Volume 108 (Part-1)

Zoological Survey of India
2008

Records of the Zoological Survey of India

Volume 108(Part-4)

Edited by the Director, Zoological Survey of India, Kolkata

Zoological Survey of India
Kolkata
2008

CITATION

Editor—Director. 2007. *Rec. zool. Surv. India,* **108**(Part-4) : i-viii, 1-123 (Published by the Director, *Zool. Surv. India*, Kolkata)

Published – December, 2008 (October-December Issue)

PRICE

India : Rs. 250.00

Foreign : $ 20.00; £ 15.00

Published at the Publication Division by the Director, Zoological Survey of India, 234/4, A J C Bose Road, 2nd MSO Building, (13th Floor), Nizam Palace, Kolkata-700 020 and printed at East India Photo Composing Centre, Kolkata-700 006.

RECORDS
OF THE
ZOOLOGICAL SURVEY OF INDIA

Vol. 108(Part-4) **2008** **Pages 1–123**

CONTENTS

COMPUTERISED DATA ON NATIONAL ZOOLOGICAL COLLECTION

The National Zoological Collections comprising nearly 15,000 types are housed in the Zoological Survey of India, Calcutta and are properly maintained. All these specimens have Registration numbers and are readily available for study as and when required. Data pertaining to locality, date of collection, name of collector, sex, up to date valid species name, name of the host (for parasite) etc., of each *type of collection* have already been computerised. The computerised data are stored in the computer centre of Zoological Survey of India. Scientists/Naturalists interested for any information on type species present in Zoological Survey of India may contact the *Director, Zoological Survey of India, 'M' Block, New Alipore, Kolkata-700 053.*

Dr. RAMAKRISHNA
Director-in-charge
Zoological Survey of India

AN APPEAL

In order to enrich the *"National Zoological Collection"* (NZC) and to up date information on the occurrence and distribution of animal species in India Scientists/Naturalists and researchers working on animal taxonomy/systematics are requested to deposit their identified specimens to the Zoological Survey of India at the following address :

Officer in Charge, Identification and Advisory Section,
Zoological Survey of India, M-Block, New Alipore,
Kolkata-700 053.

These specimens will be registered and their data will be computerised. *They are further requested to deposit their type collection positively of ZSI and use the Registration number in their publication of the new taxon.*

Dr. RAMAKRISHNA
Director-in-charge
Zoological Survey of India

Rec. zool. Surv. India : **108**(Part–4) : 1-4, 2008

A NOTE ON THE RATINGS AND FUTURE OF NON-HUMAN PRIMATES IN INDIA

R. P. MUKHERJEE*, S. CHAUDHURI AND A. MURMU
Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053
**CD-292, Salt Lake, Kolkata-700 064*

INTRODUCTION

India has an amazing high diversity of non-human primate populations and is represented by 15 species. Majority of these species are forest dwellers, but there are some, which live in wide ranging habitats and are well adapted to divergent habitats. These primate species are good indicators of the viability of ecosystems and can be used for the proper management and conservation of the divergent ecosystems. Hence, it is equally important that this primate biodiversity be maintained. Recent report released by the Conservation International and Primate Specialist Group have classified 195 primate species and subspecies as either critically endangered or endangered and this figure nearly jumped to 63% since the initial report published in January 2000. One in three primate species is now regarded as threatened. Asia accounts for almost 45% of the world most endangered primates, with 11 listed among the top 25, and is regarded as world leader in endangered primate species (Primate Specialist Group 2002). Based on the information available, Indian primates can be categorised into : (1) Common; and fairly abundant species, (2) Rare and threatened species, (3) Data deficient species and (4) Species of doubtful distribution. Each of these has its own conservation and management problems and need to address separately.

COMMON AND FAIRLY ABUNDANT SPECIES

The three species : Rhesus macaque (*Macaco mulatta*), Bonnet macaque (*Macaco radiata*) and Hanuman langur (*Semnopithecus entellus*) are common and widely distributed. Bonnet macaques are restricted to south India and the Hanuman langurs are not found in northeastern India. These species are well adapted and live in wide ranging habitats such as forested areas including the montane forests of Himalayas, towns, villages, roadsides, temples, railway stations, mangroves, tourist places etc. These three species are commensal and cause agricultural and health problems

in many areas. Rhesus is more aggressive than the other two species. Rhesus and Bonnet raid crop fields and horticulture and vegetables gardens more than the Hanuman langurs. As these species live in human-dominated environments, consequently there is an increase in man-monkey conflicts. Due to the absence of management plan for commensal monkeys, the problem of man-monkey conflicts is only going to increase in future.

RARE AND THREATENED SPECIES

Majority of Indian primates belong to this category and are forest dwellers. This category includes as many as 9 species : Pig-tailed macaque (*Macaca nemestrina*), Stump-tailed macaque (*Macaca arctoides*), Assamese macaque (*Macaca assamensis*), Lion-tailed macaque (*Macaca silenus*), Golden langur (*Trachypithecus geei*), Phayre's leaf monkey (*Trachypithecus phayrei*), Nilgiri langur (*Trachypithecus johnii*), Capped langur (*Trachypithecus pileatus*) and Hoolock gibbon (*Bunopithecus hoolock*). They live either in the forests of northeast or south India and entirely depend on the forests for their food and shelter. Assamese macaques, at places, also inhabit the temples, towns and roadside habitats. These primates have limited distribution and small in populations. Their groups are small with scattered distribution and face serious habitat loss. Most of these species are either Critically Endangered or Endangered and hence are Threatened.

DATA DEFICIENT SPECIES

The three species : Slow loris (*Nycticebtts coucang*), Slender loris (*Loris tardigradus*) and Crab-eating macaque (*Macaca fascicularis umbrossa*) inhabit the forests of northeast states of India, south India and the Nicobar Islands respectively. Out of these three, slow and slender loris are nocturnal and their status are not known. The crab-eating macaques have also not been extensively studied in the field and their present status has not been worked out.

SPECIES OF DOUBTFUL DISTRIBUTION

In recent years reports have been published regarding the occurrence of a few other species, which have not been reported in the past. The occurrences of P'ere David's or Tibetan macaque (*Macaca thibetana*) and Snub-nosed monkey (*Rhinopithecus roxellanae*) have been reported by some field workers from Arunachal Pradesh. These species are found in China and Myanmar. The occurrence of these species in India has not yet been confirmed. It has also been mentioned that the Tibetan macaque/Arunachal macaque (*Macaca munzala*) sighted in Arunachal Pradesh is probably, rnisidentification of a subspecies of Assamese macaque. To reach a definite conclusion about the occurrence of these species in India it is necessary to conduct extensive field surveys of Arunachal Pradesh.

DISCUSSION

These diverse primate populations have different conservation and management problems and need different approaches. The three common and aboundant species that live in different habitats including the human habitations have often led to serious man-monkey conflicts. They raid the crops and homes and cause health problems, They have been tolerated in the past due to religious sentiments attached to these species, but the tolerance has now decreased resulting increase in man-monkey conflicts. This increased intolerance, particularly in rural and urban areas, resulted either in elimination or driven out from the areas where the monkeys ones had abundant populations. In such scenario it is possible that the common and abundant species may well become an endangered species in certain habitats in future. At certain places small isolated populations of these species occur and need attention. To address the problems of those species that are overabundant and act as pest is to develop the natural forests and other habitats in their entire range of distribution by increasing the abundance of fruiting trees, waterholes and shelters so that they can be translocated. It is also necessary to take up fertililty control measures to those populations, which cause human nuisance. It is further suggested that the studies on rural and urban monkeys may be intensified so that more and more suitable management programmes can be drawn.

Majority of India's primate species are rare and endangered and facing possible extinction in future if no action is taken for their conservation and management. These species are primarily forest dwellers, restricted in their distribution, of small group size, low group density and are facing serious habitat loss and disturbance, and at places subjected to hunting pressure. These species need total protection, restoration and improvement of habitats, strict enforcement of Wildlife Protection Act, regular monitoring of the populations, involvement of local people and experienced field biologist in conservation and management programmes and also taking up suitable awareness programmes. Steps should be taken to link the fragmented habitats with the nearest viable and vibrant forest habitats by means of corridors.

For the data deficient species it is necessary to intensify field studies and collect information on their basic ecology and behaviour, present status, movements and home range patterns, food requirements, breeding, recruitment order, habitat requirement *etc.*, so that effective conservation and management programmes can be adopted.

As regard the occurrence of doubtful species it is necessary to conduct extensive field surveys of the entire Arunachal Pradesh. Conservation and management programmes should be drawn by keeping in mind the requirements of entire biodiversity of non-human primates.

REFERENCES

Mukherjee, R.P. 1994. Status of the Golden langur, *Presbytis geei* Khajuria. Zool. Surv. India, Status of Endangered Species, Report – **1** : 1-16.

Mukherjee, R.P. 1996. Studies on the status and ecology of Golden langur *Presbytis geei* Khajuria in India. In Report to the National Geographic Society, 88 pp.

Mukherjee, R.P. 1999. Population trend of Golden langur (*Presbytis geei* Khajuria) in Assam and status of non-human primates of north, Bengal and Mizoram, India. In Report to the National Geographic Society, 59 pp.

Primate Specialist Group, 2002. One in three Primates threatened. News letter of The Species Survival Commission IUCN – The World Conservation Union, No. 38.

Southwick, C.H. and Siddiqi, M.F. 2001. Status, Conservation and Management of Primates in India. In : ENVIS Belletin : Wildlife Protection Areas, Non-human Primates of India, A.K. Gupta (ed), **1** : 81-91. Wildlife Institute of India, Dehra Dun.

Rec. zool. Surv. India : **108**(Part–4) : 5-15, 2008

ADDITION TO THE FAUNA OF PLANT AND SOIL NEMATODES OF GUJARAT, INDIA

PADMA BOHRA AND QAISER H. BAQRI

Desert Regional Station, Zoological Survey of India, Jhalamand, Jodhpur-342 005

INTRODUCTION

When we started the work about 33 species of phytophagous nematodes have been reported by earlier workers from Gujarat. Keeping in view poor state of knowledge of nematode fauna from Gujarat state, the surveys were planned in the state by authors so that wide gap in our knowledge may be filled up. During 2000-2004 surveys were conducted to 25 districts of Gujarat. About 670 soil samples from 250 localities, from rhizosphere of 40 host plants were collected. These samples yielded wide variety of nematodes. Authors identified 107 species belonging to 49 genera of 20 families under four orders *viz.*, Tylenchida (21 spp.), Aphelenchida (1 sp.). Dorylaimida (77 spp.) and Mononchida (8 spp.).

However Baqri and Bohra (2003); Bohra and Baqri (2004) have already published one new genus and four new species and 78 species as a new records from the state. Our further study adds 13 new records from the state during (2004-2005).

The present paper reports 133 species of plant and soil nematodes species belonging to 60 genera of 27 families under four orders *viz.*, Tylenchida (42 spp.), Aphelenchida (3 sp.). Dorylaimida (80 spp.) and Mononchida (8 spp.) are now known from Gujarat. These species of plant and soil nematodes are listed below according to their systematic position. Species reported for the first time from the state are marked with asterisk (*).

MATERIAL AND METHODS

Nematodes were fixed in hot 4% formalin and mounted in anhydrous glycerine. All the specimens included in the present study have been deposited and registered in National Zoological Collection of Zoological Survey of India, Jodhpur.

NEMATODA

SYSTEMATIC LIST OF NEMATODES FROM GUJARAT

Order TYLENCHIDA Thorne, 1949
Suborder TYLENCHINA Chitwood in Chitwood & Chitwood, 1950
Infraorder TYLENCHATA Siddiqi, 2000
Superfamily TYLENCHOIDEA Orley, 1880
Eamily TYLENCHIDAF Orley, 1880
Subfamily BOLEODORINAE Khan, 1964
Genus ***Basiria*** Siddiqi, 1959

1. *Basiria brevistylus* (Khera, 1970) Ebsary, 1991
2. *Basiria bilineata* (Saha & Khan, 1982) Ebsary, 1991

Infraorder ANGUINATA Siddiqi, 2000
Superfamily ANGUINOIDEA Nicoll, 1935 (1926)
Family ANGUINIDA Nicoll, 1935 (1926)
Subfamily ANGUININAE Nicoll, 1935 (1926)
Genus ***Dilylenchus*** Filipjev, 1936

3. *Ditylenchus triformis* Hirschmann & Sasser, 1955

Suborder HOPLOLAIMINA Chizhov & Berezina, 1988
Superfamily HOPLOLAIMOIDEA Filipjev, 1934 (Paramonov, 1967)
Family HOPLOLAIMIDAE Filipjev, 1934 (Wieser, 1953)
Subfamily HOPLOLAIMINAE Filipjev, 1934
Genus ***Hoplolaimus*** Daday, 1905

4. *Hoplolaimus indicus* Sher, 1963
5. *Hoplolaimus pararobustus* (Schuurmans Stekhoven & Tenuissen, 1938) Sher, 1963

Genus ***Scutellonema*** Andrassy, 1958

6. *Scutellonema brachyurus* (Steiner, 1938) Andrassy, 1958

Subfamily ROTYLENCHOIDINAE Whitehead, 1958
Genus ***Helicotylenchus*** Steiner, 1945

7. *Helicotylenchus dihystera* (Cobb, 1893) Sher, 1961
8. *Helicotylenchus anehelicus* Sher, 1966
9. *Helicotylenchus erythrinae* (Zimmermann, 1904) Golden, 1956

10. *Helicotylenchus exallus* Sher, 1966
11. *Helicotylenchus indicus* Siddiqi, 1963
12. *Helicotylenchus multicinctus* (Cobb, 1893) Golden, 1956
13. *Helicotylenchus orthosomaticus* Siddiqi, 1972
14. *Helicotylenchus retusus* Siddiqi & Brown, 1964
15. *Helicotylenchus rotundicauda* Sher, 1966
16. *Helicotylenchus truncatus* Roman, 1965

Family ROTYLENCHULIDAE Husain & Khan, 1967, Husain, 1976

Subfamily ROTYLENCHULINAE Husain & Khan, 1967

Genus ***Rotylenchulus*** Linford & Oliveira, 1940

17. *Rotylenchulus reniformis* Linford & Oliveira, 1940

Family PRATYLENCHIDAE Thorne, 1949 (Siddiqi, 1963)

Subfamily PRATYLENCHINAE Thorne, 1949

Genus ***Pratylenchus*** Filipjev, 1936

18. *Pratylenchus loosi* Loof, 1960
19. *Pratylenchus thornei* Sher & Allen, 1953
20. *Pratylenchus zeae* Graham, 1951

Subfamily HIRSCHMANNIELLINAE Fotedar & Handoo, 1978

Genus ***Hirschmanniella*** Luc & Goodey, 1964

21. *Hirschmanniella gracilis* (de Man, 1880) Luc & Goodey, 1964
22. *Hirschmanniella mucronata* (Das, 1960) Khan, Siddiqi, Khan, Husain & Saxena, 1964
23. *Hirschmanniella oryzae* (van Breda de Haan, 1902) Luc & Goodey, 1964

Subfamily RADOPHOLINAE Allen & Sher, 1967

Genus ***Radopholus*** Thorne, 1949

24. *Radopholus similis* (Cobb, 1893) Thorne, 1949

Family MELOIDOGYNIDAE Skarbilovich, 1959 (Wouts, 1973)

Subfamily MELOIDOGYNINAE Skarbilovich, 1959

Genus ***Meloidogyne*** Goeldi, 1892

25. *Meloidogyne arenaria* (Neal, 1889) Chitwood, 1949
26. *Meloidogyne hapla* Chitwood, 1949

27. *Meloidogyne incognita* (Kofoid & White, 1919) Chitwood, 1949
28. *Meloidogyne javanica* (Treub, 1885) Chitwood, 1949
29. *Meloidogyne indica* Whitehead, 1968

Family HETERODERIDAE Filipjev & Schuurmans, Stekhoven, 1941 (Skarbilovich, 1947)

Subfamily HETERODERINAE Filipjev & Schuurmans, Stekhoven, 1941

Genus ***Heterodera*** Schmidt, 1871

30. *Heterodera cajani* Koshy, 1967
31. *Heterodera zeae* Koshy, Swarup & Sethi, 1971

Superfamily DOLICHODOROIDEA Chitwood in Chitwood & Chitwood, 1950 (Siddiqi, 1986)

Family TELOTYLENCHIDAE Siddiqi, 1960

Subfamily TELOTYLENCHINAE Siddiqi, 1960

Genus ***Telotylenchus*** Siddiqi, 1960

32. *Telotylenchus paaloofi* Tikyani & Khera, 1970

Genus ***Tylenchorhynchus*** Cobb, 1913

33. *Tylenchorhynchus divittatus* Siddiqi, 1961
34. *Tylenchorhynchus latus* Allen, 1955
35. *Tylenchorhynchus mashhoodi* Siddiqi & Basir, 1959
36. *Tylenchorhynchus microcephalus* Siddiqi & Patel, 1990
37. *Tylenchorhynchus nudus* Allen, 1955

Genus ***Bitylenchus*** Filipjev, 1934

38. *Bitylenchus brevilineatus* (Williams, 1960) Jairajpuri, 1982
39. *Bitylenchus vulgaris* (Upadhyay, Swarup & Sethi, 1972), Jairajpuri, 1982

Genus ***Scutylenchus*** Jairajpuri, 1971

40. *Scutylenchus hexincisus* (Jairajpuri & Baqri, 1968) Siddiqi, 1979

Family PSILENCHIDAE Paramonov, 1967 (Khan, 1969)

Subfamily PSILENCHINAE Paramonov, 1967

Genus ***Psilenchus*** de Man, 1921

41. *Psilenchus hilarus* Siddiqi, 1963

Suborder HEXATYLINA Siddiqi, 1980
Family PAURODONTIDAE Thorne, 1941 (Massey, 1967)
Subfamily PAURODONTINAE Thorne, 1941
Genus ***Paurodontus*** Thorne, 1941

42. *Paurodontus similis* Siddiqi, 1961

Order APHELENCHIDA Siddiqi, 1980
Suborder APHELENCHINA Geraert, 1966
Superfamily APHELENCHOIDEA Fuchs, 1937 (Thorne, 1949)
Family APHELENCHIDAE Fuchs, 1937 (Steiner, 1949)
Subfamily APHELENCHINAE Fuchs, 1937
Genus ***Aphelenchus*** Bastian, 1865

43. *Aphelenchus avenae* Bastian, 1865

Superfamily APHELENCHOIDOIDEA Skarbilovich, 1947 (Siddiqi, 1980)
Family APHELENCHOIDIDAE Skarbilovich, 1947 (Pararnonov, 1953)
Subfamily APHELENCHOIDINAE Skarbilovich, 1947
Genus ***Aphelenchoides*** Fischer, 1894

44. *Aphelenchoides besseyi* Christie, 1942
45. *Aphelenchoides parascalcaudatus* Chawla, Bhamburkar, Khan & Prasad, 196

Order DORYLAIMIDA Pearse, 1942
Suborder DORYLAIMINA Pearse, 1936
Superfamily DORYLAIMOIDEA de Man, 1876
Family DORYLAIMIDAE de Man, 1876
Subfamily DORYLAIMINAE de Man, 1876
Genus ***Dorylaimus*** Dujardin, 1845

46. *Dorylaimus stagnalis** Dujardin, 1845
47. *Dorylaimus* sp. n.

Genus ***Laimydorus*** Siddiqi, 1969

48. *Laimydorus baldus* Baqri & Jana, 1982
49. *Laimydorus finalis* Thorne, 1975
50. *Laimydorus kherai* Baqri, 1985

Genus ***Calodorylaimus*** Andrassy, 1969

51. *Calodorylaimus wasimi* Baqri & Bohra, 2003

Genus ***Mesodorylaimus*** Andrassy, 1959

52. *Mesodorylaimus adalbarti* Andrassy, 1963
53. *Mesodorylaimus brassicus* Soni & Nama, 1981
54. *Mesodorylaimus caudatus* Ahmad, 1993
55. *Mesodorylaimus margeritus* Basson & Heyns, 1974
56. *Mesodorylaimus mesonyctius** (Kreis, 1930) Andrassy, 1959
57. *Mesodorylaimus szunyoghyi* Andrassy, 1968

Subfamily THORNENEMATINAE Siddiqi, 1969

Genus ***Thornenema*** Andrassy, 1959

58. *Thornenema mauritianum* (Williams, 1959) Baqri & Jairajpuri, 1969
59. *Thornenema baldum** (Thorne, 1939) Andrassy, 1959

Genus ***Prothornenema*** Baqri & Bohra, 2003

60. *Prothornenema capitatum* Baqri & Bohra, 2003

Genus ***Sicaguttur*** Siddiqi, 1971

61. *Sicaguttur sartum* Siddiqi, 1971

Family APORCELAIMIDAE Heyns, 1965

Genus ***Makitinus*** Heyns, 1965

62. *Makatinus* sp. n.

Subfamily APORCELAIMINAE Heyns, 1965

Genus ***Aporcelaimellus*** Heyns, 1965

63. *Aporcelaimellus heynsi* Baqri & Jairajpuri, 1968

Genus ***Tubixaba*** Monteiro & Lordello, 1980

64. *Tubixaba parva* Pretorius, Kruger & Heyns, 1987

Family QUDSIANEMATIDAE Jairajpuri, 1965

Subfamily QUDSIANEMATINAE Jairajpuri, 1965

Genus ***Labronema*** Thorne, 1939

65. *Labronema confusum* (Jana & Baqri, 1983) Andrassy, 1991

Genus ***Eudorylaimus*** Andrassy, 1959

66. *Eudorylaimus* sp. n.
67. *Eudorylaimus chauhani** (Baqri & Khera, 1975) Andrassy, 1986

Genus ***Ecumenicus*** Thorne, 1974

68. *Ecumenicus monohystera* (De Man, 1880) Thorne, 1974

Genus ***Allodorylaimus*** Andrassy, 1986

69. *Allodorylaimus kosambaensis* Khan, Ahmad & Jairajpuri, 1995

Subfamily DISCOLAIMINAE Siddiqi, 1969

Genus ***Discolaimus*** Cobb, 1913

70. *Discolaimus major* Thorne, 1939
71. *Discolaimus texanus** Cobb, 1913
72. *Discolaimus tenax** Siddiqi, 1964

Genus ***Discolaimium*** Thorne, 1939

73. *Discolaimium mukhtarpuriense* Baqri & Jairajpuri, 1969
74. *Discolaimium simplex** Siddiqi, 1965

Genus ***Discolaimoides*** Heyns, 1963

75. *Discolaimoides bulbiferus* (Cobb, 1906) Heyns, 1963
76. *Discolaimoides intrastriatus** (Loss, 1945) Loof, 1964

Genus ***Latocephalus*** Patil & Khan, 1982

77. *Latocephalus gracile* Patil & Khan, 1982
78. *Latocephalus smithi** (Heyns, 1963) Patil & Khan, 1982

Genus ***Poronemella*** Siddiqi, 1969

79. *Poronemella shamimi* Baqri & Bohra, 2003
80. *Poronemella amini** Siddiqi, 1969

Genus ***Moshajia*** Siddiqi, 1982

81. *Moshajia cultristyla** Siddiqi, 1982
82. *Moshajia idiofora** Siddiqi, 1982

Family NORDIIDAE Jairajpuri & A.H. Siddiqi, 1964

Subfamily NORDIINAE Jairajpuri & A.H. Siddiqi, 1964

Genus ***Longidorella*** Thorne, 1939

83. *Longidorella xenura* Khan & Siddiqi, 1963

Subfamily PUNGENTINAE Siddiqi, 1969

Genus ***Kochinema*** Heyns, 1963

84. *Kochinema farodai* Baqri & Bohra, 2001
85. *Kochinema caudatum* Baqri & Bohra, 2001

Subfamily ACTINOLAIMOIDINAE Jairajpuri & Ahmad, 1992

Genus ***Oriverutus*** Siddiqi, 1971

86. *Oriverutus labiatus* Ahmad & Jairajpuri, 1987

Superfamily ACTINOLAIMOIDEA Thorne, 1939

Family ACTINOLAIMIDAE Thorne, 1939

Subfamily NEOACTINOLAIMINAE Thorne, 1967

Genus ***Neoactinolaimus*** Thorne, 1967

87. *Neoactinolaimus kosambus* Khan, Ahmad & Jairajpuri, 1994
88. *Neoactinolaimus attenuatus* Khan, Ahmad & Jairajpuri, 1994

Superfamily LONGIDOROIDEA Thorne, 1935

Family LONGIDORIDAE Thorne, 1935

Subfamily LONGIDORINAE Thorne, 1935

Genus ***Longidorus*** Micoletzky, 1922 (Filipjev, 1934)

89. *Longidorus elongatus* (de Man, 1876) Micoletzky, 1922
90. *Longidorus sylphus* Thorne, 1939

Genus ***Paralongidorus*** Siddiqi, Hooper & Khan, 1963

91. *Paralongidorus beryllus* (Siddiqi, Husain, 1965) Hunt, 1993
92. *Paralongidorus citri* (Siddiqi, 1959) Siddiqi, Hooper & Khan, 1963
93. *Paralongidorus major* Verma, 1973
94. *Paralongidorus microlaimus* Siddiqi, 1964

Family XIPHINEMATIDAE Dalmasso, 1969

Subfamily XIPHINEMATINAE Dalmasso, 1969

Genus ***Xiphinema*** Cobb, 1913

95. *Xiphinema americanum* Cobb, 1913
96. *Xiphinema basiri* Siddiqi, 1959

97. *Xiphinema elongatum* Sch. Stekhoven & Teunissen, 1938
98. *Xiphinema insigne* Loos, 1949
99. *Xiphinema orbum* Siddiqi, 1964

Superfamily BELONDIROIDEA Thorne, 1939

Family BELONDIRIDAE Thorne, 1939

Subfamily BELONDIRINAE Thorne, 1939

Genus ***Belondira*** Thorne, 1939

100. *Belondira bulbosa* Siddiqi, 1966
101. *Belondira porta* Thorne, 1964
102. *Belondira tenuidens* Thorne, 1964

Genus ***Axonchium*** Cobb, 1920

103. *Axonchium (Axonchium) buibosum* Williams, 1958
104. *Axonchium (Axonchium) nitidum* Jairajpuri, 1964

Subfamily DORYLAIMELLINAE Jairajpuri, 1964

Genus ***Dorylaimellus*** Cobb, 1913

105. *Dorylaimellus (Dorylaimellus) demani* Goodey, 1963
106. *Dorylaimellus (Axodorylaimellus) parvulus* Thorne, 1939
107. *Dorylaimellus (Belondorylaimellus) discocephalus* Siddiqi, 1964

Superfamily TYLENCHOLAIMOIDEA Filipjev, 1934

Family TYLENCHOLAIMIDAE Filipjev, 1934

Subfamily TYLENCHOLAIMINAE Filipjev, 1934

Genus ***Tylencholaimus*** de Man, 1876

108. *Tylencholaimus nagauriensis* Baqri & Bohra, 2001
109. *Tylencholaimus leptonchoides* Loof, 1964
110. *Tylencholaimus gertii* Kruger, 1965
111. *Tylencholaimus annulatus* Baqri & Bhora, 2001

Genus ***Utahnema*** Thorne, 1939

112. *Utahnema tenuidens* Thorne, 1939

Genus ***Metadorylaimus*** Jairajpuri & Goodey, 1966

113. *Metadorylaimus* sp. n.

Family LEPTONCHIDAE Thorne, 1935

Subfamily LEPTONCHINAE Thorne, 1935

Genus ***Leptonchus*** Cobb, 1920

114. *Leptonchus granulosus* Cobb, 1920

Genus ***Proleptonchus*** Lordello, 1955

115. *Proleptonchus clarus* Timm, 1964

Subfamily TYLEPTINAE Jairajpuri, 1964

Genus ***Tyleptus*** Thorne, 1939

116. *Tyleptus projectus* Thorne, 1939

Family MYDONOMIDAE Thorne, 1964

Subfamily MYDONOMINAE (Thorne, 1964), Jairajpuri & Ahmad, 1992

Genus ***Dorylaimoides*** Thorne & Swanger, 1936

117. *Dorylaimoides (Digidorylaimoides) micoletzkyi* (de Man, 1921) Thorne & Swanger, 1936)

118. *Dorylaimoides (Longidorylaimoides) leptura* Siddiqi, 1965

119. *Dorylaimoides (Dorylaimoides) parateres* Siddiqi, 1964

120. *Dorylaimoides (Tarjania) constrictoides* Goseco, Ferris & Ferris, 1976

Suborder NYGOLAIMINA Ahmad & Jairajpuri, 1979

Superfamily NYGOLAIMOIDEA Thorne, 1935

Family NYGOLAIMIDAE Thorne, 1935

Subfamily NYGOLAIMINAE Thorne, 1935

Genus ***Nygolaimus*** Cobb, 1913

121. *Nygolaimus anneckei** Heyns, 1935

122. *Nygolaimus harishi** Ahmad & Jairajpuri, 1980

Genus ***Aquatides*** Heyns, 1968

123. *Aquatides aquaticus* (Thorne, 1930) Thorne, 1974

124. *Aquatides thornei* (Schneider, 1937) Ahmad & Jairajpuri, 1982

125. *Aquatides* sp. n.

Order MONONCHIDA Jairajpuri, 1969
Suborder MONONCHINA Kirjanova & Krall, 1969
Superfamily MONONCHOIDEA Chitwood, 1937
Family MONONCHIDAE Chitwood, 1937
Genus ***Mononchus*** Bastian, 1865

126. *Mononchus aquaticus* Coetzee, 1968

Family MYLONCHULIDAE Jairajpuri, 1969
Genus ***Mylonchulus*** (Cobb, 1916) Altherr, 1953

127. *Mylonchulus contractus* Jairajpuri, 1970
128. *Mylonchulus hawaiiensis* (Cassidy, 1931) Andrassy, 1958
129. *Mylonchulus lacustris* (N.A. Cobb in M.V. Cobb, 1915) Andrassy, 1958
130. *Mylonchulus minor* (Cobb, 1893) Andrassy, 1958
131. *Mylonchulus subsimilis* (Cobb, 1917) Meyl, 1957

Genus ***Sporonchulus*** (Cobb, 1917) Andrassy, 1958

132. *Sporonchulus vagabundus* Jairajpuri, 1971

Family IOTONCHIDAE Jairajpuri, 1969
Genus ***Iotonchus*** (Cobb, 1916) Altherr, 1950

133. *Iotonchus jairi* (Lordello, 1958) Clark, 1960

SUMMARY

In all, 133 species of plant and soil nematodes belonging to 60 genera of 27 families under four orders viz., Tylenchida, Aphelenchida, Dorylaimida and Mononchida are now known from Gujarat. The 13 species reported for the first time from the state are : *Dorylaimus stagnalis, Mesodorylaimus mesonyctius, Thornenema baldum, Eudorylaimus chauhani, Discolaimus texanus, Discolaimus tenax, Discolaimium simplex, Discolaimoides intrastriatus, Latocephalus smithi, Poronemella amini, Moshajia cultristyla, Moshajia idiofora, Nygolaimus anneckei* and *Nygolaimus harishi*. The description and illustrations of five new species mentioned in paper will be provided in separate paper.

ACKNOWLEDGEMENTS

The authors are thankful to Dr. Ramakrishna, Director, Zoological Survey of India, Kolkata for providing facilities. The financial assistance rendered by the Ministry of Environment & Forests, New Delhi is greatly acknowledged.

REFERENCES

Baqri, Q.H. and Bohra, P. 2003. *Prothornenema* gen. n. and four new species of Dorylaimoidea (Nematoda : Dorylaimida) from India. *Int. J. Nematol.* Vol. **13**, No. 2, pp. 185-194.

Bohra, P. and Baqri, Q.H. 2004. Nematoda, In : State Fauna Series No. **8**, Gujarat (Part 2); edited by the Director; Zoological Survey of India, M-Block, New Alipore, Kolkata. pp. 355-400.

Rec. zool. Surv. India : **108**(Part–4) : 17-20, 2009

THREE NEW RECORDS OF AMPHIBIANS FROM WEST BENGAL

KAUSHIK DEUTI AND ANAND KUMAR AYYASWAMY*

Zoological Survey of India, Nizam Palace, 234/4, A.J.C. Bose Road, 2nd MSO Building, 13th Floor, Kolkata-700 020

INTRODUCTION

The amphibian fauna of West Bengal was known to consist of 39 species (Sarkar *et al.*, 1992). Thereafter, two species were reported from southern West Bengal, *viz.*, *Ramanella variegata* (Deuti, 1998) and *Chirixalus simus* (Deuti, Biswas, Ahmed & Dutta, 2000). Recently two more species were reported from the plains of northern West Bengal, *viz.*, *Kalophrynus orangensis* (Paul, Biswas & Deuti, 2007a) and *Kaloula assamensis* (Paul, Biswas & Deuti, 2007b). An amphibian survey was conducted in the Darjeeling hills of northern West Bengal in 2006-2007 and we hereby report three more new records from West Bengal.

METHODOLOGY

An extensive survey for amphibians was conducted in different areas of the hills in Darjeeling district of West Bengal in 2006 and 2007. Amphibian species were collected, killed with chloroform and first preserved in 4% solution of formaldehyde, later transferred to 70% alcahol. GPS readings indicating latitude, longitude and altitude were taken at each collection locality.

RESULTS

15 species were collected from different areas of the Darjeeling hills, which include three species not previously known to occur in West Bengal :

**Zoological Survey of India, Fresh-water Biological Station, Plot No. 366/1, Attapur, Hyderguda Ring Road, Hyderabad-500 948*

1. ***Xenophrys glandulosa*** (Boulenger, 1890)
(Fig. 1)

Material examined : Two females (ZSI A 10398 & ZSI A 10399) collected from the edge of a hill-stream at Latpancher (26°54'340"N, 88°23'538"E, altitude 1109 meters above msl) on 29.08.2006. SVL 78.45 mm and 78.65 mm respectively.

Diagnostic characters : Moderate-sized stream-dwelling frogs (males SVL 70-75 mm, females SVL 74-82 mm). Dorsal skin smooth with fine ridges, laterally numerous glandular warts or tubercles which are half black and half yellow. A posteriorly thickened supra-tympanic fold. Inter-orbital space concave, broader than upper eyelid. Tympanum distinct about half the diameter of eye. Tips of fingers and toes rounded with feebly swollen tips, no webbing on fingers but rudimentary webbing on toes. No subarticular and metacarpal tubercles. Metatarsal tubercle flat and indistinct. Dorsal colour brown or grey-brown, a brownish-black triangular marking between the eyes. Upper lip margin with a light coloured stripe, a dark vertical bar below the eye. Black spots on both sides of throat. Posterior belly and ventral thighs with many dark coloured spots. Hind limbs with indistinct dark cross bars.

Known distribution : India (Nagaland) and China (Yunnan).

Remarks : Forest-floor dwelling species, found on the edge of streams among bushes and shrubs. First record from West Bengal.

2. ***Amolops marmoratus*** (Blyth, 1855)
(Fig. 2)

Material examined : One male (ZSI A 10668) and one female (ZSI A 10669) collected from boulders beside a fast-flowing hill-stream at Kalikhola (26°55'233"N, 88°23'554"E, altitude 497 meters above msl) on 01.09.2006. SVL 46.23 mm (male) and 65.42 mm (female).

Diagnostic characters : Moderate-sized stream-dwelling frogs (males SVL 57-63 mm, females SVL 62-83 mm). Dorsal skin smooth with granules on the flanks. Tympanum distinct, more than half the diameter of eye. Tips of fingers and toes with discs, rudimentary webbing on fingers but complete webbing on toes. Dorsal colour greenish (in life) with brown spots, legs with distinct cross-bands, ventral colour pearly white. Dark vertical bars on upper and lower lips.

Known Distribution : India (Sikkim, Arunachal Pradesh and Nagaland) Nepal, China, Thailand.

Remarks : Adapted to living in torrents, in fast-flowing hill-streams with rocky bottom and boulders. First record from West Bengal.

3. ***Fejervarya teraiensis*** (Dubois, 1984)

(Fig. 3)

Material examined : One male (ZSI A 10670) and one female (ZSI A 10671) collected from a meadow beside Sukhiapokhri Boys High School at Sukhiapokhri (26°59'503"N, 88°09'596"E, altitude 2130 meters above msl) on 02.07.2007. SVL 44.32 mm (male) and 52.64 mm (female).

Diagnostic characters : Small-sized frogs (males SVL 43-51 mm, females SVL 49-56 mm). Head longer than broad. Dorsal skin with fine glandular folds, presence of Fejervaryan lines on both sides of belly. Rictal gland absent. Tips of fingers and toes pointed, webbing moderate. Inner metatarsal tubercle cylindrical but external metatarsal tubercle absent. Tarsal ridge faint and short. Dorsal colour grayish with darker shoulder spots and a mid-dorsal line or band. Upper lip with vertical brown bars. Vocal sacs in males marked by darker colouration and also by longitudinal folds on sides of throat. Nuptial pads in males present on first finger but humeral glands are absent in males.

