsal. The snout with tubercles.

Material examined : 1 ex. Tapi river, Rangubelli, D.F. Singh, 11-2-1991.

Distribution : India : Assam, foothills of Himalayas, higher reaches of Mahanadi, Orissa, Vindhya-Satpura ranges of Madhya Pradesh, Wardha river basin (Pradhan, 1997).

Elsewhere : Myanmar.

Status : Threatened.

Remarks : It is also called as Narmada mahseer, red finned or deep bodied mahseer, successfully bred in Tata Elec. Co. Lonawala. It is a sport fish and foodfish. This powerful fish attains a length of 15 cms. The size does not depend on the age, but on size of waterbody. It breeds in Aug.-Sept. and continues upto December. It is voracious plant feeder and hence can be utilised in Biological control of weeds.

Range : 55 mm.

27. *Osteobrama cotio cotio* (Ham-Buch.).

1822. *Cyprinus cotio*, Hamilton, *Fish Ganges*, pl. 39, fig. 93. (Type-locality : Bengal).

1999. *Osteobrama cotio cotio*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Cotio.

Diagnostic characters : Short, deep, compressed body of trapezoid shape. Mouth small directed upwards, eyes large, lips thin. Barbels absent, anal fin with more than 20 branched rays. Abdominal edge keeled between pelvic and anal fins. Predorsal scales 24–28. Lateral line scales 57–70, scales small. Scales between lateral line and pelvic fin $10\frac{1}{2}$ –13.

Distribution : India : Wardha river, Chandrapur Dist. Maharashtra (Pradhan, 1997), Assam (Brahmaputra drainage), West Bengal, Bihar, Madhya Pradesh, U.P.; Punjab.

Elsewhere : Pakistan, Bangladesh.

Status : Rarely occurring.

Remarks : This species has very long anal fin and rounded abdominal edge in front of pelvic fin.

28. *Osteobrama vigorsii* (Sykes)

1841. *Rohtee vigorsii* Sykes, *Trans. zool. Soc. Lond.*, 2 : 364, pl. 63, fig. 3. (Type-locality : Beema river at Pairgaon, Maharashtra).

1999. *Osteobrama vigorsii*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Beema Osteobrama.

Marathi Name : Phek, Phenkut.

Diagnostic characters : Abdominal edge sharp and trenchant between bases of pelvic fins and anal fins. Dorsal spine very strong and denticulated. Lateral line scales 73–85.

Distribution : India : Wardha river basin; Orissa, Maharashtra : Krishna and Godavari river systems.

Status : Common.

Remarks : It attains a length of 23 cms.

29. *Puntius amphibius* (Valenciennes)

1842. *Capoeta amphibia* Valenciennes (in C. & V.) 16 282, pl. 478. (Type-locality : Bombay).

1991. *Puntius amphibius*, Jayaram, *Rec. zool. Surv. India Occ. Paper No.*, 135 : 1–178.

Common Name : Scarlet banded barb.

Marathi Name : Bhondgi, Khavali.

Diagnostic characters : Boat shaped, deep, elongate body. Abdomen rounded. Eyes moderate to large, not visible from below. One pair of barbels present. Dorsal fin-spine, smooth, ossified. Lateral line complete with 24–25 scales. Pre-Dorsal scales (PDS) 7–9. LL/Dorsal 4 to 5½ scales. LL/Pelvic 2½ to 3½. Pre anal scales, 5–7. A blotch present on caudal peduncle.

Distribution : India : Rajasthan, Uttar Pradesh, Bihar, Goa, Maharashtra, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Madhya Pradesh and Orissa.

Elsewhere : Sri Lanka.

Status : Common.

Remarks : Probably this species must have come from Northern India to Eastern Maharashtra.

30. *Puntius chola* (Ham-Buch.)

1822.. *Cyprinus chola* Hamilton, *Fish Ganges*, Pp. 312, 389. (Type-locality : North eastern part of Bengal).

1991. *Puntius chola*, Jayaram, *Rec. zool. Surv. India Occ. Paper No.*, 135 : 52.

Common Name : Swamp barb, Chola barb.

Marathi Name : Khavali.

Diagnostic characters : Deep compressed body, dorsal profile more convex, BD 3 times in SL. One short pair of maxillary barbels, D. inserted equidistant. Its last unbranched ray osseous, strong and smooth. L.L. complete with 26–28 scales.

Distribution : Indian subcontinents.

Status : Common.

Remarks : Two black blotches one on gill cover and the other near base of C. Eyes of red colour. Males have orange tinge of pelvic and anal fins. In aqualiterature, it is called as two spotted barb. It is rich in oil/fat during breeding season.

31. **Puntius conchoni* (Ham-Buch.)

1822. *Cyprinus conchoni* Hamilton, *Fish Ganges*, Pp. 317, 318, 389. (Type-locality : Ponds of north east Bengal and rivers Kosi and Ami).

1991. *Puntius conchoni*, Jayaram, *Rec. zool. Surv. India Occ. Paper No.*, 135 : 1-178.

Common Name : Rosy barb.

Marathi Name : Gulabi Khavali.

Diagnostic characters : Deep bodied fish without any vertical colour bands on body. Body depth 2 to 3.5 times in SL. Barbels absent. Dorsal spine ossified. Lateral line incomplete with scales 24-26. A black blotch present above the anal fin and operculum.

Material examined : 1 ex, Khapra river near Raipur village, S.G. Patil, 1-4-1994; 65 exs, Siddukund, Gadga river, Dhakna, M.S. Pradhan, 16-2-1992; 90 exs, Pond at Chikhaldara, M.S. Pradhan, 6-2-1992; 9 exs, Khapra river, Rangubelli, M.S. Pradhan, 13-2-1992; 20 exs, Gadga river, Koha, Dhakna, M.S. Pradhan, 17-2-1992; 3 exs, Sipna river, Pili village; Semadoh, M.S. Pradhan, 9-2-1992; 9 exs, Sipna river near Kolkaz, M.S. Pradhan, 10-2-1992; 20 exs, Gadga river, M.S. Pradhan, 17-2-1992; 13??, 17??, Dolar river, in core zone, Dhakna, M.S. Pradhan, 18-2-1992; 3 exs, Dedra Khora, Koktu, P.P. Kulkarni, 8-12-1992; 35 exs, Dolar river, S.G. Patil, 23-2-1993.

Distribution : India : J & K., U.P., Bihar, M.P., Rajasthan, Assam, W. Tripura, Bengal, Nagaland, Manipur, Orissa, S. India.

Elsewhere : Pakistan, Bangladesh.

Status : Restricted distribution.

Remarks : It differs from *P. ticto* (Ham.) in having a deeper body, more number of lateral line scales (24 to 28 vs. 22 to 26) and absence of an anterior colour spot. It is an excellent aquarium fish. In one specimen from Khapra river, lateral line was extended upto caudal peduncle. Colour in life rosy. 2-3 incomplete parallel L.L. observed on a specimen collected from Chikhaldara. In male dorsal, pelvic and anal fins are black. Docile, hardy and the most popular ornamental fish. Impressively occupy reddish pink colour during the breeding season.

Range : 34-55 mm.

32. **Puntius sophore* (Ham-Buch.)

1822. *Cyprinus sophore*, Hamilton, *Fish Ganges*, Pp. 310, 389, pl. 19, fig. 86. (Type-locality : Ponds and rivers in Gangetic Provinces).

1991. *Puntius sophore*, Jayaram, *Rec. zool. Surv. India Occ. Paper No.*, 135 : 1-178.

Common Name : Stigma barb.

Marathi Name : Kudale.

Diagnostic characters : Deep bodied fish without colour bands. Body depth 2 to 3.5 times in SL. Barbels absent. Dorsal spine ossified smooth. Lateral line complete with 23-25 scales. Two black spots on the scales 4-6 and 22-24.

Material examined : 1 ex., Dharni, D.B. Bastawade, 27-9-1996.

Distribution : Widely distributed in India.

Elsewhere : Pakisthan, Nepal, Bangladesh, Sri Lanka.

Status : Common.

Remarks : It closely resembles to *P. chola*. The specimen examined was having a distinct black blotch at the base of dorsal fin. It moves in shoal and is a good aquarium fish. It is of medicinal value and common in Tamil Nadu and West Bengal.

Range : 35-60

33. **Puntius ticto* (Ham-Buch.)

1822. *Cyprinus ticto* Hamilton, *Fish Ganges*, , pp. 314. (Type-locality : Southern east part of Bengal).

1991. *Puntius ticto*, Jayaram, *Rec. zool. Surv. India, Occ. Paper No.*, 135 : 1-178.

Common Name : Fire fin barb.

Marathi Name : Kudale.

Diagnostic characters : Deep bodied fish having two blotches, one above pectoral (on 3-5 scales) and the other above anal (on 16-21 scales) Barbels absent. Dorsal fin osseous, its posterior margin serrated. Lateral line generally incomplete, with 21-26 scales.

Material examined : 10 exs, Hatida lake, S.S. Kamble, 24-11-1994; 13 exs. Dolar river near Dolar village., S.S. Kamble, 27-11-1994; 10 exs, Bhopala nalla, S.S. Kamble, 22-11-1994; 1 ex, Khandukheda river, S.S. Kamble, 20-11-1994; 25 exs, Gadga river near Dhakna, S.G. Patil, 31-3-1994; 1 ex, Khapra river, near Khopda, S.S. Kamble, 1-12-1994; 9 exs, Kolkaz, S.G. Patil, 13-2-1993; 8 exs, Tapi river near Deval Ghat, Rangubelli, 29-11-1994. 3 exs, Sipna river, Semadoh, D.F. Singh, 8-2-1991; 2♂♂, 5♀♀, Khapra river, Rangubelli, M.S. Pradhan, 13-2-1992; 1 ex, Chamarudra nalla, Kolkaz range, D.F. Singh, 9-2-1991; 73 exs, Khapra river, village Chopan, Chaurakund, P.P. Kulkarni, 12-12-1992; 40 exs, Gadga

river, Koha, Dhakna, M.S. Pradhan, 17-2-1992; 3 exs, Sipna river, Pili village., Semadoh, M.S. Pradhan, 9-2-1992; 35 exs, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 12 exs, Gadga river, near core boundry on Chikhaldara rd. Dhakna, M.S. Pradhan, 17-2-1992; 1 ex. Meldo stream, Mangiya vill., Semadoh, M.S. Pradhan, 5-2-1992; 2 exs, Hatida Talav, S.G. Patil, 22-2-1993; 7 exs, Chaddu Parit, S.G. Patil, 14-2-1993; 8 exs, Gadga river, 10 kms from Dhakna-Harisal road, A.S. Mahabal, 23-2-1997; 4 exs, Gadga river, Imlipada, 24-2-1997.

Distribution : India.

Elsewhere : Pakistan, Sri Lanka, Bangladesh, Myanmar, Thailand.

Status : Common.

Remarks : These are boat shaped fishes normally attain size upto 6 - 8 cms. Males have dorsal, pectoral and anal fins redish, while few have tubercles on the snout. It is widely distributed species in India. Inhabits montane and submontane region. It is silvery, popular aquarium fish.

Range : 17-48 mm.

34. **Barbodes carnaticus* (Jerdon).

1849. *Barbus carnaticus* Jerdon, *Madras J. Lit. Sci.*, 15 : 311. (Type-locality : Cauvery river)

1999. *Barbodes carnaticus*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Carnatica carp.

Marathi Name : Khavali.

Diagnostic characters : Two pairs of barbels present. Dorsal spine osseous, strong, equal to or longer than body depth. Lateral line complete with 28-31 scales. Dorsal fin base greater than least depth of caudal peduncle. Deep bodied fish.

Material examined : 1 ex. Tapi river, Rangubelli, D.F. Singh, 11-2-1991.

Distribution : India : Cauvery, Krishna river systems, Nilgiris, Waynaad in Kerala and Kanara in Karnataka.

Status : Declining in number.

Remarks : This fish can be cultivated in the tanks. It does not breed in ponds but spawns in flooded rivers.

Range : 80 mm.

35. *Barbodes sarana sarana* (Ham-Buch.)

1822. *Cyprinus sarana*, Hamilton, *Fish Ganges*, Pp. 307, 388. (Type-locality : Gangetic system, Bengal).

1999. *Barbodes sarana sarana*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Olive barb.

Marathi Name : Kudali, Pitule.

Diagnostic characters : Two pairs of barbels present Dorsal spine strong, serrated, lateral line complete with 31 or 32 scales, which have black dots, in the centre. PDS 10 or 11, Pre-anal 16 pre-pelvic-6. Dorsal spine serrated strong. Finger like dark spot present on caudal penduncle.

Distribution : India : North to Krishna river system.

Elsewhere : Pakistan, Nepal, Bangladesh, Myanmar.

Status : Declining in number.

Remarks : The unique species of apparently independent stock whose affinities lie with some other Cyprininae genus. It is similar to *P. filamentatus* in colouration but differs markedly. Predominantly a plant feeder, prolific breeder.

36. *Hypselobarbus curmuca* (Ham-Buch.)

1822. *Cyprinus curmuca* Hamilton, *Journ. Mysore*, 3 : 344, pl. 30, 180. (Type-locality : Vedawathi river, Tungbhadra drainage).

1999. *Hypselobarbus curmuca*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Kolus.

Marathi Name : Kolshi.

Diagnostic characters : Body deep and compressed, with rise in the profile from occiput to dorsal fin. Its depth 3.5 to 4 times in SL. Eyes large, superior. One pair of barbel, extending beyond mid-orbit. Dorsal fin inserted anterior to pelvic fins. Lateral line with 40-43 scales.

Distribution : India : Deccan and Mysore plateau in the Krishna, Godavari and Cauvery rivers.

Status : Vulnerable.

Remarks : It has long snout. It inhabits deeper portion of clear, fast flowing large rivers in the upland regions.

37. **Catla catla* (Ham-Buch.)

1822. *Cyprinus catla* Hamilton, *Fish Ganges.*, Pp. 287, 318, 387; pl. 13, fig. 81. (Type-locality : rivers and tanks of Bengal).

1999. *Catla catla*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Catla.

Marathi Name : Catla.

Diagnostic characters : Body short, deep. Abdomen rounded, head broad, large. Snout bluntly rounded, may be with pores. Mouth wide, anterior, arched. Eyes large in anterior half of head. Upper lip absent. Lower jaw with movable articulation at the symphysis but without a prominent knob. Barbels absent. Dorsal fin long inserted above pectoral fin, with 17-19 rays (3 or 4 simple), and without any spine. Anal fin short with 8 rays (5 branched). Lateral line complete with 40-43 scales.

Material examined : 1 ex., Tapi river, Rangubelli, D.F. Singh, 11-2-1991.

Distribution : India : Northern India; Wardha river basin (Pradhan, 1997).

Elsewhere : Pakistan : Indus plain and adjoining hills; Bangladesh, Nepal, Myanmar. Also introduced into rivers of Peninsular India and Sri Lanka.

Status : Declining in number.

Remarks : It is renowned and fastest growing Indian major carp. It is a good food fish. Originally it was confined to North of Krishna. It supports important fishery. Non-predatory fish, surface and mid-water feeder. It grows to a length of 40-45 cm. Under optimum conditions it grows upto 70 cm. in the first year. At the end of 3 years it grows upto 120 cms. *Catla* attains sexual maturity at the age of 2 years. It is commercially important hardy fish. It is a good fish for tank angling. It fights well. Hypophysation (Artificial propogation) is successful. From this five hybrids and golden coloured *Catla* stock can be formed.

Range : 80 mm.

38. *Cirrhinus cirrhosa* (Bloch)

1792. *Cyprinus cirrhosus* Bloch, *Naturges aushland Fish.*, 9 : 52, fig. 411. (Type-locality : Cauvery river, Tamil Nadu).

1999. *Cirrhinus cirrhosa*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366.

Common Name : Cauvery white carp.

Diagnostic characters : Head short, obtusely rounded. Eyes moderately large in the anterior half of the head. Not visible from below ventral surface. Mouth broad transverse. Lower jaw sharp with a small tubercle at the symphysis. Dorsal fin inserted ahead of pelvic fins with 11 or more rays (2-4 simple) and without any spine. Anal fin short with 7 or 8 rays (2-3 simple) Two pairs of barbels present.

Distribution : Peninsular India : Wardha river basin (Pradhan, 1997).

Status : Declining in number.

Remarks : It is active, hardy fish thrives in ponds and breeds in swift waters. It is planktonic feeder but browses on algae in marginal shallows. It is major carp of Cauvery river system and thrives well in tanks and it is a game fish. There is demand for stocking

pond from July to Nov. It attains sexual maturity at 20-25 cm size. Average growth in ponds is estimated to be 38-41 cm. in size in one year.

39. *Cirrhinus mrigala* (Ham-Buch.)

1822. *Cyprinus mrigala*, Hamilton, *Fish Ganges*, Pp. 297, 389 Pl.6., fig. 79. (Type-locality : Gangetic provinces).

1999. *Cirrhinus mrigala*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Mrigal.

Marathi Name : Mirya.

Diagnostic characters : Dorsal fin with 11 or more branched rays. One pair of small barbels present. Streamlined body, its depth about equal to length of head. Snout blunt. Lateral line scales 40–45. Colour dark grey along back with a coppery tinge, flanks silvery, yellowish, belly silvery, eyes golden. Pectoral pelvic and anal fins with orange tips.

Distribution : India : From Punjab to W. Bengal, Assam.

Elsewhere : Pakistan : Indus plain and adjacent hilly areas; Assam and Bangladesh.

Status : Declining in number.

Remarks : It is introduced in waters of Peninsular India for aquaculture. It is a major carp and game fish. It is detritus eater with a narrow range in food variety. It is bottom feeder subsisting mainly on decayed vegetation.

40. **Cirrhinus reba* (Ham-Buch.)

1822. *Cyprinus reba*, Hamilton, *Fish Ganges*, Pp. 280–386. (Type-locality : rivers and ponds of Bengal and Bihar).

1999. *Cirrhinus reba*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Reba carp.

Diagnostic Characters : Dorsal fin with 8 branched rays. It is less than body height. Lateral line scales 35–38, hexagonal. One pair of short rostral barbels present.

Material examined : 1 ex, Tapi river Rangubelli, D.F. Singh, 11-2-1991.

Distribution : Throughout India.

Elsewhere : Pakistan : Indus plain and adjoining hilly areas; Nepal; Bangladesh; Myanmar.

Status : Declining in number.

Remarks : This carp breeds in flooded shallow waters. It is cultivated in ponds. It is plankton and detritus feeder, grows rapidly. Induced breeding (hypophysation) is

successful. Males are smaller than females. Fry available in July–Sept. in the morning or evening.

Range : 70 mm.

41. *Labeo bata* (Ham-Buch.)

1822. *Cyprinus bata*, Hamilton, *Fish Ganges*, 283. (Type-locality : Bengal).

1999. *Labeo bata*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Bata labeo.

Marathi Name : Tambti.

Diagnostic characters : Body elongated, abdomen rounded. Head large, snout truncated or rounded, projecting beyond mouth, covered with tubercles or grooves across, and overhanging mouth. Eyes large in posterior half of head, not visible from below ventral surface. Lips thick, fleshy, fringed, covering both jaws, continuous at the angle of mouth, forming a labial fold. Dorsal fin rays ii–iv; 9–10. One pair of barbels present. Lateral line scales 37–40. Scales between pelvic fin base and 1.1. 5–6. Pectoral fin reaching pelvic fin. Eyes 4–4.3 in head length.

Distribution : India : Peninsular rivers, S. India, Orissa, M.P., U.P., Bihar, W. Bengal, Assam; Maharashtra State : Chandrapur Dist. Wardha river basin.

Elsewhere : Nepal and Bangladesh (Introduced).

Status : Declining in number.

Remarks : It is a minor carp and cultivated with Indian major carps. It does not breed in ponds. Induced breeding experiments are successful. It is a good foodfish.

42. **Labeo boggut* (Sykes)

1841. *Chandrostoma boggut*, Sykes, *Trans. zool. Soc. Lond.*, 2 : 359. (Type-locality : Dukkhun waterways).

1999. *Labeo boggut*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Boggut labeo.

Marathi Name : Sande.

Diagnostic characters : Dorsal profile more convex. Snout thick, projecting beyond mouth, devoid of lateral lobes, studded with few pores. Lips thick, lower fimbriated; joined to isthmus by narrow bridge. Dorsal fin (iii 8–9) situated in the anterior part. Pectorals equal to HL, not extending pelvics. Caudal, deeply forked. Scales small, in 1.1. 60–65. Silvery or bluish lines present along the body. Dark spot present near base of caudal fin.

Material examined : 1 ex, Tapi river, Kund village, S.S. Kamble, 30-11-1994; 5 exs, Tapi river, Rangubelli, D.F. Singh, 11-2-1991.

Distribution : India : Northern India upto Cauvery river system, Wardha river basin (Pradhan, 1997), Gavilgarh Ridge, Melghat (Gujar, 1992).

Elsewhere : Pakistan, Bangladesh.

Status : Common.

Remarks : This Carp is very slender, attains a length of 20 cms. It is fairly common in Peninsular rivers.

Range : 90 mm.

43. **Labeo calbasu* (Ham-Buch.)

1822. *Cyprinus calbasu*, Hamilton, *Fish Ganges*, Pp. 297, 389, Pl.2, fig. 33. (Type-locality : Bengal).

1999. *Labeo calbasu*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Black rohu.

Marathi Name : Kanas.

Diagnostic characters : Deep stout body, head large, conical, its length less than body depth. Snout depressed and pointed, without lateral lobes, with pores. Eyes not visible from below. Mouth inferior, lips thick, fringed; having inner fold. Two pairs of barbels present. Lateral line scales 40–44. Colour blackish green.

Material examined : 1 ex., Sipna river, Harisal, Semadoh, M.S. Pradhan; 1 ex, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992.

Distribution : India.

Elsewhere : Pakistan, Nepal, Bangladesh, Myanmar, Thailand and S.W. China.

Status : Common.

Remarks : It is a major Indian carp, foodfish and gamefish. It thrives well in tanks than running water. The fish also tolerates slightly brackish water. It is a bottom feeder. In this fish hypophysation experiments are successful.

Range : 50-70 mm.

44. *Labeo gonius* (Ham-Buch.)

1822. *Cyprinus gonius*, Hamilton, *Fish Ganges*, Pp. 292, fig. 38. (Type-locality : Bengal).

1999. *Labeo gonius*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Kurila labeo.

Diagnostic characters : Body elongated, dorsal profile convex, snout slightly projecting devoid of lateral lobe, studded with numerous pores. Lips thick and fringed with inner fold. One pair of short barbels, dorsal fin inserted nearer to the snout. Pectorals as long as head. Caudal fin deeply forked, with pointed lobes. Scales small, 71 to 84 in 1.1. Colour greenish black. Many scales with red lunules, indicating faint longitudinal lines.

Distribution : N. India.

Elsewhere : Pakistan, Bangladesh, Myanmar.

Status : Common.

Remarks : This carp attains a length of 1.5 m. Normally, it does not breed in ponds. It can be cultivated along with other carps. Artificial breeding is successful through hypophysation.

45. *Labeo potail* (Sykes)

1841. *Cyprinus potail*, Sykes, *Trans. zool. Soc. Lond.*, 2 : 354. (Type-locality : Beema river, Maharashtra).

1999. *Labeo potail*, Menon, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Deccan labeo.

Marathi Name : Dotondi.

Diagnostic characters : Snout overhanging with mouth. HL. 5 times in SL. Mouth small, inferior with weak lateral lobe. Lower labial fold entire. A deep groove present across the chin. One pair of barbels, Dorsal fin inserted nearer to snout. Caudal fin forked, upper lobe longer. L.1. with 39–40 scales. colour : Greyish. Each scale with a red lunule.

Distribution : India : Maharashtra, Deccan, Wardha river basin (Pradhan, 1997) and Cauvery river system.

Status : Threatened.

Remarks : This carp attains a length of 30 cms.

46. *Labeo fimbriatus* (Bloch).

1797. *Cyprinus fimbriatus* Bloch, *Ichth. Hist. Nat. Poiss*; 12 : 50, Pl. 409. (Type-locality : Madras).

1999. *Lebeo fimbriatus*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Fringed-lipped peninsular carp.

Marathi Name : Tambir.

Diagnostic Characters : Body elongate, dorsal profile convex. Snout blunt, slightly overhanging, devoid of lateral lobes, with pores, lips thick, continuous, fringed, having an inner fold above and below. Two short pairs of barbels present. Lateral line with

43-47 scales. Colour : Dark brown on back, silvery on flank and abdomen. A black blotch present at the base of C; which is deeply forked. A red spot present on each scale, forming 8-10 rows on flanks from pectoral to above anal fin.

Distribution : India : Wardha river (Pradhan, 1997), Gavilgahr ridge Melghat (Gujar, 1992), West Bengal and Eastern Ghats.

Elsewhere : Nepal, Pakistan and Myanmar.

Status : Threatened.

Remarks : This is a common carp in Tamil Nadu. It attains length of 20, 30cms in 1st and 2nd year respectively and finally upto 90 cms. Normally does not breed in ponds. It can be cultivated with other carps. It is herbivore, feeding on diatoms, blue-green and green algae, higher aquatic vegetation, insects and decayed organic matter.

47. *Labeo rohita* (Ham-Buch.)

1822. *Cyprinus rohita*, Hamilton, *Fish Ganges*, Pp. 301, pl. 36, fig. 85. (Type-locality : Gangetic provinces).

1999. *Labeo rohita*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Rohu.

Marathi Name : Tambada massa.

Diagnostic characters : Moderately elongate body, dorsal profile more arched. Snout depressed, projecting, devoid of lateral lobes. Eyes large, lips thick and fringed, with distinct inner fold, one pair of barbel present. Lateral line scales 40-44. Colour : bluish on the back. Silvery on flanks and beneath with reddish mark on each scale.

Distribution : North and Central India.

Elsewhere : Terai region of Nepal Myanmar, Bangladesh and Pakistan.

Status : Common.

Remarks : It is a major carp of India, which also is transplanted to abroad. It survives in freshwaters below Alt. 550 m. Various Fishery Departments cultivate major carps : Rohu, Mrigal and, Catla. Rohu is bottom feeder, feeding on plants and decaying vegetation. It attains sexual maturity at the end of 2nd year, spawns in flooded rivers. Spawns can be collected and cultivated in tanks. The fecundity varies from 22 lakhs to 2.5 crores. It is next to Catla but fetches more price for its tasty flesh. It attains a length of 1 meter. Riverine fish is stronger. It is also a gamefish.

Subfamily GARRINAE

48. **Garra mullya* (Sykes).

1841. *Chondrostoma mullya*, Sykes, *Trans. zool. Soc. Lond.*, 2 : 359, pl. 62, fig. 3.

1999. *Garra mullya*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Mullya garra.

Marathi Name : Mallya.

Diagnostic characters : Body short, compressed, abdomen rounded, head depressed, snout blunt. Mouth inferior, transverse, semicircular. Eyes small, in the posterior half of head, lateral, not visible from below. Lips thick, fleshy. A suctorial disc of semicartilagenous pad present on the chin, formed below ventral lip. Dorsal fin inserted slightly ahead of the pelvic. Paired fins horizontal, non plaited. Anal fin short with 6-8 rays. Lateral line complete with 34 scales.

Material examined : 1 ex, Dolar river, near Dolar village, S.S. Kamble, 27-11-1994; 3 exs, Kokktu river, S.G. Patil, 30-3-1994; 2 exs, Gurjipati, Koktu, S.G. Patil, 27-3-1994; 2 exs, Tapi river, near Katurga village, S.S. Kamble, 29-11-1994; 1 ex, Khapra river, Semadoh, M.S. Pradhan, 6-2-1992; 8 exs, Gobi nalla near Bori village., Dhakna range, P.P. Kulkarni, 5-12-1992; 3 exs, Khapra river, Rangubelli, M.S. Pradhan, 19-2-1992; 1 ex, Kuwapati, Semadoh, P.P. Kulkarni, 6-9-1993; 4 exs, Gadga river near Koha, Dhakna, M.S. Pradhan, 17-2-1992; 37 exs, Matakol forest Camp, 636, Harisal, Kolkaz, M.S. Pradhan, 14-2-1992; 5 exs, Belakund Doh, Akot road, M.S. Pradhan, 5-4-1994; 4 ex, Tapi river, Rangubelli, 12-2-1992; 1 ex, Chikalpati, Dhakna range, P.P. Kulkarni, 23-8-1993; 2 exs, Chaddu Parit, S.G. Patil, 14-2-1993; 8 exs, Koktu river, S.G. Patil, 21-2-1993; 1 ex, Dolar river in core zone, Dhakna, M.S. Pradhan, 18-2-1992; 1 ex, Dedra Khora, Koktu, P.P. Kulkarni, 8-12-1992; 1 ex, Koktu river, A.S. Mahabal, 27-2-1997; 2 exs, Bhumka baba, S.S. Kamble, 23-11-1994.

Distribution : Throughout India except Assam and Himalaya.

Status : Common.

Remarks : These fishes commonly occur in tank, rivers and in hillstreams. Paired fins are adapted to withhold in swift moving currents. It is a bottom dweller. One or two rows of 9-12 lateral, elliptical, brownish-black blotches present on body.

Range : 71-124 mm.

49 **Garra gotyla gotyla* (Gray)

1832. *Cyprinus gotyla*, Gray, *III. Ind. Zool.*, 1 : 88, fig. 3, 3a. (Type-locality : Mishmee mountains).

1999. *Garra gotyla gotyla*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Gotyla.

Marathi Name : Shingacha mallya.

Diagnostic characters : Body elongate, its depth 3.7 to 4.5 times in SL. Head depressed, its length 3.5 to 4 in SL. Snout with proboscis and transverse lobe at tip. Snout studded with tubercles. Mouth arched, mental disc well developed. Two pairs of barbels present.

Distance of vent from anal fin 4 to 7 times in inter distance between pelvic fin origin and anal fin. Colour : Dark brown on back, light pink on belly.

Material examined : 1 ex, Khapra river, Rangubelli, Kolkaz, M.S. Pradhan, 13-2-1992; Sipna river, Kolkaz, M.S. Pradhan, 10-2-1992.

Distribution : India : Himalaya, Chota Nagpur plateau, Vindhya-Satpura mountains, Wardha river (Pradhan, 1997).

Elsewhere : Bangladesh and upper Myanmar.

Status : Rarely occurring.

Remarks : This species can be distinguished by presence of median proboscis without lateral lobes on the snout. Males with prominent tubercles on snout. It attains a length of 14 cm., found in streams and lakes of the Himalaya and is valued food fish.

Range : 60 mm.

50. *Crossocheilus latius latius* (Ham-Buch.)

1822. *Cyprinus latius*, Hamilton, *Fish. Ganges*, pp. 345, 393. (Type-locality : River Tista)

1999. *Crossocheilus latius latius*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Gangetic latia.

Diagnostic characters : Elongate body, ventral profile horizontal, abdomen rounded, head small, snout prominent, obtusely pointed. Eyes large, behind middle of head. Upper and lower lips not continuous, a pair of rostral barbels present. Dorsal fin with 10-11 rays, without spine. Anal fin short with 7 rays. Lateral line continuous with 37-42 scales. Head length more than 5 times in SL. 18-19 scales present on caudal peduncle.

Distribution : India : Ganga, Brahmaputra, Mahanadi, Western Ghats, south to headwaters of Krishna river, Wardha river (Pradhan, 1997).

Remarks : This species attains a length of 12 cms. It inhabits mountain streams and lakes. Only three species are found in India under this genus.

Family BALITORIDAE

Subfamily NEMACHEILINAE

51. **Noemacheilus botia* (Ham-Buch.)

1822. *Cobitis botia*, Hamilton, *Fish Ganges*, Pp. 350; 394. (Type-locality : Rivers of north eastern part of Bengal)

1987. *Noemacheilus botia*, Menon, *Fauna India, Pisces*, 4 (1) : 141, fig. 1, pl. 13; Figs. 1, 2, 3, pl. 15.

Common Name : Stone loach.

Marathi Name : Muri.

Diagnostic characters : Body cylindrical, eyes small, mouth inferior. Eyes not visible from underside. Lips thick, fleshy and papillated, continuous. Lower lip is interrupted in middle. Dorsal fin with 9-11 br. rays, short, inserted opposite to pelvic fins. Anal fin short. Body depth 4.5 to 6 times in SL. Nostrils close to each other. Upper lip interrupted with papillae. Lower lip with papillose disc, on each side. Barbels well developed. Lateral line complete. 12-16 blackish crossbands present on body. Black ocellus present on upper portion of base of caudal fin.

Material examined : 17 exs, Badar Koi, Chikhaldara, M.S. Pradha, 6-4-1994; 2 exs, Gularghat, Khatikali rd., Dhakna range, M.S. Pradhan, 7-12-1992; 4 exs, Taruband R.H., M.S. Pradhan, 14-4-1992; 2 exs, Khapra river, Chopan village, P.P. Kulkarni, 12-12-1992; 9 exs, 12 kms on the rd. to Chikhaldara, D.B. Bastawade, 15-9-1996; 1 ex, Matakol Forest camp, 636, Harisal, Kolkaz, M.S. Pradhan, 14-2-1992; 1 ex, Belkund Doh, Akot rd., M.S. Pradhan, 5-4-1994; 1 ex, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 13 exs, Telpari, Koktu, S.G. Patil, 17-2-1993; 2 exs, Motideo nalla, S.G. Patil, 19-2-1993.

Distribution : India : Ganga, Brahmaputra, Wardha and Peninsular rivers.

Elsewhere : Pakistan : Indus Basin.

Status : Rarely occurring.

Remarks : It is 5-6 cm size stone loach inhabiting hillstreams and rivers. *Noemacheilus* fishes are indicators of water pollution as they prefer clean water.

Range : 36-38.

52. **Noemacheilus d. denisoni*, Day.

1867. *Noemacheilus denisoni*, Day, *Proc. zool. Soc. Lond.*, 287. (Type-locality : Bhawani river, base of Nilgiris).

1987. *Noemacheilus d. denisoni*, Menon, *Fauna of India, Pisces*, 4 (1) : 101, pl. 10, Fig. 7.

Common Name : Stone loach.

Diagnostic characters : Body depth 4.5 to 7 times in SL. Thread like barbels, D. inserted midway. Pelvics reach anal opening; Caudal deeply emarginated with rounded lobes. Scales small. Lateral line incomplete, ending in front of Dorsal fin.

Material examined : 9 exs, Khapra river, Raipur, S.G. Patil, 1-4-1994; 1 ex, Hatida lake, S.S. Kamble, 24-11-1994; 5 exs, Dolar river, Dolar village, S.S. Kamble; 4 exs, Ambadoh on Semadoh - Chikhali road, 1 ex, Jawahar kund, S.S. Kamble, 18-1-1994; 3 exs, Khapra river near Ghokad village, S.S. Kamble, 30-11-1994; 11 exs, Bhopala nalla, S.S. Kamble, 22-11-1994; 20 exs, Surajbandh, S.S. Kamble, 19-11-1994; 112 exs, Koktu river, Kokktu, S.G. Patil, 30-3-1994; 34 exs, Gurji pati, Koktu, S.G. Patil, 27-3-1994; 60 exs, Chamaudhra, S.S. Kamble, 17-11-1994; 40 exs, Kawakpati, Chaddupada, S.S. Kamble, 17-11-1994; 21 exs, Khed Koktu,

S.G. Patil, 28-3-1994; 1 ex, Khandukheda, S.S. Kamble, 20-11-1994; 4 exs, Bandarkoi, Chikhaldara, M.S. Pradhan, 6-4-1994; 10 exs, Gadga river, S.S. Kamble, 26-11-1994; 8 exs, Gadga river, Dhakna, S.G. Patil, 31-3-1994; 4 exs, Khapra river, Khopda, S.S. Kamble, 1-12-1994; 85 exs, Chaddu parit, Semadoh, S.S. Kamble, 4-4-1994; 2 exs, Khandu river, Khandukheda - Jarida rd; M.S. Pradhan, 3-4-1994; 12 exs, Jawahar Kund, Semadoh, S.G. Patil, 2-4-1994; 11 exs, Kolkaz, S.G. Patil, 13-2-1993; 15 exs, Dolar river, Dhakna range, D.F. Singh, 10-2-1991; 2 exs, Sipna river, Harisal, D.F. Singh, 10-2-1991; 14 exs, Koapati river, Semadoh range, D.F. Singh, 10-2-1991; 1 ex, Malur river, Chaurakund range, D.F. Singh, 12-2-1991; 20 exs, Tauraband, R.H., M.S. Pradhan, 14-2-1991; 52 exs, Gobi nalla, Bori vill., Dhakna, P.P. Kulkarni, 5-12-1992; 162 exs, Sipna river, Jawahar kund, Semadoh, P.P. Kulkarni, 15-12-1992; 7 exs, Tapi river, Deval Ghat, Rangubelli, S.S. Kamble, 29-11-1994; 1 ex, Sipna river, Semadoh, D.F. Singh, 8-2-1994; 4 exs, Khapra river, Rangubelli, M.S. Pradhan, 13-2-1992; 18 exs, Jawahar Kund Tiger Project border on Paratwada rd., Semadoh, M.S. Pradhan, 8-2-1992; 28 exs, Chamarudra nalla, Kolkaz range, D.F. Singh, 9-2-1991; 5 exs, Makai nalla, Dhargad, P.P. Kulkarni, 4-12-1992; 7 exs, Guga mal, Gunjala nalla, Koktu, P.P. Kulkarni, 9-12-1992; 116 exs, Khapra river, Chopan vill; Chaurakund, P.P. Kulkarni, 12-12-1992; 13 exs, Kuwapati, Semadoh, P.P. Kulkarni, 6-9-1993; 2 exs, Gadga river, Koha, Dhakna, M.S. Pradhan, 1 ex, Sipna river, Semadoh, 3 ex, Sipna river, Pili vill., Semadoh, 9-2-1992; 27 exs, Tapi river, Rangubelli, P.P. Kulkarni, 11-12-1992; 70 exs, Matakol forest camp, 636, Harisal, M.S. Pradhan, 14-2-1992; 140 exs, Belkund Doh, Akot rd; M.S. Pradhan, 5-4-1994; 2 exs, Gadga river, Core zone, Chikhaldara - Dhakna rd., M.S. Pradhan, 17-2-1992; 16 exs, Meldo stream, Mangiya viliage, Semadoh, M.S. Pradhan, 5-2-1992; 11 exs, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 3 exs, Khandu river, Kanaikheda, Semadoh, M.S. Pradhan, 7-2-1992; 2 exs, Gadga river, Koha, Dhakna, M.S. Pradhan, 17-2-1992; 36 exs, Gadga river, Dhakna, S.G. Patil, 25-2-1993; 7 exs, Khandukheda, 20 kms, from Semadoh, S.G. Patil, 10-2-1993; 10 exs, Telpari, Koktu, S.G. Patil, 17-2-1993; 56 exs, Talai, S.G. Patil, 15-2-1993; 30 exs, Dolar river, Dhakna, P.P. Kulkarni, 10-12-1992; 35 exs, Siddu Kund, S.G. Patil, 24-2-1993; 6 exs, Hatida Talav, S.G. Patil, 22-2-1993; 93 exs, Sarilgad fort, Kramb tank, Chikhaldara, P.P. Kulkarni, 19-12-1992; 60 exs, Chaddu Parit, S.G. Patil, 14-2-1993; 60 exs, Koktu river, S.G. Patil, 21-2-1993; 23 exs, Dedra Khora, Koktu, P.P. Kulkarni, 8-12-1992; 18 exs, Koktu river, A.S. Mahabal, 27-2-1997; 12 exs, Dolar river, S.G. Patil, 23-2-1993; 5 exs, Gadga river, 10 kms from Dhakna - Harisal rd., A. S. Mahabal, 25-2-1997; 1 ex, Bhumka baba, S.S. Kamble, 23-11-1994.

Distribution : Peninsular India, Chota Nagpur plateau (Bihar) and Bastar (M.P.).

Status : Common.

Remarks : Body marked with number of brown bands from dorsal to ventral surface. Bands broader than light interspaces, blackish band at base of Caudal fin. A black spot at base of Dorsal fin. Caudal fin forked. *N. d. denisoni* and *N. evezardi* are sympatric (sibling species) but their abundance is about 10 : 1.

Range : 14-45 mm.

53. **Noemacheilus elongatus* (Hora).

1921. *Aborichthys elongatus*, Hora, *Rec. Indian Mus.*, 22 : 735. (Type-locality : Base of Darjeeling Himalayas).

1987. *Noemacheilus elongatus*, Menon, *Fauna India Pisces*, 4 (1) : 184, pl. 7, fig. 6.

Common Name : Stone loach.

Diagnostic characters : Body slender, its depth 6.5 to 10 times in SL. Mouth semicircular, lips moderately fleshy and weakly furrowed. Dorsal fin inserted nearer to snout. Scales small. Lateral line incomplete.

Material examined : 20 exs, 12 kms on the rd to Chikhaldara, D.B. Bastawade, 15-9-1996; 5 exs, Masundi, Semadoh, D.B. Bastawade, 5 exs, Gadga river, S.G. Patil, 25-2-1993; 1 ex, Khandukhedra, 20 kms from Semadoh, S.G. Patil, 10-2-1993; 18 exs, Chikalpati, Dhakna range, P.P. Kulkarni, 23-8-1993; 20 exs, Sarilgad fort, Kramb tank fort, Chikhaldara, D.B. Bastawade, 19-12-1992; 1 ex, Chaddu Parit, S.G. Patil, 14-2-1993; 6 exs, Koktu river, S.G. Patil, 21-2-1993; 15 exs, Dedra Khora, Koktu, P.P. Kulkarni, 8-12-1992.

Distribution : West Bengal : Darjeeling.

Status : Rarely occurring.

Remarks : This species has extended its range of distribution to Melghat area under the sub-genus *Aboriychthys*, specimens of this species have flat head, 4 pairs of barbels, vent in advance position, but nearer to Caudal fin. Black spot present above the base of Caudal fin. Narrow brownish band present on body. Head with black dots and predorsal portion is having brown dots. In one example from Dhakna, two verticle bands on Caudal fin. were observed. Body of yellowish colour, with 9-14 vertical crossbars. Black spot present at the origin of dorsal fin.

Range : 25 to 60 mm.

54. **Noemacheilus evezardi*, Day.

1878. *Noemacheilus evezardi*, Day, *Fish. India*, 613, pl. 153, fig. 11. (Type-locality : Poona).

1987. *Noemacheilus evezardi*, Menon, *Fauna of India, Pisces*, 4 (1) : 191, pl. 4, Fig. 1 & 2..

Common Name : Stone loach.

Diagnostic characters : Body subcylindrical and of uniform depth. Eyes minute, Anterior nostril barbel like. Mouth semicircular, lips fleshy, both interrupted in middle. Nasal barbels pair extend upto middle of eye. Dorsal fin inserted nearer to Caudal fin base than snout, Caudal rounded. Scales small, covering entire body including breast L.L. incomplete, ending above middle of pectoral fin.

Material examined : 20 exs, Ambadoh on Sema-Chikhali rd; S.S. Kamble, 21-11-1994; 16 exs, Jawahar kund, S.S. Kamble, 18-1-1994; 1 ex, Khapra river, Ghokad village, S.S. Kamble,

30-11-1994; 1 ex, Bhopala nalla, S.S. Kamble, 22-11-1994; 3 exs, Surajbandh, S.S. Kamble, 19-11-1994; 2 exs, Koktu river, S.S. Kamble, 17-11-1994; 3 exs, Kawapati, Chaddupada, S.S. Kamble, 17-11-1994; 88 exs, Khedida, Koktu, S.G. Patil, 28-3-1994; 1 ex, Khandukheda, S.S. Kamble, 20-11-1994; 4 exs, Gadga river, S.G. Patil, 31-3-1994; 1 ex, Gularghat, Khatkali rd, Dhakna, M.S. Pradhan, 7-12-1992; 1 ex, Kolkaz, S.G. Patil, 13-2-1993; 8 exs, Koapati river, Chhadapati, D.F. Singh, 10-2-1991; 11 exs, Malur river, Chaurakund, D.F. Singh, 12-2-1991; 8 exs, Sipna river, Jawahar kund, Semadoh, P.P. Kulkarni, 5-12-1992, 4 exs, Khapra river, Rangubelli, M.S. Pradhan, 13-2-1992; 5 exs, Jawahar kund near Tiger Proj. border on Paratwada rd., Semadoh, M.S. Pradhan, 8-2-1992; 1 ex, Chamarudra nalla, Kolkaz, D.F. Singh, 9-2-1991; 47 exs, Makai nalla, Dhargad, P.P. Kulkarni, 4-12-1992; 38 exs, Guga mal, Gunjala nalla, Koktu, P.P. Kulkarni, 9-12-1992; 12 exs, Khapra river village Chopan, Chaurakund, P.P. Kulkarni, 12-12-1992; 5 exs, Sipna river, Jawahar kund, Semadoh, P.P. Kulkarni, 15-12-1992; 15 exs, 12 kms on thr rd to Chikhaldara, D.B. Bastawade, 15-9-1996; 13 exs, Matakol forest camp, 636, Harisal, Kolkaz, M.S. Pradhan, 14-2-1992; 9 exs, Belkund doh, Akot rd., M.S. Pradhan, 5-4-1994; 1 ex, Khandu river, Kanai Kheda vill. Semadoh, M.S. Pradhan, 7-2-1992; 3 exs, Gadga river, S.G. Patil, 25-2-1993; 10 exs, Sarilgad Fort, Khamba tank, Fort, Chikhaldara, P.P. Kulkarni, 19-12-1992; 11 exs, Dedra Khora, Koktu, P.P. Kulkarni, 8-12-1992.

Distribution : Maharashtra : Western Ghats : Krishna and Godavari river basin : Madhyan Pradesh : Satpura Range : Panchmari Hills.

Status : Common.

Remarks : Body with greenish yellow colour with 14-15 brown V or Y shaped vertical oblique stripes. Big round spots present on head, vertical stripe at the base of Caudal fin. Small black spot at the base of D, C & D with 3 rows of dark spots.

Range : 13 to 30 mm.

55. **Noemacheilus keralensis* (Rita & Nalbant)

1978. *Oreonectus keralensis*, Rita & Nalbant, *Trans. Mus. nat. Grgore Antipa*, **19** : 186. (Type-locality : Pampanampara, Kerala).

1987. *Noemacheilus keralensis*, Menon, *Fauna of India, Pisces*, **4** (1) : 193, Pl.10, fig. 2.

Common Name : Stone loach.

Diagnostic characters : Body depth 5.5 to 7.5 in SL. Anterior nostril barbel like. Lower lip incompletely interrupted in middle. Upper lip not interrupted. suborbital spine present.

Material examined : 1 ex, Hatida lake, S.S. Kamble, 24-11-1994.

Distribution : India, Western Ghats of Kerala.

Status : Threatened.

Remarks : Body with marked narrow, faint with vertical bands, split below l.l. A black mark at the origin of Dorsal fin present. A narrow stripe or two distant spots present at the base of Caudal fin. The specimens attain Standard Length of 5 cms; having thick black stripe on lateral sides of body. This species has extended its range of distribution.

Range : 63 mm.

56. **Noemacheilus multifasciatus* Day

1869. *Noemacheilus rupecola*, Gunther, (nec McClelland), *Cat. Fish. Brit. Mus.*, 7 : 351. (Type-locality : Darjeeling and Assam).

1987. *Noemacheilus multifasciatus* Menon, *Fauna of India, Pisces*, 4 (1) : 52, pl.1, fig. 324.

Common Name : Stone loach.

Diagnostic characters : Body robust, slender, its depth 6.5 to 10 times in Standard length., Dorsal fins inserted nearer to Caudal fins than snout. Caudal fin truncate, emarginate, scales small, embedded in skin, absent on ventral side of body. A black spot present at the base of anterior dorsal finrays. Short streaks present on rays of Dorsal fin and Caudal fin.

Material examined : 10 exs, Khandu river, Kanai kheda, Semadoh, M.S. Pradhan, 7-2-1992; 8 exs, Dedra Khora Koktu 8-12-1992.

Distribution : E. Himalayas, Tista to Ghagha and Kali drainages.

Elsewhere : Nepal Himalayas.

Status : Threatened : This species has extended its range of distribution. Body marked with 14-16 vertical bands, broader than interspaces. Bands split up below D. into narrow bands. Dorsal fin has 8 branched rays. The specimen attains a length of 10 cm. One specimen was having numerous black spots on body.

Range : 40-55 mm.

Family COBITIDAE

Subfamily COBITINAE

57. **Lepidocephalus guntea* (Ham-Buch)

1822. *Cobitis guntea*, Hamilton, *Fish Ganges*, Pp. 353, 394. (Type-locality : Ponds and rivers of Bengal).

1992. *Lepidocephalus guntea*, Menon, *Fauna of India, Pisces*, 4 (2) : 54, pl. IV, figs. 1-6, VIII figs. 1 & 2.

Common Name : Loach.

Marathi Name : Chikhali.

Diagnostic characters : Elongate, Compressed body. Its depth 5.8 to 6.8 times in TL. Mouth inferior, 3 pairs of barbels present. Mental lobe, produced into 1-2 projections. Dorsal fin inserted behind level of origin of pelvic fins, nearer to Caudal fin. Caudal fin convex or cutsquare with rounded corners. Scales small, present on head; 25-30 scales between back of body and base of anal fin.

Material examined : 4 exs, Chamarudra nalla, Kolkaz range, D.F. Singh, 10-2-1991; 18 exs, Hatida Talav, S.G. Patil, 22-2-1993.

Distribution : North India.

Elsewhere : Pakistan Bangladesh, Nepal, Myanmar and Thailand.

Status : Usually occurring.

Remarks : In young fishes 10-12 black blotches present on body. In adults blotches fuse to form continuous dark lateral band. Above and below this band thin bands present. On ground yellowish colour, dark spots not clear in females but distinct in males. Dorsal fins and Caudal fins with rows of dark spots.

Range : 40-80 mm.

58. *Lepidocephalus thermalis* (Val.)

1845. *Cobitis thermalis* Valenciennes, (in C. & V.), *Hist. Nat. Poiss.*, 18 : 78. (Type-locality : Hot springs of Kannias, E.P., Sri Lanka).

1992. *Lepidocephalus thermalis*, Menon, *Fauna of India, Pisces*, 4 (2) : 60, Pl. V, figs 1-8; pl. VIII, figs 3-5.

Common Name : Loach.

Marathi Name : Chikhali.

Diagnostic characters : Body elongate, compressed. Its depth 5.5 to 9.5 in TL. Dorsal fin inserted anterior to pelvic fins, nearer to Caudal fin than snout. Caudal fin squarely truncate. Scales small, present on head also. Suborbital spine present on ventral side of head, 30-37 scales between back of body and anal fin.

Distribution : India : coastal districts of Kerala, Karnataka and Maharashtra.

Elsewhere : Sri Lanka.

Status : common.

Remarks : Colour-Grey to green with flanks. A small black spot on upper half of base of caudal fin. Dorsal and caudal fins with rows of spots.

Order SILURIFORMES

Family BAGRIDAE

59. *Rita pavementata* (Valenciennes)

1833. *Arius pavementatus* Valenciennes, Jacq. Voy. Ind. Ori. Atl. Poiss., 2, pl. 17, fig. 2. (Type-locality : India).

1981. *Rita pavementatus*, Jayaram, HBFW Fish., : 475.

Common Name : Gogra rita.

Marathi Name : Ghoghrya.

Diagnostic characters : Body short, compressed, head large, depressed, snout obtuse. Mouth subterminal, transverse, wide. Eyes dorsolateral. Three pairs of barbes present : Maxillary, nasal and mandibular. Rayed Dorsal fin inserted on the back above half of pectoral fin with 6-7 rays and spine. Pectorals with 7-10 rays and doublely serrated spine. Pelvics 7-8 rays. A short with 8-13 rays. L.L. with scutes in anterior portion. Teeth on palate with one patch, mixed with molariform and villiform; premaxillary tooth band 3.5 to 4 times as long as broad.

Distribution : India : Rivers of Deccan upto Krishna river system.

Status : Common.

Remarks : Colour : Golden to bright yellow, eyes bright violet, barbels black, fins tinged black. This catfish attains length of 26 cm and is common in market of Hyderabad, brought alive in earthen pots.

60. *Rita chrysea* Day

1877. *Rita chrysea* Day, Fish India, P. 455. (Type-locality : Orissa).

1981. *Rita chrysea*, Jayaram, HBFW Fish India, p. 190.

Common Name : Mahanadi rita.

Diagnostic characters : Teeth on prevomer 1-1.5 times as long as broad.

Distribution : India : Mahanadi river and its tributaries (Orissa), Madhya Pradesh.

Status : Common.

Remarks : It is a smaller sized catfish than its congener. Colour Lead grey above, whitish below and with a yellowish along orbital rims. Fins greyish.

61. *Aorichthys aor* (Ham-Buch.)

1822. *Pimelodus aor* Hamilton, Fish Ganges., pp. 205, 379. pl. 20, fig. 68. (Type-locality : rivers of Bengal and upper parts of Gangetic estuaries).

1981. *Aorichthys aor*, Jayaram, *HBFW Fish. India*, P. 205.

Common Name : Long whiskered catfish.

Marathi Name : Singala.

Diagnostic characters : Body depth 4-5 times in standard length. Snout broad, rounded. Mouth subterminal. Four pairs of barbels present. Maxillary barbels extended to base of Caudal fin. Dorsal fin spine serrated at posterior edge. Adipose fin long. Mouth round, width of gape of mouth less than $\frac{1}{2}$ head length. Caudal fin with 17 rays.

Distribution : India : Ganga, Yamuna, Brahmaputra, Mahanadi, Narmada, Tapi, Krishna, Cauvery river systems.

Elsewhere : Pakistan : Indus system; Bangladesh and Myanmar.

Status : Vulnerable.

Remarks : It is a giant catfish attaining a length of 2 metres. Its flesh contains less bones hence it is good a foodfish and gamefish also.

62. *Aorichthys seenghala* (Sykes)

1841. *Platystoma seenghala* Sykes, *Trans. zool. Soc. Lond.*, 2 : 371, pl. 65, fig. 2. (Type-locality : Mula-Mutha river, Poona).

1981. *Aorichthys seenghala*, Jayaram, *HBFW Fish. India*, 475.

Common Name : Senghari.

Marathi Name : Shingta, Singala.

Diagnostic characters : Mouth $\frac{1}{3}$ rd head length. Caudal fin With 19-21 rays. Body depth 5-7 times in standard length. Four pairs of barbels. Maxillary extend to beyond anal fin. Base of adipose fin short.

Distribution : India : Himalayan and Peninsular rivers.

Elsewhere : Nepal, Afghanistan, Pakistan, and Bangladesh.

Status : Endangered.

Remarks : It is giant catfish, measuring from 40 cm to 1.5 M. It is a foodfish and sportfish.

63. *Mystus bleekeri* (Day)

1846. *Bagarus keletius* (nec Valenciennes) Bleeker, *Nat. Gen. Arch. Ned. India.*, 3 (2) : 135. (Type-locality : Bengal)

1991. *Mystus bleekeri*, Talwar & Jhingran, *Inland Fish.*, 2 : 558.

Common Name : Day's mystus.

Marathi Name : Singhala.

Diagnostic characters : Body depth about 4 times in standard length. Occipital process extends to basal bone of dorsal fin. Median longitudinal groove present. Mouth terminal, teeth villiform. Four pair of barbels. Maxillary extend posteriorly to anal fin. Dorsal fin spine smooth. Adipose Dorsal fin large. Least height of caudal peduncle about 2 times its height.

Distribution : India.

Elsewhere : Pakistan, Bangladesh, Nepal, Myanmar and Sumatra.

Status : Threatened.

Remarks : Colour : Brownish above, light below, with two longitudinal bands, one above and other below L.L. Dark shoulder spot present.

64. *Mystus cavasius* (Ham-Buch.)

1822. *Pimelodus cavasius* Hamilton, *Fish Ganges*, Pp. 203, 379, P II, fig. 67. (Type-locality : Gangetic Provinces).

1981. *Mystus cavasius*, Jayaram, *HBFW Fish India*, p. 199.

Common Name : Gangetic mystus.

Marathi Name : Katirna.

Diagnostic characters : Head length more than 5 times in tail length. Maxillary barbels reach caudal fin. Dark spot at the base of Dorsal fin. Inter orbital width more than 3 in head length. Occipital process reach basal bone of Dorsal fin. Adipose dorsal fin commencing after rayed D.

Distribution : India.

Elsewhere : Pakistan, Bangladesh, Myanmar, Thailand, Malaysia, Java, Sumatra, Borneo.

Status : Common.

Remarks : Colour : Greyish, midlateral longitudinal stripes present on body. A dark spot at the anterior base of Dorsal fin present. Its pectoral spine is harmful to handler. It is a good foodfish.

65. **Mystus oculatus* (Valenciennes)

1839. *Bagrus oculatus* Valenciennes (in C. & V.), *Hist. Nat. Poiss.*, 14 : 424. (Type-locality : Malabar).

1981. *Mystus oculatus*, Jayaram, *HBFW Fish India*, : 197.

Common Name : Malabar mystus.

Diagnostic characters : Median longitudinal groove on head short. Adipose dorsal fin

base longer than anal fin base. Occipital process reaching basal bone of dorsal fin. Head depressed. BD 4 times in standard length. Four pairs of barbels; maxillary extends to anal fin. Dorsal spine strong, adipose fin base short.

Material examined : 2 exs, Tapi river, Rangubelli, M.S. Pradhan, 22-2-1992. 1 ex. D.F. Singh, 11-2-1991.

Distribution : India : Wardha river and other rivers. Kerala and Tamil Nadu.

Status : Rarely occurring.

Remarks : This species has extended its range of distribution. Colour : Silvery grey above, light below. Dorsal fin with dark band along its middle.

Range : 60-102 mm.

66. *Mystus vittatus* (Bloch).

1797. *Silurus vittatus*, Bloch, *Ichth. Hist. Nat*; 11 : 40, Pl. 371, fig. 2. (Type-locality : Tranquebar, S. India).

1981. *Mystus vittatus*, Jayaram, *HBFW Fish India*, P. 201.

Common Name : Striped dwarf catfish.

Diagnostic characters : Body with 3 or 4 longitudinal colour bands above and below L.L. A dark shoulder spot present. No spot at the base of caudal fin. Median longitudinal groove short, Adipose Dorsal fin's base longer than anal fin base.

Distribution : Throughout India : Wardha river basin (Pradhan, 1997), Gavilgarh Ridge, Melghat (Gujar, 1992).

Elsewhere : Pakistan, Bangladesh, Nepal, Sri Lanka, Myanmar and Thailand.

Status : Common.

Remarks : Colour : Grey-silver to gold. Five bands, pale blue to dark brown to deep black present on body. Fins glossy with dark tips. This catfish attains a length of 20 cm.

Family SILURIDAE

67. **Ompok bimaculatus* (Bloch)

1797. *Silurus bimaculatus*, Bloch, *Hist. Nat. Poiss.*, Pt. 2 : 17, pl. 364. (Type-locality : Malabar).

1981. *Ompok bimaculatus*, Jayaram, *HBFW, Fish India*, P. 209.

Common Name : Indian butter catfish.

Marathi Name : Moone.

Diagnostic characters : Body elongated, compressed, Head small broad, depressed. Snout

bluntly rounded, depressed. Mouth superior, wide, cleft oblique, not extending to front border of eyes. Eyes small. Two pairs of barbels present. Dorsal fin above half of pect. Adipose dorsal fin absent. P = 11–14 rays. D. = 4–5 rays; pelvic, 7–10 rays. No spines. A. very long with 52–75 rays. Maxillary barbels extending upto anal fin.

Material examined : 1 ex, Tapi river, Katurga village S.S. Kamble, 29-11-1994, 2 exs, Tapi river, Rangubelli, D.F. Singh, 11-2-1991. 2 exs, Sipna river, Harisal, Semadoh, M.S. Pradhan, 5-2-1992; 2 exs, Sipna river, Harisal, Semadoh, M.S. Pradhan, 5-2-1992; 1 ex, Khandu river, Raipur, Semadoh, P.P. Kulkarni, 16-12-1992.

Distribution : India : Wardha river basin (Pradhan, 1997), Gavilgarh Ridge, Melghat, (Gujar, 1992).

Elsewhere : Afghanistan, Pakistan, Sri Lanka, Bangladesh, Myanmar, Thailand, Java, Sumatra, Borneo and China.

Status : Common.

Remarks : Colour : Silver green. Dorsally dark grey-green to brownish with tinge of golden yellow. A dusky spot on shoulder on l.l. small black spot on caudal peduncle, just above l.l. present. This is tasty foodfish, attains length of 45 cm.

Range : 80-155 mm.

68. *Wallago attu* (Schneider)

1801. *Silurus attu*, Schneider, *Syst. Ichth.*, p. 378, pl. 75. (Type-locality : Malabar).

1981. *Wallago attu*, Jayaram, *HBFW fish India*, p. 210.

Common Name : Boal.

Marathi Name : Pattan, Shivada.

Diagnostic characters : Body elongate, compressed, eyes small, mouth wide, its gape extend beyond eyes. Two pairs of barbels, mandibular pair much shorter, maxillary extend upto anal fin. Dorsal fin short, inserted in advance of pelvics. Pect. spine serrated from inner edge. Upper lobe of forked caudal fin, longer.

Distribution : Throughout India : Wardha river basin (Pradhan, 1997), Gavilgarh Ridge, Melghat (Gujar, 1992).

Elsewhere : Pakistan : Indus plain and hilly area; Sri Lanka, Nepal, Bangladesh, Myanmar, Thailand, Vietnam, Kampuchea, Malaya Peninsula, Sumatra and Java.

Status : Common.

Remarks : Colour : Uniform silvery. In few specimens golden gloss above, sides of body dull white. Orange yellow band along L.L. It prefers muddy tank, sluggish bottom dweller and is voracious predator, a good food fish rich in oil content and sport fish, destructive to carps. It measures upto 2 metres and weighs 45 kgs. It is aggressive and bites.

Family SCHILBEIDAE

Subfamily AILINAE

69. *Ailia coila* (Ham-Buch.)

1822. *Malapterurus coila* Hamilton, *Fish Ganges*, : 158, 375. (Type-locality : Bengal).

1981. *Ailia coila*, Jayaram, *HBFW Fish. India*, : 475.

Common Name : Gangetic ailia.

Diagnostic characters : Body elongate. Its ventral profile arched. Mouth subinferior. Four pairs of barbels present. Adipose dorsal fin minute, inserted above the last fourth of anal fin. Pectoral spine slender, not serrated. Pelvic fins absent.

Distribution : India : Jamuna, Ganga, Brahmaputra and Mahanadi, Wardha (Pradhan, 1997).

Elsewhere : Pakistan : Indus Plain; Bangladesh and Nepal.

Status : Threatened.

Remarks : It is surface to midwater fish and a good foodfish; lives in shoals and is confined to waters of Northern India.

Sub family SCHILBEINAE

70. *Clupisoma garua* (Ham-Buch.)

1822. *Silurus garua*, Hamilton, *Fish Ganges*, p. 156, 375, pl. 21, fig. 50. (Type-locality : Rivers of Gangetic provinces).

1981. *Clupisoma garua*, Jayaram, *HBFW Fish India*, : 475.

Common Name : Garua bachcha.

Diagnostic characters : Body elongate, compressed. Abdominal edge keeled between pelvic fin and vent. Head 4.5 to 5.5 times in standard length. Mouth subterminal. Four pairs of barbels present. Maxillary barbels extend to the base of pelvic fins. Dorsal fin spine slender, adipose fin absent in adults.

Distribution : India : North Indian rivers, Wardha river basin (Pradhan, 1997), Assam, W. Bengal and Bihar.

Elsewhere : Pakistan : Indus plain and adjacent hilly areas. Bangladesh and Nepal.

Status : Common.

Remarks : It is a foodfish. It inhabits fast flowing streams. In Jammu and Kashmir it is found in waterbodies of alt. 1005 and 1065 m. It is a bottom feeder, feeds on insects, shrimps, small crustaceans smaller fishes and is destructive in tanks.

71. *Eutropiichthys gongwaree* (Sykes).

1838. *Hypophthalmus goongwaree* Sykes, *Proc. Zool. Soc. Lond.*, : 163. (Type-locality : Mula Mutha river, Poona).

1981. *Eutropiichthys goongwaree*, Jayaram, *HBFW Fish India*, : 224.

Diagnostic characters : Teeth on palate interrupted in middle. Nasal barbels longer than its head length, reaching dorsal fin base.

Distribution : Peninsular India : Maharashtra and Andhra Pradesh, (Krishna and Pennar river systems).

Status : Rarely occurring.

Remarks : There are 3 species under the genus *Eutropiichthys*, occurring in Indian sub-continent and Thailand, excluding Pakistan.

72. *Eutropiichthys vacha* (Ham-Buch.)

1822. *Pimelodus vacha* Hamilton, *Fish Ganges*, pp. 196, 378, pl. 19, fig. 64. (Type-locality : Larger rivers of Gangetic Provinces).

1981. *Eutropiichthys vacha*, Jayaram, *HBFW Fish India*, : 224.

Common Name : Batchwa vacha.

Diagnostic characters : Body elongate, compressed, mouth large, cleft extending upto posterior border of orbit. Teeth villiform in broad bands on jaws; vomero-palatines present. Barbel, 4 pairs of varying length. Dorsal fin short inserted slightly advance of pelvics. Dorsal fin spine serrated on its posterior border.

Distribution : Northern India, Orissa, West Bengal, Bihar.

Elsewhere : Pakistan : Sind and Punjab; Bangladesh; Myanmar and Thailand.

Status : Endangered.

Remarks : Colour : silvery blue. It is a good food fish and game fish. It is surface and voracious feeder. The fish has & large mouth.

73. *Proeutropiichthys taakree* (Sykes)

1838. *Hypophthalmus taakree* Sykes, *Proc. Zool. Soc. Lond.*, (6) : 163. (Type-locality : Beema river Pairgaon).

1981. *Proeutropiichthys taakree*, Jayaram, *HBFW Fish India*, : 218.

Common Name : Indian taakree.

Marathi Name : Moonia, Munvi, Vyadi.

Diagnostic characters : Body elongate, compressed, eyes large. Posterior edge of

interoperculum with two spurs separated by a notch. Mouth terminal, teeth villiform on jaws. Four pairs of barbels. Nasal barbels extend beyond middle of eyes, maxillary to pelvic fins and mandibular to pectorals. Dorsal spine denticulated on its posterior edge and serrated at anterior edge. Pelvic fin spine serrated on its inner edge.

Distribution : Peninsular India; Wardha river, (Pradhan, 1997).

Status : Endangered.

Remarks : Silvery colour. This catfish attains length of 40 cm. Occurs in freshwater and tidal waters.

74. *Pseudotropius atherinoides* (Bloch)

1793. *Silurus atherinoides* Bloch, *Natuges Ausland Fische*, 8 : 48, pl. 371, fig. 1. (Type-locality : Tranquebar).

1981. *Pseudotropius atherionoides*, Jayaram, *HBFW Fish India*, : 217.

Common Name : Indian potasi.

Marathi Name : Sura.

Diagnostic characters : Nape markedly elevated, eyes large, mouth terminal, upper jaw projected considerably. Teeth villiform bands on jaw. Four pairs of barbels, maxillary pair extends to anal fin. Dorsal fin inserted anterior to pelvic. Pectoral spine extends backwards, beyond base of dorsal spine.

Distribution : Peninsular India : Wardha river (Pradhan, 1997), Eastern Himalaya.

Elsewhere : Pakistan, Bangladesh, Nepal and Myanmar.

Status : Vulnerable.

Remarks : Colour silvery greenish on back. 3-4 longitudinal bands on flank. Golden stripe on L.L. Dusky spot at the base of Caudal fin. Black spot at the nape and in front of Dorsal fin. Area above pectoral translucent. It is a good aquarium fish.

75. *Silonia childreni* (Sykes)

1838. *Ageneiosus childreni*, Sykes, *Proc. Zool. Soc. Lond.*, : 165. (Type-locality : Mula-Mutha river, Poona).

1981. *Silonia childreni*, Jayaram, *HBFW Fish India*, : 225.

Common Name : White catfish.

Marathi Name : Seelundh.

Diagnostic characters : BD 4.5 to 5 times in standard length. Mouth wide, terminal, obliquely directed upwards. Two pairs of barbels, maxillary reach upto operculum. Dorsal fin inserted anterior to pelvic.

Distribution : India : Western Ghats, Krishna, Godavari and Cauvery river systems.

Status : Endangered.

Remarks : Colour bluish on back, white on flanks. It attains length of 50 cm. Predacious and good foodfish.

76. *Silona silondia* (Ham-Buch.)

1822. *Pimelodus silondia* Hamilton, *Fish Ganges*, pp. 160, 378, pl. 7, fig. 50. (Type-locality : Gangetic estuaries).

1981. *Silonia silondia*, Jayaram, *HBFW Fish India*, p. 225.

Common Name : Silondia vacha.

Diagnostic characters : Elongate, compressed body. Its depth 4-6 times in standard length. Mouth wide, terminal, obliquely directed upwards. Two pairs of barbels, maxillary minute. Dorsal fin placed in advance of pelvics.

Distribution : Indo-Gangetic basin; Wardha river (Pradhan, 1997).

Elsewhere : Pakistan : Indus river; Bangladesh, Nepal and Myanmar.

Status : Vulnerable in Melghat.

Remarks : Back dusky green, abdomen silvery. Mouth to opercle-orange yellow. Caudal fin with reddish band at base. These are foodfishes, gamefishes move in shoal. Adults ascend from the estuaries into large rivers for breeding.

Family PANGASIIDAE

77. *Pangasius pangasius* (Ham-Buch.)

1822. *Pimelodus pangasius* Hamilton, *Fish Ganges*, : 163, 376, pl. 33, fig. 52. (Type-locality : Estuaries of Bengal).

1999. *Pangasius pangasius*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Pungas.

Diagnostic characters : Head granulated above. Occipital process reach basal bone of dorsal fin. Snout prominent, eyes large 3.5 times in head length. Mouth wide. Two pairs of barbels present, Dorsal fin Spine strongly serrated on its inner edge and finely serrated at its outer edge.

Distribution : Throughout India; Wardha river (Pradhan, 1997).

Elsewhere : Pakistan, Bangladesh, Myanmar, Thailand, Malaya Peninsula and Java.

Status : Threatened.

Remarks : It inhabits rivers and eustaries, breeds in eustaries, feeds on foul and decaying animals and vegetable matter. Due to its dirty feeding habit it is not liked as food. It is a gamefish also.

Family Sisoridae

78. **Bagarius bagarius* (Ham-Buch.)

1822. *Pimelodus bagarius* Hamilton, *Fish Ganges*, : 186, 378, pl. 7 fig. 62. (Type-locality : not given).

1981. *Bagarius bagarius*, Jayaram, *HBFW Fish India*, : 237.

Common Name : Gangetic goonch.

Diagnostic characters : Elongate body, its depth 5.5 to 7 times in SL. Head depressed. Mouth inferior, crescentric, Four pairs of barbels present, adipose dorsal fin at posterior level of anal fin; Pelvics anterior to level of dorsal fin.

Material examined : 2 exs, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992.

Distribution : Throughout India, Wardha River (Pradhan, 1997).

Elsewhere : Pakistan, Bangladesh, Myanmar, Thailand, Laos, Cambodia, Vietnam and Malaya Archipelago : Sumatra, Borneo, Java.

Status : Vulnerable.

Remarks : Colour : Greenish - olivaceous to brown with 3 dark pigmented blotches or bands on body. Caudal fin Light yellowish grey; paired fins with black spots. It is a small sized about 20 cm in length entomophagous fish. While its congener, *B. yarrelli* Sykes, is the giant catfish in Asia. *B. bagarius* inhabits rapid and rocky pools. Sluggish in habit. The flesh is not relished, hence it is neither gamefish nor good foodfish. Breeding season is prior to commencement of the monsoon. It is also called as 'living fossil'

Range : 35-60 mm.

Family Clariidae

79. *Clarias batrachus* (Linnaeus)

1758. *Silurus batrachus* Linnaeus, *Syst. Nat.*, 1st. ed., 10 : 305. (Type-locality : Assam).

1981. *Clarias batrachus*, Jayaram, *HBFW Fish India*, : 475.

Common Name : Magur.

Diagnostic characters : Body elongate, head depressed. Mouth terminal, four pairs of barbels present. Maxillary extend upto Pect., Pectoral spine strong, serrated. Dorsal and anal fin very long.

Distribution : Throughout India; Wardha river (Pradhan, 1997), Gavilgarh Ridge Melghat (Gujar, 1992).

Elsewhere : Pakistan, Nepal, Bangladesh, Myanmar, Indonesia, Singapore, Borneo and Philippines.

Status : Common.

Remarks : It inhabits foul, stagnant, muddy water. It is hardy fish, favourite foodfish, can be used as test animal in laboratory. The air bladder yields is in glass. It breeds early in July-August undertakes short migrations, withstand oxygen debt condition, as it possesses accessory respiratory organs. Induced breeding experiments are successful. Attains maturity after one year. It can be cultured.

Family HETEROPNEUSTIDAE

80. *Heteropneustes fossilis* (Bloch)

1798. *Silurus fossilis* Bloch, *Ichth. Hist. Nat. Poiss.*, 11 : 36, 370, fig. 2. (Type-locality : Bengal).

1981. *Heteropneustes fossilis*, Jayaram, *HBFW Fish. India*, : 475.

Common Name : Stinging catfish.

Marathi Name : Bitchuka-machi.

Diagnostic characters : Body elongate, subcylindrical to pelvics, compressed behind. Head depressed. Mouth small, terminal, dorsal fin short, inserted above pectoral fin; pectoral fin with strong serrated spine, 2/3 of head. A. fin long.

Distribution : Throughout India : Gavilgarh Ridge, Melghat (Gujar, 1992), Wardha river (Pradhan, 1997).

Elsewhere : Pakistan : Indus Basin; Nepal, Bangladesh, Sri Lanka, Myanmar, Thailand and Laos.

Status : Common.

Remarks : It has high economic value, a fish of pools, ponds, ditches etc. Air breathing catfish tolerates slightly brackish water, lives in shoals. Sexual maturity is attained after one year by male at the length of 5.5. cm and Female, 12 cm. Induced breeding is successful. Inflicts painful wounds by its pect. spine. The fish is of medicinal value.

Super order ATHERINOMORPHA

Order ATHERINIFORMES

Suborder EXOCOETOIDEI

Family BELONIDAE

81. **Xenentodon cancila* (Ham-Buch.)

1822. *Esox cancila* Hamilton, *Fish Ganges*, : 213, 215, 380, pl. 27, fig. 70. (Type-locality : Gangetic provinces).

1999. *Xenentodon cancila*, Menon, Rec. zool. Surv. India Occ. Paper No., 175 : 366 (Checklist).

Common Name : Freshwater garfish.

Marathi Name : Tikali.

Diagnostic characters : Body very elongate, subcylindrical, compressed dorsal fin and anal fin about equal & inserted in opposite position. Eyes long opposite each other. Caudal fin truncate, snout sharply pointed, head pointed, mouth superior. Both jaws prolonged into a beak. A longitudinal groove present on upper surface of head. Lateral line double on posterior edge in a very low position on body. Dorsal finrays 15 -18; Anal finrays 16-18; Predorsal scales more than 200.

Material examined : 1 ex, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992.

Distribution : Throughout India, Gavilgarh Ridge Melghat (Gujar, 1992), Wardha river, (1997).

Elsewhere : Pakistan (Sind, Punjab); Sri Lanka, Myanmar, Bangladesh, Malay Peninsula, Thailand.

Status : Rarely occurring.

Remarks : Colour : Greenish above, flank silvery, fading to whitish below. A silvery lateral band, 4-5 blotches present on body. It is a surface living fish, attaining length of 40 cm. It is a larvivorous and good aquarium fish.

Range : 195 mm.

Series	PERCOMORPHA
Order	PERCIFORMES
Suborder	PERCOIDEI
Family	AMBASSIDAE

82. *Chanda nama* (Ham-Buch.)

1822. *Chanda nama* Hamilton, *Fish Ganges*, : 109; 371, pl. 39, fig. 37. (Type-locality : N.E. Bengal).

1999. *Chanda nama*, Menon, Rec. zool. Surv. India Occ. Paper No., 175 : 366 (Checklist).

Common Name : Elongate glass perchlet.

Marathi Name : Chembardi.

Diagnostic characters : Body ovate, strongly compressed. Mouth large with prominent lower jaw. Lateral line with 100-107 scales. Snout shap, transparent. Eyes large, superior. Lower limb of preopercle with a doubly serrated edge. Two dorsal fins, the 1st with seven spines and 2nd with 9-18 rays. A forwardly directed procumbent spine present in the dorsal fin. L.L. discontinuous, a dark blotch on dorsal fin upper edge is present.

Distribution : Throughout India, Wardha river (Pradhan, 1997).

Elsewhere : Pakistan, Bangladesh, Nepal and Myanmar.

Status : Common.

Remarks : It inhabits fresh, brackish water lotic and lentic. A low priced fish. It can be used for malaria and guinea worm control.

83. **Pseudambassis ranga* (Ham-Buch.)

1822. *Chanda ranga* Hamilton, *Fish Ganges*, : 113, 371, pl. 6., fig. 38. (Type-locality : Gangetic Provinces).

1991. *Pseudambassis ranga*, Talwar and Jhingran, *Inland Fish*, 2 : 805.

Common Name : Indian glassy fish.

Marathi Name : Chembaridi.

Diagnostic characters : Body stout, deep and compressed. Preopercular hind edge smooth. Mouth oblique, scales small, L.L. with 47-63 scales. A lateral line distinct. A dark shoulder spot present.

Material examined : 1 ex, Tapi river Kund village, S.S. Kamble, 30-11-1994, 1 ex, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 3 exs, Salona tank Ghatang-Chikhaldara rd; M.S. Pradhan, 7-4-1994.

Distribution : Throughout India; Wardha river (Pradhan, 1997).

Elsewhere : Pakistan, Bangladesh, Myanmar, Malaysia, Thailand.

Status : Common.

Remarks : Colour : Greenish yellow, silvery. A silvery broad lateral stripe present on sides of body. It is a good aquarium fish. It makes nest and guards its youngs. Size 3-7 cm.

Range : 45-68 mm.

84. *Pseudambassis baculis* (Ham-Buch.)

1822. *Chanda baculis* Hamilton, *Fish Ganges*, : 112, 371. (Type-locality : N.E. Bengal).

1991. *Pseudambassis baculis*, Talwar & Jhingran, *Inland Fish*, 2 : 803.

Common Name : Himalayan glassy perchlet.

Marathi Name : Kachaki.

Diagnostic characters : Body small, slender, mouth oblique. Lower jaw included when mouth closed. Scales small, L.L. with 90 scales.

Distribution : Northern India, Wardha river, (Pradhan, 1997).

Elsewhere : Pakistan, Bangladesh, Myanmar, Thailand.

Status : Common.

Remarks : Body translucent, back yellowish green, flanks and belly silvery. A silvery longitudinal band on flank present. It attains length of 5 cm.

Family NANDIDAE

Subfamily NANDINAE

85. *Nandus nandus* (Ham-Buch.)

1822. *Coius nandus* Hamilton, *Fish Ganges*, : 96, 370, 30, fig. 32. (Type-locality : Gangetic Provinces).

