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FAUNA OF NAMDAPHA : ARUNACHAL PRADESH
'A PROPOSED BIOSPHERE RESERVE'

**Issued by the Director
Zoological Survey of India, Calcutta**

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**FAUNA OF NAMDAPHA : ARUNACHAL PRADESH
'A PROPOSED BIOSPHERE RESERVE'**



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1985

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DIRECTOR, ZOOLOGICAL SURVEY OF INDIA, CALCUTTA.

FOREWORD

India offers an unique richness in biological diversity from a great variety of ecological conditions. The location of our country within two realms., viz. the Himalayan region in Palearctic Realm and rest of the country in the Indo-Malayan Realm, with 12 biogeographic regions under 3 basic biomes, as listed below, enhances the possibility of existence of various exotic elements along with an array of endemic forms.

UDVARDY (1975)

1. Himalayan region	—Palaearctic <i>Realm</i>
2. Rest of India	—Indo-Malayam <i>Realm</i>
Biogeographic region	
—Himalayan highlands	
—Thar desert	
—Malabar rain forest	
—Indus Ganges Monsoon forest	
—Deccan thorn forest	
—Coromandel	
—Mahanadian	
—Bengalian rain forest	
—Burma Monsoon forest	
—Laccadives Islands	
—Maldives and Chargos Islands	
—Andaman and Nicobar Islands.	

The proposed Namdapha Biosphere Reserve, (now a National Park and Tiger Reserve) in Arunachal Pradesh contains faunal elements of at least three biotic provinces, out of a total of 12 and a confluence of Himalayan Highlands, Bengal Rain Forest and Burma Monsoon Forest has constituted the richness of fauna as can be evident from the present volume.

The Zoological Survey of India has in the past, has brought out under one cover, papers relating to different groups of fauna from the same study area (e.g. Rajasthan, *Records of the Zoological Survey of India* 61(3 & 4), 158 pp. ; Andaman and Nicobar Islands *Records of the Zoological Survey of India* 77, 1980, 362 pp. ; Fauna of Abor Expedition, *Records of the Indian Museum* 8 (1912-1922), 623 pp.,)

Keeping the earlier tradition the present volume aims at yet another such endeavour. This volume, it is hoped fulfills the much needed information on faunal resources of a prime conservation area of our country.

Scientists of the Survey first undertook an expedition to Namdapha in 1981-82 at the behest of the Department of Environment and subsequently an MAB—India Project was approved to work further on the “Qualitative Analysis of Faunal Resources of the proposed Biosphere Reserve” with Dr. A. K. Ghosh, Deputy Director as the Principal Investigator. The ZSI team under MAB, remained almost the same as of 1981-82 and with the advantage of knowing the area earlier, explored further in the region during 1982-84. The wealth of information collected so far has been analysed and the parts which have been completed, are presented in 30 papers in this exclusive volume of *Records of the Zoological Survey of India*.

The period and composition of the team which they have surveyed the area are as below :

The Party composition of three surveys conducted :

1. Dr. Shyamrup Biswas 28.3.1981 to 11.5.1981.
Sri S. S. Saha
Shri N. C. Gayen
Shri B. Ram
2. Dr. Shyamrup Biswas 27.11.1982 to 8.1.1983.
Sri S. S. Saha
Sri N. C. Gayen
Sri B. Ram
3. Dr. A. K. Ghosh 25.11.1983 to 12.1.1984
Dr. Shyamrup Biswas
Dr. A. K. Hazra
Dr. A. Dey
Sri S. R Dey Sarkar
Sri S. Barua
Sri N. C. Gayen
Sri C. K. Misra
Sri B. Ram.

The collections were made mainly under the leadership of Dr. Shyamrup Biswas, Zoologist. All the collections have been worked out by the staff and the officers of the Z. S. I. A separate list of contributors is appended herewith. Many new species were

discovered some of which have been partly published earlier for the sake of priority. However, brief abstracts of such papers are also given at the appropriate place. All the types are deposited in the N. Z. C.