Known Distribution : India (Uttaranchal), Nepal.

Remarks : Widely distributed upto 2300 meters. Terrestrial, breeding in small pools and ditches. First record from West Bengal.

DISCUSSION

Till recently, the amphibian fauna of West Bengal was known to consist of 43 species. However, one of the species, *Rana senchalensis* Chanda, 1986 described as a new species from West Bengal was synonymised (Dubois, 2000). With these three new records, the amphibian species list of West Bengal tentatively increases to atleast 45 species.

ACKNOWLEDGEMENTS

We thank the Director, Zoological Survey of Indian and the committee members of the Research Monitoring Committee, ZSI, for allowing us to conduct surveys and study the amphibians of the hills of northern West Bengal. We are grateful to Dr. Annemarie Ohler, Curator of Amphibians and Reptiles at the Paris Museum of Natural History for helping in identifying our *Xenophrys* collections, Prof Saibal Sengupta of Arya Vidyapeeth College, Guwahati for helping in identifying our *Amolops* collections and Prof Sushil Kumar Dutta of North Orissa University for helping in identifying our *Fejervarya* collections. Finally we thank the many generous Gorkha people of the Darjeeling hills who helped us in collecting our specimens.

REFERENCES

Chanda, S.K. 1986. On a collection of anuran amphibians from Darjeeling and Sikkim Himalayas, with description of a new species of *Rana* (Ranidae). *J. Beng nat. Hist. Soc.*, N.S. **5**(2) : 140-151.

Deuti, K. 1998. Occurrence of *Ramanella variegata* (Anura : Microhylidae) in West Bengal with notes on its distribution in India. *J. Bombay nat. Hist. Soc.*, **95**(1) : 126-127.

Deuti, K., Biswas, S., Ahmed, M.F. and Dutta, S.K. 2000. Rediscovery of *Chirixalus simus* Annandale, 1915 (Anura : Rhacophoridae) from Assam and West Bengal, eastern India. *Hamadryad.*, **25**(2) : 215-217.

Dubois, A. 2000. Synonymies and related lists in Zoology : general proposals, with examples in Herpetology. *Dumerilia.*, **4**(2) : 33-98.

Paul, S., Biswas, M.C. and Deuti, K. 2007a. Geographical Range Extension : *Kalophrynus orangensis* (Orang Sticky Frog). *Herpetological Review.*, **38**(1) : 97-98.

Paul, S., Biswas, M.C. and Deuti, K. 2007b. First record of the Assam Painted frog (*Kaloula assamensis* Das et al, 2004) from West Bengal. *Cobra.*, **1**(3) : 15-16.

Sarkar, A.K., Biswas, M.L. and Ray, S. 1992. Amphibia : In State Fauna of West Bengal. *Zool. Surv. Ind., State Fauna Series.*, **3**(2) : 67-100.

PLATE I

Fig. 1. : ***Xenophrys glandulosa*** (Boulenger, 1890)

PLATE II

Fig. 2. : *Amolops marmoratus* (Blyth, 1855)

PLATE III

Fig. 3. : *Fejervarya teraiensis* (Dubois, 1984)

Rec. zool. Surv. India : **108**(Part–4) : 21-36, 2009

POLYCHAETES (ANNELIDA) FROM GREAT NICOBAR ISLAND, INDIA : I. FAMILY : NEREIDAE

R. RAJASEKARAN AND OLIVIA J. FERNANDO

Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai-608 502, Tamil Nadu, India

INTRODUCTION

Polychaetes have a worldwide distribution, living on the bottom or burrow into the sediments from the intertidal zone to the greatest depths and also the pelagic systems of the oceans. Nereidae is a very important family of the phylum Annelida with highly specialized morphology and comparatively complex structure. The nereidae is also of fairly great economic significance. Diversity of polychaetes has been studied from several regions along the Indian peninsula (Southern, 1921; Fauvel, 1930, 1953; Parulekar, 1971; Rao, 1981, 1992, 1993, 1998, 1999 & 2001; Sunder Raj and Sanjeeva Raj, 1987; Misra, 1995; Sunil Kumar, 1997, 1999, 2001 & 2002). There is no complete assessment of polychaete diversity from the Great Nicobar region, though there are a few reports from the Andaman & Nicobar Islands (Tampi and Rangarajan, 1963 and 1964; Daniel and Ghosh, 1964;; Soota and Rao, 1977a; Soota *et al.*, 1980).

Great Nicobar has a unique and extraordinarily diverse fauna, which is still little exposed. The difficulty in accessing this Island, which is situated 1755 km away from the mainland may be the reason for the lack of such studies. Hence the present study on the polychaetes was undertaken from this comparatively pristine environment. Only the polychaetes of the family Nereidae are dealt with at present.

METHODS

Great Nicobar Island, the southern most Island of this archipelago, in fact the southern most land piece of India, is situated between 6°45'-7°15'N lat. and 93°38'-93°55' E long (Fig. 1). The island lies about 482 km. south of Port Blair and 145 km north of the northern tip of Sumatra. The total geographical area approximates to 1044 sq. km.

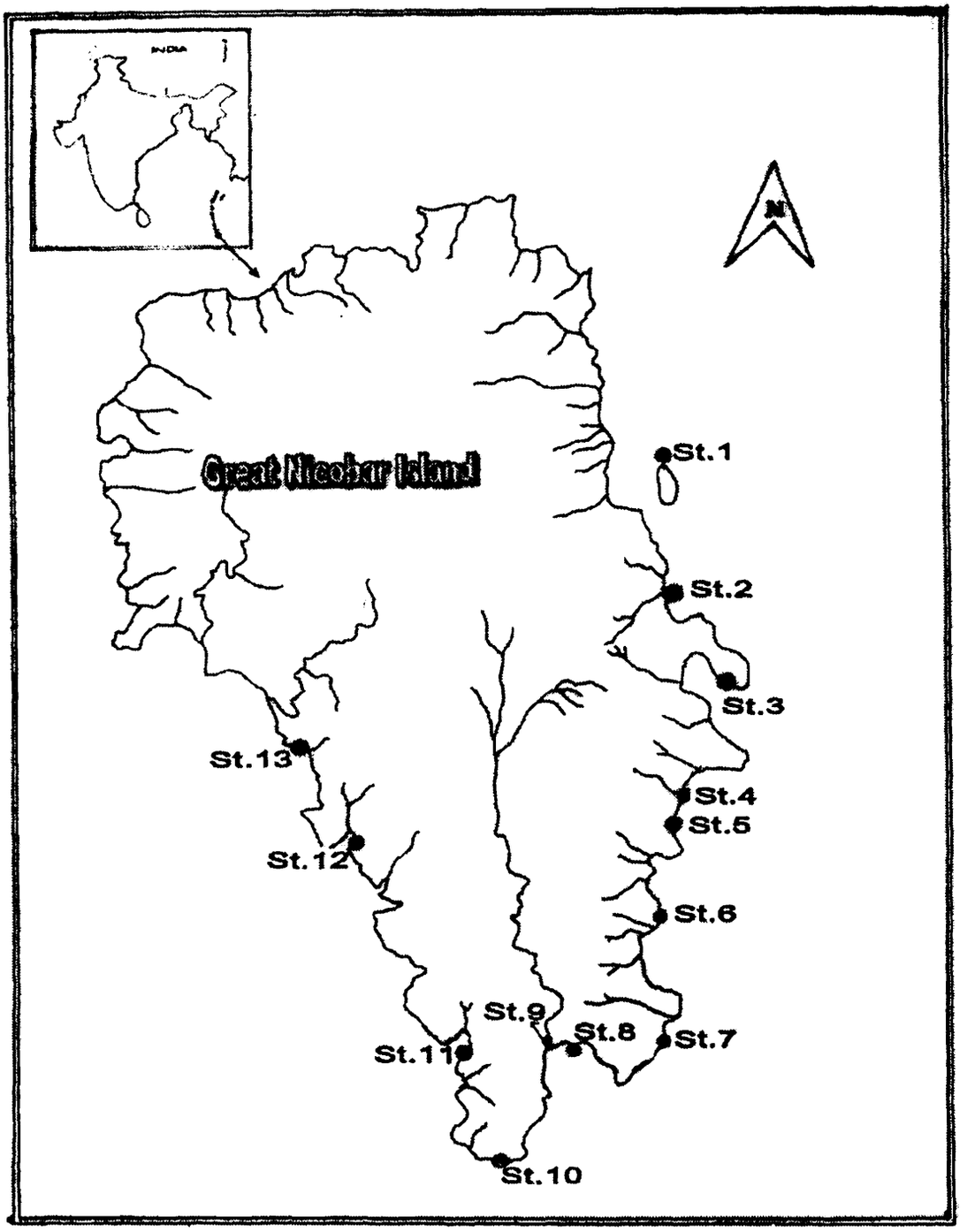


Fig. 1. : Map of the Great Nicobar Island showing different collection stations.

The materials for the present study were collected from December 2000 the February 2004 from live corals, dead corals, beach rocks, seagrass beds and mangrove sediments of the intertidal region of 13 selected stations. The sediment samples collected were sieved through a 0.5mm sieve. Polychaetes associated with dead corals were collected by breaking them with a hammer and chisel. Before fixation, polychaetes were dropped into strong alcohol to have their pharynx everted, as it is helpful in identification of this group. They were fixed in 10% formalin diluted with seawater

and later transferred to 70% ethanol. The proboscis jaws and other structures of the parapodia were examined under a microscope. The features of the polychaetes studied were drawn with a prism type Camera Lucida and the measurements were taken using a micro-occulometer.

SYSTEMATIC ACCOUNT

List of species

Family NEREIDAE Johnston, 1865

1. *Tylonereis bogoyawlenskyi* Fauvel, 1911
2. *Platynereis dumerilii* (Audouin and M. Edwards, 1883)
3. *Ceratonereis mirabilis* Kinberg, 1866
4. *Neanthes glandicincta* (Southern, 1921)*
5. *Perinereis nigropunctata* (Horst, 1889)
6. *Perinereis nuntia brevicirris* (Grube, 1876)
7. *Perinereis nuntia caeruleis* (Hoagland, 1920)**
8. *Perinereis weijhousensis* Wu Boaling, 1984**
9. *Perinereis obfuscata* (Grube, 1878)**
10. *Perinereis vancaurica* (Ehlers, 1868)
11. *Perinereis cultrifera* (Grube, 1840)
12. *Perinereis cultrifera typica* Grube, 1840
13. *Pseudonereis anomala* Gravier, 1901
14. *Pseudonereis variegata* (Grube, 1857)

*new record from Andaman & Nicobar Islands

**new record from Indian waters

Family NEREIDAE Johnston, 1865

1. ***Tylonereis bogoyawlenskyi*** Fauvel, 1911

Tylonereis bogoyawlenskyi Fauvel,1911 : 373, Fig. 1-7 ; Fauvel, 1953 : 168-169, Fig. 85 e-f ; Wu & Chen, 1963 : 21 ; Kheleboviche, 1963 : 51, plate 11, a-b ; Rao & Soota, 1981 : 76 ; Misra *et al.*, 1987 : 74 ; Rao, 1998 : 202 ; 1999 : 44 ; 2001 : 22.

Material : 23 specimens collected from St. 3 and 11.

Habitat : Burrowing in fine sands of intertidal zone.

Description : Prostomium slightly wider. Longest peristomial cirri extending to setiger 3. Oral and maxillary rings without hard paragnaths, with different shape soft papillae only. Area I has 3 conical; II, III a single row of 8-10 papillae, IV 5 – 8 slender concentrated bundles of papillae; V

none; VI a tapered papillae, basal portions with papillary mattress; VII & VIII 9-12 bluntly conical papillae. From the setiger 7-8, parapodia enlarged, dorsal and ventral cirri short, small, not extending beyond parapodial lobe, supra-notoligule inflated. Neuropodium with acicular lobe and 2 postsetal lobes. Notosetae and neuroserae of all parapodia homogomph spinigers.

Remarks : The present material agree well with the earlier descriptions

Distribution : INDIA : Andaman & Nicobar Islands, Gulf of Mannar, Krusadai Island, Tuticorin, Kilakarai, Pamban waters, Travancore, Gangetic delta, Chilka Lake, Orissa, Visakhapatnam, Cochin back waters, Pulicat lake and Godavary estuary.

Elsewhere : Indian Ocean, Persian Gulf.

2. ***Platynereis dumerilli*** (Audouin and Milne Edwards,1833)

Nereis dumerilii Audouin and Milne Edwards, 1833 : 196.

Platynereis dumerilli : Fauvel, 1923 : 359, Fig. 141 a-f; 1953 : 218, Fig. 111, a-f; Day, 1967 : 306, Fig. 14-4, d-k.

Material : 32 specimens collected from St. 1, 4, 8 and 13.

Habitat : Fine sand beneath seagrass bed of intertidal zone.

Description : Prostomium heart form. Two pairs of eyes in rectangular arrangement. Posterior margin of prostomium has a median notch. Longest peristomial cirri extends back to setiger 8. Proboscis has paragnaths in pectinate rows as follows : area I, II and V none; III 3 cluster, each has 3 rows; IV 3 curved transverse rows; VI 2 curved rows; VII, VIII have 5-7 masses, each has 2 rows. Notosetae of the first pair of parapodia are homogomph spinigers, following parapodia with 1-2 homogomph falcigers besides homogomph spinigers, terminal piece curved. Neurosetae are heterogomph spinigers and heterogomph falcigers.

Remarks : Living specimen is light green with pearly colour, dorsum of the body with orange red spots; young individual transparent, and almost white. The present materials agree well with the descriptions of Day (1967).

Distribution : INDIA : Andaman and Nicobar Islands, Gulf of Mannar and Pamban, Madras coast.

Elsewhere : Ceylon, Pacific, Indian and Atlantic Ocean.

3. ***Ceratonereis mirabilis*** Kinberg,1866

Ceratonereis mirabilis Kinberg,1866 : 170; Gravier, 1901 : 172, pl. 11, Fig. 42; Fauvel, 1953; 200, Fig. 103 a-e; Day, 1967 : 324, Fig. 14.10,a-f, Misra & Chakraborty, 1991 : 145.

Material : 29 specimens collected from St. 2, 3, 10 and 12.

Habitat : Silty sand under coral rubbles and sea grass.

Description : Prostomium with deep cleft and palps elongate. The longest peristomial cirus extends back to setiger 17. Paragnaths present only on maxillary ring of proboscis : I has none; II 10-13 cones in 2 oblique cluster; III 7-9 cones in one cluster; IV 10-14 cones. The lateral teeth of jaw indistinct. Dorsal cirrus very long. Anterior notoseate homogomph spinigers. Indistinct hetrogomph falcigers appear from middle parapodia, end of terminal piece beaked. Some posterior setigers bear homogomph falcigers in which the end of terminal piece bifid. Notopodial and neuropodial falcigers homogomph.

Remarks : The species is characterized by its cleft prostomium and presence of notopodial falcigers on posterior setigers.

Distribution : INDIA : Lakshadweep, Gulf of Mannar, Andaman & Nicobar Islands, Krusadai island, Pamban, Kilakarai, Maharastra and Goa Coast.

Elsewhere : Red Sea, Persian Gulf, Indian and Atlantic Oceans, Japan, New Caledonia, New Zealand, Honolulu, Australia, Brazil, West Indies

4. ***Neanthes glandicincta*** (Southern,1921)* (Fig. 2.a-e)

Nereis glandcincta Southern 1921 : 589-593, pl.23 : Fig. 9a-l, text-Fig. 5a-c; Fauvel 1932 : 92-93; 1953 : 181-182.

Neanthes glandicincta Wu *et al.*, 1984 : 150-151, Fig. 84,A-I; Misra,1995 : 111.

Material : 28 specimens collected from St. 9.

Habitat : Muddy sediments around mangroves.

Description : Prostomium sub-pentagonal. Two pairs of black eyes in trapezoidal arrangements on upper region of prostomium; anterior pair broad, bean-like; posterior pair hemispherical. Two palps extend laterally (Fig. 2.a). Proboscis has paragnaths on all areas of maxillary ring, but none on oral ring expect VI. I : 5-13 cones in 2 irregular rows; II 7-10 cones in 2 rows; III 20-28 unequal cones in 3 rows : IV 6-10 cones in 2 curved rows; V none, VI 1 cone. The jaws are golden with 5-6 lateral teeth (Fig. 2.b). Neuropodium has 2 presetal lobes and one postsetal lobe carrying setae between the lobes. The dorsal cirrus is shorter than notoligule. In posterior region the parapodium about 100th becomes smaller, the neurosetal lobe becomes a supra-and infra-piece (Fig. 2c). All notosetae are homogomph spinigers (Fig. 2.e). Neurosetae are homogomph and heterogomph spinigers (Fig. 2d). Dorsum of body, especially the notopodium is brown. Body color is pale yellow or milky-white. *Neanthes glandicincta* mostly inhabits estuaries.

Remarks : This is the first record of the species from Andaman & Nicobar Islands.

Distribution : INDIA : Gangetic delta, Hugli Malta estuary, Chilka lake and Godavary estuary.

Elsewhere : China.

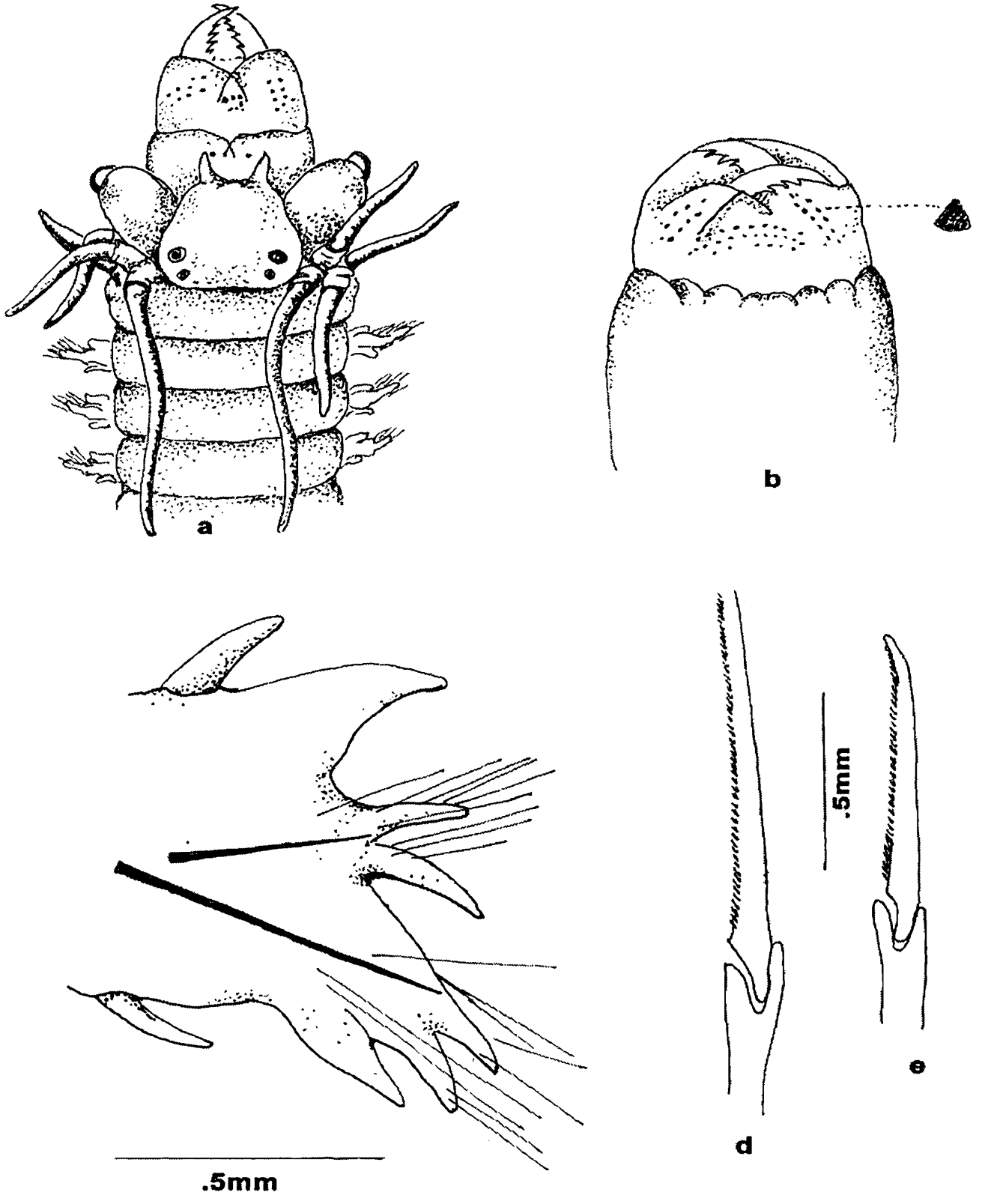


Fig. 2. : *Neanthes glandicincta* (a) Anterior end and dorsal view of proboscis, (b) Ventral view of proboscis, (c) Anterior foot, (d) Neuropodial homogomph spiniger, (e) Notopodial homogomph spiniger.

5. ***Perinereis nigropunctata*** (Horst, 1889)

Nereis nigro-punctata Horst, 1889 : 171.

Perinereis marjorii Southern, 1921 : 595;

Perinereis nigropunctata Fauvel,1932,107;1953 : 210;Day,1967 : 337, Fig. 14.13,r-v; Parulekar, 1971 : 741; Nageswara Rao & Soota, 1981 : 77, Nageswara Rao, 1995 : 325, 1998 : 202.

Material : 41 specimens including 2 heteronereids collected from St. 2-5, 8, 10 and 12.

Habitat : Found among oysters and dead coral crevices at low tide.

Description : Body 50-60 mm long with three rows of brown marks and a V on the prostomium. Tentacular cirri short. Prostomium trapezoidal with deep median furrow anteriorly. Palps with robust, short palpophores and globular palpostyles. Antennae short, triangular. Peristomium relatively long. Jaws robust. Pharynx with conical paragnaths on both rings and smooth bars on areas VI, arranged as follows : I 7, II 12 –18 in 3 curved rows; III 20-25; IV 25-35, V 3 in a triangle VI I stout bar, VII-VIII 30-40 in 2 rows. Notosetae homogomph spinigers only. Neurosetae homogomph spinigers with 1-3 robust hetrogomph falcigers.

Remarks : The present materials agree well with the earlier descriptions.

Distribution : INDIA : Andaman & Nicobar Islands, Chilka lake, Orissa, Gujarat coast, Tuticorin, Cape Comorin, Gangetic delta, Madras coast and Bombay coast.

Elsewhere : Malay Archipelago, Great Barrier Reef.

6. ***Perinereis nuntia brevicirris*** (Grube, 1876)

Nereilepas brevicirris Grube, 1876 : 19.

Perinereis mictodonta var. *mictodontoides* Augener, 1913 : 117.

Perinereis nuntia var. *brevicirris* Fauvel, 1932 : 110; 1953 : 214; Parulekar, 1971 : 742.

Material : 46 specimens including 22 heteronereids collected from St. 1, 2, 3, 5, 7 and 11.

Habitat : Found among barnacles and oysters and in dead coral crevices at low tide-tide.

Description : The largest specimen is 100 mm long and 6 mm wide, for 108 setigers. Longest peristomial cirrus extends back to setigers 7. The paragnaths on proboscis have the following arrangement : I 3 cones, II 12-15 cones in 3 oblique rows; III 13 cones in 3 longitudinal rows; IV a dense triangular group; V 3 cones in a triangle; VI a transverse row of 5 to 8 flattened broad paragnaths; VII and VIII 30-40 cones in 3 irregular rows. Notosetae with homogomph spinigers and neurosetae with hetrogomph falcigers.

Remarks : The present material agree well with the description of Fauvel (1953).

Distribution : INDIA : Gulf of Mannar, Tuticorin, Cape Comorin, Andaman & Nicobar Islands, Maharastra and Goa Coast.

Elsewhere : Japan, Australia, New Zealand, New Caledonia, Malay Archipelago, Indian Ocean, Saint Paul Island, Red Sea.

7. ***Perinereis nuntia caeruleis*** (Hoagland,1920)**
(Fig. 3a-h)

Nereis (*Heteronereis*) *caeruleis* Hoagland, 1920 : 608-610, pl. 47 Fig. 13-16, pl. 48 Fig. 1-4.

Perinereis nuntia caeruleis Wilson & Glasby, 1993 : 261-262.

Material : 22 specimens including 5 heteronereids collected from St.2, 5,11,12 and 13.

Habitat : Boring into dead corals.

Description : Body 120-125 mm long, eyes black. Antennae one-third as long as prostomium. Tentacular cirri extends back 2-4 setigers (Fig. 3.a). Jaws heavy, dark brown with no teeth (Fig. 3.b). Paragnaths I 0; II-0; III 60-90 in central group; IV 80-100 cones, bars absent; V 1 large cone

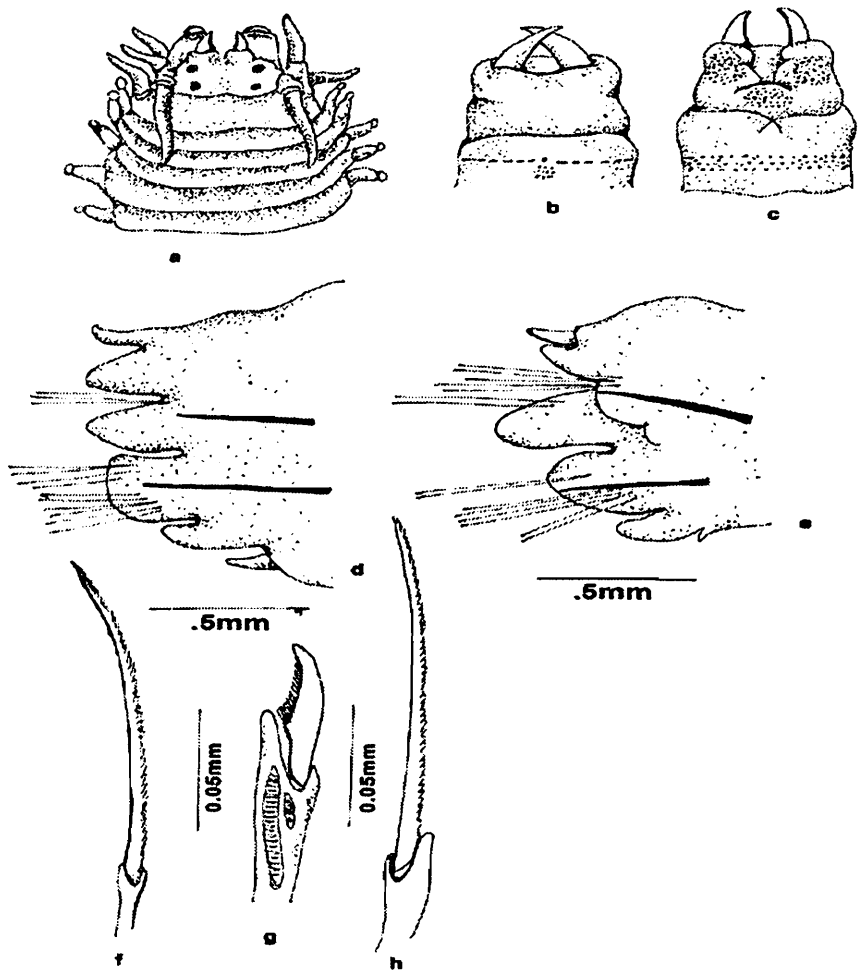


Fig. 3. : *Perinereis nuntia caeruleis* (a) Anterior end, (b) Dorsal view of proboscis, (c) Ventral view of proboscis, (d) Anterior foot, (e) Posterior foot, (f) Homogomph spiniger, (g) Hetergomph falciger, (h) Hetrogomph spiniger.

plus 10-15 small cones; VI 8-12 bars; VII-VIII about 100-150 very small cones, with 3-4 large cones on each side close to area VI (Fig. 3.c). Parapodia of setigers 1 and 2 directed anteriorly. All notosetae are homogomph spinigers (Fig. 3.f). Neurosetae are heterogomph spinigers (Fig. 3.h) and heterogomph falcigers (Fig. 3.g). Neuropodial heterogomph spingers absent from anterior most 24-35 setigers. Anal cirri as long as posterior most 4 setgiers.

Remarks : The present materials agree well with the description of Wilson & Glasby (1993). This is the first record of the species from Indian waters.

Distribution : *Elsewhere* : Australia and Philippines.

8. ***Perinereis weijhouensis,*** Wu Boaling, 1984**
(Fig. 4a-h)

Perinereis weijhouensis Wu Boaling *et al.*, 1984 : 201-204, Fig. 114 a-k.

Material : 5 specimens collected from St. 2 and 12.

Habitat : Boring into dead corals.

Description : Prostomium pentagonal. Palps thick. Longest cirrus extends backward to setiger 6-7 (Fig. 4a). Proboscis has conical paragnaths expect for area VI which has short bars (Fig. 4b) :

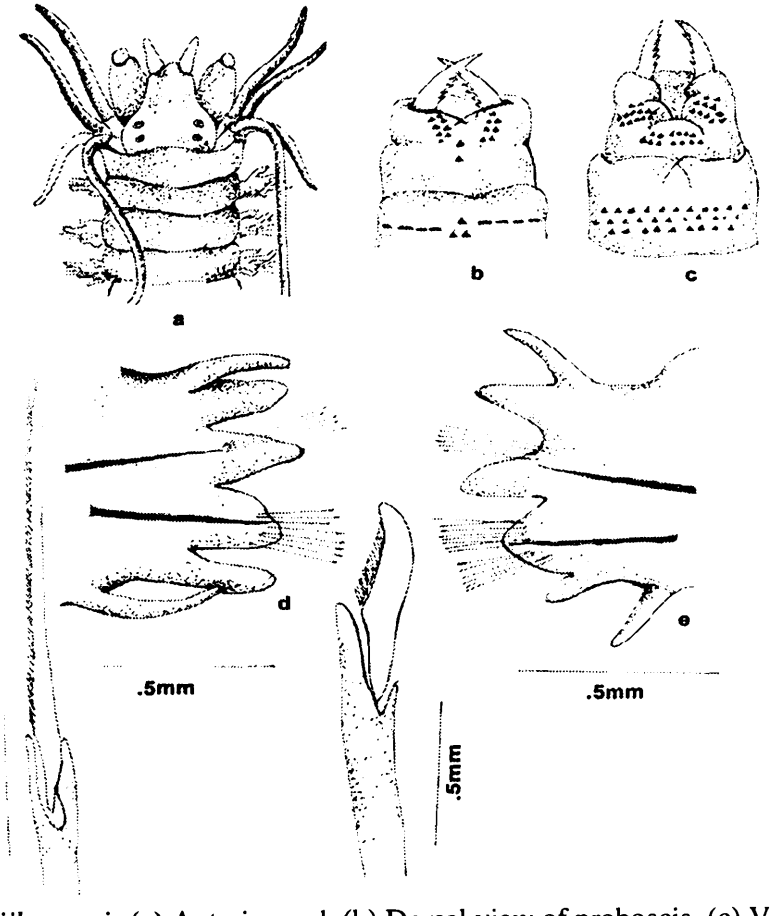


Fig. 4. : *Perinereis weijhouensis* (a) Anterior end, (b) Dorsal view of proboscis, (c) Ventral view of proboscis, (d) Anterior foot, (e) Posterior foot, (f) Homogomph spiniger, (g) Hetergomph falciger.

I has 2 cones; II 4-6 cones in 2 oblique rows; III 10-14 cones in 2 irregular rows; IV 12-15 cones in curved 2-3 rows; V has 3 cones in a triangle; VI 4-8 transversely short bars; VII-VIII have 34-40 cones in 2-3 rows; jaws amber colored, bearing 5-6 lateral teeth (Fig. 4c).

In anterior parapodium (5^{th}), the dorsal and ventral cirri are digitate and of the same length. Noto-and neuroligules conical and almost the same length. Dorsal and ventral cirri as long as notoligule and neuroligule (Fig. 4.d). In the posterior parapodium the notoligule tapers toward the end, pointed. Dorsal cirrus small, digitate, slender and shorter than the notoligule and neuroligule (Fig. 4.e). All notosetae are homogomph spinigers(Fig. 4.f). Neurosetae are heterogomph falcigers (Fig. 4.g) in both supra-acicular and infra-acicular positions.

Remarks : The prostomium and palps have coffee color spots. From the middle parapodium, the notoligule has coffee color spot. The present material agree well with the original description. This is the first record of the species from Indian waters.

Distribution : *Elsewhere* : Weizhou Island (China).

9. ***Perinereis obfuscata*** (Grube, 1878)**
(Fig. 5a-g)

Nereis (*Perinereis*) *obfuscata* Grube, 1878 : 86-87 ; Horst, 1924 : 173-174, pl.34, Fig. 5. 6

Nereis obfuscata, Ehlers,1920 : 51.

Perinereis obfuscata, Monro, 1931 : 16-18, Fig. 10a-d ; Hutchings *et al.*, 1991 : 257-258

Material : 9 specimens collected from St. 1, 5 and 11.

Habitat : Boring into dead corals.

Description : Palps with cyclindrical palpophores, rounded palpostyles. Longest tentacular cirri extends to setiger 2 (Fig. 5.a). Jaws with approximately 4 teeth(Fig. 5. b). Pharynx with conical paragnaths on both rings, with smooth bars also present on Area VI, arranged as follows : I 7-9, II 15-20 in 2 –3 crescent – shaped rows,III 8-12, IV 10-15, V 1, VI 1 short crescent–shaped bar, VII-VIII 22-30 in 2 rows (Fig. 5. c). Dorsal cirrus slightly longer than dorsal notopodial ligule (Fig. 5.d). Posterior notopodial ligule enlarged and triangular. Dorsal cirrus distally inserted on posterior setigers, extending slightly beyond tip of notopodial ligule (Fig. 5. e). Notosetae are homogomph spiniger(Fig. 25.f). Neurosetae with homogomph spinigers and heterogomph falcigers(Fig. 5. g).

Remarks : This is the first record of the species from Indian waters.

Distribution : *Elsewhere* : Australia and Philippines.

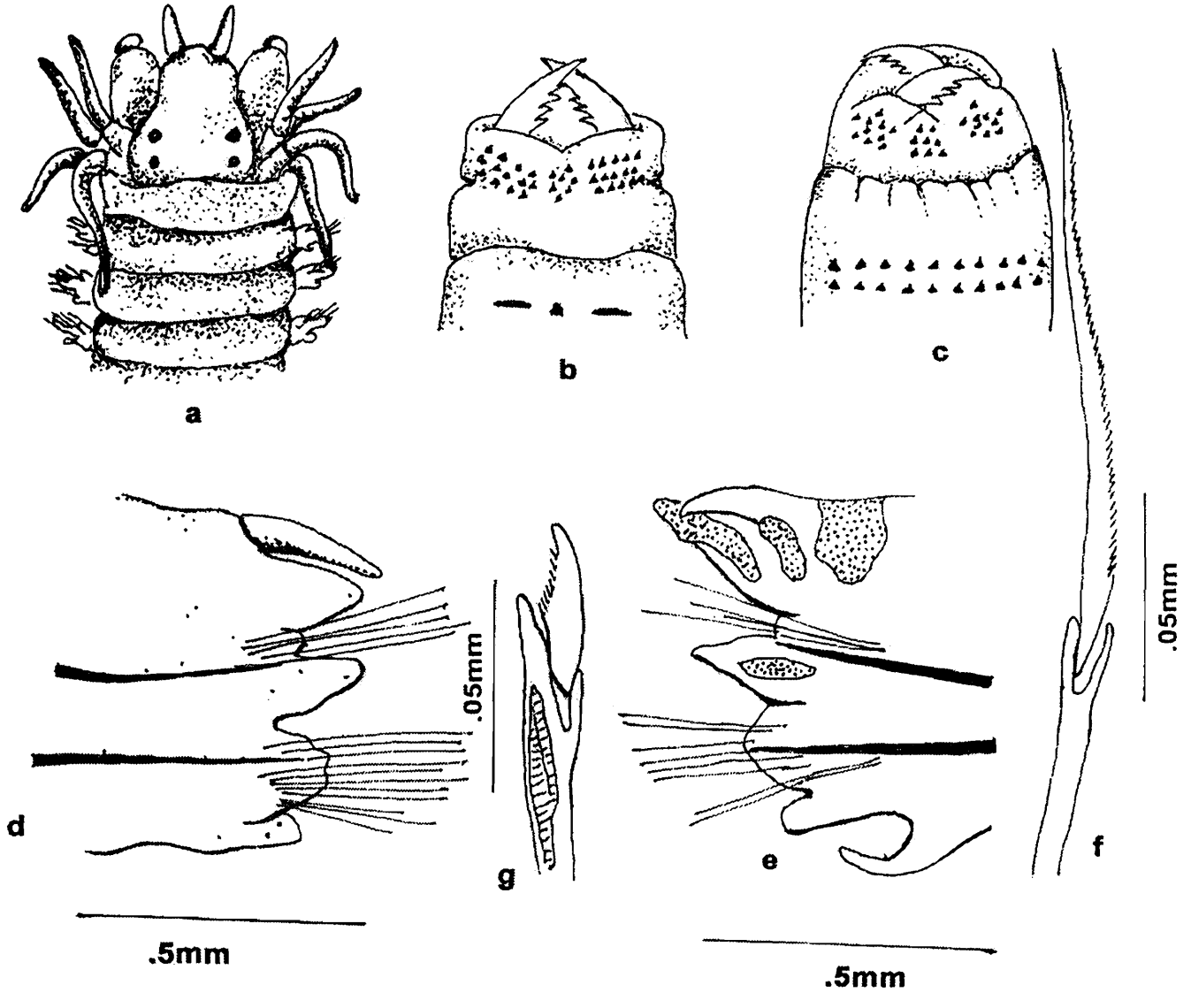


Fig. 5. : *Perinereis obfuscata* (a) Anterior end, (b) Dorsal view of proboscis, (c) Ventral view of proboscis, (d)Anterior foot, (e) Posterior foot, (f) Homogomph spiniger, (g) Hetergomph falciger.