1999. *Nandus nandus*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Mottled nandus.

Diagnostic characters : Body oblong, deep, compressed. Head large compressed. Mouth large protrusible, eyes large. Dorsal fin and anal fin spines strong, Caudal fin rounded. L.L. interrupted at 36th scales., 46-57 scales in 1.1.

Distribution : Throughout India : Satpura range, (Hora & Nair, 1941); Wardha river (Pradhan, 1997).

Elsewhere : Pakistan : Indus plain; Nepal, Bangladesh, Thailand.

Status : Common in North India.

Remarks : Inhabitants of fresh and brakish waters. It is common in ditches ponds, pools and beds etc. It is high priced food, despite bands, blotches on body. It attains a length of 20 cm. It is found in abundant number in summer.

Subfamily BADINAE

86. **Badis badis* (Ham-Buch.)

1882. *Labrus badis* Hamilton, *Fish Ganges*, : 70-72, 368, Pl. 25, fig. 23. (Type-locality : Gangetic Provinces).

1999. *Badis badis*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366. (Checklist).

Common Name : Badis, Dwarf chameleon fish.

Diagnostic characters : Body elongate, compressed. Eyes large, mouth small. D-spines slender, anal spines short. Caudal fin rounded, L.L. interrupted. Scales 26 to 30. Scales ctenoid.

Material examined : 1 ex, Salona tank, Ghatang - Chikhaldara rd., M.S. Pradhan, 7-4-1994.

Distribution : India : Himalayan rivers; Wardha river (Pradhan, 1997).

Status : Locally threatened.

Remarks : Blackish red band on body. Bluish black spot on gill openings. Fins yellowish-green, blue. A row of dark spots along the base of dorsal fin. Due to pigmentation, it is most colourful fish in the family. Colour changes rapidly. Solitary fish, often remains motionless. It attacks and feeds on live animals. Males are territorial. It is shy column feeder and a beautiful aquarium fish.

Range : 115 mm.

Family MUGILIDAE

87. *Rhinomugil corsula* (Ham-Buch.)

1822. *Mugil corsula* Hamilton, *Fish Ganges*, : 221, 381, pl. 9 fig. 97. (Type-locality : Gangetic Provinces).

1991. *Rhinomugil corsula*, Talwar & Jhingran, *Inland. Fish.*, 2 : 897.

Common Name : Corsula mullet.

Marathi Name : Vardoli.

Diagnostic characters : Body stout, elongate, head concave between eyes. Placed in anterior part of head, eyes projecting above. Mouth ventral. C. emarginate. Scales in L.L 48-52. Snout, lips thin, upper lip, not forming tip of snout or part of dorsal profile, but ventral overhung by snout. Symphysial knob present. D inserted above, a dist. between, pelvic and A., with 4 spines. D² with 8 rays; A. with 3 spines and 0\9 rays.

Distribution : India : U.P. Bihar, West Bengal, Orissa, Tamil Nadu, Maharashtra : Wardha river (Pradhan, 1997); Kerala.

Elsewhere : Bangladesh, Myanmar.

Status : Common.

Remarks : It is also called as Gangetic grey mullet. It swims in shoal in water and its dorsally placed eyes are seen, hence the name vardoli. This mullet is accidentally transported alongwith the major carps and spread all over India.

Suborder GOBIOIDEI

Family GOBIIDAE

Subfamily GOBINAE

88. *Glossogobius giuris* (Ham-Buch.)

1822. *Gobius giuris* Hamilton, *Fish Ganges*, Pp. 51, 366.

1999. *Glossogobius giuris*, Menon, *Rec. zool. Surv. India Occ. Paper*, 175 : 366. (Checklist).

Common Name : Tank goby.

Diagnostic characters : Body elongate, compressed. Eyes small, iris without process in pupil. Eyes large superior in middle of head. Tongue bilobate. Gill opening continuing far forwards below isthmus. D¹ above pect. Caudal fin oblong, rounded. Scales ctenoid on body, cycloid on head. Pelvic fins united to form disc ventrally. 28 - 36 scales in L.L., 9 - 14 scales in transverse line.

Distribution : Indo-West Pacific.

Remarks : Inhabits primarily freshwater and estuaries. It is the largest family of freshwater fishes in order Periformes.

Order CHANNIFORMES

Family CHANNIDAE

89. **Channa orientalis* Bloch & Schneider

1801. *Channa orientalis* Bloch and Schneider, *Syst. Ichth.* p. 496, pl. 90, fig. 2. (Type-locality : India).

1999. *Channa orientalis*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Asiatic snakehead.

Diagnostic characters : Body elongate, rounded in cross section. Pect. extend to anal fin. Pelvic less than 50% of pect. fin length. C. rounded, PDS. 12. Scales in L.L. 40-50. Head depressed with plate like scales; snout obtuse. Dorsal, anal fins long, free from C. Pectoral fins spotted in zones. Chin marbled. A = 21-23 rays. D = 32-37 rays. 4-5 scales between pre-opercular angle and posterior border of orbit.

Material examined : 1 ex, Koktu river near Koktu R.H., S.G. Patil, 30-3-1994; 3 exs, Gurjipati, Koktu, S.G. Patil, 27-3-1994; 6 exs, Tapi river, Rangubelli, P.P. Kulkarni, 11-2-1992. 17 exs, Gobi nalla, Bori village, Dhakna range, P.P. Kulkarni, 5-12-1992. 1 ex, Khapra river, Rangubelli, Kolkaz, M.S. Pradhan, 13-2-1992, 1 ex, Chamarudra nalla, Kolkaz range, D.F. Singh, 9-2-1991; 4 exs Khapra river, Chopan vill., Chaurakund, 12-12-1992; 1 ex, Tapi river, Deval Ghat, P.P. Kulkarni, 11-2-1992; 1 ex, Tapi river, Rangubelli, M.S. Pradhan, 12-2-1992; 1 ex, Motideo nalla, S.G. Patil, 19-2-1998; 1 ex, Siddhukund, S.G. Patil, 24-2-1993; 2 exs, Hatida Talav, S.G. Patil, 22-2-1993; 2 exs, Bhumka baba, S.S. Kamble, 23-11-1994.

Distribution : Throughout India : Wardha river, (Pradhan, 1997).

Elsewhere : Iran, Afghanistan, Pakisthan, Nepal, Sri Lanka, Bangladesh, Myanmar, Thailand, Yunan, Malaya - Archeipelago, Hainan and Taiwan.

Status : Common.

Remarks : Colour : Dorsal side and flanks green, ventral side with bluish or reddish tinge. A row of dark oblique bands present on sides. Pect. with alternate blue and orange verticle bands.

Range : 64-93 mm.

90. *Channa punctatus* (Bloch)

1794.. *Ophiocephalus punctatus* Bloch, *Natur Aus. Fische*, 7 : 139, Pl. 358. (Type-locality : Coromandal coast)

1999. *Channa punctatus*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Spotted snakehead.

Diagnostic characters : Elongate body, rounded in corss section. Plain pectorals extend to anal fin. Pelvic fin about 75% of pect. length. Scales in L.L. 37–40. Colour : Black-green dorsally, and on flanks. Ventral sides pale yellow-reddish. Many dark blotches present on flanks or numerous black spots present on body and also on dorsal and caudal fin. Five scales between preorbital angle and posterior border of summit.

Distribution : Throughout India : Gavilgarh Ridge, Melghat (Gujar, 1992), Wardha river (Pradhan, 1997).

Elsewhere : Afghanistan, Pakistan, Nepal, Sri Lanka, Bangladesh, Myanmar.

Status : Common.

Remarks : It is a medium to large sized fish, prefers stagnant water, muddy bottom dweller and can withstand slightly polluted water. Prolific breeder, breeds in ponds throughout year by forming nest. Peak breeding is before and during monsoon. The fish matures in 1st year. It was collected from 600 m. Altitude from North Bengal.

91. **Channa striatus* (Bloch).

1997. *Ophiocephalus striatus* Bloch, *Natur. Aus. Fische.*, 2 : 141, pl. 359. (Type-locality : Malbar).

1999. *Channa striatus*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Striped or banded snakehead.

Marathi Name : Dekhu sohr.

Diagnostic characters : Pectoral fin about 2 times in head length. Scales on summit of head large. 9 scale-rows between pres percular angle and posterior border of orbit. PDS. 18-20. Scales in L.L. 50-57.

Material examined : 1 ex, Chikhaldara, Bir Talav, S.G. Patil, 12-2-1993.

Distribution : Throughout India.

Elsewhere : Sri Lanka, Pakistan, Nepal, Myanmar, Malaya, Malaya - Archipelago, Thailand upto Philippines.

Status : Common.

Remarks : It breeds throughout the year. The female matures at the size of 30 cm when 2 years old. A good foodfish. Widely distributed and high priced fish. Flesh is boneless. The fish prefers slightly brakish water.

Range : 70 mm.

92. *Channa marulius* (Ham-Buch.)

1822. *Ophiocephalus marulius* Hamilton, *Fish Ganges*, : 65, 367, pl. 17, fig. 9. (Type-locality : River Ganges).

1999. *Channa marulius*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : Giant snakehead.

Marathi Name : Maral.

Diagnostic characters : Pectoral fin about half the head length; pelvic fin about 75% of pectoral fin length. 10 scales-rows between pre opercular border and hind border of orbit. PDS 16; scales in L.L. 70. A black edged ocellus present on basal portion of Caudal fin.

Distribution : Throughout India : Wardha river (Pradhan, 1997), Gavilgarh Ridge, Melghat (Gujar, 1992).

Elsewhere : Pakistan, Sri Lanka, Bangladesh, Nepal, Myanmar, Thailand and China.

Status : Common.

Remarks : It is a good sporting fish attaining the length 120 cm while normally it grows upto 4.5 cm. The fish is cultured in irrigation wells. Only 10% population survives. It is a good foodfish. It is predatory. eggs are laid in nests guarded by parents. Because of its carnivorous habit, it can be avoided in culture.

93. **Channa stewartii* (Playfair)

1867. *Ophiocephalus stewartii* Playfair, *Proc. zool. Soc. Lond.*, P 14, P. 1.3. (Type-locality : Cachar, Assam).

1999. *Channa stewartii*, Menon, *Rec. zool. Surv. India Occ. Paper No.*, 175 : 366 (Checklist).

Common Name : snakehead.

Diagnostic characters : Four or five scales between orbit and angle of preopercle, 12 or 13 predorsal scales. Pelvic fin less than 1/2 the length of pectoral fin. Pectoral fins spotted in zones, darker and lighter patches, chin marbled. Anal fin with 26 rays, circular black spots each occupying part of a scale present. The base of dorsal fin iridescent blue in life. Dorsal fin with 39-40 rays.

Material examined : 1 ex, Khandu river vill, Raipur, Semadoh, P.P. Kulkarni, 16-12-1992, 1 ex, Chaddu parit, S.G. Patil, 14-2-1993.

Distribution : India : Meghalaya, Bihar, West Bengal, Arunachal Pradesh, Maharashtra : Wardha river (Pradhan, 1997).

Elsewhere : Nepal.

Status : Rarely occurring.

Remarks : This Assamese snakehead attains a length of 25 cm. Colour dark brown in back and lighter on flanks and belly with series of bands above. L.L.

Range : 50-70 mm.

Order SYNBRANCHIFORMES

Family MASTACEMBELIDAE

94. *Macrognathus aral* (Bloch & Schneider)

1801. *Rhynchobdella aral* Bloch and Schneider, *Syst. Ichth*; 479, pl. 89 (Type-locality : Tanquebar, Tamil Nadu).

1990. *Macrognathus aral*, Talwar & Jhingran, *Inland Fishes I & II.*, 1158.

Common Name : Spiny eel.

Diagnostic characters : Snout fleshy trilobed, very long accommdating on its undersurface. Behind the anterior nostril, a concave prolongation of the upper jaw of a paired series of toothed bony plates present. Body elongate, compressed, head long, pointed. Mouth inferior, cleft narrow, eyes small, lips thin. No spines on preorbital or preoperculum. Dorsal fin in posterior half of body, with 14-22 spines and 42-58 rays. Anal fin with 3 spines and confluence with Caudal fin.

Distrubution : Throughout India : Wardha river, (Pradhan, 1997).

Elsewhere : Pakistan, Bangladesh, Myanmar, Sri Lanka, Thailand, Malaya Peninsula, Java, Sumatra, Borneo, Molluccas and Korea.

Status : Common.

Remarks : Spiny eels are mostly carnivorous, nocturnal, bottom feeder, living in fine mud in fresh or brackish water. Colour : Yellowish brown. Dorsal fin marked with 3-10 spots, on orange ground. Max. length 35 cm.

95. **Mastacembelus a. armatus* (Lacepede)

1799. *Macrognathus armatus* Lacepede, *Hist. nat. Poissons*, II, 286. (Type-locality : Not Known).

1990. *Mastacembelus a. armatus*, Yazdani, *Rec. zool. Surv. India Occ. Paper No.*, 124 : 1-36. (Fauna India, Fish).

Common Name : Spiny eel.

Diagnostic characters : Snout long, conical without any prolongation of upper jaw. Preorbital spine present. D. above pect. Spines and soft rays in D. exceeding 100. Gape of mouth 14-22% in TL., extending beyond posterior nostril. D. and A. confluent with C. Ventral (Pelvic) fins absent. Bands and reticulated pattern present on body. Max L. 60 cm.

Material examined : 3 exs, Tapi river, Katurga village Chopan village chaurakund, P.P. Kulkarni, 12-12-1992; 3 exs, Tapi river, Rangubelli, P.P. Kulkarni, 11-12-1992; 3 exs, Tapi river, Rangubelli, P.P. Kulkarni, 11-12-1992; 1 ex, M.S. Pradhan, 12-12-1992; 1 ex, D.F. Singh, 11-2-1991; 2 exs, Khandu river, Raipur, Semadoh, P.P. Kulkarni, 16-12-1992. *Distribution* : Throughout India : Gavilgarh Ridge, Melghat (Gujar, 1992), Wardha River (Pradhan, 1997); Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, Thailand, Vietnam, Tonkin, Hainan Isslls & China, Mallaya, Sumatra, Java.

Status : Common.

Remarks : The colour pattern is more definate in young specimens, where body appears, uniformly dark with few darker spots along the base of the spinous dorsal. Snout and head scaleless.

Range : 190-270 mm.

96. *Mastacembelus pancalus* (Ham-Buch.)

1822. *Macrogathus pancalus* Hamillton, *Fish. Ganges*, 30, 364, Pl. 223, fig. 7. (Type-locality : Bengal).

1990. *Mastacembelus pancalus*, Yazdani, *Rec. zool. Surv. India Occ. Paper No.*, 124 : 1-36.

Common Name : Spiny eel.

Diagnostic characters : Spines present on preopercel, spines and soft rays in dorsal fin not exceeding 100. Eleven to sixteen rays in caudal fin. 21-31 spines and 30-42 rays in dorsal fin. Dorsal and anal fin distinctly separated from caudal fin. Snout entirely scaly, top of head naked. One strong preorbital spine and 2-5 spines on preoperculum present.

Distribution : Fresh and brackish waters of India, Wardha river (Pradhan, 1997), Satpura range (Hora & Nair 1941).

Elsewhere : Pakistan.

Status : Rarely occurring.

Remarks : Colour : Brown on back, yellowish on belly. Fresh specimens were of greenish yellow colour. Round white spots or brown, vertical stripes present on body. Fins yellow with black spots.

DISCUSSION

Melghat Tiger Reserve is an area of succession and abruption of hills ranging from 600 to 1100 metres. Topographically it is near to the Eastern Ghats, oldest hill-ranges situated south of river Tapi-west flowing river. From the Gavilgarh Ridge there are many extensions running northwest and southwards. The hills of Melghat form the watershade of Purna (southwards) and Tapi river (northwards) (Gujar, 1992). Ichthyofauna of Melghat is also influenced by east flowing Godavari river system, fishes common to Deccan Plateau, Peninsular India and north Indian species with few from southern India.

The fish collection was made from tributaries of Tapi river *viz.* Khapra, Gadga, Sipna, Dolar, Khandu, Koktu, Mallur etc. (Table I, Fig. I). The present ichthyofaunal study of Melghat Tiger Reserve reveals 96 species under 52 genera, belonging to 19 families of 8 orders. Of these, 43 species have actually been collected and the remaining 53 have been inventorised from the literature (Gujar, 1992; Pradhan, 1997; and Menon, 1999). A comprehensive account by Pradhan (1997) adds significantly the information on the east flowing Wardha river.

The ichthyofauna of Melghat is dominated by 54 cyprinid and cobitid species (Order : Cypriniformes), followed by 22 species of catfishes (Order : Siluriformes), 12 species of perches (Order : Perciformes) and 8 species of other orders (Table I, Fig. III). In the order Cypriniformes, family Cyprinidae (Carps, barbs, minnows) contains larger number of species (46) and loaches, stone loaches (Family : Balitoridae) represent 8 species. Distributional study shows that fishes of Melghat represent about 16 north Indian species, originally described by Hamilton-Buchanan (1822) from Ganga river system. On the contrary, there are very few species from south India (2). The fish fauna of Melghat Tiger Reserve, mostly represent from Tapi river system, which traverses through this region and less number of species from Wardha river, which slightly touches its north eastern zone. Forty five species are rarely occurring while 30 are common to Melghat region. In order to protect marvelous ichthyofauna of Melghat, conservation steps like ban on mass killing, preventing collection of fry, fingerlings and broods, observing close period during breeding season, formation of fish ladder, fish farm and fish sanctuaries and enforcement of New Fishery Law, must be taken, alongwith enlightening the masses to save the fishes.

SUMMARY

Ichthyofauna of Melghat Tiger Reserve is represented by 96 species, belonging to 52 genera comprising 19 families under 8 order, and order Cypriniformes forms predominant group. The fish fauna is from two river systems : West flowing - Tapi and the east flowing Godavari. Out of 96 species, 30 are common, 45, are rarely occurring. For protection of threatened fish species, various scientific provisions, enhancing fish culture and formation of new fishery law are essential steps to be taken.

TABLE - I
ICHTHYOFAUNA OF MELGHAT
(SPECIESWISE)

SPP. ACTUALLY COLLECTED : 41

FROM LITERATURE : 55

TOTAL : 96

STREAMS & RESERVOIRS	RIVERS								
	KHAPRA	GADGA	SIPNA	KHANDU	DOLAR	KOKTU	TAPI (West flowing)	WARDHA (East flowing)	
21	17	11	14	12	15	10	49	72*	
ORDERS	CYPRINIFORMES (Barbs, Carps, Minnows & Loaches)			SILUFORMES (Catfishes)		PERCIFORMES (Perches)		OTHER ORDERS	
	54			22		12		8	
FISH CATEGORY	FOOD FISHES	GAME FISHES	AQUARIUM FISHES	LARVIVOROUS FISHES	COMMON	UNCOMMON	THREATENED	HILL STREAM FISHES	AIR BREATHERS
	65	10	18	15	30	45	21	15	8

[*Pradhan (1997)]

TABLE II. THREATENED FISHES OF MELGHAT

Sl. No.	Name	Locality
	Order Anguilliformes	
	Family Anguillidae	
1.	<i>Anguilla bengalensis</i> (Gray)	Wardha river
	Order Clupeomorpha	
	Family Clupeidae	
2.	<i>Goniolosa manmina</i> (Ham-Buch.)	-do-
	Order Cypriniformes	
	Family Cyprinidae	
	Subfamily Cultrinae	
3.	<i>Chela dadiburjori</i> (Menon)	Wardha river
4.	<i>Chela laubuca</i> (Ham-Buch.)	-do-
	Subfamily Rasborinae	
5.	<i>Amblypharyngodon mola</i> (Ham-Buch.)	-do-
6.	<i>Aspidoparia morar</i> (Ham-Buch.)	-do-
	Subfamily Cyprininae	
7.	<i>Neolissocheilus hexagonolepis</i> (McClelland)	Tapi river
8.	<i>Tor khudree</i> (Sykes)	Khapra, Sipna & Tapi rivers
9.	<i>Tor tor</i> (Ham-Buch.)	Tapi & Wardha rivers
10.	<i>Labeo potail</i> (Sykes)	Wardha river
11.	<i>Labeo fimbriatus</i> (Bloch)	-do-
12.	<i>Thynnichthys sandkhol</i> (Sykes)	-do-
13.	<i>Noemacheilus keralensis</i> (Rita & Nalbant)	Hatida Lake Melghat.
14.	<i>Noemacheilus multifasciatus</i> Day	Khandu river.
	Order Siluriformes	
	Family Bagridae	
15.	<i>Aorichthy aor</i> (Ham-Buch.)	Wardha river.
	Family Schilbeidae	
16.	<i>Ailia coila</i> (Ham-Buch.)	-do-
17.	<i>Eutropiichthys vacha</i> (Ham-Buch)	-do-
18.	<i>Proeutropiichthys tnakree</i> (Sykes)	-do-
19.	<i>Pseudotropius atherinoides</i> (Bloch.)	-do-
20.	<i>Silonia childreni</i> (Sykes)	Godavri river System
21.	<i>Silonia silonda</i> (Ham-Buch.)	Wardha river.

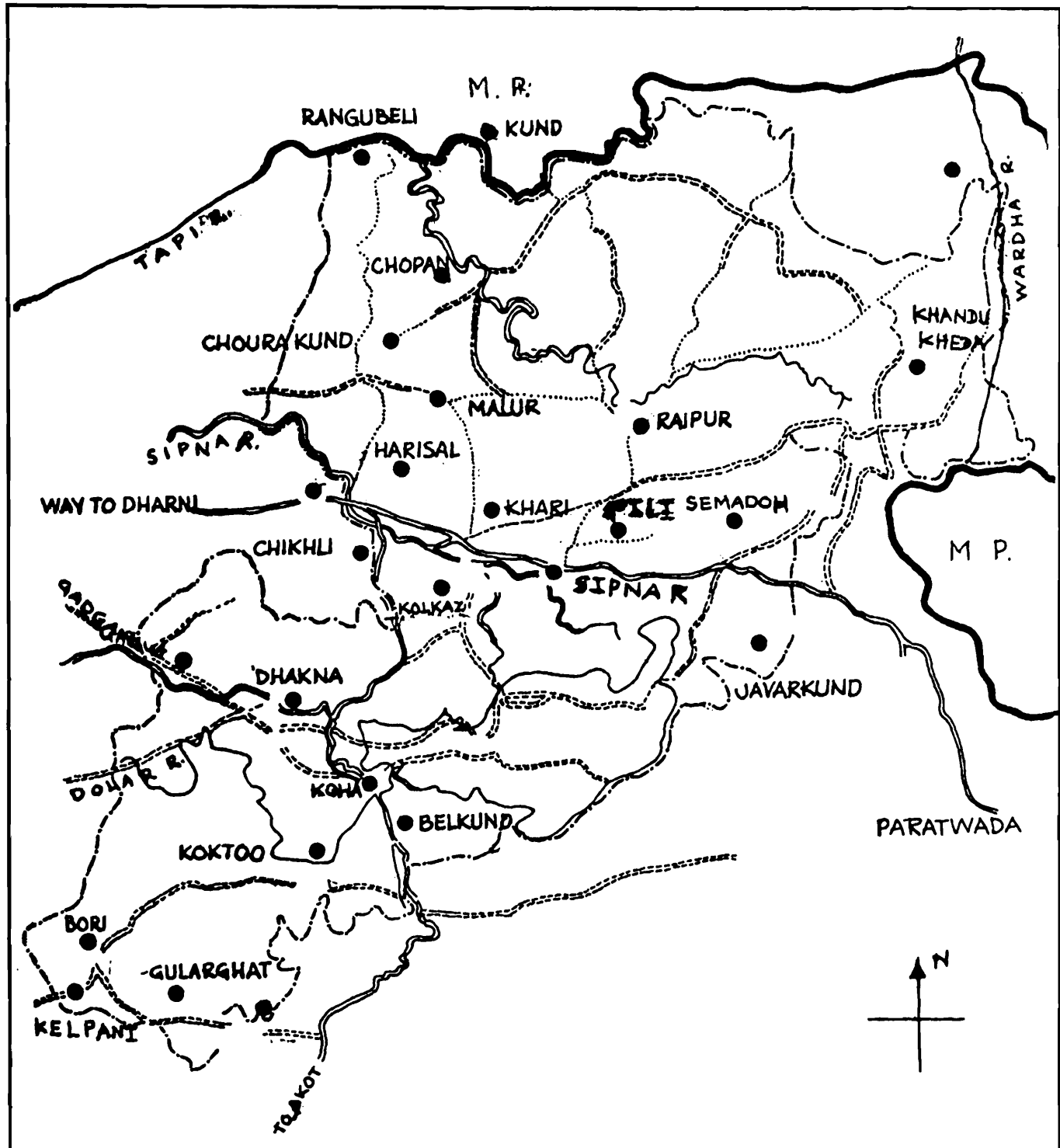


Fig. 1 : Project Tiger Melghat-Fish Localities

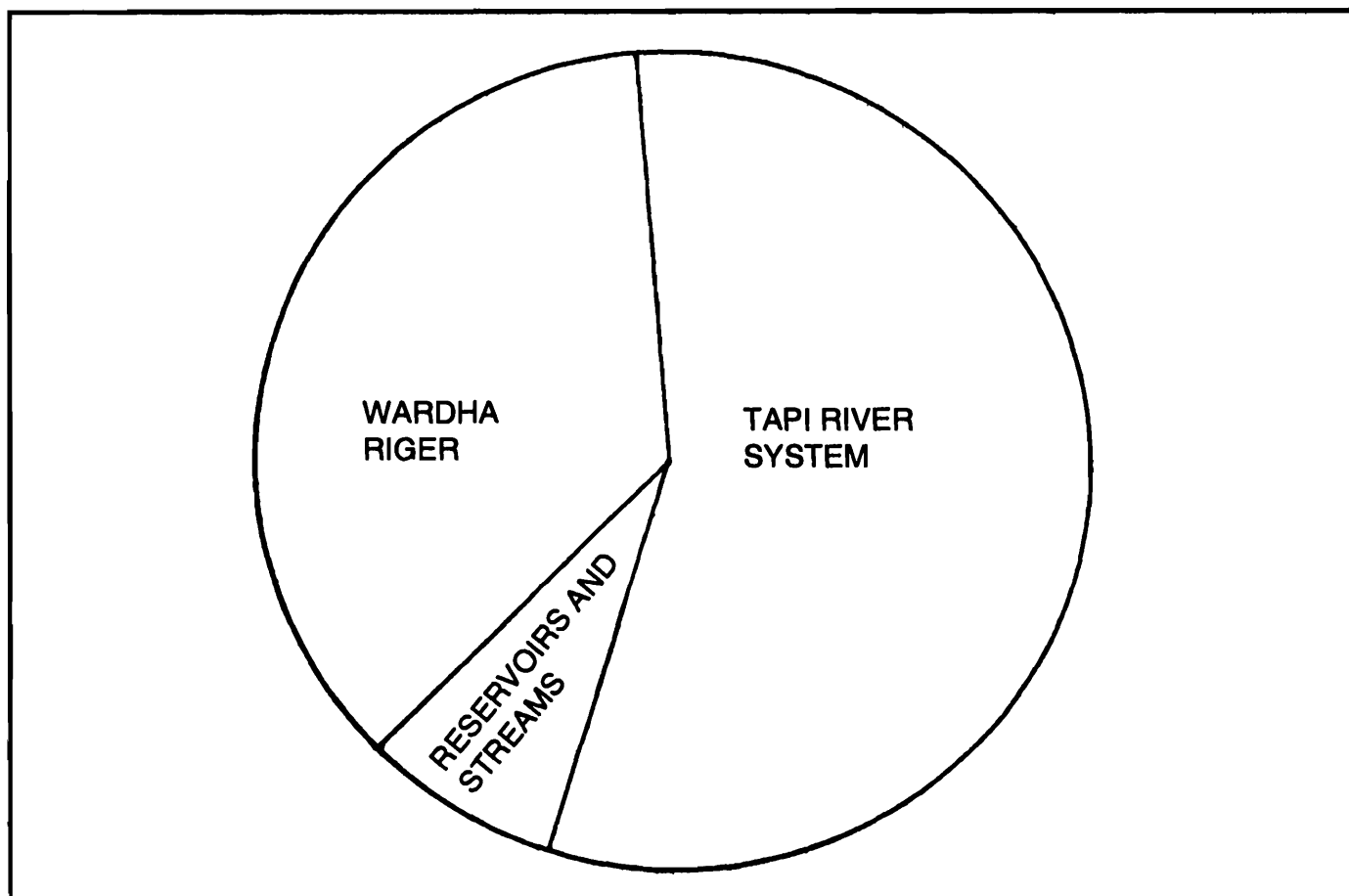


Fig. 2 : Pie chart showing % composition of fish coll. in M.T.R.

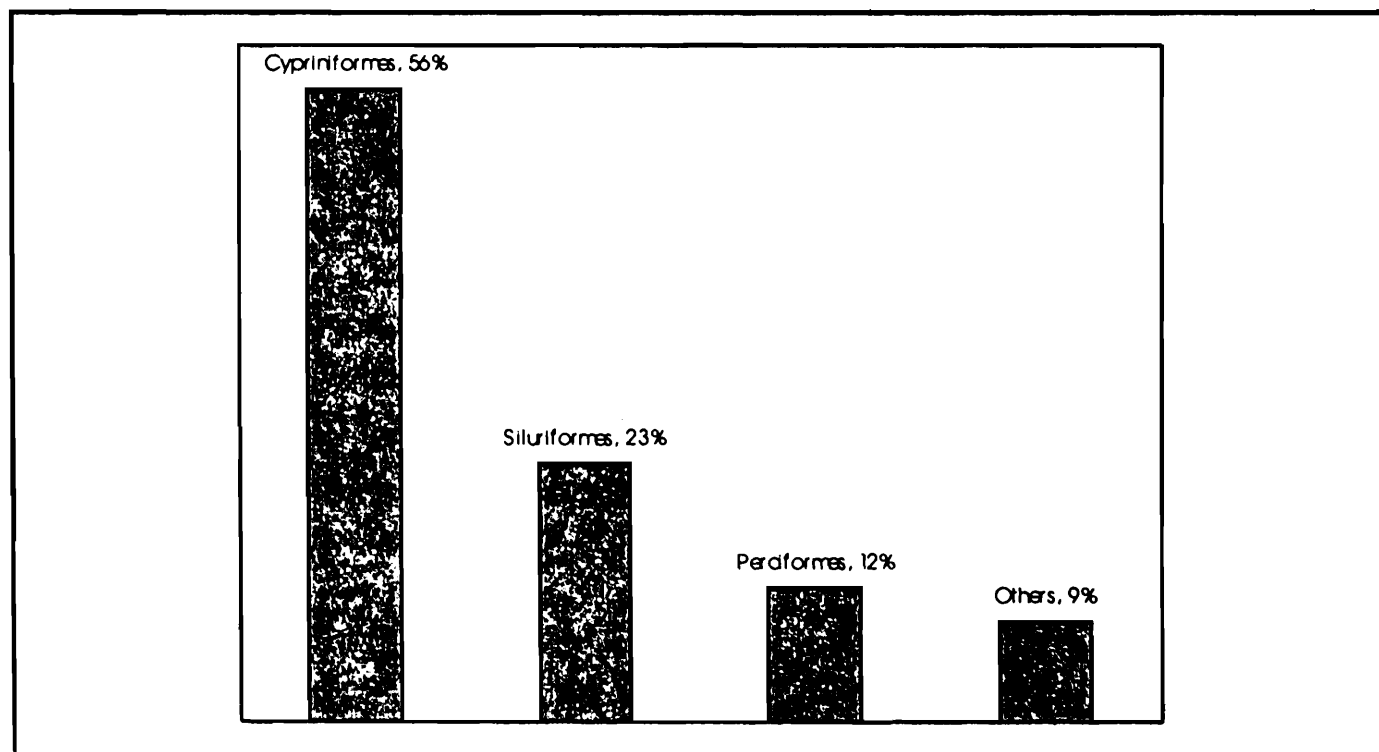


Fig. 3 : Composition of fish orders in Melghat Tiger Reserve

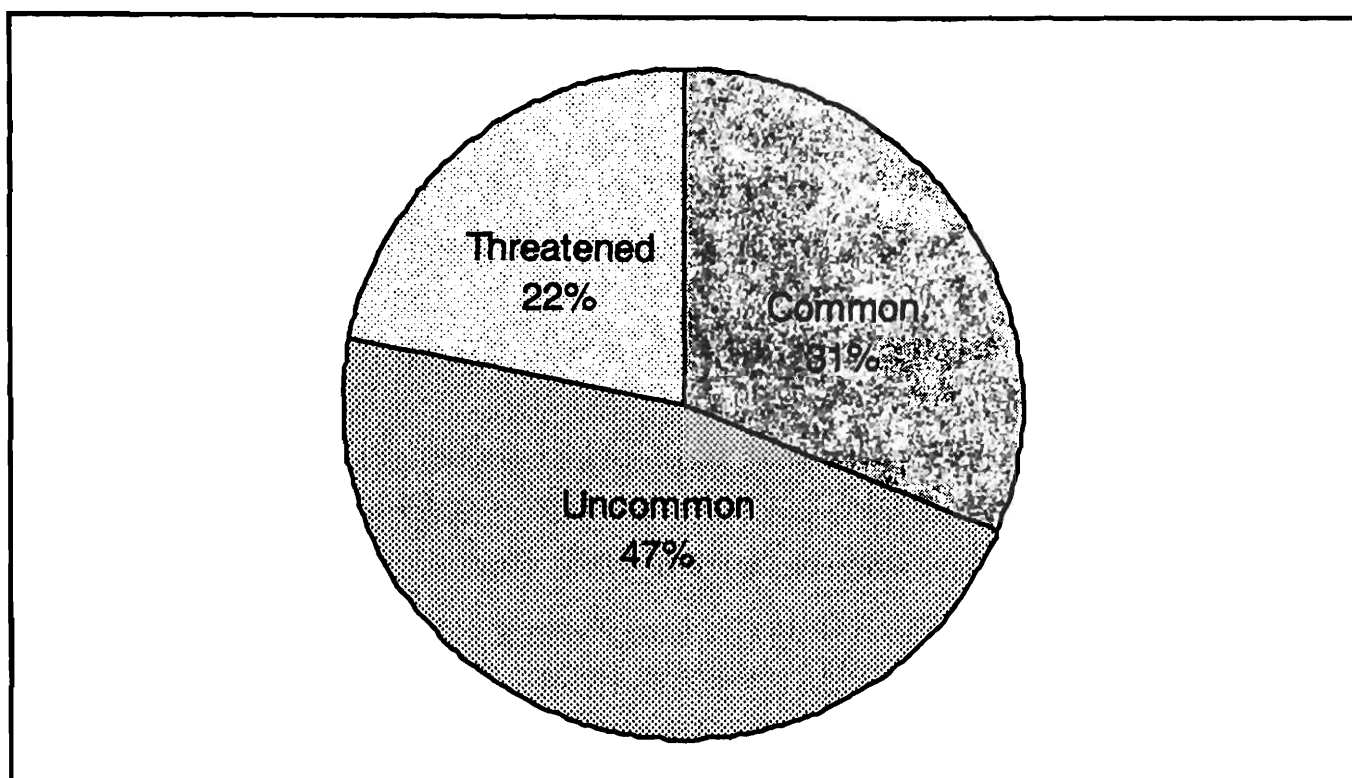


Fig. 4 : Pie chart showing status of fishes in Melghat

ACKNOWLEDGEMENTS

I am grateful to Dr. G.M. Yazdani, Ex-Scientist 'SF', Pune for his valuable guidance.

REFERENCES

- DAY, F. 1875-78. *The Fishes of India being a natural history of the fishes known to inhabit the seas and Freshwater of India, Burma and Ceylon*. Text and Atlas in 4 parts. (London, XX +1-778, 195 Pls.)
- DAY, F. 1889. *The Fauna of British India, including Ceylon and Burma. Fishes*, 1, 548 pp; 2, 509 pp. Taylor and Francis, London.
- DAVID, A. 1963. Studies on the fish and fisheries of the Godavari and Krishna river systems. Pt. I. *Proc. natur. Acad. Sci. India, Allahabad* B(2) : 263-286.
- GUJAR, R.D. 1992. Fishes of Melghat - A preliminary survey Report - In : *Two Decades of Project Tiger, Melghat. (Past, Present & Future) 1973 - 93*. (Ed. Gogate, M.G., Thosare, P.G. & Banubokade, S.B) : 61-66.
- HAMILTON-BUCHANAN, F. 1822. *An account on the Fishes found in river Ganges and its branches*; Edinburg & London : vii + 405 + 39 pls.
- JAYARAM, K.C. 1981. *The Freshwater Fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka*. - Handbook, Zoological Survey of India, Kolkata No. 2 : xii + 475.

- JAYARAM, K.C. 1991. Revision of the genus *Puntius* Hamilton from Indian region (Pisces, Cypriniformes, Cyprinidae). *Rec. zool. Surv. India Occ. Paper No.*, 135 : 1-178.
- MENON, A.G.K. 1987. *The Fauna of India and Adjacent Countries, Pisces Vol. 4, Teleostomi, Cobitoidea* pt. I, *Homalopteridae*, *zool. Surv. India* : 1-259.
- MENON, A.G.K. 1999. Checklist Freshwater Fishes of India, *Rec. zool. Surv. India, Occ. Paper No.*, 175 : 1-366.
- MISRA, K.S. 1976. *The Fauna of India and Adjacent Countries Pisces*, vol. I : 1-276 + 19 pls. *Elasmobranchii & Holocephali*.
- PRADHAN, M.S. 1997. Qualitative analysis of major vertebrate fauna from Wardha river basin (Maharashtra - State). *J. Bombay nat. Hist. Soc.*, 94 : 71-103.
- SYKES, W.H. 1841. On the Fishes of Dukhen. *Trans. Zool. Soc. Lond.*, vol. II.
- TALWAR, P.K. & JHINGRAN, A.G. 1991. *Inland Fishes of India and Adjacent Countries*, vol. I & II : 1158. Oxford & IBH Publ., New Delhi.
- YAZDANI, G.M. 1990. Contribution to the Fish Fauna of India (Including Adjacent Countries) Order : Mastacembeliformes. *Rec. zool. Surv. India Occ. Paper No.* 124 : 1-36.

INSECTA : ODONATA

P.P. KULKARNI and M. PRASAD*

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

Dragon and Demsel flies, as they are aptly described , Odonates form the most noticeable insects while on flight as well as at rest. Being prominent, this group attracted attention of workers since long and first record of Indian Odonate dates back to more than 250 years. (Fraser 1933-36) published 3 volumes on "Fauna of British India : Odonata" which are still regarded as most authentic consolidated taxonomic work. Recently (Prasad & Varshney 1995) published checklist of Indian Odonates which includes 499 species.

Prasad (1996) and Kulkarni, *et. al.* (2002) published an account of Odonata from Maharashtra state, based on the collections present in National Zoological Collection of Zoological survey of India, Kolkata and Pune. Kulkurni *et al.* (2004) worked out Odonata of Pench National Park, Nagpur and added two new records for the State. Thus a total of 86 species are now known from Maharashtra.

Faunistic Surveys of Melghat Tiger Reserve, Dist. Amravati were undertaken by Western Regional Station, Zoological survey of India, Pune during the years 1991-1994. A total of 400 (approx.). specimens were collected. All this collection was identified. As the area of Melghat Tiger Reserve was surveyed for the first time by Z.S.I. and there is no specific record of Odonate species from this area, all the 24 species are recorded for the first time from there.

* *Zoological Survey of India, 535 "M" Block, New Alipore, Kolkata, 700 053.*

Present Address : Sajjan Apartments, 81/A, Uma Kanta Sen Lane, Paikpara, Kolkata 700 030.

Order ODONATA
 Suborder ZYGOPTERA
 Superfamily COENAGRIONOIDEA
 Family COENAGRIONIDAE
 Subfamily PSEUDAGRIONINAE
 Genus *Pseudagrion* Selys, 1876

1. *Pseudagrion decorum* (Rambur)
2. *Pseudagrion microcephalum* (Rambur)
3. *Pseudagrion rubriceps rubriceps* Selys

Subfamily ISCHNURINAE
 Genus *Enallagma* Charp., 1840

4. *Enallagma parvum* Selys

Genus *Ischnura* Charp., 1840

5. *Ischnura aurora aurora* (Brauer)

Family PLATYCNEMIDIDAE
 Subfamily PLATYCNEMIDINAE
 Genus *Copera* Kirby, 1890

6. *Copera marginipes* (Ramb.)

Family Protoneuridae
 Subfamily Disparoneurinae
 Genus *Disparoneura* Selys, 1860

7. *Disparoneura quadrimaculata* (Ramb.)

Superfamily LESTOIDEA
 Family LESTIDAE
 Subfamily LESTINAE
 Genus *Lestes* Leach, 1815

8. *Lestes viridulus* Rambur

Suborder ANISOPTERA
 Superfamily AESHNOIDEA
 Family GOMPHIDAE
 Subfamily ONYCHOGOMPHINAE
 Genus *Paragomphus* Cowley, 1934

9. *Paragomphus lineatus* (Selys)

Family AESHNIDAE

Subfamily AESHNINAE

Genus *Gynacantha* Rambur, 1842

10. *Gynacantha bayadera* Selys

Superfamily LIBELLULOIDEA

Family LIBELLULIDAE

Subfamily LIBELLULINAE

Genus *Orthetrum* Newman, 1833

11. *Orthetrum glaucum* (Brauer)

12. *Orthetrum pruinsum neglectum* (Rambur)

13. *Orthetrum sabina sabina* (Drury)

14. *Orthetrum taeniolatum* (Schn.)

Genus *Potamarcha* Karsch 1890

15. *Potamarcha congener* (Rambur)

Subfamily SYMPETRINAE

Genus *Brachythemis* Brauer, 1868

16. *Brachythemis contaminata* (Fabr.)

Genus *Bradinopyga* Kirby, 1893

17. *Bradinopyga geminata* (Rambur)

Genus *Crocothemis* Brauer, 1968

18. *Crocothemis servilia servilia* (Drury)

Genus *Diplacodes* Kirby, 1889

19. *Diplacodes trivialis* (Rambur)

Genus *Neurothemis* Brauer, 1867

20. *Neurothemis intermedia intermedia* (Rambur)

Subfamily TRITHEMISTINAE

Genus *Trithemis* Brauer, 1868

21. *Trithemis aurora* (Burmeister)

22. *Trithemis festiva* (Rambur)

23. *Trithemis kirbyi kirbyi* Selys

Subfamily TRAMEINAE

Genus *Pantala* Hagen, 1861

24. *Pantala flavescens* (Fabr.)

SYSTEMATIC ACCOUNT

Order ODONATA
 Suborder ZYGOPTERA
 Superfamily COENAGRIONOIDEA
 Family COENAGRIONIDAE
 Subfamily PSEUDAGRIONINAE
 Genus *Pseudagrion* Selys, 1876

1. *Pseudagrion decorum* (Rambur)

1842. *Agrion decorum* Rambur, Ins. Neurop., : 258.

1933. *Pseudagrion decorum*, Fraser, Fauna Brit India, Odon., 1 : 286-289.

Diagnostic characters : This species has white labrum with rest of the head up to posterior ocelli pale bluish green. Light blue ground colour, thorax pale blue, with fine black lines, mid dorsal carinal ridge and a thick black humeral strip. Pterostigma diamond shaped. Beautifully bluish green colour distinguishes this species from other species of the genus. Anal appendages narrowly bifid at the apex. Inferior anal appendages short and half of the length of superior.

Material examined and locality : 1♂, Pirkheda village, 22.08.1993, Coll. P.P. Kulkarni.

Distribution : Throughout continental India.

Elsewhere : Myanmar, Nepal and Sri Lanka.

Remarks : Common species in India, found on permanent and temporary water bodies. Rare in hill streams.

2. *Pseudagrion microcephalum* (Rambur)

1842. *Agrion microcephalum* (Rambur). Ins Neurop., : 25.

1876. *Pseudagrion microcephalum*, Selys Bull. Acad. Belg., (2) : XIII : 504.

Diagnostic Characters : Labium white, bases of mandibles, gene, frons and fore part of vertex azure blue, post clypeus with three small black spots at base; Prothorax blue, anterior lobe and five parallel lines on middle lobe all confluent in front and behind, black. Thorax blue with pale to white below and beneath. Abdomen azure blue marked with black on segment 2 and segments 3 to 7 dorsally with apical narrow rings; 8 with a thick apical dorsal ring & 9th unmarked. Segment 10 with saddle shaped dorsal mark extending from base to apex.

Material examined and locality : 1♂, village Pirkheda, Dhakna range, 22.08.1993, Coll. P.P. Kulkarni.

Distribution : Throughout the plains in India.

Elsewhere : Myanmar and Sri Lanka, extending to Australia.

Remarks : Dwells near permanent and temporary water bodies. Variations in colour markings in males are recorded.

3. *Pseudagrion rubriceps rubriceps* Selys.

1876. *Pseudagrion rubriceps* Selys. *Bull. Acad. Belg.*, (2) vol. X ii, : 510.

1931. *Pseudagrion rubriceps*, Fraser. *Rec. Indian Mus.*, Vol XXX ii, : 448.

1995. *Pseudagrion rubriceps rubriceps*, Prasad and Varshney, *Oriental Ins.* 29 : 389.

Diagnostic Characters : Labium citron yellow; labrum, bases of mandibles genae, clypeus and frons bright orange; vertex and occiput dark olivaceous; prothorax black, marked with pale blue; thorax olivaceous green with golden tinge up to first lateral suture with black stripes. Legs yellow; femora black on outer and posterior surface with 4 or 5 spines; tibiae speckled with black on flexor surface. Wings with pterostigma strongly brassed, less than one cell, reddish brown, diamond-shaped; 10 post nodal nervures in forewing and 9 in the hind. (Prasad *et al.* 1987) studied collection of 8 species of the genus with notes on their measurements, collection data and variations with keys for their identification.

Material examined and locality : 2♂♂, Dhakna rest house, 14-2-1991, Coll. D.F. Singh; 1♂ Simadoh, near sipna river, 7-12-1992, Coll. P.P. Kulkarni; 1♂; 6 Km. from Dhakna on Dharani Road, Gadaga River, 28.2.1997, Coll. A.S. Mahabal.

Distribution : Throughout India.

Elsewhere : Indo China, Malaysia, Myanmar, Nepal and Taiwan.

Remarks : Earlier records show collection of this species from Pune and Wardha from Maharashtra State (Prasad 1996). Mainly found in plains but also recorded from Ootakmund Nilgiris, 7250' and Coorg 4000' elevations.

Subfamily ISCHNURINAE

Genus *Enallagma* Charp., 1840

4. *Enallagma parvum* Selys

1876. *Enallagma parvum* Selys, *Bull. Acad. Belg.*, (2) 41 : 537.

1933. *Enallagma parvum*, Fraser, *Fauna Brit. India*, 1 : 376-378.

Diagnostic Characters : Labium white, labrum, bases of mandibles, genae and anteclypeus pale sky blue; vertex & occiput black. Prothorax broadly black on dorsum, the sides pale blue, Thorax black on dorsum laterally pale blue; legs white, spines short 4-5 on hind

tibiae. Wings, pterostigma small, less than one cell, blackish in adults. Abdomen pale sky blue. In females ground colour of thorax greenish yellow to yellow abdomen with dorsal strips broader. Heterochrome females also recorded (Fraser 1933). Female specimens not present in the collection.

Material examined and locality : 2 ♂ ♂, Pirkheda village, Dhakna range, 22.08.1993, Coll. P. P. Kulkarni.

Distribution : Throughout India.

Elsewhere : Nepal, Myanmar and Sri Lanka.

Remarks : It is a small damselfly, smallest within the genus and is found on waters of weedy tanks, almost throughout the year.

Genus *Ischnura* Charp, 1840

5. *Ischnura aurora aurora* (Brauer)

1858. *Agrion delicatum* Hagen *Verh. Zool-bot. Ges. Wien.*, 8 : 479.

1865. *Ischnura aurora*, Brauer, *Verh. Zool. bot. Ges. Wein.*, 15 : 509.

1954. *Ischnura aurora*, Lieftinck, *Treubia*, 22 : 74.

1995. *Ischnura aurora aurora*, Prasad and Varshney, *Oriental Ins.*, 29 : 390.

Diagnostic Characters : Labium white; Labrum citron yellow; vertex bronzed black; eyes beautifully olive green, with semilunar spot bordering it Prothorax bronzed black on dorsum, sides and anterior lobe blue. Thorax black on dorsum, Legs pale citron-yellow, wings: pterostigma differs in fore & hind wings, in fore wings kite shaped, broader than long ; rose red for proximal half; in the hind wing much smaller about half the size. Abdomen citron yellow except segments 8 to 10 which are azure blue.

Material examined and locality : 1 ♀, Dhakna Range, 22.8.1993, Coll. P.P. Kulkarni.

Distribution : Throughout India, in Maharashtra Khed, Pune, Buldana, Aurangabad.

Elsewhere : Australia; Indonesia; Malaysia; Myanmar; Nepal; New Guinea; Papua; Philippines; Sri Lanka and Sondaic Archipelago.

Remarks : Widely distributed, found in grasses & marshy places around water bodies.

Genus *Copera* Kirby, 1890

6. *Copera marginipes* (Rambur)

1842. *Platynemesis marginipes* Rambur *Ins. Neurop.* : 240.

1993. *Copera marginipes*, Fraser, *Fauna Brit, India. Odon.*, 1 : 192-197.

Diagnostic Characters : Labium pale brownish white, labrum pale greenish yellow,

frons and vertex bronzed black, eyes bordered with white stripes. Prothorax and thorax bronzed black on dorsum, legs variably bright orange to dull reddish. Wings, pterostigma brown. Abdomen bronzed black upto middle of segment 8, from which to the end pale bluish white to creamy white. Superior anal appendages only one fourth the length of interiors. Females with posterior lobe of prothorax without spines. Fraser (1933) has described Ceylon, Coorg, Westcoast, Deccan, Assam & Bengal forms with variation in colour patterns.

Material examined and locality : 1 ♂, 1 ♀, Dhakana rest house, 14.2.1991 Coll. D.F. Singh; 4 ♂ ♂, 2 ♀ ♀, Gobi nalla near Bori Village, Dhakna range, 5.12.1992, Coll. P.P. Kulkarni; 1 ♀, 6 Km. from Dhakna on Dharni Road, Gadaga River, 28.2.1997, Coll. A.S. Mahabal.

Distribution : India : Assam, Bihar, Chandigarh, Madhya Pradesh, Maharashtra (Lone, Pune, Khandala, Hingoli, Wardha, Gondhonkher, Buldhana), Rajasthan, South Andaman Islands, West Bengal, Western Ghats & Western Himalaya).

Elsewhere : Indonesia; Malaysia; Myanmar; Nepal; Sri Lanka and Thailand.

Genus *Disparoneura* Selys, 1860

7. *Disparoneura quadrimaculata* (Rambur)

1842. *Argia quadrimaculata*, Ramb. *Ins. Neurop.* : 255.

1859. *Disparoneura quadrimaculata*, Selys, *Bull. Acad. Belg.*, (2) x, 446.

1931. *Chloroneura quadrimaculata* Fraser, *Fauna Brit. India, Odonata I* : 246-248.

1955. *Platylestes orientalis*, Baijal and Agarwal, *Agra. Univ. J. Res. (Sci)*, 4(2) : 469.

1995. *Disparoneura quadrimaculata*, Prasad & Varshney. *Oriental Ins.*, 29 : 494.

Diagnostic Characters : Labium pale whitish brown; labrum, clypeus, vertex and occiput dull brick red, labrum with a small median black spot, prothorax dull brick red, thorax bright brick red on dorsum, paler at sides, marked with black. Legs pale brown, femora speckled out with black. Wings hyaline, the fore pair traversed by a broad blackish brown fascia, wings of male broadly barred with blackish brown across middle. Wings in females without any black markings. Abdomen brick red, marked with white brown and black, (Fraser, 1933). Female differs considerably from male and more robust in build (not in the present collection).

Material examined and locality : 1 ♂, Vill. Pirkheda, Dhakna range, 22.8.1993, Coll. P.P. Kulkarni ; 1 ♂, 6 Km. from Dhakna on Dharni Road, Gadaga River, 28.2.1997, Coll. A.S. Mahabal.

Distribution : India (Central India, Delhi, Uttar Pradesh and Western Ghats).

Remarks : Found in submontane areas. Mostly recorded up to 1,500 elevation.

Superfamily LESTOIDEA

Family LESTIDAE

Subfamily LESTINAE

Genus *Lestes* Leach 1815

8. *Lestes viridulus* Rambur

1842. *Lestes viridula* Rambur, Hist. Nat. Ins. Neurop., 252-253.

1890. *Lestes viridulus*, Kirby. Cat Odon., 163.

Diagnostic Characters : Labium pale yellow, Labrum, clypeus, frons, vertex and occiput pale brown, behind the eyes pale yellow; eyes brown above, golden yellow below, prothorax pale brown uniformly, thorax pale yellow; dorsum of thorax with two very narrow conspicuous metallic green stripes running parallel. Legs pale yellow with black spines. Abdomen pale yellow at sides and almost white beneath. Anal appendages yellow, tipped with black. Females coloured as in males with a longitudinal black stripe on all femora.

Material examined and locality : 1♂, Gugamal, Koktu, 9.12.1992, Coll. P.P. Kulkarni.

Distribution : Throughout India.

Elsewhere : Thailand.

Remarks : Common in dry season and usually among dry long grasses. Recorded from Amil Chenchni and Dist. Satara from Maharashtra state.

Suborder ANISOPTERA

Superfamily AESHNOIDEA

Family GOMPHIDAE

Subfamily ONYCHOGOMPHINAE

Genus *Paragomphus* Cowley, 1934.

9. *Paragomphus lineatus* (Selys)

1850. *Gomphus lineatus* Selys, Rev. Odon., : 386.

1854. *Onychogomphus lineatus*, Selys, Bull. Acad. Belg. XXI (2) : 36.

1924. *Mesogomphus lineatus*, Fraser, Rec. Indian. Mus., XXVI, 424, 477.

1995. *Paragomphus lineatus*, Prasad & Varshney, Oriental Ins., 29 : 402.

Diagnostic Characters : Labium, labrum, face & frons sandy yellow, vesicle and occiput yellow, separated by narrow, transverse dark brown streak. Prothorax blackish brown, thorax sandy yellow, legs yellow, marked with black, tarsi black, femora with two rows

of spines. Abdomen black marked with yellow, anal appendages yellow. Females closely resemble with males, much paler than males.

Material examined and locality : 1 ♀, Semadoh, 8.2.1991; 1 ♂, Dhakna, 17.2.1991 Coll. D.F. Singh; 1 ♂, Gugamal Koktu, 9.12.1992 Coll. P.P.Kulkarni; 1 ♀, Ambadoh, Coll. S.S.Kamble.

Distribution : India : West Bengal, Dehradun (Uttaranchal), Poona Khandala (Maharashtra), Madras, Palaghat, Trichinopoly, Coorg and the Nilgiris.

Remarks : Breeds both in still and running waters, camouflages with surroundings and a bit difficult to catch. Pale and dark forms are recorded in summer & monsoon.

Family AESHNIDAE

Subfamily AESHNINAE

Genus *Gynacantha* Rambur, 1842

10. *Gynacantha bayadera* Selys

1891. *Gynacantha bayadera* Selys Ann. Mus. Civ. Stor (x) Nat. Giacomo Doria, Genova, 30 : 47.

1925. *Gynacantha lyttoni*, Fraser, J Darjeeling Nat. Hist. Soc., 9 : 31-33.

1995.. *Gynacantha bayadera*, Prasad & Varshney, Oriental Ins., 29 : 404.

Diagnostic Characters : Large sized dragonfly with homogenous colour of dull brown and green. Wings long and broad, very closely reticulated and palely tinted at bases. Abdomen markedly constricted at segment 3, of even width and cylindrical from segment 4 to end of abdomen. Anal appendages bright ochreous changing to reddish brown at apices. Females identical to males in colouration.

Material examined and locality : 2 ♀ ♀, Malur village, Chaurakund, 28.3.1993, and 1 ♀, Dhakna range, 25.8.1993 Coll. P.P. Kulkarni.

Distribution : India : Karnataka, Maharashtra, Meghalaya, Orissa, Sikkim, and West Bengal.

Elsewhere : Myanmar, Malaysia and Indo China.

Superfamily LIBELLULOIDEA

Family LIBELLULIDAE

Subfamily LIBELLULINAE

Genus *Orthetrum* Newman, 1833

11. *Orthetrum glaucum* (Brauer)

1865. *Libellula glauca* Brauer, Varh, Zool, bot. Gas. Wien, 15 : 1012.

1890. *Orthetrum glaucum*, Kirby, Cat. Odon., 39.

1936. *Orthetrum glaucum*, Fraser, Fauna Brit, India, 3 : 307–309.

Diagnostic Characters : Medium sized dragonfly with face black, eyes, dark green during life. Prothorax bright yellow to dark brown, marked with yellow; thorax in old adults pruinose dark dull blue or black. Legs black, wings hyaline, with extreme base tinted with dark amber-yellow upto the cubital nervure and up to anal triangle in hind wing; discoidal cell of hind wing entire. In female abdomen reddish brown with a broad greenish yellow stripe on mid dorsum extending up to segment 7 as against in males, pale dirty blue up to apical end of segment 8 & black for the remainder.

Material examined and locality : ♂, Gullarghat Khatakali Road, 7.12.1992 Coll. P.P. Kulkarni; 1 ♂, 1 ♀, 29.3.1994, Kelpani village, Koktu Coll. S.G. Patil; 1 ♂, Jawahar Kund near Semadoh, 2.4.1994 Coll. M.S. Pradhan.

Distribution : India : West Coast, Western Himalaya, Manipur, Meghalaya, Arunachal Pradesh, Mizoram.

Elsewhere : Sri Lanka, Nepal, Philippines and Java.

Remarks : This species is found at altitudes up to 4000 and recorded only on West coast in plains. Its occurrence in Melghat Tiger Reserve confirms its dwelling in plains.

12. *Orthetrum pruinsum neglectum* (Rambur)

1842. *Libellula neglecta* Rambur, Ins. Neurop., 86.

1936. *Orthetrum pruinsum neglectum*, Fraser, Fauna Brit. India, 3 : 311–313.

Diagnostic Characters : Head, with reddish brown colour progressively dark from labium to frons and up to vesicle & occiput; eyes blue black above, bluish-gray below during life. Prothorax and thorax reddish brown, legs black, wings hyaline with enfumed pale brown towards apices and with a reddish-brown basal marking in hind wing. Abdomen bright vermilion red in sub adults, purplish red in adults. Anal appendages red. Females differ from males in frons similar to rest of face in colour, eyes yellowish capped with brown. Thorax reddish brown, abdomen dull ochreous with sutures and borders all finely black, anal appendages dark ochreous and basal markings in wings pale and almost obsolete.

Material examined and locality : 1 ♂, Dedra Khora, Koktu, 8.12.1992, 1 ♂, Dhakna range, 22.8.1993 Coll. P.P. Kulkarni; 1 ♂, Semadoh, 4.9.1993 Coll. R.M. Sharma; 1 ♂, Khedida, Koktu 28.03.1994 ; 1 ♀, Kelpani River near Kelpani village, Koktu, 29.3.1994, Coll. S.G. Patil; 1 ♂, Somthane area, Akot road, 26.11.1994, Coll. S.S. Kamble.

Distribution : India : Himachal Pradesh (Bilaspur, Kangra, Kinnaur, Kulu, Srimaur, Solan), Uttaranchal (Chamoli, Dehradun, Nainital, Pauri and Tehri Garhwal, Uttarkashi), Bihar (Dhanbad).

Elsewhere : Nepal; Myanmar; Sri Lanka; Hong Kong; Thailand and Malaya.

Remarks : Breeds in small tanks; recorded from altitude of 7,250 from Ooty, Nilgiris. Variation in nodal index is recorded in this species.

13. *Orthetrum sabina sabina* (Drury)

1770. *Libellula sabina* Drury, *Ill. Exot. Int.*, 1 : 114.

1936. *Orthetrum sabina*, Fraser, *Fauna Brit. India*, 3 : 300-302.

1995. *Orthetrum sabina sabina*, Prasad and Varshney, *Oriental Ins.*, 409.

Diagnostic Characters : Labium yellow, middle lobe brownish to black; labrum face and frons yellowish, variably marked on anterior surface with black; frons very deeply notched so as to form two triangular facets in front. Prothorax bright yellow, thorax greenish yellow, legs black. Abdomen greenish yellow with very broad apical black rings on segments 4 to 5, narrow ring on segments 6; segments 7 to 9 and base of 10 black. Segments 1 and 3 enormously swollen dorso ventrally as well as laterally; 4 to 6 narrow, cylindrical, 7 to 9 dilated but compressed laterally; 10th very small. Anal appendages as long as segment 9. Females exactly like males.

Material examined and locality : 1 ♀, Goiya Nalla, 20.2.1993 Coll. S.G. Patil, 1 ♂, Khandu river near Khandu Kheda- Jarida road, 3.4.1994 and 1 ♂, Belkund Doh, Akot Road, 5.4.1994 Coll. M.S. Pradhan & P.P.Kulkarni.

Distribution : India : Himachal Pradesh (Bilaspur, Kangra, Sirmaur, Solan, Una), Uttaranchal (Dehra Dun, Nainital, Pauri Garhwal), Jharkhand (Singhbhum), Bihar (Dhanbad).

Elsewhere : Somalia (Somali Land); Iraq; Iran; Nepal; Sri Lanka; Myanmar; Thailand; Micronesia (Ocenia); Samoa Island (Pacific Ocean) Indonesia (Java, Sumba, Timor); Papua (New Guinea); Australia; Egypt; Angola and most of African continent.

Remarks : Found in all parts of India, up to 7000 (Nilgiri's), most predaceous; cannibalism is also recorded and preys on other dragonflies also.

14. *Orthetrum taeniolatum* (Schn.)

1842. *Libellula neglecta*, Rambur, *Ins. Neurop.*, 86.

1936. *Orthetrum taeniolatum*, Fraser, *Fauna Brit. India*, 3 : 296-298.

Diagnostic Characters : Labium, labrum, face, frons and vesicle palest brown; occiput dark brown, prothorax & thorax pulverulent blue; legs black, hinder surface yellow, wings hyaline not enfumed, pterostigma ochreous, between thick black nervures nodal

index : $\frac{9-12}{8-9} \bigg| \frac{12-8}{8-9}$ Abdomen pulverulent blue; anal appendages black.

Material examined and locality : 3♂♂, 1♀, Gullarghat Khatakali Road 7.12.1992 ; 1♂, 1♀, Dedrakhora, Kaktu, 8.12.1992; 1♂, 1♀, Gugamal, Koktu, 9.12.1992; 2♂♂, 1♀, Khapra River, Chopan Village, Chaurakund, 12.12.1992; 1♂, village Mangia on Harisal-Semadsh Road, 13.12.1992; 1♂, 1♀, Agricultural fields, 3 Km. South of Semadoh, 14.12.1992; 1♀, Pili Village, Near Kolkaz; 17.12.1992 alt coll. P.P. Kulkarni; 1♂, 2♀, Motideo Nalla, 19.2.1993; 1♂, 2♀, Gobiya Nalla, 20.2.1993; 1♂, Koktu River, 21.2.1993; 1♂, 1♀, Koktu river, Near Koktu Rest House, 30.3.1994 all Coll. S.G.Patil; 1♀, Jawahar Kund near Semadoh, 2.4.1994 Coll. M.S. Pradhan; 1♀, Khatang bamboo, Pilli area, 19.2.1997, Coll. A.S. Mahabal.

Distribution : Throughout India.

Elsewhere : Nepal and countries bordering Mediterranean Sea.

Genus *Potamarcha* Karsch, 1890

15. *Potamarcha congener* (Rambur)

- 1842. *Libellula obscura* Rambur, *Ins. Neurop* : 64.
- 1842. *Libellula congener*, Rambur, *Ins. Neurop* : 70.
- 1890. *Potamarcha obscura*, Karsch, *Ent. Zeit*, 33 : 371.
- 1891. *Potamarcha congener*, Selys, *Ann. Soc. Espan*, 20 : 221.
- 1936. *Potamarcha obscura*, Fraser, *Fauna Brit. India*, 3 : 289-291.
- 1995. *Potamarcha congener*, Prasad & Varshney *Oriental Ins.*, 29 : 410.

Diagnostic Characters : The only species of the genus. Can be distinguished by arc situated between the first and second antenodal nervures; 2 rows of cells between IR iii and Rspl. and anal field of hindwing rather broad with cells arranged in straight rows. They are dragonflies of moderate size, coloured black brown, marked with yellow but never of metallic colour.

Material examined and locality : 1♀, Khedida, Koktu, 28. 3. 1994 Coll. S. G. Patil.

Distribution : India : Himachal Pradesh (Kangra), Uttaranchal (Dehradun), Bihar (Dhanbad), Jarkhand (Singbhom), Madhya Pradesh, West Bengal, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra.

Elsewhere : Nepal; Myanmar; Sri Lanka; Philippines; Taiwan; Malaya Archipelago, Indonesia (Java, Sumatra); Papua (New Guinea) and North Australia.

Remarks : Common Species in India.

Subfamily SYMPETRINAE

Genus *Brachythemis* Brauer, 186816. *Brachythemis contaminata* (Fabr.)

1793. *Libellula contaminata*, Fabricius, Ent. Syst., 2 : 382.

1936. *Brachythemis contaminata*, Fraser, Fauna Brit. India, 3 : 365-366.

Diagnostic characters : Labium pale ochraceous; labrum reddish; face frons and vesicle olivaceous or pale green yellow, eyes broadly contiguous; prothorax with dark reddish brown stripes traversing anterior and posterior borders of middle lobe, thorax with obscure brownish stripes, wings hyaline, reticulation reddish, with a broad bright orange fascia extending from base within 2-3 cells of pterostigma in fore wing and as far as that organ in the hind; pterostigma rust red. Abdomen reddish-ochraceous, marked with obscure dorsal and sub dorsal brown stripes. Females differ in colour, with hind wings very palely tinted with yellow at extreme base without orange fascia seen in the males, pterostigma bright ochraceous. Abdomen pale olivaceous brown, with narrow black stripe on mid dorsal carina from segment 2 to end. Anal appendages yellow.

Material examined and locality : 1♂, Malur village, 12.2.1991, Coll. D.F. Singh; 1♂, Gugamal, Koktu, 9.12.1992 Coll. P.P.Kulkarni; 1♀, Motideo Nalla, 19.2.1993 ; 1♀, Hatida Talav, 22.2.1993, Coll. S.G. Patil; 1♂, 4♀♀, Jawahar Kund near Semadoh, 2.4.1994 Coll. M.S. Pradhan.

Distribution : India : Himachal Pradesh (Bilaspur, Kangra, Sirmour, Una), Uttaranchal (Dehradun, Nainital, Parui, Garhwal); Madhya Pradesh; Bihar (Dhanbad); West Bengal and East Himalaya, Maharashtra (Osmanabad, Pune. Khandala, Khed and Lonavala).

Elsewhere : China; Indonesia; Malaysia; Myanmar; Nepal; Philippines; Singapore; Sri Lanka; Taiwan and Thailand.

Remarks : It is common species in India and found in large numbers. Seen flying over water surface throughout year and recorded to undergo three generations annually.

Genus *Bradinopyga* Kirby, 189317. *Bradinopyga geminata* (Rambur)

1842. *Libellula geminata* Rambur, Ins. Neurop. : 90.

1936. *Bradinopyga geminata*, Fraser, Fauna Brit. India, 3 : 349-350.

Diagnostic Characters : Labium, labrum pale yellow or dark brown; rest of face & frons olivaceous, vesicle & occiput brown, prothorax and thorax cinereous or dirty pale yellow marbled with black. Wings hyaline, pterostigma black at centre, pure white at distal and proximal ends, discoidal cell in forewing traversed only once, but in hind wing entire.

Anal triangle 3 celled, abdomen coloured very similar to thorax. Anal appendages pale creamy white. Female exactly similar to males.

Material examined and locality : 1 ♀, Pirkheda, deserted village in Dhakna range, 4.12.1992 Coll. P.P. Kulkarni; 1 ♀, Malur fata Chaurakund, 25.8.1993; 1 ♂, Malur village, Chaurakund, 28.8.1993, Coll. P.P. Kulkarni; 1 ♀, 6 Km. from Dhakna on Dharni Road, Gadaga River, 28.2.1997, Coll. A.S. Mahabal.

Distribution : India : Uttaranchal (Dehradun, Nainital) , Delhi, Madhya Pradesh, Bihar (Dhanbad), West Bengal, Eastern Himalaya, Maharashtra, Satara (Ambenali); Peninsular India.

Elsewhere : Sri Lanka.

Remarks : This species is found in open and cultivated areas, near wells, small and cemented walls, and exhibits protective, cryptic colours. It is common in tanks, plastered March to October. However also collected in December in present record.

Genus *Crocothemis* Brauer, 1868

18. *Crocothemis servilia servilia* (Drury)

1770. *Libellula servilia*, Drury, Ill. Ex. Ins., 1 : 16.

1936. *Cocothemis servilia servilia*, Fraser, *Fauna Brit. India*, 3 : 345–347.

Diagnostic Characters : Labium ferruginous; labrum blood red, anteclypeus pale red, rest of face and frons bright blood red; eyes during life blood red above, purple laterally. Prothorax and thorax ferruginous, often blood red on dorsum during life, legs ochreous, Wings, hyaline bases of all wings marked with rich amber yellow up to cubital nervure in forewing and to first antenodal nervure nearly to arc; apices of wings lined narrowly with pale brown in old specimens.

Females differ widely in colouration from the males. Labium pale yellow; labrum, face, frons and vertex olivaceous; prothorax and thorax olivaceous brown. Wings similar to males but markings paler, abdomen ochreous, segments 8 & 9 blackish along mid dorsal carina.

Material examined and locality : 1 ♂, Malur village, 12.2.1991 Coll. D.F. Singh; 1 ♀, Agricultural fields, 3 kms south of Semadoh, 14.12.1992 Coll. P.P. Kulkarni, 1 ♀, Talai, 15.2.1993, Coll. S. G. Patil; 2 ♂♂, Gobiya Nalla, 20.2.1993 Coll. S.G. Patil.

Distribution : India : Himachal Pradesh (Kangra), Uttaranchal (Chamoli, Dehradun, Nainital, Pauri Garhwal), Madhya Pradesh, Bihar (Dhanbad), Jharkhand (Singbhum), West Bengal; Maharashtra, (Buldana Gondhonkher, Colaba Matheran, Osmanabad (Upla), Pune (Khed and Lone) and Satara (Lingmal Falls).

Elsewhere : Iraq; Nepal; Myanmar; Sri Lanka; Philippines; Indonesia (Sumba); Australia, Sundaic Archipelago and Japan.

Remarks : Common species in India. Adults are seen throughout the year on wing. Teneral males and females are similar in colour, pale straw-yellow, differ from mature males, may confuse identity of the species.

Genus *Diplacodes* Kirby, 1889

19. *Diplacodes trivialis* (Rambur)

1842. *Libellula trivialis*, Rambur, *Ins. Neurop.*; 115.

1936. *Diplacodes trivialis*, Fraser, *Fauna Brit. India*, 3 : 336-338.

Diagnostic Characters : Labium, labrum and bases of mandibles creamy yellow; face, frons, and vertex palest azure blue with fine black line at the base of frons; Prothorax pale brown to black; thorax greenish yellow with sutures finely black; the area between mid dorsal carina and humeral sutures olivaceous brown speckled with minute dots, colouration darkens with age. Legs greenish yellow, marked with black in subadults; wings hyaline with a minute yellow point in cubital space of hind wings; abdomen with segments 1 to 3 greenish yellow; remaining segments black with sub dorsal yellow stripes on segments 4-7. Females : Similar to subadult males, abdominal markings broader on segments 8 to 10.

Material examined and locality : 2 ♂♂, 1 ♀, Gugamal, Koktu, 9-12-1992 ; 2 ♂♂ Pili village near Kolkaz, 17.12.1992, Coll. P.P. Kulkarni, 1 ♀, Jawaharkund, 11.2.1993; 1 ♂, Motideo nalla 19.2.1993; 3 ♀♀, Gobiya Nalla 20.2.1993; Coll. S.G. Patil; 1 ♀, Dhakna range 22.8.1993 Coll. P.P. Kulkarni.

Distribution : Throughout India.

Elsewhere : Nepal; Myanmar ; Sri Lanka; Thailand; W. Malaysia (Malacca) and Indonesia (Sumatra).

Remarks : Common species found throughout the year near waterbodies. Also found in grassy vegetation & agricultural fields.

Genus *Neurothemis* Brauer, 1867

20. *Neurothemis intermedia intermedia* (Rambur)

1842. *Libellula intermedia* Rambur, *Ins. Neurop.*, : 91.

1936. *Neurothemis intermedia intermedia*, Fraser, *Fauna Brit. India*, 3 : 357-358.

Diagnostic Characters : Labium, bases of mandible, labrum, face, frons pale yellow; occiput and upper surface of eyes reddish-brown; eyes below golden yellow. Thorax with a distinct humeral reddish brown stripe, wings hyaline, palely tinted with yellow

and with broad basal amber-yellow marking at the base of all wings. Nodal index $\frac{12-12\frac{1}{2}}{11-9} \bigg| \frac{11\frac{1}{2}-11}{9-10}$ and $\frac{10-11\frac{1}{2}}{10-10} \bigg| \frac{11\frac{1}{2}-10}{10-9}$ Abdomen bright reddish-orchaceous with sutures on segment 2 & 3 finely darker, ventro-lateral brownish strip on segment 3-8. Females resemble males but with more defined ventro-lateral stripe.

Material examined and locality : 1 ♀, Pirkheda, a deserted village in Dhakna Range, 4.12.1992, Coll. P.P. Kulkarni.

Distribution : India : Himachal Pradesh, (Kangra) , Uttarakhand (Dehra Dun); Madhya Pradesh, Bihar, West Bengal, Maharashtra (Bombay, Deccan).

Elsewhere : Nepal; Myanmar; Sri Lanka; W. Malaysia (Malacca) and China.

Remarks : Pattern of marking on wings differentiate this species from all others within the genus.

Subfamily TRITHEMISTINAE

Genus *Trithemis* Brauer, 1868

21. *Trithemis aurora* (Burmeister)

1839. *Libellula aurora* Burmeister, *Handb Ent.* 2 : 859.

1936. *Trithemis aurora* Fraser, *Fauna Brit. India*, 3 : 383-385.

Diagnostic Characters : Labium dark ochreous, labrum dark brown, face and front of frons ochreous, changing to reddish above; eyes crimson above, brown laterally changing to liliaceous beneath. Prothorax reddish brown; thorax dull purple with obscure superior humeral brown stripe and narrow black stripe on postero-lateral suture; a short lower black line at the levels of spiracle; beneath olivaceous, marked with a black square with an angular black line crossing it. Legs black; wings hyaline with crimson reticulation and a broad amber-yellow fascia at base of wings with darker brown rays in subcostal and cubital spaces. Abdomen swollen dorso-ventrally at base; then constricted at segment 3 and again dilated fusiformly depressed and broad. Anal appendages red.

Female : Differs from male in colour and shape, with wings often broadly tipped with brown up to pterostigma; reticulation bright yellow to brown, basal markings similar to males. Abdomen subcylindrical & anal appendages black

Material examined and locality : 1 ♂, 1 ♀ Dhakna, 14.2.1991; 1 ♀, Dhakna Rest House, 17.2.1991; Coll. D.F. Singh; 1 ♂, 1 ♀, Pirkheda, deserted village, Dhakna range, 4.12.1992; 12 ♂ ♂, 2 ♀ ♀, Gobiya nalla near Bori Village, 5.12.1992; 5 ♂ ♂, 8 ♀ ♀, Gullar Ghat, 7.12.1992; 12 ♂ ♂, 3 ♀ ♀, Dedrakhora, 8.12.1992, 7 ♂ ♂, 4 ♀ ♀, Mangiya village on Harisal Road, 13.12.1992; 5 ♂ ♂, 3 ♀ ♀, Khapra village near Chopan village, 12.12.1992 ; 1 ♀, Semadoh,

14.12.1992; 7♂♂, Pilivillage near Kolkaz, 17.12.1992; all Coll. P.P. Kulkarni; 1♀, Khandukheda, 10.2.1993; 1♂, 1♀♀, Jawaharkund, 11.2.1993; 1♂, 2♀♀, Chikhaldara Birtalav, 12.2.1993; 15 examples, Cheddupati, 14.2.1993; 1♂, 2♀♀, Chipidoh, 5 km. from Koktu, 18.2.1993, 5♂♂, Motideo Nalla, 19.2.1993; ♂, Gobiya nalla, 20.2.1993; 1♀, Koktu river, 21.2.1993; 1♀, Hatida Talav, 22.2.1993; 1♂, 1♀, Dolar river, 2♂♂, Kolkaz, 23.2.1993; 1♀, Sidhukund, 24.2.1993; all Coll. S.G. Patil; 6♂♂, Koktu river, 30.3.1994; 1♀, Khandu river near Khandu Kheda 3.4.1994, 1♂, Belkund Doh, 5.4.1994 all Coll. M.S. Pradhan; 1♀ Chamundada, 17.1.1994; 1♀, Somthane area Akot road, 26.11.1994 Coll. S. S. Kamble.

Distribution : Throughout India.

Elsewhere : Pakistan; Nepal; Sri Lanka; Myanmar; West Malaysia : (Penang); Indonesia : (Borneo, Sulawesi, Java, Moluccas, Sumba, Sumatra, Timor) and Philippines.

Remarks : It is common species near hill streams, also recorded from plains in Maharashtra (Buldana, Osmanabad, Satara and Wardha).

22. *Trithemis festiva* (Rambur)

1842. *Libellula festiva*, Rambur, *Ins. Neurop*, 92.

1936. *Trithemis festiva*, Fraser, *Fauna Bri. India*, 3 : 387-389.

Diagnostic Characters : Labium blackish brown, labrum, dark olivaceous; frons, dark brown in front; matelic violet above; prothorax dark blue; thorax black; legs black; wings hyaline with a dark brown mark at base of hind wings; abdomen black and appendages black. Females differ from adult males in labium face & frons dirty yellow, thorax greenish yellow, wings similar to males but in adults broadly dark reddish brown at apices, abdomen with a narrow mid dorsal stripe.

Material examined and locality : 5♂♂, Rangubeli 11.2.1991, Coll D.F. Singh; 5♂♂, 1♀, Gobia nalla, near Bori village, Dhakna range, 5.12.1992; 6♂♂, 5♀♀, Gullarghat-Khatakali road, 7.12.1991, 1♂, Rest house, Koktu and 8♂♂, 1♀, Dedra khora, Koktu, 8.12.1991; all Coll. P.P. Kulkarni, 2♂♂, 1♀, Gugamal, 9.12.1992, Coll. R.K. Wankhade; 2♂♂, Khapra river near chopan village, 12.12.1992, 1♂, Malur village, Chaurakund, 28.8.1993; 5♂♂, Pili village near Kolkaz, 17.12.1992; 1♂, 6 km from Semadoh on Chikhaldara Road, 4.9.1993 all coll P.P. Kulkarni; 1♂, Telpani, 17.2.1993, 2♂♂, Chipidoh, 18.2.1993 ; 1♂, Khedida, Koktu, 28.3.1994, 1♂, Kelpani River near vill. Koktu, 29.3.1994 all coll S.G. Patil; 4♂♂, Andharban and around, Compartment No. 170, 22.2.1997, Coll. A.S. Mahabal.