This project was conceived and brought to execution by the undersigned through the kind courtesy and great interest shown by Dr. T. N. Khoshoo, the then Secretary, Department of Environment, Dr. Arun Kumar Sharma, Chairman of the MAB and other members of this Committee. On behalf of the Zoological Survey of India and also my personal behalf I wish to place on record our deep indebtedness to these gentlemen for the support. The entire project is being ably conducted by Dr. Asish Kumar Ghosh, Deputy Director, who has also taken relentless efforts to secure the different papers presented here. This investigation has been carried out by a team of officers who have braved difficult terrain and unexplored virgin tracts under difficult conditions. I wish to thank each and every one of them and extend my appreciation for their hard work. This volume has been specially brought out as a special issue of the *Records of the Zoological Survey of India* to enable us to highlight the fauna of this area and focus attention to its importance. Editorial assistance was rendered by Dr. K. C. Jayaram, Joint Director and Sri Sivagurunathan Publication Production Officer who has seen through its publication. I am thankful to these gentlemen also for their help.

Calcutta

B. K. TIKADER
Director
Zoological Survey of India

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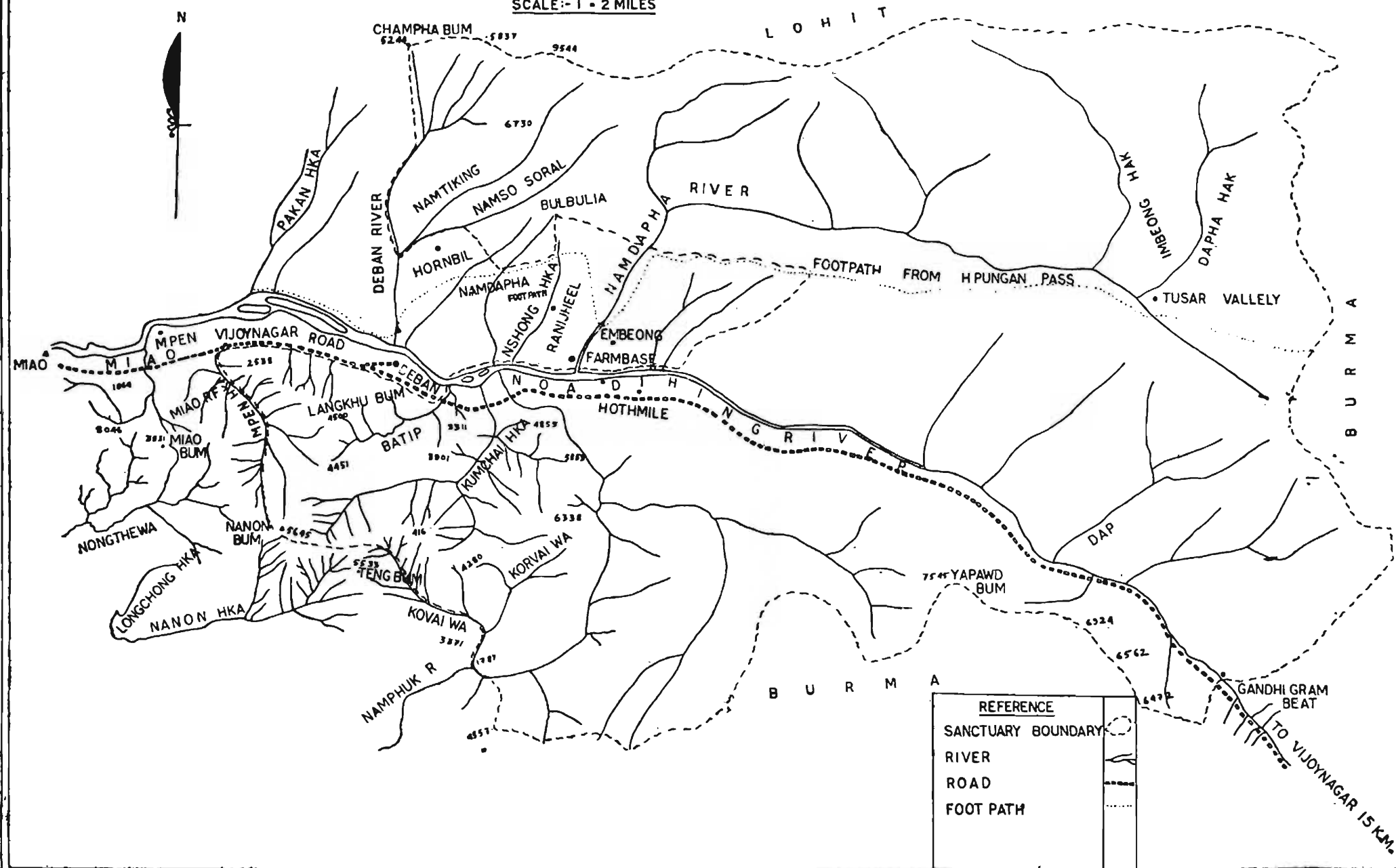
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NAMDAPHA NATIONAL PARK