10. ***Perinereis vancaurica*** (Ehlers, 1868)

Nereis vancaurica Ehlers, 1868 : p. xx.

Perinereis horsti Gravier, 1901 : 182, pl. 11, Fig. 47, text-figs. 182-4.

Perinereis vancaurica Fauvel, 1932 : 103 ; Fauvel, 1953 ; 205, Fig. 105 f-g ; Day, 1967 : 334, Fig. 14.12, k-o ; Parulekar, 1971 : 740 ; Soota *et al.*, 1981 : 96 ; Nageswara Rao & Soota, 1981 : 77 ; Misra & Chakraboorty,1991 : 146.

Material : 12 specimens collected from St. 2 and 6.

Habitat : Occurs intertidally under oyster and barnacle encrusted coral rocks.

Description : Prostomium broad and square. Longest tentacular cirri extending to setiger 5. Peristomium relatively short. Distal most part of jaw has smooth edge. Proximally cutting edge serrate rather than denticulate. Pharynx with conical paragnaths on both rings and smooth bars on

area VI. Paragnaths arranged as follows : I 1, II 16-20 in triangle, III 32-40, IV 25-45 cones, V 3 cones in a triangle, VI 2 long flattened bars, VII-VIII 58-80 in 3 irregular rows. Paragnaths in VII-VIII in 2 bands, band closest to oral end of phaynx consists of large cone in 2 irregular rows. All notosetae are homogomph spinigers. Neurosetae are heterogomph falcigers in both supra-acicular and infra-acicular positions.

Remarks : The present material agree well with the earlier description

Distribution : INDIA : Andaman & Nicobar Islands, Lakshadweep, Maharastra, Goa and Gujarat Coast.

Elsewhere : Philippines, Indo-China, Great Barrrier Reef, New Zealand, Singapore, Mergui, Red Sea, Atlantic Ocean, French Guiana.

11. ***Perinereis cultrifera*** (Grube, 1840)

Nereis cultrifera Grube, 1840 : 74

Perinereis cultrifera : Fauvel, 1923 : 352, Fig. 137, 11953, p.206, fig,a-l. ; Day, 1967 : 337, 14.13, Fig. o-q ; Misra & Chakraborty, 1991 : 146.

Material : 25 specimens collected from St. 3, 4, 10 and 13.

Habitat : Boring in dead corals.

Description : Body 85-90 mm long. Prostonmium broadly trianglar ; palps large, tentacular cirri rather long and slender. Antennae one thirds as long as prostomim, longest tentacular cirri extend back to 5 th setiger. Jaws with about 5 distinct teeth. Paragnaths : I 1-2 ; II 5-9 ; III 9-11; IV 9-12 cones; V 3 cones in triangle; VI 1 ; VII-VIII 26-30 cones in two regular rows. Notopodia with 2 equal lobes anteriorly. Dorsal cirrus as long as dorsal notopodial ligule anteriorly. Hetrerogomph spinigers present in ventral neuropodial fascicle from setiger 1. Anal cirri extend back about 7 setigers.

Remarks : The present material agree well with the earlier descriptions.

Distribution : INDIA : Lakshadwweop, Maharashtra, Travancore, Cape Comorin, Tuticorin, Gulf of Mannar, Orissa coast, Andaman & Nicobar Islands.

Elsewhere : Cosmopolitan, Indian, Pacific and Atlantic Oceans, Mediterranean Sea, Israel, Japan, Burma, Diamond Island.

12. ***Perinereis cultrifera typica*** Grube, 1840

Perinereis cultrifera typica Grube,1840 : 74; Fauvel, 1923 : 352, Fig. 137; 1953 : 208; Parulekar, 1971 : 740.

Material : 18 specimens collected from St. 5 and 11.

Habitat : Boring in dead corals and under rocks.

Description : The body 80-90 mm long. Prostomium is pyriform, and bears 2 short, small digitate tentacles. Palps are large. The longest peristomial cirrus extends backward to setiger 5-6. Proboscis has paragnaths on both rings : I 2 cones; II 12-18 cones in 3 oblique rows; III 14-20 cones in 3-4 transverse rows; IV 10-20 cones in 3 oblique rows; V 3 cones in a trianglae : VI a single flat-triangular cone; VIII-VIII 20-30 cones in 2 rows. The jaws have 4-5 lateral teeth. Dorsal cirri located on the dorsum of notoligule. Dorsal cirrus slightly longer than notoligule, but ventral cirrus shorter than neuroligule, thus being smallest. Notosetae are homogomph spinigers throughout. Neurosetae are homogomph spinigers and heterogomph falcigers in supra-acicular position. Heterogomph spinigers and heterogomph falcigers in infra-acicular position.

Remarks : The present materials agree well with the original description.

Distribution : INDIA : Tuticorin, Pamban waters, Chandipore, Andaman &Nicobar Islands, Maharastra and Goa Coast.

Elsewhere : Red Sea, Persian Gulf, Indian Ocean.

13. ***Pseudonereis anomala*** Gravier, 1901

Pseudonereis anomala Gravier,1901 : 191, pl. 12 figs. 50-52, text figs. 194-202; Fauvel, 1953 : 217, Fig. 110 e-g; Day, 1967 : 333, Fig. 14.12, g-j; Nageswara Rao & Soota, 1981 : 77

Material : 26 specimens collected from St. 3, 8, and 10.

Habitat : Boring into dead coral and coralline algae.

Description : Prostomium hexangular, bearing two pairs of eyes in trapezoidal arrangement; tentacles very small, palps large with bulbous tip. Proboscis elongated and large, with both pointed and flat triangular paragnaths; I 1 cone; II 20 cones in 3 regular rows; III 25-35cones in 4 regular rows; IV 22-30 cones in 4-5 regular oblique rows; V none; VI 10-12 bars in transverses rows; VII and VIII 10-14 flat triangular paragnaths in one regular transverse row.

Anterior parapodium has two equal triangular notoligules. The dorsal cirrus 3 times as long as supra-notoligule. From middle parapodium the supra-notoligule elongated, the dorsal cirrus situated in front of the supra-notoligule dorsally. In posterior parapodia, the supra-notoligule flattened and elongated; the dorsal cirrus at end of the surpa-notoligule. The ventral cirrus slender. In anterior parapodia, notosetae are homogomph spinigers. The neurosetal lobes have homogomph spinigers and heterogomph falcigers.

Remarks : The present materials agree well with the description of Day (1967).

Distribution : INDIA : Gulf of Mannar, Marmugao Bay, Andaman & Nicobar Islands, Cape Comorin, Kilakarai and Gujarat coast.

Elsewhere : Australia, Malay archipdago, Indo-china, Persian Gulf, Red Sea, Madagascar.

14. ***Pseudonereis variegata*** (Grube,1857)

Nereilepas variegata Grube,1857 : 164.

Nereis (Mastigonereis) variegata : McIntosh, 1904 : 37, pl. 1 figs. 6-10, pl. 2 figs. 11,12.

Pseudonereis gallapagensis Kinberg, 1866 : 174 : Fauvel,1953 : 215, Fig. 110 a-e; *Pseudonereis variegata* Day, 1967 : 331, Fig. 14-12.a-f; Misra *et.al.*,1987 : 74. Soota *et al.*, 1981 : 96, Nageswara Rao & Soota, 1981 : 77.

Material : 45 specimens collected from St. 1, 2, 4, 5, 7 and 13.

Habitat : Burrowing into rocks, dead and live corals.

Description : Body 80-90 mm long. Tentacles small, palps large, with bulbous tip. The longest peristomial cirrus reaches backward to setiger 5. Proboscis is large, paragnaths present on both rings : I 1 cone; II 16-20 points in a regular triangular cluster; III 12-18 points in 3 triangular rows; IV 17-22 points; V 1 cone; VI a single transverse bar; VII and VIII have 30-40 cones in 3-4 irregular rows. The dorsal cirri longer than notopodial lobes, slender toward the end; ventral cirrus very short, situated at the base of infra-neuroligule. Beyond setiger 50 supra-notoligule expands toward posterior end in a rectangular shape, carrying the dorsal cirrus at end. Ventral cirrus very short. The upper margin or the supra-notoligule in posterior parapodia bears gland.

Notosetae are homogomph spinigers throughout. Neurosetae in anterior and middle parapodia homogomph spinigers and heterogomph falcigers. Posterior neurosetal lobes with heterogomph spinigers and falcigers.

Remarks : Present materials agree well with the description of Day (1967).

Distribution : INDIA : Orissa coast, Gulf of Mannar, Marmugao Bay, Andaman & Nicobar Islands, Goa and Gujarat.

Elsewhere : Pacific Ocean, Galapagos, Peru, Chile, Megellan, Indo China, Indian Ocean, Madagascar, Brazil.

SUMMARY

The present paper deals with 14 species of polychaetes under family Nereidae, four species is recorded for the first time from entire Andaman & Nicobar Islands of which three are new distributional record to Indian waters.

ACKNOWLEDGEMENT

We thank the Director Dr. T. Balasubramanian, CAS in Marine Biology, Annamalai University for providing facilities. First author thanks to Ministry of Environment & Forest, Government of India for fellowship during the study period.

REFERENCES

Daniel, A. and Ghosh, A. 1964. On some Polychaetes from Little Andamans. *Curr. Sci.*, **33**(8) : 249.

Day, J.H. 1967. A monograph on the Polychaeta of Southern Africa. Pts. I and II, *Brit. Mus.(Nat. Hist.), Publ.* No. 656 : 1-878.

Fauvel, P. 1932. Polychaeta of Indian Museum, Calcutta. *Mem. Ind. Mus.*, **12** : 1-262.

Fauvel, P. 1953. Annelida Polychaeta. The Fauna of India including Pakistan, Ceylon, Burma and Malaya. The Indian Press Ltd., Allahabad. 507 pp.

Misra, A., Soota, T.D. and Chowdhury, A. 1983. On some polychaetes from Gangetic delta, West Bengal, India. *Rec. zool. Surv. India*, **81**(1 & 2) : 41-54.

Misra, A., Chakraborty, R.K. and Soota, T.D. 1987. Fauna of Orissa : Polychaeta, Zool. Surv. India, *State Fauna Series*, **1** : 69-89.

Misra, A. and Chakraborty, R.K. 1991. Polychaetes from Lakshadweep. Fauna of Lakshadweep. Zool. Surv. India. *State Fauna Series*, **2** : 137-165.

Misra, A. 1995. Polychaete fauna of Hugli-Malta Estuary, West Bengal. *Zool. Surv. India, Estuarine Ecosystem Series*, Part **2** : 93-155.

Nageswara Rao, C.A. 1981. On two new polychaetes (Nereidae) from estuarine waters of India. *Bull. zool. Surv. India*, **3**(3) : 213-217.

Nageswara Rao, C.A. 1992. Polychaete fauna of the Rushikulya estuary, Ganjam, Orissa. *Environment & Ecology*, **10**(2) : 478-479.

Nageswara Rao, C.A. 1993. Polychaetous annelids from Mahanadi eutuary, Orissa. *Enviro. & Ecol.* **11**(4) : 993-995.

Nageswara Rao, C.A. 1995. Annelida : Polychaeta; Fauna of Chilka Lake wetland Ecosystem Series 1. *zool. Surv. India* : 319-336.

Nageswara Rao, C.A. 1998. Polychaete fauna of Mahanadi Estuary, Orissa. Zool. Surv. India, *Esturine Ecosystem Series*, **3** : 199-209.

Nageswara Rao, C.A. 1999. Observation a collection of polychaetes from Godavari estuary Andhra Pradesh. *Rec. Zool. Surv. India*, **97**(Part-1) : 43-47.

Nageswara Rao, C.A. 2001. Polychaete fauna of the Godavari Estuary. Zool. Surv. India, *Esturine Ecosystem Series*, **4** : 21-32.

Nageswara Rao, C.A. and Soota, T.D. 1977. On some polychaetes from Tamil Nadu coast. *Newsl. zool. Surv. India*, **3**(5) : 331-335.

Nageswara Rao, C.A. and Soota, T.D. 1981. On some polychaetes from Gujarat Coast. *Rec. zool. Surv. India*, **79** : 73-82.

Parulekar, A.H. 1971. Polychaete from Maharashtra and Goa. *J. Bombay nat. Hist. Soc.*, **68**(3) : 726-749.

Soota,T.D. and Nageswara Rao, C.A. 1977a. On some polychaetes from Andaman and Nicobar islands. *Rec. zool. Surv. India*, **73**(1-4) : 197-210.

Soota, T.D. and Nageswara Rao, C.A. 1977b. On some polychaetes from Orissa coast. *Rec. zool. Surv. India*, **73**(1-4) : 327-336.

Soota, T.D., Misra, A. and Chakraborty, R.K. 1980. Polychaete fauna of Andaman and Nicobar islands. *Rec. zool. Surv. India,* **77** : 55-69.

Soota, T.D., Misra, A. and Chakraborty, R.K. 1981. Polychaete fauna of Gujarat coast. *Rec. zool. Surv. India,* **79**(1 & 2) : 93-104.

Southern, R. 1921. Polychaeta of the Chilka Lake and also of fresh and brackish waters in other parts of the India. *Mem. Indian Mus.*, **5**(8) : 563-659.

Sunder Raj, S.K. and Sanjeeva Raj, P.J. 1987. Polychaeta of the Pulicat Lake (Tamil Nadu). *J. Bombay nat. Hist. Soc.*, **84**(1) : 84-104.

Sunil Kumar, R. 1997. Vertical distribution and abundance of sediment dwelling macro-invertebrates in an estuarine mangrove biotope-southwest coast of India. *Indian J. Mar. Sci.*, **26**(1) : 26-30.

Sunil Kumar, R. 1999. New records of the five annelids (Class-Polychaeta) from the mangrove habitat of the South west coast of India. *J. mar. biol. Ass. India*, **41**(1 & 2) : 116-118.

Sunil Kumar, R. 2001. Biodiversity and affinity of polychaetous annelids within the mangrove ecosystem of Indo-Pacific region. *J. mar. biol. Ass. India,* **43**(1 & 2) : 206-213.

Sunil Kumar, R. 2002. Biomass, horizontal zonation and vertical stratification of Polychaete fauna in the littoral sediment of Cochin estuarine mangrove habitat, south west coast of India. *Indian J. Mar. Sci.*, **31**(2) : 100-107.

Tampi, P.R.S. and Rangarajan, K. 1963. On the occurrence of *Arenicola brasiliensis* Nonato (Family : Arenicolidae, Polychaeta) in Indian waters. *J. mar. biol. Ass. India*, **5**(1) : 108-112.

Tampi, P.R.S. and Rangarajan, K. 1964. Some polychaetous annelids from the Andaman waters. *J. mar. biol. Ass. India*, **6**(1) : 98-123.

Rec. zool. Surv. India : **108**(Part–4) : 37-40, 2009

ON THE OCCURRENCE OF TWO BALITORID FISHES OF THE GENUS *SCHISTURA* McCLELLAND FROM SIMILIPAL BIOSPHERE RESERVE, ORISSA

P. G. S. SETHY, PRAJYOTI SAHU AND S. S. MISHRA*

Estuarine Biological Station, Zoological Survey of India, Berhampur

**F. P. Spirit Building, Zoological Survey of India, Kolkata*

INTRODUCTION

The Similipal Biosphere Reserve located in the North-East part of Orissa (Dist. Mayurbhanj) is famous for its undulating terrain with diverse genetic resources (Patra and Triphaty, 1997). The biogeographical conditions provide a high potential habitat for the variety of fish fauna inhabiting the locality. Previous studies pertaining to fish fauna of Similipal Biosphere Reserve (Anon, 1999) records 31 species only, of which the family Balitoridae (Order-Cypriniformes) is represented by an unidentified species of the genus *Nemacheilus* Bleeker, 1863. Ramakrishna *et al.* (2006) also included only one Balitorid fish as *Nemacheilus* species, with indication of it being a new distributional record. Incidentally, two species of fishes were collected during the study of invertebrate faunal groups in the Biosphere Reserve. On identification these two species turned out to belong to the genus *Schistura* McCelland, 1839, hitherto not reported. Its report earlier as *Nemacheilus* sp. is due to the fact that in earlier literature the genus *Schistura* was considered as a subgenus under *Nemacheilus.* The identified specimens were deposited with EBS, ZSI, Berhampur (presently at Gopalpur-on-Sea, Orissa). The taxonomic accounts of these two species are given here to record their occurrence from this Biosphere Reserve and as well as from Orissa state.

1. *Schistura dayi* (Hora)

1935. *Nemachilus dayi* Hora, *Rec. Indian Mus.*, **37** : 57 (Hills near Raniganj, Chotanagpur).

1987. *Noemacheilus denisoni dayi* : Menon, *Fauna of India, Pisces,* **4**(I) : 99, pl. 16, fig 6.

1991. *Nemacheilus denisoni dayi* : Talwar and Jhingran, *Inland fishes of India.* **1** : 478.

1999. *Schistura denisoni dayi* : Jayaram, *The freshwater fishes of the Indian Region* : 181, 188.

Material examined : 2 ex., 54-66 mm in total length. Locality – Chahala (775 in altitude), Similipal Biosphere Reserve, Collected by – P.G.S. Sethy, during April. 2004.

Diagnostic features : D iii, 8; A ii, 5; P i, 10; V i, 6, C 18. Body depth 6.6 to 6.8, head length 5.0 to 5.4 in total length (5.5 to 5.6 and 4.1 to 4.6 in standard length). Body of uniform depth, dorsal profile slightly arched while the ventral profile is almost straight and horizontal. Head almost as broad as high at occiput. Snout somewhat rounded, shorter than postorbital distance. Eyes small, not visible from ventral surface. Mouth semicircular, lips fleshy, lower lip weakly furrowed. Nostrils close to each other. Three pairs of barbels are well developed, thread like almost as long as eye diameter. Lateral line incomplete, ending below middle of dorsal fin. Dorsal fin small, almost as high as head length; edge of dorsal fin straight; origin of dorsal fin equidistant between tip of snout and caudal fin base. Pelvic fin origin opposite that of dorsal fin; its length shorter than pectoral fin, almost reaching anal opening. Pectoral fin shorter than head. Caudal fin slightly shorter than head, deeply emarginate, with rounded lobes. Body marked with 10-12 broad vertical bands with an equal number of narrow pale interspaces. A black band at caudal base, a blackish spot at base of the dorsal fin origin. Dorsal and caudal fins with two rows of well-marked spots, other fins without spots.

Distribution : Chhota Nagpur plateau, Jharkhand; Bastar, Chhatisgarh. Inhabits small shallow swift streams with sandy or pebbly bottoms.

Remarks : The generic allocation of this species is in parlance with current nomenclature and the validity of this species is in accordance with Banarescu and Nalbant (1995). Although Menon (1987), Talwar and Jhingran (1991) and Jayaram (1999) placed this as a sub-species of *Schistura denisoni,* the original combination of Hora (1935) is considered here as valid. The lateral line in *S. denisoni* ends before dorsal fin origin, while that extends to below middle of the dorsal fin in *S. dayi.*

The type locality, "Chhotanagapur Plateau" is geographically in continuation with the Similipal forest range and hence, its distribution in Similipal Biosphere Reserve is well in expected line. Dutta *et al.* (1993) reported *S. denisoni* Day, a species well distributed in peninsular India, from Orissa. That probably refers to the species *S. dayi*, as *S. denisoni* is unlikely to occur in this part. Further collection and study of *Schistura* species from Orissa may reveal the distributional boundaries of these two species and probably add more number of species to the icthyofauna of Orissa.

2. ***Schistura scaturigina*** (McClelland)

1839. *Cobitis (Schistura) scaturigina* McClelland, *Asiat. Res.*, **19** : 308, 443, pl. 53, fig., 6 (from a figure from Hamilton's collection, Darjeeling).

1987. *Noemacheilus scaturigina* : Menon, *Fauna of India. Pisces,* **4**(I) : 86.

1991. *Nemacheilus scaturigina* : Talwar and Jhingran, *Inland Fishes of India,* **1** : 501.

1999. *Schistura scaturigina* : Jayaram, *The freshwater fishes of the Indian Region* : 183, 187.

Material examined : 1 ex., 25 mm in total length, Locality – Chahala, Similipal Biosphere Reserve, Collected by – P.G.S. Sethy, during April, 2004.

Diagnostic features : D iii, 8; A i, 5; P i, 9; V i, 7, C 18. Body depth about 8.0. head length 5.0 in total length (6.5 and 4.0 in standard length). A small elongate species with both dorsal and ventral profile almost horizontal. Head slightly broader than high at occiput, long narrow and pointed anteriorly. Snout somewhat equal to postorbital distance. Eyes small, dorso-laterally in position, not visible from ventral surface. Mouth semicircular; lips moderately fleshy, poorly furrowed. Barbels well developed; inner rostral shorter, outer rostral and maxillary subequal; outer rostral extending to margin of eye; maxillary extended to the posterior border of eye. Lateral line complete. Dorsal fin small, its origin equidistant between tip of snout and caudal base. Origin of pelvic fin slightly behind that of dorsal fin. Pelvic fin longer than head and shorter than pectoral fin. Pelvic fin not reaching anal opening. Caudal fin longer than head, deeply forked, lobes pointed. Body grayish above, olivaceous below with 9 to 12 dark vertical bands broader dorsally, narrowing down on sides and not extending to ventral surface. A narrow black bar on base of the caudal fin with one or two series of dots forming a V-shaped pattern on the fin itself. A black spot at base of the anterior dorsal ray.

Distribution : Darjeeling and Assam in eastern Himalayas, India; Nepal, Bangladesh and Bhutan.

Remarks : The generic allocation is in accordance with current nomenclature (Banarescu and Nalbant, 1995). Gunther (1868) recorded this species from Bengal. Day (1869) described it from Cossye river at Midinapur as *N. mugah,* and later Day (1889) also reported this from Orissa as *N. zonatus* (McClelland), both considered as synonyms of *S. scaturigina* by Menon (1987). The above synonymy certainly indicates the availability of *S. scaturigina* in Southern Bengal and Orissa. The present report confirms its occurrence in Northern Orissa close to Southern Bengal differing from the distributional range "eastern sub-Himalayas" as stated in the Talwar and Jhingran (1991) and Menon (1987). These small hill stream fishes from Orissa are poorly studied and so, might have escaped the eyes of earlier scientists.

ACKNOWLEDGEMENTS

The authors express their gratitude to the Director, Zoological Survey of India, Kolkata and Dr. S.Z. Siddiqi, Officer-in-Charge, Estuarine Biological Station, Z.S.I., Berhampur (presently at Gopalpur-on-Sea) Orissa, for permission, facilities and encouragement. Our thanks are also due to Dr. A.K. Karmakar, ZSI, Kolkata for his unhesitant help in identification of the fish samples. We are also grateful to the Chief Wildlife Warden, Forest Dept., Bhubaneswar and Field Director, Similipal Biosphere/Tiger Reserve, Bhanjapur, Baripada for facilities to conduct field/laboratory studies (Protected Area Network Project in Similipal Biosphere Reserve, Baripada).

REFERENCES

Anon, 1999. Checklist of Animals : *Similipal Tiger Reserve and Similipal Biosphere Reserve,* Published by Field Dir., Similipal Tiger Reserve. Bhanjapur, Baripada. Pp. vi + 49.

Banarescu, P. and Nalbant, T.T. 1995. A generical classification of Nemacheilinae with description of two new genera (Teleostei : Cypriniformes : Cobitidae). *Tran. Mus, Hist. Nat. Grigore Antipa* : 429-495.

Day, F. 1869. On the fishes of Orissa. *Proc. Zool. Soc. London* : 369-387.

Day, F. 1889. *The fauna of British India* : *Wishes.* Today and Tomorrow Printers and Publishers, New Delhi, 1 : 548 pp.

Dutta, A.K., Kundu, D.K. and Karmakar. A.K. 1993. Freshwater Fishes. *Stale Fauna Series, 1* : *Fauna of Orissa,* Part **4** : 1-37.

Gunther, A. 1868. *Catalogue of the fishes of the British Museum.* **7** : 1-512.

Hora, S.L. 1935. Notes on the fishes in the Indian Museum. XXIV. Loaches of the genus *Nemacheilus* from eastern Himalaya, with the description of a new species from Myanmar and Siam. *Rec. Indian Mus.,* **37**(1) : 49-67, 1 pl.

Jayaram, K.C. 1999. *The freshwater fishes of the Indian Region,* Narendra Publishing House, New Delhi, 1-551.

Menon, A.G.K. 1987. *The fauna of India and adjacent countries, Pisces,* 4. Teleostei-Cobitoidea, Part 1, Homalopteridae. Zoological Survey of India, Calcutta : x + 259 pp, 16 pls.

Patra, S.N. and Triphaty, P.C. 1997. *Similipal a natural habitat of unique biodiversity, Orissa Environmental Society, BBSR* : 128-134.

Ramakrishna, Siddiqui, S.Z., Sethy, P. and Dash, S. 2006. *Faunal Resources of Similipal Biosphere Reserve, Mayurbhanj, Orissa. Conservation Area Series,* **28** : 1-87, 8 pls.

Talwar, P.K. and Jhingran Arun, G. 1991. Inland Fishes of India and Adjacent countries, Vol. 1, Oxford and IBH Publishig Co. Pvt. Ltd., New Delhi, pp. 1-541.

PLATE I

Fig. 1. : *Schistura dayi* (Hora)

Fig. 2. : *Schistura scaturigina* (McClelland)

Rec. zool. Surv. India : **109**(Part–1) : 41-47, 2009

FRESHWATER FISH FAUNA OF ANDHRA PRADESH WITH COMMENTS ON THE THREATENED AND ENDEMIC SPECIES

R. P. BARMAN

Zoological Survey of India, FPS Building, Kolkata-700 016

INTRODUCTION

Andhra Pradesh is one of the eight maritme states of our country lying on the southeastern coast of the Indian Peninsula. Three major mountain ranges are located in the state. The Eastern Ghats which constitute a chain of hill ranges fringing the east coastal line, the Deccan plateau with the Sahyadri range of Adilabad district to the north border and the Horseley & other hills of the Chittoor and Anantapur districts to the south border of this state. Two major rivers of South India. *viz.*, the Godavari and the Krishna River with their several tributaries form the chief perennial river systems of this state. There are a large number of medium and small sized rivers in addition to several Man made reservoirs in this state. Moreover, there are several wetlands including one of the National Wetlands, *viz.*, Kolleru Lake in this state. The state is known to contain 158 species under 68 genera, 27 families and 10 orders of freshwater fishes (Barman, 1993). The freshwater fish fauna of this state has been reviewed in respect of the threatened and endemic freshwater fishes of our country. This has revealed that Andhra Pradesh contains 53 threatened freshwater fishes of India as per Molur & Walker (1998) and Menon (1999 and 2004). Out of th 53 threatened species, Endangered, Vulnerable, Rare and near threatened species are represented by 15, 27, 5 and 6 species respectively. Moreover, it has been found that this state also contains 33 Indian endemic freshwater fishes of which 21 species are also threatened and near threatened species of our country. Considering all the threatened, near threatened and Indian endemic fresheater fish species occurring in Andhra Pradesh, some conservation measures need to be suggested for their protection and conservation. The arrangement of the systematic list of the Fishes of Andhra Pradesh has been followed as per that of Jayaram (1999). The list of the species has been included alphabetically under the respective family. The contributing factors responsible for the threats to

the freshwater fishes or in their becoming threatened species have already been identified and described in Molur and Walker (Op. cit.), and are not dealt with in this paper.

SYSTEMATIC LIST OF THE THREATENED AND ENDEMIC FRESHWATER FISHES OF ANDHRA PRADESH

(I) LIST OF THE THREATENED SPECIES

(A) ENDANGERED SPECIES : (15 Species)

Order ANGUILLIFORMES

Family ANGUILLIDAE

1. *Anguilla bengalensis bengalensis* (Gray) (CAMP)

Order CYPRINIFORMES

Family CYPRINIDAE

2. *Cirrhinus cirrhosus* (Bloch) (Menon, 2004)
3. *Garra gotyla stenorhynchus* Jerdon (CAMP)
4. *Hypselobarbus curmuca* (Hamilton) (CAMP)
5. *Hypselobarbus jerdoni* (Day) (CAMP)
6. *Osteocheilus thomassi* (Day) (CAMP)
7. *Osteobrama neilli* (Day) (Menon, 2004)
8. *Labeo ariza* (Hamilton) **(Critically endangered species)** (CAMP)
9. *Tor khudree* (Sykes) (Menon, 2004)

Order SILURIFORMES

Family BAGRIDAE

10. *Hemibagrus punctatus* (Jerdon) (= *M. punctatus* (Jerdon) (CAMP))
11. *Mystus malabaricus* (Jerdon) (CAMP)

Family SILURIDAE

12. *Ompok bimaculatus* (Bloch) (CAMP)
13. *O. pabda* (Hamilton) (CAMP)

Family SCHILBEIDAE

14. *Pseudeutropius atherinoides* (Bloch) (CAMP)
15. *Silonia childreni* (Sykes) (CAMP)

(B) VULNERABLE SPECIES : (27 Species)

Order CLUPEIFORMES

Family CLUPEIDAE

1. *Tenualosa ilisha* (Hamilton) (Menon, 2004)

Order CYPRINIFORMES

Family CYPRINIDAE

2. *Barilius barila* (Hamilton) (CAMP)
3. *Garra gotyla gotyla* (Gray) (CAMP)
4. *Labeo dussumieri* (Valenciennes) (Menon, 2004)
5. *L. porcellus* (Heckel) (Menon, 2004)
6. *L. potail* (Sykes) (Menon, 2004)
7. *Osteobrama cotio cunma* Day (CAMP)
8. *Osteochilus nashii* (Day) (Menon, 1999)
9. *Punitus chola* (Hamilton) (CAMP)
10. *P. conchonius* (Hamilton) (CAMP)
11. *Puntius sarana* (Hamilton) (CAMP)
12. *P. vittatus* Day (CAMP) (CAMP)
13. *Rohtee ogilbii* Sykes (Menon, 2004)

Order SILURIFORMES

Family BAGRIDAE

14. *Mystus bleekeri* (Day) (CAMP)
15. *M. montanus* (Jerdon) (CAMP)
16. *M. vittatus* (Bloch) (CAMP)
17. *Sperata aor* (Hamilton) (= *Aorichthys aor* (Hamilton) (Menon, 1999))
18. *Sperata seenghala* (Sykes) (= *Aorichthys seenghala* (Sykes) (Menon, 1999))

Family SCHILBEIDAE

19. *Ailia coila* (Hamilton) (CAMP)
20. *Proeutropiichthys taakree taakree* (Sykes) (CAMP)

Family PANGASIIDAE

21. *Pagasius pangasius* (Hamilton) (Menon, 2004)

Family SISORIDAE

22. *Bagarius bagarius* (Hamilton) (Menon, 2004/CAMP)

Family CLARIIDAE

23. *Clarias batrachus* (Linnaeus) (CAMP)

Family HETEROPNEUSTIDAE

24. *Heteropneustes fossilis* (Bloch) (CAMP)

Order PERCIFORMES

Family CHANNIDAE

25. *Channa orientalis* Bloch & Schneider (CAMP)

Order PERCIFORMES

Family MUGILIDAE

26. *Rhinomugil corsula* (Hamilton) (CAMP)

Family ANABANTIDAE

27. *Anabas testudineus* (Bloch) (CAMP)

(C) RARE SPECIES : (5 Species)

Order CYPRINIFORMES

Family CYPRINIDAE

1. *Puntius gelius* (Hamilton) (Menon, 1999)
2. *Rasbora caverii* (Jerdon) (Menon, 2004)
3. *Salmostoma horai* (Silas) (Menon, 1999)
4. *Schismatorhynchos nukta* (Sykes) (Menon, 2004)
5. *Thynnichthys sandkhol* (Sykes) (Menon, 2004)

(D) NEAR THREATENED SPECIES : (6 Species)

Order CYPRINIFORMES

Family CYPRINIDAE

1. *Barilus evezardi* Day (CAMP)
2. *Cirrhinus fulungee* (Sykes) (CAMP)
3. *Labes pangusia* (Hamilton) (CAMP)

4. *Puntius guganio* (Hamilton) (CAMP)
5. *P. terio* (Hamilton) (CAMP)

Family BALITORIDAE

6. *Glyptothorax lonah* (Sykes) (CAMP)

(II) LIST OF THE ENDEMIC SPECIES : (33 Species)

Order CYPRINIFORMES

Family CYPRINIDAE

1. *Barilius evezardi* Day (Maharashtra and Andhra Pradesh) (Near threatened species) (**Near threatened species**)
2. *Salmostoma boopis* (Day) (Peninsular India : Western Ghats : Karnataka : Dakhin Kannad (South Canara) and Maharashtra)
3. *Salmostoma horai* (Silas) (**Rare species**) (Karnataka : coorg (Cauvery river) and Andhra Pradesh
4. *Salmostoma untrahi* (Day) (Orissa : Mahanadi River and Andhra Pradesh)
5. *Thynnichthys sandkhol* (Sykes) (**Rare species**) (Peninsular India : Deccan : Krishna and Godavari river)
6. *Osteobrama neilli* (Day) (**Endangered species**) (Krishna river (Deccan) and Pennar river in Cuddapah district, Andhra Pradesh)
7. *Osteobrama vigorsii* (Sykes) (Deccan : (Godavari and Krishnadrainage systems), Mahanadi river at Hirakud dam, Orissa and Andhra Pradesh)
8. *Rohtee ogilbii* Sykes (**Vulnerable species**) (Peninsular India : Krishna and Godavari river systems)
9. *Hypselobarbus curmuca* (Hamilton) (**Endangered species**) (Deccan : Krishna, Godavari and Cauvery river systems)
10. *Hypselobarbus jerdoni* (Day) (**Endangered species**) (Karnataka : Dakhin Kannada (South Canara) and Andhra Pradesh)
11. *Tor musullah* (**Endangered species**) (Maharashtra and Andhra Pradesh)
12. *Osteocheilus thomassi* (Day) (**Endangered species**) (Karnataka, Kerala and Andhra Pradesh)
13. *Puntius melanampyx* (Day) (Peninsular India : Karnataka, Kerala, Tamil Nadu and Andhra Pradesh)
14. *Osteochilus nashii* Day (= *Cyprinion nashii* (Day)) (**Vulnerable species**) (Deccan : Krishna and Godavari, Coorg, Dakhin Kannada, Nilgiri and Ananmalai drainages)
15. *Cirrhinus cirrhosus* (Bloch) (**Endangered species**)
16. *Cirrhinus fulungee* (Sykes) (**Near threatened species**)

17. *Labeo kawrus* (Sykes) (Maharashtra and Andhra Pradesh)
18. *Labeo potail* (Sykes) (**Vulnerable species**) (Deccan : Krishna and Tungabhadra drainages)
19. *Schismatorhynchos nukta* (Sykes) (**Rare species**) (Peninsular India : Deccan : Krishna river systems)
20. *Garra gotyla stenorhynchus* (Jerdon) (**Endangered species**) (Western Ghats : Cauvery and Krishna river systems)
21. *Garra mcclellandi* (Jerdon) (Tamil Nadu and Andhra Pradesh)

Family BALITORIDAE

22. *Noemacheilus anguilla* Annandale (Peninsular India : Western Ghats : Maharashtra, Karnataka and Andhra Pradesh)
23. *Schistura denisoni* Day (= *N. denisoni denisoni* Day) (Rajasthan, Madhya Pradesh, Maharashtra, Karnataka, Kerala and Andhra Pradesh)
24. *Indoreonectes evezardi* (= *N. evezardi* Day) (Western Ghats : Maharashtra, Madhya Pradesh and Andhra Pradesh)
25. *Nemacheilus moreh* (Sykes) (Peninsular India : Maharashtra, Tamil Nadu and Andhra Pradesh)
26. *Longischistura striata* Day (= *N. striatus* Day) (Western Ghats : Kerala, Karnataka and Andhra Pradesh)

Order SILURIFORMES

Family BAGRIDAE

27. *Rita gogra* (Sykes) (Rivers of Deccan up to Krishna river system)
28. *Mystus malabaricus* (Jerdon) (**Endangered species**) (Peninsular India : Kerala, Karnataka, Maharashtra and Andhra Pradesh)
29. *M. montanus* (Jerdon) (**Vulnerable species**) (Assam, Kerala, Karnataka, Maharashtra, Madhya Pradesh and Andhra Pradesh)
30. *Hemibagrus puncatus* (Jerdon) (= *M. Punctatus* (Jerdon)) (**Endangered species**) (Western Ghats : Kerala, Tamil Nadu, Karnataka and Andhra Pradesh)

Family SCHILBEIDAE

31. *Proeutropiichthys taakree taakree* (Sykes) (**Vulnerable species**) (Peninsular India)
32. *Silonia childreni* (Sykes) (**Endangered species**) (Peninsular India : Western Ghats : Krishna, Godavari and Cauvery river systems)

Family SISORIDAE

33. *Glyptothorax lonah* (Sykes) (Deccan Plataeu, the Vindhyas, Orissa Hill ranges and Andhra Pradesh) (**Near threatened species**)

DISCUSSION

The ever-increasing presure of population demands future requirement for development and employment generation on one side and production of food grains and livestock on the other side. All these requirements directly affect the land, forest and water resources equally. Andhra Pradesh is of no exception in this respect. The population pressure on these natural resources has affected the fish fauna of this state as well as the rest of the states of our country also. The list of the freshwater fishes of this state shows that this state contains 15 endangered, 27 vulnerable, 5 rare and 6 near threatened species of freshwater fishes of India. Out of 15 endangered species, 1 species, *Labeo ariza* (Hamilton) has been designated as a critically endangered species. Andhra Pradesh also contains 33 endemic freshwater fishes of our country. Among these 33 endemic species 21 are also threatened and near threatened species. Careful evaluation for the responsible factors for the present threat of the fishes is very much needed right now. In this respect the more it will be delayed to adopt the protection and conservation measures to control the responsible factors, less will be the options left to us to protect and conserve them.