Distribution : India : Himachal Pradesh (Hamirpur, Kangra, Sirmaur, Solan); Uttaranchal (Chamoli, Dehradun, Nainital, Pauri, Tehri Garhwal and Uttar Kashi); West Bengal, Assam, Maharashtra, (Khed, Pune, Matheran, Colaba, Poladpur, Lingmal falls, Mahabaleshwar, Bordharan and Wanarvira Wardha, Rajpur and Gondhonkher, Buldhana).

Elsewhere : Nepal; Sri Lanka; Myanmar; West Malaysia : (Penang); Singapore; Indonesia : (Sulawesi, Java, Lesser Sunda, Sumatra); Philippines : Taiwan and Papua (new Guinea).

Remarks : It is a common species near hill streams. Adults breed in still waters or streams with sluggish current.

23. *Trithemis kirbyi kirbyi* Selys.

1886. *Trithemis aurora kirbyi* (pass), *Proc. Zool. Soc. London* : 327, pl. 33 fig 3.

1892. *Trithemis kirbyi kirbyi*, Selys, *Ann. Mus. Civ. Genova*; 30 : 465.

1912. *Trithemis kirbyi kirbyi*, Ris; *Cat. Coll. Selys. Fasc.*, 14 : 760.

1936. *Trithemis kirbyi kirbyi*, Fraser, *Fauna Brit India*, 3 : 385.

Diagnostic Characters : Labium, labrum and anteclypeus pale, frons pale yellow, occiput brown, eyes bright red above, prothorax orcheous with a black collar, thorax golden-brown. Legs, exterior surface of tibiae, femora, yellow, with red. Wings hyaline, neuration bright red, a broad basal bright reddish yellow marking to all wings, abdomen brilliant vermilion red, with small basal black spots on mid dorsum of segments 8 & 9, anal appendages bright red. Females paler and with better defined black markings.

Material examined and locality : 1♂, 6♀♀, Gullarghat-Khatkali road, 7.12.1992; 4♂♂, 1♀, Dedrakhora, 8.12.1992; 2♂♂, 1♀, Village Mangia on Harisal-Semadoh road, 13.12.1992; all coll. P.P. Kulkarni; 3♂♂, Chipidoh, 18.2.1993; 1♂, Motideo nala 19.2.1993, Coll. S.G. Patil; 1♂, Belkund, 5.4.1994, Coll. M. S. Pradhan.

Distribution : India : Himachal Pradesh, Maharashtra, South India and Utteranchal.

Elsewhere : Sri Lanka.

Remarks : Males of this species have a habit of sitting flat on slab rock, where they are most conspicuous. They are very swift on take off and on wings. Females are relatively difficult to trace.

Subfamily TRAMEINAE

Genus *Pantala* Hagen, 1861

24. *Pantala flavescens* (Fabr.)

1798. *Libellula flavescens*, Fabricius, *Ent. Syst. Suppl.*, 285.

1861. *Pantala flavescens*, Hagen, *Syn. Neur N. Amer* : 142.

1936. *Pantala flavescens*, Fraser, *Fauna Brit. India*, 3 : 414-416.

Diagnostic Characters : Rather large sized and robust built dragonfly coloured orcherous or reddish and with uncoloured wings. Head large; eyes broadly contiguous; labium pale brown with borders dark brown, anteclypeus pale brown, post clypeus & frons bright golden yellow; eyes reddish brown above, lilaceous or bluish laterally and beneath;

prothorax rich ochreous, bluish laterally a beneath; thorax olivaceous, coated thickly with yellowish downy hairs; legs black, bases & exterior of femora yellowish; wings hyaline, with base of hind wing pale golden yellow upto anal loop and with narrow apical brown spot limited to posterior border of wing. Abdomen bright ochreous, sides of segments 1-4 pale yellow, 8-10 with sharply defined black mid dorsal pyriform spots with narrow end of them at bases of segments. Anal appendages ochreous, changing black towards apex. Females similar to males, with eyes olivaceous brown above; face vivid cream yellow; wings often evenly and deputy enfumed and always without the brown spot. Abdomen more stout and robust.

Material examined and locality : 8♂♂, 4♀♀, Pirkheda desserted village in Dhakna range, 4.12.1992; 1♀, Gullarghat Khatakali Road, 7.12.1992; 14♂♂, 6♀♀, Dedra Khora, 8.12.1992; 3♂♂, 1♀, Gugamal, 9.12.1992; 1♂, Khapra river, Chopan village, 12.12.1992; 6♂♂, 5♀♀, Agricultural fields, 3 km. South of Semadoh; 14.12.1992; 4♂♂, 1♀, Raipur village; 20.12.1992; 5♂♂, 2♀♀, Gavilgad fort near Chikhaldara; 19.12.1992; 4♂♂, 3♀♀, village Pirkheda, Dhakna range, 22.8.1993; 1♂, 1♀, Malurphata, Chaurakund, 25.8.1993; all Coll. P.P. Kulkarni; 1♂, 6 km. From Semadoh on Chikhaldara road, 4.9.1993 Coll. R.M. Sharma; 1♂, 3♀♀, Kolkaz, 7.9.1993 Coll. P.P. Kulkarni.

Distribution : Circumtropical and subtropical in distribution.

Remarks : Common species, breeds in marshes in foot hills, streams in agricultural fields. Large number of specimens emerge out and take to swarming from September to November/December.

SUMMARY

During the faunistic surveys conducted by Western Regional Station of Zoological Survey of India, approximately 400 specimens of Odonates were collected from Melghat Tigar Reserve, Amravati. Altogether twentyfour species were identified. The species *Trithemis aurora* (Burmeister) was collected most frequently and 129 individuals were identified belonging to it. Amongst the least represented in the collection 7 species, *Pseudagrion decorum* (Rambur); *Pseudagrion microcephalum* (Rambur); *Ischnura aurora aurora* (Brauer); *Disparoneura quadrimaculata* (Rambur); *Lestes viridula* Rambur; *Potamarcha congener* (Rambur); *Neurothemis intermedia intermedia* (Rambur) were represented by single individuals.

REFERENCES

- FRASER, F.C. 1933. The fauna of British India, including Ceylon and Burma, Odonata Vol. I *Taylor and Francis Ltd., London* : 1-423.
- FRASER, F.C. 1934. The fauna of British India including Ceylon and Burma. Odonata Vol. II ; *Taylor and Francis Ltd., London* : 1-398.

- FRASER, F.C. 1936. The fauna of British India including Ceylon and Burma, Odonata Vol III, *Taylor and Francis Ltd., London* : 1-461.
- KULKARNI, P.P., PRASAD, M. and TALMALE, S.S. 2002. New record of damselfly *Pseudagrion microcephalum* (Rambur) from Maharashtra (Odonata : Coenagrionidae); *Bionotes*, 4(3) : 58.
- KULKARNI, P.P. PRASAD, M. and TALMALE, S.S. 2004. Insecta : Odonata in Fauna of Pench National Park, *Conservation Area Series*, 20, *Zool. Surv. India*, : 175-205.
- PRASAD, M., RAM, R. and GHOSH, S.K. 1987. Notes on the Indian species of the Genus *Pseudagrion* Selys (Coenagrionidae : Odonata); *Bull. zool. Surv. India*; 8 (1-3) : 313-321.
- PRASAD, M. and VARSHNEY, R.K. 1995. A check list of the Odonata of India including data on larval studies. *Oriental Ins.*, 29 : 385-428.
- PRASAD, M. 1996. An account of the Odonata of Maharashtra State, India. *Rec. zool. Surv. India*, 95 (3-4) : 305-327.

INSECTA : ORTHOPTERA

P.P. KULKARNI and M.S. SHISHODIA*

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

Grasshoppers are the insects placed in the Order Orthoptera. Their fore wings are narrow and leathery but hind wings are membranous, large, placed folded under the fore wings, when not in use. Mouth parts of these insects bear strong jaws having sharply pointed and massive "teeth" for cutting and grinding rough leafy vegetation.

Hind legs of Orthopteran insects are stout, much longer than the other two pairs of legs. They are used in jumping or in hopping flight with suddenness. Abdomen is nine segmented and usually provided with a long or short ovipositor in females, which remains concealed by enlarged 9th abdominal segment, while at rest. Terminal abdominal segments may have cerci and they are invariably unsegmented. Tympanum, a peculiar ear drum, an auditory organ is situated below the wing. These insects produce a peculiar sound by stridulating or rubbing the rough surface of wing against their leg.

Reproduction in grasshoppers is by laying eggs in clusters embedded in a gummy matter which hardens immediately after oviposition.

Most of the Orthoptera are colored bright green, yellow, orange, red, brown or gray with mixture of these colors in degree and patches. This enables them to blend very well with the back ground of substratum in which they occur. Grasshoppers are voracious feeders of foliage and they can completely denude bushes in very short time, when they attack in large numbers.

Orthoptera are most abundant during monsoon rains or immediately after rains. They have numerous enemies too, in particular birds like common mynah and many others, which voraciously feed on grasshoppers.

* *Zoological Survey of India, 535 'M' Block, New Alipore, Kolkatta 700 053.*

Present Address : Salarpur Kalan, Village Dadri, Gautam Budh Nagar (U.P.)

The grasshoppers are grouped in to 1. The short horned grasshoppers, the Acridids and 2. The long horned grasshoppers or Tettigonids, depending up on the length of their antennae.

Altogether, there are 35 families under Order Orthoptera , 17 families are included under Suborder Caelifera and 18 under Ensifera. From India 20 families have reported to occur and those include approximately 1000 species belonging to 357 genera.

Although number of states in the country have been broadly covered through faunistic studies, information for the states like Karnataka, Tamil Nadu, Kerala, Maharashtra, Gujrat, Mizoram, Nagaland, Assam, Uttar Pradesh, Madhya Prdesh, Punjab, Haryana ,Sikkim and Jammu and Kashmir needs to be intensified (State of Art Report Zoology 1980).

A total of 37 species of Orthoptera are included in this paper which were collected from Melghat tiger reserve, Dist. Amravati, Maharashtra State. These species are distributed over 6 families, 16 subfamilies and 35 genera. In the present studies as many as 13 species are recorded for the first time from Maharashtra State. Those are marked with*.

SYSTEMATIC ACCOUNT

Order ORTHOPTERA

Suborder ENSIFERA

Family TETTIGONIIDAE

Subfamily PHANEROPTERINAE

Genus *Letana* Walker, 1869

1. **Letana intermedia* Ingrisch

2. *Letana* sp. Walker, 1869

Genus *Elimaea* Stål, 1974

3. **Elimaea (Orthelimaea) securigera* Brunner

Genus *Himertula* Uvarov, 1923

4. *Himertula kinneari* (Uvarov)

Genus *Ducetia* Stål, 1874

5. **Ducetia japonica* (Thunberg)

Genus *Isopersa* Brunner, 1878

6. **Isopersa pedunculata* Brunner

Subfamily CONOCEPHALINAE

Genus *Coenocephalus* Thunberg 1815

7. **Coenocephalus maculatus* (Le Guillou)

Subfamily LISTROSCELIDANAE

Genus *Euhexacentrus* Hebard, 1922

- 8.
- Euhexacentrus annulicornis*
- (Stål)

Genus *Mecapoda* Serville, 1831

- 9.
- Mecapoda elongata*
- (Linn)

Subfamily PSEUDOPHYLLINAE

Genus *Sathrophyllia* Stål, 1874.

10. *
- Sathrophyllia femorata*
- (Fabricius)

Superfamily GRYLLOIDEA

Family GRYLLIDAE

Genus *Gryllus* Linné

- 11.
- Grullus*
- sp

Family OECANTHIDAE

- 12.
- Oecanthus indicus*
- Saussure

Genus *Oecanthus* Serville, 1831

Family TETRIGIDAE

Subfamily SCELIMENAE

Genus *Euscelimena* Günther, 1938

- 13.
- Euscelimena herpago*
- (Serville)

Subfamily TETRIGINAE

Genus *Pseudoparatettix* Günther, 1937

- 14.
- Pseudoparatettix histricus*
- (Stål)

Genus *Hedotettix* Bolivar, 1887

- 15.
- Hedotettix cristergus*
- Hancock

Genus *Ergatettix* Kirby, 1914

- 16.
- Ergetettix dorsiferus*
- (Walker)

Family PYRGOMORPHIDAE

Genus *Atractomorpha* Saussure, 1861

- 17.
- Atractomorpha crenulata*
- (Fabricius)

Suborder CAELIFERA

Family ACRIDIDAE

Subfamily ACRIDINAE

Genus *Acrida* Linnaé, 1758

- 18.
- Acrida exaltata*
- (Walker)

19. *Acrida indica* Dirsh
Genus *Gonista* Bolivar, 1898
20. *Gonista* sp.
Genus *Ceracris* Walker, 1870
21. **Ceracris nigricornis nigricornis* Walker
Subfamily GOMPHOCERINAE
Genus *Aulacobothrus* Bolivar, 1902
22. *Aulacobothrus* sp.
Subfamily OEDIPODINAE
Genus *Aiolopus* Fieber, 1853
23. *Aiolopus thalassinus tamulus* (Fabricius)
Genus *Oedalius* Fieber, 1853
24. *Oedalius abruptus* (Thunberg)
Genus *Gastrimargus* Saussure, 1884
25. **Gastrimargus africanus africanus* (Saussure)
Genus *Trilophidia* Stål, 1873
26. *Trilophida annulata* (Thunburg)
Subfamily HEMIACRIDINAE
Genus *Hieroglyphus* Krauss, 1877
27. **Hieroglyphus concolor* (Walker)
28. *Hieroglyphus indicus* Mason
Genus *Parahieroglyphus* Carl. 1916
29. *Parahieroglyphus bilineatus* (Boliver)
Subfamily COPTACRIDINAE
Genus *Eucoptacra* Boliver, 1902
30. **Eucoptacra saturata* (Walker)
Subfamily CALLIPTAMINAE
Genus *Caloptenopsis* Bolivar, 1902
31. **Caloptenopsis glaucopsis glaucopsis* (Walker)
Subfamily CATANTOPINAE
Genus *Catantops* Schaum, 1853
32. *Catantops pinguis innotabilis* (Walker)
Genus *Xenocatantops* Dirsh & Uvarov, 1953
33. *Xenocatantops karnyi* (Kirby)

Genus *Stenocatantops* Dirsh and Uvarov, 1953

34. *Stenocatantops splendens* (Thunberg)

Subfamily EYPREPOCNEMIDINAE

Genus *Choroedocus* Bolivar, 1914

35. **Choroedocus illustris* (Walker)

Genus *Tylotropidius* Stål, 1873

36. *Tylotropidius varicornis* (Walker)

Subfamily CYRTACANTHACRIDINAE

Genus *Pachyacris* Uvarov, 1923

37. **Pachyacris vinosa* (Walker)

Order ORTHOPTERA

Suborder ENSIFERA

Family TETTIGONIIDAE

Subfamily PHANEROPTERINAE

Genus **Letana* Walker, 1869

1. *Letana intermedia* Ingrisch

1990. *Letana intermedia* Ingrisch, *Ent. Scand.*, 21 (3) : 260.

Material examined : Semadoh, 8.12.1991, 1 ♀, Coll. D.F. Singh; Malur village, Chaurakund, 1 ♂, 1 ♀; Kolkaz, 7.9.1993, 1 ♀, 1 ♂ Coll. P. P. Kulkarni.

Diagnostic characters : Medium sized; pronotum inflated in male; tegmina surpassing hind knees; radial sector forked (rarely unforked on one side); ninth tergite moderately projecting behind, apex subtruncate; cerci substraight behind basal curvature, with a black, baso-internal bump, internal margin with a black marked dilation of circa 1/4th the length of cercus; phallus sclerite elongate, blackish; connected with phallus by membrane, base forked and hyaline.

Distribution : India : North India (Delhi).

Remarks : This species is recorded for the first time from Maharashtra state.

2. *Letana* sp.

1869. *Letana* Walker, *Cat. Derm. Salt. Br. Mus.*, Part II : 277.

1990. *Letana* Ingrisch, *Ent. Scand.*, 21(3) : 242.

Material examined : Semadoh, 8.2.1991, 2 ♀ ♀, Coll. D.F. Singh.

Diagnostic characters : The genus with medium sized, slender, often parapterous; with bilobate and arcuate subgenital plate in male sex; pronotal disc flat; hind wings surpassing the tegmina for less than twice the length of pronotum; radial sector of tegmen branching before or in middle; sub genital plate of male divided into two diverging lobes from base; later on lobes converging again.

Distribution : The genus is distributed in India or Himalayan region from there it also spread over Indo-China.

Remarks : This species is recorded for the first time from Maharashtra state, India.

Genus **Elimaea* Stål, 1974

3. *Elimaea (Orthelimaea) securigera* Brunner

1891. *Elimaea securigera* Brunner, *Vesh. Zool. bot. Ges. Wien*, 40 : 47.

1990. *Elimaea (Orthelimaea) securigera*, Ingrisch, *Spixiana*, 13 (2) : 157.

Material examined : Chikalpati, Dhakna Range, 23.8.1993, 4 ♀ ♀; Kuwapati, Semadoh, 6.9.1993, 2 ♀ ♀; Kolkaz, 7.9.1993, 4 ♀ ♀ all coll. P.P. Kulkarni; 4–5 Kms. North of rest house, 13.9.1996, 1 ♀, Coll. D.B. Bastawade.

Diagnostic characters : Large species; anterior femur not compressed, straight; pronotum with a fine, yellowish median carinula; yellowish-brown colour may be extended to a broad band or not; tegmina slender; cerci securiform; lobes of male subgenital plate widely separated in the middle; female subgenital plate notched in the middle; ovipositor sickle-shaped, flat, curved upwards, apex crenulated.

Distribution : India : Andaman & Nicobar Islands, Assam, Himachal Pradesh, Karnataka, Meghalaya, Rajasthan, Tamil Nadu, West Bengal.

Elsewhere : Australia; Indonesia; Philippines; Nepal; Sri Lanka and Sunda Islands. This species is recorded for the first time from Maharashtra State, India.

Genus *Himertula* Uvarov, 1923

4. *Himertula kinneari* (Uvarov)

1923. *Himerta kinneari* Uvarov, *J. Bombay nat. Hist. Soc.*, 29 : 651.

1990. *Himertula kinneari*, Ingrisch, *Spixiana*, 13 (2) : 157.

Material examined : Malur Phata, Chaurakund, 25.8.1993, 1 ♀; Malur, Chaurakund, 28.8.1993, 1 ♀, Coll. P. P. Kulkarni.

Diagnostic characters : Last tergite large, narrowly sulcated along the middle, with the hind margin almost straight, very feeble and broadly sinuate, not obtusely excised; cerci with their apices compressed portion straight, forming an obtuse rounded angle with the

base; subgenital plate with the lobes very long, strongly compressed and recurved, with the apices, acute and turned outwards.

Distribution : India : Bihar, Gujarat, Himachal Pradesh, Karnataka, Maharashtra, Rajasthan, West Bengal.

Elsewhere : Baluchistan; Nepal and Persia.

Genus *Ducetia* Stål, 1874

5. **Ducetia japonica* (Thunberg)

1815. *Locusta japonica* Thunberg, *Mem. Acad. Sci. St. Petersb. (Sci. Phys.)* 5 : 282.

1961. *Ducetia japonica*, Ragge, *Bull. Br. Mus. nat. Hist. (Entom.)*, 10 (5) : 282.

Material examined : Semadoh, 8.2.1991, 1 ♀, Coll. D.F. Singh.

Diagnostic characters : Hind wings well developed; R branch of tegmina branched pectinately; cerci with interno-ventral ridge at apex; subgenital plate deeply bifurcate with contiguous lobes.

Distribution : India : Arunachal Pradesh, Assam, Bihar, Jammu & Kashmir, Karnataka, Kerala, Sikkim, Tamil Nadu, West Bengal.

Elsewhere : Bangladesh; China; Hainan; Indo-china; Japan; Java; Myanmar; Nepal; Sri Lanka; Thailand; Tibet; Tonkin etc.

Remarks : This species is recorded for the first time from Maharashtra.

Genus *Isopsera* Brunner, 1878

6. **Isopsera pedunculata* Brunner

1878. *Isopsera pedunculata* Brunner, *Mon. Phaneropt.*, : 219, 220.

Material examined : Kolkaz, 7.9.1993, 1 ♀, Coll. P.P. Kulkarni.

Diagnostic characters : Head short, pronotum transverse in front, with a concavity in the middle, hind margin roundly convex; tegmina shorter than hind wing, extending beyond the hind femora; hind wing longer than tegmina, extending beyond the middle of the hind tibiae; supra anal plate transverse with a concavity in the middle, subgenital plate widely bifurcate with long narrow flat styles; cercus flat, thick, directed inwards, apex with chitinous point.

Distribution : India : Assam, Himachal Pradesh, Orissa, Rajasthan, Tamil Nadu and West Bengal.

Elsewhere : Myanmar.

Remarks : This species is recorded for the first time from Maharashtra State, India.

Subfamily CONOCEPHALINAE

Genus *Conocephalus* Thunberg, 18157. * *Conocephalus maculatus* (Le Guillou)1841. *Xiphidion maculatum* Le Guillou, *Revue. Zool.* 4 : 294.1980. *Conocephalus maculatus*, Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)* 41 (5) : 344.1999. *Conocephalus maculatus*, Shishodia, *Rec. zool. Surv. India*, 97 (4) : 36.*Material examined* : Kolkaz, 23.2.1993, 1 ♀, Coll. S.G. Patil.

Diagnostic characters : Prosternum bispinoes; tegmina pigmented with comparatively large dark spots; no markings in costal and precostal areas; cross veins of costal and precostal areas of tegmina irregular to almost regular; hind femora unarmed ventrally; tibiae marked with spot towards base, dark on mid tibiae, often faint on others; hind tibiae with 6 apical spurs; male cerci with one internal spine; ovipositor short and straight.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Madhya Pradesh, Mizoram, Sikkim, Tamil Nadu, West Bengal.

Elsewhere : Australia; Nepal. This species is widely distributed throughout Old World, its range extending eastwards to Australia and New Guinea.

Remarks : This species is recorded for the first time from Maharashtra State, India.

Subfamily LISTROSCOLIDINAE

Genus *Euhexacentrus* Hebard, 19228. *Euhexacentrus annulicornis* (Stål)1877. *Hexacentrus annulicornis* Stål, *Ofv. K. Ventensk.-Akad. Forh.*, No. 10 : 46.1922. *Euhexacentrus annulicornis*, Hebard, *Proc. Acad. nat. Sci. Philad.*, 74 : 271.*Material examined* : Kolkaz, 7.9.1993, 1 ♀, Coll. P.P. Kulkarni.

Diagnostic characters : Vertex short, with medio-longitudinal sulcus; pronotum with transverse sulci deep, and ventral margin of lateral lobes more lamellate and sinuous; tegmina and wings short; ovipositor short and heavy, dorsal margin weakly sinuate, with a faint oblique indication toward the acute apex; dorsal and ventral margins very minutely serrulate distally; ventro-internal margin of anterior femora and ventro-external margin of middle femora armed with two large spines and with some small spinules; hind femora with ventral margins also armed with fewer but heavier spines.

Distribution : India : Assam, Maharashtra, Meghalaya, Sikkim, Tripura and West Bengal.

Elsewhere : Aru Islands; Moluccas; Philippines.

Genus *Mecapoda* Serville, 18319. *Mecapoda elongata* (Linn.)

1758. *Gryllus (Tettigonia) elongatus* Linne, *Syst. Nat.* (10th ed.) 1 : 429.

1966. *Mecapoda elongata*, Beier, *Orthopt. Catlog.*, Part 9 : 298.

Diagnostic characters : Body very large, colour brown to dry leaf colour; head more or less rounded; antennae slightly margined; prosternum with a pair of long spines; pronotum wide at posterior margin; lateral lobes of pronotum dark-brown at least on upper margin; wings fully developed ; hind femora and tibiae very large; male subgenital plate bifurcated, apex pointed and tegmina with 4-6 white spots in the middle.

Material examined and Locality : Gugamal, Koktu, 9.12.1992, 1 ♀, Coll. P.P. Kulkarni.

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Assam, Arunachal Pradesh, Himachal Pradesh, Karnataka, Maharashtra, Meghalaya, Orissa, Sikkim, Tamilnadu, Tripura, Uttar Pradesh and West Bengal.

Elsewhere : China; Australia; Celebes; Aru Island; Buru Island; Japan; Malacca; New Guinea; Philippines; Sunda Islands; Taiwan and Tonkin.

Subfamily PSEUDOPHYLLINAE

Genus **Sathrophyllia* Stål, 187410. *Sathrophyllia femorata* (Fabricius)

1787. *Locusta femorata* Fabricius, *Mantiss. Ins.*, 1 : 233.

1874. *Sathrophyllia femorata*, Stål, *Rec. Orthopt.*, 2 : 72.

1962. *Sathrophyllia femorata*, Beier, *Das Tierreich*, 73 : 201.

Material examined : Chikhaldara, 18.9.1998, 1 ♀ 1 ♂, (Night Collection); D.B. Bastawade.

Diagnostic characters : Body colour light-brownish; head without any wrinkle or hump; pronotum without any hump, broadly rounded posteriorly ; tegmina 3.5 times longer than broad, sparsely spotted with dark-brown marks; hind wings with transverse cross veins with dark-brown patches; anterior femora faintly or not undulated; anterior tibiae ventrally spined on outside; middle and hind femora undulated ventrally; ovipositor long, wide at base, directed upwards beyond the middle.

Distribution : India : Karnataka, Sikkim, Tamil Nadu, and West Bengal.

Elsewhere : Borneo; Combodia; Java; Malaysia; Myanmar and Sumatra.

Remarks : This species is recorded for the first time from Maharashtra State, India.

Superfamily GRYLLOIDEA

Family GRYLLIDAE

Genus *Gryllus* Linné

11. *Gryllus* sp.

1758. *Gryllus* Linné, *Syst. Nat.* (ed. X) 1 : 425.

1969. *Gryllus*, Chopard, *Fauna of India*, Orthoptera, 2 : 32.

Diagnostic characters : General shape stout; head round; legs short ; anterior tibiae with a large, oval, external tympanum and a small, round internal one; posterior tibiae non-serrulated at base; posterior femora strongly dilated; tegmina well developed; wings caudate; ovipositor slender and straight.

Material examined and locality : Paturda, Dhakna range, 5.12.1992. Coll. P.P. Kulkarni.

Distribution : The genus is cosmopolitan.

Family OECANTHIDAE

Genus *Oecanthus* Serville, 1831

12. *Oecanthus indicus* Saussure

1878. *Oecanthus indicus* Saussure, *Mem. Soc. Phys. Hist. Nat. Geneva*, 25 : 454.

1969. *Oecanthus indicus*, Chopard, *Fauna of India*, Grylloidea, 2 : 267.

Diagnostic characters : First two antennal segments without black markings; size small (14 mm); anterior tibiae strongly dilated at base; posterior tibiae serrulated and armed with certain number of spines; ovipositor short (4.5 mm).

Material examined and locality : 1♀ Agricultural fields, 3 kms. South of Semadoh, 14.12.1992. Coll. P.P. Kulkarni.

Distribution : India : Andaman Islands, Arunachal Pradesh, Assam, Bihar, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Tamilnadu, Tripura and West Bengal.

Elsewhere : Ambon; China; Japan; Malaysia; Malaya Archipelago; Philippines; Sri Lanka and Sumba.

Family TETRIGIDAE

Subfamily SCELIMENAE

Genus *Euscelimena* Günther, 1938

13. *Euscelimena harpago* (Serville)

1839. *Tetrix harpago*. Serville, *Ins. Orth.* p. 763.

1929. *Euscelimena herpago*, Hebard, *Rev. suidse Zool.*, 36 : 572.

Diagnostic characters : Vertex narrower than one of the eyes, more narrowed forward, antennae filiform; anterior femora crinated above; frontal costa furcillate, but the rami diverge moderately; humeral angles not at all provided with evident denticles; posterior angles of lateral lobes of pronotum acute produced outwards and with one spine; spine triangular acute and straight, apex sharp, not curvate; first joint of posterior tarsi longer than third; posterior tibial margins distinctly membraneous expanded.

Material examined and locality : 1 ♂, Pirkheda village, Dhakna Range, 5.12.1992, 2 ♂ ♂ 1 ♀, Rest house compound, Koktu, 8.12.1992; Coll. P.P. Kulkarni.

Distribution : India : Gujarat, Maharashtra.

Subfamily TETRIGINAE

Genus *Pseudoparatettix* Günther, 1937

14. *Pseudoparatettix histricus* (Stål)

1861. *Tetrix histricus* Stål, *Freg. Eugenias Resa. Orth.*, : 347.

1992. *Pseudoparatettix histricus*, Blackith, *Cat. S.E. Asian Tetrigidae* : 149.

Diagnostic characters : Size large and body robust; head a little raised above the pronotum; pronotum moderately dilated between shoulders, extended beyond the apex of hind femora; median carina of pronotum arcuate forward, often little undulate before shoulders, low on shoulders and straight behind; hind tibiae unicoloured or obscurely marked; wings extended beyond the pronotal apex.

Material examined and locality : 1 ♀, Makdi Nalla, Dhargad, 4.12.1992, Coll. P.P. Kulkarni.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Tamil Nadu, Tripura and West Bengal.

Elsewhere : E. Afghanistan; E. Africa; Australia; Borneo; Caledonia; Celebas; S. China; Holland; Indonesia; Iran; Malaysia : New Ireland; Pakistan; Philippines; Queensland; Saudi Arabia; Solomon Islands; Sri Lanka; Sumatra and Taiwan.

Genus *Hedotettix* Bolivar, 1887

15. *Hedotettix cristitergus* Hancock

1915. *Hedotettix cristitergus* Hancock, *Rec. Indian Mus.*, 11 : 122.

Material examined : 2 ♀ ♀, Makdi Nalla, Dhargad, 4.12.1992, Coll. P.P. Kulkarni.

Diagnostic characters : Vertex subequal or wider than one of the eyes; frontal carinae obtuse angle, roundly reflexed at the sides, middle carinate; frontal costa strongly advanced

before the eyes and arcuate; antennae located between the lower fourth of eyes; pronotum angulate produced over the head; median carina of pronotum strongly compressed, very thin punctate, arcuate forward; crest highest above the shoulders; hind process of pronotum subulate, extended beyond the hind femoral apices; posterior angles of lateral lobes of pronotum narrowed; wings caudate; first joint of posterior tarsi longer than the third, the first two pulvilli spinose, the third longer, substraight below.

Distribution : India : Madhya Pradesh, Maharashtra.

Genus *Ergatettix* Kirby, 1914

16. *Ergatettix dorsiferus* (Walker)

1871. *Tettix dorsifera* Walker, Cat. Derm. Salt. Brit. Mus., 5 : 825.

1992. *Ergatettix dorsiferus*, Blackith, Cat. S.E. Asian Tetrigidae : 52.

Diagnostic characters : Eyes very prominent, raised above the vertex, vertex elevated above the pronotum surface, shoulders wide with two black spots behind them, pronotum truncate and extends beyond the apex of hind femora, hind femora with small dark brown spots behind the middle of the superior margin, hind tibiae without dark brown spots, hind femora widened, flattened rugose and tuberculate.

Material examined and Locality : 1 ♀, Makdi Nalla, Dhargad, 4.12.1992. Coll. P.P. Kulkarni.

Distribution : India : Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Tamil Nadu, Tripura, Sikkim, Uttar Pradesh, West Bengal.

Elsewhere : Afghanistan, Bangladesh; Nepal; Sri Lanka; Central Asia; Turkmenia; Taiwan; South China; Greater Sunda Islands; Sumba; Iran; Indonesia and Myanmar.

Suborder CAELIFERA

Family PYROGMORPHIDAE

Genus *Atractomorpha* Saussure, 1862

17. *Atractomorpha crenulata* (Fabricius)

1793. *Truxalis crenulatus* Fabricius, Ent. Sys., 2 : 28.

1861. *Atractomorpha crenulata*, Saussure, Annls. Soc. Ent. Fr., (4) 1 : 475.

1914. *Atractomorpha crenulata*, Kirby, Fauna Brit. India, Orthopt. (Acridiidae) : 181.

Diagnostic characters : Body slender, antennae short and stout, eyes oval, narrowly carinated in front, head and pronotum crenulated behind the eyes, fastigium of vertex short, tegmina large, pointed, wings pointed, shorter than tegmina, with the bases and nervus rosy. Abdomen smooth, rosy, legs long and slender.

Material examined : 1 ♀, Village Pirkheda, Dhakna range, 4.12.1992; 1 ♀, Village Mangia on Harisal–Semadoh Road, 13.12.1992, Coll. P.P. Kulkarni.

Distribution : India : Widely distributed throughout India.

Elsewhere : Nepal; Pakistan; Bangladesh; Sri Lanka; Thailand; Malaya; N.W. Sumatra.

Remarks : Both, adults and hoppers are serious pest of young plants like Tobacco and Maize. Other crops and vegetables are also attacked.

Family ACRIDIDAE

Subfamily ACRIDINAE

Genus *Acrida* Linné 1758

18. *Acrida exaltata* (Walker)

1859. *Truxalis exaltata* Walker, *Ann. Mag. Nat. Hist.*, (3) 4 : 222.

1914. *Acrida exaltata*, Kirby, *Fauna Brit. India Orth.* (Acrididae) : 99.

1954. *Acrida exaltata*, Dirsh, *Bull. Soc. Found. Ent.*, 38 : 149.

Diagnostic characters : Varies in size and colouration from uniformly green to ochraceous and brownish. Head less robust and elongate, head and pronotum of equal length, pronotal disc relatively narrow, tegmina obtusely pointed, scarcely longer than hind femora; wings yellowish, tegmina without distinct coloured margin, male subgenital plate in profile short. Attains length upto 53 mm.

Material examined and locality : 1 ♀, Semadoh, 8.2.1991, Coll. D.F. Singh; 1 ♀ Pirkheda, Dhakna range, 4.12.1992; 1 ♀, Gullarghat- Khatakali Road, 7.12.1992; 1 ♀, Chopan Village, Chaurakund, 12.12.1992; Coll. P.P. Kulkarni; 1 ♀, Kolkaz, 23.2.1993, Coll. S.G. Patil; 2 ♂ ♂, 3 ♀, Chikalpati, Dhakna range, 23.8.1993; 1 ♀, Malur Phata, Chaurakund, 25.8.1993; 3 ♀ ♀, Chaurakund, 26.8.1993; 2 ♀ ♀, Kolkaz, 7.9.1993, Coll. P.P. Kulkarni ; 1 ♂, Khedida, Koktu, 28.3.1994, Coll. S. G. Patil.

Distribution : Throughout India.

Elsewhere : Afghanistan; Arabia; Bangladesh; Pakistan; South-East Tibet; S.E. Persia; Yemen; W. Aden Protectorate; Sri Lanka.

Remarks : This species is common in India, feeds mostly on grasses and even other economically important vegetation.

19. *Acrida indica* Dirsh

1954. *Acrida indica* Dirsh, *Bull. Soc. Fouad Ier. Entom.*, 38 : 151.

Material examined : 2 ♂ ♂, 1 ♀, Gullar Ghat – Khatakali Road, 7.12.1992; 2 ♂ ♂, Kolkaz, 7.9.1993, Coll. P.P. Kulkarni, 1 ♀, Khedida, Koktu, 2.3.1994, Coll. S.G. Patil.

Diagnostic characters : Head robust, strongly broadened in the basal part; antennae slightly shorter than head and pronotum together; lateral carinae of pronotum straight and almost parallel, slightly convergent forwards; transverse sulcus beyond the middle of pronotal disc posterior margin of metazona acutangulate and pointed; tegmina broad, with short, little narrowed apical part, apex subacute; with shorter than tegmina, broad, apex acute; subgenital plate broad, moderately long, with acute apex and with large obtuse projection in basal part.

Distribution : India : Maharashtra, Gujarat.

Genus *Gonista* Bolivar, 1898

1898. *Gonista* Bolivar, *Ann. Mus. Civ. Stor. Nat. Genova*, (2)19 (49) : 29.

1964. *Gonista*, Bei-Bienko, G. Ya & Mishchenko, L.L. *Locusts and Grasshoppers of the U.S.S.R. and adjacent countries*, Part II. Translated from Russian; 406 (Israel Program for Scientific Translations, Jerusalem, 1964).

20. *Gonista* sp.

Diagnostic characters : Head small, shorter than pronotum; eyes situated in the central part of head; vertex strongly projecting forward; antennae sword-shaped; apex of tegmina and wings usually sharpened, rarely rounded; dorsal genicular lobes of hind femur rounded.

Material examined and locality : 2 ♀ ♀, Malur village, Chaurakund, 28.8.1993, Coll. P. P, Kulkarni.

Distribution : The genus is distributed in Transcaucasia, in Central and Southeastern Asia and on the islands of Malayan Archipelago.

Ceracris Walker, 1870

21. **Ceracris nigricornis nigricornis* Walker

1870. *Ceracris nigricornis* Walker, *Cat. Derm. Salt. Br. Mus.*, 4 : 791.

1925. *Ceracris nigricornis nigricornis*, Uvarov, *Ent. Mitt. Berl.* 14 : 13-14.

Material examined : 1 ♀, Chopan Road, Chaurakund, 26. 8. 1993, Coll. P.P. Kulkarni.

Diagnostic characters : Face and pronotum coarsely punctured; tegmina brown, with anal field green, or brownish-green; hind femora externally with a narrow, but always distinct, blackish fascia just before the pre-apical pale ring. This subspecies is slightly shorter than the other subspecies of *C. nigricornis*.

Distribution : India : Arunachal Pradesh, Bihar, Himachal Pradesh, Manipur, Uttar Pradesh and West Bengal.

Elsewhere : Myanmar.

Remarks : This species is recorded for the first time from Maharashtra state, India.

Subfamily GOMPHOCERINAE

Genus *Aulacobothrus* Boliver 1902

1902. *Aulacobothrus*, Boliver, *Ann. Soc. Ent. France* 1, xx, : 597.

22. *Aulacobothrus* sp.

The individuals belonging to this genus are diagnosed as under : Vertex triangular, concave above; antennae filiform, costal ridge convex, pronotum flattened, not constricted, middle carina continuous. Tegmina complete, wings fully developed; hind femora above distinctly spotted, with outer area convex; hind tibiae red, two inner spurs of the tibiae distinctly marginal, apical spur straight. First abdominal segment with an open tympanum on the side; cerci short, conical.

The specimens collected could not be identified up to species level and need further studies.

Material examined and Locality : 2♂♂, 2♀♀, Vill. Pirkheda, Dhakna range, 4.12.1992; 1♂, 2♀♀, Gullarghat on Akot road, 6.12.1992; 5♂♂; 1 Example, Rest house compound, Koktu, 8.12.1992; 4♀♀, Gugamal Koktu, 9.12.1992. 1♀, Agricultural fields, 3 km south of Semadoh, 14.12.1992; 15 Examples, Fields near Raipur village, 16.12.1992, all coll. P.P. Kulkarni; 1♀, Kolkaz, 13.2.1993, Coll. S. G. Patil.

Distribution : India : Chennai, Himachal Pradesh, Jammu and Kashmir, Meghalaya, Sikkim, Tamilnadu, Uttar Pradesh.

Elsewhere : Indonesia : Nepal; Sri Lanka.

Subfamily OEDIPODINAE

Genus *Aiolopus* Fieber, 1853

23. *Aiolopus thalassinus tamulus* (Fabricius)

1798. *Gryllus tamulus* Fabricius, *Entomologia Systematica*, Suppl, : 195.

1968. *Aiolopus thalassinus tamulus*, Hollis, *Bull. Br. Mus. nat. Hist. (Ent.)*, 22 (7) : 347.

Diagnostic characters : Green or brown in colour, with two parallel brown stripes on the vertex, running within each eye to the back of the head. A broad brown band from back of each eye to the end of pronotum. Tegmina long, subhyaline, varied with brown, mediastinal area with two alternate long brown and whitish spaces; wings greenish hyaline dusky towards hind margin. Hind femora slender; as long as or longer than abdomen,

hind tibiae yellow towards base, with blackish spot before and behind, blue towards the middle and red towards extremity.

Material examined and locality : 1 ♀, Gullarghat on Akot–Dhargad Road, 6 ♀ ♀, 12. 1992; 1 ♀ and 1 ♂, Agricultural fields, 3 Kms south of Semadoh, 14.12.1992, Coll. P.P. Kulkarni.

Distribution : India : Andaman and Nicobar Islands, Bihar, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

Elsewhere : Sri Lanka; Bangladesh; Pakistan; Burma; Thailand; China; Hainan; Hong Kong; Taiwan; Malaya; Singapore; Sumatra; Java; Lombok; Timor; Japan; Philippines; Borneo; Celebes; New Guinea; Papua; Australia.

Remarks : This species is reported to damage large number of crops like cabbage, cotton, maize, millets, rice, sugarcane, tea, tobacco, wheat, oat, pea etc.

Genus *Oedaleus* Fiebar, 1853

24. *Oedalius abruptus* (Thunberg)

1815. *Gryllus abruptus* Thunberg, *Mem. Acad. Sci., St. Petersburg*, 5 : 233.

1884. *Oedaleus abruptus*, Saussure, *Mem. Soc. Phys. Hist. Geneve*, 28 : 117.

1914. *Oedaleus abruptus*. Kirby, *Fauna. Brit. India Orth. (Acrididae)* : 144.

Diagnostic characters : Small sized, pronotum, festigum of head almost flat, tactiform, with high sharp median carina, hind margin obtusely angular, pronotal X marking always with anterior and posterior arms separate. Tegmina brown with three pale bands before the middle; wings pale greenish yellow; hind tibiae with 13 inner and 12 outer spines; abdomen straw red coloured.

Material examined and Locality : 4 ♂ ♂, 3 ♀ ♀ Village Pirkheda, Dhakna range, 7.12.1992; 1 ♂, Gugaamal, Koktu, 9.12.1992, Coll. D.A. Thorat, 1 ♂, 1 ♀, Fields Near Rangubeli, 11.12.1992; 1 ♀, Chunkhadi village, 21.12/1994, Coll. P.P. Kulkarni.

Distribution : India : Andhra Pradesh, Bihar, Goa, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Satara, Maharashtra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Afghanistan; Bangladesh; China; Indo-China; Myanmar; Nepal; Pakistan; Sri Lanka and Thailand.

Genus *Gastrimargus* Saussure, 1884

25. **Gastrimargus africanus africanus* (Saussure)

1887. *Oedaleus (Gastrimargus) marmoratus* var. *africana* Saussure, *Mem. Soc. Phys. Hist. nat. Geneve* 30(1) : 39.

1982. *Gastrimargus africanus africanus* Ritchie, *Bull. Br. Mus. nat. Hist. (Ent.)*, **44** (4) : 248.

Diagnostic characters : Pronotum tactiform with high sharp median carina; metazona of pronotum with x marking usually effaced and without pale striae; tegmen surpassing hind knee by one third to one-half of hind femur length; pale bands of tegmina distinct; wings with complete fascia, basal area bright yellow, apical half of wings clear, wing tip sometimes infumate; internal ventral surfaces of hind femur blue-gray to blue-black.

Material examined and Locality : 1♂, 8♀♀ village Pirkheda, Dhakna range 4.12.1992; 5♂, 9♀♀, Gullarghat, Khatakali road, 6.12.1992 and 7.12.1992; 1♀, Gugamal, Koktu, 9.12.1992; 1♂, 1♀, Mangia village, on Harisal-Semadoh Road, 13.12.1992; Coll. P.P. Kulkarni.

Distribution : India : Andhra Pradesh, Bihar, Delhi, Goa, Himachal Pradesh, Madhya Pradesh, Orissa, Sikkim, Uttar Pradesh, West Bengal.

Elsewhere : Nepal; Saudi Arabia; Sri Lanka; Thailand; Tibet and Yemen A.R.

Remarks : This species was not reported earlier from Maharashtra State.

Genus *Trilophidia* Stål, 1873

26. *Trilophida annulata* (Thunberg)

1815. *Gryllus annulatus* Thunberg, *Mem. Acad. Sci. St.-Petersb.*, **5** : 234.

1963. *Trilophidia annulata*, Hollis, *Trans. R. ent. Soc. Lond.*, **117** (8) : 251.

Material examined : 2♂♂, 2♀♀, Fields near Rangubeli, 11.12.1992; 2♂♂, Agricultural Fields 3 Kms. South of Semadoh, Coll. P.P. Kulkarni

Diagnostic characters : Brown or gray with black markings, pubescent beneath; pronotum rugose, with a high median carina, forming two teeth in front, and with lateral carinae; tegmina grey, sometimes with two indistinct brown bands; hind tibiae with a pale band towards the base and with a slight pale band beyond the middle.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Goa, Karnataka, Kerala, Himachal Pradesh, Madhya Pradesh, Orissa, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal.

Elsewhere : Afghanistan; Bangladesh; Borneo; Hong Kong; Japan; Java; Korea; Malaysia; Mongolia; Myanmar; Nepal; Pakistan; Thailand and Vietnam.

Remarks : This species is recorded for the first time from Maharashtra state, India.

Subfamily HEMIACRIDINAE

Genus *Hieroglyphus* Krauss, 1877

27. **Hieroglyphus concolor* (Walker)

1870. *Oxya concolor* Walker, *Cat. Derm. Salt. B.M.* **4** : 646.

1973. *Hieroglyphus concolor*, Mason, *Bull. Brit. Mus. nat. Hist. (Entom.)* 28 (7) : 521.

Diagnostic characters : Body robust; fastigium of vertex three and a half times as broad as long; first and third suleus on sides of pronotum not joined by black band; dorsum of pronotum crossed by three sulci; posterior margin slightly more obtuse; prosternal process conical; tegmina and wings extending beyond end of abdomen; subgenital plate with subacute median lobe, and with two parallel ridges possessing large spines.

Material examined and Locality : 1 ♀, Rangubeli, 27.8.1993, Coll. P.P. Kulkarni.

Distribution : India : Delhi, Karnataka and Sikkim.

Elsewhere : Bangladesh.

Remarks : This species is recorded for the first time from Maharashtra State.

28. *Hieroglyphus indicus* Mason

1973. *Hieroglyphus indicus* Mason, *Bull. Brit. Mus. nat. Hist. (Entom.)* 28 (7) : 536.

Diagnostic characters : Comparatively small in size; fastigium of vertex twice (in male) or thrice (in female) as broad as long; frontal ridge widened downwards, with shallow suleus; median carina of pronotum entire; sulci on pronotum moderately deep, posterior sulcus slightly bow-shaped towards the centre; posterior margin obtusely-angular; prosternal process conical; tegmina and wings micropterous, reaching 2nd abdominal segment. Supra-anal plate of male with obtuse-angular apex; male cercus nearly as long as supra-anal plate, bilobate, apex oblique; subgenital plate of male with subacute apex, in female, forming acute apex; valves of ovipositor, short and robust, external lateral projection of lower valves rounded.

Material examined and Locality : 1 ♂, 1 ♀, Mangia village, on Harisal Semadoh road, 13.12.1992; 3 ♂ ♂, Malur Phata, Chaurakund, 25.8.1993; 2 ♂ ♂, 1 ♀, Rangubeli, 27.8.1993; 3 ♂ ♂; 1 ♀, Malur village, 28.8.1993; 2 ♀ ♀ 5 kms. on Hatru-Raipur Road from Hatru. 30.8.1993, Coll. P.P. Kulkarni.

Distribution : India : Maharashtra.

Genus *Parahieroglyphus* Carl. 1916

29. *Parahieroglyphus bilineatus* (Boliver)

1912. *Hieroceryx bilineatus* Boliver. *Trab. Mus. nac. Cienc. nat. Madr. (Ser. Zool.)*, 6 : 60.

1916. *Parahieroglyphus bilineatus*. Carl. *Revue suisse Zool.*, 24 : 483.

Diagnostic characters : Body medium sized; frontal ridge of head parallel sided or may diverge just below median ocellus; cercus very large, divided into 3 lobes; female larger than male. General body colour is buff with black markings.

Material examined and Locality : 2 ♀ ♀, Pirkheda Dhakna range, 4.12.1992; 3 ♀ ♀, Gullarghat, on Akot–Dhargad Road, 6.12.1992; 3 ♂ ♂, 4 ♀ ♀ Gugamal, Kaktu, 9.12.1992 ; 2 ♀ ♀, Fields near Rangubeli, 11.12.1992; 1 ♀, Mangia village, on Semadoh Road, 13.12.1992; 1 ♀, Gavilgad Fort, 4 Kms. From Chikhaldara, 19.12.1992; 2 ♂ ♂, 2 ♀ ♀, Village Raipur, 20.12.1992; Coll. P.P. Kulkarni.

Distribution : India : Himachal Pradesh, Madhya Pradesh, Maharashtra, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh.

Subfamily COPTACRIDINAE

Genus *Eucoptacra* Boliver, 1902

30. **Eucoptacra saturata* (Walker)

1870. *Acridium saturatum* Walker, Cat. Derm. Salt. Brit. Mus. 4 : 628.

1923. *Eucoptacra saturata* Uvarov, Ann. Mag. nat. Hist., (9) 7 : 503.

Diagnostic characters : Ferruginous in colour; prosternal tubercle stout and slightly acute, hind femora black beneath, as long as abdomen, hind tibiae red; tegmina with numerous small marks; hind wings hyaline, tinged with blackish.

Material examined and Locality : 1 ♂, Village Pirkheda, Dhakna range, 4.12.1992; 2 ♀ ♀, Gugamal, Kaktu, 9.12.1992; 1 ♀, Village Mangia, on Harisal Road, 13.12.1992; 2 ♂ ♂, 6 ♀ ♀, Agricultural fields, 3 kms. south of Semadoh, 14.12.1992. Coll. P.P. Kulkarni.

Distribution : India : South India, Assam, Himachal Pradesh, Madhya Pradesh, Orissa, Uttar Pradesh, West Bengal.

Remarks : There is no earlier record of this species from Maharashtra state.

Subfamily CALLIPTAMINAE

Genus *Caloptenopsis* Bolivar, 1902

31. **Caloptenopsis glaucopsis glaucopsis* (Walker)

1870. *Caloptenus glaucopsis* Walker, Cat. Derm. Salt. Brit. Mus., 4 : 702.

1950. *Caloptenopsis glaucopsis glaucopsis*, Uvarov, Eos, Madrid, Suppl., : 387.

Diagnostic characters : Frontal ridge slightly narrowed at fastigium, smooth, without dens punctures; fastigium of vertex moderately sloping, concave, a little wider than frontal ridge between antennae; pronotum not constricted in prozona; pronotal disc not or very slightly, saddle-shaped; median pronotal carina moderately raised; lateral carinae practically parallel; hind angle of pronotum obtuse, distinctly rounded; tegmina and wings

reaching upto or beyond hind knees; wings rose coloured; hind femur short and broad, inner face black, with or without reddish tinge; lower inner spines of hind tibia distinctly longer than the upper one, both regularly curved; male cercus with one subapical hook.

Material examined : 1 ♂, Chaurakund, 21.12.1992, Coll. P.P. Kulkarni.

Distribution : India : Andhra Pradesh, Bihar, Delhi, Rajasthan, Tamil Nadu.

Elsewhere : Baluchistan; S. Arabia.

Remarks : This is the first record of this species from Maharashtra State, India.

Subfamily CATANTOPINAE

Genus *Catantops* Schaum, 1853

32. *Catantops pinguis innotabilis* (Walker)

1870. *Acridium innotabilis* Walker, *Cat. Derm. Salt. Br. Mus*; 4 : 629.

1953. *Catantops pinguis innotabilis*, Dirsh & Uvarov, *Tijdschr. Ent.*, 96 (3) : 233.

Diagnostic characters : Frontal ridge finely punctured, lateral carinae distinct, eyes approximating; antennae filiform, pronotum closely punctured, lateral lobe without coloured pattern; tegmina extending beyond abdomen, under surface of body and legs pale; external disc of hind femur without the black median spot below the upper carinula; male cercus more up-covered with broadened apex and more projecting upper apical angle.

Material examined and Locality : 2 ♂♂, 3 ♀♀ village Pirkheda, Dhakna range, 4.12.1992; 1 ♂, Gullarghat on Akot-Dhargad road, 6.12.1992; 1 ♀, Koktu, 8.12.1992; 2 ♂♂, Gugamal, Koktu, 9.12.1992; 2 ♂♂, Village Mangia on Harisal-Semadoh Road, 13.12.1992; 1 ♂ 4 ♀♀ Agricultural fields 3 kms., south of Semadoh, 14.12.1992 all coll. P.P. Kulkarni; 1 ♀, Khedida, Koktu, 28.3.1994, Coll. S.G. Patil.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Goa and Islands, Himachal Pradesh, Jammu and Kashmir, Kerala, Maharashtra, Madhya Pradesh, Meghalaya, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Afghanistan; Bangladesh; Borneo; China; Hong Kong; Indo-China; Japan; Java; Kambodia; Korea; Malaya; Maldiv Islands; Myanmar; Nepal; New Guinea; Pakistan; Philippines; Sumatra; Thailand; Tibet and Yunnan.

Remarks : It is common in Indian plains and is a pest of millets, cotton, maize, rice, tea, teak etc.

Genus *Xenocatantops* Dirsh & Uvarov, 1953

33. *Xenocatantops karnyi* (Kirby)

1910. *Catantops karnyi*, Kirby, *Syn. Cat. Orth.*, 3 : 483.

1982. *Xenocatantops* Karnyi, Jago, *Trans. Am. ent. Soc.*, 108 (3) : 454.

Diagnostic characters : Head considerably produced between the antennae, eyes almost touching above, vertex sloping into the broad frontal ridge, an irregular dark band behind eyes; pronotum thickly punctured, legs testaceous; hind femora with two oblique bands on the sides, the lower outer carina spotted with black; hind tibiae with 8 to 9 black tipped spines and black spots near the base. Tegmina brown wings hyaline.

Material examined and Locality : 1♂, 1♀, Agricultural fields 3 kms south of Semadoh, 14.12.1992 coll. P.P. Kulkarni.

Distribution : Known from north, west and south India.

Genus *Stenocatantops* Dirsh & Uvarov, 1953

34. *Stenocatantops splendens* (Thunberg)

1815. *Gryllus splendens* Thunberg, *Mem. Acad. Sci. St. Petersburg.*, 5 : 236.

1953. *Stenocatantops splendens*, Dirsh & Uvarov, *Tijdschr. Ent.*, 96 (3) : 237.

Material examined : 2♀♀, 1♂, Village Pirkheda, Dhakna range, 4.12.1992; 1♂, Gugamal, Koktu, 9.12.1992, 11♂, 1♀, Mangia village, on Harisal-Simadoh Road, 13.12.1992; 3♀♀, Agricultural Fields, 3 Kms. South of Semadoh, 14.12.1992; All coll. P.P. Kulkarni.

Diagnostic characters : Colour brown or brownish testaceous; body elongated; middle segments of antennae about twice or thrice as long as broad; prosternal tubercle laterally compressed, strongly curved and inclined backwards in profile; pronotal disc not constricted in middle.

Distribution : India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Madhya Pradesh, Meghalaya, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Borneo; Celebes; China; Hainan; Java; Korea; Malaysia; Moluccas; Myanmar; Philippines; Sri Lanka; Sumatra and Thailand.

Subfamily EYPREPOCNEMIDINAE

Genus *Choroedocus* Bolivar, 1914

35. **Choroedocus illustris* (Walker)

1870. *Heteracris illustris* Walker, *Cat. Derm. Salt. Br. Mus.*, 4 : 662, 663.

1921. *Choroedocus illustris*, Uvarov, *Trans. ent. Soc. Lond.*, : 109.

Diagnostic characters : Vertex and disk of pronotum with darker median portion, rest uniform brown and bordered with narrow yellow stripe. Eyes bordered yellow posteriorly and beneath. Median carina of pronotum entire, with narrow markings of transverse sulci. Pronotum with broad yellow lateral stripes contiguous with posterior yellow border

of eyes and with two laterally placed yellow prominent spots in the middle. Hind tibiae reddish brown, with 12-15 brown spines. Tegmina with narrow sparse brown spots in radial sector. Supra anal plate well developed, tongue shaped and brown in colour.

Material examined and Locality : 1♂, Dhargad, 21.8.1993; 1♀, Raipur road, 30.8.1993, Coll. P.P.Kulkarni.

Distribution : India : Uttar Pradesh and Uttarkashi, Himachal Pradesh.

Remarks : This forms the first record of this species from Maharashtra State.

Genus *Tylotropidius* Stål, 1873

36. *Tylotropidius varicornis* (Walker)

1870. *Heteracris varicornis* Walker, *Cat. Derm. Salt. Br. Mus.*, 4 : 667.

1914. *Tylotropidius varicornis*, Kirby, *Fauna. Brit. India, Orthoptera.* : 265.

Material examined : 2♀♀, Gullarghat-Khatakali Road, 7.12.1992; 3♀♀, Gugamal, Koktu, 9.12.1992; Coll. P.P. Kulkarni.

Diagnostic characters : Pronotum brown with lateral carinae of pale colour; prosternal tubercle compressed, bituberculate at apex; hind femora thickened at base, very slender towards the tip; hind tibiae and tarsi dull blue; supra anal plate of male elongato-triangular and sulcated; cerci straight, slightly compressed and acuminate.

Distribution : India : Andhra Pradesh, Goa, Himachal Pradesh, Maharashtra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, West Bengal.

Elsewhere : Myanmar and Sri Lanka.

Subfamily CYRTACANTHACRIDINAE

Genus *Pachyacris* Uvarov 1923

37. **Pachyacris vinosa* (Walker)

1870. *Acridium venosum* Walker, *Cat. Derm. Salt. Brit. Mus.*, 3 : 588.

1922. *Pachyacris vinosa*, Uvarov, *Ann. Mag. nat. Hist.*, (9) 11 : 478.

Diagnostic characters : No pale yellow mark behind the eyes and the lateral sides of the pronotum; antennae dark at the base, reddish-brown beyond; tegmina with oblique venation in apical part; male cercus elongate, conical with acuminate apex.

Material examined and Locality : 1♀, Gullarghat Khatakali road, 7.12.1992, coll. P.P. Kulkarni.

Distribution : India : Assam, Bihar, Goa, Himachal Pradesh, Karnataka, Meghalaya, Mizoram, Orissa, Uttar Pradesh, West Bengal.

Elsewhere : China; Myanmar; Nepal; Thailand and Tongking.

Remarks : This forms the first record of this species from Maharashtra State.

REFERENCES

- BEIER, M. 1962. Orthoptera. Tettigoniidae (Pseudophyllinae). *Das Tierreich*, 73 : XI + 468 pp.
- BEIER, M. 1966. Tettigoniidae : Subfam. Meconematinae, Mecopodinae, Phyllophorinae. *Orthopterorum Catalogues*, Part 9 : 247–342. Gravenhage.
- BLACKITH, R.E. 1992. The Tetrigidae (Insecta : Orthoptera) of South-East Asia. *Cat. S.E. Asian Tetrigidae*, : Liv + 248.
- BOLIVAR, I. 1902. Les Orthopteres de St. Joseph's College a Trichinopoly (Sud de l'Inde). 3 me partie. *Ann. Soc. ent. Fr.*, Paris, 70 : 580–635, pl. 9.
- BRUNNER, VON WATTENWYL, C. 1891. *Additamenta zur Monographie der Phaneropteriden*. *Vesh. K.K. zool.-bot. Ges. Wien*, 41 : 1–196.
- CARL, C. 1916. Acridides nouveaux ou peu connus du Museum de Geneve. *Revue Suisse Zool.*, Geneva, 24 (6) : 461–518, pl. 2.
- CHOPARD, L. 1969. *The Fauna of India and the adjacent countries*, Orthoptera : Grylloidea, 2 : 1–421.
- DIRSH, V.M. 1954. Revision of the genus *Acrida* Linné (Orthoptera, Acrididae). *Bull. Soc. Fouad Entom.*, Cairo, 38 : 107–160.
- DIRSH, V.M. & UVAROV, B. P. 1953. Preliminary diagnosis of new genera and new synonym in Acrididae. *Tijdschr. Ent.*, Amsterdam, 96 (3) : 231–237.
- HANCOCK, J.L. 1915. Indian Tetriginae. *Rec. Indian Mus.*, 11 : 55–132.
- HEBARD, M. 1922. Studies in Malayan Melanesian and Australian Tettigoniidae. *Proc. Acad. nat. Sci.*, Philad., 74 : 121–299.
- HEBARD, M. 1929. Acrydiinae (Orthoptera, Acrididae) of Southern India. *Revue suisse Zool.*, 36 : 565–592.
- HOLLIS, D. 1965. A revision of the genus *Trilophidia* Stål (Orthoptera : Acridoidea). *Trans. R. ent. Soc. Lond.*, 117 (8) : 245–262.
- HOLLIS, D. 1968. A revision of the genus *Aiolopus* Fieber (Orthoptera : Acridoidea). *Bull. Br. Mus. nat. Hist. (Ent.)*, 22 (7) : 309–355.
- INGRISCH, S. 1990. Revision of the genus *Letana* Walker, 1869. (Grylloptera : Tettigoniioidea : Phaneopteridae). *Ent. Scand.*, 21 (3) : 241–276.

- JAGO, N.D. 1982. The African genus *Phaeocatantops* Dirsh and its allies in the Old World tropical genus *Xenocatantops* with the description of a new species (Orthoptera, Acridoidea, Acrididae, Catantopinae) *Trans. Am. ent. Soc.*, **108** (3) : 429–457.
- KIRBY, W.F. 1914. *The Fauna of British India, including Ceylon and Burma*. Orthoptera (Acridiidae). IX + 276 pp.
- MASON, J.B. 1973. A revision of the genus *Hieroglyphus* Krauss, *Parahieroglyphus* Carl and *Hieroglyphodes* Uvarov. (Orthoptera : Acridoidea), *Bull. Br. Mus. nat. Hist (Ent.)*, **28** (7) : 507–560.
- RAGGE, D.R. 1961. A revision of the genus *Ducetia* Stål (Orthoptera : Tettigoniidae). *Bull. Br. Mus. nat. Hist. (Ent.)*, **10** (5) : 171–2078.
- RITCHIE, J.M. 1982. A taxonomic revision of the genus *Gastrimargus* Saussure (Orthoptera : Acrididae). *Bull. Br. Mus. nat. Hist (Ent.)*, **44** (4) : 239 – 329.
- SHISHODIA, M.S., 1999. Orthoptera fauna of Patalkot, Chhindwara, Madhya Pradesh, India, *Rec. zool. Surv. India*, **97** (4) : 33–43.
1980. State of Art Report : Zoology, *Ed. and Pub.* Director, Zoological Survey of India, Orthoptera : 87-90.
- THUNBERG, C.P. 1815. Hemipterorum maxillosorum genera illustrata plurimisque novis speciebus ditata acdescripta. *Mem. Acad. Sci. St.- Petersburg.*, **5** : 211–301.
- UVAROV, B.P. 1921. Notes on the Orthoptera in the British Museum. I. The group Euprepocnemini. *Trans. ent. Soc. Lond.*, : 106–144.
- UVAROV, B.P. 1923. A revision of the Old World Cyrtacanthacrini (Orthoptera, Acrididae). *Ann. Mag. nat. Hist.*, Part II (9) **11** : 473–490.
- UVAROV, B.P. 1923. Some new or interesting Orthoptera from Persia, Baluchistan and Western India. *J. Bombay nat. Hist. Soc.*, **29** (Part 3–4) : 643–652.
- UVAROV, B.P. 1925. A revision of the genus *Ceracris* Walker (Orthoptera : Acrididae). *Ent. Mitt. Berl.*, **14** : 11–17.
- WALKER, F. 1870. *Catalogue of the specimens of Dermaptera and Saltatoria in the collection of the British Museum*. Part 4 (Acrididae) : 4 + 605 – 809 (*Brit. Mus. Nat. Hist.*).

INSECTA : HEMIPTERA (Aquatic and Semi Aquatic)

G. THIRUMALAI AND R.M. SHARMA*

Zoological Survey of India, Southern Regional Station, Chennai-600 028

INTRODUCTION

The aquatic and semi aquatic groups of Insects represent a significant level of diversity (Ghosh, 1996). They play an important role in fresh water ecosystems as polyphagous and carnivorous insects in different trophic levels. Because of their diverse habitats and dispersal capabilities, aquatic and semi aquatic hemipterans serve as zoogeographical indicators (Jordan, 1951; Hungerford & Matsuda, 1958). Some of the aquatic bugs are key stone predators and their abundance is essential to the existence of animal communities in an aquatic habitat (Murdoch *et al.*, 1984).

In spite of 80 genera and 275 species accommodated in 16 major families of aquatic and semi aquatic Hemiptera known from India (Thirumalai, 1999; 2002), little information on water bugs of any tiger reserves is available. The present account is based on the collection made available to the authors from Melghat Tiger Reserve, Amravati District, Maharashtra. The inventory comprises of 20 species accommodated under 14 genera and 6 families which forms the first report of this group from a Tiger Reserve of the country. Under each species, citation for the original description and other accompanying work necessary to understand the taxon or its occurrence in India is given.

SYSTEMATIC LIST

Order	HEMIPTERA
Suborder	HETEROPTERA
Infraorder	NEPOMORPHA
Family	NOTONECTIDAE
Subfamily	ANISOPINAE
Genus	<i>Anisops</i> Spinola

1. *Anisops cavifrons* Brooks
2. *Anisops nigrolineatus* Lundblad

* High Altitude Zoology Field Station, Zoological Survey of India, Solan 173211

- Subfamily NOTONECTINAE
 Tribe Notonectini
 Genus *Enithares* Spinola
3. *Enithares ciliata* (Fabricius)
 4. *Enithares triangularis* (Guerin-Meneville)
 Family NEPIDAE
 Subfamily RANATRINAE
 Tribe Ranatrini
 Genus *Ranatra* Fabricius
5. *Ranatra elongata* Fabricius
 6. *Ranatra filiformis* Fabricius
 7. *Ranatra varipes varipes* Stal
 Subfamily NEPINAE
 Tribe Nepini
 Genus *Laccotrephes* Stal
8. *Laccotrephes griseus* (Guerin-Meneville)
 9. *Laccotrephes ruber* (Linnaeus)
 Family BELOSTOMATIDAE
 Subfamily BELOSTOMATINAE
 Genus *Lethocerus* Mayr
 Subgenus *Lethocerus* Mayr
10. *Lethocerus indicus* (Lepeletier & Serville)
 Subfamily BELOSTOMATINAE
 Genus *Diplonychus* Laporte
11. *Diplonychus rusticus* (Fabricius)
 Family NAUCORIDAE
 Subfamily LACCOCORINAE Stal
 Genus *Helecoris* Stal
12. *Helecoris breviceps* Montandon
 13. *Helecoris obliquatus* (Spinola)
 Family CORIXIDAE
 Subfamily CORIXINAE
 Tribe Corixini
 Genus *Sigara* Fabricius
 Subgenus *Tropocorixa* Hutchinson
14. *Sigara graveleyi* (Hutchinson)

Subfamily MICRONECTINAE

Genus *Micronecta* Kirkaldy

Subgenus *Basilonecta* Hutchinson

15. *Micronecta scutellaris scutellaris* (Stal)

Infraorder GERROMORPHA

Family GERRIDAE

Subfamily CYLINDROSTETHINAE

Genus *Cylindrostethus* Mayr

16. *Cylindrostethus products* Spinola

Subfamily EOTRECHINAE

Genus *Onychotrechus* Kirkaldy

17. *Onychotrechus rhexenor* Kirkaldy

Subfamily GERRINAE

Genus *Limnogonus* Stal

Subgenus *Limnogonus* Stal

18. *Limnogonus (Limnogonus) nitidus* (Mayr)

Genus *Limnometra* Mayr

19. *Limnometra fluviorum* (Fabricius)

Subfamily HALOBATINAE

Genus *Metrocoris* Mayr

20. *Metrocoris communis* (Distant)

Keys to the families of Aquatic and Semi aquatic HEMIPTERA

1. Antenna conspicuous, longer than head, inserted in front of eyes, visible in dorsal view; lives on the surface of water; wingless & winged forms GERRIDAE
 - Antenna hidden, very much shorter than head, not visible in dorsal view; lives in submerged water; always winged forms 2
2. Rostrum short, triangular, not distinctly segmented; fore tarsi single -segmented, scoop-like, fringed with setae CORIXIDAE
 - Rostrum long, cylindrical, distinctly segmented, fore tarsi one or more segmented, simple without setae... 3
3. Oblong forms, abdomen without abdominal appendages; swims upside down... .. NOTONECTIDAE

- Flattened forms, with or without abdominal appendages; swims normally with back towards the water surface 4
- 4. Tip of the abdomen with a long and slender siphon NEPIDAE
- Tip of the abdomen without a long and slender siphon and with a short and flat siphon 5
- 5. A distinctive pair of flat retractile strap-like appendages at the apex of abdomen; size ranges from 15 to 100 mm... BELOSTOMATIDAE
- No distinctive appendages at the apex of abdomen; fore leg raptorial, size less than 15 mm... NAUCORIDAE

Family NOTONECTIDAE

Notonectidae : The members belonging to this family known as 'Back Swimmers' are truly aquatic forms which differ from all other aquatic bugs (except Pleidae and Helotrephidae) in the habit of swimming on their backs. The notonectids are small, medium sized (15-20mm), oblong bugs, characterised by- four segmented antennae, 3-4- segmented rostrum, absence of ocelli, non-raptorial legs and flattened hind legs devoid of claws.

Subfamily ANISOPINAE

Anisops cavifrons Brooks

Anisops cavifrons Brooks 1951, *Kans. Univ. Sci. Bull.*, 34 : 418.

Anisops cavifrons Brooks : Thirumalai, 1994, *Rec. zool. Surv. India, Occ. Pap. No.* 165 : 16.

Diagnosis : This species is identical to *A. batillifrons* Lundblad in almost every superficial details (Brooks, 1951) and can be distinguished from *A. batillifrons* Lundblad by the presence of a procumbent spine on the fore tibia. In males the left paramere is moderately excavate and there are three closely arranged small setae near the base of tarsus. This species has been reported from both Western Ghats and Eastern Ghats and interestingly recorded from Cochin backwaters in Kerala.

Material examined : 1♂, Khapra river nr. Semadoh, 6.ii.1992, Coll. M.S. Pradhan.

Distribution : India : Bihar, Chandigarh, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Pondichery, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal.

Elsewhere : Pakistan.

Anisops nigrolineatus Lundblad

1933. *Anisops nigrolineatus* Lundblad, *Arch. Hydrobiol. Suppl.*, 12 : 160.

1995. *Anisops nigrolineatus* Lundblad: Polhemus, *Cat. Het. Palaerctic region*, 1 : 65.

Diagnosis : It can be easily identified by the swollen interocular space beyond the margins of the eyes in males while in females the head is rounded with the vertex extending slightly beyond the anterior margin of the eyes. This species has a remarkable discontinuous distribution having been described from Sumatra but being found mainly in Southern, central and north and Northwestern parts of India.

Material examined : 1 ♀, 2 IS, Sipra river nr. Kolkaz, 10.ii.1992, Coll. M.S. Pradhan 1 ♂ 1 ♀, Tapi river, 12.ii.1992, Coll. M.S. Pradhan; 1 ♀, Khandu river, nr. Khandu Kheda, 3.iv.1994, Coll. M.S. Pradhan; 1 ♂ 2 ♀, Katang bamboo, Pili area, 19.ii.1997, Coll. A.S. Mahabal; 1 ♂ Chamhar Udhda, 20.ii.1997 Coll. A.S. Mahabal.

Distribution : India : Arunachal Pradesh, Chandigarh, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Tamilnadu, Uttar Pradesh.

Elsewhere : Afghanistan; China; Bangladesh; Indonesia; Myanmar.

Subfamily NOTONECTINAE Latreille

Tribe NOTONECTINI Latreille

Genus *Enithares* Spinola

Enithares ciliata (Fabricius)

1798. *Notonecta ciliata* Fabricius, *Suppl. Ent. Syst.*, 524.

1906. *Enithares indica* Spinola : Distant, *Fauna British India*, 3 : 42.

1910. *Enithares paviana* Distant, *Fauna British India*, 5 : 329.

1919. *E. lacta* Paiva, *Rec. Indian Mus.*, 19 : 155.

1938. *E. abbreviata* (Kirby) : Hafiz and Mathai. *Rec. Indian Mus.*, 40 : 210.

Diagnosis : The meso trochanter is rounded with a patch of black spicules along the ventral margin, covering a much larger area. This species, like the other known species of the genus, is found on water surface and usually feeds on prey caught in the surface film or floating at the surface of deep water or clinging to submerged objects.

Material examined : 2 ♂ 2 ♀ 3 IS, Malur river, Chourakund, 12.ii.1991, D.F. Singh; 1 ♂, Khandu river, Khandu Kheda, 7.ii.1992, Coll. M.S. Pradhan; 1 ♂ Tapi river, 12.ii.1992, Coll. M.S. Pradhan; 1 ♂, Cipidoh, 18.ii.1993, Coll. S.G. Patil; 2 ♂, 2 ♀ Gobiya nalla, 20.ii.1993, Coll. S.G. Patil ; 2 ♂ 2 ♀, Chadupati near Semadoh, 4.iv.1993, Coll. S.G. Patil; 3 ♂, 4 ♀, Vairat & around, 19.ix.1996, Coll. D.B. Bastawade 19 ♂, 5 ♀, 30 IS, Ambadoh, 21.ii.1997, Coll. A.S. Mahabal;

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Bihar, Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Tamilnadu, West Bengal.

Elsewhere : Bhutan and Much of South East Asia.

***Enithares triangularis* (Guerin-Meneville)**

1844. *Notonecta triangularis* Guerin-Meneville, I. Con. Reg. Anim., 354.

1906. *Enithares triangularis* (Guerin-Meneville) : Distant, *Fauna British India*, 3S : 44.

1968. *Enithares triangularis* (Guerin-Meneville) : Lansbury, *Pacific Insects*, 10 : 369.

Diagnosis : Size 13 to 15 mm; the median length of the metaxyphus 2 times longer than its basal width; Commonly found in Western Ghats and endemic to India as far as the distribution goes.

Material examined : 1♂, 2♀ 6 IS, Khandukheda, Khandu river, 7.ii.1992, Coll. M.S. Pradhan; 1♂, Kolkaz, 13.ii.1993, Coll. S.G. Patil; 1♂ 1♀, 9 IS, Chadupati near Semadoh, 4.iv.1993, Coll. S.G. Patil; 3♂ 1♀, Ambadoh, 21.ii.1997, Coll. A.S. Mahabal; 1♀, 4 IS, Ambadoh, 21.ii.1997, Coll. A.S. Mahabal.

Distribution : India : Kerala, Tamilnadu, West Bengal.

Family NEPIDAE

Nepidae : The family Nepidae, popularly known as 'Water Scorpions', comprises of dorso-ventrally flattened or cylindrical (size ranges from 15 to 55mm) bugs with long and slender legs, the anterior pair being raptorial. These bugs are characterised by single segmented tarsi and in the absence of ocelli. The long slender, non-retractile respiratory siphon is derived from the 8th abdominal tergum and has two spiracles at its base.

Subfamily NEPINAE***Laccotrephes griseus* (Guerin)**

1844. *Nepa griseus* Guerin, *Iconogr. Regne Anim.*, 352.

1906. *Laccotrephes griseus* (Guerin) : Distant, *Fauna British India*, 5 : 314;

1994. *Laccotrephes griseus* (Guerin) : Thirumalai, *Rec. zool. India, Occ. Pap. No.*, 165 : 21.

Diagnosis : This species can be identified by the presence of slightly hooked and symmetrical parameres, abdominal appendages shorter than the body, presence of an obtusely rounded tooth at the base of the anterior femora. This species is commonly found in Peninsular India. It is a very sluggish species often found under weeds or at the bottom of slow or stagnant waters.

Material examined : 4♂2♀ 3 IS, Tapi river near Rangubeli, 11.xii. 1992, P.P.Kulkarni; 1♀, Kolkaz, 13.ii.1993; 1♀, Chadupati, 14.ii.1993; 1♂1♂, Cipidoh, 18.ii.1993; 2♀, Motideo nalla, 19.ii.1993; 2♂2♀, Sidhu Kund, 24.ii.1993, Coll. S.G. Patil; 1♀, Khandu river, Khandukheda, 3.iv. 1994, M.S. Pradhan; 1♂, Khandukheda, 20.xi.1994, S.S.Kamble & Patry; 1♂, Gadga river, 6 kms. from Dhakna on Dharni Rd., 28.ii.1997, A.S.Mahabal.

Distribution : India, Andhra Pradesh, Arunachal Pradesh, Assam Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Manipur, Meghalaya, Nagaland, Orissa, Pondichery, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Malaysia; Myanmar; Seychelles; Sri Lanka; Thailand.

***Laccotrephes ruber* (Linnaeus)**

1764. *Nepa ruber*, Linnaeus *Mus. Lud. Ulr.*, 165.

1906. *Laccotrephes ruber* (Linn.) : Distant, *Fauna British India*, 3 : 18;

1994. *Laccotrephes ruber* (Linn.) : Thirumalai, *Rec. zool. Surv. India, Occ. Paper No 165* : 22.

Diagnosis : This is a common species with wide distribution in the Indo-Australian region and is largely found in habitats like rivers, streams, tanks, etc. The abdominal appendices are distinctly longer than the body, the prosternum is convex in the middle and has a curved and hook shaped male paramere.

Material examined : 2♂, Chamor nalla, Kolkaz, 9.ii.1991; and 2♀, Koapati river, Semadoh, 9.ii.1991, Coll. D.F. Singh; 4♀, Chadupati, 14.ii.1993; 3♂ 2♀, Talai, 15.ii.1993; 2♀, Kelpani, 17.ii.1993; 2♂ 2♀, Gobia nalla, 20.ii.1993; 1♂, Sidhu Kund, 24.ii.1993; 1♀, Gurgipati, Koktu, 27.ii.1993; 2♂ 2♀, Koktu river near Koktu rest house, 30.ii.1993, Coll. S.G. Patil; 1♀, Khapra river near Raipur village, 1. iv. 1994, and 1♀, Churni tank, Jarida road, 3.iv.1994, Coll. M.S. Pradhan; 2♂ 3♀, Hatida lake, 24.ix.1994, Coll. S.S. Kamble.

Distribution : India : Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : China; Japan; Nepal; Pakistan; Taiwan.

Subfamily RANATRINAE

***Ranatra elongata* Fabricius**

1790. *Ranatra elongata* Fabricius, *Skrif. Nat. Selesk.*, 1 : 228.

1972. *Ranatra elongata* Fabricius : Lansbury, *Trans. R. ent. Soc. Lond.*, 124 : 306.

1994. *Ranatra elongata* Fabricius : Thirumalai, *Rec. zool. Surv. India, Occ. Pap. No.*, 165 : 22.

Diagnosis : This genus is cosmopolitan in distribution and contains more than 120 species all over the world. It is reported to be feeding on tadpoles, nymph of mayflies and other aquatic Hemipterans and during dry seasons it is known to migrate in search of suitable areas. This species can be identified by the structure of the anterior femur, which is provided with a triangular tooth beyond the middle of its length, and the metasternal process, which is sub triangular, and centrally longitudinally foveately sulcate. The forecoxae are two-thirds the length of prothorax and anterior lobe of prothorax less than twice the length of posterior lobe.