SCALE:- 1" = 2 MILES



NAMDAPHA BIOSPHERE RESERVE : AN OVERVIEW

By

A. K. GHOSH

Zoological Survey of India, Calcutta.

INTRODUCTION

The concept of Biosphere Reserves was initiated by UNESCO in 1973-74 under the Man and Biosphere (MAB) Programme on a global context. It is aimed at conservation for present and future use, the diversity and integrity of biotic communities of plants and animals within natural ecosystem and to safeguard the genetic diversity of species on which their continuing evolution depends. The concept also includes provision of areas for ecological and environmental research including baseline studies. Selection of biosphere reserve will be dependent on representative examples of natural biomes or on unique communities or areas with unusual natural features of exceptional interest.

The Namdapha National Park and Tiger Reserve Area has been selected as one of the proposed biosphere Reserves in India by Department of Environment, Government of India. The area is at the confluence of three biotic provinces viz. Himalayan Highlands, Bengal Rain Forest and Burma Monsoon Forest leading to a great richness of biological resources, offering all the potential to meet the demand of a biosphere reserve.

Three expeditions have been conducted in the area results of which amply support the selection. In the present volume, works so far completed on these survey-material, have been presented in 26 papers and a brief overview of relevant aspects, location, biogeography and geology, topography, climate and rainfall, vegetation and fauna, presented in this paper is intended to act as general introduction to all the contributions that follow.

LOCATION

The Namdapha National Park and Tiger Project area lies within 27° 39' N latitudes and 96° 15' E and 96° and 58' E longitudes, covering an area of 1886.82 sq. km, in the Tirap District of Arunachal

Pradesh. The boundary, as demarcated, has inter district boundary of Lohit in the North, international boundary with Burma in the east and south and western part is confluent with Diyun and Miao Reserve Forest of Tirap district.

The Namdapha Biosphere Reserve Project Document (No. 2 Published in October 1981) envisages, however, a much larger area extending over Lohit and Tirap districts with core area of 2500 sq. km, a buffer area of 2000 sq. km and a command area of approximately 2500 sq. km, details of which have been dealt (p. 20-21, op. cit) in the document.

BIOGEOGRAPHY AND GEOLOGY

Biogeographically, the area falls within a single natural unit, "Indo-chinese subregion" (Mani, M. S. 1974). Further, following Dasman's (1973) classification of natural region, the area has adjoining it in the palaearctic subregion, biotic provinces of Himalayan-Karakoram and Szechwan in the oriental subregion, biotic provinces of Bengal rain Forest, Burma Monsoon Forest and Burma Rain Forest.

The geological formations include Tertiary and Quarternary sequences. The oldest of Tertiary sequence termed "*Dibang Group*" dates back to Eocene and is comprised of grey to black splintery shales with thin sandstone interbeds. The overlying 'Barail Group' dates to Oligocene and includes assemblage of sandstones, clay, shells and carbonaceous shales with coal and its underbed contains about 8 coal seams, estimated at 12 million tons of coal at depth of 120 m. by Geological Survey of India, only in 11 km long area of Namchik Reserve Forest.

The next rocklayer is termed '*Tipan Group*' dating back to 'Miocene', composed of coarse ferruginous sandstone and sandy clay with occasional thin parting of shale, grit and conglomerate and fragments of silicified and semicarboniferous fossil wood. Oil sequence of the area is associated with Tipan sandstone. The youngest of the Tertiary sequence is comprised of pebbles beds alternating with clay and soft sandstone termed '*Dihing Group*' and become exposed along the course of major drainage system, *Noa Dihing River* near Miao-Deban area, within the National Park.