ACKNOWLEDGEMENTS

I am thankful to Dr. Ramakrishna, Director and to Dr. N.C. Nandy, Joint Director Zoological Survey of India, and Kolkata for necessary facilities and encouragement for this work.

REFERENCES

Barman, R.P. 1993. *Fauna of Andhra Pradesh, Part-1 : Fishes.* In : *State Fauna Series,* **5** : 89-334, Zoological Survey of India, Kolkata, Govt. of India.

Jayaram, K.C. 1999. The Freshwater fishes of the Indian Region. Narendra Publishing House, Delhi-110 006, 551 pp., 17 pls.

Menon, A.G.K. 1999. Checklist of the Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Pap.* No. **175**, pp. 366. Zoological Survey of India, Govt. of India.

Menon, A.G.K. 2004. Threatened Fishes of India and their conservation. *Zool. Surv. India*, 1-170.

Molur, S. and Walker, S. (eds.) 1998. Report of the workshop "Conservation Assessment and Management Plan for freshwater Fishes of India" Zoo Outreach Organization, Coimbatore Breeding Specialist Group, Coimbatore, India, 156 pp.

Rec. zool. Surv. India : **108**(Part–4) : 49-83, 2008

REPTILES OF KANHA TIGER RESERVE, MADHYA PRADESH

KAILASH CHANDRA, R. C. SHARMA*, AJAY NAGPURE AND D. K. NEMA
Central Regional Station, Zoological Survey of India, Jabalpur

INTRODUCTION

The class Reptilia comprises the cold-blooded amniotic vertebrates, which are exothermic or poikilothermic secretive creatures with a crawling mode of locomotion. They may be diurnal or nocturnal and are dwellers on land, freshwater, sea (sub-pelagic) and trees (arboreal). Respiration in reptiles is by lungs (pulmonary) and they may be oviparous or viviparous. Body may be covered by scales or shields which may be soft or hard. Horny plates over the body were present in ancient Dinosaurs and ancestral stem reptiles. Reptiles may or may not be with limbs. If limbs are present, they may be bi-dactyl, tri-dactyl or penta-dactyl, many species (snakes) are devoid of limbs, girdles and toes with exceptions of Pythons, Boas and worm snakes where limbs are represented by rudimentary spurs. Reptiles inhabit different ecosystems all over the world and are presently represented by tortoises, turtles, crocodilians, snakes, lizards and Rhyncocephalia (*Sphenodon*). Most of the reptiles came in to existence about 210 million years back during the upper Permian period.

Snakes have elongated, tubercular, elastic and agile body, covered with overlapping scales and chitinous shields. Body scales in snakes may be oval, rhomboidal, and sub triangular with keels, pits and sutures. Tail in snakes may be small, moderate or long. They may be cylindrical (Land snakes), prehensile (Arboreal snakes) or flat (Marine snakes). Eyelids in snakes are fused to form a transparent spectacle over the eye in which lower eyelid takes a major part. Pupil exhibits strong variations and has evolved according to the habitats (round in terrestrial species, horizontal or vertically elliptical in arboreal species, rudimentary in fussorial species. Snakes are devoid of tympanum or external ears. Tongue in snakes is long, narrow, forked at tip and retractile into a basal sheath. olfactory organ is connected directly with the posterior olfactory lobe of the brain. Bones of the skull are most flexible and ligamentus. Teeth are aglyphous or solid in non-poisonous

**Desert Regional Station, Zoological Survey of India, Jodhpur*

species, opisthoglyphous partly in poisonous snakes, proteroglyphous in Elapid and Hydrophid snakes, and solenoglyphous in vipers. Teeth are sharp, set in grooves on the inner sides of jaws (Pleurodont) recurved, and replaced after certain intervals. Left lung much reduced, right lung widely spread in body. Male organs are two (Hemipenis). Urinary bladder is not available, cloaca serves its purpose. Out of 3273 species known throughout the world, 240 species are reported from India. Total 52 poisonous species are known, in which 32 are over land including Cobras, King cobra, Kraits, Vipers and coral snakes, and 20 are sea snakes.

A review of literature reveals that Smith (1931, 1935, 1943) did a comprehensive study of the reptiles of India and showed distribution of 33 species of reptiles in Central India and Central Province. Later on some workers studied the reptilian fauna of Kanha National Park. Agrawal (1976) recorded 8 species of reptiles from Kanha National Park. Sanyal and Sur (1995) reported the occurrence of 22 species of reptiles in this conservation area. Negi (2004) also reported Copper-head Snake (*Elaphe radiata*) from Kanha National Park. Chandra and Gajbe (2005), while compiling the information on Herpetofauna of Madhya Pradesh and Chhattisgarh included 85 species/ subspecies of reptiles from these two states, where in total 22 species of reptiles were reported from Kanha Tiger reserve.

The present inventory of reptiles of this area comprises 39 species/subspecies belonging to 30 genera under 12 families. Of which, about 80% species have been currently observed by survey team of Zoological Survey of India, Jabalpur from May 2004 to December 2004, whereas the rest of the reptile species have been compiled on the basis of published information of Agrawal (1976), Sharma (1976), Sanyal & Sur (1995) and Negi (2004). The systematic list of reptiles observed during different months in KTR and their density is given in Table-1 and the list of their common names, localities and status is given in Table-2.

STUDY AREA

Kanha Tiger Reserve (KTR) is located about 68 km. south-east of Mandla and approximately 164 km. from Jabalpur. The reserve falls in two districts of Madhya Pradesh occupying southern part of Mandla district and north-eastern part of Balaghat district and lies between 80°26' and 80°03' E longitudes and 22°07' and 22°27' N latitudes. The reserve comprises three units, namely the core zone of National Park, multiple use area of buffer zone and satellite micro core zone of Phen sanctuary. The reserve has a core area of 940 sq. km. in the tourist zone. The buffer zone is 1009 sq. km. and Phen sanctuary is 110.74 sq km. Total area of Kanha Tiger Reserve is 2059.74 sq km. The area represents typical deciduous forest of the tropical region. The Sal forests are found on the lower slopes and in the valleys, the mixed forests on the upper slopes and top of hills, and the grassland in the valleys and on plateaus, which constitute diversified habitat for a large variety of flora and fauna.

Table-1 : Month wise observation of reptiles (number of reptiles & density) in KTR.

Sl. No.	Order/Family/ Species	May 2004	June 2004	July 2004	Aug. 2004	Sept. 2004	Oct. 2004	Nov. 2004	Dec. 2004	Total
	Order **TESTUDINES** Family **EMYDIDAE**									
1.	*Melanochelys trijuga* (Schweigger)		15							15/0.45
	Family **TRIONYCHIDAE**									
2.	*Lissemys punctata punctata* (Lacépède)						1	1		2/0.06
3.	*Trionyx gangeticus* (Cuvier)					1				1/0.03
	Order **SQUAMATA** Suborder **SAURIA** Family **GEKKONIDAE**									
4.	*Cyrtodactylus collegalensis* (Beddome)									
5.	*Cyrtodactylus nebulosus* (Beddome)									
6.	*Hemidactylus brooki* Gray		1							1/0.03
7.	*Hemidactylus flaviviridis* Ruppell			2						2/0.06
8.	*Hemidactylus gracilis* Blanford									
9.	*Hemidactylus leschenaulti* Dumeril &Bibron			1	1	4				6/0.18
10.	*Hemidactylus maculatus* (Dumril & Bibron)							2		2/0.06
	Family **AGAMIDAE**									
11.	*Calotes versicolor* (Daudin)	2	7	4	4	3	5	8	5	38/1.15
12.	*Psammophilus blanfordanus* (Stoliczka)									
13.	*Sitana ponticeriana* Cuvier									
	Family **SCINCIDAE**									
14.	*Riopa punctata* (Gmelin)		1			1	1	1		4/0.12
15.	*Riopa albopunctata* Grey									
16.	*Mabuya carinata* (Schneider)	4		12		14	30	45	24	129/3.93
17.	*Mabuya macularia* (Blyth)		191	35	30	50	30	22	35	393/ 11.99
	Family **LACERTIDAE**									
18.	*Cabrita leschenaulti* (Milne–Edwards)									

Table-1 : *(Cont'd.)*.

Sl. No.	Order/Family/ Species	May 2004	June 2004	July 2004	Aug. 2004	Sept. 2004	Oct. 2004	Nov. 2004	Dec. 2004	Total
19.	Family **VARANIDAE** *Varanus bengalensis* (Linnaeus)	1						1	1	3/0.09
20.	Suborder **SERPENTES** Family **TYPHLOPIDAE** *Ramphotyphlops braminus* (Daudin)		1							1/0.03
21.	Family **BOIDAE** *Python molurus* (Linnaeus)	5				1	1			7/0.21
22.	Family **COLUBRIDAE** *Ahaetulla nasutus* (Lacepede)		1	1	1				1	4/0.12
23.	*Amphiesma stolata* (Linnaeus)			7		5	8	7		27/0.82
24.	*Atretium schistosum* (Daudin)		1				2			3/0.09
25.	*Argyrogena fasciolatus* (Shaw)									
26.	*Dendrelaphis tristis* (Daudin)			1		3	2	1		7/0.21
27.	*Elaphe helena* (Daudin)				1					1/0.03
28.	*Elaphe radiata* (Schlegel)									
29.	*Lycodon aulicus* (Linnaeus)					3	2			5/0.15
30.	*Macropisthodon plumbicolor* (Cantor)					1				1/0.03
31.	*Ptyas mucosus* (Linnaeus)		2		1		4	3	2	12/0.36
32.	*Sibynophis sagittarius* (Cantor)									
33.	*Xenochrophis piscator* (Schneider)					3	1	3		7/0.21
34.	Family **ELAPIDAE** *Bungarus caeruleus* (Schneider)				1		1			2/0.06
35.	*Naja naja naja* (Linnaeus)		3		3		1	1		8/0.24
36.	*Naja naja oxiana* (Eichwald)			1			1		1	3/0.09
37.	Family **VIPERIDAE** *Echis carinatus* (Schneider)						1	1		2/0.06
38.	*Trimeresurus gramineus* (Shaw)						2			2/0.06
39.	*Vipera russelii* (Shaw)									
	Total no.of Reptiles & Density	**12**	**231**	**64**	**42**	**93**	**93**	**96**	**79**	**710/ 21.67**

Table-2 : Reptiles of KTR showing common name, localities and status.

Sl. No.	Order / Family / Species	Common Name	Localities / References	Status (Protected Under WL(P)A, 1972)
	Order **TESTUDINES** Family **EMYDIDAE**			
1.	**Melanochelys trijuga* (Schweigger)	Black Turtle	Kisli, Kanha & Mukki range	Sch. I
	Family **TRIONYCHIDAE**			
2.	**Lissemys punctata punctata* (Lacépède)	Indian Flap-shell Turtle	Kisli, Kanha & Mukki range	Sch. I
3.	**Trionyx gangeticus* (Cuvier)	Indian Soft-shell Turtle	Kisli, Kanha & Mukki range	Sch. I
	Order **SQUAMATA** Suborder **SAURIA** Family **GEKKONIDAE**			
4.	*Cyrtodactylus collegalensis* (Beddome)	South Indian Rock-Gecko	(Agrawal, 1976; Sanyal & Sur, 1995	Near vulnerable
5.	*Cyrtodactylus nebulosus* (Beddome)	Clouded Ground Gecko	(Sharma, 1976; Sanyal & Sur, 1995)	Rare
6.	*Hemidactylus brooki* Gray	Spotted House Gecko	Kisli & Supkhar range (Agrawal, 1976; Sanyal & Sur, 1995)	Very Common
7.	*Hemidactylus flaviviridis* Ruppell	Yellow-Bellied House Gecko	Kisli, Kanha, Mukki, Supkhar range & Whole Ranges of Buffer Zone. (Sanyal & Sur, 1995)	Very Common
8.	*Hemidactylus gracilis* Blanford	Square spotted Gecko	(Agrawal, 1976; Sanyal & Sur, 1995)	Common
9.	**Hemidactylus leschenaulti* Dumeril &Bibron	Bark Gecko	Whole Ranges of Buffer Zone	Abundant
10.	**Hemidactylus maculates* (Dumeril& Bibron)	Rock Gecko	Kisli range	Common
	Family **AGAMIDAE**			
11.	*Calotes versicolor* (Daudin)	Common Garden Lizard	Kisli, Kanha, Mukki, Supkhar range & whole Ranges of Buffer Zone (Agrawal, 1976; Sanyal & Sur, 1995)	Very Common
12.	*Psammophilus blanfordanus* (Stoliczka)	Blanford's Rock Agama	(Sanyal & Sur, 1995)	Abundant
13.	*Sitana ponticeriana* Cuvier	Fan-throated Lizard	Mukki range (Sanyal & Sur, 1995)	Common

Table-2 : *(Cont'd.).*

Sl. No.	Order / Family / Species	Common Name	Localities / References	Status (Protected Under WL(P)A, 1972)
	Family **SCINCIDAE**			
14.	**Riopa punctata* (Linnaeus)	Dotted Supple Skink	Kanha & Mukki range	Common
15.	*Riopa albopunctata* Grey	Brown Dwarf Skink	(Sanyal & Sur, 1995)	Common
16.	*Mabuya carinata* (Schneider)	Common Skink	Kisli, Kanha, Mukki, Supkhar range & whole ranges of Buffer zone (Agrawal, 1976; Sanyal & Sur, 1995)	Very common
17.	*Mabuya macularia* (Blyth)	Bronze Glass Skink	Kisli, Kanha, Mukki, Supkhar range & whole ranges of Buffer zone (Agrawal, 1976; Sanyal & Sur,1995)	Very common
	Family **LACERTIDAE**			
18.	**Cabrita leschenaulti* (Milne–Edwards)	Leschenault's Snake-eye	Kisli range	
	Family **VARANIDAE**			
19.	*Varanus bengalensis* (Linnaeus)	Bengal Monitor	Kisli, Kanha, Mukki, Supkhar range & whole ranges of Buffer zone (Sanyal & Sur, 1995)	Sch. II
	Suborder **SERPENTES** Family **TYPHLOPIDAE**			
20.	*Ramphotyphlops braminus* (Daudin)	Common Worm Snake	Mukki range (Sanyal & Sur, 1995)	Sch. IV
	Family **BOIDAE**			
21.	*Python molurus* (Linnaeus)	Indian Rock Python	Kisli, Kanha, Mukki, Supkhar range. (Sanyal & Sur, 1995)	Sch. I
	Family **COLUBRIDAE**			
22.	**Ahaetulla nasutus* (Lacepede)	Common Green Whipe Snake or Vine Snake.	Kisli, Kanha & Mukki range	Sch. IV
23.	**Amphiesma stolata* (Linnaeus)	Striped Keelback	Kisli, Kanha, Mukki range & whole ranges of Buffer zone	Sch. IV
24.	**Atretium schistosum* (Daudin)	Olivaceous Keelback	Mukki range	Sch. II
25.	*Argyrogena fasciolatus* (Shaw)	Banded Racer	(Agrawal, 1976; Sanyal & Sur, 1995)	Sch. IV

Table-2 : *(Cont'd.).*

Sl. No.	Order / Family / Species	Common Name	Localities / References	Status (Protected Under WL(P)A, 1972)
26.	**Dendrelaphis tristis* (Daudin)	Common Bronzeback or Tree Snake	Kisli, Kanha, Mukki, Supkhar range	Sch. IV
27.	**Elaphe helena* (Daudin)	Comman Indian Trinket Snake	Kisli range	Sch. IV
28.	*Elaphe radiata* (Schlegel)	Copperheaded Trinket Snake	Kanha range (Sharma, 1976; Negi, 2002)	Sch. IV
29.	*Lycodon aulicus* (Linnaeus)	Comman wolf Snake	Kisli, Kanha, Mukki range & whole ranges of Buffer zone. (Sanyal & Sur, 1995)	Sch. IV
30.	**Macropisthodon plumbicolor* (Cantor)	Green keel back	Kanha, Kisli & Mukki	Sch. IV
31.	*Ptyas mucosus* (Linnaeus)	Indian Rat Snake	Kisli, Kanha, Mukki, Supkhar range (Agrawal, 1976; Sanyal & Sur, 1995)	Sch. II
32.	*Sibynophis sagttarius* (Cantor)	Contor's black headed Snake	(Sanyal & Sur, 1995)	Sch. IV
33.	**Xenochrophis piscator* (Schneider)	Checkerd keel back Water Snake	Kisli, Kanha & Mukki range	Sch. II
	Family **ELAPIDAE**			
34.	*Bungarus caeruleus* (Schneider)	Common Indian Krait	Kisli, Kanha & Mukki range (Sanyal & Sur, 1995)	Sch. IV
35.	*Naja naja naja* (Linn.)	Spectacled Cobra or Binocellate Cobra)	Kisli, Kanha & Mukki range (Sanyal & Sur, 1995)	Sch. II
36.	**Naja naja oxiana* (Eichwald)	Black Cobra	Kisli, Kanha & Mukki range	Sch. II
	Family **VIPERIDAE**			
37.	**Echis carinatus* (Schneider)	Saw Scaled Viper	Mukki range	Sch. IV
38.	**Trimeresurus gramineus* (Shaw)	Green or bamboo Pit Viper	Mukki range	Sch. IV
39.	*Vipera russelli* (Shaw)	Russell's Viper	Kanha & Mukki range (Sanyal & Sur, 1995)	Sch. II

WL (P) A, 1972-The Wildlife (Protection) Act, 1972 Sch.-Schedule.

Species marked with (*) are reported for the first time from Kanha Tiger Reserve.

Representative areas of different habitats of the Kanha Tiger Reserve were selected for the survey. A total of about 90 localities or sites were covered in the two main areas (Core and Buffer zone) under the 5 Ranges (Kisli, Kanha, Mukki, Supkhar and Khatiya narangi). The surveys were conducted during May 2004 to December 2004 covering all above five ranges.

1. Kisli range : Digdola camp, Gadbadi Nala, Kisli Forest Rest House, Chuppe meadow, Kanha road, Indri meadow, Chamar ghati, Kisli tank, Salghat road, Sondhar, Khatiya gate, Near MPT Baghira loghut, Ghanghor nala anycut, Magar nala, Near day shelter.

2. Kanha range : Deshi nala, Chuhari nala., Mukki road, Circular road, Badrinath, Chhoti chuhari, Chinchi mata, Badi chuhari, Kodo dadar, Barasingha fencing, Bison street, Any cut, Ghoda pachhad.

3. Mukki range : Baiga nala, Banzar River, C. No. 48, Aurai meadow, Nava tola, Sondhar tank no. 2, Jhandi tank, Mukki village, Garhi road, Bishan pura, Mukki Forest Rest House, Gay dhar, Aurai, Aurai tank Malkhedi, Meel dabra meadow, Mukki Gate, Ghurela Road, Banzar bridge, Parsa tola, Bada tola, Sua dadar, Lal pulia, Ghurela any cut, Mutli sarai fire line, Sondhar, C. No. 22, 23, Teli tola meadow, Ghurela camp, Khud meadow, Baihar road, Pathak nala, Mukki tank, Shringar pur tank, Domar pulia, Lal pulia camp.

4. Supkhar range : Kurkuti camp, Kamko dadar, Supkhar Forest Rest House, Chilphi road, Chilpura tank, Agariya khero, Garhi road, Chhabari ghat, Lodha Barra, Chakarwah meadow, Near range office, Kapot bahra tank and Nagar Jhori.

5. Khatiya Narangi range : Mocha, Chhapri kotwahi, Eco centre Khatiya, Nature trail.

SYSTEMATIC ACCOUNT

Class REPTILIA

Key to Orders of Class REPTILIA

The body is enclosed in a box-like bony or leathery shell ..... Testudines

Body not enclosed in a bony or leathery shell, limbs present or absent ..... Squamata

Order TESTUDINES

Key to Families of Order TESTUDINES

Limbs more or less cylindrical, digits not webbed ..... Testudinidae

Limbs paddle-shaped but more or less flattened; digits webbed ..... Emydidae

Order TESTUDINES

Family EMYDIDAE

1. ***Melanochelys trijuga tirjuga*** (Schweigger)
(Black Turtle or Indian Snail-eating Turtle)

1814. *Emys trijuga* Schweigger, *Prodr. Monog. Chel.*, : 41.

1998. *Melanochelys trijuga trijuga*, Sharma, *Fauna of India*, Reptilia, Testudines and Crocodilians, **I** : 82.

Observation localities : Kisli, Kanha Range (Deshi Nala, Mukki Road, Chuhari nala) & Mukki range

Habit and habitat : Mainly aquatic (ponds, lakes, wetlands) and completely vegetarian in habits.

Diagnostic characters : It is medium-sized, with a length of 23 cm. or slightly more. The head is small, greyish or olivaceous and the snout is shorter than the orbit. The carapace is moderately depressed, tricarinate, the lateral margins slightly reverted, the posterior margin feebly serrated in the young. Tail is very short. Limbs are flattened and with completely webbed digits.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu and mainly the central portion of Indian peninsula.

Conservation status : Vulnerable.

Family TRIONYCHIDAE

2. ***Lissemys punctata punctata*** (Lacepede)
(North Indian Flap-shell Turtle)

1788. *Lissemys punctata punctata* Lacepede, *La Tortue chagrinee, Hist. Quad Ovip.*, **1** : 171, pl. 11.

1931. *Lissemys punctata punctata*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **1** : 157.

1998. *Lissemys punctata punctata*, Sharma, *Fauna of India*, Reptilia, Testudines and Crocodilians, I, p. 125.

Observation localities : Kisli, Kanha & Mukki Range (Sondhar tank no. 2, Jhandi tank)

Habit and habitat : This species live in shallow, muddy, ditches, lakes and marshes. It is a carnivorous species mostly feeds on frogs, fishes, shrimps and snails.

Diagnostic characters : It is a small, flat turtle, generally less than 24 cm. in length. The head is moderately large; the snout is short and broad. Limbs are fully webbed, with only three claws on each foot. Tail is very short, olive-brown above. Carapace is grey-green, with numerous black-bordered yellow spots, irregularly arranged and with a light yellow marginal rim.

Distribution : Throughout India.

Elsewhere : Bangladesh, Myanmar, Nepal and Sri Lanka.

Conservation status : Lower risk-near threatened.

3. *Trionyx gangeticus* (Cuvier)
(Indian Soft-shell Turtle)

1824. *Trionyx gangeticus* Cuvier, *Oss. Foss.*, **5** : 186, 203, 206, pls. 11, 12.

1931. *Trionyx gangeticus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **1** : 167.

1998. *Trionyx gangeticus*, Sharma, *Fauna of India*, Reptilia, Testudines and Crocodilians, I, p. 135.

Observation localities : Kisli, Kanha & Mukki Range.

Habit and habitat : The species is highly aquatic and omnivorous, feed on aquatic vegetation and animal like fish, molluscs, frogs and crustaceans. It is a very prominent scavenger turtle species.

Diagnostic characters : Disc olive-green above, sometimes vermiculated with yellowish. Head greenish, with a black longitudinal streak from between the eyes on to the nape and three oblique black streaks on either side diverging from it, below whitish. Four plastral callosities, in old individuals sometimes a fifth upon the entoplastron.

Distribution : Throughout India.

Elsewhere : Bangladesh, Nepal and Pakistan.

Conservation status : Vulnerable.

Order SQUAMATA

Key to families of Order SQUAMATA

1. Limbs present ..... suborder Sauria 2
– Limbs absent ..... suborder Serpentes 6

2. Tongue rather broad and short 3
– Tongue smooth, very long and retractile 6

3. Tongue covered with villose papillae 4
– Tongue covered with imbricate, scale-like papillae 5

4. Tongue covered with villose papillae; eyes usually without movable eyelids; teeth are pleurodont ..... Gekkonidae
– Tongue smooth or covered with villose papillae; eyes with movable eyelids; teeth are acrodont ..... Agamidae

5. Tongue covered with imbricate, scale-like papillae, feebly nicked anteriorly; body covered with cycloid imbricate scales, with osteodermal plates on body ..... Scincidae
– Tongue covered with imbicate papillae, or transverse plicate, forked interiorly; dorsal scales much differentiated from those on the belly no osteodermal plates on body ..... Lacertidae

6. Tongue bifid, retractile into a sheath at the base as in snakes; back covered with rounded scales; generally without osteodermal plates ..... Varanidae

7. No poison fangs in the front of the jaw 8

– Poison fangs in the front of the jaw 10

8. Teeth only in the upper jaw, eyes vestigial, body worm like ..... Typhlopidae

– Teeth in both jaws, eyes exposed 9

9. Ventrals narrow, but quite distinct; more than 40 scales round the body ..... Boidae

– Ventrals nearly or quite as broad as the body; tail cylindrical, pointed ..... Colubridae

10. Maxillary bone with teeth behind the fangs, pupil round ..... Elapidae

– Maxillary bone very short, bearing fangs only; pupil vertical ..... Viperidae

Suborder SAURIA

Family GEKKONIDAE

4. ***Cyrtodactylus collegalensis*** (Beddome)

(South Indian Rock-Gecko)

1870. *Gymnodactylus collegalenses* Beddome, *Madras Month. J, Med. Sci.*, **ii** : 173.

1995. *Cyrtodactylus collegalensis*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

2002. *Cyrtodactylus collegalensis*, Sharma, *Fauna of India*, Reptilia, Sauria, **II**, p. 62.

Recorded from literature (Agrawal, 1976. Sanyal & Sur, 1995).

Habit and habitat : The species is arboreal and insectivorous. It is available in forests at low elevations.

Diagnostic characters : This small gecko has got a remarkable similarity with *C. nebulosus* in scalation but this species is devoid of enlarged dorsal tubercles on the back. It's colour pattern is also different and two main colour forms are recognised. Beddome's speciosus form, dorsum is having four dark brown, black-margined cross bands. In *collegalensis* dorsum is light brown to grey, with a series of large, rounded black margined spots arranged in pairs.

Distribution : INDIA : Central India and Hilly districts of Southern India.

Elsewhere : Sri Lanka.

Conservation status : A forest species, which is becoming vulnerable on account of habitat destruction as the forests are being cut at a fast rate at low elevations.

5. ***Cyrtodactylus nebulosus*** (Beddome)
(Clouded Ground Gecko)

1870. *Gymnodactylus nebulosus* Beddome, *Madras Month. J, Med. Sci.*, **ii** : 174.

1995. *Cyrtodactylus nebulosus*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

2002. *Cyrtodactylus nebulosus*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 61.

Recorded from literature (Sanyal & Sur, 1995).

Habit and habitat : The species is terrestrial and insectivorous.

Diagnostic characters : This is a small gecko with a greyish dorsal colouration with dark brown, paired, transverse, black-edged spots throughout the body and tail. The head is moderately large and depressed, covered above with small rounded scales. Upper labials 10-12 and same is the number for the lower labials. Belly is with 35-40 rounded imbricate scales across the middle of the body. Standard length 43-52 mm.; tail length 32-42 mm.

Distribution : INDIA : Madhya Pradesh (Kisli and Mukki in Mandla dist.), Andhra Pradesh, Kerala and Tamil Nadu.

Conservation status : Rare.

6. ***Hemidactylus brooki*** Gray
(Spotted House Gecko)

1845. *Hemidactylus brookii* Gray, *Cat. Liz. Brit. Mus.*, : 153.

1976. *Hemidactylus brooki*, Agrawal, *Newsl. zool. Surv. India*, **2**(6) : 248.

2002. *Hemidactylus brooki*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 107.

Observation localities : Kisli & Supkhar Range.

Habit and habitat : The species is insectivorous. It is available in trees, rocks, under stones and human dwellings.

Diagnostic characters : Head moderately large, snout obtusely pointed, 8 to 10 upper and 7 to 9 lower labials. Back with conical tubercles arranged in regular rows, colour brown or varying shades of grey with brown spots, whitish below. Femoral and preanal pores vary from 15 to 27.

Distribution : Throughout the Indian sub region.

Elsewhere : From Borneo and South China through much of Tropical Asia and the northern half of Africa.

Conservation status : Very common.

7. ***Hemidactylus flaviviridis*** Ruppell
(Yellow-Bellied House Gecko)

1835. *Hemidactylus flaviviridis* Ruppell, *Neue Wirb. Fauna. Abyss* : p. 18, pl. 6, Fig, 2.

2002. *Hemidactylus flaviviridis*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 115.

Observation localities : Kisli, Kanha, Mukki, Supkhar Range & Whole Ranges of Buffer Zone.

Habit and habitat : Insectivorous and generally nocturnal but can be seen during day time also. Inhabits in the buildings, most agile, pugnacious and a marked climber.

Diagnostic characters : This large and robust gecko is with a pale-grey or greenish-grey, brown or olive dorsum; back is with wavy, dark cross bands which are clearly visible during the day; belly is yellowish. Head is large with a broad snout; ear–opening is sub circular; head is covered with minute granules, which become more prominent and large on the snout. Upper labials 12-15 and lower labials 10-12, standard length 42-90 mm; tail length 38-90 mm.

Distribution : Throughout India, but widely in North India.

Elsewhere : Arabia, Pakistan, Iran and shores of the red Sea.

Conservation status : Very common.

8. ***Hemidactylus gracilis*** Blanford
(Square spotted Gecko)

1870. *Hemidactylus gracilis* Blanford, *J. Asiat. Soc. Beng.*, **39** : 362.

1976. *Hemidactylus gracilis*, Agrawal, *Newsl. zool. Surv. India*, **2**(6) : 248.

1995. *Hemidactylus gracilis*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

2002. *Hemidactylus gracilis*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 111.

Recorded from literature (Agrawal, 1976. Sanyal & Sur, 1995)

Habit and habitat : Insectivorous and nocturnal.

Diagnostic characters : This small, slender gecko is of greyish dorsum with dark-brown square spots arranged in two longitudinal rows on either side of a thin dark vertebral line; another more prominent line along the side of the head and body; ventrum is white, generally with dark-brown longitudinal lines. Head is narrow and quite long. Upper labials 9-10 and lower labials are generally 7 or 8. Tail is longer than the head and body. Male with an angular series of six pre anal pores. Standard length 22-37 mm.; tail length 26-43 mm.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Chhattisgarh and Maharashtra.

Conservation status : Common.

9. ***Hemidactylus leschenaulti*** Dumeril and Bibron
(Bark Gecko)

1836. *Hemidactylus leschenaulti* Dumeril & Bibron, *Erp. Gen.*, **3** : 364.

2002. *Hemidactylus leschenaulti*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 114.

Observation localities : Mukki range (Mukki, Garhi road), Kisli range (Forest Rest House) and whole ranges of buffer Zone.

Habit and habitat : Insectivorous and arboreal, sylvetic, most favourable abodes are the large trees of banyan, tamarind, mango etc. During the day these lizards hide under the bark and in crevices of these trees.

Diagnostic characters : Body stout with a lateral fold; upper labial 10 to 12 and 8 to 10 lower labials. Dorsally head and body covered with fine granules intermixed with small tubercles irregularly scattered; scales on the underside small and imbricate. Digits rather long; 9 to 11 lamellae under fourth toe. Tail strongly depressed with enlarged tubercles above. Males with 10 to 17 femoral pores on each side. Grey above and silvery white below. Back with conspicuous wavy cross bars. A dark line from eye to ear on each side of the head.

Distribution : INDIA : Madhya Pradesh, Peninsular India; Rajasthan and West Bengal.

Elsewhere : Sri Lanka and Pakistan.

Conservation status : Abundant.

10. ***Hemidactylus maculatus*** (Dumeril & Bibron)
(Rock Gecko)

1836. *Hemidactylus maculatus* Dumeril & Bibron *Erp. Gen.*, **3** : P. 358.

1935. *Hemidactylus maculatus*, Dumeril & Bibron, Smith, *Fauna Brit. Ind.*, **2** : p. 85.

2002. *Hemidactylus maculatus*, Sharma, *Fauna of India*, Reptilia, Sauria, Vol. II. P. 103-104.

Observation localities : Kisli and Mukki range (Banzar River).

Habit and habitat : This is a carnivorous species. Inhabits crevices, caves and other such structures in the rocks.

Diagnostic characters : This giant gecko in which dorsum is brown with dark-brown spots, underlating transverse bars and streaks; belly is dirty-white. Young individuals are more brilliantly coloured and spotted with dark brown. Head is large and prominent, with a bulging on the tip of snout; eye is moderately large with a vertical pupil, and snout is having somewhat convex scales. Tail is longer than the head and body, slightly depressed, oval in section, verticillate. Standard length 83-122 mm; tail length 90-130 mm.

Distribution : INDIA : Madhya Pradesh, Gujarat, Kerala, Maharashtra and Tamil Nadu.

Conservation status : Common.

Family AGAMIDAE

11. ***Calotes versicolor*** (Daudin)

(Garden Lizard)

1802. *Agama versicolor* Daudin, *Hist. Nat. Rep.*, **3** : 395.

1935. *Calotes versicolor*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **2** : 189.

2002. *Calotes versicolor*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 206.

Observation localities : Kisli range (Digdola camp, Gadbadi nala, Forest Rest House), Kanha range (Badrinath, Mukki road, Chhoti chuhari, Circular road), Mukki range (Bishan pura, Forest Rest House, Gay dhar, Near museum, Garhi road, Aurai C. No. 48, Aurai tank & meadow, Malkhedi, Meel dabra meadow, Mukki Gate), Supkhar range (Kurkuti camp, Kamko dadar), Khatiya Narangi range (Mocha, Chhapri kotwahi, Eco centre Khatiya)

Habit and habitat : Arboreal species, available where shrubs and trees are present; plentiful in vicinity of streams, riversides, gardens, desert oases. These lizards are mainly insectivorous and also feeds on vegetables matter like grass leaves twigs of delicate plants and seeds.

Diagnostic characters : Light brown or greyish above, uniform or with more or less distinct dark brown transverse spots or bars upon the back and sides; or variegated with dark brown; dark streaks radiating from the eye. Tail with light and dark annuli. Dirty whitish below, often streaked with dark brown or black. The throat may have a black transverse bar; nuchal and dorsal crest continuous.

Distribution : INDIA : Eastern Rajasthan, Madhya Pradesh, Northern Maharashtra and Western Uttar Pradesh.

Elsewhere : Bangladesh, Bhutan, Maldives, Nepal and Sri Lanka.

Conservation status : Very common.

12. ***Psammophilus blanfordanus*** (Stoliczka)

(Blanford's Rock Agama)

1871. *Charasia blanfordanus* Stoliczka, *Asiat. Soc. Beng.* : 194.

1935. *Psammophilus blanfordanus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **2** : 210.

1995. *Psammophilus blanfordanus*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

2002. *Psammophilus blanfordanus*, Sharma, *Fauna of India*, Reptilia, Sauria, **II**, p. 224.

Recorded from literature (Sanyal & Sur, 1995)

Habit and habitat : The species is insectivorous and rock dwelling.