Material examined : 1♂, Makadi nalla, Dhargad, 4.ii.1992, Coll. P.P. Kulkarni; 1♂, Gullarghat, Khatkali road, 7.xii.1992, Coll. P.P. Kulkarni; 1♂, Dedrakhora, Koktu, 8.xii.1992, Coll. P.P. Kulkarni; 1♂, Gugamal, Gunjalla nalla, 9.xii.1992, Coll. P.P. Kulkarni; 1ex. (damaged), Jawaharkund, Sipna river, 11.ii.1993; 4♂ 1♀, Talai, 15.ii.1993; 3♂, Kelpani, Dhobargav, 17.ii.1993; 1♂, Cipidoh, 18.ii.1993; 2♂ 1♀, Motideo nalla, 19.ii.1993; 2♂, Gobiya nalla, 20.ii.1993; Coll. S.G. Patil; 1 ex. (Damaged), Chikalpati, 23.viii.1993, Coll. P.P. Kulkarni; 1♀, Malur village, 28.viii.1993; Coll. P.P. Kulkarni; 1♀, Khandu river, Khandu Kheda, 3.iv.1994, Coll. M.S. Pradhan; 1♀, Jawaharkund, 18.ix.1994, Coll. S.S. Kamble; 1♀, Vairat & around, 19.ix.1996, Coll. D.B. Bastawade.

Distribution : India : Andhra Pradesh, Bihar, Delhi, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondichery, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Australia; Nepal; Sri Lanka.

Ranatra filiformis Fabricius

1970. *Ranatra filiformis* Fabricius, *Skrit. Nat. Selsk.*, 1 : 228.

1994. *Ranatra elongata* Fabricius, Thirumalai, *Rec zool. Surv. India, Occ. Pap.* No. 165 : 22.

1997. *Ranatra elongata* Fabricius, Bal & Basu, *Zool. Surv. India, State Fauna*, 6 : 266.

Diagnosis : This species is mostly found among vegetation, fringing the shallower parts of water, clinging to submerged vegetation and feeds on nymphs of dragonflies and mosquito pupae. The males of this species can be identified by the absence of a tooth and presence of several small spines on the inner margins of distally hook-shaped paramere and presence of wide interocular space. This species is smaller in size than *R. elongata*.

Material examined : 1♂ 1♀, Hatida Talav, 22.ii.1993, Coll. S.G. Patil; 1♂ 1♀, Tapi river near Deval Ghat, 29.ix.1994, Coll. : S.S. Kamble.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Manipur, Meghalaya, Orissa, Pondichery, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : China; Nepal; Pakistan; Phillipines; Srilanka.

Ranatra varipes varipes Stal

1861. *Ranatra varipes* Stal, *Ofer. K. Vetensk. Akad. Forh.*, 18 : 203

1972. *Ranatra varipes* Stal, Lansbury, *Trans. R. ent. Soc. Lond.*, 124 : 316.

1998. *Ranatra varipes varipes* Stal : *Nieser & Polhemus, Amemboa*, 2 : 22.

Diagnosis : Small body size 20-33 mm; respiratory siphon shorter than body; fore femora are broad with irregular brown markings.

Material examined : 1 ♀, Tapi river, Rangubeli, 11.ii.1991, Coll. D.F. Singh; 2 ♀, Kelpani, Dhobargav, 17.ii.1993, S.G. Patil.

Distribution : India : Assam, Manipur, Orissa, Pondichery, Tamilnadu, West Bengal.

Elsewhere : Australia; Indonesia; Malayasia; Myanmar; Srilanka; Taiwan; Thailand.

Family BELOSTOMATIDAE

Belostomatidae : This family includes the largest of the aquatic hemipterans. Members of this family are large (size ranges from 10 to 110mm), flat, brown, oval or oblong insects, commonly known as 'Giant Water Bugs'. The most distinctive adult belostomatid feature is a pair of retractile, strap-like appendages at the abdominal apex, possessing a spiracle basally.

Subfamily BELOSTOMATINAE

Diplonychus rusticus (Fabricius)

1781. *Nepa rustica* Fabricius, *Ent. Sept.*, 4 : 62

1906. *Sphaerodema rusticum* (Fab.) : Distant, *Fauna British India*, 3 : 36.

1961. *D. rusticus* (Fab.) : Lauck & Menke, *Ann. Entomol. Soc. Amer.*, 54 : 649.

1994. *D. rusticus* (Fab.) : Thirumalai, *Rec. zool. Surv. India, Occ. Pap.* No. 165 : 25.

1980. *Diplonychus indicus* Venkatesan & Rao, *J. Bombay nat. Hist. Soc.* 88 : 299.

Diagnosis : This species is commonly found in fishponds and voraciously feeds on fish fry, mosquito larvae and other aquatic organisms. This species has a single segmented fore tarsus with small claw, pale lateral basal margins of pronotum and its head length is shorter than the width between the eyes.

Material examined : 2 IS, Tapi river near Rangubeli, 11.ii.1991, Coll. D.F. Singh.

Distribution : India : Andaman & Nicobar Island, Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Jammu & Kashmir, Kerala, Madhya Pradesh, Orissa, Pondicherry, Rajasthan, Tamil Nadu, West Bengal.

Elsewhere : Australia; China; Indonesia; Japan; Malaysia; Myanmar; New Guinea; New Zealand; Srilanka; Thailand.

Subfamily LETHOCERINAE

Genus *Lethocerus* Mayr

Subgenus *Lethocerus* Mayr

Lethocerus indicus (Lepeletier & Serville)

1775. *Belostoma indica* Lepeletier & Serville, *Encycl. Meth.*, X : 272

1871. *Belostoma indicum* Lepeletier & Serville, Mayr, *Verh. zool. bot. Ges. Wien*, 12 : 426.
 1906. *B. indicum* (Lepeletier & Serville) : Distant, *Fauna British India*, 3 : 38.
 1927. *Lethocerus indicus* (Lep. & Serv.) : Buneo, *Bull. Brooklyn Entomol Soc.*, 12 : 30.
 1933. *Lethocerus indicus* (Lep. & Serv.) : Lundblad, *Arch. Hydrobiol. Suppl.*, 12 : 52.
 1995. *Lethocerus indicus* (Lep. & Serv.) : Polhemus, *Cat. Het. Palaerctic region*, 1 : 23.

Diagnosis : The 'giant Indian water bug' large, elongate, dorsoventrally flattened brown aquatic bug; divergent yellow line on anterior lobe of pronotum broad; eyes twice as long as wide and elongate. Members of this genus are found in deeper water bodies such as pond, lakes, flooded paddy fields etc.

Material examined : 1 ♀, Talai, 15.ii.1993, Coll. S.G. Patil; 1 ♀, Chadupati near Semadoh, 4.iv. 1994, Coll. M.S. Pradhan.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Karnataka, Kerala, Meghalaya, Madhya Pradesh, Maharashtra, Mizoram, Orissa, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal.

Elsewhere : China; Indonesia; Malayasia; Myanmar; Pakistan; Srilanka.

Family NAUCORIDAE

Naucoridae : The naucorids popularly, known as 'Creeping Water Bugs' or 'Saucer Bugs', are oval, flattened bugs with raptorial forelegs. The size varies from 2-15mm and the colour from brownish to blackish, often marked with yellow or green. The members of this family are easily identifiable by 3-segmented simple concealed antennae, absence of ocelli, 3-segmented rostrum and with a distinct claw at hind tarsi. The respiratory tube is absent.

Subfamily LACCOCORINAE

Genus *Helecoris* Stal

Helecoris breviceps Montandon

1897. *Helecoris breviceps* Montandon, *Ann. Soc. Ent. Belg.*, xli : 55.
 1897. *Helecoris breviceps* Montandon, Distant, 1906. *Fauna British India*, 3 : 29.
 1897. *Helecoris breviceps* Montandon, La Rivers, 1971. *Biol. Soc. Nevada, Memoire II* : 78.

Diagnosis : Oval form, size 9.5 to 10.00 mm; head and pronotum yellow with brown spots; scutellum dark brownish with tip pale; eyes inner margins parallel; found in running waters attached to hard substratum.

Material examined : 1 ♂. Malur river, Chourakund, 12.ii.1991; 2 ♂♂. Dolar river, Dhakna, 15.ii.1991, Coll. D.F. Singh; 1 ♂, 1 IS. Tapi river, Rangubeli, 12.ii.1992, Coll. M.S. Pradhan; 1 ♂ ex. Khandukheda, 20.xi.1994, Coll. S.S. Kamble.

Distribution : India : Himachal Pradesh Maharashtra; Tamilnadu.

***Helecoris obliquatus* (Spinola)**

1937. *Naucoris obliquatus* Spinola, *Essai Sur less insectes hemipteres rhynchotes on heteropteres* : 54.

1897 *Helecoris breviceps* Montandon, Distant, 1906. *Fauna British India*, 3 : 31.

1897. *Helecoris breviceps* Montandon, Distant, 1910. *Fauna British India*, 5 : 322.

Diagnosis : Oval form almost same size that of *Helecoris breviceps* broader; pronotum not distinctly bordered with a marginal furrow; members belonging to this family are poorly known from India and many of the positions are still uncertain.

Material examined : 3 ♀ ♀ Tapi river, Rangubeli, 11.ii.1991, Coll. D.F. Singh; 1 ♂ Khandukheda, Khandu river, 7.ii.1992, Coll. M.S. Pradhan; 1 ♂ Tapi river, Rangubeli, 11.xii.1992, Coll. P.P. Kulkarni.

Distribution : India : Maharashtra.

Family CORIXIDAE

Corixidae : The Corixidae or 'Water Boatmen', the largest family of aquatic Hemiptera, is characterised by single segmented front tarsus called 'pala' which is flattened, scoop-shaped. The scutellum is exposed or concealed and the male abdominal segments are asymmetrical. The corixid labium is broadly fused with the head and posses distinct transverse grooves and channels on its outer surface that harbours the stylets. The size ranges from 1.8-16mm.

Subfamily CORIXINAE

Tribe CORIXINI

Genus *Sigara* Fabricius

Subgenus *Tropocorixa* Hutchinson

***Sigara graveleyi* (Hutchinson)**

1940. *Corixa (Tropocorixa) graveleyi* Hutchinson, Hutchinson, 1940, *Trans. Conn. Acad. Arts. Sci.* 33 : 453.

Diagnosis : Pronotum dark brown with ten pale yellow lines; the males are characterized by conspicuous brush like hairs on the right side of the 8th dorsal abdominal segment.

Material examined : 4 ♀, Chamrudra, Kolkaz, 9.ii.1991; 1 ♂ 1 ♀, Malur river, Chourakund, 12.ii.1991; 1 ♀, Turma river, Bodkheda, 16.ii.1991, Coll. D.F. Singh; 4 ♀, Khandu river, Khandukheda, 7.ii.1992; 3 ♂ 12 ♀ 3 IS, Jawaharkund, 8.ii.1992; 20 ♂ 40 ♀ 7 IS, Bhawar

stream near Chourakund, 12.ii.1992; 1♂ 2 IS, Tapi river, Rangubeli, 12.ii.1992, Coll. M.S. Pradhan; 2♂ 1♀, Talai, 15.ii.1993, Coll. S.G. Patil; 7♂ 19♀ 2 IS, Khandu river, Khandukheda, 3.iv. 1994, Coll. M.S. Pradhan; 3♂ 12♀, Salona, Masundi & around, 20.ix. 1996, Coll. D.B. Bastawade; 3♂ 4♀ 1IS, Semadoh, Sipna river, 18.ii. 1997; 11♂ 3♀ 4 IS, Katang bamboo, Pili area, 19.ii.1997; 6♂ 2♀, Chamhar, Udhda, 20.ii.1997; 3♂ 1♀ (winged), Ambadoh, 21.ii.1997; 4♂ 11♀ 2 is, Koktu river, Koktu, 27.ii. 1997; and 2♂ 3♀, Gadga river, 10 kms from Dhakna, 01.iii.1997; Coll. A.S. Mahabal.

Distribution : India : Goa, Madhya Pradesh, Maharashtra, Tamil Nadu

Subfamily MICRONECTINAE *

Genus *Micronecta* Kirkaldy

Subgenus *Basilonecta* Hutchinson

Micronecta (Basilonecta) scutellaris scutellaris (Stal)

1858. *Sigra scutellaris* Stal, *Vetens akad. Forh.*, 15 : 339.
1910. *Micronecta dione* Distant, *Fauna British India*, 5 : 348.
1908. *Micronecta malabarica* Kirkaldy, *Canad.Ent.*, 40 : 209.
1910. *Micronecta malabarica* Kirkaldy: Distant, *Fauna British India*, 5 : 347.
1910. *Micronecta proba* Distant, *Fauna British India*, 5 : 348.
1940. *M. scutellaris pseudostrata* Hutchinson, *Trans. Connecticut Acad. Art. Sci.*, 33 : 371.
1940. *M. (Basilonecta) scutellaris scutellaris* (Stal, 1858) : Hutchinson, *Trans. Connecticut Acad. Art. Sci.*, 33 : 365.
1994. *M. (Basilonecta) scutellaris scutellaris* (Stal, 1858) : Thirumalai, *Rec. zool. Surv. India, Occ. Pap.* 165 : 9.

Diagnosis : This is a very widely distributed species in India and mostly found in stagnant pools, pond and ditches. It is the most common member and the largest species (2.8 to 3.1 mm) of the genus. It can be identified by club-shaped tip of the left paramere and grey or greyish brown pronotum of males.

Material examined : 1♂, Vairat & around, 19.ix. 1996, Coll. D.B. Bastawade.

Distribution : India : Andhra Pradesh; Assam. Bihar; Delhi; Himachal Pradesh; Karnataka. Kerala; Madhya Pradesh; Orissa; Punjab; Tamil Nadu; Uttar Pradesh; West Bengal.

* The cladistic analysis of Mahner (1993) gives a base to regard Micronectinae as a separate family Micronectidae (Nieser, 1999).

Elsewhere : Africa (Central); China; Indonesia; Malayasia; Saudi Arabia; Sri Lanka; Vietnam.

Family GERRIDAE

Gerridae : The gerrids, popularly known as 'Water Striders' or 'Pond Skaters' are elongate or oval insects with sub apical claws, hind femora reaching beyond the apex of abdomen and the middle legs, usually distinctly longer than the hind ones. The body is covered with a velvety hydrofuge, hair-pile and the colour varies from black or grey to brown, the dorsum being marked with light grey or yellow lines or spots. Macropterous, brachypterous, micropterous and apterous forms are frequently encountered. The size varies from 2-40mm.

Subfamily CYLINDROSTETHINAE

Cylindrostethus productus (Spinola)

1840. *Gerris productus* Spinola, Essai Sur less insectes hemipteres rhynchotes on heteropteres, 64.

1903a. *Cylindrostethus productus* (Spinola) : Distant, Fauna British India, 2 : 184.

1994. *Cylindrostethus productus* (Spinola) : Polhemus, Bishop Mus. Occ. Pap. No., 38 : 10.

1910a. *Janias elegantulus* Distant, Ann. Mag. nat. Hist., 5(8) : 145.

Diagnosis : This species is very large (more than 25 mm), elongate, dark, which can be recognised by its large connexival spines. *C. productus* is the only member of the genus so far known from India. This species has been found inhabiting smooth flowing mountain streams.

Material examined : 12♂ 4♀ (winged), Koapati river near Chadupati, 9.ii.1991, Coll. D.F. Singh.

Distribution : India : Karnataka, Kerala, Goa, Himachal Pradesh, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttaranchal, West Bengal

Elsewhere : Sri Lanka.

Subfamily EOTRECHINAE

Onychotrechus rhexenor Kirkaldy

1903. *Onychotrechus rhexenor* Kirkaldy, Entomologist, 36 : 44.

1903. *O. rhexenor* Kirk.: Distant, Fauna British India, 2 : 183. 40

1980. *O. rhexenor* Kirk. : Andersen, Steenstrupia, 6 : 128.

1989. *O. rhexenor* Kirk. : Thirumalai, Rec. zool. Surv. India, Occ. Pap. No., 118 : 44.

Diagnosis : Darker in colour; short brown sublateral stripes on mesonotum in wingless

forms; male front femur tapering towards apex, elongate patch of dark spinules on inner surface. *O. rhexenor* lives on inclined rock faces close to mountain streams, rock splashed by waterfalls and similar habitats.

Material examined : 3♂ 1♀ (winged), Ambadoh, 21.ii.1997; 1♂ 2♀ (winged), Andharban & around, 22.ii.1997, Coll. A.S. Mahabal.

Distribution : India : Karnataka, Kerala, Maharashtra, Rajasthan, Tamilnadu; Africa.

Subfamily GERRINAE

Genus *Limnogonus* Stal

Subgenus *Limnogonus* Stal

Limnogonus (Limnogonus) nitidus (Mayr)

1865. *Hydrometra nitida* Mayr, Verh. zool. bot. Ges. Wien, 15 : 443.
 1903a. *Gerris nitida* (Mayr) : Distant, Fauna British India, 2 : 178.
 1908b *Limnogonus nitidus* (Mayr,) : Kirkaldy, Wissenschaftl. Ergebn. der Schwed. Zool. Exped. nach dem Kilimandjaro, 12 : 21.
 1960. *L.(Limnogonus) nitidus* (Mayr) : Matsuda, Kans. Univ. Sci. Bull., 41 : 198.
 1975. *L.(Limnogonus) nitidus* (Mayr) : Andersen, Ent. Scand. Suppl., 7 : 62.

Diagnosis : This species has been recorded from temporary pools, rice fields, ponds from sea level to 1000 metres and found as winged individuals. This can be identified from all the known species of this genus by the presence of fairly, prominent connexival spines and yellow markings at the anterior pronotal lobe.

Material examined : 1♀ (winged), Vairat & around, 19.ix.1996, Coll. D.B. Bastawade.

Distribution : India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Chandigarh, Delhi, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Orissa, Rajasthan, Tamilnadu, Tripura, Uttar Pradesh, West Bengal.

Elsewhere : Indonesia; Malasia; Maldives Islands; Myanmar; Nepal; Singapore; Srilanka; Thailand; Vietnam.

Genus *Limnometra* Mayr

Limnometra fluviorum (Fabricius)

1798. *Cimex fluviorum* Fabricius, Ent. Syst. Suppl., 543.
 1903a. *Gerris fluviorum* (Fab.) : Distant, Fauna British India, 2 : 177
 1934. *Limnometra fluviorum* (Fab.) : Lundblad, Arch.Hydrobiol.Suppl., 12 : 371.
 1960. *Tenagogonus Limnometra fluviorum* (Fab.) : Matsuda, Kans. Univ. Sci. Bull. 41 : 206.

1995a. *Limnometra fluviorum* (Fab.) : Andersen, *Steenstrupia*, 21 : 118.

1903a. *Gerris armata* Spinola : Distant, *Fauna British India*, 2 : 180.

Diagnosis : It is a commonly found gerrid species in Southern India occurring in a wide variety of fresh water habitats. It is differentiated from other known species of this genus by the presence of a spine like projection on the dorsolateral rear margin of the middle coxae.

Material examined : 26♂ 35♀ (winged), Makadi nalla, Dhargad, 4.xii.1992; 4♂ 7♀ (winged), Gobi nalla, Bori village, 5.xii.1992; 60 ♂ 47♀ (winged) 1♀(apt), Gullarghat, Khatkali Rd. 7.xii.1992; 1♂ 1♀(winged), Gugamal, Gunjala nalla, 9.xii.1992; 1♀(winged), Tapi river, Rangubeli, 11.xii.1992, Coll. P.P. Kulkarni ; 4♀(winged), Cipidoh, 18.ii.1993; 6♂ 9♀(winged), Motideo nalla, 19.ii.1993; 14♂ 11♀(winged), Gobiya nalla, 20.ii.1993; 4♂ 3♀(winged), Gurgipati, Koktu, 27.ii.1993; 3♂ 2♀(winged), Khedida, Koktu, 28.ii.1993; 4♂ 2♀(winged), Chadupati near Semadoh, 4.iv.1993, Coll. S.G. Patil; 46♂ 68♀(winged), Khandu river, Khandukheda, 3.iv.1994; 1♀(winged), Chadupati near Semadoh, 4.ii.1994, Coll. M.S. Pradhan; 1♀(winged), Salona, Masundi, 20.ix.1996, Coll. D.B. Bastawade; 14♂ 19♀(winged), Ambadoh, 21.ii.1997; 8♂ 8♀(winged), Andharban, 22.ii.1997, Coll. A.S. Mahabal.

Distribution : India : Karnataka, Kerala, Maharashtra, Pondicherry, Tamilnadu, West Bengal.

Elsewhere : Philippines; Srilanka.

Subfamily HALOBATINAE

Genus *Metrocoris* Mayr

Metrocoris communis (Distant)

1910a. *Euodus communis* Distant, *Ann. Mag. nat. Hist.*, 5(8) : 151.

1929. *Metrocoris communis* (Distant) : Esaki, *Ann.Mag.nat.Hist.Soc.*, 4(10) : 419.

1965. *Metrocoris communis* (Distant) : Den Boer, *Zool. Verh. Leiden.*, 74 : 13.

1993. *Metrocoris communis* (Distant) : Chen & Nieser, *Steenstrupia*, 19(2) : 49.

Diagnosis : A small (4.5 to 5.8 mm) oval, black and yellow water strider with black marking on dorsal side of head and thorax. The pronotum of wingless forms with 'T'- shaped black pattern and the winged form with a median black longitudinal stripe almost reaching tip with a pair of lateral black stripes on posterior lobe. The 7th ventral segment of female with a tuft of dark brown hairs on either side laterally. *M. communis* found abundant in still or smooth flowing shaded streams, where they stroke and glide across the surface.

Material examined : 5♂, 4♀ (apterous), : 5♂, 27♀ (winged), 2 IS Sipna river, Semadoh, 8.ii.1991; 1♀ (apterous), 14♂ 12♀ (winged), Chamrudra nalla, Kolkaz, 9.ii.1991; 2♀ (apt), 5♂ 3♀ (winged) Koapati river, Chadupati, 9.ii.1991; 9♂ 5♀ (winged), Koapati river, Semadoh, 9.ii.1991; 2♂ 1♀ (apt) 2♂ 1♀ (winged), Tapi river, Rangubeli, 11.ii.1991; 7♂ 4♀ (apt) 2 IS, Gari river near Hatida village, 13.ii.1991; 2♂ 8♀ (apt) 3♀ (winged), Dolar river, Dhakna, 15.ii.1991, Coll. D.F. Singh ; 1♀ (apterous), : 5♂, 3♀ (winged), 2 IS Makadi nalla, Dhargad, 4.xii.1992; 1♀, (apterous), Gopinalla, Bori Village, 05.xii.1992; 1♀ (apterous), Gullarghat, Khatkali road, 7.xii.1992; 3♀ (apt.), Dolar river, 10.xii.1992; 1♂ 1♀ (winged), Tapi river, Rangubeli, 11.ii.1992, Coll. P.P. Kulkarni; 2♂, 1♂ (winged), 5 IS Kolkaz, 13.ii.1993 2♂ 1♀ (winged) 5 IS, Talai, 15.ii.1993, Coll. S.G. Patil; 1♀ (winged), Khandu river, Khandukheda, 3.iv.1994, Coll. M.S. Pradhan; 1♀ (apt) 1 IS, Vairat & around, 19.ix.1996; 1♀ (apt) 1 IS, Salona, Masundi, 20.ix.1996, Coll:D.B.Bastawade ; 6♂ 6♀ (winged) 2♂ 2♀ (apt), 15 IS, Chamhar Udhda, 20.ii.1997; 3♂ 3♀ (winged) 13 IS, Imlipada, Gadga river, 24.ii.1997; 7♂ 7♀ (winged) 1♂, 1♀ (apt) 8 IS, Sedukund, Gadga river, 25.ii.1997; 1♀ (apt) 2♀ (winged); 26 IS, Koktu river, Koktu, 27.ii.1997; 4 ♀ (apt) 1 IS, Gadga river, 6 kms from Dhakna on Dharni road, 28.ii.1997; 11♂ 3♀ (apt) 1♂ 1♀ (winged) 2 IS, Gadga river, 10 kms from Dhakna, 01.iii. 1997, Coll. A.S. Mahabal.

Distribution : India : Chandigarh, Himachal Pradesh, Karnataka, Maharashtra, Meghalaya, Orissa, Punjab Tamil Nadu, Uttaranchal, Uttar Pradesh.

Elsewhere : Afghanistan; Iran; Iraq; Oman.

SUMMARY

The aquatic and semi aquatic groups of insects are overall indicators of both recent and long-term environmental conditions (Thirumalai & Raghunathan, 1988; Ramakrishna, 2000). Inventorisation of aquatic insect resources becomes a high priority area to study the functional aspects of community structure incorporated in food webs that provides information on energy flow (Ananthakrishnan, 1999). The present report of 20 species of water bugs from Melghat Tiger Reserve represents about 41 % of the group so far known from Maharashtra. Though, Tamilnadu ranks first in the total number of species so far reported (96), it stands 8th in the area of wetlands availability. On the contrary, Maharashtra ranks 5th in the wetland area, the total species known is only 50. Thus, the present study reaffirms the necessity of more efforts to systematically explore this group intensively from Maharashtra in general and Melghat Tiger Reserve in particular.

REFERENCES

- ANANTHAKRISHNAN, T.N. 1999. Multidimensional links in biodiversity research: An integrated exercise. *Current Science*, 77 (3) : 356-358.
- BROOKS, G.T. 1951. A revision of the Genus *Anisops* (Notonectidae, Homoptera) *Kans. Univ. Sci. Bull.* 34(8) : 301-519.
- GHOSH, A. K. 1996. Insect biodiversity in India. *Oriental Insects*, 30 : 1-10.
- HUNGERFORD, H.B AND R. MATSUDA. 1958. Some interesting aspects of the world distribution and classification of aquatic and semi-aquatic Hemiptera. *Proc. 10 International Cong. Ent.*, 1(1956) : 337-348.
- JORDON, K.H.C. 1951. Zoogeographische Betrachtungen über das ostliche sachsen dargestelltandentschen Neuf unter von Heteropteren. *Zool. Anz.*, 147 : 79-84.
- MAHNER, M. 1993. Systema Cryptoceratorum Phylogenicum (Insecta, Heteroptera). *Zoologica*, 48 : 1-302.
- MURDOCH, W.W., SCOTT, M.A. and P. EBSWORTH. 1984. Effects of the general predator Notonectidae (Hemiptera) upon a fresh water community. *J. anim. Ecol.*, 53 : 791-808.
- NIESER, N. 1999. Introduction to the Micronectidae (Nepomorpha) of Thailand. *Amemboa*, 3 : 9-12. Patrick, R and Palavage D.M. 1994. The value of species as indicators of water quality. *Proc. Acad. Nat. Sci. Philadelphia*, 145 : 55-92
- RAMAKRISHNA. 2000. Limnological investigation and distribution of micro and macro invertebrates and vertebrates of Fox Sagar Lake, Hyderabad. *Rec. zool. Surv. India*, 98(1) : 169-196.
- THIRUMALAI, G. 1999. Aquatic and semi-aquatic Heteroptera of India. *Indian Association of Aquatic Biologists (IAAB) Publication No. 7* : 1-74 pp.
- THIRUMALAI, G. 2002. A Checklist of (Gerromorpha: Hemiptera) from India. *Rec. zool. Surv. India*, 100(1-2) : 55-97.
- THIRUMALAI, G and RAGHUNATHAN M.B. 1988. Population fluctuations of three families of aquatic Heteroptera in perennial pond. *Rec. zool. Surv. India*, 85 (3) : 381-389.

INSECTA : HOMOPTERA : APHIDOIDEA : APHIDS

P.P. KULKARNI

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

Aphids are small, soft-bodied insects. They feed on different parts of plants. Aphids cause direct damage to the plants by sucking cell sap from their host. They are commonly known as plant lice. Aphids act as vectors of plant viruses and thus assume more economic importance. Infestation by aphids causes dwindling of plants by sucking the sap. The sugary secretion voided by them through the anus, accumulates on plants and ants get attracted to it (Behura, 1997). Deposition of this "honey dew" on the leaf surface also allows the growth of sooty mould, which in turn proves detrimental to the plant life (Raychaudhury, 1980). Aphids are extremely polymorphic and some species are highly polyphagous too. Aphids infest variety of plants, they include fruit trees, pulses, oil seeds, cash crops, vegetables, and garden plants also. The preferred site for feeding is the tender parts of plants like young leaves and shoots, but aphids may infest roots as well.

Alate and wingless aphids are of common occurrence. Life cycle of aphids is complex, involving primary and secondary hosts and a variety of morphs. They reproduce parthenogenetically and have a very high capacity of reproduction.

Thus, aphids can infest large number of plants in amazing speed. Viviparous morphs of aphids reproduce by giving birth to young ones, while sexual females lay eggs, usually on the bark of trees. Life cycle of aphids has alteration of generations. It can be believed that aphids migrate a distance and reappear with availability of host plants. This can be said in case of aphids infesting seasonal food crops.

More than 790 species of aphids are known to occur in India (Ghosh, L.K., 1990). Sexual morphs of about 102 species are recorded so far (Behura, 1994, 1997). Though most of the sexual morphs of aphids are found in hilly regions of North East India (Basu and Raychaudhuri, 1980), apterous oviparous female of *Coloradoa rufomaculata* (Wilson) was recorded from Nanded, in Maharashtra State (Rao and Kulkarni 1977).

Information on aphids of Maharashtra dates back to the work of Deshpande (1937). He enlisted 15 species of aphids with notes on their morphology and host plants. Aphids stand much high on economic aspects of crop produce by incurring heavy losses due to their infestation. Thus work on their control measures was attended to but their taxonomy remained un-attended till Kaul (1963), (unpublished record). 27 species of aphids from central Maharashtra were worked out by him with data on morphology, and host plants. Patel and Kulkarni (1953), published description of a new species of aphid *Cerciaphis emblica* infesting *Phyllanthus emblica*. This species was later included under the Genus *Schoutedenia* Rubsaamen 1905 (Ghosh and Agarwal, 1993).

Further account on taxonomy of Maharashtra aphids is available through the works of (Rao and Kulkarni 1971–1975; Kulkarni, 1971–1981 and Deshpande *et al.*, 1981). Kulkarni and Chavan (1996) provided an update of aphids of Maharashtra. Later, Kulkarni and Chavan (1997) gave an account of aphid fauna of Citrus while Kulkarni and Sharma (1998) reported as a plant *Martinia annua*. Thus, about 35 species of aphids are known to occur from the state.

There has been no record of aphids from Melghat Tiger Reserve area earlier. During the course of faunistic surveys of this area 8 species of aphids were collected. They belong to 6 genera as enlisted below :

Superfamily	APHIDOIDEA
Family	APHIDIDAE
Subfamily	APHIDINAE
Tribe	Aphidini
Subtribe	Aphidina
Genus	<i>Aphis</i> Linneaus

1. *Aphis craccivora* Koch
2. *Aphis gossypii* Glover
3. *Aphis nerii* Boyer de Fonscombe

Subtribe **Rhopalosiphina**

Genus ***Rhopalosiphum*** Koch

4. *Rhopalosiphum maidis* (Fitch.)

Tribe **Macrosiphine**

Genus ***Uroleucon*** Mordvilko

Subgenus ***Uromelan*** Mordvilko

5. *Uroleucon* (*Uromelan*) *comopsitae* (Theo.)

Genus ***Lipaphis*** Mordvilko

6. *Lipaphis erysimi* (Kalt.)

Genus *Myzus* Passerini7. *Myzus persicae* (Sulzer)Genus *Brevicoryne* V. d.Goot8. *Brevicoryne brassicae* (Linnaeus)

SYSTEMATIC ACCOUNT

Superfamily APHIDOIDEA

Family APHIDIDAE

Subfamily APHIDINAE

Tribe Aphidini

Subtribe Aphidina

Genus *Aphis* Linnaeus, 17581. *Aphis craccivora* Koch1854. *Aphis craccivora* Koch, *Die Pflanzenlause Aphiden*, Nnnburg, 1 : 124.1909. *Aphis craccivora*, Lefroy and Howlett, *Indian Insect Life* : 1-786.1972. *Aphis craccivora*, Rao and Kulkarni, *Marath. Univ. J. (Nat. Sci.)*, 11 : 287-288.1990. *Aphis craccivora*, Ghosh, L.K. *Memoirs. zool. Surv. India*, 17 (3) : 22-28

Common Names : All aphids are known as "Mava Kitak" or "Mavyache Kide " in local language, "Marathi" in Maharashtra State.

Diagnostic characters : *Apterous viviparous female* : Body blackish, oval, about 1.6-2.8 mm long, with 1.2-1.6 mm as its maximum width. Head smooth, with small antennal tubercles. Antennae six-segmented, 0.5-0.8 times as long as body; processus terminalis about 2.1-2.8 times as long as base of antennal segment VI. Rostrum reaching up to hind coxae, ultimate rostral segment, about 0.85-1.0 times as long as hind tarsus II. Abdominal dorsum black, with dark continuous median patch, with polygonal reticulations. This area appears shining black in life. Siphunculi black, imbricated, cylindrical, about 0.14-0.20 times as long as body and 1.5-2.0 times as long as cauda. Cauda elongate, black, little constricted at basal 0.3-0.5 portion, bearing 5 to 9 hairs of moderate length. First Tarsal Chaetotaxy : 3.3.2.

Material examined and locality : Apterous and alate viviparous ♀♀, ex. Grass, Belkund, Harisal Road, 24.8.1993; Chaurakund, 26.8.1993; Chikhaldara, 5.1.1996, all coll. P.P. Kulkarni.

Distribution : Cosmopolitan.

2. *Aphis gossypii* Glover

1877. *Aphis gossypii* Glover, *Rep. Comm. Agric. USA, for 1816* : 36.
 1938. *Aphis gossypii*, Deshpande, *J. Bombay nat. Hist. Soc.*, 39 : 740–744.
 1972. *Aphis gossypii*, Rao and Kulkarni, *Marath Univ. J. (Nat. Sci.)*, 11 : 287–288.
 1990 *Aphis gossypii*, Ghosh, L. K., *Memoirs zool. Surv. India*, 17 (3) : 35–41

Diagnostic characters : Apterous viviparous female : Body pale, about 1.3–1.7 mm long, with 0.7–1.1 mm at its maximum width. Antennae 0.5–0.7 times as long as body ; segments IV + V shorter than VI, processus terminalis, 2.0–3.5 times as long as the base of antennal segment, VI. Rostrum reaching beyond mid coxae, ultimate rostral segment 1.0–1.3 times as long as hind tarsus II. Abdominal dorsum pale to light brown, with or without scattered brown sclerites. Siphunculi light brown to dark brown, imbricated, cylindrical , tapering to apex; about 0.1–0.19 times as long as body. Cauda spinose, dusky and slightly constricted near the middle, bearing 5–6 hairs. First Tarsal Chaetotaxy : 3 : 3 : 2.

Alate viviparous female : Body pale brownish, 0.9–1.8 mm long, with 0.5–0.9 mm at its maximum width. Head brownish. Antennae about 0.6–0.8 times as long as body, processus terminalis 2.1 to 3.6 times as long as the base of antennal segment VI, antennal segment III with 5 to 7 secondary rhinaria distributed over entire length. ultimate rostral segment 1.0 to 1.2 times as long as hind tarsus II. Abdominal dorsum pale, smooth, with pattern of sclerites from tergite 6 to 8. In addition, some abdominal and distinct post siphuncular sclerites often present. Siphunculi brownish about 1.0–1.4 times as long as body and 1.5 to 1.9 times as long as cauda. Cauda bearing 4 to 7 hairs. Wing venation normal.

Material examined and locality : Apterous viviparous ♀♀, Bori village, Dhakna range, 5.12.1992; ex. Grass, Belkund, Harisal Road, 24.8.1993; Chopan Road, Chaurkund, 26.8.1993; Village Paturda, Dhakna Range, 22.8.1993, Coll. P.P. Kulkarni.

Distribution : Cosmopolitan.

3. *Aphis nerii* Boyer de Fonscombe 1841

- 1841 *Aphis nerii* Boyer de Fonscombe, *Ann. Soc. Ent. Fr.*, 10 : 179.
 1918 *Aphis nerii*, Das, *Memoirs Indian Mus.*, 6(4) : 220–222.
 1980 *Aphis nerii*, Kulkarni and Kacker, *Bull. zool. Surv. India*, 3 : 103–105.
 1980 *Aphis nerii*, Raychaudhuri (ed.) *Aphids of North East India and Bhutan*, The Zoological Soc. Calcutta, 56
 1990. *Aphis nerii*, Ghosh, L. K., *Memoirs zool. Surv. India*, 17(3) : 48–51.

Diagnostic characters : Apterous viviparous female : Body pale brownish, 1.75–2.7 mm long, with 0.9–1.7 mm as its maximum width. Head broader than long,. Antennae six-segmented, 1.0 to 1.8 times as long as body, processus terminalis 3.8 to 4.3 times as long as base of antennal segment VI. Rostrum reaching up to or beyond hind coxae. Ultimate

rostral segment 1.2–1.6 times as long as hind tarsus II. Abdominal dorsum pale, with polygonal reticulations, 8th tergite with 2 hairs. Siphunculi stout, broad, black to dark brown, cylindrical, tapering towards apex about 0.2–0.23 times as long as body. Cauda spinose, rather broad, thumb-shaped, bearing about 10 hairs. First tarsal chaetotaxy : 3 : 3 : 3.

Alate viviparous female : Body pale, 1.6–2.4 mm long, with 0.6–1.0 mm at its maximum width. Antennae six-segmented, about 0.7–0.9 times as long as body, antennal segment III with 6–14 small to large circular secondary rhinaria distributed through out its length, segment IV with 0–2 secondary rhinaria. Rostrum reaching beyond hind coxae. Ultimate rostral segment 1.20–1.25 times as long as hind tarsus II. Post siphuncular sclerite developed. Siphunculi cylindrical, dark brown, tapering, imbricated and 1.7–2.0 times as long as cauda. Cauda dark, conical, strongly spinose, bearing 10 to 11 hairs. Wing venation normal.

Material examined and locality : Apterous viviparous ♀♀, Ex. *Calotropis* sp., Simadoh, Near Sipna river, 7.12.1992; Malur village, Chaurkund, 28.3.1993; DhaknaRange, 25.8.1993; ex. *Nerium* sp., Belkund, Akot Road, 5.4.1994, Coll.P.P. Kulkarni.

Distribution : Throughout India.

Elsewhere : Africa; America; Australia; Bhutan; British Guinea; China; Europe; Fiji; Formosa; Japan; Java; Korea, Malaya; Middle East; Nepal; New Zealand; Siam; Solomon Is; Spain; Sri Lanka; Somali Land; Transvaal, U.S.A.

Remarks : This species is normally found on *Asclepiadaceae* and *Apocynaceae*. In Melghat Tiger Reserve, this species was found on *Nerium* sp. and *Calotropis* sp. Specimens orange coloured in life, with dark siphunculi.

Subtribe Rhopalosiphina

Genus *Rhopalosiphum* Koch. 1854

4. *Rhopalosiphum maidis* (Fitch.)

1855. *Aphis maidis* Fitch. Trans. N.Y. agric Soc., 15 : 531

1953. *Rhopalosiphum maidis*, Cottier, N.Z. Dept. Sci. Ind. Res. Bull., 106 : 162–165.

1963. *Rhopalosiphum maidis*, Behura, Proc.1st Summer School, Zool. Simla, (1961) : 55.

1977. *Rhopalosiphum maidis*, Kulkarni, Marath. Univ. J. (Nat. Sci.) : 15(9) : 145–146.

1980. *Rhopalosiphum maidis*, Raychaudhuri (ed), *Aphids of North East India and Bhutan*, The Zoological Society, Calcutta, 67–69.

Diagnostic characters : Apterous viviparous female : Body 1.55–2.1 mm long with 0.8–0.97 at its maximum width. Head smooth, with weakly developed lateral frontal tubercles having rhopalosiphine projections. Antennae six-segmented, 0.5–0.65 times as long as body, pt. 2.0–2.3 times as long as base of antennal segment VI. Rostrum reaching up to hind coxae, ultimate rostral segmsent about 1.8. to 2.3 times as long as hind tarsus II. Mid

thoracic furca sessile. Dorsum of abdomen pale, dorsal abdominal hairs with blunt or fine apices. Siphunculi about 0.80–0.10 times as long as body, dark, cylindrical, slightly swollen, with a well developed flange. Cauda short, pale, 0.6 to 0.9 times as long as siphunculi, and with 5 to 9 hairs. First tarsal chaetotaxy : 3 : 3 : 3.

Alate viviparous female : Head smooth, with antennal tubercles weakly developed. Antennae six-segmented, about 0.48–0.5 times as long as body, segment II with 11–25, IV with 1–10 and V with 5 secondary rhinaria. Processus terminalis about 2.0–2.8 times as long as base of antennal segment VI; flagellum progressively imbricated from base to apex; rostrum reaching up to hind coxae; ultimate rostral segment 0.7 to 0.8 times as long as hind tarsus II. Abdomen with well developed marginal sclerites on each segment, with inconspicuous median sclerotic patches; with a dusky band each on segment 7 and 8. Siphunculi slightly swollen or clavate on distal half; with well developed flange ; cauda dark, spinose, about 0.5 to 0.6 times as long as siphunculi and 1.3 to 1.4 times as long as hind tarsus II, with 5 to 6 hairs.

Material examined and locality : Gobi nalla, Near Bori village, 5.12.1992; Simadoh, Near Sipra river, 7.12.1992; Ex. grass, Pirkheda village, 22.8.1993; coll. P.P. Kulkarni.

Distribution : Cosmopolitan.

Tribe Macrosiphini

Genus *Uroleucon* Mordvilko, 1914

Subgenus *Uromelan* Mordvilko, 1914

5. *Uroleucon (Uromelan) compositae* (Theobald)

- 1914. *Dactynotus (Uromelan) compositae* Mordvilko, Faune de la Russie, *Insecta : Hemiptera* : 64
- 1915. *Dactynotus (Uromelan) comopsitae*, Theobald, *Bull. Ent. Res.*, 6 : 123
- 1958. *Dactynotus (Uronelan) compositae*, Eastop, *The Aphididae of East Africa* : 37
- 1980. *Dactynotus (Uronelan) compositae*, Raychaudhuri (ed.) : *Aphids of North East India and Bhutan*, Zool. Soc. Calcutta : 131-132.
- 1985. *Uroleucon (Uromelan) compositae*, Agarwala and Ghosh, *Memoirs zool. Surv. India*, 16(3) : 53.

Diagnostic characters : Apterous viviparous female : Large aphids, with body 2.8–3.09 mm long, with 1.1–1.3 mm at its maximum width. Head smooth, dark brown, with lateral frontal tubercles very well developed, diverging and smooth. Median frontal prominence very weak, dorsal cephalic hairs thick. Antenne six-segmented almost equal to sub-equal to body length. Flagellum dark brown, tapering towards apex; segment III with 80–90 secondary rhinaria distributed through-out its length, antennal segment IV and V without secondary rhinaria. Ultimate rostral segment with about 8 secondary hairs. Processus terminalis long, about 6.0–6.5 times as long as base of antennal segment VI. Siphunculi dark, imbricated, with polygonal reticulations on apical 0.4 portion, about 0.27–0.32 times

as long as body, without an apical flange. Abdomen pale, smooth. With well developed post siphuncular sclerite. Cauda elongate, tapering, dark brown, about 0.5–0.52 times as long as siphunculi and with 14 to 16 hairs.

Alate viviparous female : Body dark brown in life. Large aphids, with length of body 2.6 to 2.8 mm with 0.8 to 0.9 mm at its maximum width. Head, thorax and abdomen as in apterous viviparous female. Antennae six-segmented, segment III with about 80 secondary rhinaria distributed over its entire length, processus terminalis, about 5.8 to 6.0 times as long as base of antennal segment VI. Abdomen pale, with well developed post siphuncular sclerite. Siphunculi and cauda as in apterae.

Material examined and locality : Agricultural fields, Near Semadoh, 14.12.1992; Malur village, Chaurakund, 28.3.1993; Khandukheda, Jarida Road, 3.4.1994, Coll. P.P. Kulkarni.

Distribution : India : Meghalaya, South India, West Bengal, Maharashtra.

Elsewhere : Africa, Moritius; Taiwan.

Genus *Lipaphis* Mordvilko 1928

6. *Lipaphis erysimi* (Kalt)

1842. *Aphis erysimi*, Kaltenbach, *Mon. fam. Pfl.*, 99

1928. *Lipaphis erysimi* Mordvilko, *Keys to the identification of Russian Insects* (In Russian) : 200

1980. *Lipaphis erysimi*, Raychaudhuri (ed.) *Aphids of North East India and Bhutan*, Zool. Soc, Calcutta, 159

1980. *Lipaphis erysimi*, Kulkarni, *Marath. Univ. J. (Nat. Sci.)* 19(12) : 19-20

1983. *Lipaphis erysimi* Das and Raychaudhuri, *Rec. zool. Surv. India, Occ. Paper No.*, 51 : 27

1984. *Lipaphis erysimi*, Agarwala and Ghosh, *Memoirs zool. Surv. India*, 16(3) : 44.

Apterous viviparous female : Body 1.5–1.8 mm long with 1.0–1.2 mm at its maximum width. Head smooth, lateral frontal tubercles low, some-what scabrous and diverging. Median frontal prominence as high as lateral frontal tubercles. Antennae six-segmented, segment I and II scabrous, short, flagellum distinctly imbricated, without secondary rhinaria, processus terminalis, about 1.75 to 4.00 times as long as base of antennal segment VI. Rostrum short, reaching at the most up to mid coxae, ultimate rostral segment shorter than hind tarsus II. Abdominal dorsum pale, marginally small tubercles present on segments 3 to 5. Siphunculi sub cylindrical, little constricted, slightly below the middle and again attenuated, small but distinct flange present. Cauda dusky, gradually tapers distally, with about 6 hairs.

Alate viviparous female : Body 1.5–1.8 mm long with 0.9–1.0 mm at its maximum width. Head smooth, as in apterae, antennal segment III with many round, flat secondary rhinaria distributed all over, IV with secondary rhinaria and sometimes those present on V also. Processus terminalis, 2.0–2.2 times as long as base of antennal segment VI. Siphunculi short, 1.2–1.3 times as long as hind tarsus II. Abdominal dorsum with pigmented patches

spinally, on hair bases on segment 6 and brown bars on segments 7 and 8. Muscle plates arranged segmentally and pleurally on the antesiphuncular segments. First tarsal chaetotaxy : 3 : 3 : 3.

Material examined and locality : Agricultural fields 3 km south of Simadoh, 14.12.1992; Pili village, Near Kolkaz, 17.12.1992; Malur Phata, Chaurakund, 25.8.1993, coll. P.P. Kulkarni.

Distribution : Cosmopolitan.

Genus *Myzus* Passerini 1860

7. *Myzus (Necterosiphon) persicae* (Sulzer)

1776. *Aphis persicae* Sulzer, *Abgekurtzte Gesch I'nskten.* : 105
 1913. *Aphis persicae*, Siraki, *Agr.Expt. St., Formosa, spec. Rept.* 8 : 114
 1976. *Myzus persicae*, Basu & Raychaudhuri, *Oriental Ins.*, 10(1) : 10.
 1980. *Myzus persicae*, Kulkarni, *Marath Univ. J. (Nat. Sci.)* 19 (12) : 29–30.
 1980 *Myzus persicae*, Raychaudhuri (ed.) *Aphids of North East India and Bhutan*, Zoological Soc., Calcuta, 217.
 1985. *Myzus (Necterosiphon) persicae*, Agarwala & Ghosh, *Memoirs zool. Surv. India*, 16(3) : 49.

Diagnostic characters : *Apterous viviparous female* : Body 1.6–1.9 mm long with 1.0–1.2 mm at its maximum width. Head dorsally spinulose, ventrally also spinulose, with weakly developed median frontal tubercle. Lateral tubercles well developed, diverging and with inner margins converging, dorsal cephalic hairs short, with acuminate apices. Antennae six-segmented, about 0.9–1.0 times as long as body, processus terminalis, about 3.5–3.8 times as long as base of antennal segment VI. Ultimate rostral segment almost as long as hind tarsus II. Dorsum of abdomen pale, without sclerotic patches. Siphunculi cylindrical, distinctly clavate, with a distinct flange, 0.23–0.25 times as long as body. Cauda slightly constricted at middle. First tarsal chaetotaxy : 3 : 3 : 3. Nymphs with spinulose tibiae.

Alate viviparous female : Head pigmented, as in apterae, dorsum of abdomen with a large, dark central patch, sclerotic marginal patches on abdomen also present. Hairs on dorsum with blunt apices, siphunculi cylindrical, dark to pale brown more strongly clavate than in apterae. Wing venation normal.

Material examined and locality : Agricultural fields near Semadoh; 14.12.1992; Pirkheda village, 22.8. 1993; Malur village, Chaurakund, 28.8.1993, Coll. P.P. Kulkarni.

Distribution : Cosmopolitan.

Genus *Brevicoryne* Van Der Goot

8. *Brevicoryne brassicae* (Linnaeus)

1758. *Aphis brassicae*, Linnaeus, *Syst.Nat.*, (10) ed, 1 : 452

1915. *Brevicoryne brassicae*, van deer Goot, *Beitr. Kennt. Holland, Blattlause*, : 245
1971. *Brevicoryne brassicae* Miyazaki, *Insecta Matsumuruna*, 34(1) : 187-188.
1980. *Brevicoryne brassicae* Raychaudhuri (ed.) *Aphids of North East India and Bhutan*, Zool. Soc., Calcutta : 111.
1985. *Brevicoryne brassicae* Agarwala & Ghosh, *Memoirs Zool. Surv. India*, 16(3) : 40.

Diagnostic characters : Apterous viviparous female : Head smooth, or slightly wrinkled and pigmented; lateral frontal tubercles very low and median frontal elevation as high as or higher than lateral frontal tubercles, dorsal cephalic hairs long, with acute to sub acute apices,. Antennae six-segmented, about 0.45–0.65 times as long as body, segment I and II finely imbricated, rest of the flagellum strongly imbricated., without secondary rhinaria, processus terminalis, 2.0–4.0 times as long as base of antennal segmaent VI. Ultimate rostral segment reaches almost to the base of mid coxae., shorter than hind tarsus II. Abdomen with pleural pigmented irregular shaped, wrinkled patches with various degree of coalescence with those occurring spinally on segments 1–7, segment 8 with spinopleural band and scattered muscle plates on antesiphuncular segments. Siphunculi about 0.05 to 0.08 times as long as body, barrel-shaped, finely imbricated, almost without flange. Cauda dark, triangular about 1.10–1.30 times as long as siphunculi bearing 5–7 hairs. First tarsal chaetotaxy : 3 : 3 : 3.

Alate viviparous female : Head as in apterae, pigmented. Antennae six- segmented, with numerous distinctly protuberant secondary rhinaria distributed all over segment III. Prothorax with a pigmented transverse band; mid thoracic furca with separate arms. Abdominal dorsum with spinopleural segmental bars in each segment, marginal spinular patches on segment 2–5 along with muscle plates. Wing venation normal. First tarsal chaetotaxy : 3 : 3 : 3. Nymphs with smooth hind tibiae.

Material examined and locality : Agricultural Fields, near Semadoh, 14.12.1992; Pilli village, Near Kolkaz, 17.12.1992; Pirkhada village, Dhakna, Range, 22.8.1993, coll. P.P. Kulkarni.

Distribution : Cosmopolitan.

REFERENCES

- AGARWALA, B.K. and GHOSH A.K. 1985. A synoptic list and keys to the genera of Aphididae of India. *Mem. zool. Surv. India.*, 16(3) :188 pp
- BASU, R.C. and RAYCHAUDHURI, D. N. 1980. A study of sexuales of aphid (Homoptera : Aphididae) in India. *Rec. zool. Surv. India, Occ. Paper No.*, 18 : 54 pp.
- BEHURA, B.K. 1994. The mystery of aphid life history. *J. Aphidol.* 8 (1&2) : 1-18.
- BEHURA, B. K., 1997. Biology of Indian aphids : A review. *J. Aphidol.* 11(2) : 147 : 154.
- DAS, B.C. and RAYCHAUDHURI, D.N. 1983, Aphids of Nepal. *Rec. zool. Surv. India, Occ. Paper No.*, 51 : 79pp.

- DESHPANDE, S.V., KADAM, B.A., KULKARNI, P.P. and RAO, S.N. 1981. Incidence of Aphids on Triticales and the fauna of the Maharashtra region (Maharashtra State). *Res. Bulletin Marath. Agric. Univ.* 3 : 70–71.
- DESHPANDE, V.G. 1939. A preliminary account of the Aphididae of Poona. *J. Bombay nat. Hist. Soc.*, 39(4) : 740-744.
- GHOSH, L. K., 1990. A taxonomic review of the genus *Aphis* Linnaeus (Homoptera) Aphididae) in India. *Mem. Zool. Surv. India*, 17(3) : 1-159.
- KAUL, O.B. 1963. Studies on the aphid fauna of Central Maharashtra M. Sc. Thesis University of Poona (Unpublished).
- KULKARNI, H.L. 1950. Systematics of safflower aphid (*Macrosiphum jaceae* L.). *Poona Agric. College Mag.* 40 : 85–88.
- KULKARNI, P.P. 1980. Two new species of aphids (Homoptera; Aphididae) from Maharashtra. *Bull. zool. Surv., India*, 2 (2&3) : 177-181.
- KULKARNI, P.P. and RAO, S.N. 1978. Studies on the aphid fauna from Marathwada Region (Maharashtra State) IV. *Marath. Univ. J. (Nat. Sc.)* 17 (10) : 111–114.
- KULKARNI, P. P. and Rao, S.N. 1980. Studies on the aphid fauna from Marathwada Region (Maharashtra State) V. *Marath. Univ. J. (Nat. Sci.)*, 19 (12) : 19–31.
- KULKARNI, P.P. and CHAVAN, V.M. 1997. Aphid fauna of citrus in Western Maharashtra and their role as vectors of *Citrus tristiza* virus. *Nat. Symp. Plant Pathogens & Env.* B.A.M.U., Aurangabad (Abs.) : 18.
- KULKARNI, P.P. and SHARMA, R.M. 1998. A Report on *Martinia annua* L. as a Natural trap of aphids. *J. Aphidology*, 12 : 93.
- KULKARNI, P.P. and CHAVAN, V.M. 1996. An up date of aphids of Maharashtra. 6th nat. *Symp. on Aphididae, Gorakhpur*, (Abs.) : 2.
- PATEL and KULKARNI, 1953. *Cerciaphis emblica* sp.nov. (Family : Aphididae). A new aphid pest on *Emblica officinalis*, *J. Bombay nat. History Soc.*, 51(2) : 435–438.
- RAO, S.N.& KULKARNI, P. P. 1971. New records of aphids (Homoptera : Aphididae). From Marathwada (Maharashtra State). *Marath. Univ. J. (Nat. Sci.)* 5 (1) : 287–288
- RAO, S.N. and KULKARNI, P.P. 1975. Indian Root aphids. *ibid*, 14(7) : 189–192.
- RAO, S.N. & KULKARNI, P.P. 1977. Studies on the aphid fauna (Homoptera : Aphididae) From Marathwada (Maharashtra State). *Marath. Univ. J. (Nat. Sci.)* 16 (9) 141–150.
- RAO, S.N. & KULKARNI, P. P. 1977. Studies on the aphid fauna (Homoptera : Aphididae) From Marathwada (Maharashtra State). *Marath. Univ. J. (Nat. Sci.)* 16 (9) : 171–174.
- RAYCHAUDHURI, D.N. (Ed.) 1980. Aphids of North East India and Bhutan. *The Zool. Soc. India*, Calcutta, 521 pp.

INSECTA : DIPTERA : CECIDOMYIIDAE (Gallmidges)

R.M. SHARMA

Zoological Survey of India, High Altitude Zoology Field Station, Solon-173211 (H.P.)

INTRODUCTION

The name gallmidge comes from the ability of the larvae to produce structural abnormalities or 'galls' on various organs of plants. The abnormal growth or deformities arise mostly by overgrowth (hypertrophy) and excessive cell division of tissues (hyperplasy) in response to the feeding activity of a parasite on the host plant. Among gall making insects, gallmidges are well-known gall makers on variety of herbaceous and woody plants (Sharma, 2001).

About 5-10% of known gall midge species occur in large number on plants that are important to man. In forest ecosystem gall midges may occur in great number but the damage is not so important. Gall midges and their associate plant hosts can make excellent model systems for the study of host-plant relationship. The high degree of specificity in the association between a cecidozoan (gall maker) and host plant, together with gall characters are very useful tools in taxonomy (Sharma, 2002).

Gallmidges or cecidomyiids are minute to small, delicate, slender bodied, nematocerous (with long antennae), somewhat hairy flies usually go unnoticed. Adult gall midges measure from 0.5 mm to 3 mm in length (in some species, the length may reach up to 8 mm or even less than 0.5 mm). They usually have holoptic compound eyes with relatively broad eye bridge (there are some exceptions). Antennae long, slender and moniliform. Mouthparts consist of a pair of palps with one to four segments. A pair of small broad wings with reduced wing venation. Legs are usually long and slender but devoid of tibial spurs (this character separates the family from closely related other families). Both sexes have well pronounced external genitalia.

Nothing is known about the gallmidges of any Tiger Reserves. The present account is based on the collection of either gall or adult gall midges made by the author from Melghat Tiger Reserve. The inventory comprises of 15 species belonging to 8 genera under single sub family- Cecidomyiinae.

SYSTEMATIC ARRANGEMENT

Order	DIPTERA
Suborder	NEMATOCERA
Superfamily	MYCETOPHYLOIDEA
Family	CECIDOMYIIDAE
Subfamily	CECIDOMYIINAE
Supertribe	Oligotrophidi

1. *Dasineura psoraleae* Sharma

Supertribe Lasiopteridi

2. *Lasioptera achyranthesae* Sharma
3. *Lasioptera bothriochloae* Rao & Sharma
4. *Lasioptera bryoniae* Schiner
5. *Lasioptera cephalandrae* Mani
6. *Lasioptera nenuae* (Grover)
7. *Lasioptera tomentosae* (Grover)
8. *Lasioptera* sp.

Supertribe Asphondyliidi

9. *Asphondylia tectonae* Mani

Supertribe Cecidomyiidi

10. *Contarinia eragrostidis* Felt
11. *Contarinia orientalis* (Rao & Sharma)
12. *Horidiplosis mathuri* Mani
13. *Odinadiplosis odinae* Mani
14. *Procontarinia matteina* Kieffer & Cecconi
15. *Punarnavomyia boerhaaviaefoliae* (Mani)

SYSTEMATIC ACCOUNT

1. *Dasineura psoraleae* Sharma

1987. *Dasineura psoraleae* Sharma, J. Bombay. nat. Hist. Soc., 84 (1) : 186.

A large number of midges were bred from the inflorescence of the host plant. No marked galls on the flower buds are formed, the larvae fed on the ovary of the buds, which ultimately fail to produce legumes. The larvae pupate in the flower bud.

Host Plant : *Psoralea corylifolia* Linn (Leguminosae.)

Distribution : Earlier recorded from type locality Aurangabad (Maharashtra).

2. *Lasioptera achyranthesae* Sharma

1988. *Lasioptera achyranthesae* Sharma, J. Bombay. nat. Hist. Soc. 85 (2) : 376.

A large number of leaf and stem galls were collected from the different localities of Tiger reserve.

Host Plant : *Achyranthes aspera* Linn. (Amaranthaceae).

Distribution : First recorded from the type locality Aurangabad, subsequently collected by author from many places in Maharashtra & Karnataka and Punjab. Mani (1973) recorded only galls from Coromandal Coast in South India.

3. *Lasioptera bothriochloae* Rao & Sharma

1977. *Lasioptera bothriochloae* Rao & Sharma, J. ent. Res. 1 (2) : 148.

2000. *Lasioptera bothriochloae* Sharma, Zoo's Print Journal, 15 (7) : 298.

A large number of midges were bred from the ear heads of grass host.

Host Plant : *Dichanthium pertusum* (L) W.D. Clayton (= *Bothriochloa pertusa* (L). A. Camus) (Poaceae).

Distribution : Throughout Maharashtra.

4. *Lasioptera bryoniae* Schiner

1868. *Lasioptera bryoniae* Schiner, Reise der oesterrei chischen Fregatte Novara, Diptera, 2 : 5

1973. *Lasioptera bryoniae* : Gagne, Cat of Dipt. Oriental region, 1 : 489

1981. *Lasioptera bryoniae* : Grover, Cecid. Internl. 2 (2-3) : 80.

Incidentally, this species was the first gall midge described from India by Schiner in 1868 (Mani, 1934). A large number of midges along with its braconid parasite (*Stenobracon* sp). were bred from the shoot galls of the host plant. The present record of the species after a gap of 134 years is interesting. The author also bred the midges from shoot galls collected at Pune (Akurdi).

Host Plant : *Diplocyclos* (= *Bryonia*) *palmatus* (L) Jeffry (Cucurbitaceae). Vernacular name of the host plant is Shivlingi.

Distribution : Madras (Tamilnadu), Melghat and Pune (Maharashtra).

5. *Lasioptera cephalandrae* Mani

1934. *Lasioptera cephalandrae* Mani, Rec. Indian Mus; 36 : 397.

A few midges were bred from the shoot galls of the host plant. This is one of the most widely distributed species in India.

Host Plant : *Coccinia indica* W. & A. (Cucurbitaceae).

Distribution : Throughout India.

6. *Lasioptera nenuae* (Grover)

1965. *Bimba nenuae* Grover, *Marcellia*, 32 : 251.

1973. *Lasioptera nenuae* : Gagne, *Cat. Dipt. Oriental region*, 1 : 490.

1981. *Lasioptera nenuae* : Grover, *Cecidol. Internl*, 2 (2-3) : 82.

A few midges were bred from the shoot galls of the host plant.

Host Plant : *Luffa acutangula* (L) Roxb, (Cucurbitaceae).

Distribution : Uttar Pradesh, Maharashtra.

7. *Lasioptera tomentosae* (Grover)

1967. *Thomasiella tomentosae* Grover, *Cecidol. Indica* 2 : 152

1973. *Lasioptera tomentosae*: Gagne, *Cat. Dipt. Oriental region*, 1 : 490

1981. *Lasioptera tomentosae*: Grover, *Cecidol. Intl.* 2 (2-3) : 82

2000. *Lasioptera tomentosae*: Sharma, *Zoo's Print Journal*, 15 (7) : 298

A large number of midges were bred from the ear heads of the grass host. This is one of the most common species, heavily infesting the inflorescence, which adversely affects seed production of forage grass.

Host Plant : *Setaria intermedia* R & S (= *tomentosa* Kunth) (Poaceae).

Distribution : Throughout India.

8. *Lasioptera* sp.

2000. *Lasioptera* sp. Sharma, *Zoo's Print journal*, 15 (7) : 298

A few female specimens were reared from the grass earhead. The specific identity could not be ascertained for want of males. This could be a different species. However it is a new host record.

Host Plant : *Setaria pumila* (Poir) R & S. (Poaceae).

Distribution : Collected only from Melghat Tiger Reserve.

9. *Asphondylia tectonae* Mani

1974. *Asphondylia tectonae* Mani, *Oriental Ins.* 8 (1) : 61

1981. *Asphondylia tectonae*: Grover, *Cecid. Intn.* 2 (2-3) : 84

2001. *Asphondylia tectonae*: Sharma, Zool. Surv. India, Con. Area Series, 11 : 161

No midges could be reared from the stem/leaf galls collected in the Tiger Reserve. Leaf galls are profusely developed on the lower surface. Stem galls are occasionally seen. This gall midge is widely distributed where teak forests occur.

Host Plant : *Tectona grandis* L. (Verbenaceae)

Distribution : Throughout Western Ghats and Vindya- Satpura ranges.

10. *Contarinia eragrostidis* Felt

1927. *Contarinia eragrostidis* Felt, Treubia, 9 : 381.

1973. *Contarinia eragrostidis*: Gagne, Cat. Dipt. Oriental region, 1 : 499

1984. *Contarinia eragrostidis*: Sharma, Geobios New Reports, 3 : 146.

2000. *Contarinia eragrostidis*: Sharma, Zoo's Print journal, 15 (7) : 298

A few midges were reared from the ear heads of grass host. This species was originally recorded from Java. Subsequently added to the Fauna of Indian gall midges by Sharma (1984) from Andaman Islands.

Host Plant : *Eragrostis unioides* Nees (Poaceae).

Distribution : Andaman Islands, Maharashtra.

11. *Contarinia orientalis* (Rao and Sharma)

1977. *Bothriochloamyia orientalis* Rao & Sharma, Entomon, 2 (2) : 237.

1985. *Contarinia orientalis*: Sharma, Bull. Zool, Surv. India, 7 (2-3) : 331.

2000. *Contarinia orientalis*: Sharma, Zoo's Print journal 15 (7) : 298.

Several midges were bred from the ear heads of grass host, besides a few were collected by sweeping nets over vegetation.

Host Plant : *Dichanthium pertusum* (2) W.D. Clayton. (= *Bothriochloa pertusa* (L). A. Camus) (Poaceae).

Distribution : Throughout Maharashtra.

12. *Horidiplosis mathuri* Mani

1935. *Horidiplosis mathuri* Mani, Rec.Indian. Mus. 37 : 440.

1981. *Horidiplosis mathuri* : Sharma & Rao, Marathwada Uni. J. Sci. 20 (3) : 24.

1981. *Horidiplosis mathuri* : Grover, Cecidol. Intl. 2 (2-3) : 96.

Many leaf galls were collected from the host plant in Tiger Reserve. Attempts to breed adults from these galls failed.

Host Plant : *Ficus recemosa* (= *glomerata*) Roxb (Moraceae)

Distribution : Throughout India.

13. *Odinadiplosis odinae* Mani

1935. *Odinadiplosis odinae* Mani, *Rec. Indian Mus*, 37 : 436

1973. *Odinadiplosis odinae* Gagne, *Cat, Dipt, Oriental region* 1 : 505

1981. *Odinadiplosis odinae*: Grover, *Cecidol. Intl.* 2 (2-3) : 102

A large number of leaf galls were collected from the Tiger Reserve, attempts to breed adults were unfruitful.

Host Plant : *Lannea coromandelica* (Houtt) Mere (= *Odina wadier* Roxb.) (Anacardiaceae).

Distribution : Throughout India.

14. *Procontarinia matteina* Kieffer and Cecconi

1906. *Procontarinia matteina* Kieffer and Cecconi *Marcellia*, 5 : 135

1955. *Procontarinia matteina* : Rao, *Agra. Univ. J. Res. (Sci)*, 4 (1) : 251

1973. *Procontarinia matteina* : Gagne, *Cat, Dipt, Orient. reg*, 1 : 509

1981. *Procontarinia matteina* : Grover, *Cecidol. Intl.*, 2 (2-3) : 105b

1989. *Procontarinia matteina* : Sharma, *Bull. Bot. Surv. India*, 31(1-4) : 31

A large number of leaf galls were collected from the Tiger Reserve but adults could not be recovered. This is one of the most common species found all over India.

Host Plant : *Mangifera indica* L. (Anacardiaceae).

Distribution : Throughout India including Andaman Islands.

15. *Punarnavomyia boerhaaviaefoliae* (Mani)

1943. *Cecidomyia boerhaaviaefoliae* Mani, *Indian J. Ent.* 5 : 161

1953. *Punarnavomyia boerhaaviaefoliae* Mani, *Indian. J. Ent.* 15 : 124

1973. *Punarnavomyia boerhaaviaefoliae* : Gagne, *Cat, Dipt, Orient. reg.*, 1 : 509

1981. *Punarnavomyia boerhaaviaefoliae* : Grover *Cecidol. Intl.* 2(2-3) : 105c

A few flower bud galls were collected from the tiger reserve but emergence of adults failed to take place.

Host Plant : *Boerhaavia repanda* Willd (Nyctaginaceae).

Distribution : Delhi (North India), Melghat (Maharashtra).

SUMMARY

The paper embodies the systematic account of gall midges collected from Melghat Tiger Reserve, Maharashtra State, which resulted in the enumeration of 15 species belonging to 8 genera under single subfamily.

REFERENCES

- GAGNE, R.J. 1973. Family : Cecidomyiidae. In Delfinado, M.D. and D.E. Hardy, Eds. A. Catalogue of the Diptera of the Oriental Region, 1 : 480-517.
- GROVER, P. 1981. A Catalogue of Indian gall midges. *Cecidologia Internationale*, 2(2-3) : 63-108.
- MANI, M.S. 1934. Studies on Indian Itonididae (Cecidomyiidae : Diptera). *Rec. Indian Mus.* 36 : 371-452.
- MANI, M.S. 1973. Plant galls of India. *Macmillan India*, 354 pp.
- RAO, S. N. 1955. Catalogue of Oriental Itonididae (Cecidomyiidae : Diptera). *Agra Univ. Jour. Res (Sci)* 4(1) : 213-282.
- SHARMA, R.M, 1989 : Midge galls (Diptera : Cecidomyiidae) of Andaman Islands, India. *Bull. Bot. Surv. India*, 31(1-4) : 28-49.
- SHARMA, R.M. 2000. Checklist of Indian grass gall midges (Diptera: Cecidomyiidae) with their host grass (Poaceae) index. *Zoo's Print. Journal*, 15 (7) : 297-299.
- SHARMA, R.M. 2001. Insecta : Gall midges (Diptera : Cecidomyiidae). *Zool. Surv. India, Fauna of Nilgiri Biosphere Reserve, Fauna of Conservation Area Series*, 11 : 159-163.
- SHARMA R.M 2002. Zoocecidia (Plant galls). *Zool. surv. India, Fauna of Eravikulam National Park, Conservation Area Series*, No. 13 : 53-55.

INSECTA : LEPIDOPTERA (Rhopalocera and Grypocera)

R.M. SHARMA AND C. RADHAKRISHNAN*

Zoological Survey of India, High Attitude Zoology Field Station, Solan-173211

INTRODUCTION

Lepidoptera, a highly visible invertebrate group and an important faunal component has always attracted the attention of naturalists. They are ideal for field studies and their various ecological requirements make them excellent indicators of environmental change.

Ghosh *et. al.* (1993) have studied the Lepidoptera from eight Indian Tiger Reserves, which does not include Melghat Tiger Reserve of Maharashtra State. Thus the present study forms the first comprehensive and consolidated account of the butterflies and skippers occurring in the Reserve. The study comprises 45 species under 36 genera in eight families. However, this list is not exhaustive as the butterfly diversity existing in the reserve should certainly be much more than the one recorded here. The nomenclature followed in this account is after Varshney (1993, 1994 & 1997).

SYSTEMATIC ARRANGEMENT

Order	LEPIDOPTERA
Suborder	RHOPALOCERA
Superfamily	PAPILIONOIDEA
I. Family	PAPILIONIDAE
Subfamily	PAPILIONINAE
Tribe	Leptocircini

1. *Pathysa nomius* Esper.
2. *Papilio demoleus* Linn.
3. *Papilio polytes* Linn.

* Zoological Survey of India, Western Ghats Field Research Station, Calicut-673 002

	Tribe	Troidini
4. <i>Pachliopta aristolochiae</i> (Fab.)		
	II. Family	PIERIDAE
	Subfamily	PIERINAE
	Tribe	Pierini
5. <i>Belenois aurota</i> Fab.		
6. <i>Cepora nerissa</i> Fab.		
7. <i>Delias eucharis</i> Drury		
8. <i>Appias albina</i> Boisduval		
	Tribe	Colotini
9. <i>Hebomoia glaucippe</i> Linn.		
10. <i>Pareronia valeria</i> Cramer		
	Subfamily	COLIADINAE
11. <i>Catopsilia pomona</i> Fab.		
12. <i>Terias brigitta</i> Stoll.		
13. <i>Terias hecabe</i> Linn.		
14. <i>Terias laeta</i> Boisduval		
	III. Family	DANAIDAE
	Subfamily	DANAINAE
15. <i>Danaus chrysippus</i> Linn.		
16. <i>Danaus genutia</i> Cramer		
17. <i>Parantica aglea</i> Stoll.		
18. <i>Tirumala limniace</i> Cramer		
19. <i>Euploea core</i> Cramer		
	IV. Family	SATYRIDAE
	Subfamily	SATYRINAE
	Tribe	Melanitini
20. <i>Melanitis leda</i> Linn.		
	Tribe	Mycalesini
21. <i>Mycalesis mineus</i> Linn.		
22. <i>Mycalesis perseus</i> Fab.		
	Tribe	Ypthini
23. <i>Ypthima huebneri</i> Kirby		

	V. Family	NYMPHALIDAE
	Subfamily	BIBLIDINAE
24. <i>Ariadne ariadne</i> Linn.		
	Tribe	Argynnini
25. <i>Phalanta phalantha</i> Drury		
	Subfamily	NYMPHALINAE
	Tribe	Vanessidi
26. <i>Cynthia cardui</i> Linn.		
27. <i>Precis iphita</i> Cramer		
28. <i>Junonia almana</i> Linn.		
29. <i>Junonia hierta</i> Linn.		
30. <i>Junonia lemonias</i> Linn.		
31. <i>Junonia orithya</i> Linn.		
	Tribe	Hypolimini
32. <i>Hypolimnas bolina</i> Linn.		
33. <i>Hypolimnas misippus</i> Linn.		
	Subfamily	LIMENTIDINAE
	Tribe	Neptini
34. <i>Neptis hylas</i> Linn.		
	Tribe	Limenitidini
35. <i>Moduza procris</i> Cramer		
	Tribe	Euthaliini
36. <i>Symphaedra nais</i> Forster		
	Subfamily	ACRAEINAE
37. <i>Acraea terpsicore</i> Linn.		
	VI. Family	RIODINIDAE
	Subfamily	RIODININAE
38. <i>Pseudagrion decorum</i> (Rambur)		
	VII. Family	LYCAENIDAE
	Subfamily	POLYMMATINAE
	Tribe	Polyommagini
39. <i>Catochrysops strabo</i> (Fab.)		
40. <i>Lampides boeticus</i> (Linn.)		

41. *Pseudozizeeria maha* (Kollar)

42. *Euchrysops cnejus* (Fab.)

43. *Chilades laius* (Stoll)

Suborder GRYPOCERA

VIII. HESPERIIDAE

Subfamily COELIADINAE

44. *Hasora badra* (Moore)

Subfamily HESPERIINAE

45. *Telicota ancilla* Mabille

SYSTEMATIC ACCOUNT

1. *Pathysa nomius* (Esper.) (The Spot Swordtail)

1801. *Papilio nomius* Esper, Die Ausländische Schmetterlinge : 210

1932. *Pathysa nomius* Evans, Identification of Indian Butterflies : 54.

1939. *Graphium nomius* Talbot, Fauna Brit. India, Butterflies, 1 : 207.

1987. *Pathysa nomius* Larsen, J. Bombay nat. Hist., Soc.; 84 : 46.

1993. *Pathysa nomius* Varshney, Oriental Insects, 27 : 351.

Material examined : 3 exs, Koktu, 30.iii.1994, M. S. Pradhan & party.

Many workers put this species under *Graphium* but Eliot (1978) and Larsen (1987) are of the view that it is legitimate to maintain the generic name *Pathysa* for the Swordtails, rather than to subsume them under *Graphium*.

In Indian limits, this species is seen in the deciduous forests of Western and Eastern Ghats, Satpuras, and along the Himalayan foothills to north-eastern India. It also extends into Myanmar and other eastern parts of the Oriental region.

Larvae feed on plants of the custard apple family Annonaceae like Mast tree, *Polyalthia longifolia* and *Saccopetalum tomentosum*.

2. *Papilio demoleus* Linn. (The Lime Butterfly)

1758. *Papilio demolues* Linnaeus, Syst. Nat. ed. 10 : 464.

1895. *Papilio demoleus* Rothschild, Nov Zool. 2 : 279.

1907. *Papilio demoleus* Bingham, Fauna Brit. India Butterflies, 2 : 39.

1939. *Papilio demoleus* Talbot, Fauna Brit. India Butterflies, 1 : 187.

1993. *Papilio demoleus* Varshney, *Oriental Insects*, 27 : 352.

Material examined : 1 ex., Pipalpada, 5.11.1992, M.S. Pradhan & party; 1 ex., Khapra river, Rangubeli, 13.ii.1992, M.S. Pradhan & party; 2 exs. Gularghat, 7.xii.1992, P. P. Kulkarni & party; 1 ex. Gavilgad fort, 19.xii.1992, P. P. Kulkarni & party; 5 exs., Cipidoh, 18.ii.1993, S.G. Patil & party; 1 ex. Pirkheda, Dhakna range 22.viii.1993. P.P. Kulkarni & party; 9 exs., Malur phata, 25.viii.1993, P.P. Kulkarni & party; 1 ex. Chaurakund, 28.viii.1993, P.P. Kulkarni & party; 1 ex. Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party; 1 ex. Hatru-Merita Rd. 31.viii.1993, R.M. Sharma & party; 1 ex. Khandu river, 3.iv.1994, M.S. Pradhan & party.

It is one of the commonest butterflies in the Indian region, northern Burma with distribution extending to Persia and Arabia. Larval food plants of this species are citrus, bel, ber and curry leaf plant.

3. *Papilio polytes* Linn. (The Common Mormon)

1758. *Papilio polytes* Linnaeus, *Syst. Nat.* ed. 10 : 460.

1939. *Papilio polytes* Talbot, *Fauna Brit. India, Butterflies*, 1 : 176.

1987. *Papilio polytes* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 43.

1993. *Papilio polytes* Varshney, *Oriental Insects*, 27 : 352

Material examined : 1 ex. Chikhaldara, Gavilgad, 12.ii.1993, S. G. Patil & party.

This most common species is polymorphic and mimic red-bodied Swallowtails, male and female show distinct dimorphism. Males are smaller in size. It readily comes to flowers and occurs near human habitations.

This species is among the world's most interesting butterflies and an excellent insect for both field and genetic studies. Caterpillars of this species initially appear like fresh bird droppings and are green in the last instar. Larve feed on cultivated lime and oranges, Ban Nimbu (*Glycosmis spp.*), Bel (*Aegle marmelos*) and curry leaf plant (*Murraya spp.*).

4. *Pachliopta aristolochiae* (Fab.) (The Common Rose)

1775. *Papilio aristolochiae* Fabircius, *Syst. Ent.*, : 443.

1932. *Trogs aristolochiae* Evans, *Identification of Indian Butterflies* : 44.

1939. *Polydrous aristolochiae* Talbot, *Fauna Brit. India Butterflies*, 1 : 86.

1987. *Pachliopta aristolochiae* Larsen, *J. Bombay, nat. Hist. Soc.*, 84 : 40.

1993. *Pachliopta aristolochiae* Varshney, *Oriental Insects*, 27 : 354.

Material examined : 1 ex. Gobiya nalla, 20.ii.1993, S. G. Patil & party.

This red-bodied swallowtail is at home in most types of habitats, except in dense and wet forests. It is distributed throughout India. Caterpillars feed on wild and garden varieties of *Aristolochia*. It is attracted to flowers of *Lantana*, *Cosmos*, *Zinnia* etc.