The Tertiary sequence as such can be distinctively divided into 4 groups viz. (1) Dibang (2) Borail (3) Tipan (4) Dihing and contain two major resources viz. coal and oil,

The Quarternary sequence is mostly composed of clays, loose coarse sand, gravel and boulder deposit covering tertiary rock, as older alluvium.

The area is earthquake prone and consequently the rivers tend to change their course abruptly.

TOPOGRAPHY

The area is wedged between Dapha Bum Ridge of Mismi Hills and northern limit of Patkai Hills. The Dapha Bum Ridge ends at east on Homekharn Bam, with extensive tableland and high peaks over 4000 m. the highest being Dapha Bum (4571 m). The highest peak within the present sanctuary, and a part of Dapha Bum Ridge system, is Champai Bum (2513 m). The major rivers, Namdapha River and Deban River drain the entire south face of the ridge and the region is well known as heavy landslip prone area. All these ridge, bum and river lie north of Diyun valley, while south of Diyun valley has Miao Bum (1198 m), Nanon Bum (1717 m) and Teng Bum (1680 m) forming natural boundary of existing National Park, running parallel to Patkai range, which has the highest peak along international boundary, in Yapwp Bum (2276 m).

The Diyun valley forms the most significant area within the National Park and is proposed to be included as the core area of Biosphere Reserve. The major river of the entire region, Noa Dihing or Diyun from Patkai Range runs in an east west direction along the valley and is fed by numerous small streams and at least 4 rivers eg. Namchik River, Khaisang River, Namdapha River and Deban River. The valley starting east of Miao is less than 150 meter above sea level and extend 175 km in an exactly east west direction with uppermost reaches less than 1500 meter, after curving southeast near Tapawa Bum (2276 m) of Patkai Hills. Tropical climate and vegetation offer ideal ecological condition for rich biological resources. The level along north bank of Diyun, below Deban river and Namdapha river offer dense evergreen vegetation on flat tops on river sediment or galcier morain, attaining a length of about 100 meter and stretching over 8-10 km.

In the upper reaches of mountains, around the National Park specially in high land areas connecting Dapha Bum Ridge with Patkai, perennial snow is recorded. The valley below the snow clad mountains is termed Tushar (Snow) valley and composed the nival zone, followed

by alpine and sub-alpine zones and ending at the Tropical Rain Forest around Diyun or Noa-Dihing valley.

The National Park area as such is composed of forested hills with moderate to precipitous slopes and drained by numerous stream (*Hka* or *Wa* in local term); which remain dry during winter months, and flat land of varying depth stretching over Namphuk, Korapani, western part of Miao and southwestern part of Diyun Reserve Forest.

CLIMATE AND RAINFALL

The region is well known for prolonged monsoon and excessive rainfall which may extend over 8 months from March-November and interrupted only by a brief winter season between November to February. However winter rain is not uncommon and can cause major disruption in any exploratory field work as evidenced by earlier surveys of Z. S. I. and Forest Official Patrol in the area. Average temperature during winter ranges between 15°-21°C, while during March to October, varies between 22°-30°C maximum being in the months of June-August when weather becomes oppressive.

Southwest monsoon from May to October account for seventy five percent of total annual rainfall while northeast monsoon during December to March account for only fifteen percent. Premonsoon showers are common during end of April and May and help afforestation programme. Total average rainfall is recorded at 6300 mm, according to Forest Department source.

VEGETATION

The climatic conditions offering favourable rainfall, temperature gradients and humidity have caused a rich assemblage of floral resources with characteristics of Tropical Evergreen Forest, although the region is located north of geographical tropics. The forest survey record classifies the vegetation, following manual of Champion and Seth, into these principal categories.

- Type I IB / CI —Northern Tropical Evergreen Forest or Assam Valley Tropical Wet Evergreen Forest. This is dominated by *Diptocarpus* (*Hollong* loc. name).
- Type II Sc / 1S₂ (b)x —North Indian Tropical moist deciduous Forest. This is dominated by *Terminalia* (*Hollock* local name) *Duabanga* (*Khokon* loc. name).