Diagnostic characters : This species closely resembles with *Psammophilus dorsalis* in general body shape and pholidostic characters except that it is olive-bronze or dark-brown in dorsal

colouration, spotted profusely with brown and usually with a series of large, boat shaped dark-brown spots with light brown or pale centres on the complete back and tail. In the adult male, these markings of back and tail merge out and giving the lizard somewhat brownish appearance. It also differs by having a deeper ante-humeral fold; dorsal body scales are comparatively larger, always keeled and imbricate, 80-100 scales round the middle of the body. Standard length 100 mm; tail length 200 mm.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Bihar, Orissa, Eastern and Western Ghats.

Conservation status : In abundance.

13. ***Sitana ponticeriana*** Cuvier
(Fan Throated Lizard)

1844. *Sitana ponticeriana* Cuvier, *Guerin Icon. Reg. Anima. Rep.*, : pl. 10, fig. 2.

1935. *Sitana ponticeriana*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **2** : 144.

2002. *Sitana ponticeriana*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 164.

Observation localities : Mukki range.

Habit and habitat : It inhabits all biotopes except the heavy rainfall forests and deserts. The preferred habitat is rocky terrain, scrubby jungles and sandy country.

Diagnostic characters : Light or dark brown above, with a series of dark brown, black-edged, rhomboidal spots along the middle of the back; a more or less distinct light line along each side of the spots and sometimes a light vertebral line dividing them. Flanks, top of head and upper surfaces of limbs with or without dark markings. Whitish below.

Distribution : Throughout India except at heavy rainfall areas.

Elsewhere : Nepal, Pakistan and Sri Lanka.

Conservation status : Common.

Family SCINCIDAE

14. ***Riopa punctata*** (Gmelin)
(Dotted Garden Skink)

1799. *Scincus punctatus* Gmelin, *Hist. Amph.*, : 197.

1835. *Riopa punctata* Smith, *Fauna Brit. Ind.*, **2** : 318-319.

Observation localities : Mukki Range (Ghurela road, Aurai meadow, Mukki gate). Supkhar range (Kamko dadar).

Habit and habitat : It spends most of its life underground.

Diagnostic characters : A small and slender skink; snout obtuse; supra-nasals entire, in contact with one another behind the rostral; frontal longer than the fronto-parietals and interparietal together; a pair of nuchals, rarely absent. Legs vestigial. Lower eyelid with a transparent disc. Young with two prominent yellowish dorso-lateral streaks. The dark basal spots on the back are united with each other and from 6 longitudinal lines down the back. The pattern, however, breaks up with age. Tail scarlet red in young which also fades with age.

Distribution : Widely distributed throughout India.

Conservation status : Common.

15. ***Riopa albopunctata*** (Grey)
(Brown Dwarf Skink)

1845. *Riopa albopunctata* Gray, *Ann. Mag. Nat. Hist.*, **18** : 430.

1935. *Riopa albopunctata*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **2** : 316.

1995. *Riopa albopunctata*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, zool. Surv. India : 51-62.

2002. *Riopa albopunctata*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 319.

Recorded from literature (Sanyal & Sur, 1995).

Habit and habitat : Insectivorous and terrestrial.

Diagnostic characters : Brown or reddish-brown above, each scale with a more or less distinct dark spot forming longitudinal series; sides of neck and anterior part of body dark brown or black, thickly spotted with white; yellowish-white below. Body scales are almost equal, dorsals may or may not be larger than the lateral scales; 26-28 scales round the middle of body; 63-72 scales are down the middle of back. The limbs are moderately large, digits are short, 12-15 lamellae under the fourth toe; tail swollen at the base standard length 60 mm.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Assam, Bengal, Bihar, Uttar Pradesh, and Kerala.

Conservation status : Common.

16. ***Mabuya carinata*** (Schneider)
(Common Keeled Grass Skink or Brahminy Skink)

1807. *Scincus carinata* Schneider, *Hist. Amphib.*, **2** : 183.

1935. *Mabuya carinata*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **2** : 266.

1991. *Mabuya carinata*, Sanyal, *Fauna of Orissa*, **4** : 61.

2002. *Mabuya carinata*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 276.

Observation localities : Kisli Range (Chuppe meadow, Digdola camp, Forest Rest House, Kanha road, Indri meadow, Chamar ghati, Kisli tank, Salghat road). Mukki Range (Nava Tola, Mukki, Banzar bridge, Parsa tola, Bada tola, Garhi road, Sua dadar, Baiga nala, Aurai, Lal pulia, Gay dhar, Ghurela any cut, Forest Rest House, Mal khedi, Mutli sarai fire line, Near Mukki gate, Sondhar, Sardar barra, Sondhar bada tank, C. No. 22, 23, Teli tola meadow, Ghurela tank, Ghurela camp, Khud meadow), Supkhar Range (Forest Rest House, Chilphi road, Nagar jhori, Chilpura tank, Agariya khero, Garhi road, Kamko dadar). Khatiya Narangi range (Chhapari kotwahi, Nature trail)

Habit and habitat : Diurnal, terrestrial, insectivorous, occasionally feed on small vertebrates.

Diagnostic characters : Brown to olive or bronzy above, uniform or with dark brown or black spots, or longitudinal streaks along the lateral margins of the scales. Sides darker brown or chestnut, with or without light spots. A light dorso-lateral line starting from above the eye and continued to the base of the tail. Lower parts whitish or yellowish.

Distribution : Throughout India except North-west India and West Bengal.

Elsewhere : Nepal.

Conservation status : Very common.

17. ***Mabuya macularia*** (Blyth)
(Bronze Grass Skink or Little Skink)

1839. *Euprepes sehae* (in part) Dumeril & Bibron, *Erp. Gen.*, **5** : 692.

1853. *Euprepes macularia* Blyth, *J. Asiat. Soc. Beng.*, **22** : 652.

1935. *Mabuya macularia*, Smith, *Fauna Brit. Ind.*, **2** : 264-266.

2002. *Mabuya macularia*, Sharma, *Fauna of India*, Reptilia, Sauria, II, p. 274.

Observation localities : Kanha range (Deshi Nala, Badrinath, Chhoti chuhari, Ghora pachhad, Chinchi mata, Badi chuhari, Kodo dadar, Mukki road, Chuhari nala, Barasingha fencing, Circular road, Bison street and Any cut). Mukki range (Nava tola, Mukki, Banzar bridge, Khud meadow, Ghurala camp, Baihar road, Parsa tola, Bada tola, Garhi road, Aurai anycut, Mukki village, Gay dhar, Forest Rest House, Pathak nala, Ghurala road, Aurai meadow, Aurai tank, Sardar barra, Sondhar & Sondhar tank No. 2, C. No. 48,23 22, Teli tola meadow, Meel dabra meadow, Nava tola, Mukki tank, Banzar river, Mutli sarai fire line and Ghurala meadow. Supkhar range (Chilphi Road, Forest Rest House, Chakarwah meadow, Chhaparawa camp, Nagar jhori, Chilpura tank, Near range office, Kapot bahra tank, Kurkuti camp, Chhabari ghat camp). Kisli range (Digdola camp, Kanha road, Forest Rest House, Chamar ghati, Indri camp, Indri meadow, Khatiya gate, Near MPT Baghira loghut and Salghat road). Khatiya Narangi range (Nature Trial).

Habit and habitat : Diurnal, terrestrial and insectivorous.

Diagnostic characters : Head small, snout short not depressed; eye small. Fronto-nasal not broader than long; ear opening oval, slightly smaller than eye, 6 to 7 upper and 7 lower labials, 28 to 30 rows of scales round the body. Dorsal scales with 5 to 7 low keels; lateral scales smooth, 12 to 17 lamellae under the fourth toe. Tail round. The colour pattern of this species varies. The general body colour is brown with or without spots.

Distribution : Throughout India.

Elsewhere : Myanmar, Pakistan, Thailand, North Vietnam, South Vietnam and Malaysia.

Conservation status : Very common.

Family LACERTIDAE

18. ***Cabrita leschenaulti*** (Milne-Edwards)
(Leschenault's Snake-eye)

1829. *Cabrita leschenaulti* Milne-Edwards, *Ann. Sci. Nat. Paris*, **xvi** : 80.

1935. *Cabrita leschenaulti*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **2** : 374.

2002. *Cabrita leschenaulti*, Sharma, *Fauna of India*, Reptilia, Sauria II : 376.

Observation localities : Kisli range

Habit and habitat : Insectivorous, burrowing and diurnal.

Diagnostic characters : Brownish or golden above; a light stripe edged above with black commences behind the supraciliary edge and passes along the side of the body and tail; a second borders the upper lip and passes along the flank, the interval between the two light stripes being black, or green spotted with black sometimes the lower light stripe may bordered with black below. Lower parts greenish-white, the tail and hind-limbs often reddish in life. Standard length 50 mm. tail length 100 mm.

Distribution : INDIA : Indian Peninsula, Andhra Pradesh, Bihar, Orissa, Madhya Pradesh and Tamil Nadu.

Elsewhere : Sri Lanka.

Conservation status : Not threatened.

Family VARANIDAE

19. ***Varanus bengalensis*** (Linnaeus)
(Common Indian Monitor)

1758. *Lacerta monitor* Linnaeus, *Syst. Nat. ed.*, **10** : 201.

2002. *Varanus bengalensis*, Sharma, *Fauna of India*, Reptilia, Sauria, **II** : 402.

Observation localities : Kisli Range (Near MPT Log hut).

Habit and habitat : This diurnal monitor lizard is of the burrowing habits and prefers to live in burrows, hollow of trees, nalas, under stones and boulders in dense vegetation bordering marshes, ponds, canals and tanks. It feeds mainly on insects, small mammals, snakes, lizards and vegetable matter.

Diagnostic characters : It is a medium-sized, dark brown monitor, about 72-75 cm. in head and body length. The tail is very strong, long, compressed and measures about 100 cm. in length. The snout is convex terminally. The nostrils are oblique slits lying midway between the eye and the end of the muzzle. The tongue is very long, forked and protrusible.

Distribution : Throughout India.

Elsewhere : Myanmar, Sri Lanka, Pakistan, Nepal and Uzbekistan.

Conservation status : Endangered.

Suborder SERPENTES

Family TYPHLOPIDAE

20. ***Ramphotyphlops braminus*** (Daudin)
(Common Worm or Blind Snake)

1803. *Eryx braminus* Daudin, *Hist. Nat. Rept.*, **7** : 279.

1943. *Typhlops braminus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 46.

1991. *Ramphotyphlops braminus*, Sanyal, *Fauna of Orissa*, **4** : 64.

2003. *Ramphotyphlops braminus*, Sharma, *Hand book of Indian Snakes,* : 14.

Observation localities : Mukki range (Banzar River and Mukki village).

Habit and habitat : Worms feed on soft bodied larva and eggs of ants and termites. Lives beneath the soil, or stones or debris. They are also found under logs, moist leaves and humus in wet forests and even city gardens.

Diagnostic characters : Length about 170 mm.; colouration brown or blackish above, lighter below, snout, anal region and end of tail usually whitish. Snout rounded, strongly projecting; nostrils lateral; eye distinct, in the ocular shield or at its junction with the supra-ocular; 290-320 transverse rows of scales.

Distribution : Throughout India including Andaman & Nicobar Islands.

Elsewhere : Sri Lanka, Indo-China, and South-East Asia.

Conservation status : The most widespread species of the genus.

Family BOIDAE

21. ***Python molurus*** (Linnaeus)

(Indian Rock Python)

1758. *Coluber molurus* Linn, *Syst. Nat.*, 10th ed. : 225.

1943. *Python molurus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 106.

2003. *Python molurus*, Sharma, *Hand book Indian Snakes* : 50.

Observation localities : Kisli Range (Ghanghor nala anycut).

Habit and habitat : These snakes inhabits in dense as well as in open forests with rocky outcrops near to marshes or streams. Python feed mainly on warm-blooded prey ranging in size from mice and birds to jackals, civets and even deer and wild boar.

Diagnostic characters : Body length ranges from 2.5-4.5 m. The head is distinct from the neck and has symmetrical shields. The eyes have vertical pupils. The scales on the body are smooth and are arranged in 60-75 rows. The tail is rather short. The colour of the body varies from pale grey to yellow above, and is yellow below. A dorsal series of large walnut coloured crown saddlers alternate with pinkish laterals.

Distribution : Throughout India, forests up to 2000 m above sea level.

Elsewhere : Nepal, Pakistan and Sri Lanka.

Conservation status : Protected under Schedule-I of Indian Wildlife Act. 1972.

Family COLUBRIDAE

22. ***Ahaetulla nasutus*** (Lacepede)

(Common Vine Snake)

1789. *Coluber nasutus* Lacepede, *Hist. Nat. Serp.*, **1** : 100; **2** : 277, pl. 4.

1943. *Dryophis nasutus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 376.

2003. *Ahaetulla nasuta*, Sharma, *Hand book Indian Snakes* : 172.

Observation localities : Supkhar range (Chhabari ghat).

Habit and habitat : Diurnal and live in scrub jungle, dry deciduous, moist deciduous and evergreen forests.

Diagnostic characters : Verdant green above, the interstitial skin black and white, forming oblique lines, best marked on the anterior half of the body. Pale green below, a white or yellow line along the outer margin of the ventrals. Lips sometimes yellowish, throat white, sometimes bluish. Snout acuminate, terminating in a pointed dermal appendage, variable in length, shorter than the eye.

Distribution : Throughout India.

Elsewhere : Myanmar, Bangladesh, Nepal, Thailand and Sri Lanka.

Conservation status : Common.

23. ***Amphiesma stolata*** (Linnaeus)
(Striped Keelback)

1758. *Coluber stolatus* Linnaeus, *Syst. Nat.*, 10th ed. : 219.

1943. *Natrix stolata*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 303.

1991. *Amphiesma stolata*, Sanyal, *Fauna of Orissa*, **4** : 68.

2003. *Amphiesma stolata*, Sharma, *Hand book Indian Snakes* : 136.

Observation localities : Mukki range (Aurai tank, Aurai meadow, Aurai anycut, Banzar river, Bishan pura, Nava tola, C. No. 48, Forest Rest House, Meel dabra meadow, Pathak nala, Parsa tola, Bada tola, Shringar pur tank,Garhi tola, Garhi road, Near Mukki gate, Sardar barra, Sondhar, Meel dabra). Kisli range (Forest Rest House). Supkhar Range (Lodha Barra). Khatiya Narangi ranges (Eco Centre).

Habit and habitat : Paddy fields, ponds edges, thick grass and bushes are favoured places. They are diurnal and spend nights sleeping under rocks, holes or the branches of trees or bushes. Frogs are the main diet but also take toads, small lizards and rodents.

Diagnostic characters : Olive-greenish or brownish above with black spots or reticulated cross-bars intersected by two dorso-lateral yellow or buff stripes; on the hind part of the body the stripes are best marked and the black spots least evident, the green colour being almost uniform dark-olive. Lower parts whitish. Top of head olive, uniform or the shields edged with black, lips yellowish.

Distribution : Throughout India.

Elsewhere : Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka.

Conservation status : Common in the plains.

24. ***Atretium schistosum*** (Daudin)
(Olivaceous Keelback Water Snake)

1803. *Coluber schistosus* Daudin, *Hist. Nat. Rept.*, **7** : 132.

1943. *Atretium schistosum*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 319.

2003. *Atretium schistosum*, Sharma, *Hand book Indian Snakes* : 146.

Observation localities : Kisli range (Salghat road, C. No. 48). Mukki Range (Baiga nala, Banzar River, C. No. 48, Mukki village).

Habit and habitat : Semi-aquatic and vicinity of fresh water bodies.

Diagnostic characters : Olive-brown or greenish above, uniform or with two series of small black spots along the back. A more or less distinct dark lateral streak sometimes present. Upper lip, outer row of scales and lower surface yellow. Scales in 19 : 19 : 17 rows, more or less distinctly keeled, the keels strongest on the posterior part of the body and tail.

Distribution : INDIA : Madhya Pradesh, Orissa and Peninsular India.

Elsewhere : Bangladesh, Nepal, and Sri Lanka.

Conservation status : Very common.

25. *Argyrogena fasciolatus* (Shaw)
(Banded Racer)

1802. *Coluber faciolatus* Shaw, *Gen. Zool. iii* : 528.

1943. *Coluber faciolatus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 170.

1995. *Argyrogena faciolatus*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

2003. *Argyrogena faciolatus*, Sharma, *Hand book Indian Snakes* : 82.

Recorded from literature (Agrawal 1976, Sanyal & Sur, 1995).

Habit and habitat : The alert, fast snake favours high grass or bushes. They occupy rodent burrows, rock piles and heavy bushes. They are diurnal and feed on frogs, insects, mice and rats.

Diagnostic characters : Light or dark olive-brown above, beautifully ornamented with narrow cross-bars on the anterior half of the body; these are formed by a pattern of white, and dark brown or black, the colours being more or less equally distributed upon the scales; posterior part of body with indistinct dark cross-bars or spots, these markings gradually disappearing towards the tail, which is uniform brown in colour; head above marbled with light and dark olive, and two white spots, one on each side of the interparietal suture. Lower part whitish or yellowish. Total length : male 1015 mm, tail 250 mm; female 1000 mm, tail 210 mm.

Distribution : INDIA : Madhya Pradesh, Uttar Pradesh, Gujrat, West Bengal and throughout Peninsular India.

Elsewhere : Bangladesh, Pakistan and Sri Lanka.

Conservation status : Common.

26. *Dendrelaphis tristis* (Daudin)
(Common Indian Bronze-back)

1758. *Coluber tristis* Daudin, *Rept Hist. Nat.*, **6** : 430.

1943. *Ahaetulla tristis*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 248.

2003. *Dendrelaphis tristis*, Sharma, *Hand book Indian Snakes* : 113.

Observation localities : Kisli range (Indri camp and Salghat road). Mukki range (Aurai meadow, Aurai tank, C. No. 48, Khud meadow, Meel dabra meadow, Sondhar, Ghurela Camp and Baihar road). Supkhar range (Garhi road).

Habit and habitat : Arboreal occupying low bushes, thorn, thorn trees such as *Scacia*, toddy palms and Palmyra. They are diurnal and very active even during the hottest part of a summer day. They are usually found in the open and rarely hide. Mainly feed on frogs and lizards.

Diagnostic characters : Bronze-brown or purplish-brown above, light greyish, greenish or yellowish below. A more or less distinct buff flank stripe along the outer two scale rows, edged or spotted with black, an indistinct black temporal stripe extending to the neck, where it may break up into vertical bars, vertebral scales on neck, where it may break up into vertical bars. Upper lip yellow.

Distribution : Throughout India.

Elsewhere : Bangladesh, Nepal, Pakistan and Sri Lanka.

Conservation status : Uncommon.

27. ***Elaphe helena*** (Daudin)
(Common Trinket Snake)

1803. *Coluber helena* Daudin, *Hist. Nat. Rept.*, **6** : 277.

1943. *Elaphe helena*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 149.

1991. *Elaphe helena*, Sanyal, *Fauna of Orissa*, **4** : 67.

2003. *Elaphe helena*, Sharma, *Hand book Indian Snakes* : 69.

Observation localities : Kisli range (Khatiya road).

Habit and habitat : During the hot weather, Trinket snakes live deep in termite mounds, rock piles and crevices. In the cool season they emerge and are found in leafy trees and bushes. They are active during night and day. The adult is mainly a rodent eater, killing its prey by constriction. Occasionally, birds and their eggs are also eaten.

Diagnostic characters : Light or dark brown above; with dark brown or black cross-bars containing white ocelli, these are most conspicuous anteriorly and on the sides more than on the back, this pattern gradually disappears on the hinder part of the body, which is brown above with a broad dark stripe on each side; a black vertical streak below the eye and an oblique one behind it, lower parts yellowish.

Distribution : Throughout India.

Elsewhere : Bangladesh, Nepal, Pakistan and Sri Lanka.

Conservation status : Common between 500 m. and 2000 m. Rare in the plains.

28. ***Elaphe radiata*** (Schlegel)
(**Copperheaded Trinket Snake**)

1837. *Coluber radiatus* Schlegel, *Phys. Serp. ii* : 135.

1943. *Elaphe radiata*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 146.

2003. *Elaphe radiata*, Sharma, *Hand book Indian Snakes* : 68.

Observation localities : Kanha range.

Habit and habitat : Prefers open country near jungles and fields, gardens near villages. They are diurnal an active, intrepid snake. Apparently feeds exclusively on mammals, particularly rodents.

Diagnostic characters : Snout twice as long as the eye; Body colouration above greyish-brown, fawn or yellowish-brown, sometimes with a reddish or greenish tinge in life, with four black stripes a short distance behind the neck; the upper pair, on either side of the vertebral line, are broad, the outer pair on scale rows 3 are much narrower and are usually broken into a series of elongated spots on the anterior part of the body.

Distribution : INDIA : Chhattisgarh, Madhya Pradesh, Uttarakhand, West Bengal, Orissa and Eastern Himalayas.

Elsewhere : Southern China, and through the whole of the Indo-Chinese sub region to the Malay Archipelago. Bangladesh, Nepal, Pakistan and Sri Lanka.

Conservation status : Not uncommon.

29. ***Lycodon aulicus*** (Linnaeus)
(**Common Wolf Snake**)

1754. *Coluber aulicus* Linnaeus, *Mus. Adolph. Frieder*, **1** : 29.

1943. *Lycodon aulicus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 263.

1991. *Lycodon aulicus*, Sanyal, *Fauna of Orissa*, **4** : 69.

2003. *Lycodon aulicus*, Sharma, *Hand book Indian Snakes* : 123.

Observation localities : Kisli range (Indri meadow, Forest Rest House)

Habit and habitat : The snake most often seen near human habitations. They are nocturnal and feed on skins, geckos, lizards and frogs.

Diagnostic characters : Snout more or less spatulate and projecting beyond the lower jaw. Body colouration brown or greyish-brown above, with 12-19 white cross-bars which expand laterally or bifurcate, enclosing triangular patches; the bars may be pure white or heavily speckled with brown, they are sometimes reduced to short vertebral spots. Upper lip white or spotted with brown.

Distribution : Throughout India.

Elsewhere : Bangladesh, Nepal, Pakistan, Sri Lanka and Myanmar.

Conservation status : One of the commonest snakes of the Indian plains.

30. ***Macropisthodon plumbicolor*** (Cantor)
(Green Keelback)

1839. *Tropidonotus plumbicolor* Cantor, *Proc. Zool. Soc.*, : 54.

1943. *Macropisthodon plumbicolor*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 314.

2003. *Macropisthodon plumbicolor*, Sharma, *Hand book Indian Snakes* : 144.

Observation localities : Supkhar range (Garhi Chilphi road)

Habit and habitat : Found in green as well as open deciduous forests, mainly in hilly region. They are durinal.

Diagnostic characters : Head rather broad and short, nostril between two nasals. Body colour grass-green above, a black stripe from the eye to the angle of the mouth and more or less regular transverse black spots or cross-bars on the back and tail. Belly whitish-yellow or plumbeons, rarely with darkish spots.

Distribution : INDIA : Chhattisgarh, Karnataka, Kerala, Madhya Pradesh, North Maharashtra, Uttar Pradesh, Rajasthan and Tamil Nadu.

Elsewhere : Pakistan and Sri Lanka.

Conservation status : It is somewhat rare found only in the forests and hills.

31. ***Ptyas mucosus*** (Linnaeus)
(Rat Snake)

1758. *Coluber mucosus* Linnaeus, *Mus. Ad. Frid.*, **1** : 37.

1943. *Ptyas mucosus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 159.

2003. *Ptyas mucosus*, Sharma, *Hand book Indian Snakes* : 75.

Observation localities : Kisli range (Khatiya gate, Magar nala). Mukki range (Domar pulia, Forest Rest House, Garhi road, Gay dhar, Nava tola fire line, Near Mukki gate, Sardar barra, Sondhar, Sondhar bada tank, Bishanpura). Supkhar range (Kamko dadar). Khatiya Narangi range (Eco-centre).

Habit and habitat : Diurnal in habits but in populated areas may not be commonly seen out during the day. Mainly eat rodents and occasionally feeds on frogs, lizards, birds and even small snakes.

Diagnostic characters : Body olive-green, brown, yellowish or greyish above, with irregular but strongly marked black crossbars on the posterior half of the body. Yellowish-white below, the posterior ventrals and sub caudal edged with black. Maxillary teeth 20-25. Scales in 16 or 17 rows at mid-body; V. 190-213, C. 100-146, A. 2.

Distribution : INDIA : Throughout India including Andaman and Nicobar Islands.

Elsewhere : Bangladesh, Nepal, Pakistan and Southeast Asia.

Conservation status : A common snake in all parts of the country.

32. ***Sibynophis sagittarius*** (Cantor)
(Cantor's black-headed snake)

1839. *Calamaria sagittaria* Cantor, *P. Z. S.* : 49.

1943. *Sibynophis sagittarius*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 280.

1995. *Sibynophis sagittarius*, Sanyal & Sur, *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

2003. *Sibynophis sagittarius*, Sharma, *Hand book Indian Snakes* : 131.

Recorded from literature (Sanyal & Sur, 1995)

Diagnostic characters : Light brown above, with a vertebral series of black dots; greyish-brown on the sides, the colour occupying four scale-rows, and bordered above with black; head and nape dark brown or black, with a large elongate oval patch of yellow on each side at the back of the head; snout variegated with yellow; a yellow border to the nuchals patch behind; lips yellow, spotted with black. Lower parts yellow, with a black dot on the outer edge of each ventral shield. Total length : 305 mm, tail 250 mm.

Distribution : Madhya Pradesh, North-eastern India, Ganges basin, West Bengal and Western Himalayas.

Elsewhere : Bangladesh.

Conservation status : Not Common.

33. ***Xenochrophis piscator*** (Schneider)
(Checkered Keelback)

1799. *Hydrus piscator* Schneider, *Hist. Amph.*, **1** : 247.

1943. *Natrix piscator*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 293.

2003. *Xenochrophis piscator*, Sharma, *Hand book Indian Snakes* : 138.

Observation localities : Mukki Range (Bishan pura, Domar pulia, Ghurala anycut, Nava tola, Nava tola fire lne, Shringarpur tank)

Habit and habitat : Lakes, ponds, wells, rivers, streams and flooded rice-fields. They are active in day and night. Young water snakes feed on tadpoles and water insects. As they grow larger, they take fish, frogs and occasionally rodents and birds.

Diagnostic characters : Body olivaceous or yellowish above, whitish or yellowish below. Maxillary teeth 22-28, gradually enlarged posteriorly, nostrils directed slightly upwards. Scales in 19 rows, more or less distinctly keeled, except the outer one or two rows, which are smooth.

Distribution : Throughout India excluding Andaman and Nicobar Islands.

Elsewhere : Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka.

Conservation status : Common.

Family ELAPIDAE

34. ***Bungarus caeruleus*** (Schneider)

(Common Indian Krait)

1801. *Pseudoboa caerulea* Schneider, *Hist. Amph.*, **2** : 284.

1943. *Bungarus caeruleus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 413.

2003. *Bungarus caeruleus*, Sharma, *Hand book Indian Snakes* : 188.

Observation localities : Kisli range (Forest Rest Hosue, Khatiya). Khatiya Narangi range (Eco-centre).

Habit and habitat : It inhabits fields, low scrub jungles and are common in the vicinity of human habitation. Feed on mainly snakes, lizards and rodents. They are generally nucturnal.

Diagnostic characters : Length usually less than 2 metres. Black or bluish-black above with narrow white crossbars, which are least distinct on the anterior part of the body, or entirely absent. The eyes are small and very dark which makes the pupil almost invisible.

Distribution : INDIA : Throughout India including the Andaman and Nicobar Islands; upto 1700 m above sea level.

Elsewhere : Bangladesh, Pakistan and Sri Lanka.

Conservation status : Common.

35. ***Naja naja naja*** (Linnaeus)

(Spectaled Cobra or Binocellate Cobra)

1758. *Coluber naja* Linnaeus, *Syst. Nat.*, 10th ed. : 221.

1943. *Naja naja*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 427.

2003. *Naja naja naja*, Sharma, *Hand book Indian Snakes* : 196.

Observation localities : Kisli Range (Near day shelter, Khatiya, Magar nala). Kanha range (Chhoti chuhari, Ghoda pachhad). Mukki range (Baiga nala, Banzar River, C. No. 48, Ghurala road, Aurai meadow, Malkhedi, Nava tola). Supkhar range (Garhi road, Chilphi road).

Habit and habitat : They are found in all types of Country : Plains, open fields and even in the regions heavily populated by man. Frequently found near or in water and is a strong swimmer. Evening hours are preferred for moving about and hunting. Feed on insects, lizards, frogs, toads, small snakes, rodents and birds.

Diagnostic characters : Colour variable, generally brownish to blackish. Head not very distinct from the neck, dilated into a hood, the anterior ribs elongate. A spectacle mark on the hood or mark absent. Eyes moderate, pupil round. Scales smooth, in 19-25 rows, no occipital shields.

Distribution : Throughout India.

Elsewhere : Africa, Malaysia, and Southern Asia.

Conservation status : Not very common.

36. ***Naja naja oxiana*** (Linnaeus)
(Black Cobra)

1943. *Naja naja oxiana*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 428.

2003. *Naja naja oxiana*, Sharma, *Hand book Indian Snakes* : 197.

Observation localities : Kisli, Kanha & Mukki range

Habit and habitat : Found almost anywhere in heavy jungle, open cultivated land; in populated areas. Snakes feed on insects, lizards, frogs, toads, small snakes, rodents and birds.

Diagnostic characters : Young-light greyish or brownish above, uniform or with dark reticulations chiefly to the interstitial skin; or with dark transverse or chevron-shaped cross-bars. The bars on the hood are blacker than those on the body and extend across the under surface; belly whitish. Adult-brownish to blackish, usually without any other distinct markings, lighter below than above.

Distribution : INDIA : Gujarat, Rajasthan, Maharashtra, Madhya Pradesh, Punjab, Himachal Pradesh and Kashmir.

Elsewhere : Pakistan, Afghanistan and Central Asia.

Conservation status : Not very common.

Family VIPERIDAE

37. ***Echis carinatus*** (Schneider)
(Saw-scaled Viper)

1801. *Pseudoboa carinata* Schneider, *Hist. Amphib.*, **2** : 2.

1943. *Echis carinatus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 487.

2000. *Echis carinatus*, Sharma, *Fauna of Gujarat*, **1** : 294.

2003. *Echis carinatus*, Sharma, *Hand book Indian Snakes* : 223.

Observation localities : Mukki range (Nava tola, Sondhar tank No 2, Sondhar).

Habit and habitat : Dry, sandy or rocky terrain of the plains. Not found in heavily forested areas and usually not in higher hills. They are nocturnal and feed on mice, lizards, frogs, scorpions and other arthropods.

Diagnostic characters : Pale brown or greyish or sandy above with a vertebral series of pale dark edged spots which are connected on each side with a light inverted-U or inverted-V shaped mark enclosing a dark area, these spots are usually more or less connected with one another and form an undulating light line along the side of the body. A cruciform mark on top of the head, behind the eyes. Whitish below, uniform or spotted with brown.

Distribution : Throughout India, mostly on the plains.

Conservation status : Common.

38. ***Trimeresurus gramineus*** (Shaw)
(Green or Bamboo Pit Viper)

1802. *Coluber gramineus* Shaw, *Gen. Zool.,* **iii** : 420.

1943. *Trimeresurus gramineus*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 515.

2003. *Trimeresurus gramineus*, Sharma, *Hand book Indian Snakes* : 234.

Observation localities : Mukki range (Lal pulia camp and Forest Rest House)

Habit and habitat : It is usually seen during the rains. Frequents low vegetation, showing a marked preference for bamboo in localities where it occurs. They feed on small mammals, but take other small vertebrates also – rats, mice, shrews, small birds and lizards.

Diagnostic characters : Green or yellowish-green above, uniform or with occasional small dark brown spots produced by an extension of the colour of the interstitial skin on to the base of the scales; whitish or greenish below. The green of the dorsum may extend on to the outer edges of the ventrals and the pale colour of the ventrals on to the outer dorsal scales, the resulting pattern being a broken and uneven line along the flanks; upper lip whitish a dark temporal streak present or absent. Total length of male 630 mm, tail 115 mm; female 800 mm., tail 135 mm.

Distribution : INDIA : Madhya Pradesh, Maharashtra, Eastern and Western Ghats.

Conservation status : Not uncommon.

39. ***Vipera russelli*** (Shaw)
(Russell's viper)

1797. *Coluber russelli* Shaw, *Nat. Misc.*, 8, pl. 291.

1943. *Vipera russelli*, Smith, *Fauna Brit. India*, Reptilia & Amphibia, **3** : 483.

2000. *Vipera russelli*, Sharma, *Fauna of Gujarat*, **1** : 294.

2003. *Vipera russelli*, Sharma, *Hand book Indian Snakes* : 220.

Observation localities : Kanha and Mukki range.

Habit and habitat : Dry and semi-arid tracts and open country. They are nocturnal and feed on snakes, lizards, mice, rodent and other arthropods.

Diagnostic characters : Body length generally 3-4 feet but can reach 6 feet. Scales in 27-33 rows, supranasal strongly crescentic. Snout obtuse, with distinct canthus, nostrils very large. Light brown above, with 3 longitudinal series of large rounded or oval spots, which are usually brown in the centre, have a black margin and are edged again with white.

Distribution : Throughout India up to 3000 m. above sea level.

Elsewhere : Myanmar, Indo-China, Pakistan and Sri Lanka.

Conservation status : Not very common.

DISCUSSION

The reptilian fauna of KTR is represented by 39 species/subspecies belonging to 30 genera under 12 families. The major orders of reptiles represented in the fauna of KTR are :

1. Testudines (Tortoises and turtles)
2. Squamata (Lizards, geckos, and snakes)

Number of reptiles observed in Kanha Tiger Reserve has been plotted in fig.1 (months-wise), which shows that the largest number of reptiles (231) observed in the month of June. Number of species observed in Kanha Tiger Reserve has been plotted in fig. 2, which reveales that the maximum number of species (17 species) are reported during the month of October.

Three species of Testudines inhabit the wetland area of the reserve. These are the Indian Flapshell Turtle (*Lissemys punctata*), Indian Softshell Turtle (*Trionyx gangeticus*) and the Peninsular Black-Shell Turtle (*Melanochelys trijuga*).

Among the lizards, the three species commonly found are the Garden Lizard (*Calotes versicolor*), Fan-throated Lizard (*Sitana ponticeriana*) and Blanford's Rock Agama (*Psammophilus blanfordanus*).

The family Scincidae are represented by four species. The Common or Brahminy Skink (*Mabuya carinata*), Bronze Glass Skink or Little Skink (*Mabuya macularia*) are very common, whereas Dotted Garden Skink (*Riopa punctata*), and Brown Dwarf Skink (*Riopa albopunctata*) are less common than above species.

The Gekkonids are represented by seven species. The Yellow-Bellied House Gecko (*Hemidactylus flaviviridis*), Spotted House Gecko (*Hemidactylus brooki*) and Square spotted Gecko (*Hemidactylus gracilis*) are common but the Bark Gecko (*Hemidactylus leschenaulti*), Rock Gecko (*Hemidactylus maculates*) are less common and South Indian Rock-Gecko (*Cyrtodactylus*

collegalensis) and Clouded Ground Gecko (*Cyrtodactylus nebulosus*) are rare species. Among the Varanidae, only one species, the Bengal Monitor (*Varanus bengalensis*) is commonly found in the forest. It has a very long, forked and protrusible tongue.

Two families of poisonous snakes and three families of non-poisonous snakes represent the Serpentes. The Elapidae include the Common Cobra (*Naja naja naja*), Black Cobra (*Naja naja oxiana*) and the Common Krait (*Bungarus caeruleus*). The Cobra is the most familiar poisonous snake in India and much admired for its magnificent hood. It can move very swiftly. The Common Krait is mainly terrestrial and nocturnal in habit. It is deadly poisonous like the Cobra. Both the Cobra and Krait possess neurotoxic venom, which causes death by respiratory failure.

The family Viperidae are represented by three species : The Green or Bamboo Pit Viper (*Trimeresurus gramineus*), Russell's viper (*Vipera russelli*) and the Saw-scaled Viper (*Echis carinatus*). In the vipers, the head is broad and the snout is obtuse, thus making the head appear distinct from the trunk. The Russell's viper is a long, thickset snake easily distinguished by the three longitudinal rows of oval blotches on its trunk. The Saw-scaled Viper is much smaller in size. The vipers possess haemotoxic venom that causes death by haematuria. The Russell's viper can be more dangerous than the Cobra as it is a sluggish creature and when disturbed, instead of moving away quietly, it can attack unprovoked.

The Typhlopidae are small worm-like snakes and represented by one species, the Common Worm Snake (*Ramphotyphlops braminus*).

The Boidae are represented by one form, the India Rock Python (*Python molurus*). The Python is second largest among Indian snakes. It is both terrestrial and arboreal in habit and has a peculiar method of catching prey. It hangs from the branch of a tree in pursuit of an unwary prey. When an animal comes within attacking range, it flings its body upon the prey and coils round it.