5. *Belenois aurota* Fab.
(The Pioneer or Caper White)

1793. *Papilio aurota* Fabricius, *Syst. Ent.* : 197.
 1904. *Anapheis mesentina* Moore : 158.
 1932. *Anapheis aurota* Hemming : 283.
 1932. *Belenois mesentina* Evans, Identification of Indian Butterflies : 71.
 1987. *Anapheis aurota* Larsen, J. *Bombay nat. Hist. Soc.*, **84** : 48.
 1993. *Belenois aurota* Varshney, *Oriental Insects* **27** : 358.

Material examined : 1 ex. Chikalpati, Dhaknarange, 23.viii.1993, P.P. Kulkarni & party.

This sun-loving fast flier is at home in open, dry country. It is Palaetropical in distribution and found in the Indian subcontinent, Arabia, all over Africa. It occasionally invades the Mediterranean area. It is known to migrate in large swarms. This species is readily attracted to flowers. Larval food plants belong to family Capparaceae.

6. *Cepora nerissa* Fab.
(The Common Gull)

1775. *Papilio nerissa* Fabricius, *Syst. Ent.*, : 471.
 1932. *Huphina nerissa* Evans, Identification of Indian Butterflies : 72.
 1939. *Cepora nerissa* Talbot, *Fauna Brit. India Butterflies* **1** : 362.
 1987. *Cepora nerissa* Larsen, J. *Bombay nat. Hist. Soc.*, **84** : 47.
 1993. *Cepora nerissa* Varshney, *Oriental Insects*, **27** : 358.

Material examined : 1 ex. Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party.

This is one of the most common butterflies distributed practically in the entire Oriental region. It is very much fond of flowers. On hot summer days large numbers may be seen mudpuddling on wet patches. Larval food plants are various species of Capers (*Capparis*) of family Capparaceae.

7. *Delias eucharis* Drury
(The Common Jezebel)

1773. *Papilio eucharis* Drury, *Illustr. Nat. Hist. Pl* x, figs 5,6
 1939. *Delias eucharis* Talbot, *Fauna Brit. Indian Butterflies*, **1** : 352-356.

1987. *Delias eucharis* Larsen, *J. Bombay nat. Hist. Soc.*, **84** : 46.

1993. *Delias eucharis* Varshney, *Oriental Insects*, **27** : 359.

Material examined : 1 ex. Rangubeli Tapi River, 12.ii.1992, M.S. Pradhan & party; 2 exs Cipidoh, 18.ii.1993, S.G. Patil & party; 1 ex. Ambadoh, 21.xi.1994, S.S. Kamble & party.

This is one of the most striking Indian butterflies and sometimes seen even in the middle of busy roads with its lazy mincing flight. Its poisonous body and bright colours keep off predators. It is common throughout India except in arid zones. Larval food plants belong to the family Loranthaceae.

8. *Appias albina* Boisduval (The Common Albatross)

1836. *Pieris albina* Boisduval, *sp. Gen. Lep.*, **1** : 480.

1907. *Appias albina* Bingham, *Fauna Brit. India Butterflies* **2** : 212.

1986. *Appias albina* Ghosh & Chaudhary, *Rec. zool. Surv. India*, **2** : 212.

1986. *Appias albina* Ghosh & Chaudhary, *Rec. zool. Surv. India*, **84** : 116.

1993. *Appias albina* Varshney, *Oriental Insects*, **27** : 359.

Material examined : 2 exs. Pirkheda, 22.viii.1993, P.P. Kulkarni & party; 1 ex. Chikalpati, 23.viii.1993, P.P. Kulkarni & party; 1 ex. Gavilgad, Chikhadara, 5.ix.1993, P.P. Kulkarni & party.

This species is found in the evergreen and semi evergreen forests, especially in the openings. It is fairly distributed in forests of Southern India and from north-eastern India to south-east Asia and parts of Australia. It is fond of flowers. It has strong migratory habits. The caterpillars feed on different species of *Drypetes*, (Euphorbiaceae) which grow in the evergreen forests.

9. *Hebomoia glaucippe* Linn. (The Great Orange Tip)

1758. *Papilio glaucippe* Linnaeus, *Syst. Nat. ed.* **10** : 469.

1907. *Hebomoia glaucippe* Bingham, *Fauna Brit. India, Butterflies*, **2** : 274.

1932. *Hebomoia glaucippe* Evans, *Identification of Indian Butterflies* : 84.

1939. *Hebomoia glaucippe* Talbot, *Fauna Brit. India, Butterflies*, **1** : 476.

1993. *Hebomoia glaucippe* Varshney, *Oriental Insects*, **27** : 361.

Material examined : 1 ex. Hatru-Raipur Rd. 30.viii.1993, R. M. Sharma & party.

This species is the largest among Indian pierids. It is powerful and fast flier. With its black-edged orange wing tips against white, it a conspicuous insect in flight. The caterpillar

of this species is a startlingly effective snake mimic. When disturbed, it rears up its head, revealing a couple of blue and yellow eye-spots, which gives it a snake-like appearance. This species is distributed in suitable country throughout the Oriental region. Larvae feed on Capers.

10. *Pareronia valeria* Cramer
(The Common Wanderer)

1776. *Papilio valeria* Cramer, In Cramer, Uittl; Kapellen, 1 : 133.

1932. *Pareronia valeria* Evans, Identification of Indian Butterflies, : 84.

1993. *Pareronia valeria* Varshney, *Oriental Insects*, 27 : 362.

Material examined : 1 ex. Hatru-Raipur Rd., 30.viii.1993, R. M. Sharma & party.

This species is common throughout India and prefers open forests with moderate rainfall. It is also encountered in well-wooded parts of urban areas. The characteristic wandering flight of this species gained it the common name. A swift flier often seen visiting flowers or basking in the morning sun. The female mimics the Blue Tiger. Outside India it is found in Myanmar and other parts of the Oriental region. The Capers are the larval food plants.

11. *Catopsilia pomona* Fab.
(The Lemon or Common Emigrant)

1775. *Papilio pomona* Fabricius, *Syst. Ent.*, : 479.

1932. *Catopsilia pomona* Evans, Identification of Indian Butterflies, 75.

1939. *Catopsilia pomona* Talbot, *Fauna Brit. India Butterflies*, 1 : 493.

1987. *Catopsilia pomona* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 52.

1993. *Catopsilia pomona* Varshney, *Oriental Insects*, 27 : 362.

Material examined : 1 ex. Dhakna range, 14.ii.1991, D.F. Singh & party; 1 ex. Gobiya nalla, 10.ii.1993, S.G. Patil & party; 3 exs. Kolkaz, 13.ii.1993, S.G. Tatil & party; 1 ex. Pirkheda, 22.viii.1993, P.P. Kulkarni & party; 2 exs. Malur phata, 25.viii.1993, P. P. Kulkarni & party; 1 ex. Hatru-Raipur Rd., 30.viii.1993, R.M. Sharma & party; 4 exs. Chitandeo, 20.ix.1994, S.S. Kamble & party; 6 exs. Kelpani, 26.ix.1994, S.S. Kamble & party; 2 exs. Tapi River, 30.ix.1994, S.S. Kamble & party; 1 ex. Jawaharkund, 11.ix.1996, D.B. Bastawade & party.

This is a large and powerful butterfly and one of the most variable among Indian pierids with regards to colouration and size of the adult. It is found in all types of habitats except wet evergreen forests and high altitudes. Since, this species adjusts easily to the local conditions, its distribution has no significant effect based on climatic, geographic and vegetational variations. It has a great liking for flowers and is an avid mudpuddler and migratory species.

The range of its distribution covers the entire Oriental region and parts of Australia. Larval food plants belong to family Caesalpinaceae and Fabaceae.

12. *Terias brigitta* Stoll
(The Small Yellow)

1780. *Papilio brigitta* Stoll in Cramer, *Uitl. Kapellen*, 4 : 82.
1867. *Terias brigitta* Wallace, *Trans. Ent. Soc. Lond.*, 4 : 323.
1939. *Eurema brigitta* Talbot, *Fauna Brit. India Butterflies*, 1 : 515.
1993. *Terias brigitta* Varshney, *Oriental Insects*, 27 : 363.

Material examined : 3 exs. Pirkheda, 4.xii.1992, P.P. Kulkarni & party; 2 exs. Gugamal, Koktu, 9.xii.1992, P.P. Kulkarni & party; 3 exs., Jawaharkund, 11.ii.1993, S.G. Patil & party; 3 exs. Kolkaz, 13.ii.1993, S.G. Patil & party; 1 ex. Talai, 15.ii.1993, S.G. Patil & party; 13 exs. Malur phata, 25.viii.1993, P.P. Kulkarni & party; 5 exs. Kuwapati, 6.ix.1993, P.P. Kulkarni & party; 3 exs. Kolkaz, 7.ix.1993, P.P. Kulkarni & party.

This butterfly is most common having widest possible distribution both geographically and ecologically. It is distributed in the whole Ethiopian and Indo-Australian regions extending north to Formosa and South China. Larval food plants belong to the family Caesalpinaceae.

13. *Terias hecabe*
(The Common Grass Yellow)

1758. *Papilio hecabe* Linnaeus, *Syst. Nat. ed.* 10 : 470.
1932. *Terias hecabe* Evans, *Identification of Indian Butterflies*, : 78.
1939. *Eurema hecabe* Talbot, *Fauna Brit. India Butterflies*, 1 : 526
1993. *Terias hecabe* Varshney, *Oriental Insects*, 27 : 364.

Material examined : 7 exs. Pirkheda, 4.xii.1992. P.P. Kulkarni & party; 3 exs. Gugamal, Koktu, 9.xii.1992, P.P. Kulkarni party; 1 ex. Kolkaz, 17.xii.1992, P.P. Kulkarni & party; 2 exs Talai, 15.ii.1993, S.G. Patil & party; 1 ex. Telpani, 17.ii.1993, S.G. Patil & party; 1 ex. Siddhakund, 24.ii.1993, S.G. Patil & party; 1 ex. Pirkheda, 22.viii.1993, P.P. Kulkarni & party; 10 exs. Chikalpati, 23.viii.1993, P.P. Kulkarni & party; 1 ex. Kuwapati, 6.ix.1993, P.P. Kulkarni & party; 1 ex. Kolkaz, 22.ix.1994, S.S. Kamble & party; Sedukund, Gadaga river, 25.ii.1997, A.S. Mahabal & party.

This most common butterfly is bright yellow in colour with black borders on the upper side of its wings and mostly found in habitats that have been altered by human activity. The range of its distribution covers the entire old world tropical zone from Africa and Arabia to India and the Oriental region. Since it is found practically everywhere and with its vast range of distribution, it is considered as one of the world's most numerous butterflies.

Larval food plants belong to the families Caesalpiniaceae, Mimosaceae and Fabaceae.

14. *Terias laeta* Boisduval
(The Spotless Grass Yellow)

1836. *Terias laeta* Boisduval, *Sp. Gen. Lep.*, 1 : 674.
1939. *Eurema laeta* Talbot, *Fauna Brit. India Butterflies*, 1 : 517.
1987. *Eurema laeta* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 53.
1993. *Terias laeta* Varshney, *Oriental Insects*, 27 : 363.

Material examined : 3 exs. Mangiya vil. 5.ii.1992, M.S. Pradhan & party; 1 ex. Khandukheda, 7.ii.1992, M.S. Pradhan & party; 4 exs. Semadoh-Chikhadara rd. 11.ii.1992, M.S. Pradhan & party; 3 exs. Chaurakund, 12.ii.1992, M.S. Pradhan & party; 4 exs. Pirkheda, 4.xii.1992, P.P. Kulkarni & party; 1 ex. Gobia nalla, 5.xii.1992, P.P. Kulkarni & party; 1 ex. Gullarghat, 7.xii.1992, P.P. Kulkarni & party; 4 exs. Gugamal, 9.xii.1992, P.P. Kulkarni & party; 8 exs. Chadupati, 14.ii.1993, S.G. Patil & party; 3 exs. Talai, 15.ii.1993, 8 exs. Cipidoh, 18.ii.1993, 2 exs., Motidera nalla, 19.ii.1993, 4 exs. Gobiya nalla, 20.ii.1993, 3 exs. Koktu river, 21.ii.1993, 4 exs. Hatidatalao, 22.ii.1993, 9 exs. Dolar river, 23.ii.1993, 1 ex Siddhakund, 24.ii.1993. All S.G. Patil & party; 3 exs. Pirkheda, 22.viii.1993, P.P. Kulkarni & party; 1 ex. Hatru-Raipur Rd. 30.viii.1993; R.M. Sharma & party; 1 ex. Ambadoh, 21.ix.1994, 1 ex. Kuwapati, 17.ix.1994, 1 ex. Kolkaz, 22.ix.1994, all S.S. Kamble & party; Sedukund, 1 ex. Gadga river, 25.ii.1997, A.S. Mahabal & party.

The most common species found in nearly all types of terrain, showing very strong seasonal dimorphism. In the wet season form both wings are with well-developed black borders where as in the dry season form the border on the forewing does not usually reach the tornus and on the hind wing it is reduced to apical spots or is absent.

Widely distributed in India, Sri Lanka, Myanmar, Thailand and Indo-China. Larval food plants belong to families Caesalpiniaceae and Fabaceae.

15. *Danaus chrysippus* Linn.
(The Plain or Common Tiger)

1758. *Papilio chrysippus* Linnaeus, *Syst. Nat.* ed 10 : 471.
1932. *Danaus chrysippus* Evans, *Identification of Indian Butterflies* : 88.
1947. *Danaus chrysippus* Talbot, *Fauna Brit. India Butterflies*, 2 : 20.
1987. *Danauschrysippus* Larsen, *J. Bombay nat. Hist. Soc.* 84 : 313.
1993. *Danaus chrysippus* Varshney, *Oriental Insects*, 27 : 365.

Material examined : 1 ex. Pirkheda, 4.xii.1992, P.P. Kulkarni & party; 1 ex. Chaurakund, 12.xii.1992, P.P. Kulkarni & party; 1 ex. Chikhaldara, 12.ii.1993, S.G. Patil & party; 1 ex.

Kolkaz, 13.ii.1993, S.G. Patil & party; 3 exs. Chikalpati, Dhakna range, 23.viii.1993, P.P. Kulkarni & party; 1 ex. Kolkaz, 22.xi.1994, S.S. Kamble & party; 1 ex. Somthan-Akot Rd., 26.ix.1994, S.S. Kamble & party.

This the most familiar butterfly in Indian region. It is found throughout India including desert regions. This species is basically found in plains where its food plant *Rui* or *Aak* (*Calotropis* sp.) grows in abundance. It is one of the unpalatable species, mimicked by several others like the female Danaid Egg fly. Its global distribution covers Africa, most of Asia and parts of the Australian region.

16. *Danaus genutia* Cramer
(The Striped Tiger)

1779. *Papilio genutia* Cramer, *Pap. Exot.* 3 : 23.
1882. *Danaus genutia* Distant, *Rhopalocera Malayana* : 18.
1987. *Danaus plexippus* Talbot, *Fauna Brit. India Butterflies*, 2 : 25.
1987. *Danaus genutia* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 314.
1993. *Danaus genutia* Varshney, *Oriental Insects*, 27 : 365.

Material examined : 3 exs. Dhakna Rest House, 14.ii.1991, D.F. Singh & party; 1 ex. Gugamal, Koktu, 9.xii.1992, P.P. Kulkarni & party; 1 ex. Kolkaz, 21.xii.1994, S.S. Kamble & party; 1 ex. Semadoh, Sipna River, 18.ii.1997, A.S. Mahabal & party.

Tawny wings with bold black stripes make this butterfly a handsome and conspicuous insect. It is common in scrub jungles, though it occurs almost throughout India, but it prefers the areas with heavy to moderate rainfall. It flies with fairly rapid wing beats and advertise warning colours. This species is often seen with other milkweed butterflies in large numbers during migratory flights.

Outside India it is found in rest of the Indian subcontinent, extending to South-east Asia and Australia.

Larval food plants are small herbs, twiners and creepers of family Asclepiadaceae.

17. *Parantica aglea* Stoll
(The Glassy Tiger)

1782. *Papilio aglea* Stoll, in Cramer, *Pap. Exot.* 4 : 173.
1947. *Danaus aglea* Talbot, *Fauna Brit. India Butterflies*, 2 : 37.
1987. *Parantica aglea* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 314.
1993. *Parantica aglea* Varshney, *Oriental Insects*, 27 : 366.

Material examined : 1 ex. Chikalpati, 23.viii.1993, P.P. Kulkarni & party.

Looks like the Blue Tiger (*Tirumala limniace*) but small in size with transparent whitish markings. Males have scent patches on the hind wings. Much weaker species as compared to other Danaids. It is found in well forested as well as open areas with heavy rainfall. It occurs from Mumbai southwards in peninsular India and from Jammu to Hong Kong and Malaysia.

Caterpillars feed on *Tylophora carnosa*, *T. indica*, *T. tenuis*, *Ceropegia* sp. *Calotropis gigantea* and *Cryptolepis buchanani* (Asclepiadaceae).

18. *Tirumala limniace* Cramer (The Blue Tiger)

1775. *Papilio limniace* Cramer, *Pap. Exot.*, 1 : 92.
 1932. *Danaus limniace* Evans, Identification of India Butterflies, : 87.
 1947. *Danaus limniace* Talbot, *Fauna Brit. India Butterflies* 2 : 31.
 1987. *Tirumala limniace* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 314.
 1993. *Tirumala limniace* Varshney, *Oriental Insects*, 27 : 366.

Material examined : 1 ex. Bhawar stream, Chaurakund, 12.ii.1992, M.S. Pradhan & party; 1 ex. Pirkheda, 4.xii.1992, P.P. Kulkarni & party; 1 ex. Gullar ghat, 7.xii.1992, P.P. Kulkarni & party; 2 exs. Chikhaldara, 12.ii.1993, S.G. Patil & party; 1 ex. Chikalpati, 23.viii.1993, P.P. Kulkarni & party.

This is a common species found almost throughout India, both in hills and in plains, but not in deserts and at high altitudes. It frequently visits gardens. It is always found in company of other milkweeds during migratory flights.

This species is found in most of the Oriental region but is absent from Sumatra and Borneo.

Larval food plants are Blood flower (*Asclepias curasavica*), Wax plant (*Hoya* sp.), *Tylophora indica* and *Waltakaka volubilis* (Asclepiadaceae).

19. *Euploea core* Cramer (The Common Crow)

1780. *Papilio core* Cramer, *Pap. Exot.*, 3 : 133.
 1932. *Euploea core* Evans, Identification of Indian Butterflies, : 90.
 1947. *Euploea core* Talbot, *Fauna Brit. India Butterflies*, 2 : 67.
 1987. *Euploea core* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 315.
 1993. *Euploea core* Varshney, *Oriental Insects*, 27 : 367.

Material examined : 1 ex. Dhakna Rest House, 14.ii.1991, D.F. Singh & party; 1 ex.,

Pirkheda, 4.xii.1992, 2 exs., Gular ghat, 7.xii.1992, 3 exs., Gugamal, Koktu, 9.xii.1992, 2 exs. Pili, village, Kolkaz, 17.xii.1992, All P.P. Kulkarni & party; 7 exs., Chikhaldara, 12.ii.1993, 7 exs., Kolkaz, 13.ii.1993, 1 ex. Chadupatti, 14.ii.1993, 2 exs. Talai, 15.ii.1993, 1 ex. Gobiya nalla, 20.ii.1993, 2 exs. Dolar River, 23.ii.1993, all S.G. Patil & party; 1 ex. Pirkheda, 22.viii.1993, 2 exs., Malur phata, 25.viii.1993, 1 ex., Gavilgad, Chikhaldara, 5.ix.1993, all P.P. Kulkarni & party; 1 ex. Kolkaz, 21.xi.1994, S.S. Kamble & party; 1 ex., Jawahar kund, 11.ix.1996, 1 ex. Dhakna, 25.ix.1996, All D.B. Bastawade & party; 1 ex. Gadga River, 25.ii.1997, A.S. Mahabal & party.

It is one of the most common, abundant species among Danaids. It is active throughout year and found in the company of other milkweeds during migratory flights. Males usually display fully extended abdominal hair pencils. This species has several mimics.

This species is found in Sri Lanka, most of the Oriental region and Australia to the Pacific, but lacking in Borneo, Sumatra and the Philippines.

The larval food plants are *Ficus* spp. (Moraceae), *Nerium* spp. (Apocynaceae) and milkweeds (Asclepiadaceae). All these plants have milky unpalatable latex.

20. *Melanitis leda* Linn. (The Common Evening Brown)

1775. *Papilio ismene* Cramer, *Pap. Exot.*, 1 : 41.

1947. *Melanitis lead* Talbot, *Fauna Brit. India Butterflies*, 2 : 366.

1994. *Melanitis leda* Varshney, *Oriental Insects*, 28 : 152.

Material examined : 1 ex. Chikhaldara, 12.ii.1993, S.G. Patil & party, 1 ex. Malur phata, 25.viii.1993; 1 ex. Rangubeli, 27.viii.1993, 2 exs. Malur vill. 28.viii.1993, 1 ex. Semadoh, 4.ix.1993; 1 ex. Kuwapati, 6.ix.1993, 2 exs. Kolkaz, 7.ix.1993. All P.P. Kulkarni & party.

This familiar butterfly is very common throughout India except in the arid north-east. It is active in early morning and at dusk. Frequently met with at electric light source. It rests in the undergrowth and among fallen leaves for most of the day. It is fond of rotting fruits and rarely visits flowers. Seasonal forms are strikingly distinct in this species.

It is found in dense evergreen forests, deciduous forests, and scrub jungles. Widely distributed in the Middle East, South and South-east Asia and the Australian Region.

Larval food plants mostly belong to family Poaceae e.g. *Oryza* spp. *Sorghum* spp.

21. *Mycalesis mineus* Linn. (The Dark Brand Bush Brown)

1767. *Papilio mineus* Linnaeus, *Syst. Nat.*, 1 : 768.

1947. *Mycalesis mineus* Talbot, *Fauna Brit. India Butterflies*, 2 : 134.

1994. *Mycalesis mineus* Varshney, *Oriental Insects*, 28 : 157.

Material examined : 1 ex. Mangiya village, Semadoh, 5.ii.1992, M.S. Pradhan & party; 1 ex. Kolkaz, 7.ix.1993, P.P. Kulkarni & party; 1 ex. Kolkaz, 21.xi.1994, S.S. Kamble & party.

This species is identified by its short and lighter band on underside of forewing. This species occurs in peninsular India up to Madhya Pradesh. Orissa and Bengal. Outside India it is found in Sri Lanka, Philippines, Taiwan, Sulawesi and Malaysia. Caterpillars feed on grasses.

22. *Mycalesis perseus* Fab.
(The Common Bush Brown)

1775. *Papilio perseus* Fabricius, *Syst. Ent.*, : 243.

1947. *Mycalesis perseus* Talbot, *Fauna Brit. India Butterflies*, 2 : 130.

1994. *Mycalesis perseus* Varshney, *Oriental Insects*, 28 : 157.

Material examined : 1 ex. Pirkheda, Dhakna range, 4.xii.1992, P.P. Kulkarni & party.

This butterfly is habitant of wetter and wooded regions and keeps itself to shady places. It inhabits deciduous, semi-evergreen and evergreen forests but very common in bamboo clad areas. Over ripe fruits attract this species. It was unusually caught attracted to light in the month of December 1998 by one of us (RMS) at Andamans.

It is found in India, Sri Lanka and South-east Asia. Larval food plants are variety of grasses.

23. *Ypthima huebneri* Kirby
(Common Four ring)

1871. *Ypthima huebneri* Kirby, *Cat. Diurn. Lep.*, : 95.

1947. *Ypthima huebneri* Talbot, *Fauna Brit. India Butterflies*, 2 : 329.

1987. *Ypthima huebneri* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 565.

1994. *Ypthima huebneri* Varshney, *Oriental Insects*, 28 : 159.

Material examined : 1 ex. Kolkaz, Mangiya vill. 7.xii.1992, P.P. Kulkarni & party.

It is a small grayish brown butterfly. It is quite common in the open as well as in forests and in the hills. Species of *Ypthima* get their common name as 'ring' from the bold eye-spots or rings, which mark the underside of the hindwings. The number and location of such markings vary from species to species and serve as a tool for identification. However, the markings are seasonal and almost disappear during dry periods. This species is much weaker on the wing when compared to other 'rings'

This species is distributed throughout India. It does not occur in Sri Lanka but is found in Indo-China and Malaysia.

Larval food plants are variety of grasses.

24. *Ariadne ariadne* Linn.
(The Angled Castor)

1763. *Papilio ariadne* Linnaeus, *Centur. Ins.*

1994. *Ariadne ariadne* Varshney, *Oriental Insects*, 28 : 167.

Material examined : 2 exs. Kuwapati, 17.xi.1994, S.S. Kamble & party.

This species is readily distinguished from another species, the common castor, by its conspicuous white spot at the apex of the forewing and angled nature of the forewings. The female is slightly paler than male. It is a weak flier and flies close to the ground. It inhabits scrub and secondary deciduous forests; also occurs in the highly disturbed areas around human habitations.

It is found practically throughout the Oriental region. Larval food plants belong to family Euphorbiaceae especially the Castor plant; *Ricinus communis*, the recorded host. Besides, it also feeds on *Tragia* spp.

25. *Phalanta phalantha* Drury
(The Common Leopard)

1770. *Papilio phalantha* Drury, *Exot. Inst.*, 1 : 41.

1932. *Atella phalantha* Evans, *Identification of India Butterflies* : 187.

1980. *Phalanta phalantha* Varshney *et al.* *Rec. zool. Surv. India, Occ. Paper No.* 31 : 18.

1994. *Phalanta phalantha* Varshney, *Oriental Insects*, 28 : 171.

Material examined : 4 exs, Pirkheda, 4.xii.1992, 4 exs., Pirkheda, 22.viii.1993, 4 exs., Chikalpati, 13.viii.1993, 5 exs., Malurphata, 25.viii.1993, 4 exs. Rangubeli, 27.viii.1993, 3 exs., Malur village. Chaurakund, 28.viii.1993, all P.P. Kulkarni & party; 1 ex. Hatru-Raipur Rd. 31.viii.1993, R.M. Sharma & party; 2 exs. Gavilgad, 5.ix.1993, P.P. Kulkarni & party; 1 ex. Kuwapati, 6.ix.1993. P.P. Kulkarni & party; 1 ex. Somthan-Akot Rd. 26.ix.1994, S.S. Kamble & party.

This bright tawny butterfly is extremely active, seen flitting from flower to flower with half-open wings. It avoids shady places. Both sexes look alike. It chases away passing butterflies while basking in the sun. It is also seen mudpuddling with other butterflies on damp patches.

The distribution range of this species covers the entire Oriental region, whole of Africa and South-western Arabia.

Larvae feed on variety of food plants from different families viz. Salicaceae, Smilacaceae and Flacourtiaceae.

26. *Cynthia cardui* Linn.
(The Painted Lady)

1758. *Papilio cardui* Linnaeus, *Syst. Nat.* ed. 10 : 475.
 1932. *Vanessa cardui* Evans, *Identification of Indian Butterflies*, : 177.
 1971. *Cynthia cardui* Field, *Smithson. Contr. Zool.*, 84 : 37.
 1994. *Cynthia cardui* Varshney, *Oriental Insects*, 28 : 175.

Material examined : 1 ex. Pirkheda, 22.viii.1993, P.P. Kulkarni & party; 1 ex. Jawaharkund, 18.ix.1994, S.S. Kamble & party.

This is world's most widely distributed species and probably the best-known butterfly owing to its migratory habit. It is found all over the world except in South America.

Larval food plants are *Debregeasia* sp. (Urticaceae), *Zornia gibbosa* (Fabaceae), *Tricolepis* sp. *Gnaphalium* sp. *Artimisia* sp. and *Blumea* sp. (Asteraceae).

27. *Precis iphita* Cramer
(The Chocolate Pansy)

1779. *Papilio iphita* Cramer, *Pap. Exot.*, 3 : pl. 209
 1932. *Precis iphita* Evans, *Identification of Indian Butterflies*, : 177.
 1994. *Precis iphita* Varshney, *Oriental Insects*, 28 : 176.

Material examined : 1 ex. Bitkaripani, Pipalpada, 5.ii.1992, M.S. Pradhan & party; 1 ex. Khandu River, Khandukheda, 7.ii.1992, M.S. Pradhan & party; 1 ex. Dolar River, 17.xi.1994, S.S. Kamble & party; 1 ex. Kolkaz, 22.xi.1994, S.S. Kamble & party.

This chocolate brown butterfly is commonly found in the forests of Southern and Central India. Its global distribution covers practically the entire Oriental region. Unlike other pansies, this species keeps itself to the shady places.

Larval food plants belong to the family Acanthaceae e.g. *Strobilanthes* sp., *Asteracantha* sp. and *Hygrophila auriculata*.

28. *Junonia almana* Linn.
(The Peacock Pansy)

1758. *Papilio almana* Linnaeus, *Syst. Nat.* ed. 10 : 472.
 1905. *Junonia almana* Bingham, *Fauna Brit. India Butterflies*, 1 : 361.
 1994. *Junonia almana* Varshney, *Oriental Insects*, 28 : 176.

Material examined : 1 ex. Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party.

This bright and tawny coloured butterfly with its large eye-spots on the upper sides

of hind wings and two smaller ones on each of forewings make it unmistakable. Seasonal variations in these spots are remarkable. Marigold flowers attract this species.

It occurs throughout India and its range covers most of the Oriental region. Larval food plants are *Barleria* sp., *Osbeckia* sp., *Acanthus* sp. and *Hygrophila auriculata*.

29. *Junonia hierta* Fab.
(The Yellow Pansy)

1798. *Papilio hierta* Fabricius, *Ent. Syst. Suppl.*, : 424.

1932. *Precis hierta* Evans, *Identification of Indian Butterflies*, : 176.

1987. *Junonia hierta* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 569.

1994. *Junonia hierta* Varshney, *Oriental Insects*, 28 : 176.

Material examined : 1 ex. Pirkheda, 4.xii.1992, 1 ex., Gobia nalla, 5.xii.1992, 2 exs. Gugamal, 9.xii.1992, all P.P. Kulkarni & party; 1 ex. Hatru-Raipur Rd. 30.vii.1993, R.M. Sharma & party.

As the common name indicates, it is predominantly yellow. It's forewing apex is black with yellow spots and with a brilliant blue oval patch in the basal area on the upper side of its hind wings which separates this species from other pansies. Males are territorial and chase off others. It is fond of flowers especially Marigold.

It is a Palaeotropical species found in Thailand, Myanmar, India and Pakistan. Larval food plants are *Hygrophila auriculata* and *Barleria* sp.

30. *Junonia lemonias* Linn.
(The Lemon Pansy)

1758. *Papilio lemonias* Linnaeus, *Syst. Nat. ed.* 10 : 473.

1905. *Junonia lemonias* Bingham, *Fauna Brit. India Butterflies*, 1 : 357.

1987. *Junonia lemonias* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 570.

1994. *Junonia lemonias* Varshney, *Oriental Insects*, 28 : 176.

Material examined : 1 ex., Pirkheda, 4.xii.1992, 1 ex. Gobia nalla, 5.xii.1992, 3 exs., Gugamal, Koktu, 9.xii.1992, 5 exs. Malur phata, 25.viii.1993, all P.P. Kulkarni & party; 1 ex. Chikaidhara, 12.ii.1993, S.G. Patil & party; 1 ex Koktu, 30.iii.1994, M.S. Pradhan & party; 1 ex. Sipra River, 23.xi.1994, S.S. Kamble & party; 1ex. Jawaharkund, 11.ix.1996, 1 ex. Dhakna, 25.ix.1996, all D.B. Bastawade & party.

This species is commonest among the pansies and it frequents gardens, fallow lands and open wooded areas. It is found almost throughout the year but more numerous in monsoon and post-monsoon months. This species is a frequent visitor to damp patches and takes great delight in visiting flowers.

It is distributed in the Indian subcontinent extending to Malaysia in the east. Larval food plants are *Corchorus oliforius*, *Nelsonia canescens* and *Lepidagathis* sp. *Hygrophila auriculata*, *Cannabis sativa* and *Sida rhombifolia*.

31. *Junonia orithya* Linn.
(The Blue Pansy)

1758. *Papilio orithya* Linnaeus, *Syst. Nat.* ed. 10 : 473.

1905. *Junonia orithya* Bingham, *Fauna Brit. India Butterflies*, 1 : 358

1987. *Junonia orithya* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 569

1994. *Junonia orithya* Varshney, *Oriental Insects*, 28 : 176.

Material examined : 1 ex., Pirkheda, 4.xii.1992, 1ex., Gullar ghat, 7.xii.1992, 1ex. Gavilgad Fort, 19.xii.1992. All P.P. Kulkarni & Party; 2exs. Somthan- Akot Rd. 26.xi.1994, S.S.Kamble & party.

It is one of the prettiest of Indian butterflies, easily recognized by its brilliant blue hind wings. Found in dry and open plains, it is active even during the hottest part of the day. Forest paths and dry riverbeds are its favourite haunts.

It is distributed in most of the Oriental region. Arabia and all of Africa.

Larval food plants are *Justicia procumbens* and *Lepidagathis prostrata*.

32. *Hypolimnas bolina* Linn.
(The Great Eggfly)

1758. *Papilio bolina* Linnaeus, *Syst. Nat.* ed. 10 : 479.

1905. *Hypolimnas bolina* Bingham, *Fauna Brit. India, Butterflies*, 1 : 386.

1994. *Hypolimnas bolina* Varshney, *Oriental Insects*, 28 : 177

Material examined : 1 ex., Chikhaldara, 12.ii.1993, 1ex. Sidhakund, 24.ii.1993, all S.G. Patil & party; 1 ex, Pirkheda, 22.viii.1993, 4exs. Rangubeli, 27.viii.1993, 4exs. Malur village, 28.viii.1993, All P.P. Kulkarni & party; 3exs. Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party; 2exs. Semadoh, 4.ix.1993, 2exs. Kuwapati, 6.ix.1993, All P.P. Kulkarni & party; 1ex. Dolar River, 27.xi.1994, 1ex. Rangubeli, 30.ix.1994, all S.S. Kamble & party; 2exs. Jawaharkund, 11.ix.1996, D.B. Bastawade & party.

The upper wing surface of the male of this species with its iridescent bluish white egg-shaped markings makes it a handsome insect. Males are highly territorial and chase away the encroachers. Female is a perfect mimic of the Common Crow, but the two blue spots on her fore wings and broad pale yellow or white scalloped border of hind wings separate it from the common crow.

This species is common throughout India but abundant in moist, well-forested areas. The distribution covers the entire Oriental region and many Pacific islands.

Larval food plants are *Elatostemma cuneatum* and *Protulacea oleracea*, *Laportea interrupta* and *Sida rhombifolia*.

33. *Hypolimnias misippus* Linn.
(The Danaid Eggfly)

1764. *Papilio misippus* Linnaeus, *Mus. Ulr.*, : 264

1905. *Hypolimnias misippus* Bingham, *Fauna Brit. India, Butterflies*, 1 : 388

1987. *Hypolimnias misippus* Larsen, *J. Bombay Nat. Hist. Soc.*, 84 : 571

1994. *Hypolimnias misippus* Varshney, *Oriental Insects*, 28 : 177

Material examined : 2 exs. Pirkheda, Dhaknarange, 23.viii.1993, P.P. Kulkarni & party.

This species is an excellent example for sexual dimorphism. The female is a perfect mimic of the Plain Tiger and is less seen than her handsomely marked male. The male is highly territorial.

It occurs in lightly wooded country, deciduous forests and even near human habitations. It is found throughout Indian subcontinent, Southeast Asia and Africa.

Larval food plants are Purslane or Office-time (*Portulaca* spp.) and *Abutilon* sp. *Asystasis* sp., *Barleria cristata* and *Hibiscus* sp.

34. *Neptis hylas* Linn.
(The Common Sailor)

1758. *Papilio hylas* Linnaeus, *Sys. Nat.*, ed. 10 : 486

1927. *Neptis hylas* Fruhstorfer, In Seitz, *The Macrolepidoptera of the world, The Indo-Australian Rhopalocera*, 9 : 101

1994. *Neptis hylas* Varshney, *Oriental Insects*, 28 : 178

Material examined : 1 ex. Dhaknarange, 14.ii.1991, D.F. Singh & party; 1 ex. Mangiya village, 5.ii.1992, 2exs. Khandukheda, 7.ii.1992, all M.S. Pradhan & party; 1ex. Kolkaz, 22.xi.1994, S.S. Kamble & party.

Among the several species of Sailors found in India, this species is the one, most frequently encountered in wooded and hilly country. Its typical sailing flight with characteristic horizontal bands on wings makes it easily identifiable. It prefers well-watered and densely vegetated streams in deciduous forests. It also enters into human habitations and gardens to visit flowers. Its range of distribution covers most of the Oriental region.

Larval food plants include many plant species from diverse families e.g. Bombacaceae, Fabaceae, Icacinaceae, Sterculiaceae and Tiliaceae.

35. *Moduza procris* Cramer (The Commander)

1777. *Papilio procris* Cramer, *Pap. Exot.*, 2 : pl. 106.
 1905. *Moduza procris* Bingham, *Fauna Brit. India, Butterflies* 1 : 291
 1932. *Limnitis procris* Evans, *Identification of Indian Butterflies* : 161
 1994. *Moduza procris* Varshney, *Oriental Insects*, 28 : 181

Material examined : 1 ex Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party.

This butterfly cannot be overlooked in the forested areas owing to its striking colours and graceful sailing flight. It is more a forest insect found in both dry and wet regions of peninsular India up to Madhya Pradesh and from Dehara Dun to West Bengal and further east. It is fond of flowers and caterpillars feed on a variety of plants including *Mussaenda* sp.

36. *Symphaedra nais* Forster (The Baronet)

1771. *Papilio nais* Forster, *Nov. Spec. Ins. Cent.*, 1 : 73
 1932. *Euthalia nais* Evans, *Identification of Indian Butterflies*, : 157
 1987. *Symphaedra nais* Larsen, *J. Bombay Nat. Hist. Soc.*, 84 : 577.
 1994. *Symphaedra nais* Varshney, *Oriental Insects*, 28.

Material examined : 1 ex. Ambadoh, 11.ii.1992, M.S. Pradhan & party.

This bright tawny orange coloured butterfly is a familiar sight on forest paths. When disturbed it flies off only to settle again at a short distance away. It comes avidly to both rotten fruit and water.

It is endemic to Sri Lanka and the Indian subcontinent and found in various deciduous forests. Its caterpillar is very much similar to the Baron's (*Euthalia*) and feeds on Tendu (*Diospyros melanoxylon*) and Sal (*Shorea robusta*).

37. *Acraea terpsicore* Linn. (The Tawny Coster)

1775. *Papilio violae* Fabricius, *Syst. Ent.*, : 460
 1905. *Telchinia violae* Bingham, *Fauna Brit. India Butterflies*, 1 : 471
 1987. *Acraea terpsicore* Larsen, *J. Bombay nat. Hist. Soc.*, 84 : 580
 1994. *Acraea terpsicore* Varshney, *Oriental Insects*, 28 : 191

Material examined : 1 ex. Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party.

This butterfly is unmistakable due to its bright, tawny-red colour coupled with its characteristic wing shape and slow flight. The forewings are rounded at the apex. Both sexes are alike. It visits flowers but not damp patches. This species is unpalatable to its predators. Even the slightest touch brings forth an oily, smelly liquid from the glands situated in its body joints.

It is endemic to Sri Lanka and the Indian subcontinent. Very common in India. Larval food plants are creepers of Passion flowers (*Passiflora* spp.) belonging to family Passifloraceae and members of family Cucurbitaceae.

38. *Abisara echerius* (Stoll)
(The Plum Judy)

1790. *Papilio echerius* Stoll, In Cramer, *Pap, Exot.*, 5 : pl. 31

1905. *Abisara echerius* Bingham, *Fauna Brit. India, Butterflies*, 1 : 492

1994. *Abisara ocherius* Varshney, *Oriental Insects*, 28 : 193

Material examined : 1 ex. Near Meldo stream, Mangiya village, 5.ii.1992, M.S. Pradhan & party.

This is the only representative of the family Riodinidae found in the collections of Melghat Tiger Reserve. This medium sized, reddish brown butterfly with prominent pale green eyes inhabits deciduous, semi-evergreen and evergreen forests. It is distributed in peninsular India to Western Himalaya.

Larval food plants are *Embelia robusta* and *Ardisia* sp.

39. *Catochrysops strabo* (Fab.)
(The Forget-Me-not)

1793. *Hesperia strabo* Fabricius, *Ent. Syst.*, 3 : 287

1907. *Catochrysops strabo* Bingham, *Fauna Brit. India, Butterflies*, 2 : 411

1987. *Catochrysops strabo* Larsen J. *Bombay nat. Hist. Soc.*, 84 : 297

1997. *Catochrysops strabo* Varshney, *Oriental Insects*, 31 : 93

Material examined : 1 ex., Kolkaz, 13.ii.1993, 1 ex., Cipidoh, 18.ii.1993, 1ex. Koktu, 21.ii.1993, All S.G. Patil & party.

This species is found all over India, especially common in weedy and wastelands. It is very fast on the wing. Its global distribution covers practically the entire Oriental region.

The larval food plants belong to families Fabaceae and Sapindaceae.

40. *Lampides boeticus* (Linn.)
(The Pea Blue)

1767. *Papilio boeticus* Linnaeus, *Syst. Nat.* ed. 12 : 78
 1907. *Polyommatus boeticus* Bingham, *Fauna Brit. India, Butterflies*, 2 : 432
 1962. *Lampides boeticus* Cantlie, *The Lycaenidae portion of Brigadier Evans, The Identification of Indian Butterflies*, 1932 : 69
 1997. *Lampides boeticus* Varshney, *Oriental Insects*, 31 : 94

Material examined : 1 ex. Pirkheda, 4.xii.1992, P.P. Kulkarni & party; 2 exs., Talai, 15.ii.1993, 1ex. Hatida Talao, 22.ii.1993, all S.G. Patil & party.

This species shows great variations in size and exhibits sexual dimorphism. Upper side of male is violet blue and the female is brown with blue scaling at the bases of their wings.

It is common in cultivated and fallow fields, lowlands and montane grasslands, scrub and disturbed forests. It is widely distributed in tropical Asia and Africa, entering north into the Palaearctic in England on one side and China on the other.

Larval food plants are peas, beans and their relatives. At times it is a minor pest of these plants.

41. *Pseudozizeeria maha* (Kollar)
(The Pale Grass Blue)

1848. *Lycaena maha* Kollar, in Huegel's *Kashmir*, 4 : 422
 1907. *Zizeeria maha* Bingham, *Fauna Brit. India, Butterflies*, 2 : 355
 1997. *Pseudozizeeria maha* Varshney, *Oriental Insects*, 31 : 96

Material examined : 1 ex. Pirkheda, 4.xii.1992, P.P. Kulkarni & party; 1ex. Hatida Talao, 22.ii.1993, S.G. Patil & party.

This species is the largest among the Grass Blues and commonly found practically anywhere, even on paths in primary wet evergreen forest. It is more abundant during post-monsoon months.

Outside India it is found in Sri Lanka extending east to Hong Kong and the Philippines.

Larval food plants are *Nelsonia* sp. *Oxalis corniculata*, *Strobilanthes* spp. and *Tephrosia pauciflora*.

42. *Euchrysops cnejus* (Fab.)
(The Gram Blue)

1798. *Hesperia cnejus* Fabricius, *Ent. Syst. Suppl.*, : 480

1962. *Euchrysops cnejus* Cantlie, The *Lycaenidae* portion (except the *Arhopala* group) of Brigadier Evans, The Identification of Indian Butterflies, 1932 : 65

1997. *Euchrysops cnejus* Varshney, *Oriental Insects*, 31 : 104

Material examined : 3 exs., Pirkheda, 4.xii.1992, 1ex. Gugamal, 9.xii.1992, all P.P. Kulkarni & party; 2 exs. Semadoh, 18.ii.1997, A.S. Mahabal & party.

A species of open and drier areas and an effective colonizer of agricultural lands where it is usually more common than in natural habitats. The seasonal population of this species depends on the availability of larval food plants.

It is widely distributed throughout India, Southeast Asia, extending to the Australian region and even to far-flung islands in the Pacific Ocean.

Larval food plants include cultivated and wild legumes.

43. *Chilades laius* (Stall)
(The Lime Blue)

1987. *Chilades laius* Larsen, J. *Bombay nat. Hist. Soc.*, 84 : 296

1997. *Chilades laius* Varshney, *Oriental Insects*, 31 : 107

Material examined : 1 ex. Gobiyanalla, 20.ii.1993, S.G. Patil & party; 1 ex. Ambadoh, 21.ix.1994, S.S. Kamble & party.

It is a large blue butterfly found around citrus plants in human habitations or in forest areas. The caterpillars feed on various species of citrus plants (Rutaceae).

44. *Hasora badra* (Moore)
(The Common Awl)

1865. *Goniloba badra* Moore, *Proc. Zool. Soc. London* : 778

1949. *Hasora badra* Evans, A catalogue of HesperIIDae from Europe, Asia & Australia in *Brit. Mus. (nat. Hist.)* : 66

2001. *Hasora badra* Eliot, *Bionotes*, 3 : 35

Material examined : 1 ex Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party.

Two pale spots on under side of its hind wings easily identify this skipper. It is distributed in Western Ghats, Nilgiris, and Sikkim to Myanmar. Also found in Sri Lanka. Caterpillars feed on *Derris ulginosa*.

45. *Telicota ancilla* Mabille
(The Dark Palm Dart)

1949. *Telicota ancilla* Evans, A catalogue of HesperIIDae from Europe

1981. *Telicota ancilla* Varshney et al., *Rec. zool. Surv. India, Occ. Paper No. 31* : 12

2000. *Telicota ancilla* Kunte, *Butterflies of Peninsular India* : 217

Material examined : 1 ex. Hatru-Raipur Rd. 30.viii.1993, R.M. Sharma & party.

It is a black coloured butterfly with orange bands on the forewings; the hind wings are black with a pale orange band. It is mostly found in hilly wooded areas. It is distributed throughout India and Sri Lanka, extending to Southeast Asia & Australia. Larvae feed on Bamboos, *Oryza spp.* and *Saccharum spp.* (Poaceae)

SUMMARY

The paper embodies the systematic account of butterflies and skippers collected during different surveys conducted by Western Regional Station, Pune in the Melghat Tiger Reserve, Maharashtra State.

The study resulted in the enumeration of 45 species belonging to 36 genera spread over 8 families viz. Papilionidae (4), Pieridae (10), Danaidae (5), Satyridae (4), Nymphalidae (14), Riodinidae (1), Lycaenidae (5) and Hesperidae (2). The figures in parenthesis indicate the number of species treated under each family.

REFERENCES

ELIOT, J.N. 1978. Corbet and Pendlebury's Butterflies of the Malay Peninsula, Kuala Lumpur.

GHOSH, S.K., MONDAL, D.K. & CHAUDHARY, M. 1993. Butterflies and Moths in Indian Tiger Reserves. Ed. Director, Zoological Survey of India : 1-12.

LARSEN, T.B. 1987. The Butterflies of the Nilgiri Mountains of Southern India (Lepidoptera : Rhopalocera). *J. Bombay nat. Hist. Soc.*, 84 (1) : 26-54; 84(2) : 291-316 and 84(3) : 560-584.

VARSHNEY, R.K. 1993, 1994, & 1997. Index Rhopalocera Indica. Part III. Genera of Butterflies from India and Neighbouring countries. *Oriental Ins.* 27 : 347-372; 28 : 51-198; 31 : 83-137; Index. 138 A-C.

CHILOPODA : SCOLOPENDRIDAE

B.E. YADAV

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

The centipede taxonomy is less studied in the world, except few monographic accounts by Attems (1930). In India, Jangi (1955, 1959) and Jangi and Das (1984) offered a pioneered work on the centipedes of Nagpur and Deccan. While Khanna (1977), Kumar and Khanna (1984) comprehensively studied centipedes of northern India and foothills of Himalaya. Khanna (2001) illustrated checklist of Indian centipedes, which is a landmark study, constituting an account of 100 centipedes. For distribution of centipedes outside India it can be referred to. Occurrence, abundance and new records of centipedes of Western Ghats and Maharashtra are studied by Yadav (1993a and 1993b).

The previous work of Jangi (1955) from Nagpur Dist. of Maharashtra and Jangi and Dass (1984) from Deccan reflects on 9 species of centipedes with 6 new to the science. In the present study 15 species of centipedes under 5 genera belonging to two families, viz., Scolopendridae and Cryptopidae have been recorded from Melghat; of which 5 species have been inventorised from the literature.

SYSTEMATIC LIST

(*Asterics indicate species actually collected)

Superphylum	ARTHROPODA
Phylum	UNIRAMIA
Subphylum	MYRIAPODA
Class	CHILOPODA
Subclass	EPIMORPHA
Order	SCOLOPENDROMORPHA
Family	SCOLOPENDRIDAE

Subfamily SCOLOPENDRINAE

Tribe Scolopendrini

1. **Scolopendra amazonica* (Bucherl)
2. **Scolopendra morsitans* Linnaeus
3. **Scolopendra hardwickei* Newport
4. *Scolopendra mirabilis* (Porat)
5. **Cormocephalus nigrificatus* Verhoeff.
6. **Cormocephalus westwoodi* (Newport)
7. **Cormocephalus nudipes* Jangi & Dass
8. *Cormocephalus pilosus* Jangi

Tribe Asanadini

9. **Asanada indica* Jangi & Dass
10. **Asanada sokotrana* Pocock
11. *Asanada brevicornis* Meinert

Subfamily OTOSTIGMINAE

Tribe Otostigmini

12. **Rhysida nuda subnuda* Jangi
13. **Rhysida neocrassispina* Jangi & Dass
14. *Rhysida longipes longipes* (Newport)

Family CRYPTOPIDAE

15. *Cryptops orientalis* Jangi

1. **Scolopendra amazonica* (Bucherl)

1946. *Scolopendra morsitans amazonica* Bucherl, W. Mem. Inst. Butantan, 19 : 135 - 137.
1959. *Scolopendra amazonica*, Jangi, Ent. News; 70 : 257 - 259.
1984. *Scolopendra amazonica*, Jangi & Dass, J. Sci. Ind. Res., 43 : 27 - 54.
1997. *Scolopendra amazonica*, Khanna & Yadav, Rec. zool. Surv. India, 96 (1-4) : 211-220.
2001. *Scolopendra amazonica*, Khanna, Ann. For., 9(2) : 199 - 219.

Diagnostic characters : Body elongate, flat with 21 pairs of legs, spiracles triangular. Cephalic plate overlapping the first tergite. 20th pair of legs without tarsal spur, prefemur of anal legs ventrally with 3 rows of 3 spines in each.

Material examined : 1 ex, Salona, Musundi, 20-11-1996, D.B. Bastawade, 1 ex. Ambadoh and around, D.B. Bastawade, 18-8-1996, 2 exs. 30 km East of Semadoh on Paratwada road, 12-9-1996, D.B. Bastawade, 1 ex, near Dolar river, core zone, Dhakna, M.S. Pradhan, 18-2-1992; 1 ex, near Meldo stream, Mangia village, Semadoh, M.S. Pradhan, 5-2-1992.

Distribution : cosmopolitan. Throughout India : Nagpur (Jangi, 1955) Khanna (2001).

Remarks : Centipedes are nocturnal, carnivorous, cryptic creatures. This species is found concealed beneath stones, available in the rainy season.

2. **Scolopendra morsitans* Linnaeus

1758. *Scolopendra morsitans* Linnaeus, *Syst. nat.*, 10 : 638.
 1955. *Scolopendra morsitans*, Jangi, *Ann. Mag. Nat. Hist.*, 8 : 69-80.
 1959. *Scolopendra morsitans*, Jangi, *Ent. News.*, 70 : 257-259.
 1984. *Scolopendra morsitans*, Jangi & Dass, *J. Sci. Ind. Res.*, 43 : 27-54.
 1997. *Scolopendra morsitans*, Khanna & Yadav, *Rec. zool. Surv. India*, 96 (1-4) : 211-220.
 2001. *Scolopendra amazonica*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic characters : Large, robust specimens, 20th pair of legs having tarsal spur. Anal leg prefemur with 3 rows of 3 spines in ventral side.

Material examined : 2 exs, Dhurni road, Kolkaz, D.B. Bastawade, 14-9-1996; 7 ♀♀, 1 ♂, Jawahar Kund, Semadoh, D.B. Bastawade, 11-9-1996; 2 exs, Ramdegi, R.M. Sharma, 7-12-1996; 3 ♂♂, 1 ♀, Pipal Padav, D.B. Bastawade, 16-9-1996; 1 ex, Dhakna to Koktu (via Belkund, Bori), 26-9-1996. D.B. Bastawade, 1 ex, 12 km on the road to Chikhaldara, 15-9-1996, D.B. Bastawade. 1 ex, Chikhaldara, D.B. Bastawade, 22-9-1996; 2 exs, Mekhla, D.B. Bastawade, 13-9-1996; 1 ex, Vairat, D.B. Bastawade, 19-9-1996; 1 ♂, 1 ♀, Kolkaz, M.S. Pradhan, 13-2-1992; 1 ex. Near Dolar river, core zone, Dhakna, M.S. Pradhan, 18-2-1992.

Distribution of species elsewhere : Cosmopolitan. Throughout India; Nagpur (Jangi 1955), Khanna (2001).

Remarks : *S. morsitans* Linn. and *S. amazonica* Bucherl are sympatric (sibling) species. In males anal leg prefemur, femur and tibia are dorsally flat and marginate while in females, rounded. These centipedes exhibit different colours like dark greenish grey, etc. (Yadav, 1999). The specimens from Melghat were exceptionally long.

3. **Scolopendra hardwickei* Newport

1844. *Scolopendra hardwickei* Newport, *Ann. Nat. Hist.*, 13 : 97.
 1955. *Scolopendra hardwickei*, Jangi, *Ann. Mag. Nat. Hist.*, 12 (8) : 69-80.
 1984. *Scolopendra hardwickei*, Jangi & Dass, *J. Sci. Ind. Res.*, 43 : 27-54.
 1997. *Scolopendra hardwickei*, Khanna & Yadav, *Rec. zool. Surv. India*, 96 (1-4) : 211-220.
 2001. *Scolopendra hardwickei*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic characters : Body banded with alternate yellow, black, dark green bands. Anal legs ventrally without spines.

Material examined : 1 ex, Chopan village, Chaurakund; P.P. Kulkarni, 26-8-1993.

Distribution : India : Andaman and Nicobar Islands, Madhya Pradesh, Maharashtra, Gujarat, Tamil Nadu; Khanna (2001).

Remarks : It is an interesting colourful species, measuring about 10-12 cm in length.

4. *Scolopendra mirabilis* (Porat)

1876. *Cormocephalus mirabilis* Porat, *Bih. Svenska Ak.*, 4 (7) : 18.

1903. *Trachycormocephalus mirabilis*, Kraepelin, *Mitt. Mus., Humburg*, 20 : 219.

1977. *Trachycormocephalus mirabilis*, Khanna, *Orient. Ins.*, 11(1) : 151-156.

1986. *Scolopendra mirabilis*, Lewis, *J. nat. Hist.*, 20 : 1083-1088.

1993. *Scolopendra mirabilis*, Yadav, *Rec. zool. Surv. India.*, 93 (3-4) : 321-328.

1997. *Scolopendra mirabilis*, Khanna & Yadav, *Rec. zool. Surv. India*, 96 (1-4) : 211-220.

2001. *Scolopendra mirabilis*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic characters : Head with basal plate, lateral emargination on the tergites 17th to 21st.

Distribution : India : Rajasthan, Jodhpur, Nagaur Dist., Maharashtra; Khanna (2001).

Remarks : These are small, slender specimens, inhabiting the soil below stones.

5. **Cormocephalus nigrificatus* Verhoeff

1937. *Cormocephalus nigrificatus* Verhoeff, *Zool. Anz. Leipziq*, 120 : 81.

1984. *Cormocephalus nigrificatus*, Jangi & Dass, *J. Sci. Ind. Res.*, 43 : 27-54.

2001. *Cormocephalus nigrificatus*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic characters : Cephalic plate posteriorly with 2, anteriorly diverging sutures, legs without tarsal spurs. 21st tergite without longitudinal median sulcus. Lateral margination absent on tergites anterior to 21. Maxillipedes without preformal process.

Material examined : 1 ex, 6 km. from Semadoh - Chikhaldara road, R.M. Sharma, 4-9-1993.

Distribution : India : Kerala : Trivendrum, Khanna (2001).

Remarks : Although it is restricted to Western Ghats, this species has extended its range of distribution in Melghat area. These are long slender specimens.

6. **Cormocephalus westwoodi* (Newport)

1845. *Cormocephalus westwoodi* Newport, *Trans. Linn. Soc., London*, 19 : 349-439.

1984. *Cormocephalus westwoodi*, Jangi & Dass, *J. Sci. Ind. Res.*, **43** : 27-54.

2001. *Cormocephalus westwoodi*, Khanna, *Ann. For.*, **9**(2) : 199-219.

Diagnostic characters : The 21st tergite with a complete longitudinal median sulcus. Lateral tergital margination being anywhere from 2nd to 19th tergite, 6½ to 13 basal antennal segments glabrous.

Material examined : 1 ex, Jawahar Kund, Tiger Project border on Paratwada road Semadoh, M.S. Pradhan, 8-2-1992.

Distribution : Sri Lanka, Deccan, Gujarat, Maharashtra; Khanna (2001).

Remarks : This is an old world polytypic species with its distribution from South Africa to New Zealand.

7. **Cormocephalus nudipes* Jangi & Dass.

1984. *Cormocephalus nudipes* Jangi & Dass, *J. Sci. Ind. Res.*, **43** : 27-54.

1993. *Cormocephalus nudipes*, Yadav, *Rec. zool. Surv. India*, **93** (1-2) : 165-174.

2001. *Cormocephalus nudipes*, Khanna, *Ann. For.*, **9**(2) : 199-219.

Diagnostic characters : The 21st tergite with a complete longitudinal median sulcus. Lateral tergital margination present anywhere from tergite 2-19. Lesser number of antennal segments glabrous. Coxopleural process present. Anal legs smooth with spurred claw.

Material examined : 1 ex, near Gadga river, Koha, Dhakna, M.S. Pradhan, 17-2-1992.

Distribution : India : Andhra Pradesh; Nalgonda District; Karnataka : Mangalore and Karwar. Maharashtra : Pune Dist.; Khanna (2001).

Remarks : Rarely found in the semi-wet soil.

8. *Cormocephalus pilosus* Jangi

1955. *Cormocephalus pilosus* Jangi, *Ann. Mag. nat. Hist. Ser.* **12** (8) : 69-80.

1984. *Cormocephalus pilosus*, Jangi & Dass, *J. Sci. Ind. Res.*, **43** : 27-54.

1993. *Cormocephalus pilosus*, Yadav, *Rec. zool. Surv. India*, **93** (1-2) : 165-174.

2001. *Cormocephalus pilosus*, Khanna, *Ann. For.*, **9**(2) : 199-219.

Diagnostic characters : The 21st tergite with a complete longitudinal median sulcus. Lateral tergital margination being anywhere. Lesser number of antennal segments glabrous. Coxopleural process present. Anal leg pilose with spurred claw.

Distribution : India : Maharashtra; Nagpur Dist. Khanna (2001), Andhra Pradesh; Karnataka, Madhya Pradesh, Goa, Pondicherry, Tamil Nadu; Jangi & Dass (1984).

Remarks : Although it is a common species, it could not be collected from Melghat. It is easily recognised by its pilose anal legs.

Tribe Asanadini

9. **Asanada indica* Jangi & Dass

1984. *Asanada indica* Jangi & Dass, *J. Ind. Sci. Res.*, **43** : 27-54.
 1993. *Asanada indica*, Yadav, *Rec. zool. Surv. India*, **93** (1-2) : 165-174.
 2001. *Asanada indica*, Khanna, *Ann. For.*, **9**(2) : 199-219.

Diagnostic characters : Body elongate small (about 2 cm. in length) slender, terminal leg segment without coxopleural pores. Anal legs without spines, claw serrated. Anal leg possesses dorsal groove. Short antennae 17 segmented, 6 glabrous. Legs without tarsal spur. Legs 1-20 pairs with 2 claw spurs. Anal legs short, thick. Paired longitudinal median sulcus complete on 20th tergite. 21st more than twice as broad as long. Longitudinal median sulcus groove present on posterior half of anal leg prefemur and femur.

Material examined : 1 ex, Chikalpati, Dhakna range, P.P. Kulkarni, 23-8-1993.

Distribution : India : Maharashtra, Delhi, Haryana, Himachal Pradesh, Kerala, Maharashtra, Rajasthan, Uttar Pradesh and Uttarakhand; (Khanna, 2001).

Remarks : These smaller centipedes are generally found below cowdung, in termite mounds etc.

10. **Asanada sokotrana* Pocock.

1891. *Asanada sokotrana* Pocock, *Ann. Mag. nat. Hist.*, **7** : 51-68 & 221-231.
 1984. *Asanada sokotrana*, Jangi & Dass, *J. Sci. Ind. Res.*, **43** : 27-54.
 1993. *Asanada sokotrana*, Yadav, *Rec. zool. Surv. India*, **93** (1-2) : 165-174.
 2001. *Asanada sokotrana*, Khanna, *Ann. For.*, **9**(2) : 199-219.

Diagnostic characters : Paired longitudinal median sulcus complete on tergite 21st, which is more than twice as broad as long. Longitudinal median sulcus groove present throughout on anal leg femur.

Material examined : 1 ex, Pipal padav, D.B. Bastawade, 16-9-1996.

Distribution : Maharashtra, Nagpur District, Aurangabad, Parbhani and Pune District; Jangi & Dass (2001)., Kerala and Tamil Nadu; Khanna (2001).

Remarks : These centipedes occur in the rainy season, remain concealed beneath the stones and dry barks.

11. *Asanada brevicornis* Meinert

1886. *Asanada brevicornis* Meinert, *Viden Skabl. Meddel. mathi. Fore Kjobe* pt. 3.
 1984. *Asanada brevicornis*, Jangi & Dass, *J. Sci. Ind. Res.*, **43** : 27-54.
 1993. *Asanada brevicornis*, Yadav, *Rec. zool. Surv. India*, **93** (1-2) : 165-174.

2001. *Asanada brevicornis*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic characters : Anal legs long and slender. The 21st tergite and sternite about times as broad as long. Longitudinal median sulcus groove present posteriorly on anal refemur, femur and tibia.

Distribution : India : Andaman & Nicobar Island, Delhi, Haryana, Himachal Pradesh, Kerala, Rajasthan, Uttar Pradesh, Uttaranchal, (Khanna, 2001). Maharashtra : Ahmednagar, Aurangabad, Bir, Nasik, Nagpur, Pune Districts.

Remarks : These centipedes are small & slender.

Subfamily OTOSTIGMINAE

Tribe Otostigmini

12. **Rhysida nuda subnuda* Jangi

1955. *Rhysida nuda subnuda* Jangi, *Ann. Mag. nat. Hist.*, Ser. 12 (8) : 69-80.

1984. *Rhysida nuda subnuda*, Jangi and Dass, *J. Sci. Indl. Res.*, 43 : 27-54.

2001. *Rhysida nuda subnuda*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic characters : 10 pairs of round spiracles are present. Maxillipedes with median dental process. Tergites having P.M.L.S. These are long sturdy brownish grey - greenish black coloured actively wandering centipedes, 20th pair of legs with tarsal spur and 1st pair with femoral.

Material examined : 1 ex, Jawahar Kund, near Tiger Project border on Paratwada road, Semadoh, M. S. Pradhan, 8-2-1992. 1 ex, Dhakna to Koktu (Via Belund, Bori), 26-9-1996, D.B. Bastawade; 1 ex, on the way to Dharni and around 26-9-1996, D.B. Bastawade.

Distribution : India : Andhra Pradesh, Karnataka, throughout Maharashtra, Nagpur; (Jangi & Dass, 1984); Khanna (2001). Orissa, Tamil Nadu.

Remarks : These centipedes are found below stones, dry cowdungs, noticed abundant in the monsoon.

13. **Rhysida neocrassispina* Jangi & Dass

1984. *Rhysida neocrassispina* Jangi & Dass, *J. Sci. Ind. Res.*, 43 : 27-54.

2001. *Rhysida neocrassispina*, Khanna, *Ann. For.*, 9(2) : 199-219.

Diagnostic character : Tergites except anterior ones with complete paramedian longitudinal sutures and marginate laterally. Coxopleural process without lateral spine. Sternites with paramedian longitudinal sutures. First 3 pairs of walking legs with 2 tarsal spurs and the remaining with one. Ventrolateral spine of anal leg prefemur is equal to ventro medial. These are longer specimens.

Material examined : 1 ex., Bhawar stream, Chaura Kund, Kolkaz, M.S. Pradhan, 12-2-1992.

Distribution : India : Tamil Nadu : Coimbatore Dist.; Khanna (2001).

Remarks : This species has extended its range of distribution.

14. *Rhysida longipes longipes* (Newport)

1845. *Rhysida longipes* Newport, Trans. Linn. Soc., London, 19 : 349-439.

1955. *Rhysida longipes longipes*, Jangi, Ann. Mag. Nat. Hist., Ser., 12, 8 : 69-88.

1984. *Rhysida longipes longipes*, Jangi & Dass, J. Sci. Ind. Res., 43 : 27-54.

2001. *Rhysida longipes longipes*, Khanna, Ann. For., 9(2) : 199-219.

Diagnostic characters : Tergites with para median sutures and marginate laterally, coxopleural process with lateral spine. Prefemur of anal legs with posteriomedial spiny process.

Distribution : India : Goa, Madhya Pradesh, Maharashtra : Nagpur, Amravati Districts., Karnataka; Jangi & Dass (1984), Arunachal Pradesh, Andaman & Nicobar Island, Delhi, Uttar Pradesh, Uttaranchal and West Bengal; (Khanna, 2001).

Remarks : It occurs abundantly in monsoon months (breeding season) below stones and boulders nearby waterbody.

Family CRYPTOPIDAE

15. *Cryptops orientalis* Jangi

1955. *Cryptops orientalis* Jangi, Ann. Mag. Nat. Hist. Ser., 12, 8 : 69-80.

Diagnostic characters : Blackish brown to yellowish coloured blind centipedes. Two curved markings present on head. Tergites setose with median longitudinal sulcus and transverse sulci. Walking legs 1 – 19 with bisegmented tarsi, prefemur of anal legs ventrally, thorny with medial tooth. Femur with lateral tooth and acute thorn on medial position. Tibia with medial tooth and 9 others saw like; 1st tarsus with 3 saw like teeth.

Distribution : India : Maharashtra, Nagpur; Jangi (1955).

Remarks : These are cryptic, subterranean, blind centipedes.

SUMMARY

The centipede fauna of Melghat Tiger Project Dist. Amravati, State Maharashtra and around constitutes 15 species, belonging to 5 genera of 3 tribes and two subfamilies under two families viz. Scolopendridae and Cryptopidae. The family Scolopendridae forms

predominant group representing 14 species, within which subfamily Scolopendrinae represents 11 species under 4 genera viz. *Scolopendra* – 4 spp., *Cormocephalus* – 4 spp. and *Asanada* – 3 spp.; while the subfamily Otostigminae contains 3 species under the genus *Rhysida*. Further family Cryptopidae has only one species *Cryptops orientalis* Jangi from Nagpur District.

Scolopendra amazonica (Bucherl) and *Scolopendra morsitans* Linn. are common, and cosmopolitan occurring sympatric, also in Melghat area, while *Scolopendra hardwickei* Newport (tiger centipede) and *Scolopendra mirabilis* (Porat) are rare.

The genus *Cormocephalus* represents 4 spp. viz. *Cormocephalus nigrificatus* Verhoeff, which is the 1st record from Melghat. *Cormocephalus westwoodi* (Newport) although found in Deccan and Sri Lanka; it is also noticed from Nasik, Solapur and Pune Districts of Maharashtra.

Blackish and red laterite soil of Melghat Tiger Reserve is homesite of very small, slender centipedes of genus *Asanada*, viz. *Asanada sokotrana* Pocock, *Asanada indica* Jangi & Dass, *Asanada brevicornis* Meinert. These smaller, brownish red coloured centipedes having shorter life cycle, also inhabit termite mounds.

Although the collection was made in monsoon period (September) and winter (February), the subfamily Otostigminae is poorly represented by a single genus *Rhysida* viz. *Rhysida nuda subnuda* Jangi, while few specimens of relatively uncommon *Rhysida longipes longipes* Jangi & Dass, *Rhysida neocrassispina* Jangi & Dass have been recorded from the region. Jangi (1955) and Jangi & Dass (1984) inventorised 9 species of centipedes with the original description of six new species from Nagpur and around. The present study adds another six species to update centipede fauna to fifteen species from this region.

Indiscriminate use of chemical fertilizers, insecticides, pesticides, soil erosion removal of the soil for construction purpose, degradation of habitats, deforestation etc. are the causes of depleting number of terrestrial arthropods in general and the centipede fauna in particular, (Yadav, 1994).

For conserving the centipedes which are friends of farmers as soil fertilizers and biocontrol agents at microlevel, essential measures to take are : 1) To control soil pollution, 2) To curb removing of the soil and 3) To enhance the natural environment for propagation of terrestrial organisms.

ACKNOWLEDGEMENTS

I am grateful to Dr. Vinod Khanna, Northern Regional Station, Zoological Survey of India, Dehra Dun for critically going through the manuscript.

REFERENCES

- ATTEMS, C.G. 1930. Scolopendromorpha. *Dass Tierr.*, 54 (2) : 1–308.
- JANGI, B.S. 1955. On the Chilopod Fauna (Scolopendromorpha) of Nagpur, India. *Ann. Mag. Nat. Hist., Ser. 12*, 8 : 69–80.
- JANGI, B.S. 1959. A further note on taxonomy of the centipede *Scolopendra morsitans* Linn. *Ent. News*, 70 : 253–257.
- JANGI, B.S. and DAS, C.M.S., 1984. Scolopendridae of the Deccan. *J. Sci. Indl. Res.*, 43 : 27–54.
- KHANNA, V. 1977. Studies on the Centipede genus *Trachycromocephalus* (Myriapoda, Scolopendridae) from Rajasthan, India. *Orient. Sci.*, 11 (1) : 151–156.
- KHANNA, V. and KUMAR, A. 1984. Scolopendrid centipedes of Western Himalaya, U.P. with an annotated list of Indian species. (Chilopoda, Scolopendromorpha, Scolopendridae). *U.P. J. Zool.*, 4 (1) : 83–98.
- KHANNA, V. and YADAV, B.E. 1997. Indian species of genus *Scolopendra* Linn. (Chilopoda, Scolopendridae) with description of new species. *Rec. zool. Surv. India*, 96 : (1 – 4) : 211–220.
- KHANNA, V. 2001. A checklist of the Indian species of the centipedes (Chilopoda : Scolopendromarpha). *Ann. For.* 9(2) : 199–219.
- LEWIS, J.G.E. 1986. The genus *Trachycormocephalus*, a junior synonym of *Scolopendra*, with remarks on the validity of other genera of the tribe Scolopendrini (Chilopoda, Scolopendrini). *J. nat. Hist.*, 20 : 1083–1088.
- YADAV, B.E. 1993a. Scolopendridae (Chilopoda) of Western Ghats with some first records from the state of Maharashtra, India. *Rec. zool. Surv. India*, 93 (3–4) : 321–328.
- YADAV, B.E. 1993b. On a collection of centipedes (Myriapoda, Chilopoda) from Pune, Maharashtra. *Rec. zool. Surv. India*, 93 (1–2) : 165–174.
- YADAV, B.E. 1994. The Scolopendrid centipedes. *J. Sci. & Cult.*, 60 : 77–79.
- YADAV, B.E. 1999. Colour pattern in scolopendrid centipedes. *Zoo's Print J.*, 14 (8) : 96.

ARACHNIDA : SCORPIONIDA AND SOLIFUGAE

D.B. BASTAWADE

Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044

INTRODUCTION

The Arachnida fauna of India has fairly been studied by various European and recently by Indian Arachnologists but there is meager information available specially on protected areas like Melghat Tiger Reserve (MTR). The present efforts are first of its kind to know and understand the faunal diversity in the area. The present studies are based on 10 extensive field explorations, carried out for four years continuously in different seasons, by different survey parties of Zoological Survey of India. All the species reported here were actually collected and studied by the author.

LIST OF SPECIES

Order SCORPIONIDA

Family BUTHIDAE

1. *Mesobuthus tamulus tamulus*, (Fabr.)
2. *Lychas(Endotrichus) laevifrons* (Pocock)
3. *Stenochirus politus* Pocock
4. *I. (R.) isadensis* Tikader and Bastawade
5. *I. (R.) rigidulus* Pocock
6. *Isometrus (Reddyanus) acanthurus* Pocock

Family ISCHNURIDAE

7. *Hormurus nigristernis* Pocock

Family SCORPIONIDAE

8. *Heterometrus (Chersonesometrus) fulvipes* (Koch)

Order SOLIFUGAE

Family GALEODIDAE

9. *Galeodes indicus* Pocock

SYSTEMATIC ACCOUNT

Order SCORPIONIDA
 Family BUTHIDAE
 Sub-family BUTHINAE
 Genus *Mesobuthus*

1. *Mesobuthus tamulus tamulus* (Fabr.)

1798. *Buthus tamulus* Fabricius, *Syst. Suppt.*, : 294.

1900. *Buthus tamulus tamulus* : Pocock, *Fauna of Brit. India, Arachnida*, : 23.

1973. *Mesobuthus tamulus tamulus* : Vachon, *Bull. Mus. natn. Hist. nat., paris, 3e ser., Zool.* 104(140) : 857-958.

1983. *Mesobuthus tamulus tamulus* : Tikader & Bastawade, *Fauna of India, Scorpions*, 3 : 673.

Common Name : Yellow Scorpion.

Local Name : Pivala Vinchu (Marathi), Chol (Karnataka), Bichhi (Bengali)

Diagnostic Characters : Body yellowish-red, darker on middle and sub-lateral portions of mesosomal tergites and prosomal and metasomal carinae. Body size ranges between 60 - 80 mm, prosoma with posterior median carinae forming Lyre-form configuration and granular, pectinal teeth count 25-35, may reach up to 40 in case of ♂. Pedipalps slender, narrow on manus in ♀ but more robust and globular in ♂, with 'A' type Trichobothria of β pattern on femora. Males smaller and slender in body size.

Habits and habitats : Mostly found in drier areas, hide under smaller to medium size stones, boulders, occasionally under bricks, cow dungs and rarely in burrows and loose crevices. Common intruder of human settlements, remain in dark and undisturbed corners of houses. Sting haemotoxic, some times fatal to children and weak persons.

Material examined : 28 ♂♂, 64 ♀♀ and 17 young; about 66% of total scorpions collected. Coll. Dr. D.B. Bastawade, Dhakna-Koktu, Dt. 26.09.1996, Reg. No. I/2625; Chikaldara and around, Dts. 15.09.1996 & 22.09.1996, Reg. Nos. I/2614 & I/2619, Makhala and around, Dt. 13.09.1996, Reg. No. I/2616, Ambadoh and around, Dt. 18.09.1996, Reg. No. I/2623, Dharni Rd. Nr. Kolkaz, Dt. 14.09.1996 & 26.09.1996, Reg. Nos. I/2615 & 2626, Vairat and around, Dt. 19.09.1996, Reg. Nos. I/2612 and I/2617, Makhala and around, Dt. 13.09.1996, Reg. No. 2616, Chikkadara, Dt. 15.09.1996, Reg. No. I/2613, Jawahar Kund, Dt. 11.09.1996 Coll. Dr. P.P. Kulkarni, Village Paturda, Dhakna Range, Dt. 05.02.1992, Reg. No. I/2123, Village Pirkheda, Dhakna range, Dt. 22.08.1993, Reg. No. I/2334, Chikalpati, Dhakan range, Dt. 23.08.1993, Reg. No. I/2333; Coll. Dr. R.M. Sharma, on the way from Simdih - Chikaldara, Dt. 04.09.1993, Reg. No. I/2336; Cipidoh; Coll. Dr. S.G. Patil, Dt. 18.02.1993, Reg. No. I/1940, Talai, Dt. 15.02.1993, Reg. No. I/1939; Coll. Dr. M.S. Pradhan, Harisal,

Kolkaz, Dt. 13.02.1992 & 14.02.1992, Reg. No. I/1774 & 1777; Chikaldara–Dhakna Rd., Dt. 17.02.1992, Reg. No. I/1776; Makhana–Khandukheda Rd., Dt. 07.02.1992, Reg. No. I/1775; Sipnapada; Coll. S.S. Kamble, 21.11.1994, Reg. No. I/2298.

Distribution : All over Indian sub-continent except North–Eastern states, could be recognized in 5 sub-species.

Status : Very commonly occurring species.

Genus *Lychas* C. Koch

Sub-genus *Endotrichus* Tikader & Bastawade

2. *Lychas (Endotrichus) laevifrons* Pocock

1897. *Lychas laevifrons* Pocock, *J. Bombay nat. Hist. Soc.*, 11 : 113.

1983. *Lychas (Endotrichus) laevifrons* : Tikader & Bastawade., *Fauna of India, Scorpions*, 3 : 79-85.

Common Name : Brown Scorpion.

Local Name : Rakhat Vinchu (Marathi).

Diagnostic Characters : Body size medium, color yellowish-dark brown to blackish, prosoma more darker with few yellow spots, mesosomal tergites with 4 darker and 5 yellowish bands, metasoma more darker on last two segments and telson, sting with a sub-aculear spine, carapace with no carinae but granular sparsely throughout, tergite I–VI also with only weak median carina each and more granular on lateral portions, metasomal segments carinated and almost all carinae evenly and minutely granular but more granular and crenulate on last two segments, pectinal teeth 20-22 in number, 'A' type trichobothria with β on femur pattern and of *Endotrichus* sub-type.

Habit and habitats : Normally arboreal in habit, hides under loose barks of large to medium size trees at 4–6' high, some times perverted to lead terrenian habits under medium to small stone and boulders. Sting toxicity much less and non-fatal.

Material examined : 2 ♀ ♀, about 2% occurrence in collected material. Coll. Dr. D.F. Singh, Bodkheda, Dhakna range, Dt. 16.02.1991, Reg. No. I/1518; Coll. Dr. S.G. Patil, Sidukund, Dt. 24.02.1993, Reg. No. I/1941.

Distribution : This species occurs fairly common in Gujarat, Madhya Pradesh, Bihar, West Bengal, Orissa and Northern Maharashtra (Vidarbha region and rarely in Southern Maharashtra).

Status : Rare occurrence, first authentic report from Melghat in particular.

Genus *Stenochirus* Pocock

3. *Stenochirus politus* Pocock

1899. *Stenochirus politus* Pocock, *J. Bombay nat. Hist. Soc.*, 12 : 26

1983. *Stenochirus politus* : Tikader & Bastawade, *Fauna of Indian, Scorpions*, 3 :153-158.

Common Name : Black Scorpion.

Local Name : Kala Vinchu (Marathi).