Type III Miscellaneous Forest : No single species is particularly dominant. This includes open understocked inferior forest trees e.g. *Dillania indica* (Cutenga loc.), *Erythrina suberosa* (Madar loc.), *Bischofia jayanica* (Uriam loc.), *Kydia calicina* (Pichola loc.) and grasses e.g. *Imperata arundinaceum* (Thatch), *Saccharum spontaneus* (Khagri), *Phragmites kirka* (Nol loc.), *Alpinia* (Tara loc.), *Erianthus rovanaceae* (Ekra, loc.).

Type I forest is known to be a three storied forest with *Dipterocarpus* (Hollong loc.) *Shorea assamica* (Mekai, loc.) presenting the most dominant layer. *Dipterocarpus* occurring in large belt on the well drained areas at high elevation and *Shorea* grows in patches in the drier and gravelly soil. Other trees in the top story include *Artocarpus chaplasi* (Sam loc.) *Cinnamum cecidodapha* (Gonosoroi loc.), *Terminalia myriocarpa* (Hollock loc.), *Toona ciliata* (Puma loc.).

The Middle storey consists predominantly of *Mesua. ferrea* (Nahor loc.) in some areas while in other Nahor may be poor or non existant. Middle storey, as such is not dominated by a single species, that can be noted but *Castaonopsis indica* (Hingari loc.). *Canarium resiniferum* (Dhuma loc.), *Duabanga grandiflora* (Khokon loc.) *Disoxylon hamiltoni* (Gendheli Poma loc.), *Cryptomeria peniculata* (Gorumara loc.), *Eleocarpus genitrus* (Rudrakh loc.), *Dillengnia indica* (Cutenga loc.), *Magnolia griffithi* (Sopa loc.) and *Michelia* spp. etc. can be pointed out as primary components.

The lower storey of the forest is composed of mainly shade trees e.g. *Baceaurea sapinda* (Leleka loc.), *Dillenia indica* (Cutenga loc.), *Atica lanceaetolia* (Morhalla) etc. and density of canopy of this stratum is corelated with the density of upper canopies but in case of mixed forest canopy in upper strata, shade trees in lower storey is replaced by deciduous trees e.g. *Albizzia* spp. (Sires loc.), *Molia azodarech* (Ghora neem loc.), *Mallotus albus* (Morolia loc.) and bamboo, specially *Dendrocalamus hamiltoni* (Koko bans loc.).

The undergrowth is composed of woody shrubs and scitaniinous shrubs ; woody shrubs ; include *Leea indica* (Kukurathaniga loc.), *Leea acuminata* (Charathaniga), *Melastoma malabarica* (Phutka loc.) etc. and other shrubs in moist area include *Alpinia* spp. (Tara, Bogitora loc.) *Phyrnium* spp. (Kaupat loc.) *Musa* spp. (Kolgach loc.). In dry areas, Canes and Palms, specially *Pinanga gracilus* (Baruga tamul loc.) occur in

abundance besides *Calamus* spp. (*Houkabet*, *Lesuibet*, *Raidung* loc.) *Livistonia jenkinsii* (*Tekopat* loc.) may occur occasionally.

The ground offer thick humus on forest floor and different species of ferns, a number of species of beonia and large number of shrubs and herbs form a thin ground cover. Ferns may be Polypodaceous or tree fern *Cyathea* spp. and *Angiopteris* orchids are mostly *Dendrobium* and *Cymbidium*.

Type II. Two distinct storeys can be distinguished in this type of forest. Top storey being composed of *Terminalia myriocarpa* (*Hollock* Loc.), *Duabanga grandiflora* (*Khokan* Loc.), *Amoora wallichii* (*Anari* loc.), *Sterculia alata* (*Udal* loc.), *Terminalia citrina* (*Hilika* loc.), *Terminalia belerica* (*Bohera* loc.) etc.

The middle storey is composed of *Bischia jayanica* (*Urium* loc.), *Gynocardium odonata* (*Dalmurga* loc.), *Vatica lanceaefolia* (*Morhal* loc.) and Bamboo.

This type of forest also shows profuse climbers like *Acacia pinnata* (*Kuchai* loc.), *Tinospora cordifolia* (*Hegum lota* loc.), *Mikania cordata*, *Vitis latifolia* (*Gowalia lota* loc.)