The family Colubridae include most of the non-poisonous snake species found in nature. The Rat Snake (*Ptyas mucosus*) is a long and swiftly moving snake, which readily devours rodents. Other commonly found snakes are the Wolf Snake (*Lycodon aulicus*), Vine Snake (*Ahaetulla nasuta*), Striped Keelback (*Amphiesma stolata*), Olivaceous Keelback (*Atretium schistosum*), Banded Racer (*Argyrogena fasciolatus*), Checkered Keelback (*Xenochrophis piscator*), Green Keelback (*Macropisthodon plumbicolor*), Common Indian Trinket Snake (*Elaphe helena*), Copperheaded Trinket Snake (*Elaphe radiata*) Bronzebacked Snake (*Dendrelaphis tristis*), and Contor's black headed Snake (*Sibynophis sagittarius*).

SUMMARY

The paper presents the information on reptilian fauna of Kanha Tiger Reserve, Madhya Pradesh. Total 39 species/subspecies of reptiles belonging to 30 genera under 12 families are reported from

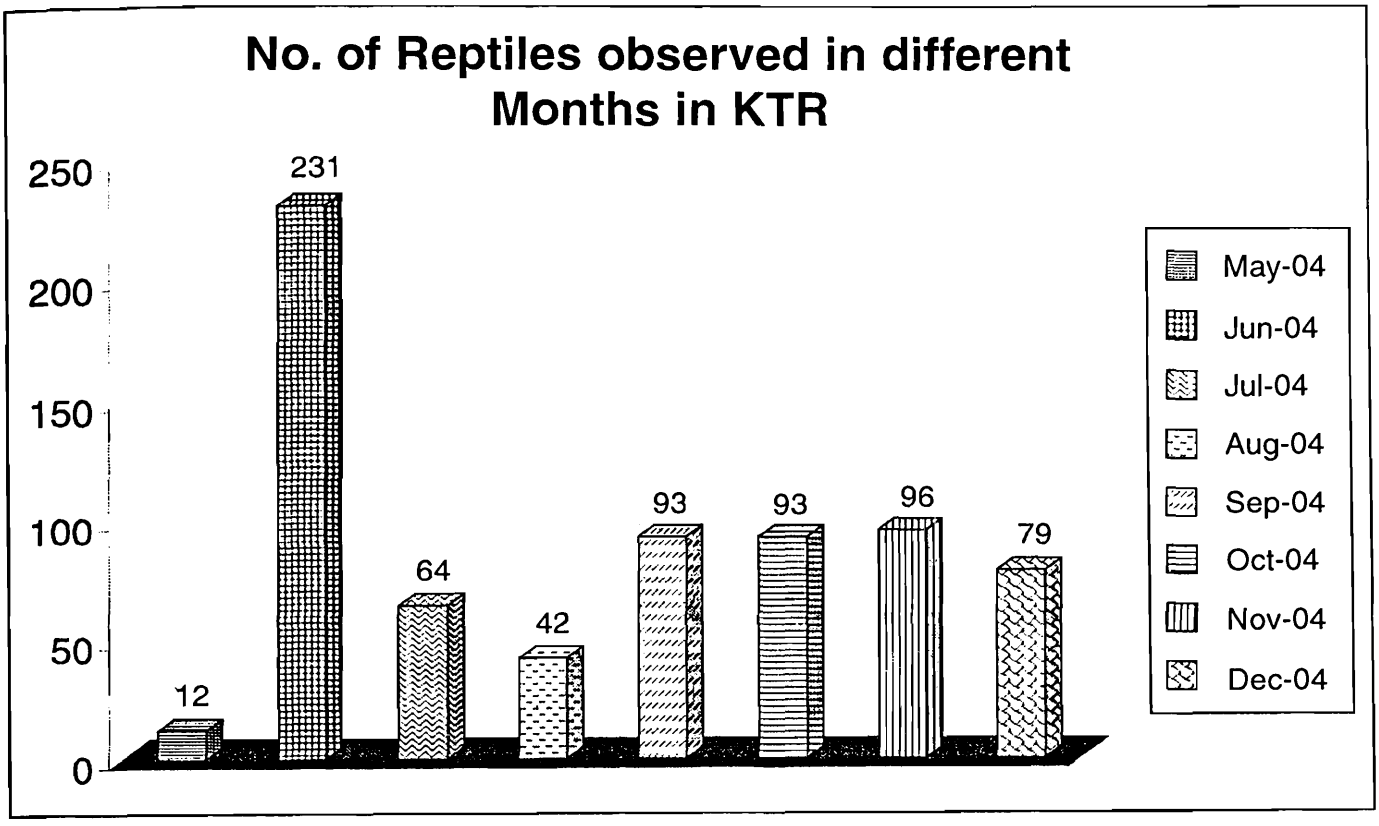

No. of Reptiles observed in different Months in KTR
250
200
150
100
50
0
12
231
64
42
93
93
96
79
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04

Fig. 1

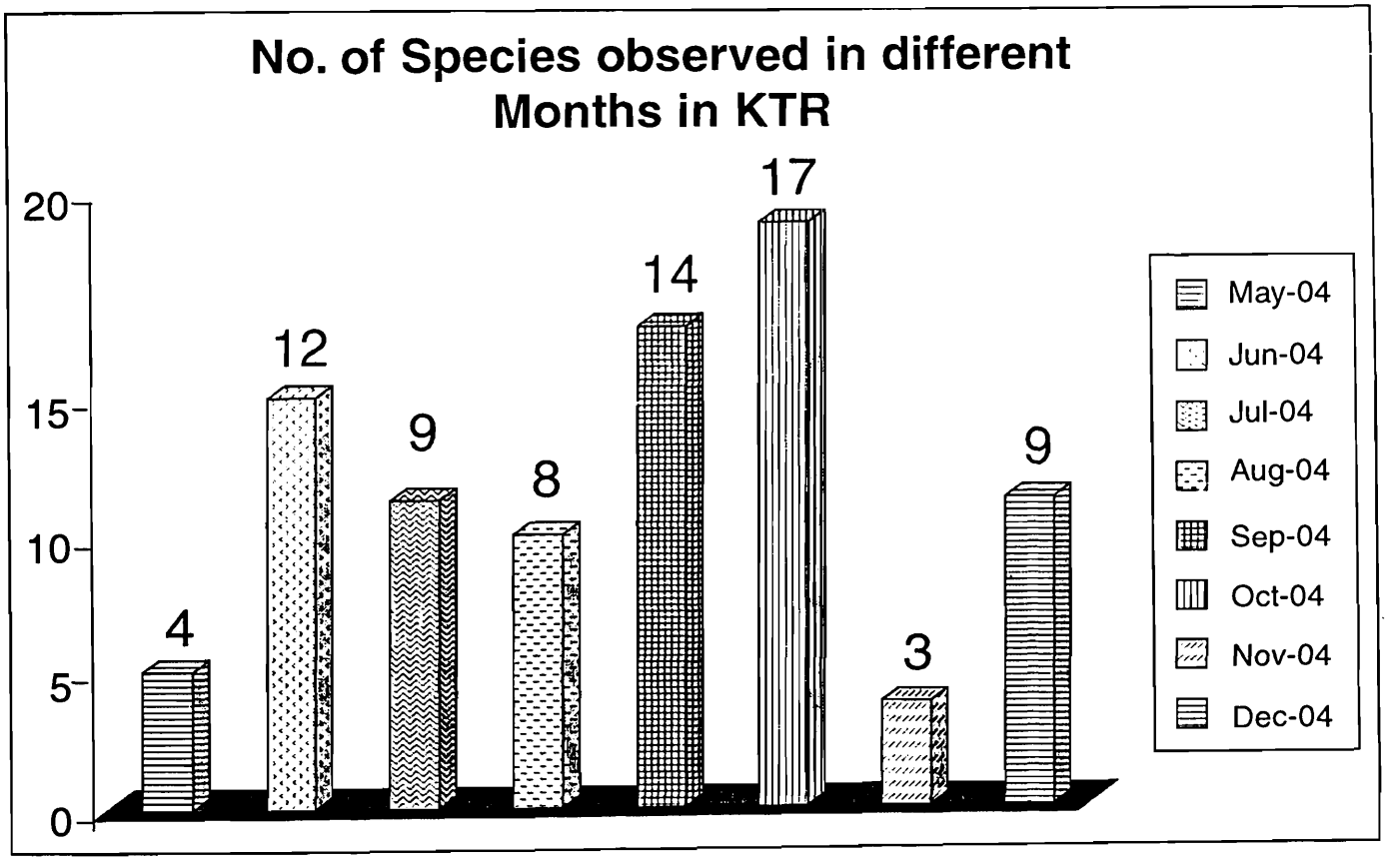

No. of Species observed in different Months in KTR
20
15
10
5
0
4
12
9
8
14
17
3
9
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04

Fig. 2

the KTR. Of which, about 80% species have been currently observed by survey team of Zoological Survey of India, Jabalpur from May 2004 to December 2004, whereas the rest of the reptiles species have been compiled on the basis of published information. Out of 39 species, 17 species are reported for the first time from KTR. The systematic list of reptiles observed in various localities during different months and their density along with their status in the tiger reserve have also been incorporated.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India to provide the necessary facilities to undertake the above work. Authors also express their deep sense of gratitude to the authorities of Forest Department, Madhya Pradesh, for assigning the task and granting the financial assistance to undertake the project entitled on "Avifauna of Kanha Tiger Reserve" Thanks are also due to the forest officials of the Kanha Tiger Reserve, particularly to Shri K. Nayak, Conservator of Forests & Field Director, Shri H.S. Negi Deputy Director, Shri, R.K. Shukla, Research Officer, and Shri B.R.Nagpure, Range Officer, Kisli for their constant support during the survey work. The investigators also thank the members of scientific team for undertaking the survey of KTR. Shri M. E. Limje, Photographer Gr. III, of the regional station deserves special thank for the photographic work.

REFERENCES

Agrawal, H.P. 1976. Fauna of Kanha National Park, Reptilia. *Newl. zool. Surv. India*, **2**(6) : 247-249.

Chandra, K. and Gajbe, P.U. 2005. An inventory of Herpetofauna of Madhya Pradesh and Chhattisgarh. *Zoos' Print Journal*, **20**(3) : 1812-1819.

Moulton, C. and Hulsey, E. 1999. *Kanha Tiger Reserve*, Portrait of an Indian National Park, Vakils, Feffer and Simons Ltd., Mumbai : 128-129.

Negi, H.S. 2004. First Record of the Copper-head Snake *Elaphe radiata* from Madhya Pradesh. *J. Bombay Nat. Hist Soc.*, **101**(1) : 166.

Sanyal, D.P. 1991. *Reptilia.* In : *State Fauna Series 1 : Fauna of Orissa, Part* **4** : 51-74. (Published by Zoological Survey of India, Kolkata).

Sanyal, D.P., Dattagupta, B. and Gayen, N.C. 1993. *Fauna of Andhra Pradesh Part-1, State Fauna Series*, **5** : 1-63. (Published by Zoological Survey of India, Kolkata).

Sanyal, D.P. and Sur, S. 1995. *Fauna of Kanha Tiger Reserve, Madhya Pradesh*, Zool. Surv. India : 51-62.

Sharma, R.C. 1976. Three new records of Reptiles from M. P., India, *Newsl. zool Surv. India*, **2**(3) : 101-102.

Sharma, R.C. 1998. *The Fauna of India and the adjacent countries*, Reptilia vol. **I**. (Testudines and Crocodiliands) : 1-196. (Published by Zoological Survey of India, Kolkata).

Sharma, R.C. 2000. *Reptilia* : In : *State Fauna Series 8 : Fauna of Gujarat, Part* **1**, Vertebrates : 243-297. (Published by Zoological Survey of India, Kolkata).

Sharma, R.C. 2002. *The Fauna of India and the adjacent countries*, Reptilia vol. **II**. (Sauria) : 1-430. (Published by Zoological Survey of India, Kolkata).

Sharma. R.C. 2003. *Hand book on Indian Snakes* : 1-292. (Published by Zoological Survey of India, Kolkata).

Smith, M.A. 1931. *The Fauna of British India including Ceylon and Burma*, Loricata and Testudines Vol. **1**. Taylor and Francis, London, xxviii + 185 pp.

Smith, M.A. 1935. *The fauna of British India including Ceylon and Burma*, Reptilia and Amphibia, Vol. **2** (Sauria). Taylor & Francis, London, 440 pp.

Smith, M.A. 1943. *The fauna of British India including Ceylon and Burma*, Reptilia and Amphibia, Vol. **3** (Serpentes). Taylor & Francis, London, 583 pp.

PLATE I

Lissemys punctata (Lecepede)
Indian Flap-Shell Turtle

Trionyx gangeticus (Cuvier)
Indian Soft-Shell Turtle

Cyrtodactylus nebulosus (Beddome)
Clouded Ground Gecko

Hemidactylus flaviviridis (Ruppell)
Yellow-Bellied House Gecko

Calotes versicolor (Daudin)
Common Garden Lizard

Psammophilus blanfordanus (Stoliczka)
Blanford's Rock Agama

PLATE II

Sitana ponticeriana (Cuvier)
Fan-throated Lizard

Mabuya macularia (Blyth)
Bronze Glass Skink

Varanus bengalensis (Schneider)
Common Indian Monitor

Python molurus (Linnaeus)
Indian Rock Python

Lycodon aulicus (Linnaeus)
Common wolf Snake

Macropisthodon plumbicolor (Cantor)
Green Keelback

PLATE III

Ptyas mucosus (Linnaeus)
Indian Rat Snake

Xenochrophis plscator (Schnelder)
Checkered Keelback

Bungarus caeruleus (Schneider)
Common Indian Krait

Naja naja oxiana (Eichwald)
Black Cobra

Trimeresurus gramineus (Shaw)
Green or Bamboo Pit Viper

Vipera russelii (Shaw)
Russell's Viper

Rec. zool. Surv. India : **108**(Part–4) : 85-104, 2008

A STUDY ON THE ICHTHYOFAUNAL DIVERSITY OF WETLANDS IN AND AROUND KOLKATA

MOUSUMI PAL AND SUBRATA KAR*

Senior Lecturer, Department of Zoology, Sovarani Memorial College, Jagatballavpur, Howrah

INTRODUCTION

Wetlands support a good diversity of freshwater and brackish water fish throughout the country. Wetlands like marshes, rice-fields, grass and sedge covered shallow aquatic habitats are generally temporary, drying up during the hot summer months, either fully or at least partially. Lakes, ponds, reservoirs etc. are deep and rarely dry up completely. All are variable in depth, nature of substrate (largely, very muddy), seasonality and often with dense growth of emergent (like rice-fields), submerged and floating vegetation. As the large rivers are influenced by tides, it is very difficult to draw a distinctive line between freshwater and brackish water and some marine and estuarine fishes move inland into freshwaters. The present work embodies results of a study that reveals 46 species of major freshwater and estuarine fishes of the wetlands of Kolkata and its surroundings.

STUDY AREA AND NATURE OF WETLANDS

Among a number of wetlands present in and around Kolkata, only 3 (three) have been selected as study area. These are (i) freshwater wetland of Bartibill near Barrackpore – this is a freshwater marshy land connected with Ganges by canal and used for agricultural purpose and here aquatic flora is very rich and diverse; (ii) sewage-fed wetland in Bantala of Eastern Kolkata – it is sewage fed wetland, connected with sewage canal and storm water canal; sewage-fed fishery is done here and (iii) semi-estuarine wetland of Kharibaria and Gopalpur near Basirhat – these are vast plain fishing bheries connected with branches of Bidyadhari through canals, used for fishery, aquatic flora are very few.

**Zoological Survey of India, Kolkata*

HABITS AND HABITATS

In both deep and stagnant and slow moving wetlands we find surface dweller, mid water swimmer and bottom dweller fish. Smaller fish tend to occupy the shallow peripheral areas. Surface-swimming small fishes in fresh and brackish water wetlands are mostly rice fish, guppies and other mosquito fish. Danios and flying barbs swim more erratically, breaking the surface for feeding. Surface dwellers have a flat dorsal profile that is on level with the surface of water. Carps, barbs and many other fishes having a laterally compressed muscular body with high dorsal fin and a deeply forked tail are capable of swift movement and inhabit mid-waters. A number of species of *Puntius* and *Labeo* are midwater-swimming and bottom feeder. Bottom dwellers, have a flattened ventral profile and an arched dorsal profile. Some catfishes, loaches and *Garra* are good examples of bottom dwellers. Loaches and *Garra* typically attach themselves to rocks or submerged objects. The bottom-dwelling catfishes and snakeheads tend to hide within cavities and crevices.

Fishes that swim in the midwaters and along the surface usually stay in groups. Bottom-dwellers are more territorial and tend to be solitary. Similarly, those species that prefer to occupy caves and crevices are also solitary, predators and rare.

According to the trophic niche occupied by the fish in a water body fishes are grouped into (i) surface feeder (ii) column or mid feeder and (iii) bottom feeder. According to the character of diet they thrive on, adult fishes have been classified into herbivorous, carnivorous and omnivorous. Some put plankton and detritus feeding fish into a separate class. The feeding behaviour is species characteristic.

Normally fishes lay eggs unprotected in water. The males fertilize these eggs by spraying sperms over them, as the breeding pair swims together. Mouth-breeding cichlids keep brood eggs in their mouth and several other fishes, like stickleback and gouramies, build nests for laying and protecting their eggs either at bottom or floating on the surface. Some fishes are ovo-viviparous or 'live-bearers' Most of the Cypriniform fishes predominate freshwater and breed during monsoon, while the estuarine fishes *viz.* Mugilidae breed in winter.

The enemies of fishes are the mink, otter and cats among the mammals; the kingfisher, herons, ducks and terns among birds; and occasional bull frog; several snakes and many fishes, spawn eaters, fry catchers and adult eating, predacious fishes.

Fishing for sport is a more recent development when compared to hunting and trapping. The common Indian fishes considered as game fish include some of the carps, larger catfish and mahseer. A species that fights is often a favourite fish as it provides the angler with a challenge and tests his endurance and skill.

Some of the important works on the faunal composition in the wetland areas were done mainly by Yazdani and Singh (1990, 2002), and Nandi *et. al.* (1993, 1999), and Alfred and Nandi (2001). But works on ichthyofaunal composition of the area under study are very scanty. Identification of fishes have been done based on Yazdani (1986) Jayaram (1999), Talwar and Jhingran (1994), and Daniels (2002).

SYSTEMATIC ACCOUNTS

Family NOTOPTERIDAE

The feather backs are moderately large fishes, elongate with the body broad, strongly compressed laterally with thin scales on head also. Abdomen serrated before the pelvic fins.

1. *Notopterus notopterus* (Pallas) – **Pholui**

Size : Grows to 60 cm.

Habitat : Freshwaters : tanks, beels, lakes, ponds, tributaries.

Behaviour : Found throughout the water body and carnivorous in habit.

Breeding : Breeds both in stagnant and running water in rainy season. Ripe females bear a small number of eggs which are laid in clumps on submerged vegetation.

Diagnostic characters : Silvery sides with bluish-grey back, golden yellow tinge on head, greyish spots all over the body.

Family CYPRINIDAE

It is the largest single family of freshwater fishes. Among 45 species dealt here, 18 species belong to Cyprinidae. All species belonging to this large family are popularly called barbs, carps, danios, rasboras and minnows. These are laterally compressed with forked tail and well-developed scales.

2. *Catla catla* (Ham.) – **Katla/Katol**

Size : Large fish grows to a maximum length 150 to 200 cm. and a weight of 70 kg.

Habitat : Freshwaters : tanks, lakes, ponds.

Behaviour : Major Carp. Adults are non-predatory, herbivores and feeding is restricted to the surface and mid-waters. The juveniles feed on insects in addition to detritus and algae.

Breeding : Breeds in rivers during the south-west monsoon. Adults reach sexual maturity at the age of 2 years.

Diagnostic characters : This is a large fish with a massive head, thick lips and very large scales. It has a silvery body with dark grey above and whitish on the belly or dull greyish. L.l. 38-43.

3. ***Cirrhinus mrigala*** (Ham.) – **Mrigal/Mrigel**

Size : Large fish attaining a maximum length of 100 cm.

Habitat : Freshwaters : rivers, tanks, ponds.

Behaviour : Major Carp. Adults are popular game fish, bottom dweller, entirely herbivorous and also detritus eater. The juveniles are omnivorous until they are about 5 cm.

Breeding : Breeding usually takes place during the south-west monsoon in the shallow margins of rivers and bundhs.

Diagnostic characters : It has a downward facing mouth with the upper lip being prominent. It is dark grey with coppery tinge along the back with big and bright golden scales on the sides and silvery white on the belly, fins orange stained with black. L.l. 40-45.

4. ***Cirrhinus reba*** (Ham.) – **Kharkeba**ta

Size : Small carp, growing up to a maximum length of 30 cm.

Habitat : Freshwaters : rivers, tanks, beels, ponds.

Behaviour : Bottom feeder, largely herbivorous and feeding on detritus.

Breeding : Breeding occurs in flood waters during the months of June-September. This species is very fast growing.

Diagnostic characters : Distinguished by the large hexagonal scales and a very short pair of barbels. It is silvery, scales with dark edges forming longitudinal bands above lateral line. L.l. 35-38.

5. ***Labeo bata*** (Ham.) – **Bhangon bata/bata**

Size : Grows to 60 cm.

Habitat : Freshwaters : big rivers, tanks, lakes, ponds, beels.

Behaviour : Minor carp, column or mid-feeder, feeding on submerged aquatic plants.

Breeding : Breeds during monsoon months in rivers.

Diagnostic characters : Colour varies with age, generally silvery, darkest along the back, lower fins stained with orange, fine black dots on all the fins. L.l. 37-40.

6. ***Labeo rohita*** (Ham.) – **Rui**

Size : Large barb/carp and grows to a maximum size of 100 cm. and weight more than 50 kg.

Habitat : Freshwaters : big rivers, tanks, lakes, ponds, beels.

Behaviour : Major Indian carp, a good game fish, column or mid-feeder, doing best in flowing waters and feeding on submerged aquatic plants.

Breeding : Breeds during the south-west monsoon. It spawns in flooded rivers at depth between 50 to 60 cm. laying as many as 2 to 3 lakhs eggs.

Diagnostic characters : An arched back and large eyes are the main characteristics. It is generally brownish blue or reddish blue along the back with silvery sides and below, scales with dark borders with red or orange centre inside. L.l. 40-42.

7. ***Labeo calbasu*** (Ham.) – **Kalbasu/Kalbose/Kalibaush**

Size : Large barb/carp and grows to a maximum size of 90 cm.

Habitat : Freshwaters : rivers and ponds and also found in brackish water.

Behaviour : Major Carp. It is a popular game fish, bottom dweller, omnivorous and detritus feeder.

Breeding : Breeding occurs in the flowing water.

Diagnostic characters : The mouth is downwards facing and has two pairs of barbels. It is blackish or metallic grey all over the body, slightly lighter below, fins black, upper caudal lobe sometimes edged white. L.l. 40-44.

8. ***Amblypharyngodon mola*** (Ham.) – **Mourala/Morola**

Size : Grows to 7-8 cm.

Habitat : Freshwaters : rivers, ponds, beels, lakes, paddy fields, ditches.

Behaviour : Column feeder and feeds on submerged vegetation.

Breeding : Breeds both in stagnant and running water in rainy season.

Diagnostic characters : Silvery body with a deep greyish longitudinal band in the middle of the body; dorsal, caudal and the whole of the body covered with minute black dots. L.l. 65-75.

9. ***Salmostoma bacaila*** (Ham.) – **Chela**

Size : Grows to 18 cm.

Habitat : Freshwaters : tanks, beels, rivers, ponds lakes, tributaries.

Behaviour : Surface dweller and useful larvivorous species.

Breeding : Breeds during monsoon in rivers.

Diagnostic characters : Uniformly silvery. L.l. 86 to 110.

10. ***Cyprinus carpio*** (L.) – **American Rui/Common Crap**

Size : Grows to 45 to 60 cm. in length.

Habitat : Freshwaters : tanks and ponds mostly reared one. It prefers water with mud or silt substrate.

Behaviour : A popular game fish, bottom dweller, and prefers to stay in large groups. It is quite adaptive. It is omnivorous and also known to dig and burrow into the pond embankments in search of organic matter. It gulps in mud and rejects indigestible matter, making the pond water turbid.

Breeding : The females lay about a million eggs in water where there is an abundance of floating aquatic plants. The eggs attach themselves to the plant.

Diagnostic characters : A stout bodied carp with small mouth and thick lip. It has golden yellow sides with dark back and white belly and dark and pink tinged fins. L.l. 30-40.

11. ***Osteobrama cotio*** (Ham.) – **Mouwa/Chanda**

Size : Grows to 15 cm.

Habitat : Freshwaters : rivers, beels, tanks, bheries, ponds.

Behaviour : Surface or column feeder, possibly a useful larvicide.

Breeding : Breeds in rivers in monsoon.

Diagnostic characters : Silvery black on the back, sometimes with a silvery lateral band, sometimes a black blotch before the base of the dorsal fin and another on the nape. L.l. 55-70.

12. ***Rasbora daniconius*** (Ham.) – **Dankoni/Dhera/Dadhika/Darkina**

Size : Grows up to a length of 10 cm.

Habitat : Freshwaters : tanks, beels, rivers, ponds.

Behaviour : The Blackline Rasbora is generally a slow moving fish, swimming or propelling itself by jerking its body. The young fish tends to move in group.

Breeding : Usually breeds before the rains. The young are dispersed during rains.

Diagnostic characters : Small, slender and elongated fish. It has a greenish yellow back with silvery sides, a bluish lateral stripe edged with golden yellow, fins pale orange, caudal lobes tinged with black. L.l. 30-34.

13. ***Danio devario*** (Ham.) – **Baspata**

Size : Grows to 10 cm.

Habitat : Freshwaters : rivers, ponds, tanks, ditches.

Behaviour : Very active shoaling fish, swimming close to the surface, it swims gracefully by gently bending the body in a serpent-like movement. It is quite expert in swimming against the current in swift flowing water.

Breeding : Breeds both in stagnant and flowing water in monsoon.

Diagnostic characters : Greenish above and silvery at sides, three horizontal bluish lines divided by yellow bands extending backwards to caudal. L.l. 41-48.

14. ***Esomus danricus*** (Ham.) – **Dadhikha, Danrika**

Size : Grows to maximum 12.5 cm. but the usual size is less than 10 cm.

Habitat : Freshwater : ponds, tanks, ditches and canals.

Behaviour : Flying barbs are active fish that swim and feed close to the surface. They prefer well aerated water. The species is capable of leaping high and far out of the water.

Breeding : Breeding takes place during October-December.

Diagnostic characters : This slender fish is identified by its gold and black lateral band, its long maxillary barbels and pectoral fin wing-like, fins orange red. L.l. 27–30.

15. ***Puntitus sophore*** (Ham.) – **Puthi/Puti**

Size : Attains the maximum length of 13 cm. although the normal size is 5-6 cm.

Habitat : Freshwaters : tanks, beels, paddy fields, tributaries.

Behaviour : Adults usually move in large groups. They often spread over long distances during the rains, specially during floods.

Breeding : Breeds during the monsoon.

Diagnostic characters : Small barb with a moderately deep body and clear fins. It is silvery, often with a black diffused spot at the caudal fin base, a scarlet lateral band and a dark spot at the base of dorsal fin, an orange golden spot below the eye, and tips of fins reddish or orange tinged. L.l. 23-26.

16. ***Puntius conchonius*** (Ham.) – **Kanchan puti**

Size : Attains the maximum length of 14 cm. although the normal size is 5 to 6 cm.

Habitat : Freshwaters : ditches, tanks, beels, ponds, in small irrigation canals also.

Behaviour : Generally they are lively creatures moving about in groups. When they are feeding on submerged plants at the bottom of turbid waters, a number of eye spots are an obvious sign of the Rosy Barb's presence. The newly hatched fry feed on plankton and grow rapidly.

Breeding : Breeds in shallow water with luxuriant vegetation and breeding adults are seen during the months of April-May.

Diagnostic characters : Greenish grey on the back becoming silvery towards the sides, a large round black blotch on the middle of the caudal peduncle (on 19th-20th scales) orange coloured fins, dorsal fin tip tinged with black. L.l. 24-26.

17. ***Puntius sarana*** (Ham.) – **Saral puthi/Swarna puthi**

Size : Attains a maximum length of 25 cm.

Habitat : Freshwaters : tanks, beels, ponds, tributaries, lakes.

Behaviour : Adults usually move in large groups. They feed on submerged vegetation.

Breeding : Breeds during the monsoon in running water among the submerged boulder and vegetation.

Diagnostic characters : Medium size fish with a deep body. It is dark grey above and silvery below, sometimes horizontal bands along the rows of scales in the upper half of the body, often a golden blotch on the opercle, fins greyish white. L.l. 32-34.

18. ***Puntius ticto*** (Ham.) – **Tita-puthi**

Size : Attains a maximum length of 10 cm.

Habitat : Freshwaters : ditches, tanks, beels, ponds. It dwells along the margins of the still and shallow water.

Behaviour : A very active fish moving with other barbs in shallow water. It is rather peaceful in temperament. The fry feeds mainly on zooplankton.

Breeding : Usually breeds at a water temperature of 24-26 °C. About 150 eggs are laid in batches.

Diagnostic characters : Small brightly patterned silvery fish with two black lateral spots during seasonal changes (March to September), often develops bright red colour on the flanks and olive green on the back. L.l. 22-26.

Family BAGRIDAE

Popularly known as catfish possess an elongated body without scales. The mouth is wide and the nostrils are far apart.

19. ***Sperata seenghala*** (Sykes) – **Arr-tengra**

Size : Attains a maximum length of 150 cm. although the normal size is 40 cm.

Habitat : Freshwaters : rivers, beels. canals, flooded fields and ponds.

Behaviour : This is a predatory species feeding on other fishes. It is a good sport fish and graceful swimmer.

Breeding : Normally breeds before the onset of monsoon. It builds circular nests in the month of March.

Diagnostic characters : Large river cat fish with wide mouth. A round black spot on the posterior end of adipose fin, brownish along back, silvery on sides and below.

20. ***Mystus vittatus*** (Bloch) – **Tengra**

Size : Attains a maximum length of 21 cm.

Habitat : Freshwaters : tanks, beels, canals, flooded fields and ponds. It is usually found among marginal vegetation with muddy substrate and rarely in rivers.

Behaviour : Generally solitary, moving about along the bottom. The colour of the fish varies with the nature of the water and age of the fish. They are not very aggressive. It feeds on aquatic insects and other invertebrates.

Breeding : Breed during the rains in August-September. The young disperse with the rainwater.

Diagnostic characters : Small silvery fish with prominent golden tinge, 5 narrow black bands on the body above and below the lateral line, a black shoulder spot usually present, fins edged with dark black.

21. ***Mystus tengara*** (Ham.) – **Tengra**

Size : Attains a maximum length of 18 cm.

Habitat : Freshwaters : tanks, beels, ponds, paddy fields.

Behaviour : Generally solitary, moving about along the bottom. The colour of the fish varies with the nature of the water and age of the fish. They are not very aggressive. It feeds on aquatic insects and other invertebrates.

Breeding : Breed during the rains in August-September. The young disperse with the rainwater.

Diagnostic characters : Brilliant yellow with dark shoulder spot and about 5 black longitudinal bands.

Family SILURIDAE

Popularly known as sheat fish, includes species that are generally elongated and laterally flattened with a highly reduced dorsal fin.

22. ***Ompok bimaculatus*** (Bloch) – **Pabda**

Size : Grows to 45 cm.

Habitat : Freshwaters : rivers, beels, kharies.

Behaviour : Occurs in shallow, often muddy water and also in sandy rivers and tanks. It is generally solitary, moving about close the bottom in a serpentine motion. It is a voracious feeder. It hides among rocks and debris and the overall brownish colouration camouflaging the catfish and making it like a dead fish.

Breeding : Breeds during the monsoon.

Diagnostic characters : Medium sized, laterally flattened catfish with a wide mouth. Silvery shot with purple, a black spot on the shoulder behind the gill opening, dorsal side greenish dark with a wash of golden yellow when alive, a small triangular black spot just above the lateral line on caudal peduncle.

23. ***Ompok pabo*** (Ham.) – **Pabda/Pabo**

Size : Grows to 24 cm.

Habitat : Freshwaters : rivers, beels, kharies.

Behaviour : Generally solitary, moving about close to the bottom in a serpentine motion. It is a voracious feeder. It hides among rocks and debris and the overall brownish colouration camouflaging the catfish and making it like a dead fish.

Breeding : Breeds during the monsoon.

Diagnostic characters : Silvery with a faint shoulder spot.

24. ***Ompok pabda*** (Ham.) – **Pabda/Pabo**

Size : Grows to 17 cm.

Habitat : Freshwaters : rivers, beels, kharies.

Behaviour : Generally solitary, moving about close to the bottom in a serpentine motion. It is a voracious feeder. It hides among rocks and debris and the overall brownish colouration camouflaging the catfish and making it like a dead fish.

Breeding : Breeds during the monsoon.

Diagnostic characters : Usually silvery, glossed with gold and black shoulder spot above middle of pectoral fin and another generally close to base of caudal fin, silvery green with yellowish tinge, dark back fading to silver on abdomen, anal and caudal fins golden yellow when alive.

25. ***Wallago attu*** (Schn.) – **Boal**

Size : Grows to 200 cm. and weighs up to 45-55 kg. It is the largest Indian freshwater fish.

Habitat : Freshwaters : big rivers and its tributaries, beels, tanks and channels.

Behaviour : The adult is predatory, aggressive and voracious feeder, preying on other fish. It stays at the bottom of the water in search of food. It is known to inflict painful bites when handled. It is a good sport fish. Breeding pairs are known to swim close to the surface in rivers.

Breeding : The breeding coincides with the rain.

Diagnostic characters : Large elongated, laterally flattened catfish with a wide mouth, small eyes and deeply forked tail. Uniform silvery, grey above becoming dull white below, in fresh specimen, a light greenish wash on the back and cream colour on the sides with a faint orange-yellow band along the lateral lines.

Family SCHILBEIDAE

Popularly known as schilbid catfish. The body is elongated and laterally flattened, the head is conical and the nostrils are wide spaced.

26. ***Ailia coila*** (Ham.) – **Kajri/Kajoli**

Size : Grows to 18 cm.

Habitat : Freshwaters : rivers and its tributaries.

Behaviour : Inhabits surface to mid-water area, lives in shoals and feeds on submerged vegetation.

Breeding : Breeds during late rainy season.

Diagnostic characters : Skin smooth, silvery, some of the fins edged with grey, upper jaw longer and overhung by the snout.

Family CLARIIDAE

Popularly called air breathing catfish, possess a labyrinthine organ that enables them to breathe air directly. They have small eyes and four pairs of well-developed barbels.

27. ***Clarias batrachus*** (Linn.) – **Magur**

Size : Grows to maximum 46 cm.

Habitat : Freshwaters : beels, ponds, kharies and flooded rice field and estuaries of rivers.

Behaviour : The adults stay buried in the bottom of the water bodies. Due to the ability to breathe air directly they can stay out of water for a long time and are known to move over wetlands in search of water. They are quite aggressive if handled, inflicting painful stings with their pectoral spines. The young individuals feed enormously.

Breeding : Breeds during the months of July-August coinciding with the monsoon. Most frequently, it breeds in the flooded rice field.

Diagnostic characters : Uniform rich reddish or greyish black, smooth skinned.

Family HETEROPNEUSTIDAE

Popularly called stinging or air sac catfishes, have a long internal sac enabling them to survive even out of water. The mouth is small and has four pairs of well-developed barbels.

28. ***Heteropneustes fossilis*** (Bloch) – **Singhi**

Size : Grows to 30 cm.

Habitat : Freshwaters : rivers, beels, ponds, kharies, floodwater and ditches.

Behaviour : It can tolerate even turbid and muddy waters due to its ability to breathe air directly. The adults swim in shoals close to the bottom, being most active at night. Solitary adults stay within crevices and amongst debris with their barbels projecting outwards. They are very agile and when caught, can wriggle and inflict most painful stings. They can stay out of water for long periods. This species is known to stay below the surface of mud in wetland-bed coming back to life after the rains.

Breeding : Breeds during the monsoon in ditches and flood pools and spawns in a depression excavated by both the parents. The eggs are spherical, heavy and settle at the bottom, where they stick to the substrate.

Diagnostic characters : Dark purplish brown or leaden brown often with two yellowish lateral bands in juveniles.

Family BELONIDAE

Freshwater Gars have elongate, slender body with small scales. Both jaws elongated as a beak, armed with sharp teeth.

29. ***Xenentodon cancila*** (Ham.) – **Kankley**

Size : Grows to 30 cm.

Habitat : Freshwaters : rivers, beels, lakes, ponds, kharies.

Behaviour : Surface dweller and carnivorous.