Diagnostic Characters : Body size medium to small, color dark brown to black with light yellowish-brown spots on prosoma and mesosomal tergite I–VI, pedipalps and legs I–IV infuscated, prosoma entirely smooth and finely punctate, body surface smooth and finely punctate, metasoma smooth carinae obsolete, posterior IV and V segments wider than long with only lobate inferior lateral carinae, sting vesicle pyriform, twice as long as deep; Pedipalp manus slender 'A' type trichobothria with α pattern on femora. Pectinal teeth count 15/15.

Habits and habitats : Not exactly known. Probably inhabit through loosely fixed rocks and crevices and might be preferring to stay in loose soil between the stone and crevices or in close association of roots and rocks. Recently known an unusual case of house intrusion at Chennai was observed by R. Whitekar and Ashok Captain (personal communication).

Material examined : 1 ♂ representing only 0.2% of collection, reported for the first time from Melghat area. Coll. S.S. Kamble, Nr. Deval Ghat, Rangubeli, 29.11.1994, Reg. No. I/2295.

Distribution : Tamil Nadu {(Chennai) unpublished data}, Karnataka (Kanara) Maharashtra (Amaravati) and Madhya Pradesh (Mandala National Park).

Status : Very rarely occurring species.

Subfamily CENTRURINAE

Genus *Isometrus* Hempr. & Ehranb

Subgenus *Reddyanus* Vachon

4. *Isometrus (Reddyanus) isadensis* Tikader & Bastawade

1983. *Isometrus (Reddyanus) isadensis* Tikader & Bastawade, *Fauna of India, Scorpions*, 3 : 280-286.

Common Name : Scorpion.

Local Name : Pivala Vinchu (Marathi).

Diagnostic Characters : Body size small, 20–25 mm in length, color yellowish to variegated pale brownish, surface finely granular, carapace with no carinae, median eyes situated anteriorly in the ratio 1 : 2.5; mesosomal tergites I–VI each only a median carina, last sternite more granular with two pairs of granular carinae; metasoma six times longer than as long as carapace, lateral carinae crenulate on segments I–III, telson shorter than segment V, smooth on vesicle, ventral crest smooth ending in to triangular subaculear nodule armed with a pair of minute teeth on inner margin; pectinal teeth 11–12 in number, male

larger than female with thinner, slender and longer pedipalps, 'A' type trichobothria with β pattern on femora, sting with a sub-acular nodule below.

Habits and habitats : Mostly found under small to medium size stones and pebbles or occasionally through thin crevices of soft rocks. Nothing known about its toxin and toxicity.

Material examined : 7 ♀ ♀, 1 ♀ imm. and 3 ♂ ♂, representing about 6.4% of collection; reported for the first time from Melghat area. Coll. Dr. P.P. Kulkarni, Pirkheda Village, Dhakna range, Dt. 22.08.1993, Reg. No. I/2334; Coll. Dr. D.B. Bastawade, Bhimkund Motha and around, Dt.21.09.1996, Reg. No. I/2624.

Distribution : Maharashtra {Aurangabad (Type-Locality), Pune}.

Status : Rarely occurring species.

5. *Isometrus (Reddyanus) rigidulus* Pocock

1897. *Isometrus rigidulus* Pocock, J. Bombay nat. Hist. Soc., 11 : 113.

1983. *Isometrus (Reddyanus) rigidulus* : Tikader & Bastwade, *Fauna of India, Scorpions*, 3 : 262 -267.

Common Name : Scorpion.

Local Name : Vinchu (Marathi).

Diagnostic Characters : Body size small, colour bluish with yellow stripes on mesosomal tergites, variegated on prosoma and darker on metasomal carinae but paler on pedipalps and legs; carapace entirely granular including ocular tubercles, median eyes situated anteriorly in the ratio 1 : 1.75, with out carinae; mesosomal tergites I–VI granular each with a median granular carina, sternites I–IV smooth, sternite V entirely granular and with two pairs of granular carinae, pectinal count 14–15; metasoma about five times as long as carapace, all segments carinated, dorsals weakly dentiform on II–III, laterals granular on III–IV, segment V slightly longer than carapace, telson shorter than carapace or segment V, vesicle as long as segment IV, smooth, with sub-acular nodule with a pair of denticles on inner margin; males with more robust manus and some times granular, 'A' type trichobothria with β pattern on femora. Sting with triangular sub-aculear spine.

Habits and habitats : Normally found under small stones and boulders and rarely under loose barks of large trees of different forest plant species at 5 to 6' height. Nothing known about its toxicity and toxin.

Material examined : 4 ♀ ♀, 4 ♂ ♂; representing about 5% of collections and this species being reported for the first time from Reserve area. Coll. Dr. D.B. Bastawade, Masundi and around, Dt. 20.09.1996, Reg. No. I/2622; Jawahar kund, Nr. Semadoh, Dt. 11.09.1996, Reg. No. I/2620; Coll. Dr. M.S. Pradhan, Dt. 08.02.1999, Reg. No. I/1778; Coll. Dr. S.G. Patil, Dt. 14.02.1993, Reg. No. I/1942 and Coll. S.S. Kamble, Dt.27.11.1994, Reg. No. I/2297.

Distribution : Madhya Pradesh (Gwalior).

Status : Rarely occurring species.

6. *Isometrus (Reddyanus) acanthurus* Pocock

1898. *Isometrus acanthurus* Pocock, J. Bombay nat. Hist. Soc., 12 : 264.

1983. *Isometrus (Reddyanus) acanthurus* : Tikader & Bastwade, Fauna of India : Scorpions, 3 : 299–305.

Common Name : Scorpion.

Local Name : Vinchu (Marathi).

Diagnostic Characters : Body size medium, color yellowish brown but paler on appendages, prosoma variegated yellowish, mesosomal tergites with 5 darker and 4 yellowish bands plus « » marks on lateral portions; carapace coarsely granular, with out carinae, median eyes situated anteriorly in the ratio 1 : 1.9; mesosomal tergites I-Vi closely granular and each with a median granular carina only on posterior portion; pectinal teeth count 16/16; metasoma comparatively more longer about 7 times as long as carapace, dorsal carinae of segments III & IV strongly spined upright on posterior ends, bent forward; pedipalps slender with narrow manus and 'A' type trichobothria of β pattern on femora.

Habits and habitats : Mostly found hiding under the loose barks of various plant species at 6-7' height including particularly the Teak plants in reserve area but on few occasion found under small to medium sized boulders.

Material examined : 5♂♂, Representing 2.9 % of collection, this species being reported for the first time from reserve area. Coll. Dr. D.B. Bastawade, On the way to Chikkadara Nr. Simadoh, Dt. 15.09.1996, Reg. No. I/2614, Makhala and around, Dt. 13.09.1996, Reg. No. I/2616, Pipalpada and around, Dt. 16.09.1996, Reg. No. I/2627.

Distribution : Maharashtra (Pune and Raigad).

Status : Rarely occurring species.

Family ISCHNURIDAE

Subfamily ISCHNURINAE

Genus *Hormurus* Thorell

7. *Hormurus nigripes* Pocock

1897. *Hormurus nigripes* Pocock, J. Bombay nat. Hist. Soc., 11 : 117.

1983. *Hormurus nigripes* : Tikader & Bastwade, Fauna of India, Scorpions, 3 : 506–611.

Common Name : Scorpion.

Local Name : Vinchu (Marathi).

Diagnostic Characters : Body size medium up to 40 mm long, smooth, finely punctate,

color dark brown to blackish except yellow telson; carapace entirely smooth and finely punctate, median eyes anteriorly situated in the ratio 1 : 1.5; mesosoma all tergites smooth, finely punctate, middle portion slightly elevated; metasoma short, about twice as long as carapace and too weak, inferior carinae with few granules on segment I & II, irregularly granular inferior laterals and inferior carinae on IV & V; pedipalps enlarged on manus always longer than wide with 'C' type trichobothria with only 3 ventrals on patellae, pectinal teeth count only 6/6.

Habits and habitats : Normally lives in self made burrows in soft soil, occasionally traced through loose soil under stones. Nothing known about its toxin and toxicity.

Material examined : 1♂, 2♀, representing only 2.15 % of collection. Coll. Dr. D.B. Bastawade, 50 Kms E 'O' Simadoh on Paratwada Rd., Dt. 12.09.1996, Reg. No. I/2618; Coll. Dr. S.G. Patil, Jawaharkund, Sipna R. Nr. Semadoh, Dt. 11.02.1993, Reg. No. I/1938; Coll. S.S. Kmble, Kawapati, Chadupada, Dt.17.11.1994, Reg. No. I/2296.

Distribution : Gujarat (Panch Mahal) and Rajasthan (Udaipur).

Status : Not a common species, needs confirmations from different places.

Family SCORPIONIAE

Sub-family SCORPIONINAE

Genus *Heterometrus* Hemp. & Ehren

Subgenus *Chersonesometrus* Counzijn

8. *Heterometrus (Chersonesometrus) fulvipes* (Koch)

1838. *Palamnaeus fulvipes* C. Koch, *Arachn.*, 4 : 45.

1900. *Palamnaeus fulvipes bengalensis* : Pocock, *Fauna Brit. India: Arachnida* : 89.

1983. *Heterometrus (Chersonesometrus) fulvipes* : Tikader & Bastwade, *Fauna of India, Scorpions*, 3 : 599-603.

Common Name : Black Scorpion.

Local Name : Ingali (Marathi), Kakada Bichhi (Bangali).

Diagnostic Characters : Large scorpion, body measuring up to 90 mm in length, colour dark black except telson and legs, carapace smooth to weakly granular, deeply notched on middle of anterior margin, median eyes situated anteriorly in the ratio 1 : 1.2; mesosomal tergites weakly granular on lateral margins otherwise smooth, metasoma stout and strong, three and a half times as long as carapace, all segments strongly carinated and inferior laterals on V more serrated on posterior 1/3 portion, anal rim also serrated, with robust telson, vesicle as long as IV segment, having strongly curved sharp aculeus; pedipalps exceptionally large, expanded on manus and dorsal surface convexed with few larger granules, 'C' type trichobothria with 3 Ventrals on patellae. Pectines well developed,

yellow and teeth count 13/13. spine formulae for tarsomeres II for Legs I–IV : 3/5 3/5, 3/5 3/5, 4/5 4/5 and 4/6 4/6.

Habits and habitats : Truly burrowing species, prepares tunnels up to 10-11" deep in soft loose soil, prefers support of large to medium sized boulders on hill side slopes. Active burrow making during pre and post monsoon seasons.

Material examined : 12 ♀ ♀, 2 ♂ ♂ and 8 Ys.; representing about 15.6 % of collection. Coll. Dr. D. B. Bastawade, 13 Kms Northwest 'O' Chikkalsara, Dt.15.09.1996, Reg. No. I/2613, Makhal and around, Dt.13.09.1996, Reg. No. I/2616 Coll. Dr. P.P. Kulkarni, 5 Kms 'O' Hatru on Raipur Rd. Dt.30.08.1993, Reg. No. I/2337, Chopan, Chourahkund, Dt. 26.08.1993, Reg. No. I/2335.

Distribution : Rajasthan (Ajmer), Gujarat (Panch Mahal and Kathiawar), Maharashtra (Nasik, Chandrapur, Jalgaon, Raigad and Thane).

Status : Fairly good occurring species.

Order SOLIFUGAE

Family GALEODIDAE

Genus *Galeodes* Olivier

9. *Galeodes indicus* Pocock

1895. *Galeodes fatalis* Pocock, J. Bombay nat. Hist. Soc., 9 : 441.

1900. *Galeodes indicus* : Pocock, Faun, British India, Arachnid : 142-143.

Common Name : Sun/Wind Spiders.

Local Name : Not available.

Diagnostic Characters : Body size medium, color invariably yellow, body surface clothed with fine long silky hair, mostly mistaken as spider. Legs exceptionally longer, thinner and IV with thin membranous structure called *malleolus*. Chelicerae exceptionally robust and strong (largest chelicerae in invertebrates) most actively operative and strongly dentate. Palps thin and elongate, non-chelate but strongly spined on ventral portions. Carapace (Prosoma) truncated on anteriormargin, with a pair of median eyes. Abdomen leathery, sternite I modified into genital organ, sternite V with *Ctinidia* in males, anal segment small exceeding up to upper edge.

Habits and habitats : Truly nocturnal in habit, vigorous and voracious feeders; normally inhabit in drier and remote areas.

Material examined : 2 ♀ ♀; Coll. Dr. M.S. Pradhan, Hill nr. Kusumbhat on Dhakna-Dharni Rd., Dt. 19.02.1992, Reg. No. I/1773, Coll. S.S. Kamble, Highest point on Kepau Rd., Dt. 26.11.194, Reg. No. I/2306.

Distribution : Uttar Pradesh (Gaya), Madhya Pradesh (Gwalior and Bilaspur (Type-locality)) and Maharashtra (Thana).

Status : Rarely occurring species, reported for first time from Reserve area.

SUMMARY

The total area of Melghat Tiger Reserve was surveyed by different parties of Zoological Survey of India, Western Regional Station, Pune in different seasons of the year during 1991 to 1997. The total zoological collections available were 14000 (appr.) in number and out of which 6000 (appr.) were the vertebrate and 8000 (appr.) were the invertebrates. Arachnids are represented by about 500 (appr.) in number, amongst 143 were the Scorpions. The present observations are based on these collections, which constitute 8 species belonging to 3 families. Family Buthidae appears to be most common and exhibit a wide range of distribution in varied habitats, representing 6 species out of 8 so far reported here, further the species of the Genus *Isometrus* among Buthids seem to be most commonly found in reserve area and represented by 3 species. Whereas the Family Ischnuridae and the Family Scorpionidae are seen distributed at few limited localities and in particular soil texture, burrowing on open ground or with the shelter of fixed stones and logs throughout the forested areas. Interestingly the existence was noticed in the case of two Buthid species namely *Mesobuthus tamulus tamulus* (Fabr.) and *Stenochirus politus* (Pocock) the latter being reported for the first time from reserve area and in the state Maharashtra.

REFERENCES

- POCOCK, R.I. 1900. *Fauna of British India, Arachnida*, London, : 1-279.
- TIKADER, B.K. and D.B. BASTAWADE, 1983. *Fauna of India, Scorpions*, 3 : 1-673.

ARACHNIDA : ARANEAE (SPIDERS)

D.B. BASTAWADE

Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044

INTRODUCTION

The Araneae (Spiders) fauna of Indian subcontinent has received comparatively more attention than any other arachnid groups known, still remains to be worked out on large scale from this area. The systematic studies of faunal diversity of this region had begun during British regime and naturalists like Ferguson(1906), Pocock (1900) and Gravely (1910-1925) and others have contributed much of the information on invertebrate fauna especially the arachnids. Such work was then followed and continued by exceptional scientists and workers like Tikader (1960-89), Patel (1963-2004), Sadana (1973-2000), Biswas (1975-2004), Gajbe (1973-2004) and Malhotra (1975-1986), who described many new species and revised some of the families reported from India. Unfortunately the gaps still persist for particular information for conservation areas such as Melghat. The present efforts are to substantiate towards filling up some of the gaps exist as far as Arachnida fauna is concerned from the area of Melghat Tiger Reserve, Dist. Amaravati, Maharashtra.

INVENTORY OF THE SPECIES

Family ARANEIDAE

1. *Nephila maculata* (Fabr.)
2. *Neoscona mukerjei* Tikader
3. *Neoscona theis* (Walck.)
4. *Neoscona laglaizei* (Simon)
5. *Leucauge decorata* (Blakw.)

Family LYCOSIDAE

6. *Hippasa olivacea* (Thorell)
7. *Arctosa himalayensis* Tikader and Malhotra

8. *Lycosa lambai* Tikader and Malhotra
9. *Arctosa* sp.
10. *Evipa* sp.
Family TETRAGNATHIDAE
11. *Tetragnatha mandibulata* Walckenaer
Family ERESIDAE
12. *Stegodyphus mirandus* Pocock
Family PHOLCIDAE
13. *Pholcus phalangioides* (Fuesslin)
Family THERIDIIDAE
14. *Theridion indica* Tikader
Family PALPIMANIDAE
15. *Palpimanus vultuosus* Simon
Family OONOPIDAE
16. *Triaeris melghaticus* sp.n.
Family CLUBIONIDAE
17. *Oedignatha* sp.
Family HETEROPODAE
18. *Heteropoda/Olios* sp.
19. *Spariolenus* sp.
Family HERSILIDAE
20. *Hersilia* sp./*Tama* sp.
Family SCYTODIDAE
21. *Scytodes* sp.
Family THOMISIDAE
22. *Xysticus* sp.
Family GNAPHOSIDAE
23. *Nodocion* sp.
Family OXYOPIDAE
24. *Oxyopes/Peucilis* sp.
Family SALTICIDAE
25. *Salticus/Marpissa* sp.

SYSTEMATIC ACCOUNT

Order ARENEAE

Family ARANEIDAE

Genus *Nephila* Leach1. *Nephila maculata* (Fabricius)1793. *Aranea maculata* Fabricius, *Ent. Syst.*, 2 : 425.1900. *Nephila maculata* : Pocock, *Fauna Brit, India, Arachn.*, : 217.1982. *Nephila maculata* : Tikader, *Fauna of India, Spiders (Araneidae)*, 2(1) : 97-99.*Common Name* : Giant Wood Spider*Local Name* : Koli (Marathi), Makadi (Hindi).

Diagnostic Characters : Large spiders, body size range from 35 to 45 mm. Males comparatively smaller in body size and also differ in colour pattern and never found to spin webs but hang around the female in variable numbers; cephalothorax longer than wide, slightly narrowed in front, cephalic region higher than thoracic region and provided with a pair of short, sharp tubercles posteriorly, thoracic area rather flat with deep circular median fovea, ocular quad nearly as long as wide slightly narrowed in front; chelicerae strong and stout, dark brown in colour with prominent boss at the base; abdomen long and cylindrical, dorsum with pair of mid-longitudinal yellow lines, epigyne heavily sclerotized with transeverse concave groove with a distinct ridge anteriorly, internal genitalia with a pair of round spermathecae with coiled duct posteriorly, opening in posteriorly placed groove. Two colour variants seen in this area and differ in having colors on legs, one variety bears dark black legs where as the other has light to dark brown legs.

Habits and habitats : Inhabiting wooded and forest area of Indian subcontinent, females spin enormously large individual webs of much sticky threads and sit at center of the web, normally head positioned towards ground, spins large sticky webs between adjacent large trees and patiently waits for prey, generally feeds on medium to large bodied insects such as Dragon flies and grass hoppers and sometimes smaller bird caught in to the nests. Many males are always noticed on the periphery of the web, are very small and comparatively light orange-red in colour. Their bite is not fatal but portion remains painful and swollen for 6-8 hrs.

Material examined : 17 ♀ ♀, 12 ♂ ♂. Coll. Dr. D.B. Bastawade, Nr. Kolkaz on Dharni Rd., Dt.14.09.1996, Reg. No. I/2630, 30 Kms. E'o' Semadoh on Paratwada Rd., Dt.12.09.1996, Reg. No. I/2632, Dhakna to Kotku via Bakun-Bori, Dt.25 & 26.09.1996, Reg/ No. I/2631, Pipapada and around, Dt.16.09.1996, Reg. No. I/2529; Coll. Dr. P.P. Kulkarni, Malur Village, Chaurakund, Dt. 28.08.1993, Reg. No. I/2328, Kolkaz, Dt. 07.09.1993, Reg. No. I/2325 and Hartu- Raipur Rd., Dt.30.08.1993, Reg. No. I/2330; Coll. S.S. Kamble, Kawapati, Chhadarpada, Dt.17.11.1994, Reg. No. I/ 2299.

Distribution : India : Forested areas of Uttaranchal, Uttar Pradesh, Madhya Pradesh, Bihar, Chhatisgarh, West Bengal, Sikkim, Entire North Eastern states, Maharashtra, Goa, Karnataka, Tamil Nadu, Kerala and Andaman and Nicobar.

Elsewhere : Sri Lanka; Myanmar; Malaysia; China; Australia; Japan And New Guinea.

Genus *Neoscona* Simon

2. *Neoscona mukerjei* Tikader

1980. *Neoscona mukerjei* Tikader, *Proc. Indian Acad. Sci.*, **89**(3) : 247.

1981. *Nephila mukerje* : Tikader, *Fauna of India, Spiders (Araneidae)*, **2**(1) : 248-253.

Common Name : Spider

Local Name : Koli (Marathi), Makadi (Hindi).

Diagnostic Characters : Small spiders of body size 8-12 mm., carapace longer than wide, narrowed in front, cephalic region with conspicuous 'V' shaped dark brown patch, thoracic with deep longitudinal groove, anterior median eyes slightly larger than posterior medians, lateral eyes placed closer to each other, both rows recurved and ocular quadrangle wider in front; chelicerae strong, yellowish with moderate boss; abdomen sub-triangular, longer than wide, tapering posteriorly, dorsum with a club shaped greyish white patch, arranged longitudinally, 5 pairs of sigilla prominent mid-dorsally, epigynum provided with a moderately long scape with a deep constriction and a pair of indistinct lateral lobes.

Habits and habitats : Mostly observed to spin a thin threaded small sized radial geometric webs through tall grasses and bushes. When disturbed drops down at once to avoid predation. There is tremendous color variation specially the color pattern on dorsal portion of abdomen, 18 colour variations have been reported by Tikader (1982).

Material examined : 3 ♀ ♀, 1 ♂. Coll. Dr. D.B. Bastawade, Chikkaldara and around, Dt. 22.09.1996, Reg. No. I/2630, Coll. Dr. M.S. Pradhan, Dt. 19.02.1992, Reg. No. I/1713; Coll. Dr. P.P. Kulkarni, Dt. 28.08.1993, Reg. No. I/2328.

Distribution : Through out Indian subcontinent.

3. *Neoscona theis* (Walckenaer)

1841. *Epeira theis* Walckenaer, *Hist. nat. Ins. Apt.*, **2** : 53.

1904. *Neoscona theis* : F. O. P. Cambridge, *Biologia. Oent. am. Aran.*, **2** : 470.

1982. *Neoscona theis* : Tikader, *Fauna of India, Spiders, (Araneidae)*, **2**(1) : 269-271.

Common Name : Spider.

Local Name : Koli (Marathi), Makadi (Hindi).

Diagnostic Characters : Body size smaller 8-10 mm; carapace longer than wide, narrowing

in front, with a pair of lateral and a median longitudinal dark brown bands, thoracic region with a distinct longitudinal median groove, ocular quad longer than wide and wider in front than behind; chelicerae strong, stout, brown and with prominent boss; abdomen sub-oval, longer than wide, with a conspicuous mid-longitudinal chalk white bar having four pairs of lateral projections and guarded by deep brown or black patches. Epigyne with prominent black rim with a constriction at the middle and a pair of lateral lobes, internal genitalia with a pair of rolled pouched spermathecae distally opening at the constriction.

Habits and habitats : This inhabits through deciduous forest areas and found to prepare web with the support of 2-3 adjacent thin twigs. Prepares smaller snares along with rolling of small to medium size leaves at centric or eccentric place of the web, web may be at considerable height above ground level. It becomes difficult to notice and collect these spiders from such nest in collection fields. Preys on smaller insects and other invertebrates entangle in the web.

Material examined : 2 ♀♀ Coll. Dr. D.B. Bastawade, Near Kolkaz, on Dharni Rd., Dt. 14.09.1996, Reg. No. I/2630; Coll. S.S. Kamble, Kawapati, Nr. Dhaddarpada, Dt. 17.11.1994, Reg. No. I/2299.

Distribution : Maharashtra (Pune), Gujarat, Orissa and West Bengal.

Elsewhere : South New Guinea and China to Pacific Islands.

4. *Neoscona laglaizei* (Simon)

1977. *Epeira laglaizei* Simon, *Annls. Soc. ent. Fr.*, 7(5) : 77.

1900. *Araneus laglaizei* : Pocock, *Fauna Brit. India, Arachn.*, : 224.

1981. *Neoscona laglaizei* : Tikader, *Fauna of India (Araneidae)*, 2(1) : 263-265.

Common Name : Spider.

Local Name : Koli (Marathi), Makadi (Hindi).

Diagnostic Characters : Body 8-10 mm in length, body colour yellowish grey, cephalothorax longer than wide narrowing in front, ocular quad as long as wide and provided with an elevation, medians same in size, lateral close to each other and placed on tubercle; chelicerae moderately strong with medium sized boss at the base; abdomen tapering and pointed posteriorly with 2 pairs of light coloured bands in middle, epigyne with short broad scape directed upwards distally and with a pair of elongated dark spots at the basal rounded portion, internal genitalia with a pair of double rounded spermathecae without clear ductular openings.

Habits and habitats : Prepares smaller snares along with rolling of small to medium size leaves at centric or eccentric place of the web and hides in rolling of the leaf, web may be at considerable height from ground level. It becomes difficult to notice and collect

these spiders from such nest in fields. Preys on smaller insects and other invertebrates entangle in to net. Many times seen along with other species of *Neoscona*.

Material examined : 4 ♀♀ Coll. Dr. D.B. Bastawade, Near Kolkaz, on Dharani Rd., Dt. 14.09.1996, Reg. No. I/2630; Coll. Dr. M.S. Pradhan, Bitkaripani, Pipalpada, Dt. 05.02.1992, Reg. No. I/1768; Coll. Dr. A.S. Mahabal, Karan Bamboopili area, Dt. 19.02.1997, Reg. No. I/2787.

Distribution : India : Tamil Nadu (Ootacamund).

Elsewhere : Sri Lanka : Perandeniya, Trincomali, Myanmar : Tounghnoo. Tharrawaddy, Rangoon, Tenasser, Java, Indo–Australia–Malayasia Region and China to Philippines, New Guinea.

Genus *Leucauge* White

5. *Leucauge decorata* (Blackwall)

1864. *Tetragnatha decorata* Blackwall, *Ann. Mag. nat. Hist.*, 14 (3) : 44.

1900. *Argyropeira celebesiana* : Pocock, *Fauna Brit. India, Arachn.*, : 216.

1921. *Leucauge decorata* : Gravely, *Rec. Indian Mus.*, 22(4) : 454.

1983. *Leucauge decorata* : Tikader, *Fauna of India, Spiders (Aranene)*, 2(1) : 79-80.

Common Name : Spider.

Local Name : Koli (Marathi), Makadi (Hindi).

Diagnostic Characters : Body 9-12 mm in length; carapace longer than wide, cephalic region slightly higher than thoracic region and provided with deep trifold median groove, ocular quad slightly wider than long, median eyes sub-equal in size and laterals slightly smaller than medians, both rows of eyes recurved; chelicerae large, stout, yellowish with small boss; abdomen elongated and not much pointed posteriorly and bent upwards, with a pair prominent anterior lateral humps, body colour yellowish on cephalothorax and legs with greenish shades on legs, abdomen silvery white with blackish patches and lines of light coloured bands, female epigynum plate like having a thin semilunar rim anteriorly and internal genitalia with pair of obliquely placed roughly rounded spermathecae opening posteriorly with short ducts on posterior portion.

Habits and habitats : These spiders prepare Two tier nests (webs) upper tier remains of very much irregular mesh of web thread, whereas the second tier is dome shaped and prepared below the first, where the individual spider remain in an inverted position. Generally females are seen to occupy such nests along with chain of their star shaped flat, dirty gray coloured egg cocoon attached to web tread on one side.

Material examined : 4 ♀♀ Coll. Dr. P.P. Kulkarni, Malur Village, Chaurkund, Dt. 28.08.1993, Reg. No. I/2328; Coll. Dr. S.G. Patil, Semadoh and around, Dt. 15.02.1993,

Reg. No. 1772; Dr. D.B. Bastawade, 30 Kms, E 'o' semadoh on Paratwada Rd., Dt. 12.09.1996, Reg. No. I/2632.

Distribution : India : Kerala (Cochin), Tamil Nadu (Chingleput), Pondecheri, Karnataka (Banglore), Maharashtra (Pune), Gujarat, Orissa, West Bengal (Darjeeling, Kalimpong), Assam, Meghalaya (Shillong), Bihar, Sikkim, Uttaranchal (Dehra Dun).

Elsewhere : Sri Lanka (Colombo and Peradeniya); Myanmar (Maymyo); Pakistan (Rawalpindi).

Family TETRAGNATHIDAE

Genus *Tetragnatha* Latreille

6. *Tetragnatha mandibulata* Walckenaer

1837. *Tetragnatha mandibulata* Walckenaer, *Ins. Apt.*, 2 : 211.

1897. *Tetragnatha mandibulata* : Pocock, *Fauna Brit. India, Arachn.*, : 215.

1977. *Tetragnatha mandibulata* : Tikader, *Rec. zool. Surv. India*, 75 : 153-212.

Common Name : Spider.

Local Name : Koli (Marathi), Makadi (Hindi).

Diagnostic Characters : Body shape narrow more elongated, about 12-15 mm long, yellowish to dark yellowish with greenish tinge and one or two pairs of whitish stripes dorsal surface of abdomen, legs exceptionally long as compared to the body; carapace flat and narrowed anteriorly with truncated margin, eyes in two slightly procurved rows; chelicerae large and exceptionally long with large teeth and longer fangs; male palp with exposed round cymbium, female genitalia simple with tubular epigynum.

Habits and habitats : Normally found in the vicinity of water bodies and streams, prepare radially symmetrical delicate webs, just about 2' to 3' above water surface between available supports, feed on smaller insects visiting the streams or aquatic bodies which entangle in to the webs.

Material examined : 3 ♀ ♀, 2 ♂ ♂. Coll. Dr. P.P. Kulkarni, Malur Village, Chaurakund, Dt. 28.08.1993, Reg. No. I/2328; Coll. S.S. Kamble, Near Deval Ghat, Rangubeli, Dt. 29.11.1994, Reg. No. I/2302.

Distribution : Almost throughout Indian sub-continent.

Family LYCOSIDAE

Genus *Lycosa* Latriella

7. *Lycosa lambai* Tikader and Malhotra

1980. *Lycosa lambai* Tikader and Malhotra, *Fauna of India, Spiders (Lycosidae)*, 1(2) : 431-433.

Common Name : Wolf spiders.

Local name : Landaga Koli (Marathi), Makadi (Hindi).

Diagnostic characters : Hunting spider of body 18-22 mm long; cephalothorax longer than wide, narrowed anteriorly and dark black, a distinct fovea on thoracic region, ocular quad narrow but wider behind, dark brown patches at the base of cephalothorax, tibiae of all legs with pair of brown longitudinal streaks at pro and retro lateral extremities. Female epigyne with a pair of elliptical spermathecae, darker at the base. Male unknown.

Material examined : 1 ♀ Coll. Dr. M.S. Pradhan, Panjubeli, Kolkaz, Dt. 13.02.1992, Reg. No. I/1766.

Distribution : Maharashtra (Ratnagiri).

Genus *Hippasa* Simon

8. *Hippasa olivacea* (Thorell)

1887. *Dipontia olivacea* Thorell, *Ann. Mus. civ. Stor. nat. Genova*, 5(2) : 297.

1895. *Hippasa olivacea* : Thorell, *Spiders of Burma*, : 217.

1924. *Hippasa olivacea* : Gravely, *Rec. Indian Mus.*, 26 : 593.

1980. *Hippasa olivecea* : Tikader & Malhotra, *Fauna of India, Spiders, (Lycosidae)*, 1(2) : 283-5.

Common Name : Wolf spider.

Local name : Landaga koli (Marathi), Makadi (Hindi).

Diagnostic characters : Body size 10 -15 mm long, brownish green in colour, cephalothorax with distinct central fovea with thin but conspicuous brown bands extend for middle to the sides. Chelicerae strong, inner margin of fang with 3 teeth. Abdomen longer, tapering posteriorly with dorsal alternate dark and pale greenish patches. Epigyne simple with a median plate and lateral cellular looped spermathecae.

Habits and habitats : Specimens were collected near by water bodies and streams.

Material examined : 2 ♀ ♀, 1 ♀ y. Coll. Dr. M.S. Pradhan, Bitkaripani, Pipalpada,, Dt. 05.02.1992, Reg. No. I/1768; Coll. Dr. S.G. Patil, Kolkaz, Dt. 13.02.1993, Reg. No. I/1948.

Distribution : India : ???

Elsewhere : Myanmar.

Genus *Arctosa* Koch

9. *Arctosa himalayensis* Tikader and Malhotra

1980. *Arctosa himalayensis* Tikader and Malhotra, *Fauna of India, Spiders, (Lycosidae)*, 1(2) : 369-371.

Common Name : Wolf spider.

Local name : Landaga koli (Marathi), Makadi (Hindi).

Diagnostic characters : Body size 9-11 mm in length, cephalothorax and legs brown, abdomen greenish brown with paler spots with longitudinal lens shaped markings, ventral portion of leg femora with out any patch or band, female epygine with central axe shaped plate, darker on lateral portions.

Material examined : 2 ♀ ♀, Coll. Dr. S.G. Patil, Chadelupati, Dt. 14.02.1994, Reg. No. I/1947; Coll. S.S. Kamble, Somthan, Akot, Dt. 08.11.1994, Reg. No. I/2304.

Distribution : India : Uttaranchal (Dehradun).

Family ERESIDAE

Genus *Stegodyphus* Simon

10. *Stegodyphus mirandus* Pocock

1899. *Stegodyphus mirandus* Pocock, Jr. *Bombay nat. Hist. Soc.*, 12 : 750.

1987. *Stegodyphus mirandus* : Tikader, *Handbook of Indian spiders* : 150-151.

Common Name : Social spider.

Local name : Koli (Marathi), Makadi (Hindi).

Diagnostic characters : Male body size 18-22 mm long, robust body, legs short and stout, body colour uniformly greyish black, except bright yellowish red on tibiae, tarsi and metatarsi of legs II-IV (Pocock 1900); cephalothorax longer than wide, cephalic region raised, eyes placed in two rows, anterior row slightly procurved where as posterior row recurved, lateral eyes placed away from medians, ocular quadrangle almost quarrish. Female larger than male and 25-30 mm long, abdomen bronze-black above and rich golden red on sides, spinnerets black with large cribellum.

Habits and habitats : Social spiders, 10 to 100 individuals live in a common nest of thickly woven bunch of sticky threads, bundled along with few to many leaves and twigs of various trees, the nest is channeled with many irregular passages through which the individuals move and keep in contact with each other. The main nest is supported time to time with sparsely spread out sheet of web for getting increased chances of prey. Such nest are preferably prepared at the height of 5 -10' above the ground level. The mature and gravid females leave the parent nest for proliferation and prepare new nests close or near to the parent nest. There seems to be no division of labour or any ratio maintained for males and females.

Material examined : 2 ♂ ♂, Coll. Dr. P.P. Kulkaeni, Charakund, Choppan Rd., Dt. 25.08.1993, Reg. No. I/2326(1 ♂), and Dhargad near Rest House, Dt. 21.08.1993, Regi. No. I/2332 (1 ♂).

Distribution : India : Maharashtra (Bhandup, Thane, Mumbai; Uran, Raigad and Pune).

Family PHOLCIDAE

Genus *Pholcus* Walckenaer11. *Pholcus phalangioides* (Fusselin)

1775. *Pholcus phalangioides* Fuesslin, *nebst der Ankdg. Ein. Neu. Inst. Werk*, : 9

1987. *Pholcus phalangioides* : Tikader, *Handbook of Indian Spiders*, : 170-171.

Common Name : Long bodied cellar spiders.

Local name : Koli (Marathi), Makadi (Hindi).

Diagnostic characters : Body elongated, thin delicate and about 8 - 12 mm in length, greyish green in colour, abdomen smooth, shining, narrow and elongated, legs very long and thin, delicate as compared to body, these spiders prepare smaller, irregular snares and remain at the center in an inverted position and female typically carries the egg sac in its chelicerae. Their webs are used by gallmidges as resting places.

Habits and habitats : Occupies dark corners of remote vacant houses and buildings, hallow tree trunks, medium to smaller size pits through the side cuttings of rocks and out crops, prepares smaller snares, can easily be pointed out by the presence of numerous tiny whitish gall midges, resting on their web threads (Sharma and Bastawade 2002). Spider usually occupies the center of the snare, vigorously vibrates if disturbed, otherwise difficult to notice the occupant.

Material examined : 7 ♀ ♀, 2 ♂ ♂. Coll. Dr. D.B. Bastawade, Jawahar Kund and around, Dt. 11.09.1996, Reg. No. I/2692; Chikaldara and around, Dt. 22.09.1996, Reg. No. I/2635 and Dhakna, Dt. 25.09.1996, Reg. No. I/2631.

Distribution : Almost through out Indian sub-continent.

Elsewhere : Sri Lanka, Burma, Bangladesh and Pakistan.

Family THERIDIIDAE

Genus *Theridion* Walckenaer12. *Theridion indica* Tikader

1977. *Theridion indica* Tikader, *Rec. zool. Surv. India*, 72 : 168.

1987. *Theridion indica* : Tikader, *Handbook of Indian Spiders*, 210-213.

Common Name : Comb-footed spiders.

Local name : Koli. (Marathi), Makadi (Hindi).

Diagnostic characters : Small spiders body size ranging from 4-6 mm in length, characteristically globular on abdomen, coloured with regular admixture of chalk white and brownish green patches on mid dorsal and lateral sides, uniformly light brownish red

on ventral portion, carapace narrowed in front, eyes placed close and ocular quadrangle almost rectangular; prepares small irregular snares among rubbles, under smaller stones and bricks and in darker corners of walls; males smaller than females but almost same colour pattern on abdomen.

Habits and habitats : Prepares smaller snares in the wall corners of houses, under stone, rubbles, bricks and wooden logs etc., feeds on smaller insects. Male and female stay together, female lays brownish egg sacs and remains near to sacs, subsequent egg sacs may be laid before hatching of the first one. Common intruder of human habitations, transported through human activities and agencies.

Material examined : 2 ♀ ♀, Coll. D. B. Bastawade, Semadoh, Nr. Forest R/H, Dt.12.09.1996, Reg. No. I/2632; Coll. Dr. D.F. Shingh, Dhakna Rest House, Dt. 16.02.1991, Reg. No. I/1517.

Distribution : Through out India including Andaman and Nicobar Islands.

Family PALPIMANIDAE

Genus *Palpimanus* Dufour

13. *Palpimanus vultuosus* Simon

1895. *Palpimanus vultuosus* Simon, *Bull. Mus. Paris*, 1(2) : 289-297.

1981. *Palpimanus vultuosus* : Platnick, *Bull. Br. arachnol. Soc.*, 5(4) : 169-173.

1987. *Palpimanus vultuosus* : Tikader, *Handbook of Indian spiders*, : 166-107.

Common Name : Spiders.

Local name : Koli (Marathi), Makadi (Hindi)

Diagnostic characters : Reddish to dark reddish with brownish tinge on body, ranges between 8-10 mm in length, I pair of legs characteristically enlarged, robust with thick prolateral scopula on distal segments. Scutum present on anterior portion of abdomen, female genitalia typically with paired membranous sacs associated with basal plate and male palpi with out haematodochae. Slow moving spiders generally hide under barks of large trees, occasionally seen under stone in monsoon season.

Habits and habitats : Rarely occurring spiders, secretive in nature, inhabit mostly under the barks of large trees like Neem (*Azadirachta indica*), Mango (*Mangifera indica*), Jamun (*Syzgium cumini*), Anjan (*Terminalia formentosa*), Palas (*Butea frondosa*), and rarely on teak wood. During monsoon some times seen under stones and bricks. Slow moving spiders, can easily be collected. No information is available on breeding, developments and feeding habits.

Material examined : 4 ♀ ♀, Coll. Dr. D.B. Bastawade, Chikhadara and around, Dt. 22.09.1996, Reg. No. I/2.35.

Distribution : India : Maharashtra (Sangli, Kolhapur, Satara, Pune, Raigad, Nasik and Nagpur), Andhra Pradesh (Cuddapa), not much information available for other parts of India.

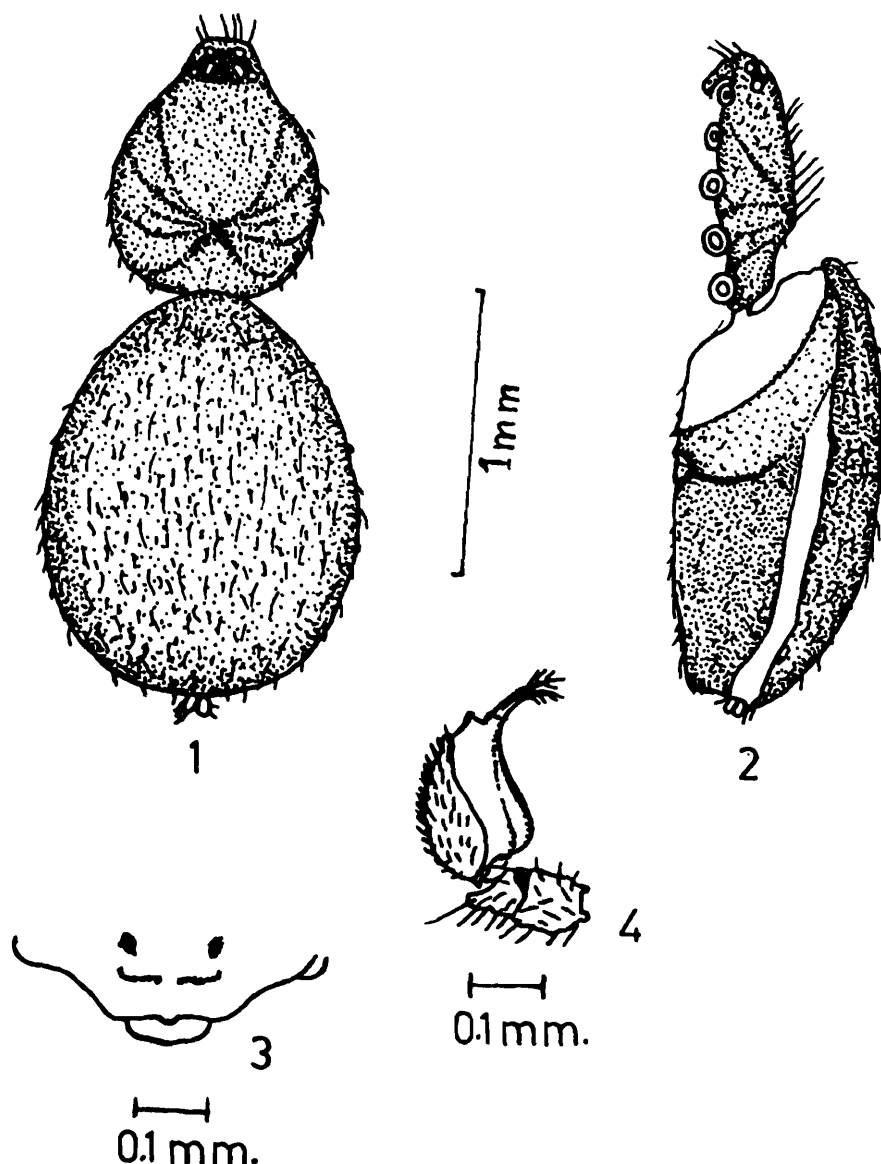
Family OONOPIDAE

Genus *Triaeris* Simon

14. *Triaeris melghaticus* sp. n.

(Figs. 1-4)

General : *Holotype* : Female. Cephalothorax, abdomen and legs reddish brown, covered with short hair on entire body, dorsal and ventral portion covered with scutum.



Figs 1-4 : 1. Dorsal view of female *Triaeris melghaticus* sp. n.; 2. Lateral view of female *Triaeris melghaticus* sp. n.; 3. Ventral view of epigyne of *Triaeris melghaticus* sp. n.; 4. Lateral view of male palp of *Triaeris melghaticus* sp. n.

Measurements (in mm.) : Total length 2.30–2.40; carapace 0.95 long, 0.72 wide; abdomen 1.35–1.45 long and 1.05 wide.

Cephalothorax : Longer than wide, clothed with fine hair except median elevated area, covered with whitish and longer hair (Figs. 1 & 2), narrowed in front, slightly cephalic region slightly raised with black ocular area on anterior portion, provided with six pearly white eyes situated in two rows, posteriors slightly procurved with medians elliptical longitudinally and larger than others; clypeus moderate, anterior margin provided with 5-6 spine like hair; sternum heart shaped and pointed anteriorly, clothed with fine short hair; chelicerae smaller and delicate, fang furrow armed with minute teeth; palps simple and modified in male with forked and hairy terminal spine like apophysis for transfer of spermatides (Fig. 4).

Abdomen : Longer than wide, almost elliptical, slightly narrowed anteriorly and overlapping the posterior portion of cephalothorax, covered dorso-ventrally with thicker scutum except lateral narrow stripe and posterior spinnerets, clothed with fine stout shorter brown hair (Fig. 2); epygine simple with a medium plate like structure (Fig. 3).

Type Data : *Holotype* : 1 ♀, *Paratypes* : 6 ♀ ♀, and 3 ♂ ♂, all in 70% rectified spirit.

Type Locality : Salona Masundi and around in Melghat Tiger Reserve, Dist. Amaravati, Maharashtra; Coll. Dr. D.B. Bastawade, Date : 20.ix.1996.

Other material examined : 5 ♀ ♀, 3 ♂ ♂; *Locality* : On the way to Pavani, Pench National Park, Dist. Nagpur, Maharashtra; Coll. Dr. D.B. Bastawade, Date : 26.ix.1997.

Discussions : This species closely resembles with *Triaeris nagpurensis* Tikader and Malhotra (1974) but it differs 1. Total body size much larger than *Triaeris nagpurensis*. 2. Cephalic region not as high as in *Triaeris nagpurensis*. 3. Ocular quad much more wider than in *Triaeris nagpurensis*. 4. Epygine structurally different. 5. Structure of male palp also different in having a forked hairy spine where as single simple hairless spine in *Triaeris nagpurensis*.

Etymology : Name of locality of Tiger reserve 'Melghat' with suffix -*cus melghaticus*.

Habits and habitats : Tiny red spiders prefer to stay under smaller tree barks of large trees like Mango (*Mangifera indica*), Jamun (*Sizygium cumini*), Jack-fruit (*Artocarpus integrifolia*), Neem (*Azadirachta indica*), Kusum, Anjan (*Terminalia formentosa*), Palas (*Butea frondosa*), Banyan (*Ficus bengalensis*) and Peepal (*Ficus religiosa*) etc. These spiders are found with other minute arthropods like Pseudoscorpions, Ants, Coleopteran, Hemipterans and Plant mites etc. Almost nothing is known about their other biological aspects.

Distribution : India : Maharashtra (Pench National Park, Nagpur).

SPIDERS BELONGING TO OTHER FAMILIES

The spiders belonging to the genera *Xysticus* (Thomisidae), *Arctosa*, *Evippa*, *Lycosa*, *Hippasa* (Lycosidae) (remaining species identified up to generic taxa), *Heteropoda*/Olios

and *Spariolenus* (Heteropodidae), *Oedignatha* (Clubionidae), *Hersilia*, *Tama* (Hersilidae) and *Scytodes* (Scytodidae), *Nodocion* (Gnaphosidae), *Oxyopus*, *Peucilis* (Oxyopidae) and (Salticidae) could not be identified up to specific taxa owing to non availability of species keys, concerned literature and collections of only immature specimens. Their identification was possible only up to the generic taxa, have been incorporated for authentic report from this conservation area at present for future guidance and reference.

Few specimens of arachnid order Opiliones (=Phalangida) were available for studies and could be identified only up to sub-family as further identification was not possible due to the want of literature and the revisionary studies of known species described mainly by Roewer (1910-45) from Indian sub-continent and the types have been deposited in various Indian and European Museums.

REFERENCES

- FERGUSON, 1906. *Travancore state Manual I* : 1-160.
- GAJBE, U.A. 1999. Studies on some spiders of the family Oxyopidae (Araneae : Arachnida) from India, *Rec. zool. Surv. India*, Kolkata, **97**(3) : 31-79.
- GRAVELY, F.H. 1921. Some Indian spiders of the sub-family Tetragnathinae, *Rec. Indian Mus. Calcutta*, **22** : 423.
- GRAVELY, F.H. 1922. Common Indian spiders, *J. Bombay nat. Hist. Soc.*, **28** : 1045-50.
- FUESSLIN, J.C. 1775. Verzeichnis der ihm bekannten schweizerischen Insekten mit einer ausgemachten Kupfertafel : *nebst der Ankündigung eines neuen Insekten Werkes*, Zurich and Winterthur, : 62 (Araneae : 60-61).
- MAJUMDAR, S.C. and B.K. TIKADER, 1991. Studies on some spiders of the family Clubionidae from India, *Rec. zool. Surv., Occ. Paper No.*, **102** : 1-173.
- PATEL, B.H. 1973. On some new species of Spiders of family Clubionidae from Gujarat, India, *Proc. Indian Acad. Sci.*, **78**(1) : 1-9.
- POCOCK, R.I. 1900. *Fauna of British India, Arachnida*, : 1-279.
- ROEWER, F.C. 1911 Opiliones aus British India und Sarwak, *Arch. Naturg. Berlin*, **2-3**(11) : 161-188.
- ROEWER, F.C. 1939. On a collection of Indian Opiliones of the Govt. Mus. Madras, *Rec. Indian Mus.*, **41** : 407-408.
- SADANA, G.L. 1974. A new species of Spider a genus *Marpissa* C. L. Koch (Salticidae) from India, *Bull. Br. Arachn. Soc.*, **3**(2) : 49-50.
- SHARMA, R.M. and D.B. BASTAWADE, 2001. Occurrence of gall midges (Diptera : Cecidomyiidae) on webs of spiders (Araneae : Pholcidae), *Bionotes*, **3**(4) : 84.

- TIKADER, B.K. 1980. *Fauna of India Spiders (Araneae : Thomisidae)*, I(1) : 1-247.
- TIKADER, B.K. and M.S. MALHOTRA, 1980 *Fauna of India Spiders (Araneae : Lycosidae)*, 1(2) : 248 : 446.
- TIKADER, B.K. and BIJAN KUMAR BISWAS, 1981. Spider fauna of Calcutta and vicinity, part I, *Rec. Indian Mus., Misc. Paper*, 30 : 1-149.
- TIKADER, B.K. 1982. *Fauna of India, Spiders (Araneae : Araneidae and Gnaphosidae)* 2 (1 & 2) : 1-536.
- TIKADER, B.K. 1987. *Handbook of Indian Spiders*, : 1-251.

FRESHWATER MOLLUSCA

S.G. PATIL

Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044

INTRODUCTION

The Phylum Mollusca includes soft bodied animals which is protected by hard structure called shell. They occurs in various habitats from deep sea, coastal belt and divided into freshwater, marine, esturine and terrestrial. This area was not surveyed earlier hence it was decided to survey the conservation area of Melghat Tiger Reserve, Dist. Amaravati. Out of the seven classes of Mollusca only five classes occur in Indian subcontinent. The publication on Mollusca of Maharashtra by Subba Rao & Mitra (1979) is noteworthy before that many workers attempted to survey Maharashtra, like Annandale and Prasad (1919), Hora (1926), Tonapi and Mulherkar (1963), Tonapi (1971) and Suryarao *et al.* (2002) About the general functions abundance and diversity of species have been given by Subba Rao (1991b) and above the taxonomy by Preoton (1915). Here only two classes of freshwater Mollusca Gastropoda and Bivalvia have been studied. In all 23 species have been reported from this region.

Socio-economic significance

Freshwater Mollusca play significant role in aquatic ecosystem. Already a list of edible Mollusca was published by Subba Rao (1989) and Subba Rao (1993). Many species like *Bellamya bengalensis*; *Pila globosa*, *Lamelliden marginalis* are proved to be food for many aquatic animals as well as man. Some of the Mollusca such as *Lamellidens marginalis*, *L. corrianus* are reported to produce pearls as in some parts of India. Some shells are used for buttons and also help in the manufacture of poultry food.

Some of them are intermediate host for trematode parasites and for spreading several diseases. The list of intermediate host and parasites is also available SubbaRao (1993). Some of them choke the public water distribution system and they are also indicators of pollution.

LIST OF MOLLUSCA

Phylum	MOLLUSCA
Class	GASTROPODA
Subclass	PROSOBRANCHIA
Order	MESOGASTROPODA
Family	VIVIPARIDAE
Subfamily	BELLAMYINAE

Bellamya bengalensis f. typica (Lamarck)

B. bengalensis f. doliaris (Gould)

Family	PILIDAE

Pila globos (Swainson)

P. virens (Lamarck)*

Family	THIARIDAE
Subfamily	THIARINAE

Thiara (Thiara) scabra (Mueller)

Thiara (Tarebia) lineata (Gray)*

T (Melanoides) tuberculata (Mueller)

Subfamily	PALUDOMINAE

Paludomus obesus (Philippi)

Order	BASOMMATOPHORA
Family	LYMNAEIDAE

Lymnaea (Pseudosuccinea) acuminata (Lamarck)

L. (P) luteola (Lamarck)

L. (P) luteola f. australis Annandale and Rao

Family	ANCYLIDAE

Ferrissia verruca (Benson)*

Family	PLANORBIDAE

Indoplanorbis exustus (Deshayes)

Gyraulus convexiusculus (Hutton)

Class	BIVALVIA
Order	UNIONOIDA
Family	UNIONIDAE
Subfamily	UNIONINAE

Lamellidens consobrinus Lea

L. marginalis (Lamarck)

Family AMBLEMIDAE

Parreysia (P) *favidens* (Benson)*

P. (P) annandalei Preston

P. (P) corrugata (Mueller)

P. (P) corrugata laevirostris (Benson)

P. (P) cylindrica Annandale and Prashad*

P. (Rodiatula) caerulea Lea

Order VENEROIDA

Family CORBICULIDAE

Genus *Corbicula* Megerk Von Muchifeld

Cordicula striatella Deshayes

* Not actually collected.

SYSTEMATIC ACCOUNT

Class GASTROPODA

Order MESOGASTROPODA

Family VIVIPARIDAE

Genus *Bellamya* Jousseaume 1886

Bellamya bengalensis f. typica (Lamarck, 1886)

Banded pond snail

1822. *Paludina bengalensis* Lamarck, *Hist. nat. Anim. Sans. Vert.*, 6, 2 : 174.

1921. *Vivipara bengalensis* Annandale, *Rec. Indian Mus.* 22 : 267.

1980. *Vivipara bengalensis* : forma *typica* (Lamarck) Subba Rao, Das and Mitra, *Rec. zool. Surv. India*, 77 : 225, p 1, fig.5.

Material Examined : Amaravati dist., 2 exs., Kolkaj Tapi River, Date 12/5/92, Coll. M.S. Pradhan, 2 exs., Loc. Purna river, Melghat, 15.2.92, Coll. M.S. Pradhan; 2 exs., Kelpani, 17.2.93, Coll. S.G. Patil; 3 exs., Hatida Talav, 22.2.93, Coll. S.G. Patil.

Distribution : India : Maharashtra, Melghat Tiger Reserve, Amaravati dist., Ujani Wetland, Solapur dist. common through out rest of India.

Elsewhere : Bangladesh, Myanmar, Sri Lanka.

Status : Most common through out.

Remarks : There are 11 recognised forms under this species on difference in shell of

which 3 forms found in Maharashtra, Pune dist. This species is used as food in some part of Eastern India.

***Bellamya bengalensis f. doliaris* (Gould, 1943)**

Banded pond snail

1843. *Paludina doliaris* Gould. *Proc. Bost. Soc. Nat. Hist.* 1 : 144.

1921. *Vivipara bengalensis* (Lamarck) Race *doliaris*, Annandale and Sewell, *Rec. Indian Mus.*, 23 : 273-274 pl. fig.9.

Material examined : 2 exs. Hatida Talav, 22.2.93, Coll. S.G. Patil.

Distribution : India : Maharashtra, Melghat, Amaravati dist., Ujani, Solapur dist. Madhya Pradesh, Orissa.

Elsewhere : Myanmar.

Status : Common in Pune, Nasik, Maharashtra; Parts of West Bengal, Orissa, Assam and Madhya Pradesh.

Remarks : It can be separated from *typica* being smaller in size more conical also biangulate at body whorl. It was reported to choke water supply system in Calcutta and Nagpur (Subba Rao, 1993).

Family PILIDAE

Genus *Pila* Roeding, 1798

***Pila globosa* (Swainson)**

1822. *Amullaria globosa* Swainson; *Zool Illustrations* vol. 2 pl. CXIX. Type locality : Rivers of India.

Material examined : 2 exs., Motideo Nala, Tapi river, 19.2.93, Coll. M.S. Pradhan.

Distribution : India : Maharashtra, Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, Orissa and Assam.

Remarks : Many larval trematodes were recorded from this species. These appear to have little less inflated whorl, more conical spine and sub canalculate sutures.

Pila virens* (Lamarck)

1822. *Ampullaria virens* Lamarck, *Hist. nat. anim. Sans. Vert.*, 6(2) : 179. Type locality not mentioned.

1858. *Ampullaria maura* Reeve *Conch Icon.*, 10 *Ampullaria*, sp. no. 57 : pl. xiii, fig. 57.

1925. *Pila virens*, Prashad, *Mem. Indian Mus.* 8 : 75 pl. XIV, fig.13.

This species is variable in its colour. The shape of spire also varies and difficult to separate from its closely related species, *P. globosa*.

Distribution : It is common species in South India, also in Maharashtra. Not found in present collection.

Family THIARIDAE

Subfamily THIARINAE

Genus *Thiara* Roeding, 1986

Thiara (Thiara) scabra (Mueller)

1774. *Buccinum scabrum* Mueller. *Hist. verm Ten Fluv.*, 2 : 136. Type locality Tranquebar.

1850. *Melania acanthica* lea. *Proc. Zool. Soc. Lond.* p.194.

1973. *Thiara (Thiara) scabra* Pace. *Malac Review suppl*, 1 : 52, pl.12, figs.1, 2 pl 13, fig.3.

Material examined : 2 exs., Motideo Nala, 19.3.93, coll. M.S. Pradhan.

Status : Common throughout India.

Distribution : India : Melghat Tiger Reserve, Ujani, Maharashtra. Through out except Kashmir.

Elsewhere : Coasts of Indo-Pacific, from Zanjibar to New Hebrides, North to the Philippines, various Pacific Islands.

**Thiara (Tarebia) lineata* (Gray) 1828

1828. *Helix lineata* Gray, in wood's Index Test supp., : 24, fig. 68. Type locality Ganges.

1915. *Tiara (Tarebia) lineata* Preston, Fauna British India.

Mollusca (Freshwater Gastropoda and Pelecypoda), p.34..

Distribution : India : Maharashtra, West Bengal, Bihar, Madhya Pradesh, Uttar Pradesh, Assam; Bhutan; Myanmar; Sri Lanka.

Remarks : This species often synonymised with *T granifera* Lamarck but easily distinguished from the former by the absence of rows of nodules and presence of distinct dark spiral lines.

Thiara (Melanoides) tuberculata Mueller (1874)

1964. *Nerita tuberculata* Mueller. *Hist. verm Torr Fluv.*, 2 : 191. Type locality Coromandel coast.

1836. *Melania pyramis* Benson. *J. Asiat. Soc. Beng.* 5 : 357, Type locality Ganges.

1969. *Melanoides (Melanoides) peddamunjalensis* Rey and Rey Chowdhuri. *Proc. Zool. Soc. Calcutta*, 22 : 48, p.14, fig.12-17.

Type locality : Peddamunigal, Nagarjunakonda, Nalgonda dist. A.P.

1976. *Melanoides (Melanoides) tuberculatus* : Starmuehler, 1976, *Ann. Natur. Hist. Mus. Wien.*, **80**, 591.

Material examined : 3 exs., Kelpani, Melghat, 29.3.92, Coll. Dr. S.G. Patil.

Distribution : India : Maharashtra, Melghat, Ujani Wetland Solapur, Orissa throughout India except Kashmir, North and South Africa, Eastern Mediterranean countries, South east Asia, Southern China, Malaysia, Malay Archipelago, North Australia, various Pacific Islands and North to Ryukyu Islands of Japan, New Hebrides.

Remarks : Shells are typically narrowly elongate and distinctly sculptured and differ from the shells collected from sandy river beds, rounded whorl, distinctly sculptural with vertical ribs and spiral striae and also with dark brown dots or streaks here and there.

Subfamily PALUDOMINAE

Genus *Paludomus* Swainson 1840

Paludomus (Paludomus) obesus Philippi, 1842

1842. *Melania obesa* Philippi. *Abbild Beshreib conch* 2 : 170, *Melania* pl.4, fig.3. Type locality "Patria Nova Hallandia.

Material examined : 2 ex, Sidhu kund, 24.2.92. Coll. S.G. Patil.

Distribution : India : Maharashtra, Melghat Tiger Reserve, Bombay, Khandala, Ahmednagar and Ratnagiri.

Remarks : Annandale (1919) mentioned it as a widely distributed species. It generally reported from the streams of Western India.

Subclass PULMONATA

Order BASOMMATOPHORA

Family LYMNAEIDAE

Genus *Lymnoca* Lamarck, 1799

Lymnaea (Pseudosuccinea) acuminata f. rufescens Gray 1820

1820. *Limnaea rufescens* Gray, in Sowerby's *Genera of Shells*, 1 : *Lymnaea*, 178, fig.2.

Material examined : 3 exs., Kelpani, 29.3.92, Coll. S.G. Patil; 2 exs., Tapi river, S.G. Patil, 20.2.93, Coll. S.G. Patil.

Distribution : India : Maharashtra, Ujani, Dist. Solapur, Melghat, Amaravati dist. widely distributed in rest of the India.

Elsewhere : Pakistan, Bangladesh, Myanmar.

Remarks : Occur in permanent water bodies with abundant vegetations. It is easily recognised by its thin transparent shell, large inflated body whorl with a short, acuminate spire, aperture widely open, columella twisted.

***Lymnaea (Pseudosuccinea) luteola* Lamarck, 1822**

Freshwater snail

Material examined : 2 exs., Tapi river, 20.2.93, S.G. Patil.

Status : Common throughout India.

Distribution : India : Maharashtra, Melghat Tiger Reserve, Ujani, Solapur.

Elsewhere : Sri Lanka and Myanmar.

Remarks : This species is reported to be very particular about its habitat and is often found in temporary waterbodies. They burry themselves in dormant conditions. It is reported to be a pest to paddy and Azole, Intermediate host for many parasites of live stocks. Producers of biofertilizer in some part of West Bengal Subba Rao (1989). This species can be distinguished from its more ovate shell with narrower aperture and less pointed spine.

***Lymnaea (Pseudosuccinea) luteola f. australis* Annandale and Rao**

1925. *Lymnaea (pseudosuccinea) luteola f. australis* Annandale and Rao. *Rec. Indian Mus.* 27 : 184-185, fig.iv, No. 3.

1943. *Lymnaea (Pseudosuccinea) luteola australis* Ray, *J. Asiat Soc. Beng.* 9 : 64..

Material Examined : 3 exs., Rangubeli, Tapi, 12.2.92. Coll. M.S. Pradhan.

Distribution : India : Maharashtra, Melghat, Amaravati, Pune, Satara, Assam, Bihar, Uttar Pradesh, Punjab, Madhya Pradesh, Karnataka, Kerala, Tamil Nadu.

Elsewhere : Sri Lanka , Myanmar, Bangladesh and Pakistan.

Remarks : A smaller form, spire comparatively longer body whorl well rounded, sutures rather shallow.

Family ANCYLIDAE

***Ferrissia* Walker, 1903**

Ferrissia verruca* (Benson 1855)

1855. *Ancylus verruca* Benson, *Ann. mag. nat. Hist.* (2), 15 : 12. Type locality : Bhimtal Kernaonsem in Palude Prope, Moradabad, nivo Rajhera" Hanlay and Theobald, 1876 *Conch India* Pl.81, fig.2, 3.

1921. *Ancylus (Ferrissia) verruca* Annandale and Prashad, *Rec. Indian Mus.* **22** : 589, Fig.18 B.

Common name : Freshwater Limpet.

Distribution : Throughout India.

Elsewhere : Sri Lanka.

Family PLANORBIDAE

Subfamily BULININAE

Genus *Indoplanorbis* Annandale and Prashad, 1921

Indoplanorbis exustus (Deshayes, 1834)

1834. *Planorbis exustus* Deshayes, in Belanger, *Voy Indes. orientalis*, p. 417, pl. 1, figs.11-13. Type locality Malbar coast.

1956. *Indoplannorbis exustus* Benthem Jutting, *Treubia* **23**(2) : 471. Rajgopal and Subba Rao 1968. *Proc. Symposium on Mollusca*, pl. 1, p. 110.

Material examined : 5 exs., Gobyanala, 20.2.93. Coll. S.G. Patil.

Distribution : India : Maharashtra, Melghat, Throughout the plains of India, Jammu and Kashmir.

Elsewhere : Pakistan, Persia, Sri Lanka, Myanmar, Malaya, Indo China, Thailand, Sumatra, Java, Celebes.

Remarks : This species is a known vector snail is implicated as intermediate host for the largest number of parasites.

Genus *Gyraulus* Charpentier, 1837

Gyraulus convexiusculus (Hutton)

1849. *Planorbis convexiusculus* Hutton. *J. Asiat. Soc. Beng.* **18**(2) : 657.

1956. *Gyraulus convexiusculus* Benthem Jutting *Treubia*, **23**(2) : 463.

Material examined : 4 exs., Kelpani, 17.2.93, Coll. S.G. Patil.

Distribution : India : Common throughout.

Elsewhere : Extends from Iran to Philippines.

Remarks : Maximum diameter, rarely exceeds 5 mm., whorls 4 or 5 rounded, suture well defined peripheri subangulate, closely and obliquely striate, umbilicus wide all the whorl distinctly seen above, aperture ovate lunate.

Class BIVALVIA
 Order UNIONOIDA
 Family UNIONIDAE
 Subfamily UNIONINAE
 Genus *Lamellidens* Simpson, 1900
Lamellidens consobrinus (lea, 1859)

1859. *Unio consobrinus* lea. *Proc. Acad. Nat. Sci. Philad*, 3 : 331, type locality : China.

1921. *Lamellidens consobrinus* : Prashad, 1921, *Rec. Indian. Mus.*, 22 : 608.

Material examined : 2 ex. Hatida Talao, 22.3.93, Coll. S.G. Patil.

Distribution : India : Maharashtra, Melghat.

Elsewhere : Sri Lanka.

Remarks : Shell rhomboidal, thick, umbones more inflated than in *L. marginalis*, dorsal margin curved and obliquely truncate, posterior side obtusely angled, anterior side rounded, left valves with two ragged cardinals.

Lamellidens marginalis (Lamarck, 1819)

1819. *Unio marginalis* Lamarck. *Hist. Nat. Anim. Sans. Vert.* 4 : 79, type locality Bengal.

1900. *Lamellidens marginalis* Simpson *Proc. U.S. natn. mus.*, 22 : 854 Prashad, 1921, *Rec. Indian Mus.*, 22 : 606, fig. 29A.

Material examined : 2 ex., Sidhukind, 24.2.92, Coll. S.G. Patil.

Shell oblong, ovate thin very smooth, Periostracum blackish brown shining, light brown border along the ventral margin, posterior side broad, roundedly angular, two curved lateral teeth.

Distribution : India : Maharashtra, Pune, Melghat, Amaravati dist., Assam, Manipur, West Bengal, Bihar, Uttar Pradesh, Tamil Nadu.

Elsewhere : Myanmar and Peru.

Family AMBLEMIDAE Rafinesque, 1820
 Subfamily PARREYSIINAE
 Genus *Parreysia* Conrad 1853

Parreysia (Parreysia) annandalei Preston, 1912

1921. *Parreysia annandalei* Preston. *Rec. Indian Mus.*, 7 : 302.

Type locality : Gowhatty.

Material examined : 1 ex. Sidhukind, 24.2.92, Coll. S.G. Patil.

Shell oval convex, coarsely and concentrically ribbed Anterior side sharply rounded and posterior side bluntly subrostrate.

Distribution : India : Maharashtra, Melghat, Assam.

***Perreysia (Parrerysia) var. nagpoorensis* (Lea), 1860**

1859. *Unio nagpoorensis* lea. *Proc. Acad. Natw. Sci. Phila.*, 3 : 331.

1960. *Parreysia (Parreysia) corrugata* Var. *nagpoorensis*. Satyamurti, *Bull. Madras Govt. Mus., N. S. Nat. Hist. Soc.* 6(4) : 144-145.

Material Examined : 2 exs. Sidhukund, 24/2/92, Coll. S.G. Patil.

Distribution : India : Maharashtra, Amaravati, Melghat, Nagpur, Pune, Andhra Pradesh, Tamil -nadu & West Bengal.

Parreysia (Parreysia) favidens* (Benson)

1860. *Unio favidens* Benson. *Ann. Mag. nat. Hist.*, 10, 188.

Thicker larger more inequilateral, both anterior and posterior margins angulate, cardinal teeth strong and broad.

Distribution : India, common throughout.

Elsewhere : Bangladesh, Myanmar and Pakistan.

***Parreysia (Parreysia) corrugata* (Muller)**

1774. *Mya corrugata* Mueller. *Verm. Terr., et. Fluv.*, Pt. 2, P. 214, No.398.

Type locality : Rivers of coromandel.

1900. *Parreysia corrugata* Simpson. *Proc. U.S. natn. Mus.* 22 : 841. Preston, 1912, *Rec. Indian Mus.*, 7 : 297.

Material examined : 2 exs., Hatida Talao, 22/3/93, Coll. S.G. Patil.

Shell green elliptic to oval scarcely inequilateral; Ventral margin convex, lunule, well marked, cardinal teeth strong, not lameller, sculptured somewhat radiating, oblique linear ridges.

Distribution : India : Common with wide range of distribution, Maharashtra, Melghat, Andhra Pradesh, Bihar, Karnataka, Punjab.

Elsewhere : China, Bangladesh.

***Parreysia (Parreysia) corrugata* (Mueller) sub. sp. *laevirostris* (Benson)**

1862. *Unio laevirostris* Benson. *Ann. Mag. nat. Hist.*, (3) 10 : 191.

1900. *Parreysia corrugata* (Mueller) var. *laevirostris* : Simpson. *Proc. U.S. natn. Mus.*, 22 : 842, Preston
1912. *Rec. Indian Mus.*, 7 : 297.

Material examined : 3 exs., Hatida Talao, 22.3.93. Coll. S.G. Patil.

Distribution : India : Maharashtra, Pusad, Melghat, Assam, Bihar, Andhra Pradesh.

Elsewhere : Bangladesh.

****Parreysia (Parreysia) cylindrica* Annandale and Prashad 1919**

1919. *Parreysia (Parreysia) cylindrica* Annandale and Prashad. *Rec. Indian Mus.*, 16 : 150, pl.iv, figs. 6, 7. Type locality, Yenna river, Upper Krishna watershed at Medha, Maharashtra.

Shell thick dorsal margin straight and anterior margin broadly rounded umbonal region, sculptured with corrugated ridges.

Distribution : India : Maharashtra.

Remarks : Closely resembles to *P. faridensis* in all characters except in the shell, which is more elongated.

Subgenus *Radiatula* Simpson***Parreysia (Radiatula) caerulea* Lea (1931)**

1831. *Unio caeruleus* Lea. *Trans. Amer. Phil. Soc.*, 4 : 95, pl. 13, fig. 25. Type-locality, Hoogly river, 100 miles above Calcutta.

1915. *Nodularia (N) caerulea* Preston. *Fauna British India, Mollusca (Freshwater Gastropoda and Pelecypoda)*.

Material examined : 2 exs Tapi river, 20.2.93. Coll. S.G. Patil.

Variable in grown up valves sculpture restricted to umbonal region, posterior umbonal carina very distinct.

Distribution : India : Maharashtra, Melghat dist. Amaravati, Assam, Bihar, Orissa, Punjab, Sind, Uttar Pradesh, West Bengal.

Elsewhere : Myanmar.

Order VENEROIDA**Family CORBICULIDAE*****Corbicula striatella* Deshayes**

1854. *Corbicula striatella* Deshayes. *Proc. Zool. Soc. Lond.*, 22 : 344. Type locality : Pondicherry, Prashad, 1928, *Mem. Indian Mus.*, 9 : 18, Pl. iii, fig.9-11.

1861. *Corbicula subradiata*, Prime 1861, *Proc. Acad. Nat. Sci. Phila* : P. 128, Prashad, 1921, *Rec. Indian Mus.* **22** : 613.

Material examined : 2 exs. Hatida Talao, 22.3.93, Coll. S.G. Patil.

Shell thick, large, tumid, triangular ovate to ovate, dorsal margin arched, more on the anterior side than on the posterior, umbones prominent, Periostracum shining lemon yellow in young, darker and often brownish in full grown specimens, striae regular, concentric and raised into ridges, pallial line with trace of sinus; muscle scars fairly deeply developed.

Distributions : Commonest Indian species and occurs throughout India, Maharashtra, Melghat.

Elsewhere : Pakistan, Peshawar, Sindh and Myanmar.

SUMMARY

In all 23 species of Mollusca have been recorded for the first time from Melghat Tiger Reserve, district Amaravati on the basis of present collection and earlier records from this region. *Bellamya bengalensis* was common almost to every place of collections. Three species *Thiara* are found in this region. Among Basommatophora genus *Lymnaea* was represented by three species. The class Bivalvia was better represented by the genera *Lamellidens* and *Parreysia*. For observation on pestiferous snails, requires further study of Molluscan fauna of this area.

REFERENCES

- ANNANDALE, N and PRASAD, B. 1919. The fauna of certain small streams in Bombay Presidency VI. Some freshwater Molluscs from the Bombay Presidency. *Rec. Indian Mus.*, **16** : 139-152, pl. XX.
- HORA, S.L. 1926a. On some interesting features of the Western Ghats. *J. Bombay nat. Hist. Soc.*, **31** : 447-449.
- PRESTON, H.B. 1915. *The fauna of British India* including Ceylon and Burma, Mollusca (Freshwater Gastropoda and Pelecypoda) London. Taylor and Francis : 1-XI+1-244.
- SURYA RAO, K.V., S.C. MITRA AND S. MAITRA. 2002. Mollusca. In : *Wetland ecosystem series*, **2** : *Fauna of Ujani*, 110-115.
- SUBBA RAO, N.V. AND MITRA, S.C. 1979. On land and freshwater Molluscs of Pune district, Maharashtra *Rec. zool. Surv. India*, **75** : 1-37.
- SUBBA RAO, N.V. 1989. *Handbook freshwater Molluscs of India*, Zoological survey of India : XXXII + 289 pp.

SUBBA RAO, N.V. 1991b. General introduction to Mollusca. In : Snail, Flukes and Man. *Zool. Surv. India* : 5-16.

SUBBA RAO, N.V. 1993. Freshwater Mollusca of India in "Recent Advances in freshwater Biology" (ed. K.S. Rao) 187-220, 4+61.

TONAPI, 1971. Studies on the freshwater and amphibious Mollusca of Poona, with a note on their distributions part II. *J. Bombay nat. Hist. Soc.* **68** (1) : 115-126, Plts.

TONAPI, G.T. and MULHERKAR, L. 1963. On freshwater molluscs of Poona. *J. Bombay nat. Hist. Soc.*, **60**(1) : 104-120. Map, Pl.5.

CLADOCERA : CRUSTACEA

P.D. RANE

*Zoological Survey of India, Western Regional Station,
Rawet Road, Sector 29, Pune-411 044*

INTRODUCTION

The study of Cladocera was stimulated mainly by their importance in biological processes of inland waters and their significance as biological indicators, particularly in palaeological studies (Smirnov and Times, 1983).

Our knowledge on cladocera from various conservation areas : National parks and sanctuaries was very scanty and inadequate. Therefore, this was the first attempt to study the cladocera fauna from one of the conservation areas of Maharashtra i.e. Melghat Tiger Reserve. This report is mainly based on series of plankton collections made by various survey parties of Zoological Survey of India, Western Regional Station, Pune, during the years 1991-1997.

The order Cladocera belongs to subclass Branchiopoda of class Crustacea, which includes minute microcrustaceans usually inhabit every type of habitat in littoral, limnetic and benthic zones of freshwater lakes, ponds, marshes and even brackish waters and about 8 species are truly marine. Cladocera are commonly known as *waterfleas* and constitute one of the major groups of animals of great economic importance in freshwater ecosystems. They are primary consumers, directly utilising primary producers and hence determine to a large extent the energy flow in the ecosystem. They occupy a definite ecological niche in freshwater ecosystem. They are the main food source for animals like copepods and insect larvae and almost all fishes feed heavily on them. The exuviae of Cladocera which have preserved in sediments of fresh water bodies which can give considerable insight of past conditions of old lakes and ancient waterbodies, that have great significance in palaeological studies.

Important work on Cladocera fauna from Indian conservation areas are those of Venkatraman (1988, 1990, 1992) for Keoladeo National Park, Rajasthan; Rane (1984) for Kanha National Park, Madhya Pradesh and Raghunathan and Rane (2001) on studies of Cladocera from Nagarhole National Park, Tamil Nadu. 50 zooplankton samples were

collected by plankton net from about 25 freshwater habitats such as ponds, rivers, roadside ditches, temporary tanks around Melghat Tiger Reserve by taking vertical and horizontal hauls by plankton nets. In small shallow ponds, buckets of water could be hauled and poured through plankton net to collect good number of limnetic species. For the weed inhabiting or benthic forms a net with long handle and wire meshed covered lid to sieve off the obstructing algae and weeds was very effective. Cladocera species were preserved in 4% formalin or 70% alcohol for further studies.

SYSTEMATIC LIST

All species from undermentioned list are collected actually from Melghat Tiger Reserves, freshwater waterbodies and no species of Cladocera was recorded before from this area, all are new records.

Phylum	ARTHROPODA
Class	CRUSTACEA
Subclass	BRANCHIOPODA
Superorder	DIPLOSTRACA
Order	CLADOCERA
Suborder	EUCLADOCERA
Superfamily (a)	SIDOIDEA
Family (I)	SIDIDAE
1. <i>Latonopsis australis</i> Sars	
2. <i>Diaphanosoma senegalensis</i> Gauthier	
3. <i>D. sarsi</i> Richard	
4. <i>D. excisum</i> Sars	
Superfamily (b)	CHYDOROIDAE
Family (II)	DAPHNIIDAE
5. <i>Ceriodaphnia cornuta</i> Sars	
6. <i>Daphnia lumholtzi</i> Sars	
7. <i>Simocephalus vetulus</i> (O.F. Muller)	
8. <i>S. serrulatus</i> (Koch)	
9. <i>Scapholeberis kingi</i> Sars	
Family (III)	MONIDAE
10. <i>Moina micrura</i> Kurz	
Family (IV)	MACROTHRICIDAE
11. <i>Macrothrix spinosa</i> King	

12. *Echinisca triserialis* (Brady)
13. *Ilyocryptus spinifer* Herrick
- Family (V) CHYDORIDAE
14. *Pleuroxus aduncus* (Jurine)
15. *Chydorus ventricosus* Daday
16. *C. reticulatus* Daday
17. *C. eurynotus brehmi* (Biswas)
18. *Dunhevedia crassa* King
19. *Pseudochydorus globosus* (Baird)
- Subfamily ALONINAE
20. *Alona davidi punctata* (Daday)
21. *A. costata* Sars
22. *A. pulchella* King
23. *A. rectangula* Sars
24. *Leydigia ciliata melghatensis* ssp. nov.
25. *Biapertura affinis* (Leydig)
26. *B. verrucosa* (Sars)
27. *B. karua* (King)
28. *Euryalona orientalis* (Daday)
29. *Ephemeroporus barroisi* (Richard)

SYSTEMATIC ACCOUNT

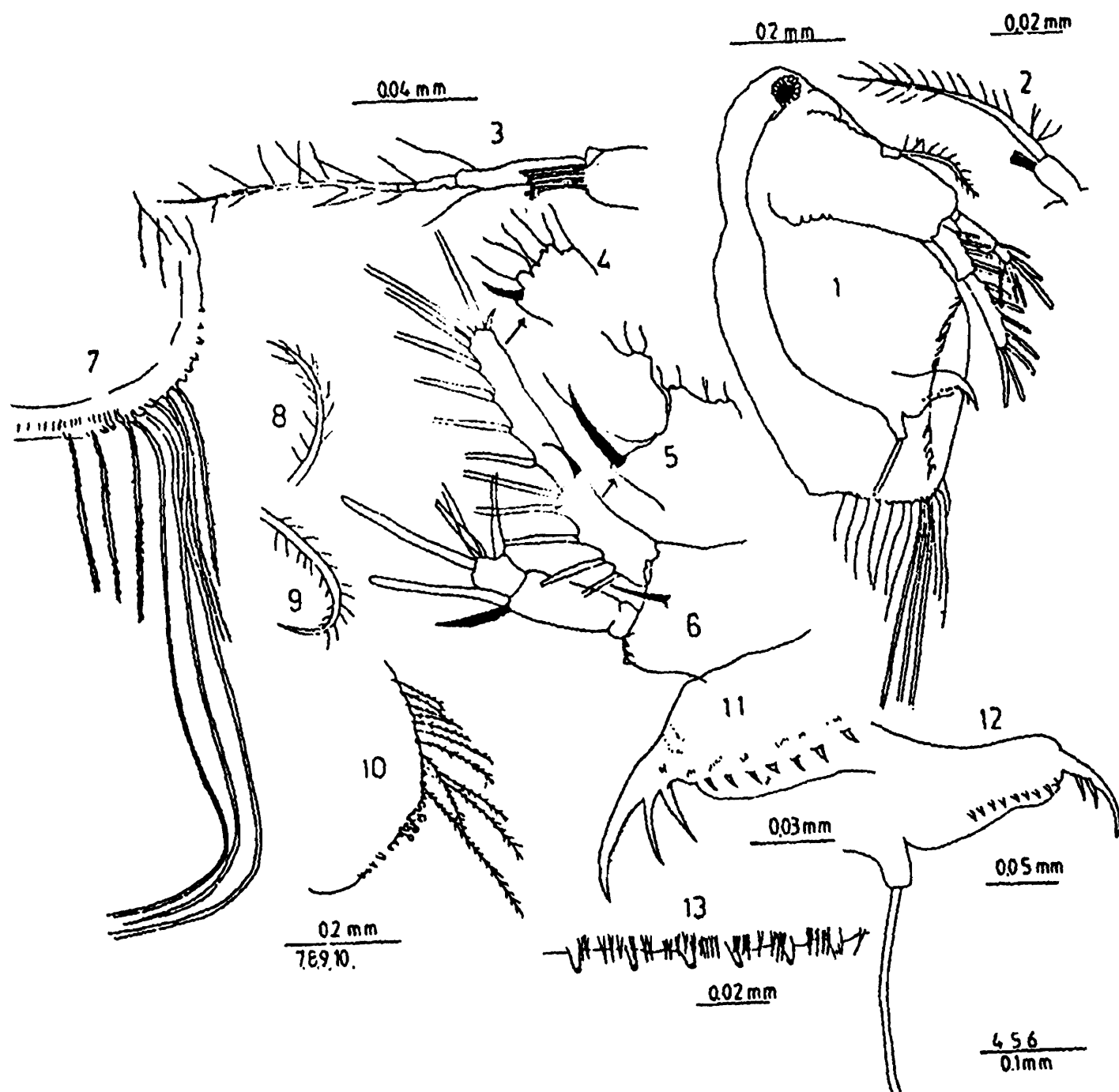
1. *Latonopsis australis* Sars (PLATE I, figs. 1-13)

1888. *Latonopsis australis* Sars, Forh. vid. Selsk., *Christiania*, No. 7 : 6-15, pl. 1, figs., 1-6.
1892. *Latonopsis australis* Birge, *Trans. Wis. Acad. Sci. Arts & Letts.*, 8 : 383-388, pl. 13, figs. 1-5.
1988. *Latonopsis australis* : Michael and Sharma, *Fauna of India, Cladocera* (Ed.) Director, ZSI, Calcutta, 41-43, figs. 8, a-e.

Material examined and Locality : Melghat Tiger Reserve : 2 exs., Hatida talao, 22.3.93, (Coll. S.G. Patil). 1 ex., Semadeh in Sipra river, 8.2.1991; 1 ex., Chamarudra near Kolkaz, 9.2.1991 (Coll. D.F. Singh). 1 ex., Sidu Kund in Gadga river, 25.2.1997 (Coll. A.S. Mahabal).

Diagnostic characters : Massive head and body connected without noticeable fold. Body elongated; ventral margin of valve with numerous long setae; three setae at the posteroventral corner especially long. Head large, without a distinct rostrum. Eye located in the middle part of the head. Ocellus small located immediately in front of the base of

PLATE - I



Figs. 1-13 : *Latonopsis australis* Sars : 1. Female; 2. antennule; 3. ventral view of antennule; 4&5. distal portion of the antennal segments enlarge; 6. antenna; 7. ventrolateral part of carapace with three very large feathered setae; 8&9. hook like setae of antenna; 10. ventro lateral part of carapace; 11. postabdomen with row of single anal teeth and two basal spine; 12. postabdomen; 13. posterior most part of carapace enlarged.

labrum. Antennules long and segmented, attached to the anteroventral corner of the head. Antenna on a thick base. Antennal setae 4-7/0-1-4. Two ventral must setae of triarticulate branch especially large and with their ends hooks. Postabdomen relatively small, conical, shightly dialated in proximal part. Anal teeth small arranged singly, 7-9 and situated closer to distal end of abdomen. Claw much in-curved. Two basal spines. Length: 1.1 mm.

Distribution : India : Rajasthan, Tamil Nadu, Maharashtra (Tulsi Dam, Bombay).

Elsewhere : Australia, Oriental regions, North and South America, Europe (Yugoslavia).

Remarks : The present species is distinguished from closely allied species by its antennule being shorter than the ventral margin of head and the absence of fornix.

2. *Diaphanosoma senegalensis* Sars (Plate II, figs. 1-10)

1951. *Diaphanosoma senegalensis* Gauthier, *Alger*, 43-45, pl. IX a-j.

1952. *Diaphanosoma hydrocephalus* Brehm, *Zool. Anz.*, 149 : 138-140, abb. 1-4.

Material examined and Locality : Melghat Tiger Reserve : 5 exs., Hatida talao, 22.3.93, (Coll. S.G. Patil). 4 exs., Kalpani, 30.4.94, (Coll. M.S. Pradhan).

Diagnostic characters : Carapace almost oblong in outline; posterodorsal corner with a distinct angle, dorsal margin slightly arched. Ventral margin of valves almost straight; distal part of ventral shell margin with short row of gradually decreasing setae, followed by row of denticles. Shell duplicature narrow. Head markedly large with sloping anterior margin. Eye moderately large, located near the anterior ventral margin of head. Antennae not reaching posterior end of valves. Claw short; with three basal spines increasing in length distally and with setae on its concave margin. Length: 1.6 mm.

Distribution : India : Maharashtra, Madhya Pradesh, South India.

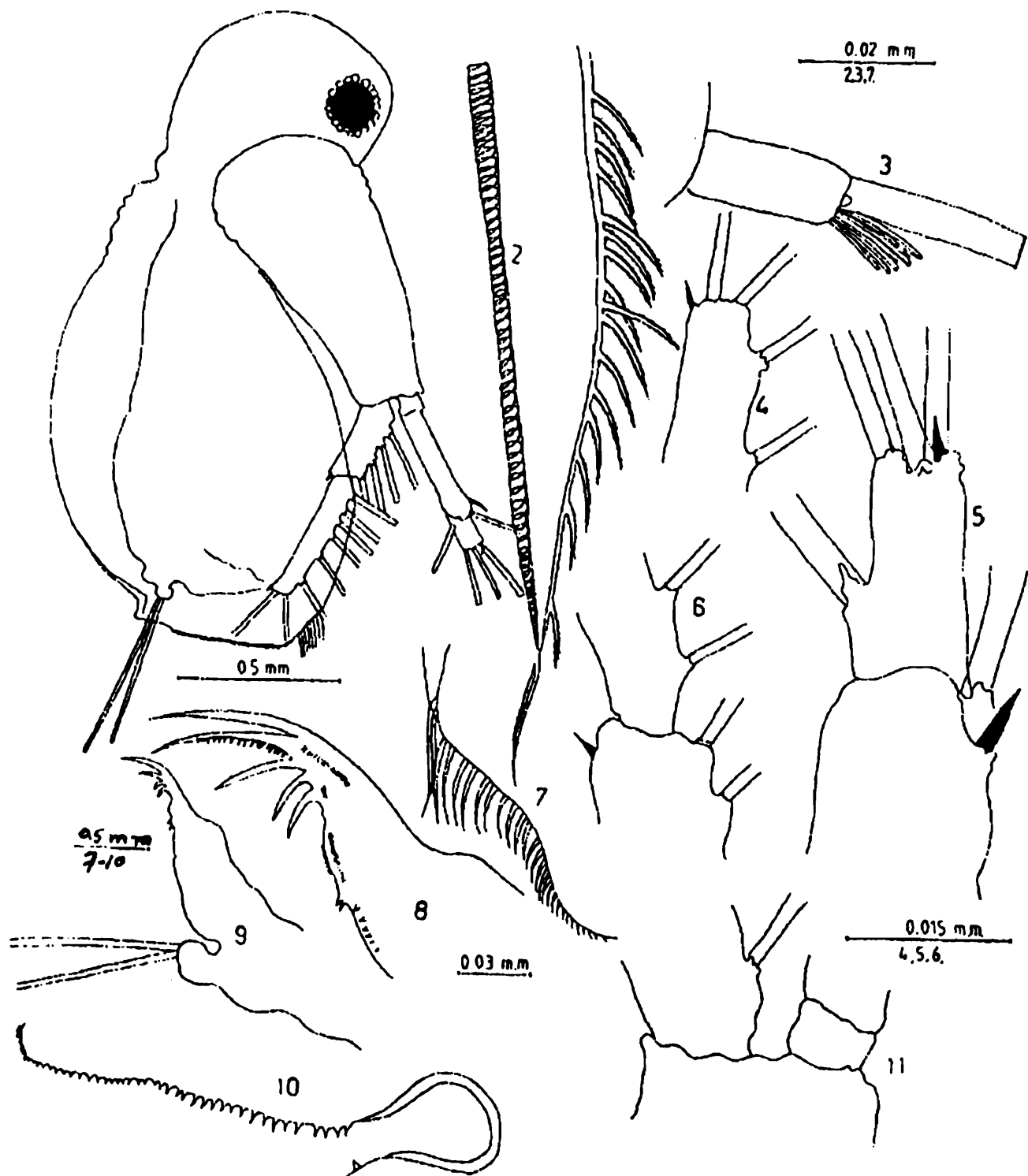
Elsewhere : Africa.

Remarks : Venkataraman and Krishnaswamy (1984) amended the original name *D. senegal* to *D. senegalensis* while recording this species from South India. It is rare species which has extremely specific structural features, the structure and armature of margin of valve is especially remarkable : the ventral inflection with numerous indentical setae, the presence of large head and anal teeth. This species also has only limited distribution from equatorial zone almost to the boundry between the tropical and subtropical zones (Korovchinsky, 1991).

3. *Diaphanosoma sarsi* Richard (Plate III, figs. 1-12)

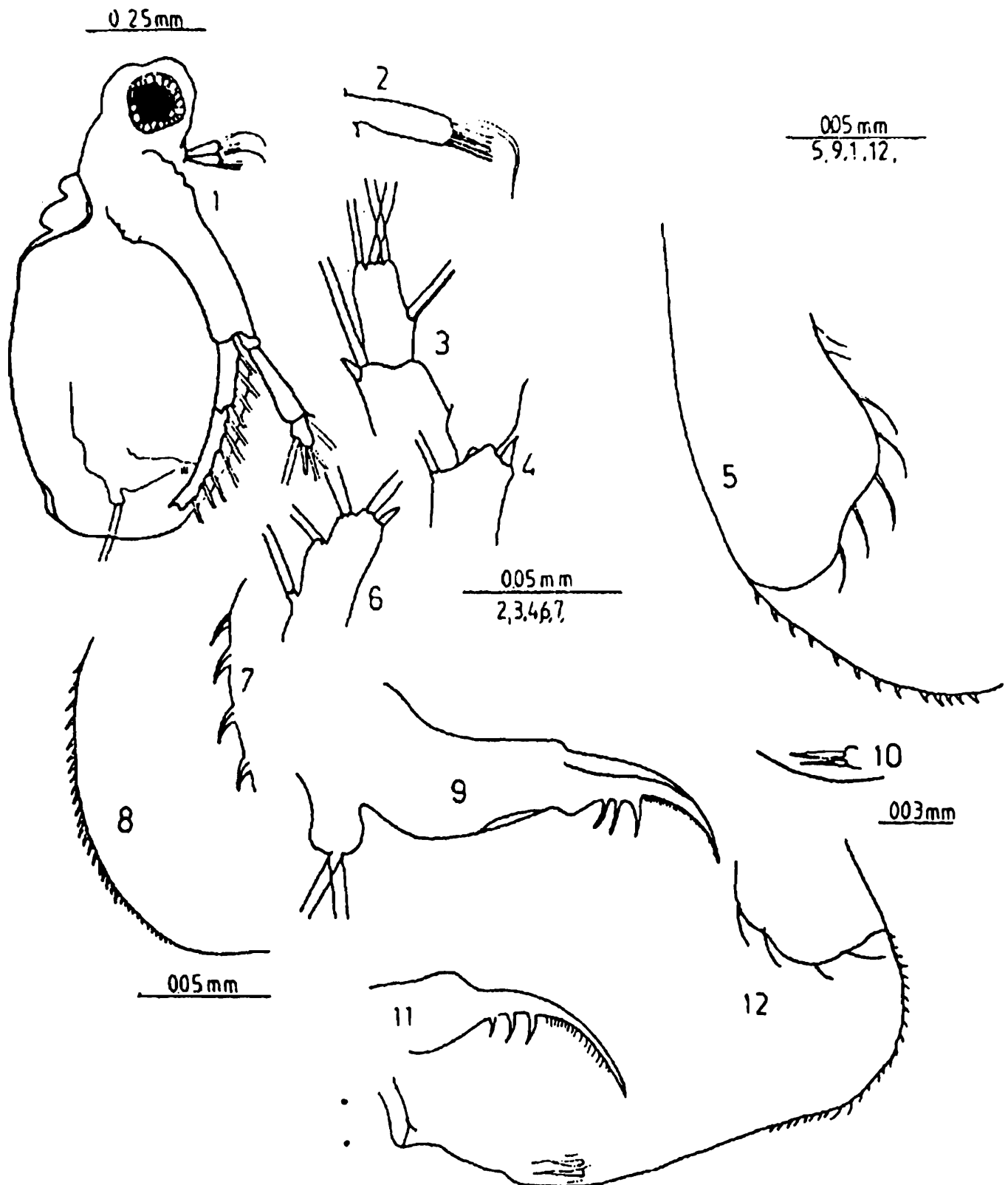
1894a. *Diaphanosoma sarsi* Richard, *Revue biol. du Nord France*, VI : 365, pl. 15, figs. 1-8.

PLATE - II



Figs. 1-10 : *Diaphnosoma senegalensis* Gauthier 1. female; 2. shell duplicature; 3. antennule; 4, 5, 6 & 11. distal segments of antenna enlarged; 7. shell duplicature at posterolateral region; 8. claw portion of postabdomen; 9. postabdomen; 10. denticles at posterior side of carapace enlarged.

PLATE - III



Figs. 1-12 : *Diaphamosoma sarsi* Richard : 1. female; 2. antennule; 3, 4, & 6. stout spine of distal parts of segments of antenna; 5. carapace duplicature and lateral denticles; 7 & 8. lateral denticles on carapace enlarged.

Material examined and Locality : Melghat Tiger Reserve : 1 ex., Chaurakunda at Malur vill.; 28.8.93; 6 exs., Gavighat tank at Chikaldhara, 19.12.94 (Coll. P.P. Kulkarni). 1 ex., Kelpani Kotku, 23.3.94 (Coll. S.G. Patil).

Diagnostic characters : Carapace oblong in outline, transversely truncate behind, with almost rectangular posterodorsal corner. Posteroventral corner obliquely cut off and armed with a series of small denticles (12-20) followed by small setae. Dorsal margin more arched, ventral margin almost straight or slightly ascending. Shell duplicature broad on distal end. Head rather narrow, slightly tapering distally and almost obliquely truncated at frontal end. Large and small eye both type of specimens are seen in the collection. Antennae not reaching hind edge of carapace. Postabdomen narrow. Claw with three basal spines rapidly decreasing in size proximally. Length: 1.16 mm.

Distribution : India : New Delhi, Tamil Nadu, West Bengal, Rajasthan, Bihar, Meghalaya.

Elsewhere : Pantropical.

Remarks : This species differs from the nearest one, *D. excisum* Sars and its varieties mainly by the greater breadth of the shell duplicator and more spines at its inferoposteal corner.

4. *Diaphanosoma excisum* Sars (Plate IV, figs. 1-9)

1885. *Diaphanosoma excisum* Sars. Forb. vid. Selsk., *Christiania*, No. 8 : 13-18, pl. 2, figs. 1-3.

1933a. *Diaphanosoma paucispinosum* Brehm, *Arch. Hydrobiol.*, 11, 656-659, fig. 3.

Material examined and Locality : Melghat Tiger Reserve : 4 exs., Talaii, 15.2.93; 1 ex., Kuktu river pool, 21.2.93 (Coll. S.G. Patil).

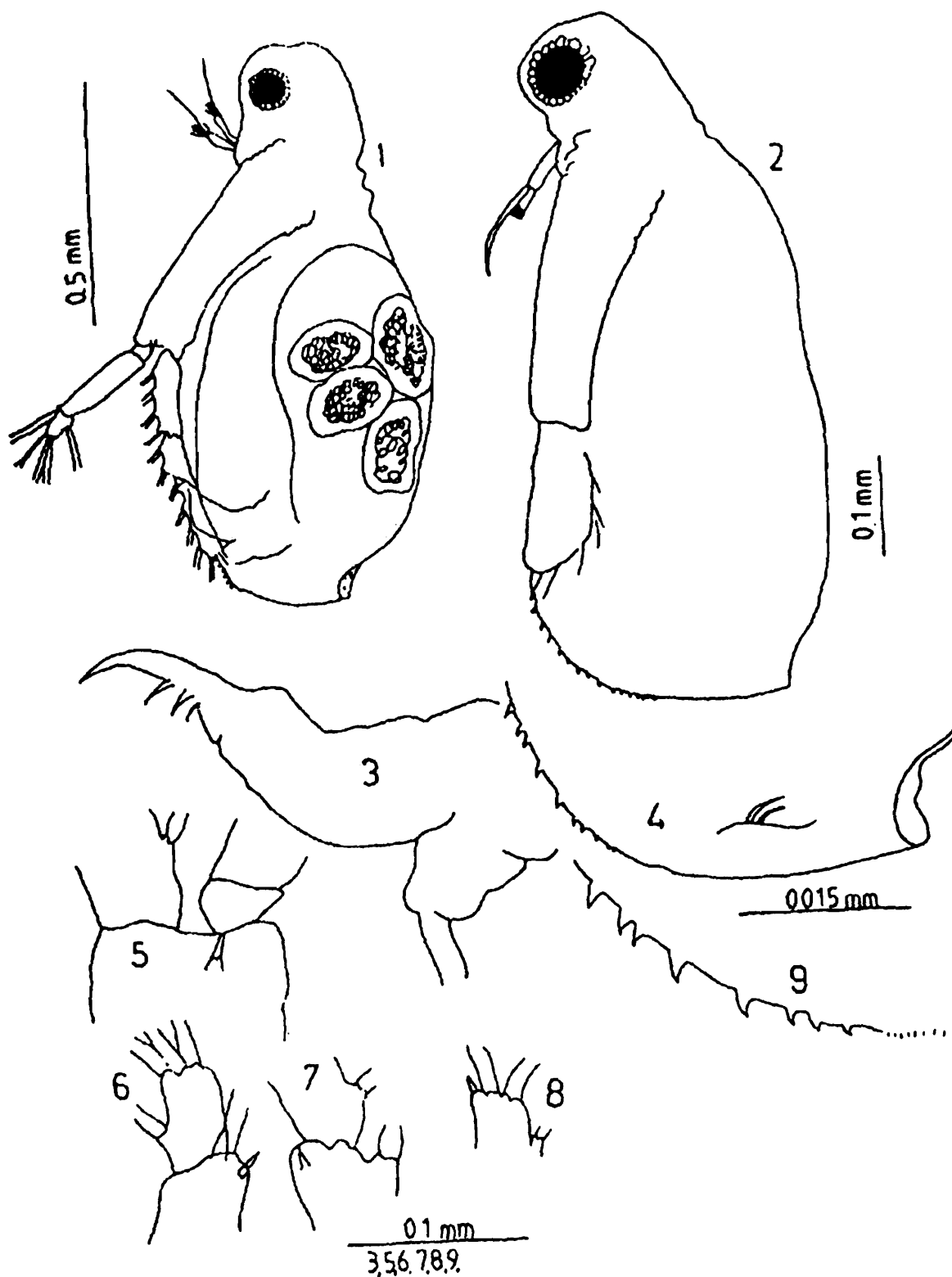
Diagnostic characters : Carapace almost oblong in outline and posterior end abruptly truncate. Posterodorsal corner of valve almost ending in right angle. Posteroventral corner with variable number of denticles followed by delicate cilia; number of denticles sometimes differing even on the two valves. Head large, oblong-quadrate and obtusely truncated anteriorly. Eye relatively large, with numerous crystalline lenses; located in the frontal portion of head, close to the ventral margin. Antennae not reaching posterior margin of valves. Postabdomen narrow with fine setules. Claw with three basal spines, decreasing in size proximally. Length 0.8 mm.

Distribution : India : Rajasthan, Kerala, Assam, West Bengal, Bihar.

Elsewhere : Common in tropics and subtropics.

Remarks : This species can be easily recognised from allied species by its shorter antenna and absence of hairs on the side of postabdomen; the body is more robust and superoposteal angles are markedly deflected.

PLATE - IV



Figs. 1-9 : *Diaphanosoma excisum* Sars : 1. female (from Talai tank with small eye); 2. female (from Kokatu with large eye); 3. postabdomen; 5,6,7&8. distalmost part of antennal segments; 9. lateral denticles on carapace enlarged.

5. *Ceriodaphnia cornuta* Sars

(Plate V, figs. 1-7)

1885. *Ceriodaphnia cornuta* Sars, Norske, Vidensk. Selsk Forhandl. Christiania., 8 : 26-28, pl. 5, figs. 1-3.

1894a. *Ceriodaphnia rigaudi* Richard, Revue Biol. Nord. France, 6 : 367.

Material examined and Locality : Melghat Tiger Reserve : 2 exs., Gavighat tank at Chikaldhara, 19.12.97 (Coll. P.P. Kulkarni). 5 exs., Chipidoh, 18.2.93 (Coll. S.G. Patil).

Diagnostic characters : Carapace of female broadly oval in outline, produced posteriorly into short projection, lying slightly above the longitudinal axis. Valve distinctly reticulate with large polygonal or hexagonal meshes, free edges of valve smooth. Head small, depressed and separated from body by a distinct ocular depression, with rounded frontal part and produced in front of antennules into a very acute, short and deflexed rostrum. Head also with short spine or horn over eye on anterior margin in some specimens. Eye large, ocellus small. Antennules small, fusiform not extending to tip of rostrum; lateral sensory seta somewhat distal to middle. Postabdomen moderately broad, with 5-6 anal spines. Claw short, stout and finely setulate. Length: 0.6 mm.

Distribution : India : West Bengal, Gujarat, Bihar, Quilon, Rajasthan, Meghalaya, Tamil Nadu, Karnataka, Madhya Pradesh, Punjab, Haryana, Himachal Pradesh.

Elsewhere : South East Asia, N. and S. America, S.Africa, China, Japan, Palestine, Egypt.

Remarks : This species is distinctive in that the anterior portion of head is produced into a beaklike acute structure.

6. *Daphnia lumholtzi* Sars

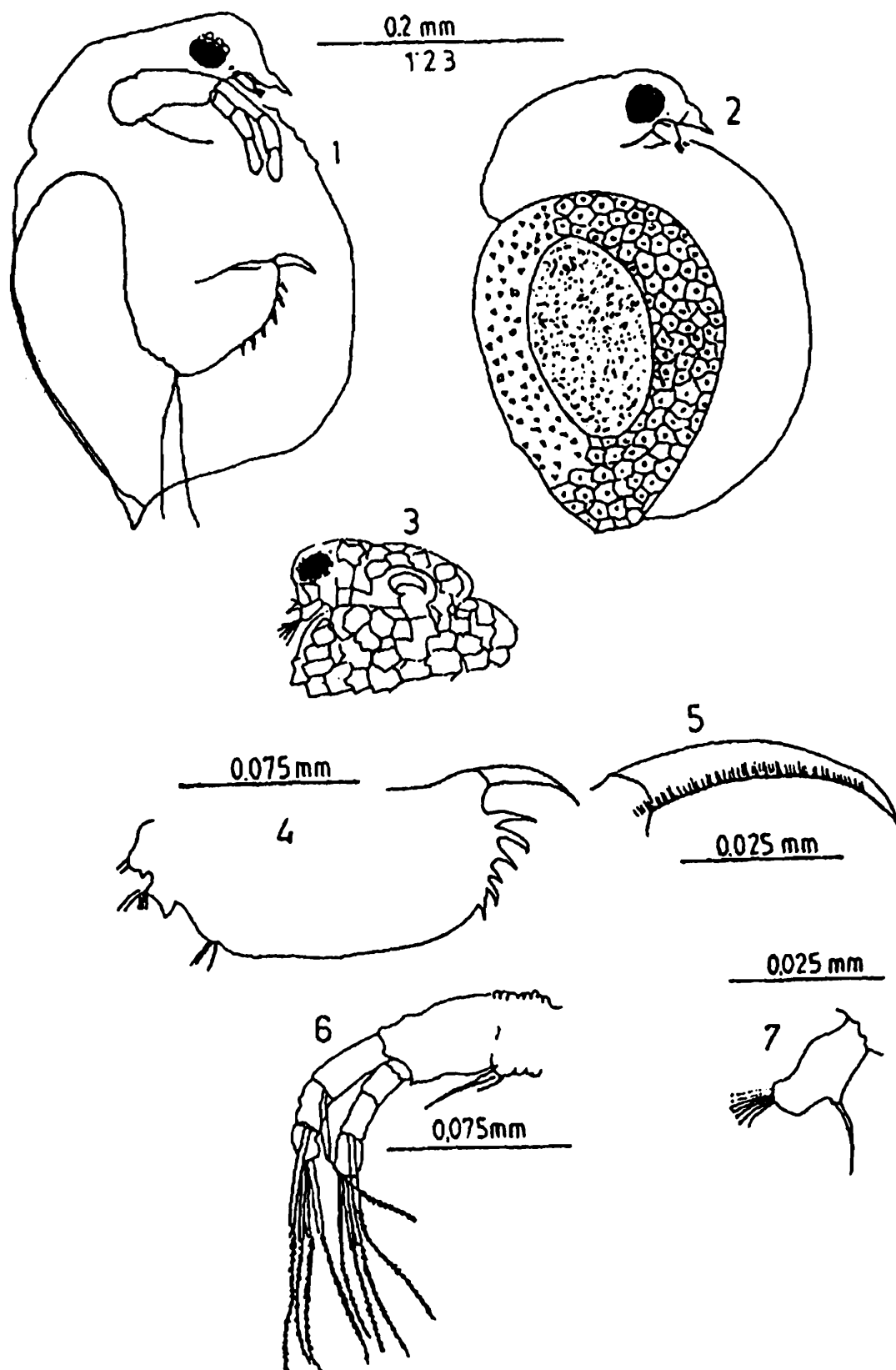
(Plate VI, figs. 1-10)

1885. *Daphnia lumholtzi* Sars, Selsk. Forh., Christiania, No. 8 : 19-26, pl.1, Figs. 1-10, pls. 3 & 4.

Material examined and Locality : Melghat Tiger Reserve : 13 exs. (10 females and 3 males) Gobaya Nala waterpool, 20.2.93 (Coll. S.G. Patil). 2 exs., Sipra river, Semadoh, 10.2.91 (Coll. D.F. Singh).

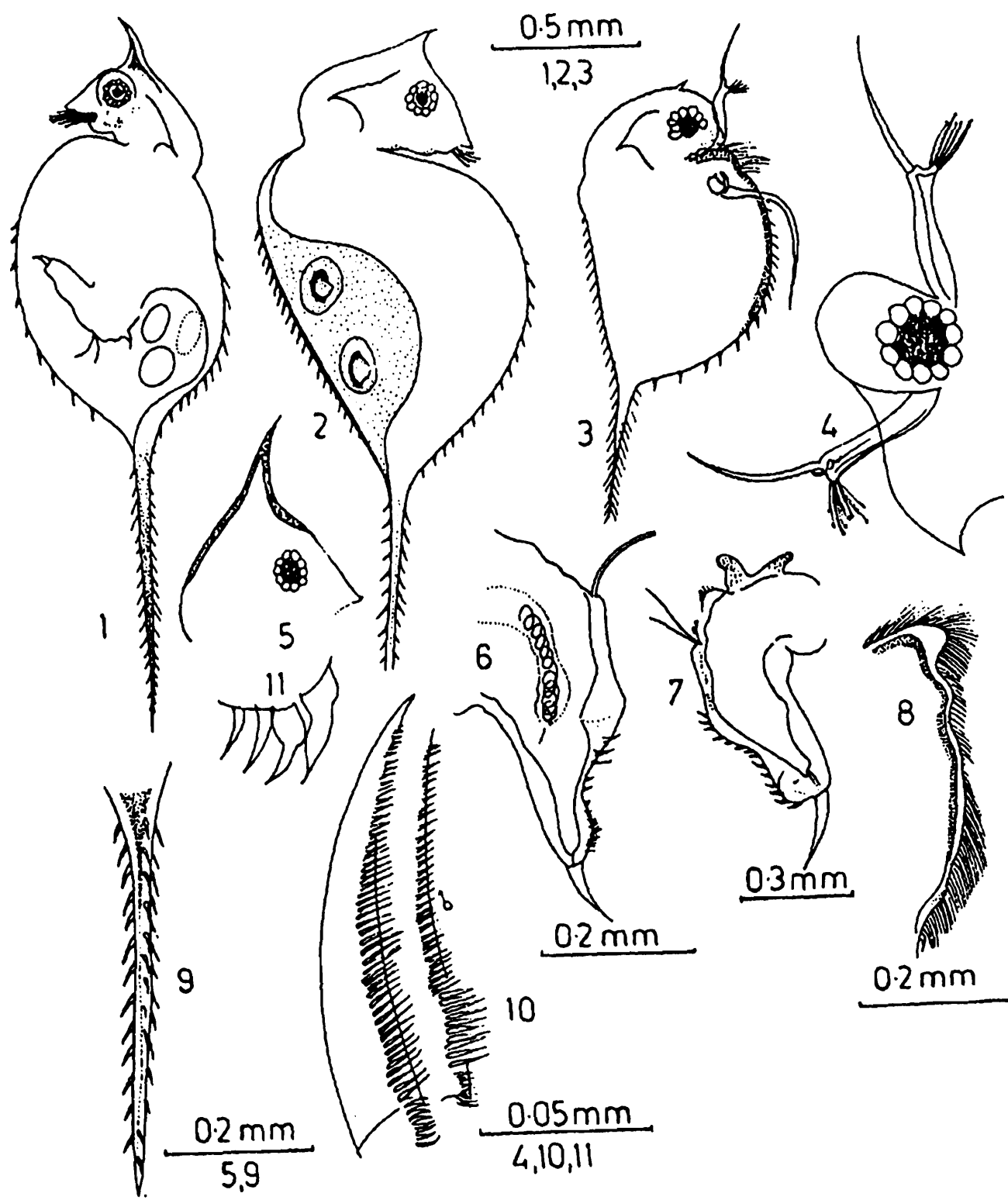
Diagnostic characters : *Female* : Carapace broadly oval, narrowed posteriorly and continued into a long posterior spine. Dorsal surface of valves moderately arched and armed with elongated and distinct spinules, which continued to posterior spine; spinules extending till behind middle region of ventral surface of valve. Head produced anteriorly into helmet of variable length. Antennule well developed, situated close to rostrum. Eye large, ocellus small. Fornices extremely well developed, produced into lateral spine. First abdominal process nearly twice length of second; all processes except first distinctly pubescent. Postabdomen tapering distally with 10-13 anal spines and groups of lateral setae. Claws stout, curved with 3 groups of setae. Ephippium relatively broad and egg chambers obliquely placed. Length : 2.5 mm

PLATE - V



Figs. 1-7 : *Ceriodaphnia cornuta* Sars : 1. female; 2. ehippial female; 3. reticulation in juvenile specimen; 4. postabdomen; 5. claw; 6. antenna; 7. antennule.

PLATE - VI



Figs. 1-10 : *Daphnia lumholtzi* Sars : 1. female; 2. ehippial female; 3. male; 4. ventral view of male head; 5. lateral view of female head; 6. male postabdomen; 7. female postabdomen; 8. anterior margin of male carapace; 9. tail piece of a female; 10. pectinate claw of female and male.

Male : Head set off from carapace by a distinct depression. Fornices well developed. Antennules large and movable, with a long flagellum. First leg modified into hooklike process. Length: 1.1 mm.

Distribution : India : Rajasthan, Chandigarh, Punjab, N/E India, Uttar Pradesh. West Bengal, Madhya Pradesh, Madras (Tamil Nadu), Andhra Pradesh, Gujarat, Orissa, Bihar, Himachal Pradesh.

Elsewhere : W. Pakistan, Ceylon, Palestine, Syria, Egypt, Australia, and widespread Asia.

Remarks : The important characters of this species are: long head spine, well developed laterally expanded fornix, and long, distinct marginal denticles of the valve.

7. *Simocephalus vetulus* (O.F. Muller)

(Plate VII, figs. 1-11)

1776. *Daphne vetula* O.F. Muller, Zool. Daniae Prodrum Seu Animalium Norvegiae, etc., Havniae, 199, No. 2399.

1900. *Simocephalus vetulus* Lilljeborg, Nova Acta Regiae Societatis Scientiarum Upsaliensis, Ser. 3, 19 : 166-17, tab. xxiv, figs. 8-18.

Material examined and Locality : Melghat Tiger Reserve: 2 exs., Gurgipati, 27.3.94 (Coll. S.G. Patil). 3 exs. Tapi river near Rangubeli, 13.2.91 (Coll. D.F. Singh).

Diagnostic characters : Carapace rounded trigonal in outline, considerably extended posteriorly. No posterior spine present; posterodorsal corner with blunt angle. Dorsal margin moderately to strongly arched; posterior part of dorsal margin with distinct denticles. Head small, prominent; rounded in front. Eye moderately large, ocellus large and elongated. Postabdomen very broad, deeply emarginate with about 10 anal spines, curved and ciliated, decreasing proximally. Claw long, curved and denticulate. Length upto 2 mm.

Distribution : India : Rajasthan, Northern U.P., Kashmir, Punjab, Mysore, Kumaon, N. Himalaya, Bihar, W. Bengal.

Elsewhere : Tibet, England, Australia, Switzerland, Turkey, Russia and N. & S. America.

Remarks : The ocellus is elongate, thus separating it from other known species of *Simocephalus*.

8. *Simocephalus serrulatus* (Koch)

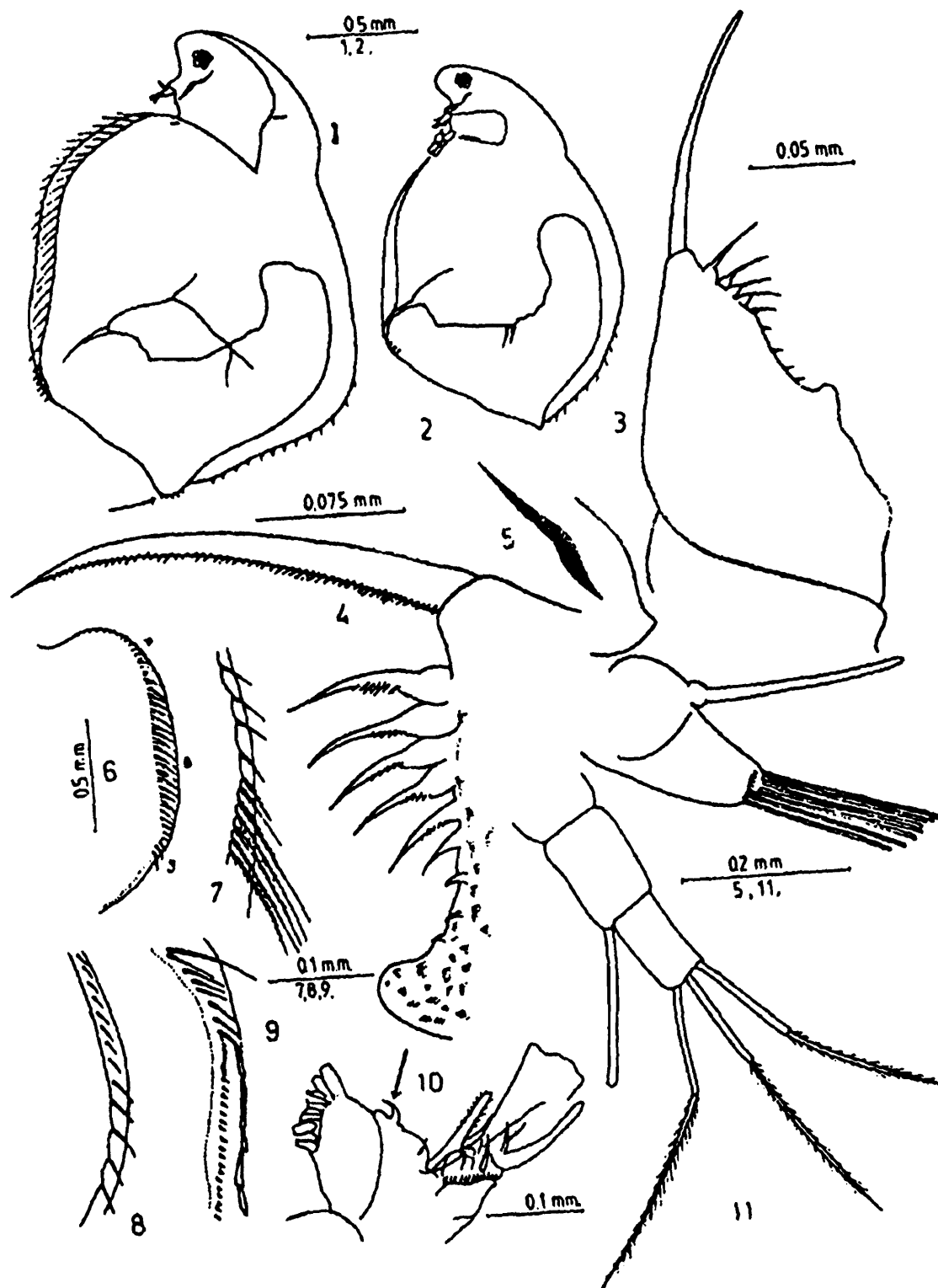
(Plate VIII, figs. 1-5)

1841. *Daphnia serrulata* Koch, Friedrich Pustel : Rosemberg. Hefts., 8 : 35-37, pl. 14.

1900. *Simocephalus serrulatus* Lilljeborg, Nova Acta Regiae Societatis Scientiarum Upsaliensis, 3 (19) : 179, pl. 26, figs. 9-16.

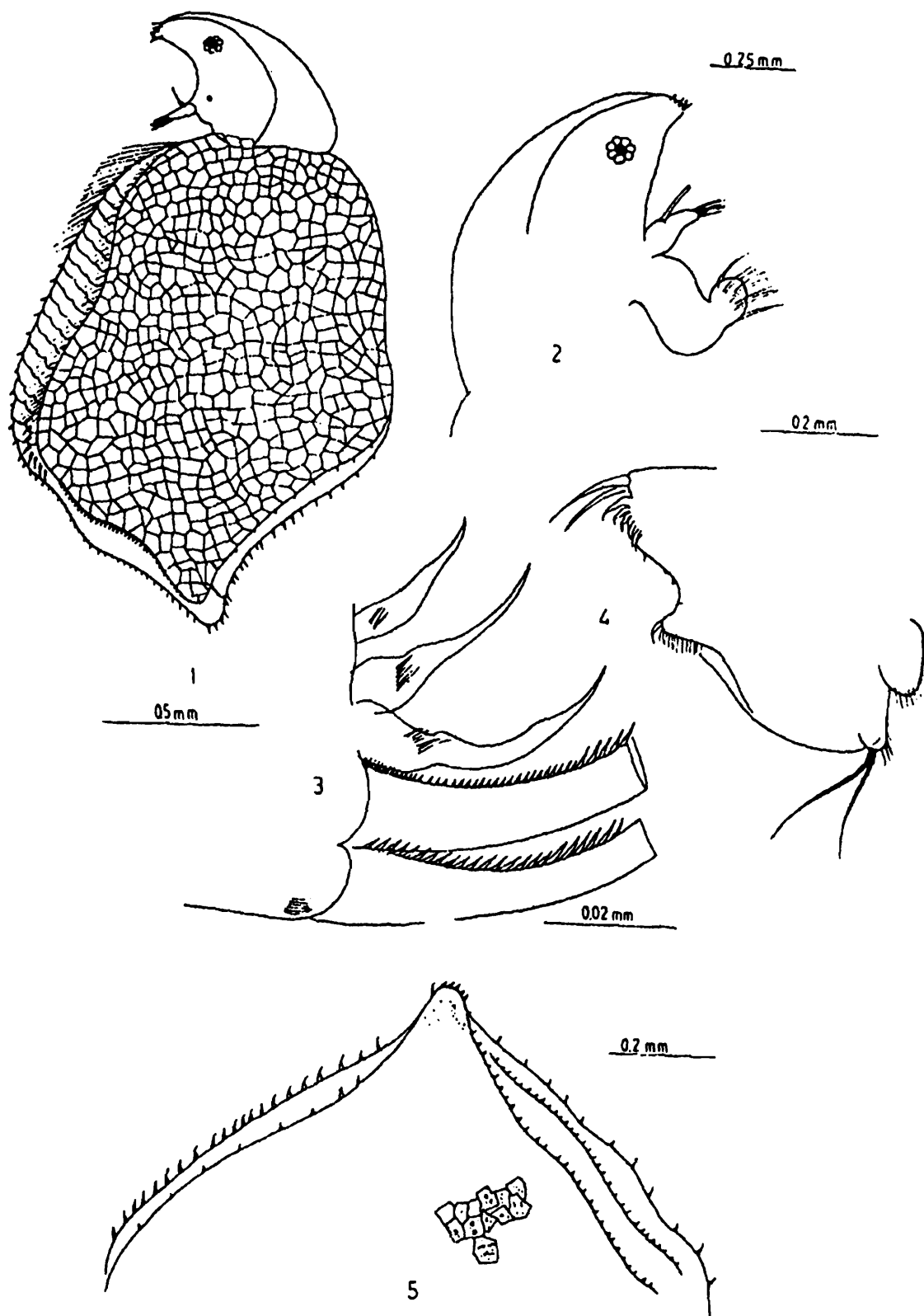
Material examined and Locality : Melghat Tiger Reserve: 1 ex. Godga river near Dhakua, 17.3.91 (Coll. D.F. Singh). 2 exs., Talai, 15.2.93 (Coll. S.G. Patil).

PLATE - VII



Figs. 1-11 : *Simocephalus vetulus* (O.F. Muller) : 1. female with ventral protuberance; 2. female without protuberance, lateral view; 3. postabdomen; 4. distal most part of postabdomen; 5. ocellus and antennule; 6. marginal valve setae; 7,8&9. setae enlarged of different regions of ventral margin of valve; 10. hook shaped part of first leg of female; 11. dorsal ramus of female antenna.

PLATE - VIII



Figs. 1-5 : *Simocephalus serrulatus* (Koch) : 1. female; 2. anterior part of head; 3. distal part of postabdomen with denticulate claw; 4. postabdomen, 5. carapace posterior protuberance.

Diagnostic characters : Carapace broadly oval or rhomboidal fin outline, strongly widened behind. Dorsal margin evenly arched, ventral margin bulging in middle; posterior protuberance slightly above the median axis of body. Posterior part of the dorsal margin and terminal protuberance denticulated. Head comparatively small; with dorsal margin evenly curved and front forming below an acute angle armed with a number of minute denticles; rostral projection small. Eye comparative large; ocellus small, almost rhomboidal in form. Postabdomen with about 8 denticles. Claw long, slender with fine setules on its concave margin. Length: 1.00 mm.

Distribution : India : Tamil Nadu, Meghalaya.

Elsewhere : North and South America, Africa, Java, Europe, Australia, New Zealand.

Remarks : This species can be recognised from allied species by its head having dorsal margin evenly curved, slightly pointed and armed with number of minute denticles.

9. *Scapholeberis kingi* Sars

(Plate IX, figs. 1-5)

1903. *Scapholeberis kingi* Sars, *Archiv. Math. Natur., Christiania*, 25 : 8-10, pl.1, Figs. 2 a-c.

Material examined and Locality : Melghat Tiger Reserve : 2 exs., Hathida talav, 23.3.93; 1 ex., Chipideo, 18.2.93 (Coll. S.G. Patil).

Diagnostic characters : Carapace oval-quadrangular in outline; transversely truncated at posterior margin. Body slightly compressed but with no keel. Head moderate in size with large eye and small ocellus. Rostrum well developed and trilobate; middle lobe evenly rounded, with narrow hyaline membrane in front, and about half as wide as the head. Head never with a dorsal spine. Antennules short located behind the rostrum and project from beyond lateral lobes. Posteroventral corner of each valve produced into a short spine pointing backward. Ventral margin of valve almost straight and densely ciliated. Valve sculptured with distinct transverse striae. Postabdomen short and broad, rounded at posterior and with 4-5 anal spines. Claw moderately long, stout and with setae on its concave margin. Ehippium with one egg. Length: 0.6-0.7 mm.

Distribution : India : Rajasthan, West Bengal, Tamil Nadu, Meghalaya and Assam, Kashmir.

Elsewhere : Africa, Australia, North America, Sri Lanka, Germany, China, Thailand, Indonesia.

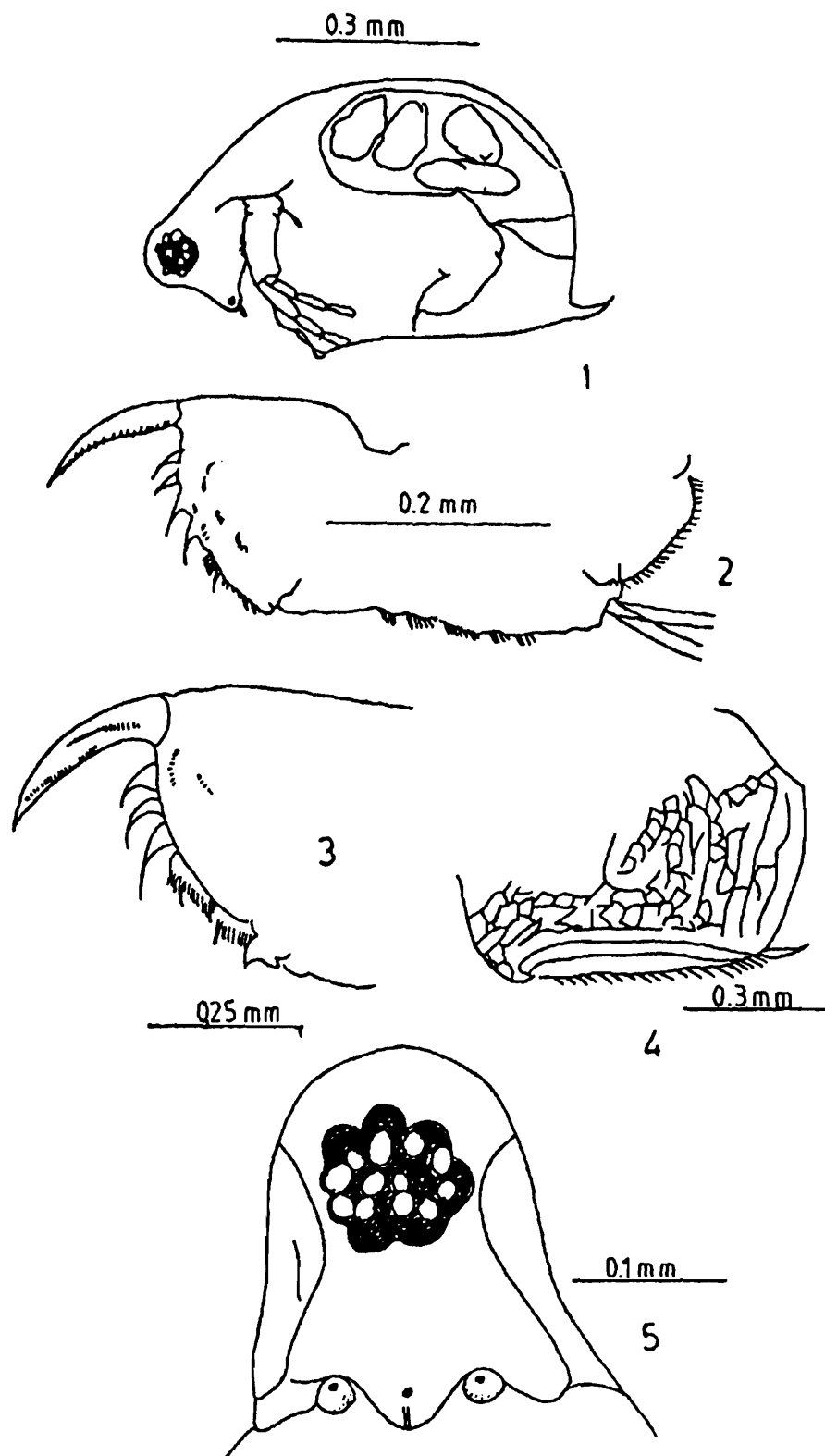
Remarks : This species can be separated from the nearest species *S. aurita* (Fischer) which has whitish or greenish colour which is always dark-brown, black in the present species.

10. *Moina micrura* Kurz

(Plate X, figs. 1-11)

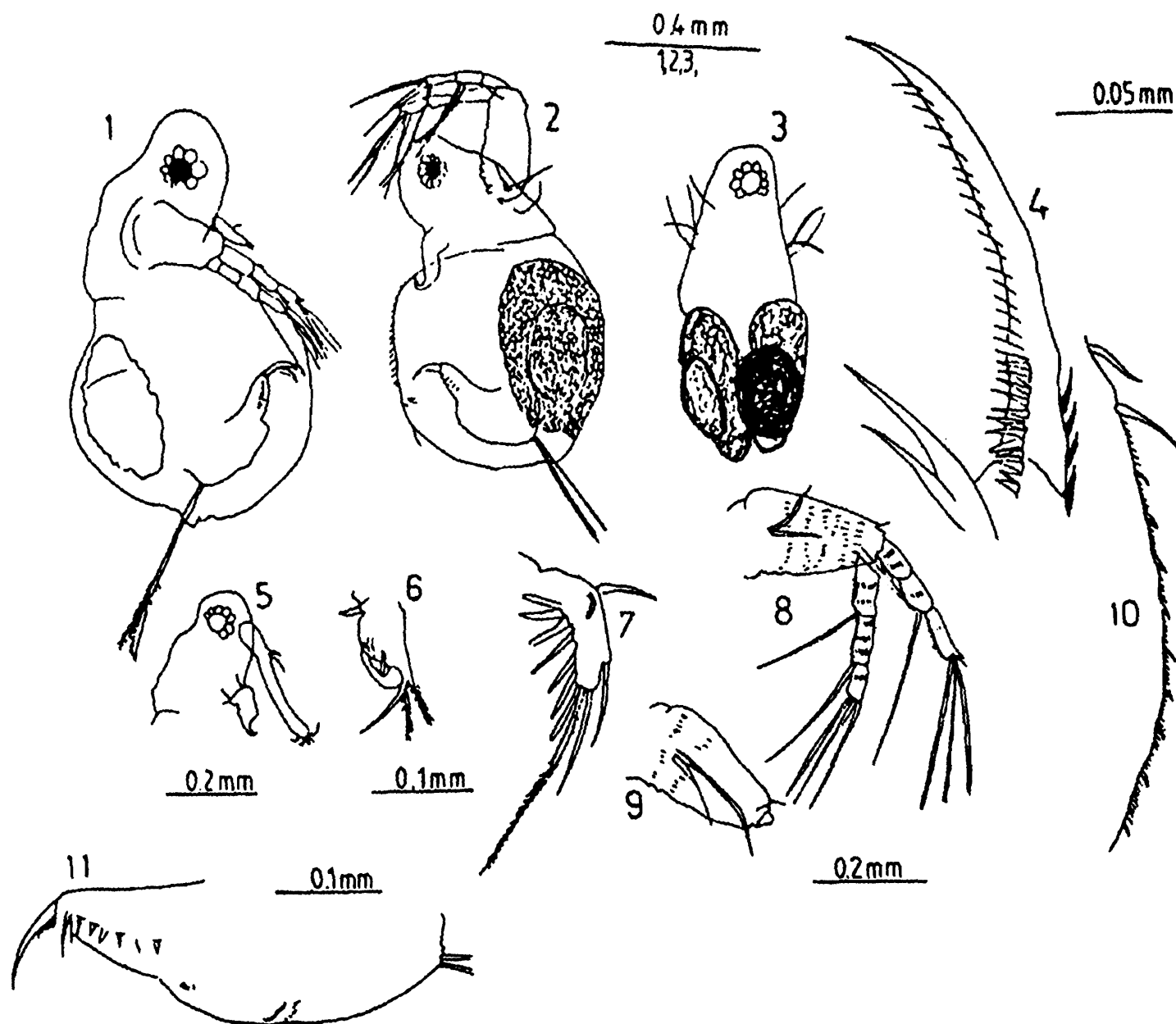
1874. *Moina micrura* Kurz, *Sitzeber. K. Acad. Wiss. Wein. Math. Nat.*, 70 : 13-15, pl. I, fig. 1.

PLATE - IX



Figs. 1-5 : *Scapholeberis kingi* Sars : 1. female; 2. postabdomen; 3. distal most part of postabdomen with pectinate claw; 4. valve reticulation; 5. ventral view of head showing position and structure of rostrum.

PLATE - X



Figs. 1-11 : *Moina micrura* Kurz : 1. parthenogenetic female; 2. ehippial female; 3. ehippial female with reproductive egg dorsal view; 4. postabdomenal claw; 5. male head; 6. claw on first leg of male; 7. first leg of female; 8. antenna; 9. basal segment of antenna; 10. posterior region of ventral side of carapace.

1905. *Moina ciliata* Daday, *Zoologica*. Stuttgart., 18 : 201-202, pl. 13, figs. 9-13.

Material examined and Locality : Melghat Tiger Reserve : 1 ex., Mular of Chaurakunda, 8.3.1991; 1 ex., Dharni, 12.3.1991 (Coll. D.F. Singh). 2 exs., Chadupati, 14.2.93 (Coll. S.G. Patil). 3 exs., Choppan vill. 26.8.93 (Coll. P.P. Kulkarni).

Diagnostic characters : Head large with well developed supraocular depression. Eye large. No setules either on head or valves. Ventral margin of valves with 11-25 long setae followed by groups of short setae on the posterior margin. Antennules originated well behind the eye; antennules large thin with a long basal setae. Postabdomen short, slender and with distal conical part. Dorsal margin of postabdomen with groups of short setae, distal margin with bident and 5-9 feathered lateral setae, decreasing size proximally. Claw large and curved, ventral base of claw with 3-7 teeth. Concave margin of each claw with 5 setae, proximal setae comparatively larger and forming distinct pecten. Length: 0.6-1 mm.

Distribution : India : Tamil Nadu, Kerala, West Bengal, Nilgiri Hills, Bihar, Rajasthan, N.W. India, Haryana, Bijapur.

Elsewhere : Africa, Syria, USSR, France, Phillippines, North America.

11. *Macrothrix spinosa* King (Plate XI, figs. 1-8)

1852. *Macrothrix spinosa* King, *Pap. Proc. Roy. Soc. Van Diemen Land, Hove Town*, 2(2) : 25-26, pl. 6 E.

Material examined and Locality : Melghat Tiger Reserve: 2 exs., Govilghat - Chikhaldhara, 5.9.93 (Coll. P.P. Kulkarni). 10 exs., Gurgipati, 27.3.94; 1 ex., Kelpani Koktu, 21.2.93 (Coll. S.G. Patil). 2 exs., Solona tank-Ghatang, 30.3.94 (Coll. M.S. Pradhan).

Diagnostic characters : Carapace broadly rounded oval in outline. Dorsal margin almost evenly arched, ventral margin subangulated in middle and obliquely ascending posteriorly; posterior end with short protuberance occurring about in line of axis of body. Head subtriangular and with slightly prominent rostral projection. Head shield widening abruptly at the level of compound eye. In the lateral view, a ridge departing from compound eye arched at level at the base of antenna and running downwards towards ventral edge of head shield. Antennules enlarged at apex; anterior margin with several fine incisions and clusters or rows of setules and with ventral angulation. The shell is reticulated and dorsal surface with more or less distinct squamous sculpture, giving dorsal edge a minute serrulate appearance. Ventral edge of valves serrate and armed with slender spines. Eye large, ocellus small and located near the tip of rostrum. Postabdomen short, bilobed and with a row of small but strong anal denticles along the dorsal edge and row of minute lateral spines. Claw very short and with setae on the concave margin. Length: 0.3-0.4 mm.

Distribution : India : Tamil Nadu, Rajasthan, Manipur.

PLATE - XI



Figs. 1-8 : *Macrothrix spinosa* King : 1. female; 2. ventral marginal spinelike setae; 3. dorsoposterior denticles on carapace; 4. antennule; 5. labrum; 6. antenna; 7. natatorial setae; 8. postabdomen.

Elsewhere : Malaysia, Thailand, Sri Lanka, Sumatra, Java, Australia, Africa, S. America.

Remarks : This species is close to *M. hisuticornis* Norman and Brady and *M. laticornis* (Jurine), but is easily distinguished from the former by its. Squamose marking on the shell and from the latter in its bilobed postabdomen.

12. *Echinisca triserialis* Brady
(Plate XII, figs. 1-5)

1886. *Macrothrix triserialis* (Brady), J. Linn. Soc. Lond. (Zool.), London, 19 : 295, pl. 47, figs. 16-20.

1976. *Echinisca triserialis* : Smirnov, Zool. Inst. Acad. Nauk. USSR New Ser., 112 : 109-110, figs. 81-83.

Material examined and Locality : Melghat Tiger Reserve : 10 exs., Gurgipati, 27.3.94 (Coll. S.G. Patil).

Diagnostic characters : Body almost oval in outline; dorsal margin slightly arched, ventral more strongly arched and produced point posteriorly. Valves reticulate, dorsal margin with serrations particularly in posterior region; ventral margin with serrations and bristles and serrations on posteroventral margin arranged in groups of three. Head large, moderately arched and with conspicuous ridge over its edges; produced below into small rostrum. Eye large, ocellus small and located near the tip of rostrum. Antennules slender, cylindrical and olfactory setae (esthates) unequal in length; antennules with notches on anterior margin, sensory seta situated near the base. Postabdomen large, moderately broad, bilobed, with anal spines on both lobes, lateral setae present in transverse rows. Claw short and curved. Length: 0.5 mm.

Distribution : India : Kerala, Rajasthan, West Bengal.

Elsewhere : Cosmotropical.

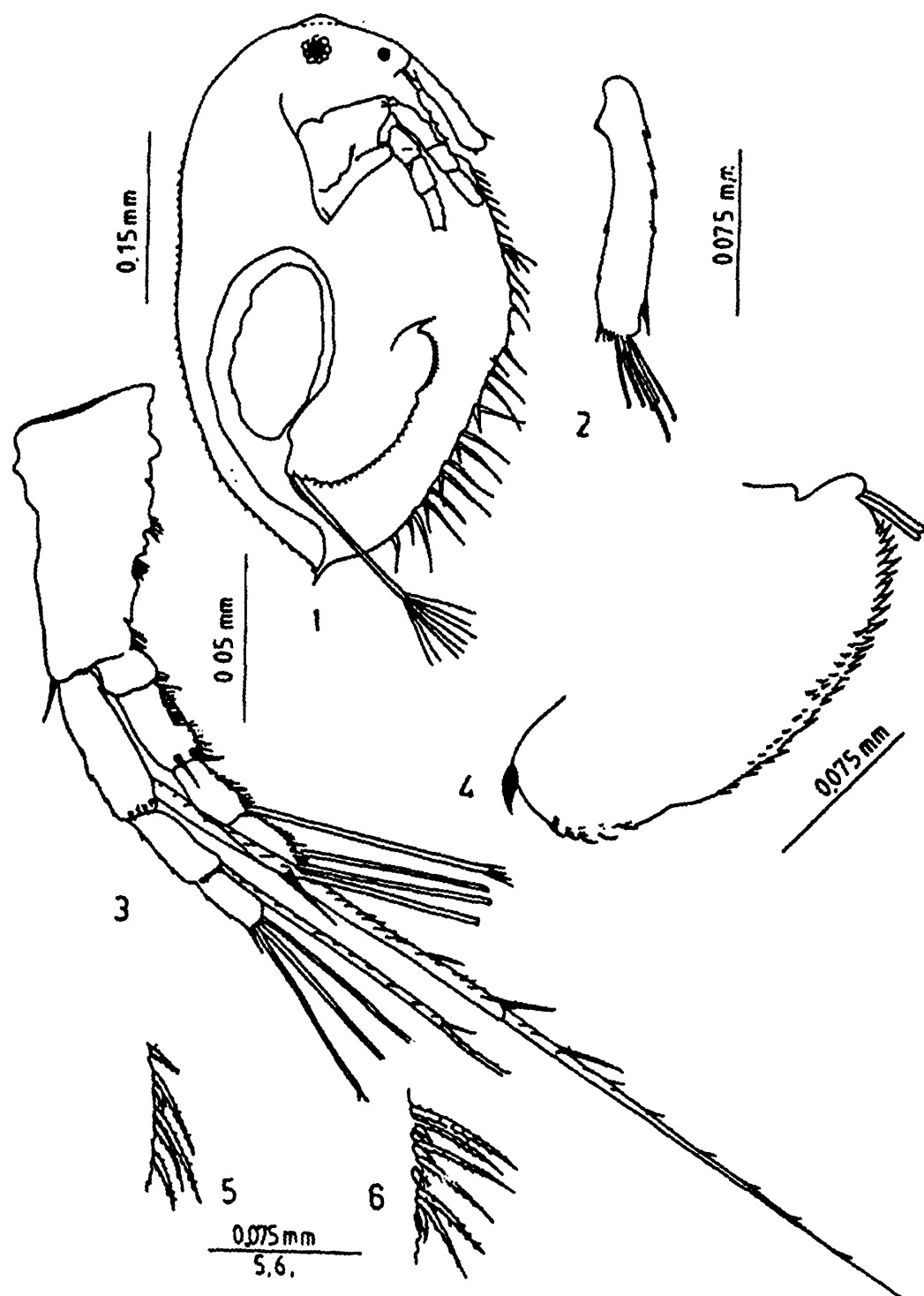
Remarks : The genus *Echinisca* is understood as comprising *Macrothrix* like forms having the antennule not dilated distally. This genus has postabdomen unlobed and ungrouped small teeth along its preanal and anal margin. Present species can be separated from other species by its largest setae of antenna with short spines and with two larger spines in the area of joint between its proximal and distal segments.

13. *Ilyocryptus spinifer* Herrick
(Plate XIII, figs. 1-13)

1882. *Ilyocryptus spinifer* Herrick, 10th Annual Rep. Geol. and Nat. Hist. Survey, Minn., 39-41, 246, pl. 8, figs. 1-5.

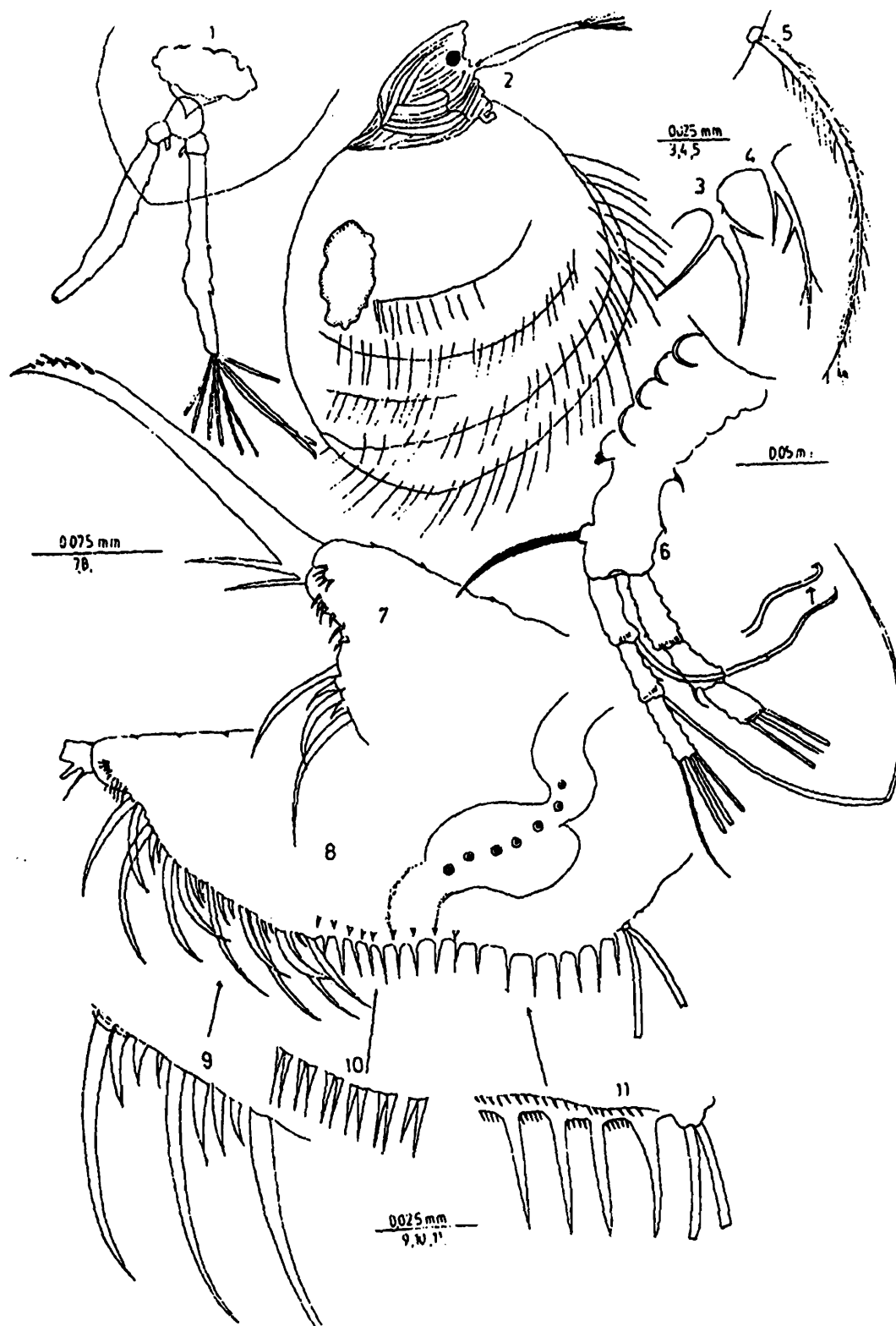
Material examined and Locality : Melghat Tiger Reserve: 2 exs., Kolkaj, 13.2.93 (Coll. S.G. Patil). 1 ex., Chipidoh, 18.2.93; 1 ex., Churni tank near Churni vill. on Jerida Road. 8.4.94 (Coll. M.S. Pradhan).

PLATE - XII



Figs. 1-5 : *Echinisca triserialis* (Brady) : 1. female; 2. antennule; 3. antenna with groups of spines on endopodite segment and 2-3 large spines on the junction of longest seta of antenna; 4. postabdomen; 5. setae at ventral margin of valves.

PLATE - XIII



Figs. 1-13 : *Ilyocryptus spinifer* Herrick : 1. ventral view of female head; 2. female; 3, 4 & 5. ventral and ventro-posterior marginal setae; 6. antenna with different types of apex of the lateral setae;; 7. anterior part of postabdomen with two basal spines; 8. dorsal margin of postabdomen; 9,10&11. teeth at various regions of postabdomen (enlarged).

Diagnostic characters : Body form oval-triangular in outline. Posterior and ventral edge of valves rounded and usually bearing long and branched setae. Head keeled. Antennules long, biarticulated (two segmented) and attached to ventral side of the head. Antennary setae usually long. Postabdomen large, broad and anus opening in the depression on the dorsal margin of postabdomen; with 5-7 preanal spines and 4-8 postanal lateral spines. Claw long, slightly curved with basal spines of unequal length. Length 0.7 mm.

Distribution : India : Kerala (Trivendrum), Rajasthan, West Bengal, Meghalaya.

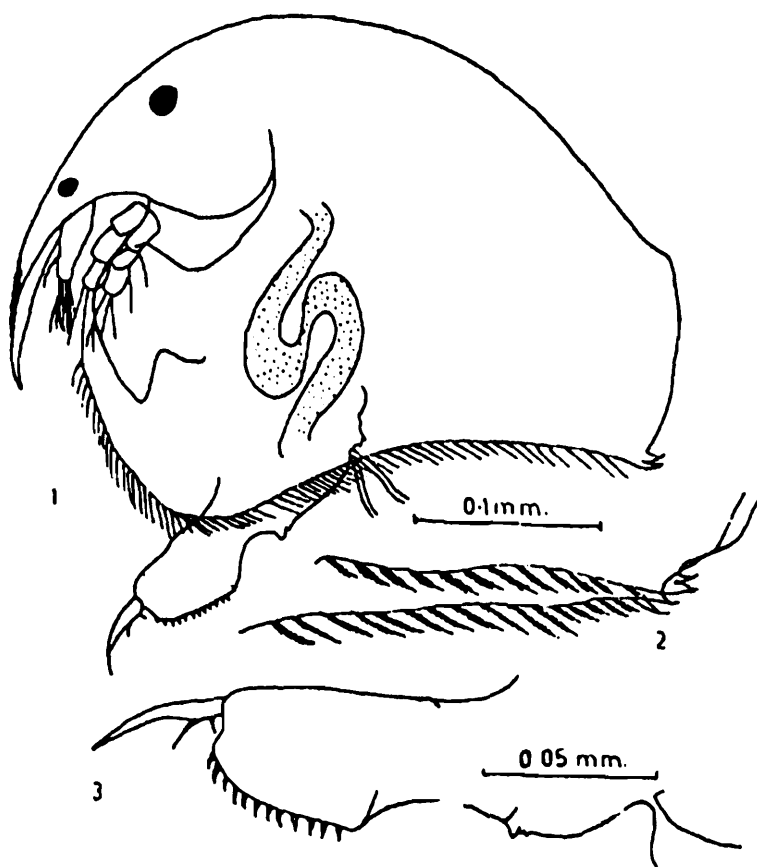
Elsewhere : Pantropical, North America, China, Australia, Cuba.

Remarks : This species is characterized by its thin, long antennule, its length 8-10 times of its width and anal aperture opens in the middle part of posteabdomen. Moulded shells not discarded and many valves seen one over the other.

14. *Pleuroxus aduncus* (Jurine)
(Plate XIV, figs. 1-3)

1820. *Monoculus aduncus* Jurine, *Histoire des Monocles, qui se trouvent aux environs de Geneve*, 152-153, pl. 15, figs. 7-8.

PLATE - XIV



Figs. 1-3 : *Pleuroxus aduncus* (Judrine) : 1. female; 2. posteroventral corner of carapace with two denticles; 3. postabdomen.

1900. *Pleuroxus aduncus* : Lilljeborg, *Nova Acta. Reg. Soc. Sci. Upsala*, Ser. III, 19 : 541-545, pl. LXXV, figs. 11-17.

Material examined and Locality : Melghat Tiger Reserve : 5 exs., Ambadon, 21.2.97 (Coll. A.S. Mahabal). 3 exs., Govilghat at Chikhaldhara, 5.9.93 (Coll. P.P. Kulkarni).

Diagnostic characters : Posteroventral corner of valve with 1-3 posteriorly directed denticles. Height of posterior margin of valve about one third of maximum height. Dorsal margin strongly convex; ventral margin with feathered setae. Rostrum long, pointed and directed downward. Antennules reaching about middle of rostrum, with sensory setae in the middle of anterior margin. Plate of labrum convex anteriorly and with slightly pointed apex. Ocellus smaller than eye. Postabdomen short, tapering distally. Anal denticles small, irregularly distributed forming group of 8-10. Lateral setae present. Claw with two basal spines. Length: 0.52 mm.

Distribution : India : Rajasthan, Himachal Pradesh, Kashmir.

Elsewhere : W. Pakistan (Punjab), Central Asia and N. & S. America.

15. *Chydorus ventricosus* Daday
(Plate XV, figs. 1-11)

1898. *Chydorus ventricosus* Daday, *Termis Fuzetek.*, 21 : 28-29, figs. 10, a-d.

Material examined and Locality : Melghat Tiger Reserve : 3 exs., Kolkaj, 13.2.93; 1 ex., Hatida Talao, 22.3.93 (Coll. S.G. Patil).

Diagnostic characters : Body almost oval in outline. Postrodorsal and posteroventral corners of valves rounded, without denticles. Ventral margin strongly bulged in the middle, with 11-15 long setae on the antero-ventral margin; 27-35 submarginal setae posterior to bulge, placed well above margin in a sinuous curve. Valves with faint polygon with wavy margin, enclosing pigment patches and dots. Rostrum long, pointed. Antennules thick, about half length of rostrum. Labral Plate long, broadly rounded and slightly indented on the anterior margin near tip. Ocellus about half diameter the size of eye; located closer to eye than to apex of rostrum. Postabdomen elongated, slightly tapering distally and preanal corner distinct, with 9-10 marginal spines on concave margin; bearing long slender basal spine. Length: 0.6 mm.

Distribution : Nilgiri Hills, Gujarat, Rajasthan.

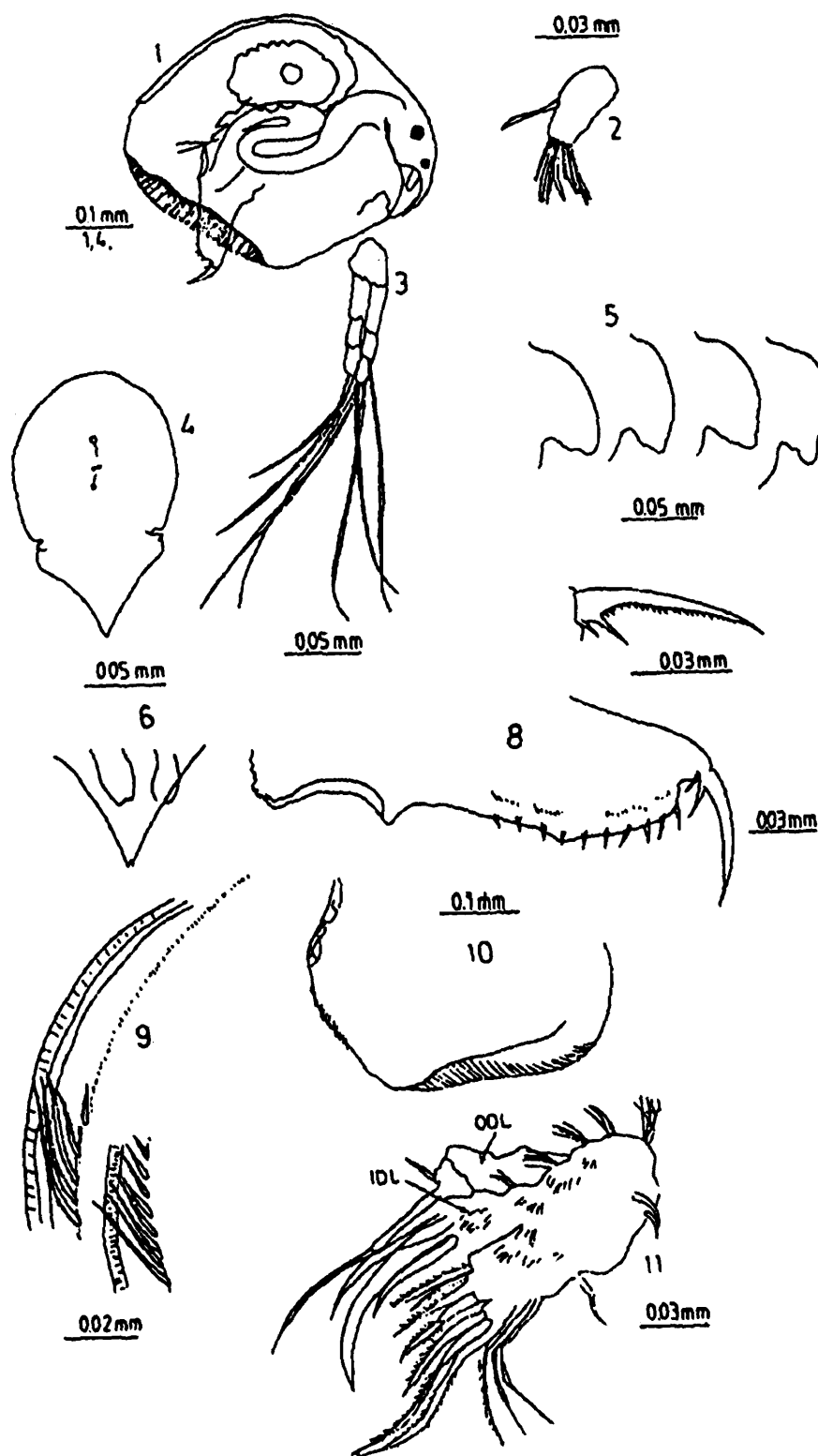
Elsewhere : Sri Lanka, China, Java, East Africa, South America (Paraguay).

16. *Chydorus reticulatus* Daday
(Plate XVI, figs. 1-8)

1898. *Chydorus reticulatus* Daday, *Termes Fuzetek.*, 21 : 27-28, figs. 9 a-d.