Breeding : Breeds during monsoon.

Diagnostic characters : Body elongate and both jaws lengthened into a long beak. It is greenish grey above and lighter below with abdomen whitish, a dark edged silvery stripe from eye to caudal fin base, often 4 or 5 black lateral blotches between pectoral and anal bases.

Family CHANNIDAE

Large-mouth fishes with a snake-like head are popularly called snakeheads or murrels. Their bodies are long and cylindrical with dorsal and anal fins spreading over more than half of the body.

30. ***Channa marulius*** (Ham.) – **Sal/Gajal**

Size : Grows to maximum 180 cm; normally, it measures around 50 cm. and can weigh as much as 30 kg.

Habitat : Freshwaters : rivers, beels, lakes, ponds, kharies, preferring deep water with rocky and sandy bottom.

Behaviour : Known to be territorial and aggressive. They are predatory, feeding on other fishes, water birds, snakes etc. The adults raise their young in nests and guard them intensely from intruders. They are also considered an excellent sport fish. They can directly breathe air and thus can stay alive for many hours without water.

Breeding : Breeds from April till June in specially built floating nests of weeds and leaves in which the orange yellow eggs are deposited.

Diagnostic characters : Large fish with a large, flattened snake like head and wide mouth. Colour greatly varies with environment, generally brown or greenish grey above, paler below, 4 to 5 large ocelli, dark brown with a hinder margin, lighter than ground colour on lateral line. L.l. 60-70.

31. ***Channa striatus*** (Ham.) – **Shol**

Size : Grows to maximum 75 cm; normally they measure about 40 cm.

Habitat : Freshwaters : rivers, beels, tanks, ponds, kharies, large ditches and also in rivers.

Behaviour : Favours deep and still water. It is solitary, aggressive and highly predatory. The nesting pairs are known to attack when encountered. They also feed on other fish.

Breeding : The female matures at the age of one year. They breed during the rains. The eggs are amber coloured and over a thousand are laid in a nest of weeds, built in a tunnel like hollow.

Diagnostic characters : Dark greyish black above, dirty white and yellowish white beneath, greyish bands descend from sides to abdomen, fins greyish, a large black blotch may be found at the end of the base of dorsal fin when young. L.l. 50-57.

32. ***Channa punctatus*** (Bloch) – **Lata**

Size : Grows to 30 cm.

Habitat : Freshwaters : pond, ditches, lakes, rivers and estuaries.

Behaviour : Spotted snakeheads are generally solitary and predacious. They can stay a long period of time without water. They are also capable of leaping high and long out of water, when confined and turning around and biting the hand when caught. They feed mainly on other fish.

Breeding : Breeds throughout the year. It does not build a nest. The amber coloured floating eggs are laid in shallow water with a silty substrate.

Diagnostic characters : Colour varies with environment, generally greenish grey becoming yellow below, a dark stripe along the side of head and several short cross bands from back to middle of body, fins spotted. L.l. 37-40.

Family CENTROPOMIDAE

Barramundis have oblong, elevated, moderately compressed body. Ctenoid scales on head to orbit only and body. Opercle with a strong spine. Anal and dorsal fins with a scaly sheath.

33. ***Lates calcarifer*** (Bloch) – **Bhetki**

Size : Grows to 152 cm.

Habitat : Coastal waters, estuaries and lagoons.

Behaviour : Carnivorous.

Breeding : Breeds in June-July. It comes down to the sea and spawn there. Spawning takes place in inshore water near the mouths of rivers during the rains.

Diagnostic characters : Ctenoid scales but not deciduous, lateral line uninterrupted extending to caudal fin. Colour green-like above and silvery below, eyes bright pink.

Family NANDIDAE

Commonly called leaf-fishes have outwardly protruded large mouth and large spiny dorsal fin and rounded tail fin.

34. ***Nandus nandus*** (Ham.) – **Nadosh**

Size : Grows to maximum 20 cm.

Habitat : Fresh and brackish water : rivers, beels, tanks, ponds, paddy fields and kharies.

Behaviour : The leaf fish is generally shy and retiring fish, solitary and predatory in nature. It prefers to stay close to the rock and at the bottom in rather dark corners.

Breeding : Breeds during monsoon and very much common in summer months.

Diagnostic characters : Greenish brown with bronze to brassy reflections (when alive), 3 vertical broad bands (patches) over the body, a dark blotch on the free portion of tail, narrow bands or spots across the fins. L.l. 46-57.

Family CICHLIDAE

It is a very large family of tropical freshwater fish, popularly known as cichlids. The species of this family vary enormously in size and shape. Some examples include exotic aquarium fishes such as the angelfish, oscar etc.

35. *Oreochromis mossambica* (Peters) – **Tilapia/Telapia**

Size : Grows to maximum 25 cm, the normal size being much smaller.

Habitat : Freshwaters : tanks, ponds, kharies, floodwaters, ditches, mostly cultured areas.

Behaviour : The adults are aggressive and territorial, intolerant of both their own kind and other fish. The males scoop out circular pits in shallow water, which they then defend from intruders. Their large mouth enables them to carry away stones and debris while clearing the pits. They are omnivorous and dominate the water bodies where they occur.

Breeding : Breeds throughout the year. The females carry the fertilized eggs inside the large mouth and do not feed at that time.

Diagnostic characters : Greenish-olive to golden, each scale with a dark centre, vertical fins blackish with indistinct white spots, younger ones with one ovate black spot behind the base of the last dorsal spine. L.l. 28-36 (interrupted).

Family MUGILIDAE

Commonly called Mullets. Body oblong to elongate and compressed. Two dorsal fins short and widely separated.

36. *Liza parsia* (Ham.) – **Parshey**

Size : Grows to 40 cm.

Habitat : Estuarine water : shallow coastal water and lagoons.

Behaviour : Carnivorous.

Breeding : Breeds during winter. It comes down to sea and spawns there.

Diagnostic characters : Body slender, head dorsoventrally flattened, greenish above with 3-6 stripes along row of scales. L.l. 31-36.

37. ***Liza tade*** (Forsskal) – **Bhangon**

Size : Grows to 47 cm.

Habitat : Estuarine water : shallow coastal water and lagoons.

Behaviour : Carnivorous.

Breeding : Breeds during winter. It comes down to sea and spawns there.

Diagnostic characters : Slender and elongated body, head much depressed and pointed. Body greenish brown above with a dark line along each row of scales. L.l. 30-35.

38. ***Rhinomugil corsula*** (Ham.) – **Kharsula**

Size : Grows to 31 cm.

Habitat : Freshwater : rivers and ponds.

Behaviour : Surface feeder and carnivorous.

Breeding : Breeds in winter in river.

Diagnostic characters : Body stout, head concave between eyes and the eyes projecting above the concave level. Dark brown dorsally and silvery below. L.l. 48-52.

39. ***Mugil cephalus*** Linn. – **Parshey**

Size : Grows to 91 cm.

Habitat : Seas, estuaries and rivers.

Behaviour : Carnivorous.

Breeding : Breeds in winter. During breeding season it comes down to sea.

Diagnostic characters : Body robust, head broad and much flattened. Olive green on back. 6-7 indistinct brown bands on the flanks. L.l. 38-42.

Family POLYNEMIDAE

Thread fins have oblong and somewhat compressed body. Head and body covered with small ctenoid scales. Pectoral fins divided into two sections, upper with rays attached and lower 3–7 extremely elongate, free filamentous rays. When the fish swims slowly in open water the free lower rays spread apart like the ribs of an umbrella.

40. ***Eleutheronema tetradactytum*** (Shaw) – **Gurjali**

Size : Grows to 180 cm.

Habitat : Inhabits sandy shore and muddy estuary.

Behaviour : Carnivorous.

Breeding : Breeds in August-September and during breeding it comes up to the estuary from sea.

Diagnostic characters : Body large, elongate and slightly compressed, eyes large. Silvery green above and yellowish white on belly and sides.

Family GOBIIDAE

Bottom-dwelling fishes, popularly called gobies. Gobies are generally cylindrical with a large head, relatively dorsally placed eyes, a two-lobed dorsal fin and a rounded tail fin.

41. ***Glossogobius giuris*** (Ham.) – **Beley**

Size : Grows to 30 cm.

Habitat : Fresh water : rivers, tanks, beels, ponds and kharies.

Behaviour : Generally sluggish in nature, taking advantage of its camouflaging colouration. The adults are bottom dwellers and prefer sandy and muddy substrate while the juveniles rest close to the shore of shallow water. They are predatory in nature and feed on other fishes.

Breeding : Known to enter the sea, possibly to breed. The eggs are green in colour and are firmly attached to the submerged objects such as logs.

Diagnostic characters : A long tapering fish with a somewhat vertically compressed and pointed head. Pelvic fins united and disc like and jugular in position. Transparent yellowish grey with 4 to 6 blotches on the body along the lateral line; L.l. 30-34.

Family ANABANTIDAE

Commonly called climbing perches. They have labyrinthine organ which helps to breathe in air. These are cylindrical fishes with large heads and gill covering that are often armed with spines. The dorsal fin also bears well-developed spines.

42. ***Anabas testudineus*** (Bloch) – **Koi**

Size : Grows to maximum 25 cm. but they are normally much smaller.

Habitat : Swamp, ditches, beels, kharies, tanks, ponds and estuaries.

Behaviour : The adults are solitary and aggressive and are associated with turbid and stagnant water over grown with aquatic vegetation. This is capable of breathing air directly and survives many hours without water. It is known to walk across land in search of water during summer. Using the spine of gill cover the adults can wriggle up crevices and even into hollow tree trunks that are close to water, thus earning the title of climbing perch.

Breeding : The eggs are scattered in open water at the onset of rains without any nest. The male wraps itself on the female's body, fertilizing the eggs as they are laid.

Diagnostic characters : Obong body, laterally compressed with wide head. Greyish green above, greenish yellow or reddish yellow below, 4 wide cross bands on body. Sometimes a black spot on caudal base; L.l. 28-32.

Family BELONTIDAE

Popularly called labyrinth fishes. They are air breathers owing to the presence of labyrinthine organ. They build bubble-nests.

43. *Colisa fasciatus* (Schneider) – **Khalisa**

Size : Grows to maximum 5 cm.

Habitat : Freshwaters : beels, kharis, tanks, ponds, ditches and rivers.

Behaviour : Generally peaceful in nature and given to staying in shoals. It is also shy and often hides beneath aquatic plants. Individuals move up together, cautiously, with the pectoral fins projected forward and held stiffly like feelers, come to the surface, take in air and then dive deep down to the bottom of the pool. This is a bubble nest builder and the adults disperse widely during the flood.

Breeding : The eggs are laid within a bubble nest that is built on the surface between submerged plants. The males guard the nest, eggs and young until the fry are able to swim freely.

Diagnostic characters : Greenish or bluish above, dirty white below, 14 or more orange (mixed with red) coloured vertical bands descend obliquely downwards from back to belly and bordered by blue bands, eyes red, ventral fins edged with red, dorsal and caudal fins spotted with orange. L.l. 29-31.

Family MASTACEMBELIDAE

Popularly called spiny eels. These are built like snakes, with long and soft snouts.

44. *Mastacembelus armatus* Lacepede – **Banmachh, Bam/Bami**

Size : Grows to 75 cm.

Habitat : Fresh water : rivers; beels, tanks, kharies, ponds, ditches.

Behaviour : The fish is solitary in nature swimming mostly in the mid waters and prefers water bodies with sand, boulder or pebble substrate. The adults tend to hide within cavities of burrow into the bottom while at rest. They feed along the bottom and sides, by probing the detritus with their long snouts. They are fond of taking live food, especially worms buried in the bottom. They move about at night.

Breeding : The females carry eggs and are stouter and sometimes the eggs are visible through the pale skin.

Diagnostic characters : An eel shaped elongated fish, rich brownish above and light grey below and sides, undulating dark brown patterns between back and lateral line, more prominent at the posterior end; a black narrow line through the eye.

45. ***Macrognathus pancalus*** Ham.– **Pankal/Turi**

Size : Grows to 18 cm.

Habitat : Fresh water : rivers, beels, tanks, kharies, ponds, ditches.

Behaviour : Solitary in nature swimming mostly in the mid waters and prefers water bodies with sand, boulder or pebble substrate. They feed along the bottom and sides, by probing the detritus with their long snouts. They are fond of taking live food.

Breeding : Not yet known.

Diagnostic characters : An eel shaped fish with tapering head and tail. Greenish olive above, yellowish below, yellowish white spots on scales.

46. ***Macrognathus aral*** (Bloch) – **Goichi**

Size : Grows to 38 cm.

Habitat : Fresh water : rivers, beels, tanks, kharies, ponds, ditches.

Behaviour : Solitary in nature swimming mostly in the mid waters and prefers water bodies with sand, boulder or pebble substrate. They feed along the bottom and sides, by probing the detritus with their long snouts. They are fond of taking live food.

Breeding : Not yet known.

Diagnostic characters : An eel shaped fish, devoid of preorbital spine, with distinct lateral line and shorter lower jaw.

REFERENCES

Anon, 1962. The Wealth of India, Raw materials, vol. IV, CSIR Publication, New Delhi.

Alfred, J.R.B. and Nandi, N.C. 2001. Wetlands : Freshwater : ENVIS – Zoological Survey of India in Ecosystems of India, 165-193.

Daniels, Ranjit. R.J. 2002. India – a lifescape : Freshwater Fishes of Peninsular India, University Press, Hyderabad.

Jayaram, K.C. 1999. The freshwater fishes of Indian Region, Narendra Publishing House, Delhi.

Nandi, N.C., Das, S.R., Bhuniya, S. and Dasgupta, J.M. 1993. Wetland faunal resources of West Bengal. 1. North and South 24-Parganas districts. *Rec. Zool Surv. India*, Occ paper No. **150** : 1-50.

Nandi, N.C., Venkataraman, K., Das, S.R. Bhuniya, S. and Das, S.K. 1999. Faunal resources of West Bengal. 2. Some selected wetlands of Haora and Hugli district. *Rec. Zool. Surv. India*, **97**(4) : 1-43.

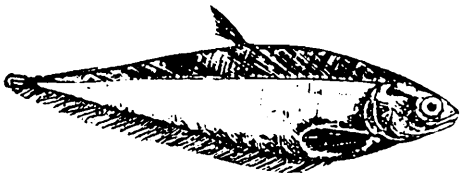
Talwar, P.K. and Jhingran, A.G. 1994. Inland fishes of India and adjacent countries, Oxford and IPH Publishing Co. Pvt. Ltd.

Yazdani, G.M. 1986. Freshwater fishes in Wildlife Wealth of India (Resource & Management), Ed. By Trilok Chandra Majupuria.

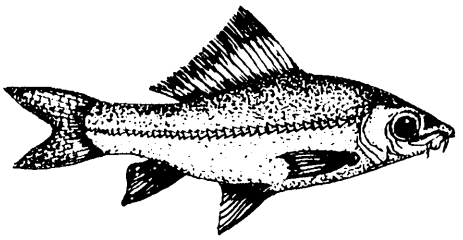
Yazdani, G.M. and Singh, D.F. 1990. On the fish resources of Ujaini wetland, Pune (Maharashtra). *Journal of Bombay Natural History Society*, **87** : 157-160.

Yazdani, G.M. and Singh, D.F. 2002. Fishes : Zoological Survey of India, *Wetland Ecosystem, Series No. 3 : Fauna of Ujaini*, **1** : 143-156.

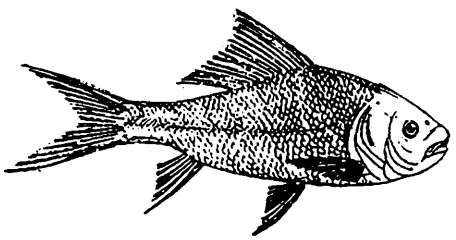
PLATE I



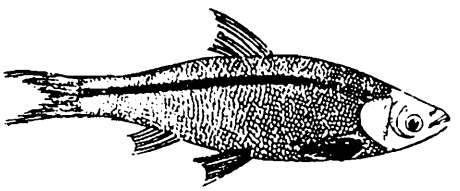
Notopterus notopterus



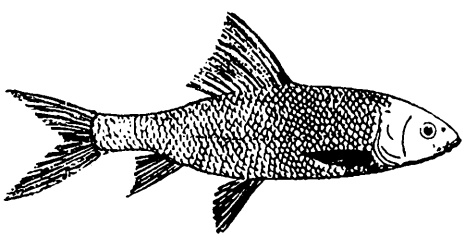
Labeo calbasu



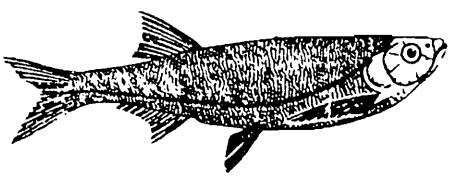
Catla catla



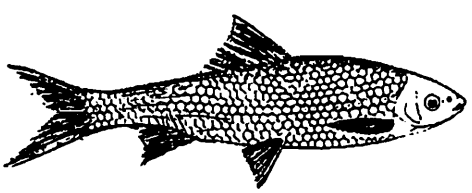
Amblypharyngodon mola



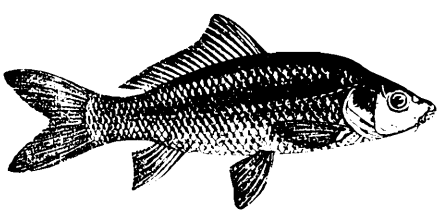
Cirrhinus mrigala



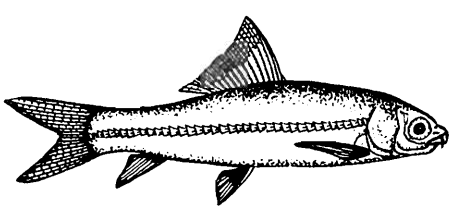
Salmophasia bacaila



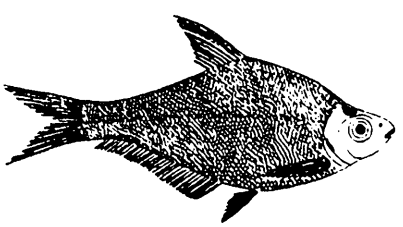
Cirrhinus reba



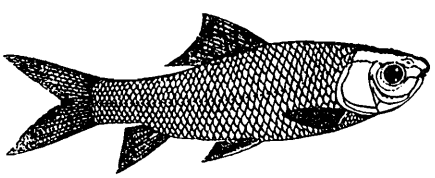
Cyprinus carpio



Labeo bata

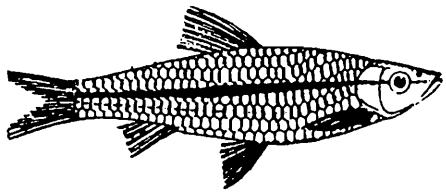


Osteobrama cotio

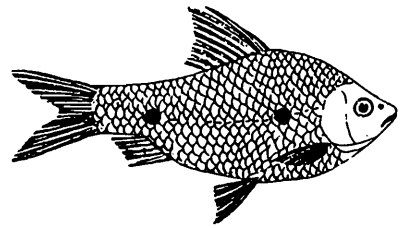


Labeo rohita

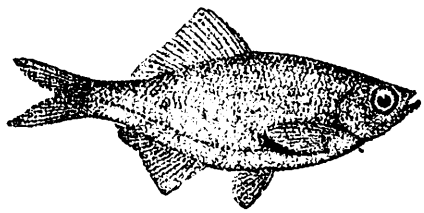
PLATE II



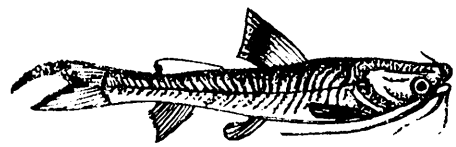
Rasbora daniconius



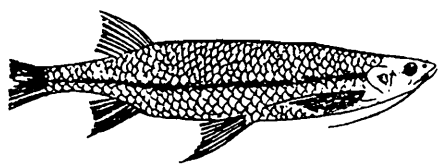
Puntius ticto



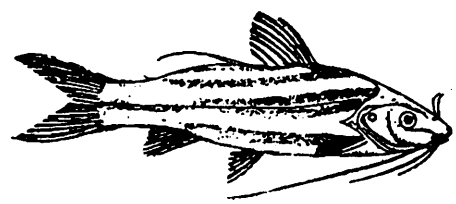
Danio devario



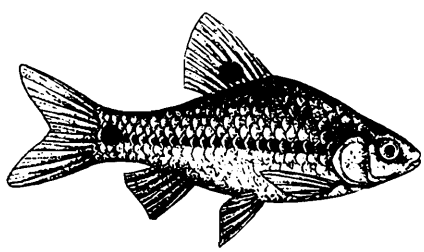
Sperata seenghala



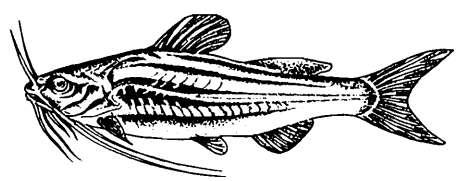
Esomus danricus



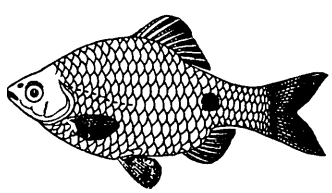
Mystus vittatus



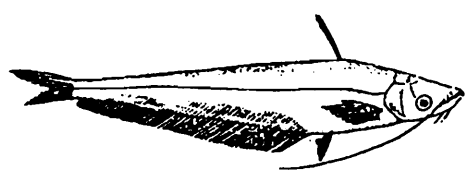
Puntius sophore



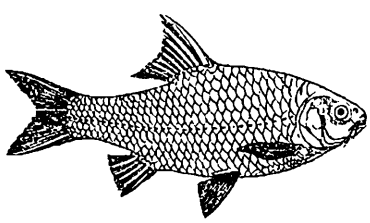
Mystus tengara



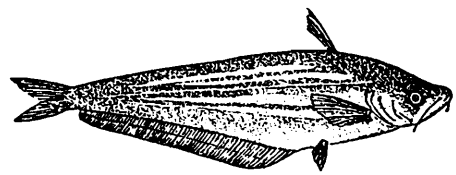
Puntius conchonius



Ompok bimaculatus

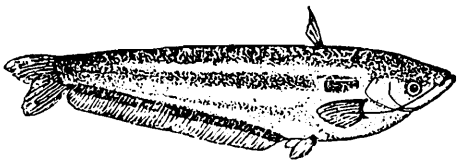


Puntius sarana



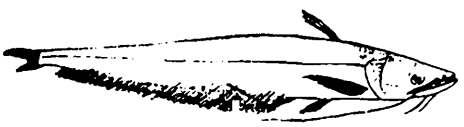
Ompok pabo

PLATE III



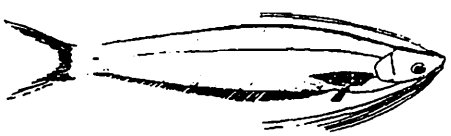
Ompok pabda

Channa marulius

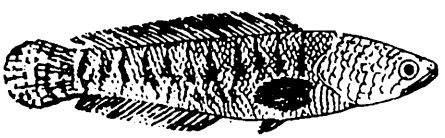


Wallago attu

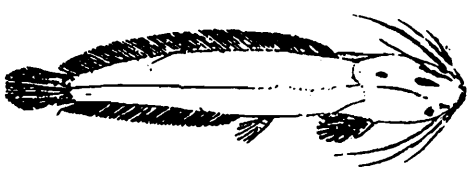
Channa striatus



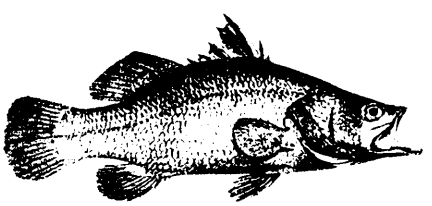
Ailia coila



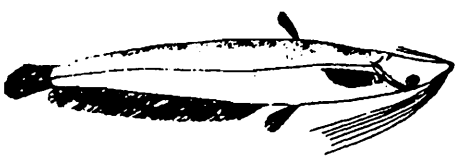
Channa punctatus



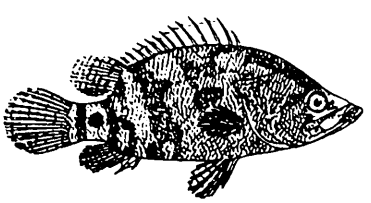
Clarias batrachus



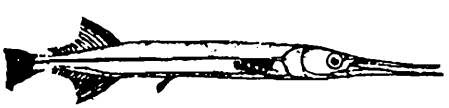
Lates calcarifer



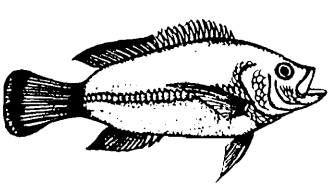
Heteropneustes fossilis



Nandus nandus

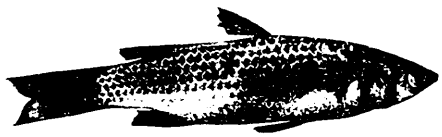


Xenentodon cancila

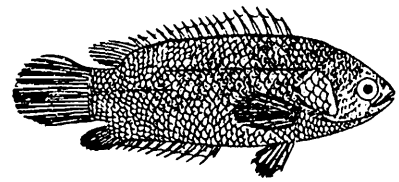


Oreochromis mossambica

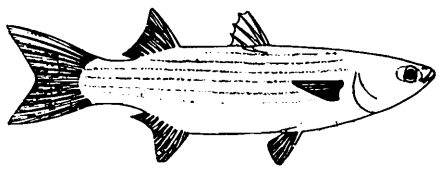
PLATE IV



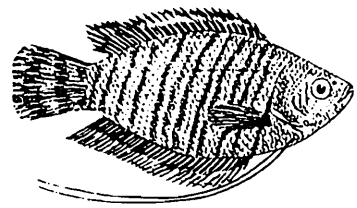
Liza parsia



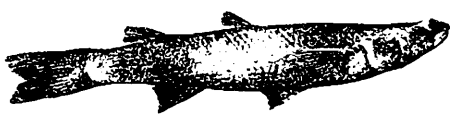
Anabas testudineus



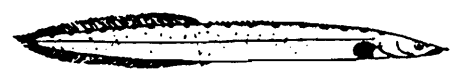
Liza tade



Colisa fasciatus

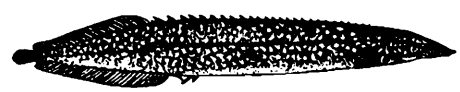


Rhinomugil corsula

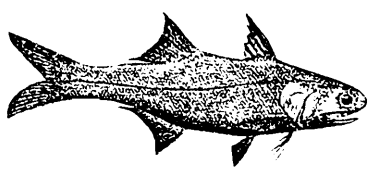


Mastacembelus armatus

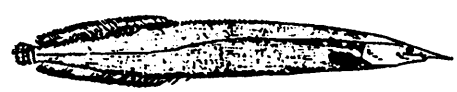
Mugil cephalus



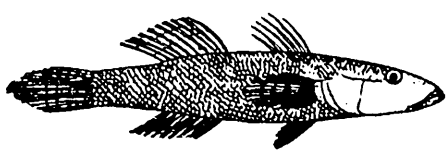
Macrognathus pancalus



Eleutheronema tetradactylum



Macrognathus aral



Glossogobius giuris

Rec. zool. Surv. India : **108**(Part–4) : 105-112, 2008

ON FOUR NEW NEMATODE SPECIES OF THE GENUS *DIPLOTRIAENA* RAILLIET AND HENRY, 1909, FROM UTTARAKHAND, INDIA

S. R. DEYSARKAR* AND DEBABRATA SEN

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053

INTRODUCTION

In the course of a faunistic survey in Almora, Champawat and Pithoragarh districts of Uttarakhand (then Uttar Pradesh) was undertaken during March-April, 1990, several helminth parasites were collected by thr first author from a number of birds and mammals of that region. The present paper deals with the descriptions of four new species of avian nematodes belonging to the genus *Diplotriaena* Railliet and Henry, 1909.

All measurements are in millimeter.

SYSTEMATIC ACCOUNT

Order SPIRURIDA

Superfamily DIPLOTRIAENOIDEA

Family DIPLOTRIAENIDAE (Skrjabin, 1916, subfam.) Anderson, 1958

Subfamily DIPLOTRIAENINAE SKRJABIN, 1916

Genus *DIPLOTRIAENA* Railliet and Henry, 1909

1. *Diplotriaena champawatensis* sp. n.

(Fig. 1. a, b and c)

Material : Holotype 1 male; Z.S.I. Reg. No. WN 972; host : Himalayan Whistling Thrush, *Myiophoneus caeruleus temmincki* (Aves: Passeriformes: Muscicapidae); location body cavity; locality-Champawat, district Champawat, Uttarakhand; Coll. S. R. Dey Sarkar; 12. 04 1990; paratypes 3 females; Z. S. I. Reg. No. WN 973; other details as in the holotype.

*Present Address : *2/24, Rashmoni Bazar Road, Kolkata-700 010*

Diagnosis : Body finely striated and rounded at both extremities; no lips; one pair of cephalic papillae on each side of the head; trident-like structures present on either side of anterior end of oesophagus and opening by pores on either side of the oral opening; the prongs of the tridents being equal, striated and with rounded tips; oesophagus divided into two parts; eight pairs of caudal papillae in male; spicules unequal, dissimilar and non-alate; vulva at glandular oesophageal portion of the body.

Description : Male. Body 23.84 mm long, 0.56 mm wide; tridents two in number, prongs equal, striated and with rounded tips, 0.272 mm long; nerve ring at 0.288 mm from the anterior end; oesophagus divided into two parts, an anterior, narrower and muscular, 0.288 mm long, 0.048 mm wide, and a posterior wider, glandular, 1.472 mm long, 0.16 mm wide; entire oesophagus 1.76 mm long; spicules unequal and dissimilar, left longer, tubular, ventrally curved, 1.312 mm long, non-alate with pointed tip; right spicule smaller, cork-screw shaped, about 1½ turns, 0.72 mm long in straight line and 0.88 long in curvature, non-alate; cloaca sub-terminal at 0.117 mm from the posterior end; caudal papillae 8 pairs, 2 pairs pre-anal and the rest post-anal in position.

Female : Body 46.56–56.64 mm long, 0.75–0.80 mm wide; trident as in the male, 0.176–0.240 mm long; nerve ring at 0.272–0.30 mm from anterior end; vulva at 0.528–0.560 mm from anterior end; anus terminal; eggs embryonated, 0.032 × 0.048 mm in diameter.

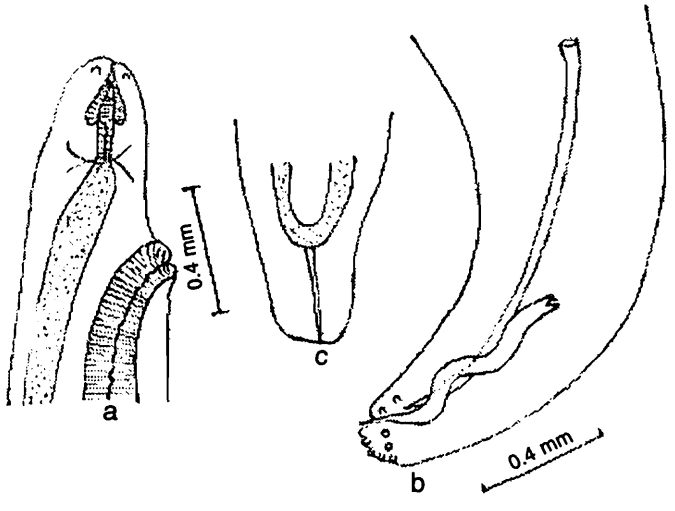


Fig. 1. : *Dipletriaena champawatensis* sp. n. a. Anterior end of female, showing vulva; b. Pesterior end male; c. Posterior end of female.

Discussion : The present species differs from all other recorded species of the genus in various body measurements and in the number and arrangement of caudal papillae in the male. Hitherto, two species *Diplotriaena mukteswarensis* Singh, 1962 and *Diplotriaena nepalensis* Soota and Chaturvedi, 1967 are described from the same specific host i. e., *Myiophoneus caeruleus temmincki*

from India (Mukteswar- Kumaun, Uttarakhand) and Nepal respectively. The present species differs from them in the following respect: in *D. mukteswarensis* the left spicule is smaller (0.979 mm vs. 1.312 mm), caudal papillae 6 pairs, 2 pairs preanal, 2 pairs adanal large and 2 pairs postanal in position where as the present species having 8 pairs of caudal papillae of equal size, 2 pairs preanal and the rest postanal; in *D. nepalensis* body is longer (38.2 mm vs. 23.84 mm), both the spicules are smaller (left 1.0 mm and right 0.64 mm long vs. left 1.312 mm and right 0.72 mm long), caudal papillae 5 pairs (4 + 1 + 0 vs. 8 pairs (2 + 0 + 6).

It is therefore, regarded as new and a specific name *Diplotriaena champawatensis* sp. n. is being proposed to accommodate it.

2. ***Diplotriaena zootherae*** sp. n.

(Fig. 2. a and b)

Material : Holotype 1 male; Z.S.I. Reg No. WN 974; host: Orange headed Ground Thrush, *Zoothra citrina citrina* (Aves : Passeriformes : Muscicapidae); location coelomic cavity, near heart; locality Champawat (ca.1370 m), district Champawat, Uttarakhand; Coll. S. R. Dey Sarkar; 12.04.1990.

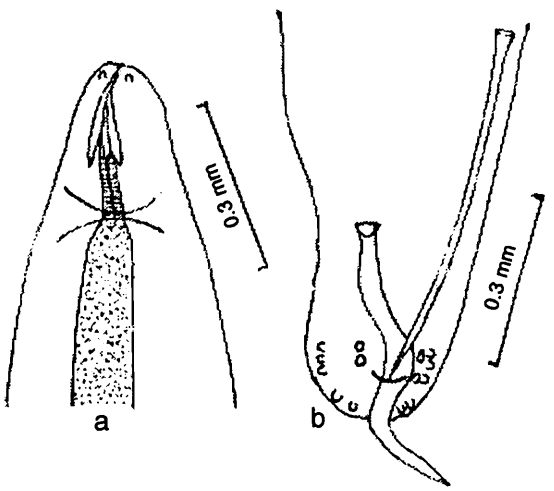


Fig. 2. : *Dipletriaena zootherae* sp. n. a. Anterior end and b. Posterior end of female.

Diagnosis : Body long, delicate, unstriated and rounded at both extremities; mouth simple without lips; the prongs of the tridents equal, unstriated and distally pointed; oesophagus divided in to two parts; 7 pairs of caudal papillae in male, 5 pairs pre-anal and 2 pairs post-anal; spicules unequal and dissimilar.

Description : Male. Body 25.44 mm long, 0.352mm wide; tridents two in number, prongs equal, smooth and with pointed tips, 0.272 mm long; nerve ring at 0.24 mm from the anterior end;

oesopgagus divided into two parts, an anterior muscular and narrower, 0.32 mm long, 0.032 mm wide and a posterior wider and glandular, 1.92 mm long; entire oesophagus 2.24 mm long; spicules unequal and dissimilar, the left being longer, more or less straight, 0.656 mm long, the right shorter, spiral about one turn, 0.448 mm long in straight line and 0.528 mm in curvature; cloaca subterminal, 0.112 mm from the posterior end; caudal papillae 7 pairs of equal size, 5 pairs pre-anal and two pairs post-anal, terminal; of the pre-anals 2 pairs ventral and 3 pairs lateral in position.

Female : Unknown.

Discussion : Though a single specimen was available for study, the present species differs from the closely related species thus: from *Diplotriaena mukteswarensis* Singh, 1962, in the size of spicules, size and shape of the prongs of the tridents, and in the number and position of the caudal papillae (in *D. mukteswarensis*, male body 24.042 mm long, prongs of the tridents equal, 0.196 mm long, spicule left 0.979 mm and right 0.745 mm long; caudal papillae 6 pairs (2 + 2 + 2); from *Diplotriaena chandragiriensis* Soota and Chaturvedi, 1971, in the size of spicules, number and arrangement of caudal papillae (in *D. chandragiriensis* male body 22.0 mm long, spicules left 0.77 mm and right 0.55 mm long; caudal papillae 5–6 pairs [4 + 0 + (1 – 2)].

Hence, it is regarded as new to science and a specific name *Diplotriaena zootherae* sp. n. is being proposed to accommodate it.

3. ***Diplotriaena niltavae*** sp. n.

(Fig. 3. a, b and c)

Material : Holotype 1 male; Z.S.I. Reg. No. WN 975; host- Large Niltava, *Niltava grandis grandis* (Aves : Passseriformes : Muscicapidae); location abdominal cavity; locality–Champawat (ca. 1370 m), district Champawat, Uttarakhand; coll. S. R. Dey Sarkar; 11.04.1990; paratypes 2 males, 2 females, Z.S.I. Reg. No. WN 976; other details as in the holotype.

Diagnosis : Body delicate and smooth; two pairs of cephalic papillae on either side of the head; tridents with equal unstriated prongs and rounded tips; anterior end rounded and posterior end truncate in both sexs; caudal papillae 12 pairs; spicules unequal and dissimilar, the left being longer, almost straight and the right smaller, stouter and spiral about one turn; vulva of female in the glandular oesophageal portion of the body.

Description : Male. Body 24.0–24.4 mm long, 0.496–0.512 mm wide; tridents two in number, 0.128 mm–0.144 mm long; prongs equal, unstriated and with rounded tips; nerve ring at 0.224 mm–0.240 mm from the anterior end; oesophagus divided into an anterior narrower and muscular and a posterior glandular and wider portion; the anterior muscular portion 0.352 mm long, 0.032 mm wide and the posterior portion 2.288 mm long, 0.064 mm wide; entire oesophagus 2.64 mm long; spicules unequal, dissimilar, non-alate, with pointed tips; the left longer, 0.656–0.720 mm

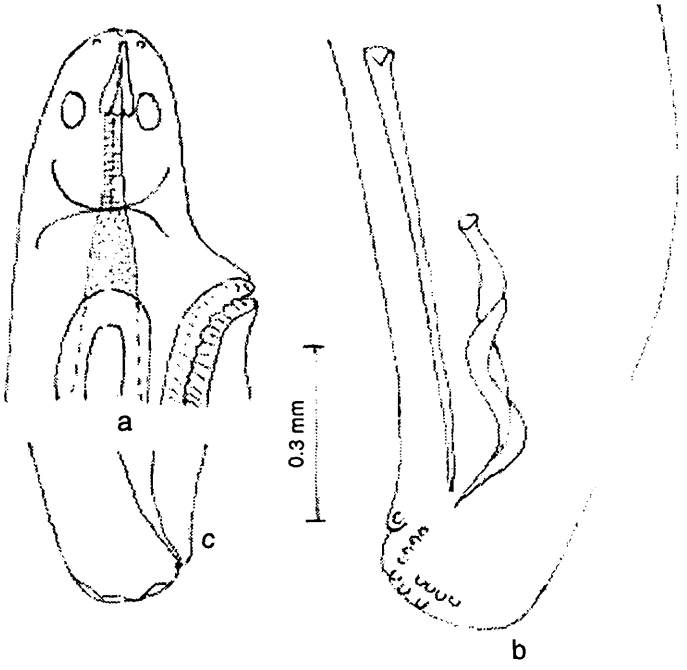


Fig. 3. : *Dipletriaena niltavae* sp. n. a. Anterior end of female, showing vulva; b. Pesterior end of male; c. Posterior end of female.

long, almost straight and the right being stouter and spiral about one turn, measuring 0.464–0.496 mm in straight line; cloaca subterminal at 0.08–0.112mm from the posterior end; caudal papillae 12 pairs, one pair pre-anal on the cloacal lip and the rest post-anal, of the post-anals 4 pairs ventral, 4 pairs lateral and 3 pairs terminal in position.

Female : Body 36.0–36.4 mm long, 0.72–0.80 mm wide; tridents as in the male, 0.128–0.144 mm long; nerve ring at 0.256 mm from the anterior end; oesophagus as in the male, the junction of oesophagus and intestine not traceable due to heavy deposition of eggs; vulva at 0.40–0.448 mm from the anterior end; anus almost terminal; eggs 0.024–0.032 mm × 0.032–0.048 mm in diameter.

Discussion : The species under study approaches nearer to *Diplotriaena mukteswarensis* Singh, 1962, *Diplotriaena chandragiriensis* Soota and Chaturvedi, 1971 and *D. doonensis* Soota and Tripathi, 1975 in the relative body size and of the size of the prongs of the tridents, but it differs from them in the number and arrangements of caudal papillae in the male and the relative size of the spicules. It is nearer to *D. molpastisi* Majumdar and Chakravarty, 1963 in the size of spicules (in *D. molpastisi* left spicule 0.65mm and the right spiocule 0.45 mm long), but differs from it in various body measurements, size and shape of the prongs of the tridents, number and arrangement of caudal papillae (in *D. molpastisi* tridents 0.15 mm long and the prongs being corrugated, caudal papillae 10 pairs, 4 pairs pre-anal and 6 pairs post-anal. Further, it is closer to *D. tricuspis* (Fedchenko, 1874) Seurat, 1915, in the number of caudal papillae in male but differ from it thus:

in various body measurements, in the arrangement of caudal papillae, *D. tricuspis* having a variable number of caudal papillae, 9–14 pairs, of them 3–4 pairs being pre-anal; in having longer spicules, left 1.0–2.5 mm and right 0.55–0.96 mm long, but the present species having 12 pairs of caudal papillae, one pair pre-anal and the rest post-anal and left spicule up to 0.72 mm and the right up to 0.496 mm long. Therefore, the present species regarded as new and a new specific name *Diplotriaena niltavae* sp. n. is proposed to accommodate it.

4. ***Diplotriaena almoraensis*** sp. n.

(Fig. 4. a, b)

Material : Holotype 1 male; Z.S.I. Reg No. WN 977; host–Tit, *Parus major*, (Aves : Passeriformes : Paridae); location–body cavity; locality–Dinapani (1859 m), 10 km North-East of Almora, district Almora, Uttarakhand; coll. S. R. Dey Sarkar; 03.04.1990; paratype: posterior fragment of a male; Z.S.I. Reg. No. WN 978; other particulars as in the holotype.

Diagnosis : Body long, delicate and smooth; mouth simple without lips; tridents with unstriated equal prongs and rounded tips; anterior end round and posterior end truncate; oesophagus divided; caudal papillae 5 pairs, 1 pair pre-anal and 4 pair post-anal; spicules unequal and dissimilar.

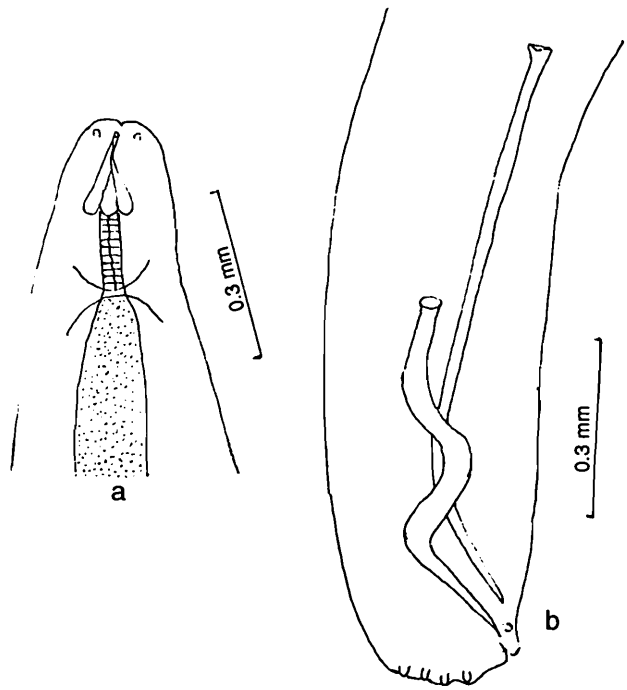


Fig. 4. : *Dipletriaena almoraensis* sp. n. a. Anterior end of and b. Pesterior end of male.

Description : Male. Body 39.2 mm long, 0.32 mm wide; tridents with unstriated equal prongs, and rounded tips, 0.16 mm long; nerve ring at 0.32 mm from the anterior end; oesophagus divided, anterior portion narrower and muscular, 0.32 mm long, and the posterior portion wider and glandular, 1.28 mm long; entire oesophagus 1.60 mm long; spicules unequal and dissimilar, the left longer, ventrally curved, 0.848–1.072 mm long and the right being shorter and spiral about one turn, 0.448–0.560 mm long; spicules ratio about 1 : 1.9; caudal papillae 5 pairs, 1 pair pre-anal and 4 pairs post-anal, terminal in position; cloaca at 0.08 mm from the posterior end.

Female : Unknown.

Discussion : The present species comes closer to *Diplotriaena doonensis* Soota and Tripathi, 1975, in number and arrangement of caudal papillae but differs from it in body length, size and shape of the prongs of tridents, size and ratio of spicules (in *D. doonensis* body being 21.6–24.0 mm long in males; prongs equal with transverse markings, 0.19–0.20 mm long; spicules, left 0.88 mm and right 0.6–0.66 mm long and their ratio being 1 : 1.5). It also approaches nearer to *D. kumaunensis* Singh, 1962, *D. nepalensis* Soota and Chaturvedi, 1967 and *D. chandragiriensis* Soota and chaturvedi, 1971, in number of caudal papillae, but differs from them in the arrangement of caudal papillae and their relative body measurements and the length of spicules (in *D. kumaunensis* male body being 22.1mm long, length of prongs of tridents 0.15mm, left spicule 0.623 mm and right spicule 0.418 mm long, caudal papillae 5 pairs (= 3 + 1 + 1); in *D. nepalensis* male body being 38.2 mm long, prongs 0.18 mm long, left spicule 1.0mm and the right spicule 0.64 mm long, caudal papillae 5 pairs (= 4 + 0 + 1); in *D. chandragiriensis* male body 22.0 mm, prongs 0.13 mm, left spicule 0.77mm and the right spicule 0.55mm long, caudal papillae 5–6 pairs [= 4 + 0 + (1 – 2)]. It also differs markedly from all other species known under the genus and from different hosts in the number of caudal papillae and size and shape of spicules.

Therefore, the present species is regarded as different from all known forms under the genus *Diplotriaena* Railliet and Henry, 1909, and is named *Diplotriaena almoraensis* sp. n.

SUMMARY

The paper deals with four new species of the genus *Diplotriaena* Railliet and Henry, 1909, of avian nematodes from Almora and Champawat districts, Uttarakhand, India.

ACKNOWLEDGEMENT

The authors are thankful to the Director, Zoological Survey of India, Kolkata, for giving laboratory facilities during this work. Due gratitude is also expressed to Dr. Amalendu Chatterjee,

Scientist–E, Officer-in Charge and other members of Nemathelminthes Section, Z.S.I., for their co-operation and help.

REFERENCES

Baylis, H. A. 1939. Fauna of British India including Cylon and Burma. Nematoda. Vol. II (Filarioidea, Dictophymoidea and Trichinelloidea). Published by Taylor and Francis, London. Also published by Today Tomorrow's Printers and Publishers, New Delhi. 274 pp.

Majumdar, G and Chakravarty, G. K. 1963. New nematodes from birds. Pt. I. *z. f. Parasitenkunde*, **23** : 1-10.

Singh, K. S. 1962. Parasitological Survey of Kumaun Region. Part-I. On three new species of the genus *Diplotriaena* Railliet and Henry, 1909 (Diplotriaeninae: Filariidae : Nematoda) from birds of Mukteswar. *Indian Journal of Helminthology*, **14,** No. I : 16-23.

Soota, T. D. and Chaturvedi, Y, 1967. On two new nematode species of the genus *Diplotriaena* Railliet and Henry, 1909, from Nepal and India. *J. Zool. Soc. India,* **19** (1 & 2) : 133-136.

Soota, T. D. and Chaturvedi, Y, 1971. Description of a new nematode of the genus *Diplotriaena* Railliet and Henry, 1909, and notes on the taxonomic status of another nematode *Porrocaecum haliasturi* Gupta, 1960. *J. Zool. Soc. India,* **23**(1) : 21-23.

Soota T. D. and Triparhi, 1975. On some nematode from Doon valley, Uttar Pradesh, India. *Proc. Zool. Soc.,* Calcutta, **28** : 103-109.

Yamaguti, S. 1961. Systema Helminthum. III. The Nematodes of Vertebrates. Pt. I & II. 1261 pp. Interscience Publishers, Inc. New York.

Rec. zool. Surv. India : **108**(Part–4) : 113-117, 2009

NEW RECORDS OF ODONATA (ANISOPTERA) FROM MAHARASHTRA

R. BABU, CHAYA SINHA AND M. PRASAD*

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053, India

INTRODUCTION

The Odonata (dragonflies and damselflies) is a small order of insects and they are more common in warmer parts of the world than in temperate areas. A variety of characteristics separate dragonflies from the rest of the insect world and make them perfectly designed aerial predators. Dragonflies are among the most attractive and fascinating order of insects. Damselflies are slimmer, often smaller, and usually fly more slowly than dragonflies. Earlier information on the odonata fauna of Maharashtra state has been recorded by Fraser (1933, 1934 and 1936), Bhasin (1953), Mitra (1986), Prasad (1996), Kulkarni and Prasad (2002, 2005), and Kulkarni *et al.* (2002, 2004, 2005, 2006), who have reported a total of 86 species from the Maharashtra. The present paper reports five species of Odonates (Anisoptera) representing four genera under two families which have recorded for the first time from Maharashtra state.

MATERIALS AND METHODS

The materials studied in this paper were collected by various parties from Zoological Survey of India, Kolkata and Western Regional Station, Z.S.I., Pune and present in the National collections of Zoological Survey of India, Kolkata.

SYSTEMATIC ACCOUNT

Phylum ARTHROPODA

Class INSECTA

Order ODONATA

Suborder ANISOPTERA

*Present Address : *Sajjan Apartments, 81/A, Uma Kanta Sen Lane, Paikpara, Kolkata-700 030*

Superfamily AESHNOIDEA

Family GOMPHIDAE

Genus ***Anormogomphus*** Selys

1. ***Anormogomphus heteropterus*** Selys

1854. *Anormogomphus heteropterus* Selys, *Bull. Acad. Belg.*, **21** : 61.

1934. *Anormogomphus heteropterus,* Fraser, *Fauna Brit. India, Odonata,* **2** : 174-176.

Diagnostic characters : Eyes and ocelli brown; an obscure brown line at base of frons and in front of occiput. Prothorax sandy-yellow with obscure brownish transverse lines; thorax darker yellow with a grass-green tinge laterally; legs sandy-yellow with black spines; wings pale, pterostigma pale yellow between black nervures, covering 1-2 cells. Abdomen pale sandy yellow marked with dark brown spot on each side of segment 1, baso-lateral and broad apico lateral on segment 2, small blackish-brown spot on each side of apical border of segment 3 and 6. Anal appendage yellow.

Material examined : 1 ♀, Hammalwada, Aurangabad, 04.ix.1964, Coll. R.N. Chopra.

Distribution : INDIA : Arunachal Pradesh, Bihar, Himachal Pradesh, Maharashtra (Aurangabad), Orissa, Punjab and Uttarakhand.

Elsewhere : Pakistan.

Genus ***Onychogomphus*** Selys

2. ***Onychogomphus grammicus*** (Rambur)

1842. *Gomphus grammicus* Rambur, *Ins. Nevrop.* p. 164.

1854. *Onychogomphus grammicus,* Selys, *Bull. Acad. Belg.*, **21**(2) : 35.

1936. *Onychogomphus grammicus,* Fraser, *Fauna of Brit. India, Odonata,* **2** : 256-257.

Diagnostic characters : Labium yellowish; labrum, face and frons sandy yellow; base of frons, vertex and occiput black. Prothorax black, thorax yellow marked with black; legs yellow; wings hyaline, pterostigma yellow between black nervures, covering 5 cells. Abdomen tumid at base, segment 1 yellow with a basal black spot on each side, segment 2 with a trilobed yellow dorsal band tapering apically and lying between narrow black stripes, the sides broadly yellow, 3 to 6 yellow with broad black apical rings and a median spot on the jugal suture tapering laterally, basally and apically; 4 to 6 apical ring sends a prolongation forwards on either side which meets the jugal spot and encloses a yellow subdorsal spot; 7 to 10 ochreous or reddish yellow. Anal appendages as long as segment 9 and 10.

Material examined : 1 ♂, Ahmednagar, 15.iv.1983, Coll. A. R. Lahiri.

Distribution : INDIA : Central India, Northern India and Maharashtra (Ahmednagar).

Superfamily LIBELLULOIDEA

Family LIBELLULIDAE

Genus ***Indothemis*** Ris

3. ***Indothemis limbata limbata*** (Selys)

1891. *Trithemis limbata* Selys, *Ann. Mus. Civ. Genova*, **30** : 463.

1911. *Indothemis limbata,* Ris, *Cat. Coll. Selys* fasc., **13** : 530-531.

1936. *Indothemis limbata limbata,* Fraser, *Fauna Brit. India, Odonata*, **3** : 341-342.

Diagnostic characters : Labium, labrum, face, frons, occiput black, sides of face, frons and bases of mandible yellowish or pale brown; eyes black above, brown below; prothorax, thorax and abdomen uniformly black; legs black; wings hyaline, apices very narrowly blackish-brown for not more than one cell deep; base of wings dark mahogany-brown; pterostigma ochreous, paler along posterior border. Anal appendage black.

Material examined : 1 ♂, Lonavala, Poona, 16.x.1965, Coll. B.S. Lamba.

Distribution : INDIA : Arunachal Pradesh, Assam, Maharashtra (Pune), Mizoram, Orissa, Karnataka and West Bengal.

Elsewhere : Malaysia, Myanmar, Singapore and Thailand.

Genus ***Orthetrum*** Newman

4. ***Orthetrum japonicum internum*** MacLachlan

1894. *Orthetrum japonicum internum* MacLachlan, *Ann. Mag. Nat. Hist.*, **13**(6) : 431.

1936. *Orthetrum japonicum internum,* Fraser, *Fauna of Brit. India, Odonata,* **3** : 304-305.

Diagnostic characters : Labium and labrum ochreous, middle lobe labium dark reddish brown; face and frons olivaceous green. Prothorax black, thorax olivaceous green on mid-dorsum and antealar sinus, humeral region with a broad stripe of reddish-brown. Legs black; wings hyaline, extreme base tinted with dark amber-yellow; discoidal cell traversed in forewing. Abdomen broad at base, tapering to the anal end, entirely pulverulent bluish white, almost chalky white in adult.

Material examined : 2 ♂♂, Near forest nursery, Seminary Hills, Nagpur, 1.iv.2005, Coll. R. Babu.

Distribution : INDIA : Arunachal Pradesh, Assam, Maharashtra (Nagpur), Meghalaya, Nagaland and Western Himalaya.

Elsewhere : China, Japan, Myanmar, Nepal, Pakistan, Taiwan, Thailand and Vietnam.

5. ***Orthetrum testaceum testaceum*** (Burmeister)

1839. *Libellula testacea* Burmeister, *Handb. Ent.*, **2** : 859.

1890. *Orthetrum testaceum,* Kirby, *Cat. Odon.*, p. 39.

1910. *Orthetrum testaceum testaceum* Ris, *Cat. Coll. Selys Lib. Fasc.*, **10** : 181.

1936. *Orthetrum testaceum testaceum,* Fraser, *Fauna of Brit. India, Odonata,* **3** : 309- 310.

1954. *Orthetrum testaceum testaceum,* Lieftinck, *Treubia*, **22** (suppl.) : 138.

Diagnostic characters : Labium, labrum, face and frons yellowish or pale brown. Prothorax and thorax ferruginous; legs reddish brown. Wings hyaline with very pale uniform brownish tint slightly intensified at apices and dark golden-amber spot at base of the hind wing extends up to arc and to the anal angle. Abdomen broad at base, strongly carinated, bright scarlet-red.

Material examined : 1 ♂, Nallah behind Home Guard, Poona, 25.xi.1960, Coll. B. K. Haldar; 1 ♂, N. C. L. Compound, Poona, 8.viii.1961, Coll. B. K. Haldar.

Distribution : INDIA : Arunachal Pradesh, Maharashtra (Pune) and Orissa.

Elsewhere : Bangladesh, China, Hong Kong, Indonesia, Malaysia, Philippines, Singapore, Thailand, Taiwan and Vietnam.

SUMMARY

The paper incorporates the account of five species under four genera are recorded for the first time from Maharashtra. All the five species are represented by single or double specimens.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. Ramakrishna, Director, Zoological Survey of India, and Dr. A.K. Hazra, Joint Director (Retd.) and Officer-in-Charge of Entomology Division, Zoological Survey of India, Kolkata for providing various facilities and encouragement to carryout this work. We are also thankful to Smt. Supriya Nandy of the same Department for her kind help.

REFERENCES

Bhasin, G.D. 1953. Odonata. In : *A Systematic catalogue of the main identified entomological collection of the Forest Research Institute, Dehra Dun, Parts 9-21* (Eds. M.L. Roonwal *et al.*). *Indian Forest Leafl.*, **121**(3) : 63-69.

Fraser, F.C. 1933. *Fauna of British India including Ceylon and Burma, Odonata*, Vol. I. pp. 428. Taylor & Francis Ltd., London.

Fraser, F.C. 1934. *Fauna of British India including Ceylon and Burma, Odonata*, Vol. II. pp. 398. Taylor & Francis Ltd., London.

Fraser, F.C. 1936. *Fauna of British India including Ceylon and Burma, Odonata*, Vol. III. pp. 461. Taylor & Francis Ltd., London.

Kulkarni, P.P. and Prasad, M. 2002. Insecta : Odonata. In : *Fauna of Ujani. Zool. Surv. India Wetland Ecosys. Series*, **3** : 91-104.

Kulkarni, P.P. and Prasad, M. 2005. Insecta : Odonata. In : *Fauna of Melghat Tiger Reserve. Zool. Surv. India Conservation Area Series*, **24** : 297-316.

Kulkarni, P.P., Prasad, M. and Talmale, S.S. 2002. New record of damselfly *Pseudagrion microcephalum* (Rambur) (Odonata : Coenagrionidae) from Maharashtra. *Bionotes*, **4**(3) : 58.

Kulkarni, P.P., Prasad, M. and Talmale, S.S. 2004. Insecta : Odonata. In : F*auna of Pench National Park. Zool. Surv. India Conservation Area Series*, **20** : 175-205.

Kulkarni, P.P., Prasad, M. and Talmale, S.S. 2005. Insecta : Odonata. In : *Fauna of Tadoba-Andhari Tiger Reserve. Zool. Surv. India Conservation Area Series*, **25** : 197-226.

Kulkarni, P.P., Talmale, S.S. and Prasad, M. 2006. Insecta : Odonata. In : *Fauna of Sanjay Gandhi National Park. Zool. Surv. India Conservation Area Series*, **20** : 175-205.

Mitra, T.R. 1986. Note on the Odonata fauna of Central India. *Rec. zool. Surv. India*, **83** : 69-81.

Prasad, M. 1996. An account of the Odonata of Maharashtra State, India. *Rec. zool. Surv. India*, **95** : 305-327.

Rec. zool. Surv. India : **108**(Part–4) : 119-120, 2008

Short Communication

REDISCOVERY OF ROBUST PELOBATID FROG, *XENOPHRYS ROBUSTA*, AFTER FIFTY YEARS WITH THREE COLOUR MORPHS

INTRODUCTION

The Robust Pelobatid from, *Xenophrys robusta* (Boulenger, 1908) was described on the basis of two specimens, a male (SVL 54 mm) and a female (SVL 114 mm), collected from the "Darjeeling hills" by J. Gammie in 1906. Subsequently Nelson Annandale collected a specimen from Sureil in 1908 and F.H. Gravely collected a specimen from Kalimpong in May, 1915 (Sankar *et al.*, 1992). The last collections were made "near Darjeeling" in June and September, 1957 as reported by J.C. Daniel (1962).

During a recent amphibian survey, we collected five specimens of the Robust Pelobatid from (*Xenophrys robusta*) in two hill-streams near Latpancher in the Darjeeling hills of northern West Bengal, India. On 28th August, 2006 a male (Male 1, Reg. No. ZSIC A10397) was collected while it was on the rock edge of a stream at altitude : 1097 m above msl (26°55'233" N and 88°23'554" E). On 29th August, 2006 a female (Reg. No. ZSIC A10401) and three males (Male 2, 3 & 4 bearing Reg. No. ZSIC A10398, A10399 & A10400 respectively) were collected on the boulders of a fast-flowing stream at altitude : 1109 m above msl (26°54'340" N and 88°23'538" E).

Two of the males (Reg. No. ZSIC A10397 & A10400) were light brown in colour on the dorsal side but the other two males (Reg. No. ZSIC A10398 & A10399) were dark grey, while the female was orange-red. Earlier George Albert Boulenger while describing the species in 1908 mentioned that these frogs had a brown dorsum. These collections by us after about fifty years show that the species has atleast three colour morphs.

ACKNOWLEDGEMENTS

We are grateful to the Director, Zoological Survey of India, Kolkata for permitting us to conduct a survey on amphibians in the Darjeeling hills of northern West Bengal. We thank Dr. R.A. Khan and Dr. Ramakrishna of ZSI, Kolkata and Mr. C. Radhakrishnan of ZSI, Calicut for their helpful suggestions and Prof. Sushil Kr. Dutta of North Orissa University, Baripada, Orissa for confirming

**Zoological Survey of India, FPS Building, 27, Jawaharlal Nehru Road, Kolkata-700 016*

The measurements (in mm) of all the five specimens are given below :

Characteristics	Male 1 A10397	Male 2 A10398	Male 3 A10399	Male 4 A10400	Female A10401
Snout-vent length	72.65	78.45	78.65	82.55	93.35
Head length	26.35	28.20	26.45	27.70	28.35
Head width	28.15	30.25	30.95	32.10	33.45
Head depth	14.85	16.35	16.30	16.20	18.15
Eye diameter	9.05	10.25	9.75	10.55	9.90
Inter-orbital distance	9.55	9.90	9.65	9.75	11.15
Inter-narial distance	9.95	10.10	9.70	9.85	10.95
Eye-snout distance	9.75	10.15	10.70	10.85	11.35
Eye-nostril distance	4.85	5.45	5.85	6.15	7.05
Axilla-groin length	29.45	29.55	30.35	30.95	31.35
Humerus length	12.65	13.35	13.45	14.65	17.75
Radio-ulna length	15.25	16.65	16.30	16.90	21.80
Third finger length	18.25	18.55	18.85	19.25	19.60
Femur length	37.35	42.85	38.85	43.85	44.35
Tibia length	38.65	42.35	43.45	43.60	47.85
Fourth toe length	28.45	29.20	30.35	29.45	34.75

the identification of the specimens. We also thank Pratyush Mohapatra and Padam Gurung for assisting us in the field to make the collections at Latpancher.

REFERENCES

Boulenger, G.A. 1908. Batrachians of the genus *Megalophrys*. *Proc. Zool. Soc. Lond.*, **1908** : 407-430.

Daniel, J.C. 1962. Notes on some amphibians of the Darjeeling area, West Bengal. *J. Bombay nat. Hist. Soc.*, **59**(2) : 666-668.

Frost, D.R. 2006. Amphibian species of the World : an online reference. Version 4 (17 August, 2006). Electronic database accessible at http://research.amnh.org/herpetology/amphibian/index.php. American Museum of Natural History, New York, USA.

Sarkar, A.K., Biswas, M.L. and Ray, S. 1992. Amphibia in Fauna of West Bengal. *Zool. Surv. Ind., State Fauna Series*, 3(2) : 67-100.

KAUSHIK DEUTI AND ANAND KUMAR*

Zoological Survey of India, Nizam Palace, 234/4, A.J.C. Bose Road, 2nd MSO Building, 13th Floor, Kolkata-700 020

PLATE I

Fig 1.: Male (Dark-Grey)

Fig 2.: Female (Orange-Red)

Fig 3.: Male (Light-Brown)

Rec. zool. Surv. India : **108**(Part–4) : 121-123, 2008

Short Communication

A NOTE ON HOOLOCK GIBBON (*BUNOPITHECUS HOOLOCK*) IN NORTHEAST INDIA

The Hoolock gibbon (*Bunopithecus hoolock*) also known as white-browed gibbon, is arboreal, brachiates, frugivorous, diurnal, monogamous, territorial lesser ape and is found in the rain and moist deciduous forest of northeast India, Bangladesh, western part of Myanmar and southern China. Their activity is mainly restricted to middle and upper canopy of the forests.

The geographical range of distribution of this ape extends from south of Brahmaputra river in northeast India to west of Chindwin river in Myanmar, which covers northeast India, Bangladesh and western part of Myanmar. In the past Hoolock gibbon was widely distributed in this entire geographical range but due to decrease in quality habitat, increase in canopy gaps and hunting, the species is now localised in fragmented and isolated areas in most parts of its present range of distribution and is fighting for survival. Recent surveys indicate that gibbon populations are more in outside the protected areas, National Parks and reserved forests (Sinha, 2005).

In northeast India, the gibbons are restricted to natural rain forests with close canopy, so the loss of habitat has direct bearing on their survival. In the past, the species was common in all the seven states. Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura of northeast India. The excessive jhuming (shifting cultivation) in many areas of these states, the good and viable hoolock gibbon habitats have been lost and turned into barren lands or hills.

Based on the information available and the field studies carried out by the authors, the present fragmented distribution of hoolock gibbon in northeast India is shown in Fig. 1. At present they have occupied an area of about 800 km^2 in India and Bangladesh. It is predicted that they are losing 3-4% of their habitat every year and their population declining by 1-2% in a year (Anonymous, 2003). There is very little information available about the distribution and status of this ape in Nagaland. In Arunachal Pradesh the gibbons are found east of Dibong river in Dibong Valley, Lohit, Chaglang and part of Tirap districts. The good and viable gibbon population occurs in this region. Viable gibbon populations were recorded in the forests of Namdhapa, Miao and Kamlang Nagar (Mukherjee *et al.*, 1988). Till 1974-75 the gibbons were also reported from Subansiri

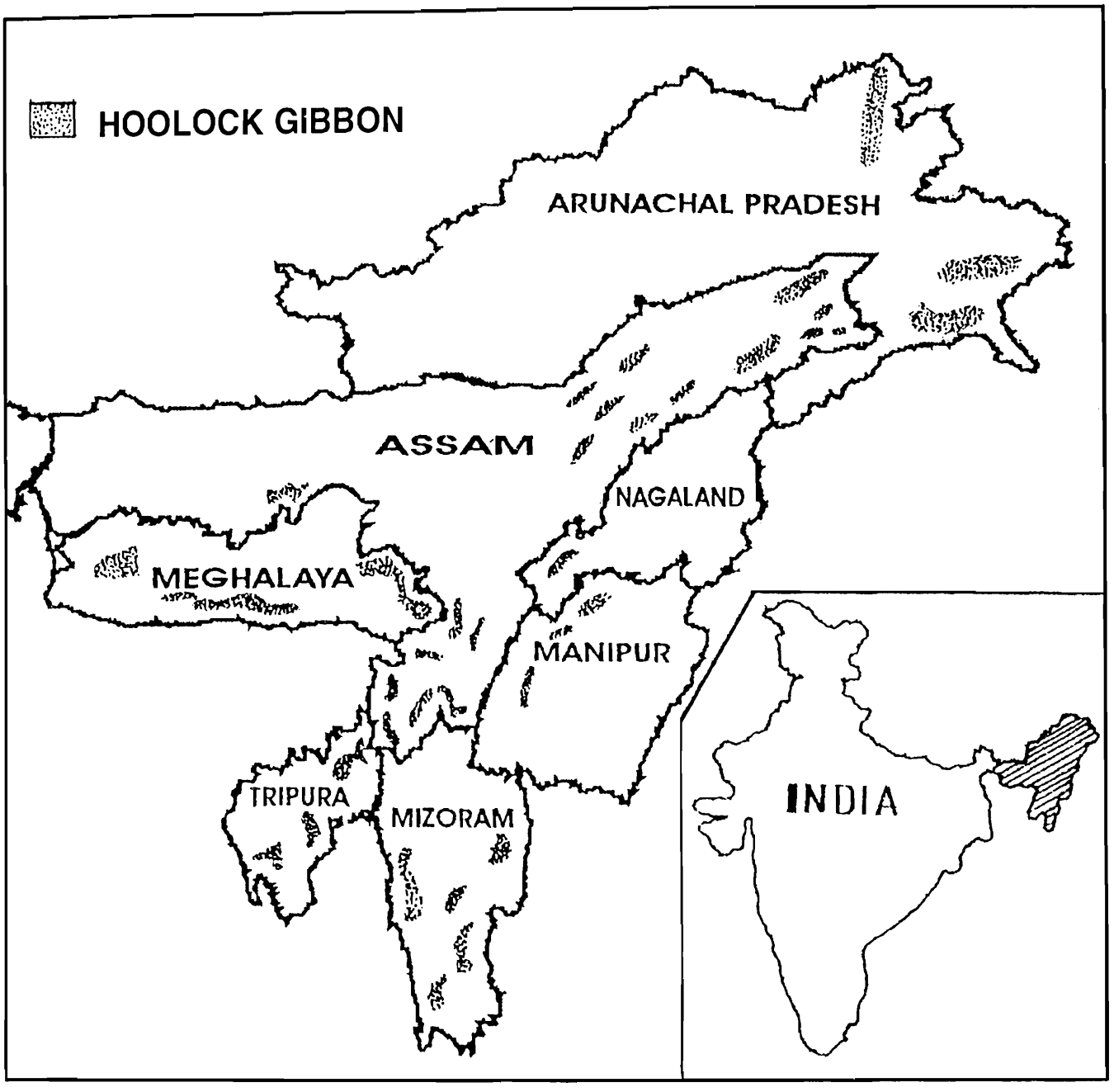


Fig. 1. : Distribution of Hoolock gibbon in northeast India.

district (Borang and Thapliyal, 1993) and even in 1978 they were recorded from the forests of Banderdewa, a place close to Itanagar (Saha personal communication). However, they are now confined to east and south banks of Dibang-Brahmaputra river system.

Gibbons are common in the forests of Garo Hills of Meghalaya, but the habitat in this part is also affected by jhum cultivation with the result, gibbons are localized in small fragmented and discontinuous forest patches and their survival remain doubtful. In Tripura, the gibbons are found in the forested areas of south, north and west districts. In Manipur they are confined to the forested areas close to Assam and Nagaland. In Mizoram the gibbons are found in Dampa Tiger Reserve in

the west, Murlen National Park in the east, Phawngpui Wildlife sanctuary and some other isolated areas like Negengpui WLS, Lengteng WLS, Khawnglung WLS, Tawi WLS. In Assam it is found in the forests of Tinsukia, Dibrugarh, Jorhat, North Cachar Hills, Cachar, Hilakandi, Karimganj and Karbi Anglong districts and Kaziranga National Park besides small localized populations in some other parts.

Field studies show that barring a few areas the gibbons are under tremendous pressure for survival in their range of distribution in northeast India mainly due to continuous deforestation over the years and now majority of the non-viable populations have restricted in the fragmented areas (Sinha, 2005). The groups are rapidly disappearing from such isolated and segregated forests. By the end of our field studies, which spread over a period of about six years, at Tripura at least six groups-two groups at Longthari range, two groups at Khasi Bari and a group each at Ambassa and Fatikroy disappeared from our study sites (Mukherjee, 1986).

The species is considered as endangered in South Asia and the main threats are selective logging, firewood and timber collection, jhuming, human settlement, roads and dams construction, and extension of railway and power lines. Fragmentation of habitat, soil erosion, hunting for food and use of body parts for traditional medicines, accidental death and poor reproduction lead to further decline of gibbon population.

REFERENCES

Anonymous, 2003. Status of South Asian Primates. 2003. Conservation Assessment and Management Plan (C.A.M.P) Workshop Report (eds. S. Molur, D.B. Jones, W. Dittus, A. Eudey, A. Kumar, M. Singh, M.M. Feeroz, M. Chalise, P. Oriya and S. Wallker). 1-432.

Borang, A. and Thapliyai, G.S. 1993. Natural distribution and ecological status of Non-human primates in Arunachal Pradesh. *Indian Fores.*, **119**(10) : 834-844.

Mukherjee, R.P. 1986. The ecology of hoolock gibbon *(Hylobates hoolock)* in Tripura, India. Prim. Eco. & Cons. James G. Else and Phyllis C. Lee (eds) pp. 115-124.

Mukherjec, R.P., Chaudhuri, S. And Murmu, A. 1988. Hoolock gibbon in Arunachal Pradesh, Northeast India. *Primate Conservation,* **9** : 121-123.

Sinha, P.R. 2005. Conservation of Hoolock gibbon (*Bunopithecus hoolock*) in Northeastern India. In Envis Bulletin, Wildlife Protected areas, Vol. **8**, A.K. Gupta (ed.) Wildlife Institute of India, Dehra Dun.

MUKHERJEE, R.P.*,
CHAUDHURI, S. and MURMU, A.
Zoological Survey of India, Kolkata
**CD-292, Salt Lake, Kolkata-700 064*

सत्यमेव जयते

E.K. JANAKI AMMAL NATIONAL AWARD FOR TAXONOMY 2007

The Ministry of Environment and Forests invites application from Taxonomists with outstanding contribution for conferring two Awards, one each in the fields of Plant Taxonomy and Animal Taxonomy, for the year 2007.

Details of the Scheme are available on the web site :

http://envfor.nic.in

The last date of receipt of nominations is

14.07.2008

जहाँ है हरियाली ।
वहाँ है खुशहाली ।।

Ministry of Environment and Forests

Government of India