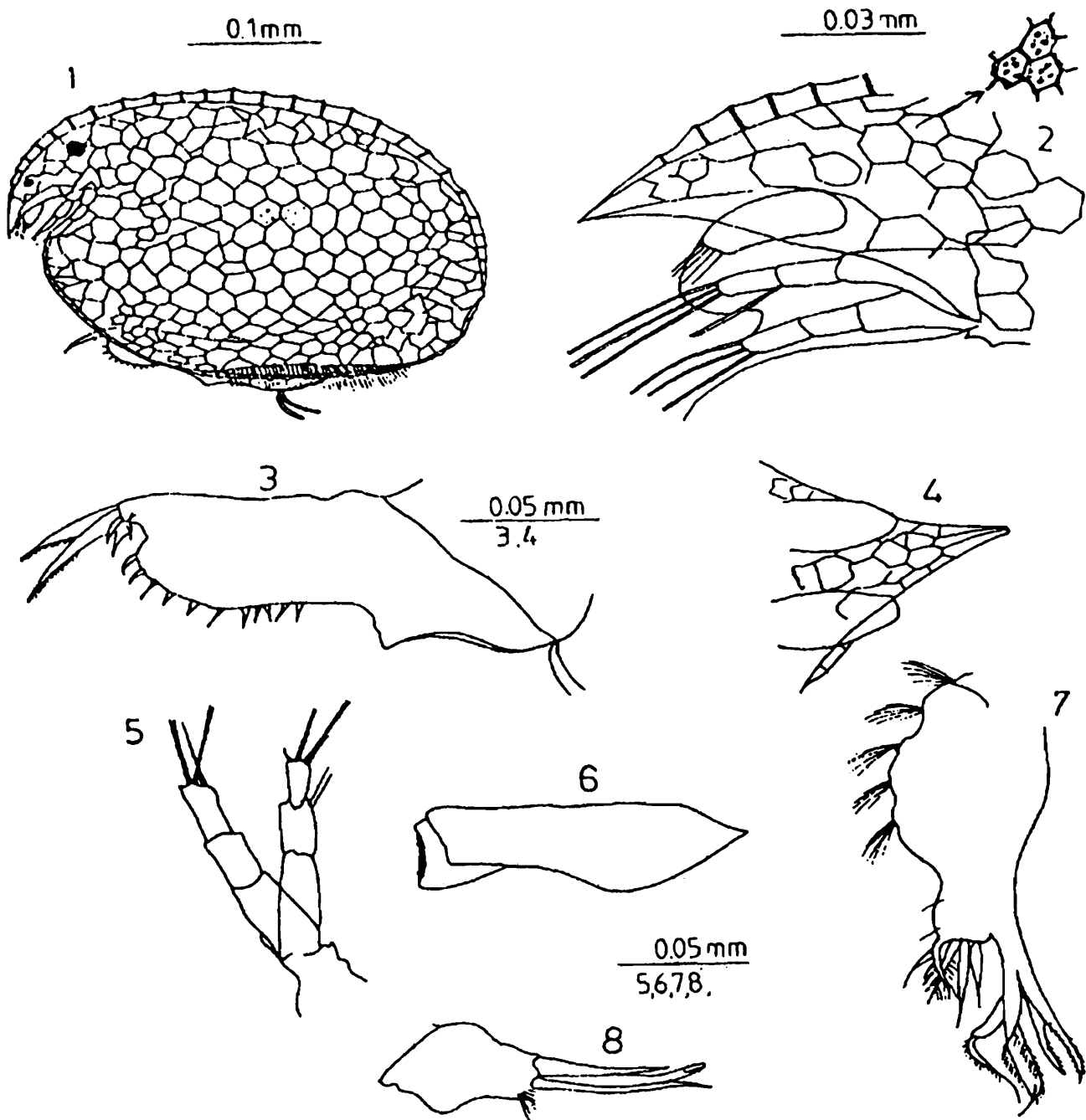
Material examined and Locality : Melghat Tiger Reserve : 2 exs., Kapra river ditch, 12.12.92 (Coll. P.P. Kulkarni).

PLATE - XV



Figs. 1-11 : *Chydorus ventricosus* Daday : 1. female; 2. antennule; 3. antenna; 4. head shield; 5. labrum-different shapes; 6. rostrum; 7. claw with basal spines; 8. postabdomen; 9. posteroventral margin of valve with stout setae; 10. carapace; 11. first trunk leg of female.

PLATE - XVI



Figs. 1-8 : *Chydorus reticulatus* Daday : 1. female ; 2. anterior part of head; 3. postabdomen; 4. ventral view of rostrum; 5. antenna; 6. mandible; 7. first leg; 8. IDL of first trunk limb of female.

Diagnostic characters : Body somewhat spherical outline, length slightly more than height. Postero-ventral corner of valve rounded. Valve strongly reticulated with concentration of dots within each cell; straight sided polygonal cells on surface of valves. Rostrum long, pointed. Antennules reaching middle of rostrum. Plate of labrum elongated and with rounded apex. Ocellus smaller than eye. Postabdomen short with distinct preanal corner and many lateral grouped setae. Claw with two basal spines, setae on concave margin. Length 0.27 mm.

Distribution : India : Rajasthan, Kerala.

Elsewhere : Sri Lanka, Java, Thailand.

Remarks : *C. reticulatus* can be easily distinguished from *C. spericus* by shape of upper portion of labrum and its postabdomen. The sculpture on the shell is similar to the original discription by Daday.

17. *Chydorus eurynotus brehmi* (Biswas)
(Plate XVII, figs. 1-6)

1965. *Chydorus brehmi* Biswas, *Crustaceana, Leiden*, 11(2) : 113-114, fig. 1.

1971. *Chydorus eurynotus brehmi* Comb. n. Smirnov, *USSR. Sci. Zool. Inst. Nova. Ser. No. 101*, 12 : 378 p. (Translated from Russian)

Material examined and Locality : Melghat Tiger Reserve : 5 exs., Gavighat tank at Chikaldhara, 19.12.97 (Coll. P.P. Kulkarni).

Diagnostic characters : Valve without sculpture. Plate of labrum with round anterior margin but ending with a papilliform process. Antennule ending far before apex of rostrum. Posabdomen preanal corner with 12 anal denticles. Ocellus about half as long as eye. Length: 0.57 mm.

Distribution : India : Rajasthan, Maharashtra (only second time recorded from India after original description).

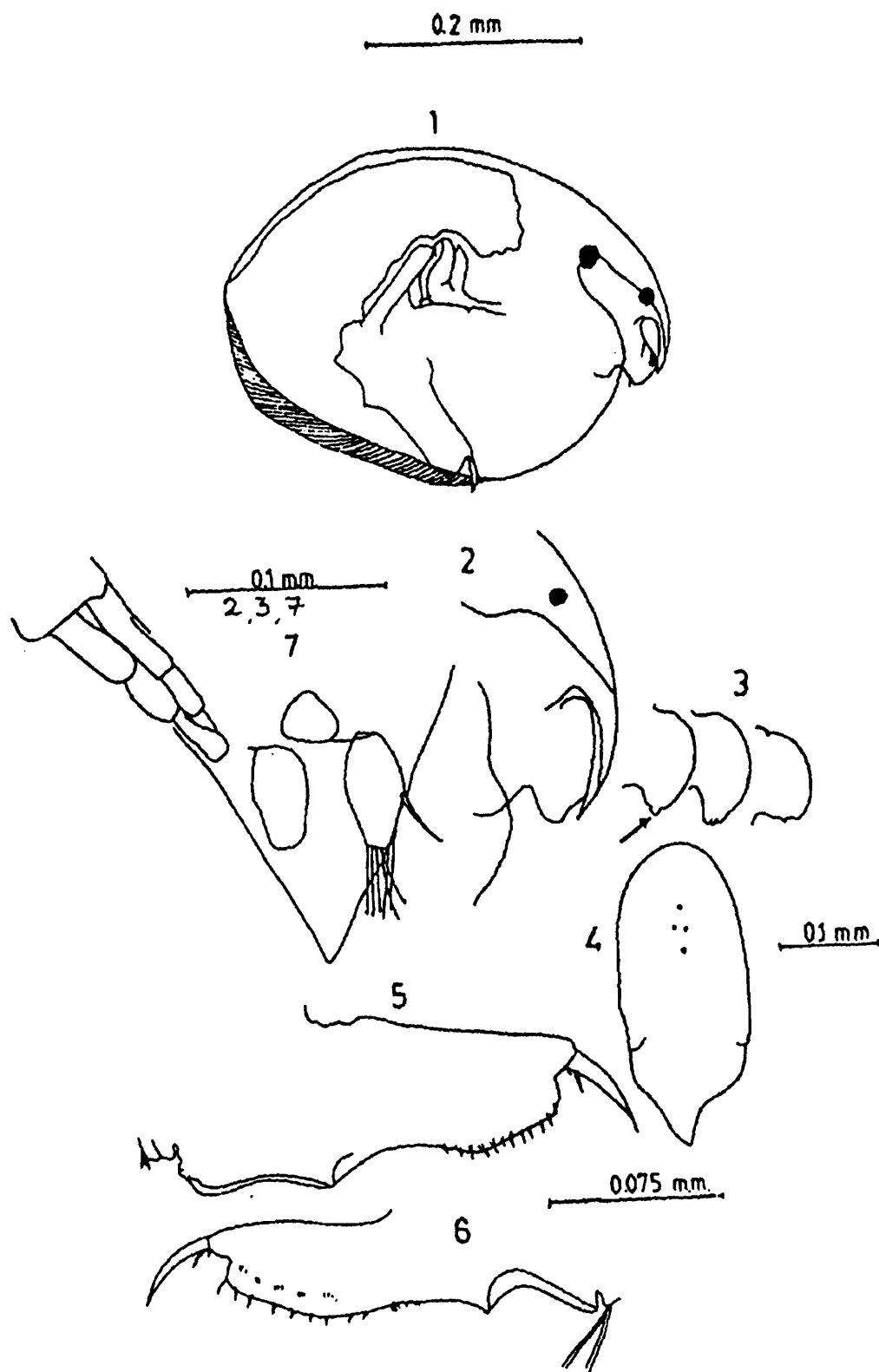
Remarks : Brehm (1936) doubtfully mentioned similar specimen from Nilgiri Hills. Later on Biswas 1965 recorded a new species *C. brehmi* from Jaipur dist., Rajasthan on the basis of peculiar papilliform process on the tip of the Plate of labrum. Smirnov (1971) shifted this species to *C. eurynotus brehmi* com. n. as showing the same character of labrum with slightly produced apex similarly which was always found in *C. eurynotus* species.

18. *Dunhevedia crassa* King
(Plate XVIII, figs. 1-10)

1853. *Dunhevedia crassa* King, *Pap. and Proc. Roy. Soc. van Diemens land, Hovert Town*, 2 : 261, pl. VII F.

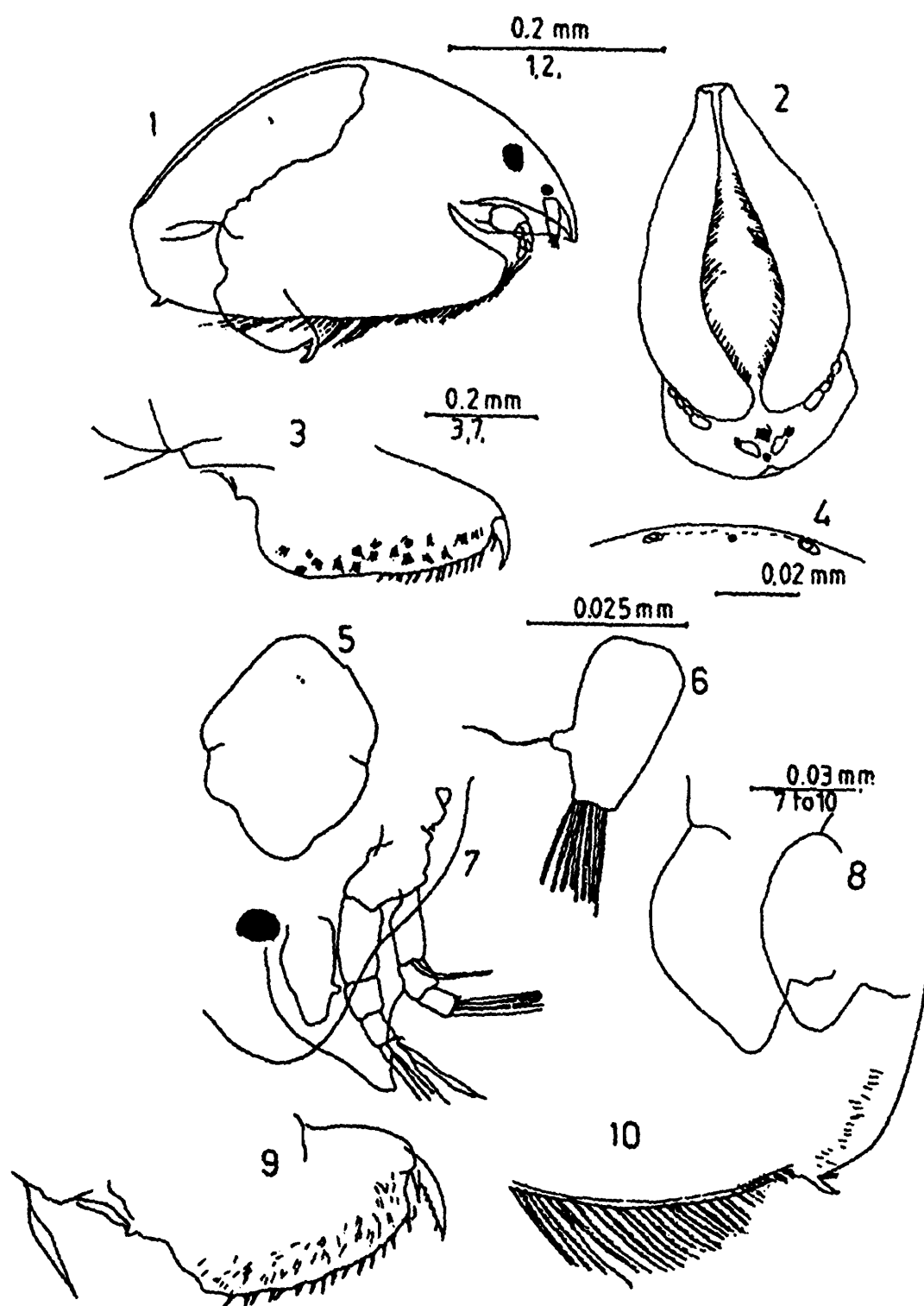
Material examined and Locality : Melghat Tiger Reserve: 3 exs., water pools near Dhakna, 16.2.91; 1 ex., Malur-Chaurakunda, 17.2.91 (Coll. D.F. Singh).

PLATE - XVII



Figs. 1-6 : *Chydorus eurynotus brehmi* (Biswas) : 1. female; 2. anterior part of head; 3. labrum with a papilliform apical process; 4. head shield; 5&6. postabdomen of female.

PLATE - XVIII



Figs. 1-10 : *Dunhevedia crassa* King : 1. female; 2. ventral view of female; 3. postabdomen; 4. head pores; 5. head shield; 6. antennule with lateral setae; 7. anterior part of head ventral view; 8. labrum; 9. postabdomen; 10. posteroventral region of female with long setae.

Diagnostic characters : Body curved dorsally, oval in outline and maximum height slightly before the middle. Posteroventral corner of valves with one denticle. Ventrwl margins of valves with feathered setae which are longest in the middle. Rostrum blunt, labrum rounded with pointed apex. Ocellus small and situated slightly closer to eye than to apex of the rostrum. Antennules ending slightly before apex of rostrum. Thick and tapering distally; lateral sensory seta situated on a tubercle distal to middle of anterior margin of antennule and sensory papillae at most half as long as antennules. Postabdomen oval with 15-18 anal spines and numerous lateral groups of setae. Length: 0.5 mm.

Distribution : India : West Bengal, Gujarat, Rajasthan, Tamil Nadu, Kerala, Maharashtra (Ujani wetland).

Elsewhere : Holarctic region, Ethiopian, Indo-Malayan, Auastralian region and also southern part of European USSR.

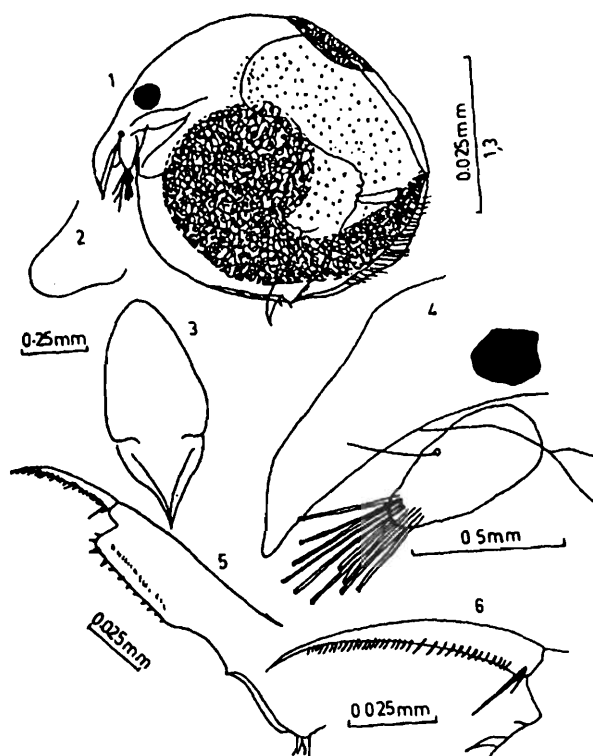
Remarks : The present species differs from *D. serrata* by the body is short and high with the dorsal margin much arched and in the latter more elongate and with less arched dorsal edge.

19. *Pseudochydorus globosus* (Baird)
(Plate XIX, figs 1-6)

1843. *Chydorus globosus* Baird, Ann. Mag. Nat. Hist., 68 : 90, pl. III, figs. 1-4.

1948. *Pseudochydorus globosus* Fryer, Phil. Trans. Roy. Soc., 254 : 324-328, figs. 92-111.

PLATE - XIX



Figs. 1-6 : *Pseudochydorus globosus* (Baird) : 1. female; 2. labrum; 3. head shield; 4. anterior region of head with rostrum, ocellus and antennule; 5. postabdomen; 6. anterior part of postabdomen with claw armature.

Material examined and Locality : Melghat Tiger Reserve : 1ex., Chaura Kunda at Malur Vill. 28.8.93 (Coll. P.P. Kulkarni). 1 ex., Tapi river kunda at Rangubeli, 10.2.91, (Coll. D.F. Singh).

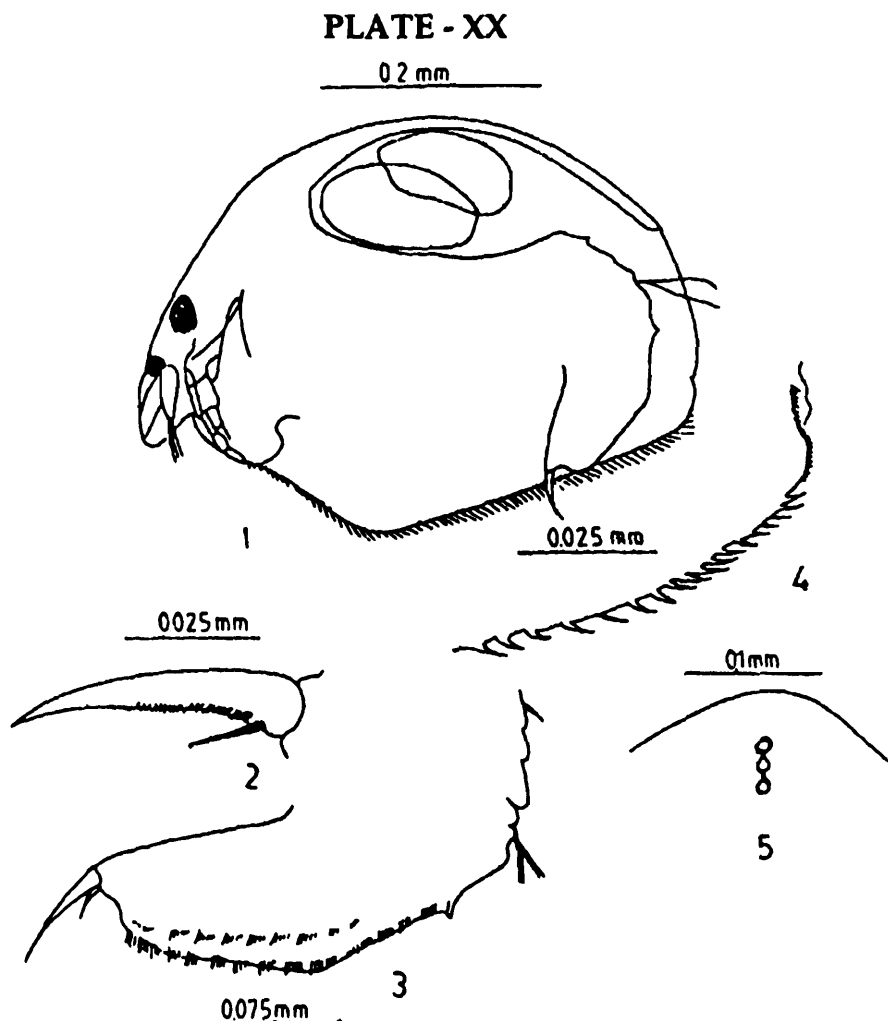
Diagnostic characters : Body almost spherical, slightly longer than high; posteroventral corner of valve rounded without denticle. Valve with pattern of polygons. Rostrum pointed and ventrally directed. Head shield with rounded posterior margin; Antennules not reaching apex of rostrum. Postabdomen narrow, almost uniformly wide; anal spines about 20, decreasing in size proximally. Group of lateral setae present. Anal margin with setae. Claw with two basal spines and row of setae on concave margin. Length 0.82 mm.

Distribution : India : Tamil Nadu, West Bengal, Meghalaya, Maharashtra (Ujani wetland Pune).

Elsewhere : Holartic, Indo-Malayan, Australia, USSR.

20. *Alona davidi punctata* (Daday)
(Plate XX, figs. 1-6)

1898. *Alona punctata* Daday, *Termes, Fuzetek*, 21 : 39-40 pp., figs. 18, a-e.



Figs. 1-5 : *Alona davidi punctata* (Daday) : 1. female; 2. claw with basal spine; 3. postabdomen with anal teeth in groups; 4. ventral margin with thick and evenly spaced setae; 5. head pores.

1939. *Alona davidi* var *punctata* Gauthier, Bull. Inst. fr. Afr. noire I : 176-182 pp., figs. 10.

Material examined and Locality : Melghat Tiger Reserve : 1 ex., Hatumarita, 31.8.92., 3 exs., Charakunda at Malur vill., 28.8.93; 5 exs. Kapra river, 12.12.92 (Coll. P.P. Kulkarni).

Diagnostic characters : Body almost oval in outline; maximum height slightly before the middle. Posterodorsal of valves rounded. Posteroventral corner without denticles. Ventral margin of valve projecting in the middle, with feathered setae passing on posteroventral corner into a row of short setules which continue on the posterior margin. Valve punctate. Rostrum blunt. Head shield with three main connected head pores and two lateral small pores. Plate of labrum rounded. Ocellus smaller than eye. Postabdomen widest in the middle with 10-12 groups of spines, dorsally and groups of setae laterally. Claw with one rather large basal spine; setae on the concave margin. Length: 0.6 mm.

Distribution : India : West Bengal, Tamil Nadu.

Elsewhere : Ethiopian and Australian region, Argentina.

21. *Alona costata* Sars

(Plate XXI, figs. 1-10)

1862. *Alona costata* Sar, Forhandl. Vidensk. Selask. Christiania, 286 p.

Material examined and Locality : Melghat Tiger Reserve : 2 exs., Govilghat at Chikaldhara, 5.9.93 (Coll. P.P. Kulkarni). 1 ex., Hathida Talao, 22.3.93 (Coll. S.G. Patil).

Diagnostic characters : Valve with rounded posterodorsal and posteroventral corner. Valve with longitudinal and interconnections. Posterior margin of valves with a row of spinules on its inner margin. Antennule not reaching apex of rostrum. Antennular setae 0-0-3/1-1-3. Plate of labrum rounded. Ocellus much smaller than eye and situated half way between eye and apex of rostrum. Postabdomen short and tapering distally, dorsal margin almost straight and preanal corner only slightly projecting beyond the base of claws. Anal spines 11-12, decreasing in size proximally. Group of lateral setae present in a row, the distal setae being longest in each groups. Anal margin almost straight. Claw with basal spine. Length: 0.6 mm.

Distribution : India : Himachal Pradesh, Manipur.

Elsewhere : Holarctic, Ethiopian, Indo-Malayan, Neotropical and European USSR.

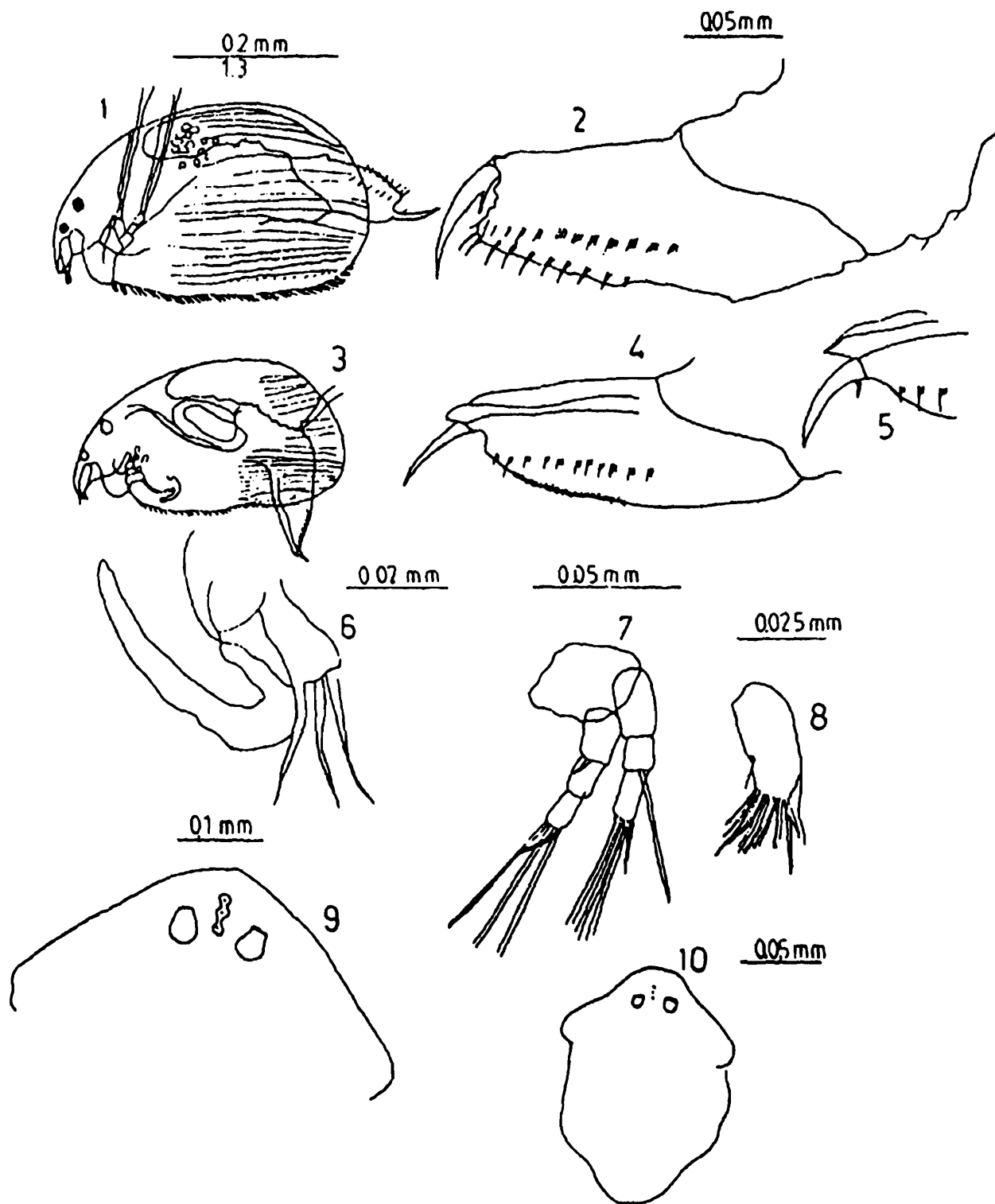
22. *Alona pulchella* King

(Plate XXII, figs. 1-6)

1854. *Alona pulchella* King, Pap. Proc. R. Soc. Van Diemens Land, 2 : 260, pl. VIII B.

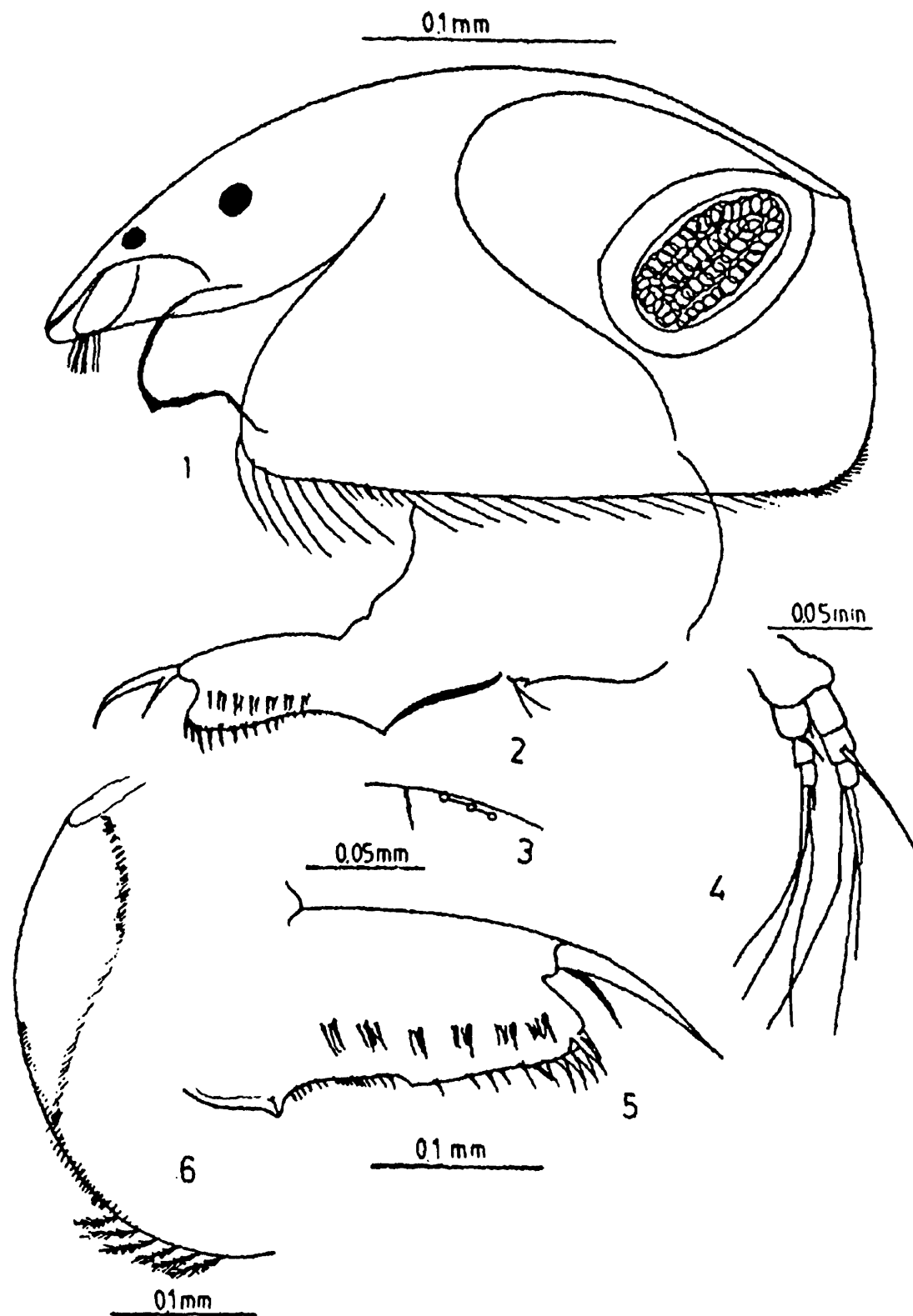
Material examined and Locality : Melghat Tiger Reserve : 2 exs., Govilghat Chikhaldhara, 5.3.93 (Coll. P.P. Kulkarni). 1 ex., Chamhar height, 20.2.97 (Coll. A.S. Mahabal).

PLATE - XXI



Figs. 1-10 : *Alona costata* Sars : 1. female; 2. postabdomen of female; 3. male with hook at first leg; 4&5. postabdomen of male with vas difference opening on the ventral side of postabdomen and without anal teeth; 6. hook on the first leg of male; 7. antenna; 8. antennule; 9. head pores; 10. head shield.

PLATE - XXII



Figs. 1-6 : *Alona pulchella* King : 1. female; 2. postabdomen; 3. head pore; 4. antenna; 5. postabdomen with large basal spine; 6. postero-lateral region of the carapace.

Diagnostic characters : Body almost oval in outline. Valve generally punctate or with reticulation. Rostrum blunt. Antennules not reaching apex of rostrum. Plate of labrum with convex anterior margin and slightly pointed apex. Ocellus situated half way between eye and apex of rostrum. Postabdomen with almost straight dorsal and ventral margins; lateral setae in groups, distal setae longest in each groups. Preanal corner distinct but not projecting. Claw with one basal spine. Length: 0.5 mm.

Distribution : India : Gujarat, West Bengal.

Elsewhere : Cosmotropical.

23. *Alona rectangula* Sars

(Plate XXIII, figs. 1-7)

1862. *Alona rectangula* Sars, Forh. vid. Selsk, Christiania, 160.

Material examined and Locality : Melghat Tiger Reserve : 3 exs., Chamhar-Vdhda height, 20.2.97 (Coll. A.S. Mahabal). 2 exs., Govilghat-Chikaldhara, 5.9.93 (Coll. P.P. Kulkarni).

Diagnostic characters : Valves with longitudinal lines, without pits. Ocellus smaller than eye. Postabdomen with 7 anal spines accompanied by setae. Distal groups of lateral setae projecting beyond margin of postabdomen. Claw with basal spine, with setae on 3/4 of its concave margin. Length: 0.5 mm.

Distribution : India : Ladakh, Gujarat, Rajasthan, Meghalaya, Kashmir, West Bengal.

Elsewhere : Africa, USSR.

24. *Leydigia ciliata melghatensis* ssp. nov.

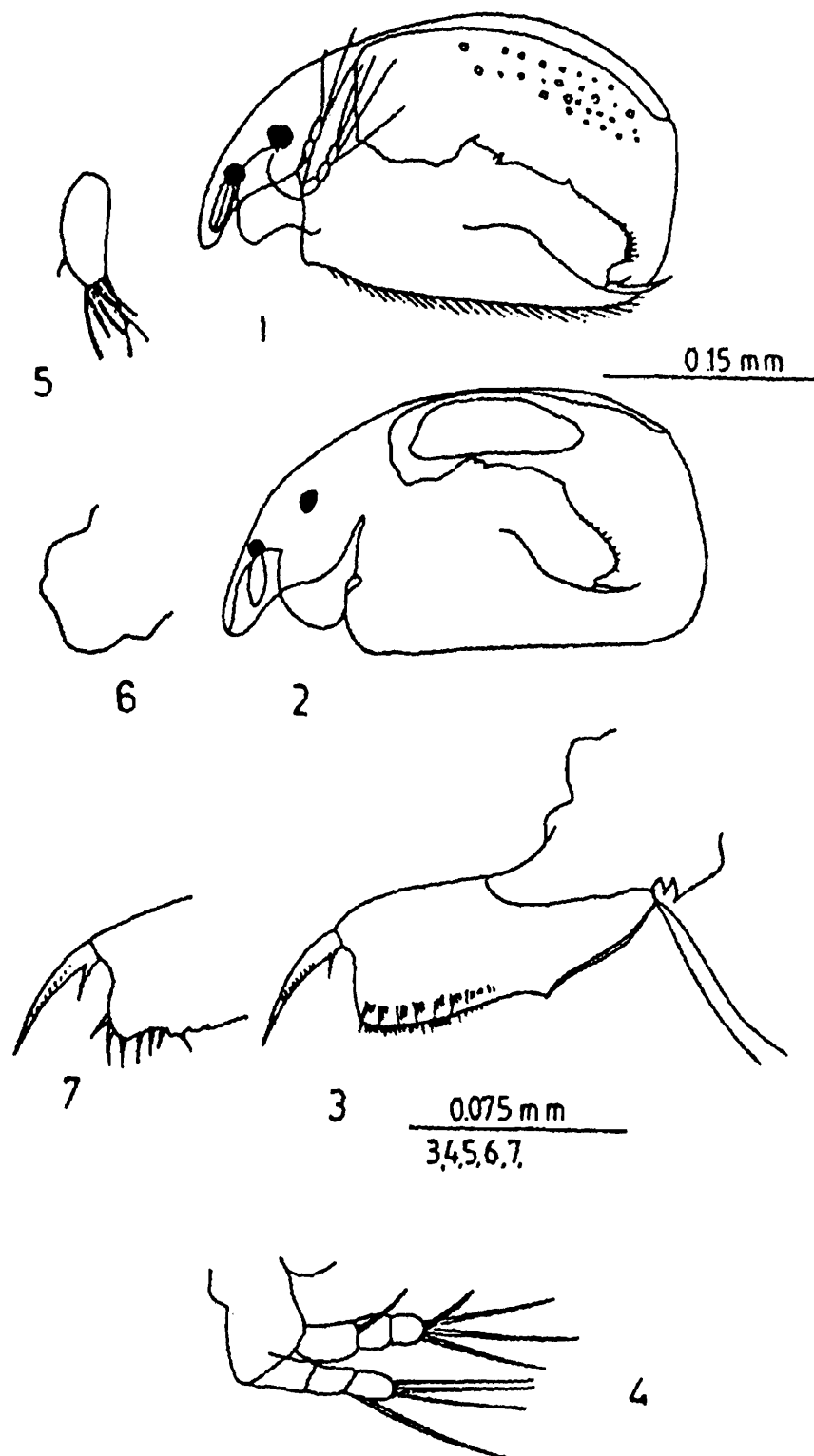
(Plate XXIV, figs. 1-10)

Holotype : 1 ♀ (in spirit); *Paratype* : 5 ♀ ♀, 3 ♂ ♂ (in spirit); *Allotype* : 1 ♂ (in spirit).

Type locality : India, Maharashtra state, Amaravati distt., Gavilghat tank near Chikaldhara, 19.12.97, Melghat Tiger Reserve, Coll. Dr. P.P. Kulkarni.

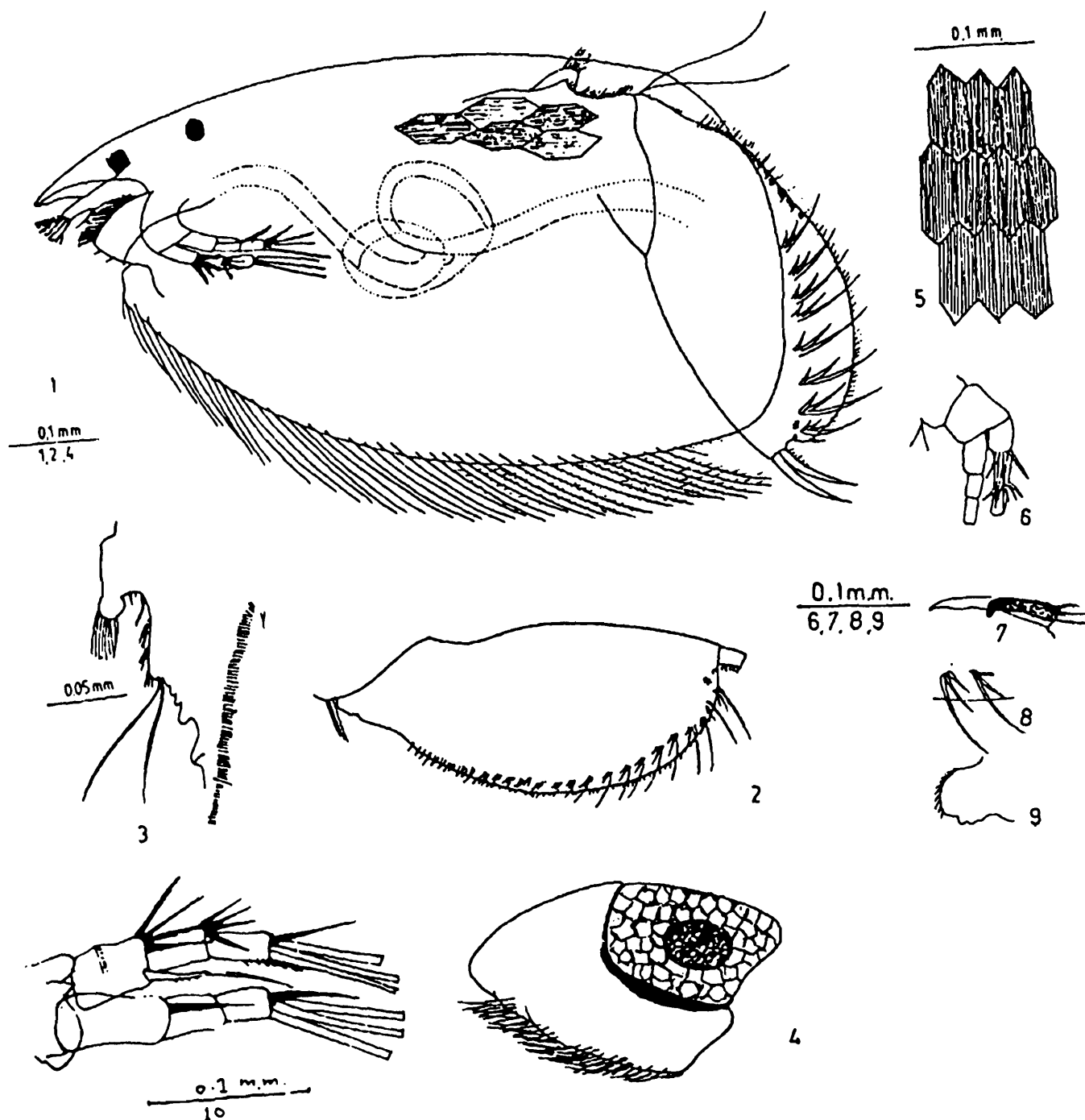
Female : Body almost oblong, posterodorsal corner blunt, posteroventral corner rounded without denticles. Valve yellowing-brown in colour with fine longitudinal anastomosing lines anteroposteriorly; sometimes at dorsal region hexagonal bricklike reticulation, ephippial females have granulate valves, under high magnification the granules appears like irregular stars. Antennules not reaching apex of the rostrum, with a unequal sensory setae at tip and one stout seta at 1/4 length near the tip. Antenna small with 3 segmented dorsal and ventral ramus. Setae on antenna 0-0.3/1-1.3. Exopodite of antenna with group of 4 spines on first and group of 4 spine on second segment. The proximal are almost one and half larger than distal. Third segment with one large spine and three setae. Endopodite of antenna with large lateral spine on first and third segment, larger spine on first is almost

PLATE - XXIII



Figs. 1-7 : *Alona rectangularis* Sars : 1&2. female; 3. postabdomen; 4. antenna; 5. antennule; 6&7. labrum and distal part of postabdomen of deformed specimen.

PLATE - XXIV



Figs. 1-10 : *Leydigia ciliata melghatensis* subsp. nov. : 1. Parthenogenetic female; 2. postabdomen and groups of lateral setae of three each anal denticles; 3. postanal part of postabdomen near natatorial setae; 4. ehippium; 5. sculpture on carapace showing rectangular to hexagonal cells with fine striation inside; 6. outer segments of male antenna with grouped setae; 7. male claw and vas deferens opening on the apex of penis like process; 8. lateral groups of setae on postabdomen; 9. male labrum; 10. outer segment of antenna with spines like setae in the group of 4 on first and second segments.

reaching the tips of second segment. Plate of labrum large, triangular with many hair like setae on anterior upper margin. Postabdomen large, slightly narrow at the proximal end near natatorial setae and broad at distal middle region. Postabdomen with large 8-9 lateral setae which are in groups of 3; first is very large and third in each group very small. Posterior to these lateral setae 15-16 groups of small setae in group of 5-6, of which the first is the largest but these are hardly reaching out of ventral margin of postabdomen. Anal margin slightly convex. 3-4 rounded club like process present between natatorial setae and the preanal corner. Above natatorial setae is slight concavity with hairs and a knob with many long setae. Claw long, slightly curved with two sets of hairs on the concave side, first group larger than second and there is large seta at the junction of both groups. Small basal spine but that is generally not well marked. Eye and ocellus present. Ocellus is larger than eye. Ventral margin of valve with several unequal setae; first 1/3 group with small, marginal setae; later 2/3 part with large feathered setae placed submarginally and are replaced later by fine spinules at the postero-lateral angle. Length: 0.5-0.8 mm.

Male : Length : 0.6 mm. Males are smaller and wider than females. Postero-dorsal corner of valve at the level of maximum height. Antennules thicker than female, do not reach apex of rostrum. Antennules with stout spine at antero-dorsal margin and olfactory setae at tips. Plate of labrum with small cilia-like setae on anterior margin; posterior margin sinuate. Ocellus slightly larger than eye. Vas deference open on apex of penis like process above the claw. Postabdomen with 6 lateral groups of setae, each with 3 setae each; 7th with 2 setae only. First and second segments of exopodite of antenna with group of 4 spines each. Spines of first segment quite larger than group of second segmental spines. Leg first with strongly developed hook which has transverse rugae near tip on concave side. Anteroventral corner of valve is markedly incised. Endite of leg first anteriorly with brush of setae opposite to hook.

Ephippium : Length : 0.38-0.45 mm. One sexual egg in the ephippium. Oval egg placed centrally in the ephippium, covered distinctly with darker yellow reticulated vacuole.

Differential diagnosis : The taxon *Leydigia ciliata* originally described by Gauthier (1939) from lake Chad. The present subspecies *L. c. melghatensis* ssp. nov. has put in it because it shows similarities in lateral postabdominal setae which are in groups of 3 and the postabdomen narrows at the proximal end. It differs to the original species in following characters: in *L. ciliata* the group of spines on first and second segments of exopodite of antenna in male and female are in groups of three while in present *L.c. melghatensis*, they are in groups of 4 in female and 4-6 in male on respective segments. These grouped spines on first and second segment are of same length in *L. ciliata*, but in present new subspecies the spines of first segment of antenna of female are one and half times larger than spines on second segment. In male of present new ssp. the middle two spines on first segment are quite large, almost double the length of other two spines, may sometimes reaches the distal end of the third segment. There is also a striking difference in the

structure of male postabdomen. In male of *L. ciliata* the penis like process extend upto about $\frac{2}{3}$ the length of claw and third seta in lateral group of postabdominal setae is about $\frac{2}{3}$ of the length of first lateral setae of that group which in *L. c. melghatensis* the penis like process only reaches $\frac{1}{2}$ the length of claw and the third postabdominal seta in each group is about less than $\frac{1}{3}$ of the length of first longest lateral setae of that group. Sculpture on the valves of *L. ciliata* are with fine anastomosing lines but *L. c. melghatensis* these antero-posteriorly directed fine lines are in the form of reticulated cells mostly at dorsal area of valve which has pentagonal to hexagonal pattern of cells.

In *L. australis* Sars, the eye is about $\frac{1}{3}$ the length of ocellus; in *L. ciliata* the eye is about $\frac{1}{2}$ the length of ocellus, which is almost equal or slightly smaller than ocellus in present new subspecies. The reticulated brick like pattern of cells on dorsal and sometime at ventral margin (generally well marked in fresh specimens) is unique character only found in present new subspecies.

25. *Biapertura affinis* (Leydig)
(Plate XXV, figs. 1-19)

1860. *Lynceus affinis* Leydig, *Naturgeschichte der Daphniden*, Tübingen., 223, pl. 1x, figs. 68-69.

1971. *Biapertura affinis affinis* : Smirnov, USSR, Acad. Sci. Zool. Institute. Nova Ser. No. 101, Leningrad, 467-462, figs., 582-587.

Material examined and Locality : Melghat Tiger Reserve : 6 exs., Chadeurpati, 14.2.93 (Coll. S.G. Patil).

Diagnostic characters : Body oblong in outline, maximum height in the middle region. Posteroventral corner of valve with rows of groups of setae continuing as a row of spinules on the posterior margin. Valves marked with longitudinal lines. Two main head pores on head shield, with narrow connection between them. Antennules not reaching apex of rostrum. Spines are present on segments of antennae. Plate of labrum with convex anterior margin. Ocellus is smaller than eye, situated nearer to eye than to apex of rostrum. Postabdomen uniformly wide; dorsal margin rounded with 12-16 anal denticles. Lateral groups of setae on concave margin. Length: 0.8 mm.

Distribution : India : Kashmir, Meghalaya, Gujarat, West Bengal.

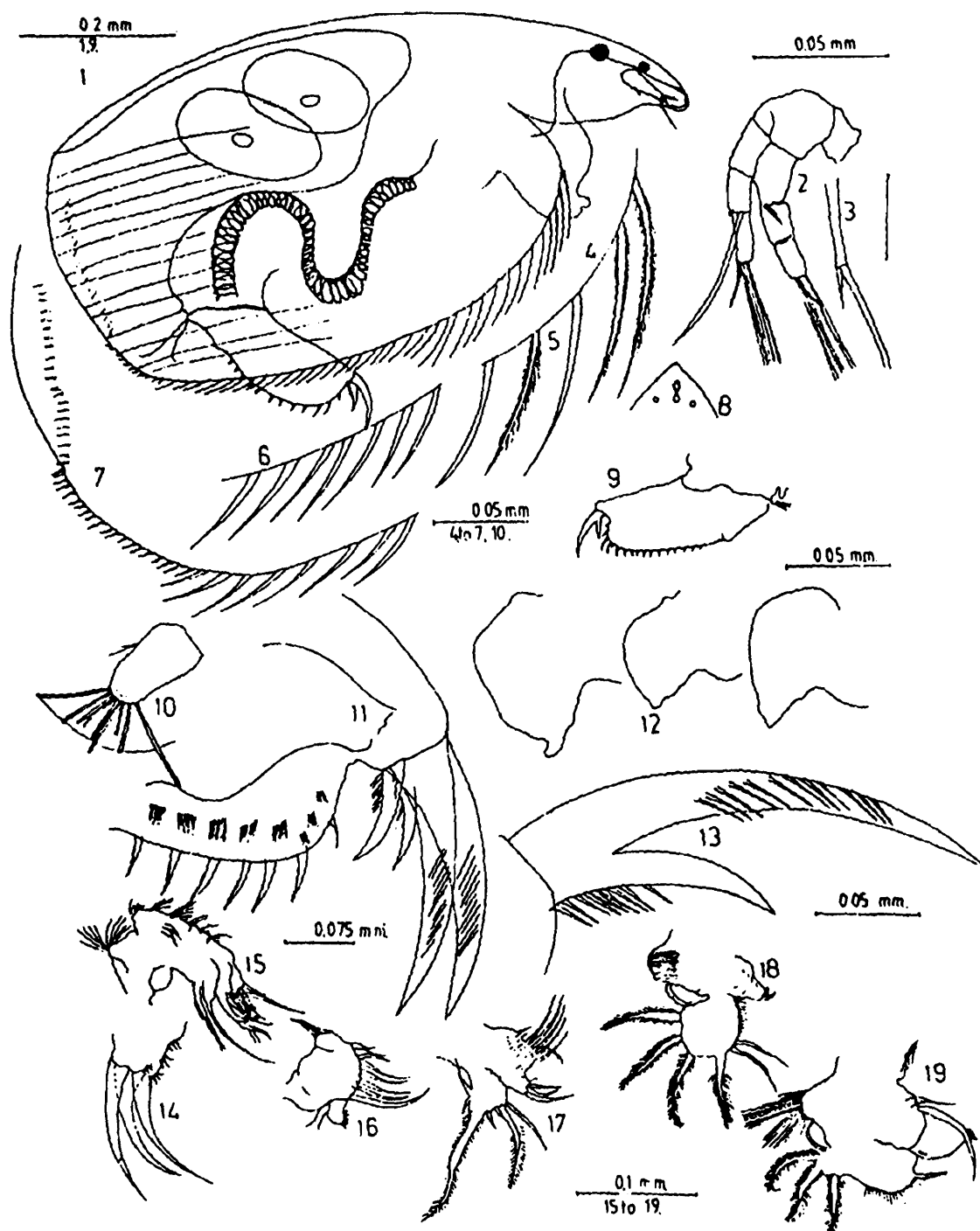
Elsewhere : Cosmopolitan, USSR and Central Asia.

26. *Biapertura verrucosa* (Sars)
(Plate XXVI, figs. 1-3)

1901. *Alona verrucosa* Sars, *Arch. Math. Nat.*, 23 : 56-57, pl. IX, figs. 7, 7a.

1988. *Biapertura verrucosa* : Michael and Sharma, *Fauna of India, Cladocera*, ed. Director, Zoological Survey of India, Calcutta, 210 p., figs. 73 a-d.

PLATE - XXV



Figs. 1-10 : *Biapertura affinis* (Leydig) : 1. parthenogenetic female; 2. antenna; 3. spine at joint of distal setae of antenna; 4,5&6. different type of marginal setae at ventral margin of carapace; 7. fine setules at posteroventral corner of female extending upto inner side on posterior margin; 8. head pores; 9. postabdomen; 10. antennule; 11. distal part of postabdomen; 12. labrum; 13. enlarged claw with basal spine; 14&15. female 1st leg; 16. 2nd leg; 17. 3rd leg; 18. 4th leg; 19. 5th leg.

PLATE - XXVI



Figs. 1-3 : *Biapertura verrucosa* (Sars) : 1. female; 2. PLATE of labrum; 3. postabdomen.

Material examined and Locality : Melghat Tiger Reserve : 2 exs., Chamhar height 20.2.97 (Coll. A.S. Mahabal). 1 ex., Kapra river, 12.2.92; Chaurakunda at Chopur vill., 20.8.93 (Coll. P.P. Kulkarni).

Diagnostic characters : Posteroventral corner of valve rounded. Valves with tubercles. Two main head pores connected and two lateral pores. Antennules almost reaching apex of rostrum. Plate of labrum with incision at lower portion of labral Plate but no distinct denticle anteriorly. Ocellus smaller than eye and situated nearer to eye than to apex of rostrum. Postabdomen short with curved dorsal margin and rounded distal margin. Anal

margin projecting and situated in the middle of the dorsal margin of postabdomen. Postabdomen with 6-8 anal spines and lateral setae rather large and in groups. Claw with basal spine and setae on the concave margin. Length: 0.32 mm.

Distribution : India : Gujarat, Maharashtra.

Elsewhere : Indo-Malayan, Ethiopian and Neotropical regions.

27. *Biapertura karua* (King)
(Plate XXVII, figs. 1-7)

1853. *Alona karua* King, *Pap. Proc. R. Soc. Van Diemens Land*, 2 : 260, pl. VIII.

1971. *Biapertura karua* Smirnov: *USSR, Acad. Sci. Zool. Institute; Nova Ser. No. 101 : Leningrad*, 479-480, figs. 600-603.

Material examined and Locality : Melghat Tiger Reserve : 4 exs., Chaurakunda at Malur vill. 28.8.93; 2 exs., Kapra river, 12.12.92 (Coll. P.P. Kulkarni). 1 ex., Govilghat, Chikhaldara, 22.2.97 (Coll. A.S. Mahabal).

Diagnostic characters : Body oval in outline, maximum height slightly before middle. Posteroventral corner of valves with 3 denticles, separated from each other by margin of valve. Valve straight with occasional polygons. Antennules almost reaching apex of rostrum. Plate of labrum rounded. Ocellus smaller than eye. 7-8 anal spines present with lateral groups of setae. Claw with very small basal spine. Length : 0.35 mm.

Distribution : India : Meghalaya, West Bengal, Tamil Nadu.

Elsewhere : Cosmopolitan.

28. *Euryalona orientalis* (Daday)
(Plate XXVIII, figs. 1-10)

1898. *Alonopsis orientalis* (Daday), *Termes, Fuzetek*, 21 : 45-48, figs. 21-22.

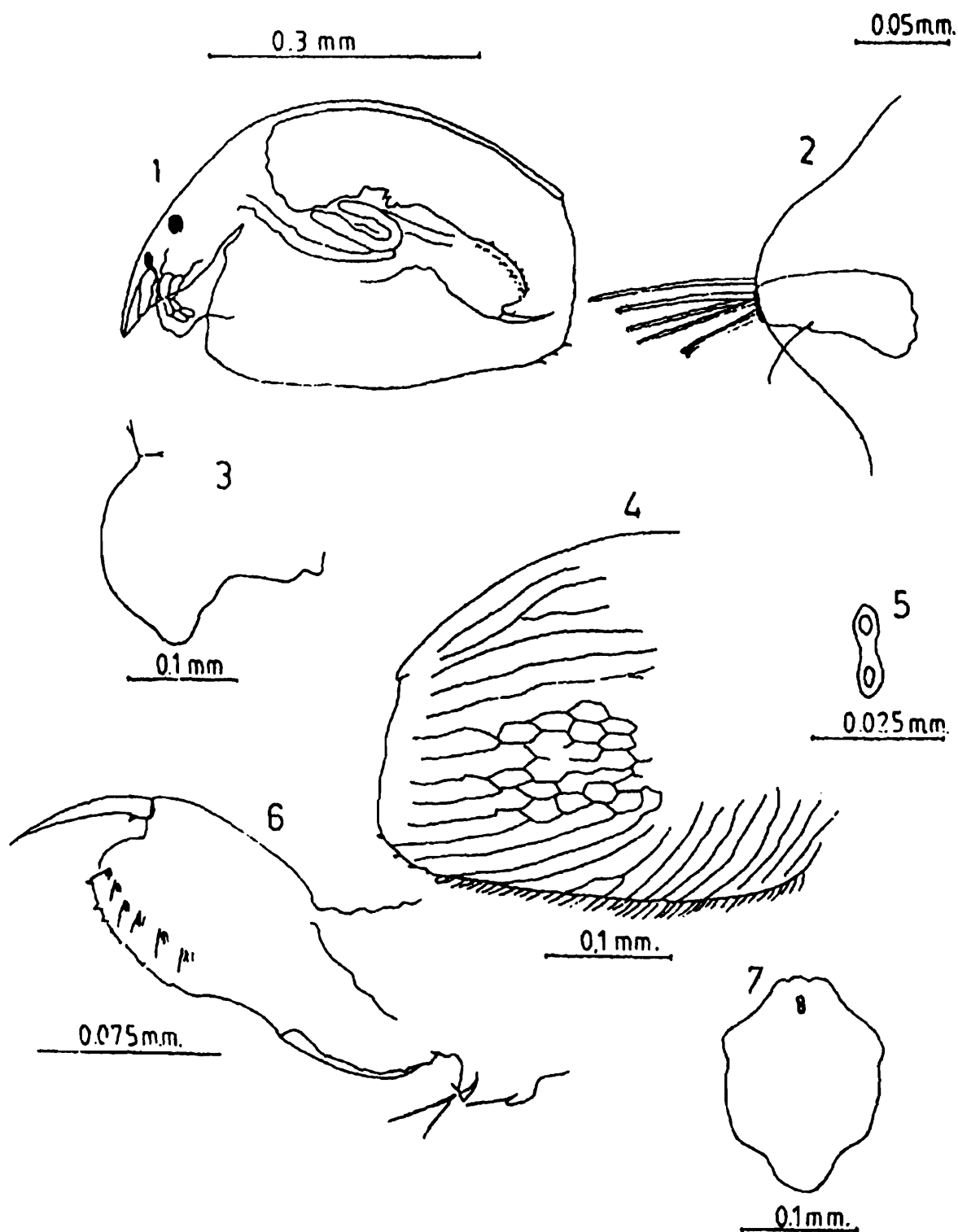
1905. *Euryalona orientalis* Daday, *Zoologica Stuttgart*, 18 : 180-181, pl. XI, figs. 14-15.

Material examined and Locality : Melghat Tiger Reserve : 3 exs., Chipidoh, 18.2.93 (Coll. S.G. Patil). 2 exs., Ambadoh, 27.2.97, (Coll. A.S. Mahabal).

Diagnostic characters : Posteroventral corner of valves rounded, without denticles. Ventral margin of valves with blunt process before middle and setae arising there from some distance of the margin. Anterior margin of valve with fine setae. Antennules reaching apex of the rostrum. Plate of labrum with convex anterior margin and blunt apex. Ocellus smaller than eye and situated halfway between eye and apex of rostrum. Postabdomen narrow and slightly curved with about 20 anal denticles, decreasing in size proximally. Claw with basal spine and with setae on proximal half of concave margin. Length: 1 mm.

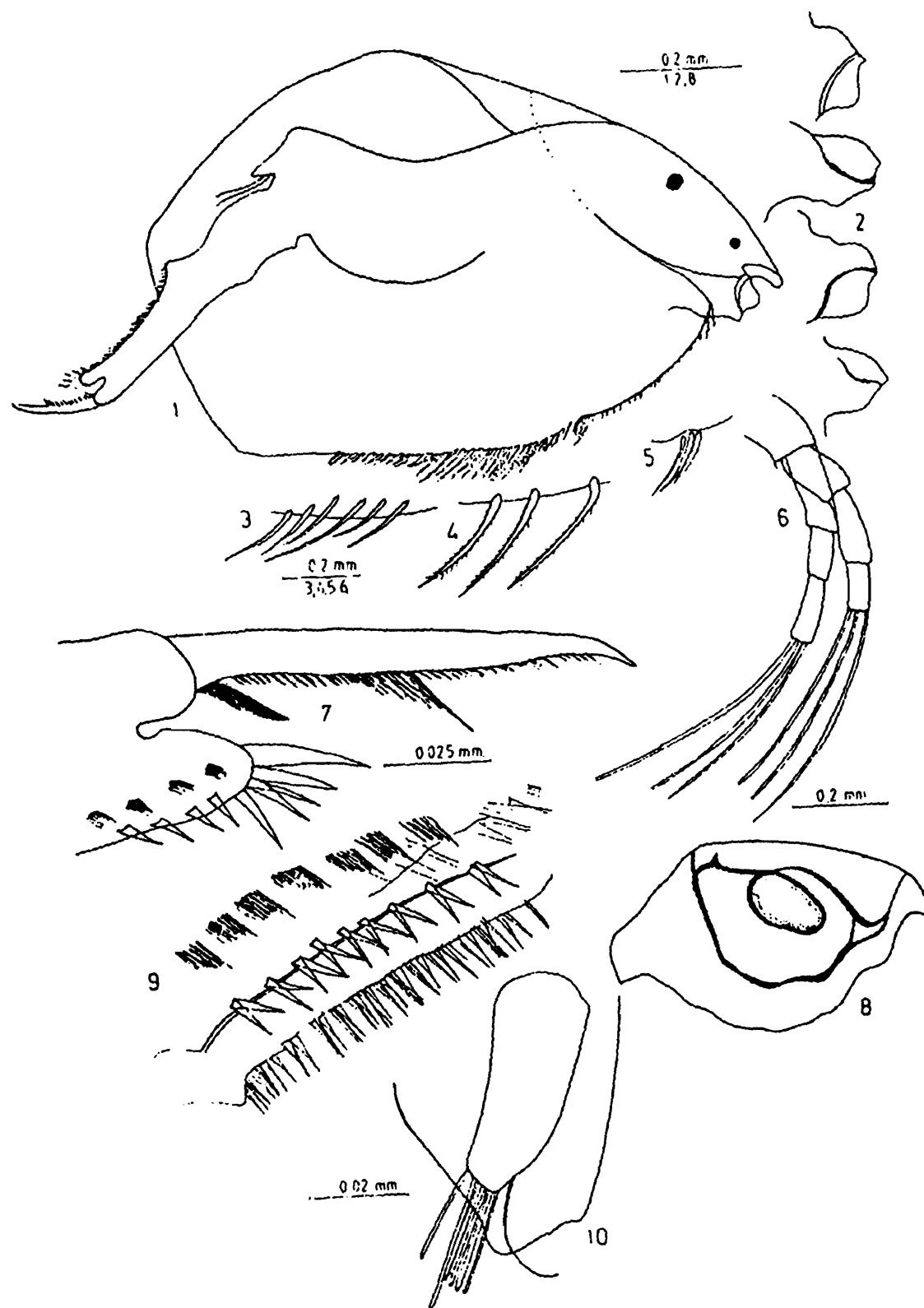
Distribution : India : Tamil Nadu, West Bengal.

PLATE - XXVII



Figs. 1-7 : *Biapertura karua* (King) : 1. female; 2. antennule; 3. PLATE of labrum; 4. carapace sculpture and postero-ventral corner with 3-4 denticles; 5. head pore; 6. postabdomen; 7. head shield.

PLATE - XXVIII



Figs. 1-10 : *Euryalona orientalis* (Daday) : 1. female; 2. labrum, different shapes; 3,4&5. ventral marginal setae; 6. antenna; 7. distal part of postabdomen with claw, basal spine, anal spines and lateral setae; 8. ephippium; 9. anal teeth and lateral grouped setae enlarged; 10. antennule.

Elsewhere : Shore of Gulf Maxico, Northeast China, Indo-Malayan, Ethiopian and Neotropical regions.

29. *Ephemeroporus barroisi* (Richard)
(Plate XXIX, figs. 1-9)

1894. *Pleuroxus barroisi* Richard, *Ann. Sci. natur. Zool.*, 18 : 375-377, figs. 9-12.

1982. *Ephemeroporus barroisi* (Richard) = nomen dubium, Frey, *Hydrobiologia*, 86 : 233-237, pl. 1.

Material examined and Locality : Melghat Tiger Reserve : 7 exs., Chipidoh, 18.2.93, 2 exs., Koktu river doh, 21.2.93 (Coll. S.G. Patil). 1 ex., Turma river pool near Bodkheda, 18.2.91 (Coll. D.F. Singh).

Diagnostic characters : Body broadly elliptical in outline, maximum height in the middle, dorsal and ventral margin similarly convex, posterior margin almost straight. Posterodorsal corner of valves rounded. Posteroventral corner of each valve with denticle. Rostrum with apical notch. Antennule short, conical and not reaching apex of rostrum. Plate of labrum with produced apex and with 3-5 denticles on anterior margin. Ocellus smaller than eye, situated halfway between eye and apex of rostrum. Postabdomen short, with 9 unequal anal spines. Preanal corner projecting. Claw with two basal spines and setae on concave margin. Length-0.35 mm.

Distribution : India : Tamil Nadu, Kerala, West Bengal, Gujarat, Maharashtra (Ujani wetland).

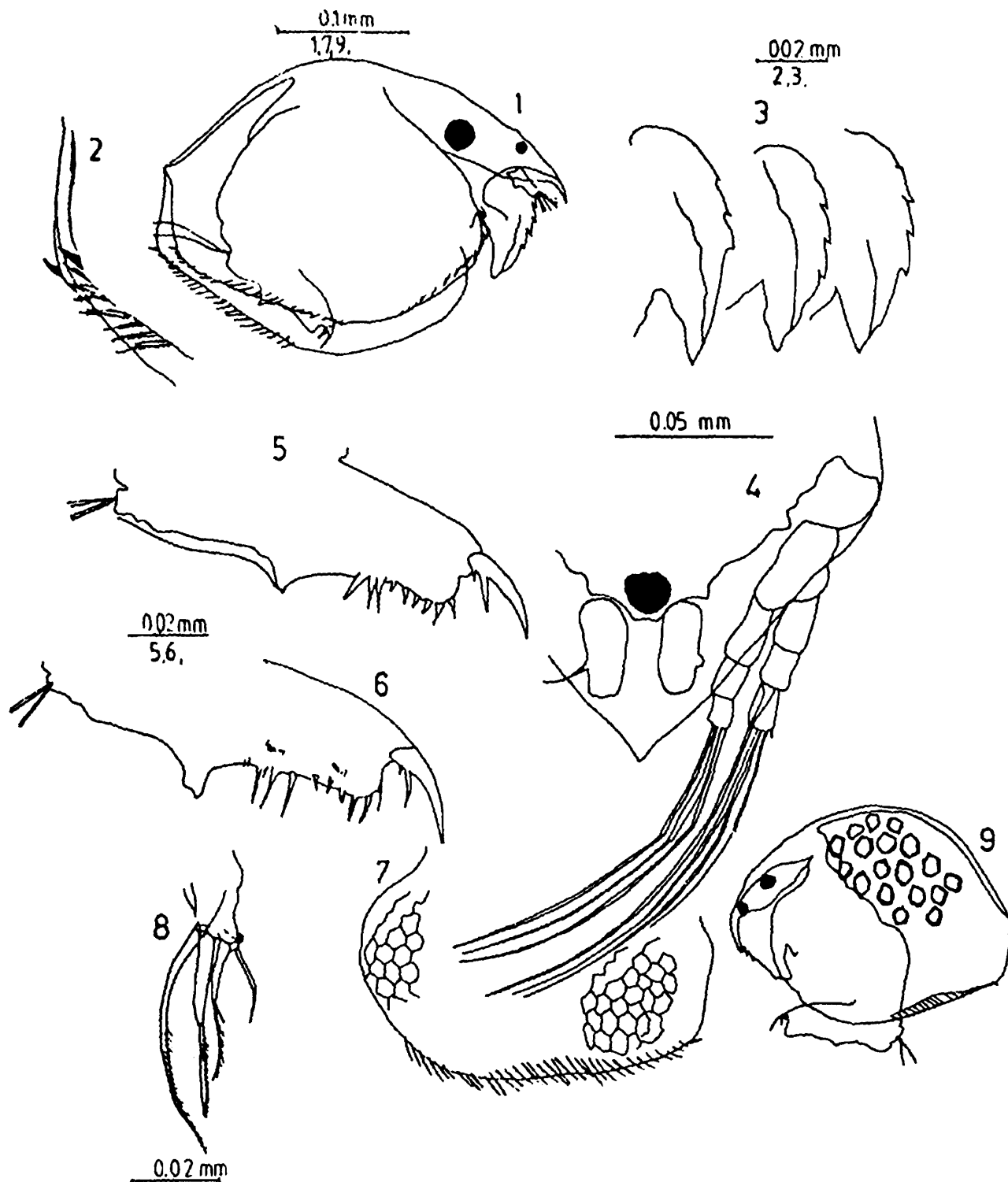
Elsewhere : Cosmotropical.

Remarks : This species was earlier refers as *Chylodsrus barroisi* Richard. Frey (1982) relocated this genera with group of species into newly erected genus *Ephemeroporus* (meaning is short lived passage i.e. named because the median head pore occurs only in instar I)

SUMMARY

Present study based on zooplankton samples actually collected from all types of freshwater habitats in Melghat Tiger Reserve, at different times of the year, by Zoological Survey of India, Western Regional Station tour parties during period of 1991-1997. A total of 26 species, 2 subspecies and one new subspecies of Cladocera belonging 5 families and two subfamilies are recorded. Specimens of all species are actually collected and recorded for the first time in this conservation area of Melghat Tiger Reserve of Maharashtra state. Males are rather rare but they are of considerable value in reaching accurate diagnosis of the species. Few males found in the collections are well illustrated. A special effort has been made to provide lists and illustrations of each and every taxa of Cladocera. The drawings (Plate Nos. I to XXIX) have been prepared from specimens collected from Melghat

PLATE - XXIX



Figs. 1-9 : *Ephemeroporus barroisi* (Richard) : 1. female; 2. posteroventral corner of valve with a denticle; 3. different shapes of labrum; 4. ventral side of anterior part of head; 5&6. postabdomen; 7. carapace with reticulation and ventral setae; 8. Inner distal lobe of 1st leg of female; 9. ephippial female with dorsal thicker cells of ephippium.

Tiger Reserve, to make the diagnosis of each species as easy as possible. Regarding the zoogeographical distribution present Cladocera fauna appears that it has greater affinities to South-East Asian, Australian and African fauna than with Palaearctic. A new subspecies *Leydigia ciliata melghatensis* ssp. nov. has been described from this area.

REFERENCES

- BAIRD, W. 1850. The natural history of British Entomostraca. Roy. Soc. London. : 1-364.
- BAIRD, W. 1843. The natural history of the British Entomostraca. Ann. Mag. Nat. Hist., 68 : 81-95.
- BIRGE, E.A. 1892. List of Crustacea, Cladocera from Madison. Trans. Wis. Acad. Sci. Arts. and Letts., 4 : 77-109.
- BISWAS, S. 1966. A new species of genus *Chydorus*, Leach 1843 (Crustacea : Cladocera : Chydoridae) from Rajasthan, India. Crustaceana, 11 : 113-114.
- BISWAS, S. 1971. Fauna of Rajasthan, India. Part II. (Crustacea : Cladocera). Rec. zool. Surv. India., 63 : 95-141.
- BISWAS, S. 1964 b. Five species of Daphniidae (Crustacea : Cladocera) from Simla Hills in India, with a new record of *Alona costata* Sars from NEFA; J. Zool. Soc. India, 16 : 92-98.
- BRADY, G.S. 1886. Note on Entomostraca collected by Mr. A. Haly in Ceylon. J. Linn. Soc. Zool., 19 : 292-317.
- BREHM, V. 1933a. Die Cladoceren der Deutschen Limnologischen Sunda-Expedition. Arch. Hydrobiol., suppl. 11 : 631-771.
- BREHM, V. 1952. *Diaphanosoma hydrocephalus* nov. spec. eine eigenartige Sidide aus Vorder-Indien. Zool. Anz., 149 : 138-140.
- DADAY, E. 1905. Untersuchungen über die süßwasser. mikrofauna paraguays : Cladocera. Zoologica. Stuttgart, 18 : 154-233.
- DADAY, E. 1898. Mikroskopische Süßwassertiere aus Ceylon. Termes Fuzetek., 21 : 1-123.
- FREY, D. G. 1982. Relocation of *Chydorus barroisi* and related species (Cladocera, Chydoridae) to a new genus and description of two new species. Hydrobiologia, 86 : 231-269.
- FRYER, G. 1968. Evolution and adaptive radiation in the Chydoridae (Crustacea : Cladocera) : a study in comparative functional morphology and ecology. Phil. Trans. Roy. Soc., 254 : 221-385.
- GAUTHIER, H. 1939. Contribution à l'étude de la faune dulcaquicole de la région du Tchad et particulièrement des Branchiopodes et des Ostracodes. Bulletin, Institut. Fondamental d'Afrique Noire, Dakar, 1 : 110-244.

- GAUTHIER, H. 1951. Contribution a l'étude de la faune des eaux douces au Senegal (Entomostraces). *Alger.*, 1-169.
- GOULDEN, C.E. 1968. The systematics and evolution of Moinidae. *Trans. Amer. Phil. Soc.*, N.S., **58** (6) : 3-101.
- HERRICK, C.L. 1882. Notes on some Minneosota Cladocera. *10th Annual Rep. Geol. and Nat. Hist. Survey Minn.*, 235-252.
- JENKIN, P.M. 1934. Report on the Percy Sladen Expedition to some Rift. vally lakes in Kenya in 1929. Cladocera from the Rift. vally lakes in Kenya. *Ann. Mag. Nat. Hist.*, **13** : 281-308.
- KOCH, C.L. 1841. Deutschlands Crustacean, Myriopoden und Arachniden. *Friedrich Pustet Rosenberg. Hefts.*, **8** : 35, 36, 37.
- KOROVCHINSKY, N.M. 1991. The second record of *Diaphanosoma senegal* Gauthier, 1951 (Crustacea : Daphniiformes : Sididae) in Africa with redescription of species and ecological and distributional setes. *Hydrobiologia*, **222** : 187-196.
- KURZ, W. 1874. Dodekas neuer Cladoceren nebst einer kurzen ubersicht der Cladocerenfauna Bohmens. *Sitzber. K. Acad. Wiss. Wein. Math. Nat.*, **69** : 40-46.
- LEYDIG, F. 1860. Naturgeschichte der Daphniden. *Tubingen* : 1-252.
- LILLIJBORG, W. 1900. Cladocera Sueciae, *Nova Acta. Reg. Soc. Sci. Upsala, Ser.*, **19 VI** : 701, 87 pl.
- MICHAEL, R.G. and SHARMA, B.K. 1988. Fauna of India and Adjacent countries, Indian Cladocera (Crustacea : Branchiopoda : Cladocera). *Ed. Director, Zoological Survey of India, Calcutta*, 262.
- MULLER, O.F. 1776. Zoologiae Danicae prodronus seu Animalium Daniae at Norvegiae indigenarum popularium, *Havniae* : 1-273.
- MULLER, O.F. 1785. Entomostraca seu Insecta Testacea, quae in aquis Daniae et Norvegiae reperit, descripsit et conibus illustravit. *Lipsiae et Havniae* : 1-135.
- RANE, P.D. 1984. Occurrence of *Pleuroxus similis* Vavra (Cladocera : Crustacea) in Kanha National Park, India. *J. Bombay nat. Hist. Soc.*, **81** (3) : 724.
- RAGHUNATHAN, M.B. and RANE, P.D. (2001) Cladocera of Nagarhole National Park, Nilgiri Biosphere Reserve. *Conservation Area Series*, **11** : 31-37. *Zoological Survey of India*.
- RICHARD, J. 1894a. Cladoceres recueillis par le Dr. Theod. Barrois en palestine en Syrie et en Egypte. *Revue biol. du Nord. France*, **VI** 360-378.
- SARS, G.O. 1862b. Forsatte sit Foredrag over de af ham i Omegmen af Christiania iagttanne Crustacea. *Forhandlinger i Videnskabs-Selskabet i Christiania*, 1861 : 250-302.

- SARS, G.O. 1885. On some Australian Cladocera raised from dried mud. *Forhandlinger i Videnskabs-Selskabet i Christiania*, 1885, 1-46.
- SARS, G.O. 1888. Additional notes on Australian cladocera raised from dried mud. *Forhandlinger i Videnskabs Selskabet i Christiania*, 1888, 1-74.
- SARS, G.O. 1895. On freshwater Entomostraca from the neighbourhood of Sydney partly raised from dried mud. *Arch. Math. Nat.*, 18 : 1-81.
- SARS, G.O. 1901. Contribution to the knowledge of the freshwater Entomostraca of South America, as shown by artificial hatching from dried mud Part 1. Cladocera. *Arch. Math. Nat.*, 23 : 1-102.
- SARS, G.O. 1903b. Freshwater Entomostraca from China and Sumatra. *Archiv. For Math. Og. naturv.*, XXV, 8 : 1-44.
- SMIRNOV, N.N. 1971. The world Chydorid fauna (In Russian) *USSR Acad. Sci. Zool. Inst. Nova. Ser. No. 101 Leningrad* : 539.
- SMIRNOV, N.N. 1976. World Macrothricidae and Moinidae (In Russian) fauna USSR, Rakoobraznye, vol. 1, Part 3, *Zool. Inst. Acad. Nauk. USSR new series.*, 112 : 1-237.
- SMIRNOV, N.N. and TIMMS, B.V. 1983. A Revision of Australian Cladocera (Crustacea) *Rec. Aust. Mus. suppl.* 1 : 1-132.
- VENKATARAMAN, K. 1992. Cladocera of Keoladeo national park, Bharatpur and its Environs. *J. Bombay nat. His. Soc.*, 89(1) : 17-27.
- VENKATARAMAN, K. 1999. Freshwater Cladocera (Crustacea) of South Tamil Nadu. *J. Bombay nat. Hist. Soc.* 96 (2) : 268-280.
- VENKATARAMAN, K. and KRISHNASWAMY, S. 1984. A new record of *Diaphanosoma senegalensis* Gauthier, 1951 from Madurai, South India. *Curr. Sci.* 53(9) : 1041-1042.