Type III. The composition of miscellaneous Forests has been mentioned under classification ; one of the major Weed which invades this forest in abandoned Jhoom land or other areas, in *Mikania cordata* which along with *Eupatorium* form the major weed problem all over the northeastern region.

6. FAUNAL RESOURCES

The proposed biosphere reserve includes areas, earlier marked as 'Namdapha Wildlife Reserve, then a wildlife sanctuary (Ali & Ripley, 1979) and now a National Park and Tiger Reserve and contains elements of three biotic provinces e.g. Himalayan highland, Bengalian Rain Forest, Burma Monsoon Forest and this has opens up possibility of existence of rich, varied fauna and flora. The vertebrate-faunal components listed in the documents (Nair, 1981, Anon, 1983), includes Hoolock Gibbon, Slow Loris, Tiger, Clouded Leopard, Snow Leopard, Golden Cat, Red Panda, Musk Deer., The great Indian Horbill, Blyths Tragopan, Golden Eagle, Black Eagle and number of other species considered endangered and threatned under Indian Wild Life (Protection) Act. In order to investigate the details of the faunal elements, a team of scientists from Zoological Survey of India undertook a

preliminary survey during 1981-82 at the behest of Department of Environment, Government of India. The team returned with an wealth of collections of fauna revealing enormous possibility of existence of a rich gene-pool of primitive, rare, endangered components along with recent forms, undergoing a dynamic process of evolution. In order to investigate further into the faunal resources of the proposed biosphere reserve which encompasses a much larger area, a separate project was submitted to MAB-India Committee and on getting the same approved, further surveys were conducted during 1982-83 and 1983-84. The material collected during these surveys from most difficult and unexplored areas are now being worked out. The present document forms the first volume of publication on Faunal resources of the region.

In this volume, all vertebrate groups have been included ; besides, a number of orders of Insects, metastigmatic ixodid ticks and molluscs have been dealt. It will be evident from the papers presented in this work that in every group of animals, an assemblage of diverse faunal elements occur in the region. A number of new taxa, including a new genus and species of Mammals, two new species of Amphibia, four new species of Fishes and 19 new species of different Insect groups, are reported. Earlier a new species and a new subspecies of Bird has been reported by Ripley (1980) from the same area. A large number of taxa are reported here for the first time from the area and some for the first time from India. The richness of faunal components, revealed through the surveys conducted so far, is established beyond doubt.

In a second and final volume to follow the present one, additional informations collected subsequently (upto 1985), will be presented with a complete qualitative analysis of the faunal resources of the proposed biosphere reserve from one of the most interesting biogeographical region of the country.

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INSECTA : DICTYOPTERA : BLATTARIA

By

K. P. MUKHERJEE

AND

A. K. HAZRA

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(With 5 Figures)

Family : BLATTIDAE

Subfamily : BLATTINAE

1. *Periplaneta australasiae* (Fabricius)

(Fig. 1)

1775. *Blatta australasiae* Fabricius, *Syst. Ent.*, : 271

1838. *Periplaneta australasiae*, Burmeister, *Handb. Ent.*, 2 (2) : 503, 1012

1966. *Periplaneta qustralasiae*, Princis, *Orthopterorum Catalogus*, Part 8 : 447

Material examined : 1 ex., Miao, Tirap distt., 5.v.81 (At light).

Remarks : It is similar to the American Cockroach but slightly smaller in size, 32 mm. long. General colour red brown. Pale yellow marginal ring on the pronotum is marked by a dark band. Tegmina and wings elongated, extend beyond the abdomen. The Australian Cockroach has a pale yellow stripe on the humeral region of the tegmina. Anterior dorsal surface of the abdomen coloured alternately pale yellow and dark brown. Posterior segments of the abdomen darkbrown.

Distribution : Like some other Cockroaches, this species has been widely distributed by commerce throughout the world, although it is primarily a tropical and subtropical insect.

Family : DEROCALYMMIDÆ

Subfamily : DEROCALYMMINAE

2. *Trichoblatta sericea* (Saussure)

(Fig. 2)

1863. *Perisphaeria sericea* Saussure, *Me'm. Soc. Gene've*, 17 : 138

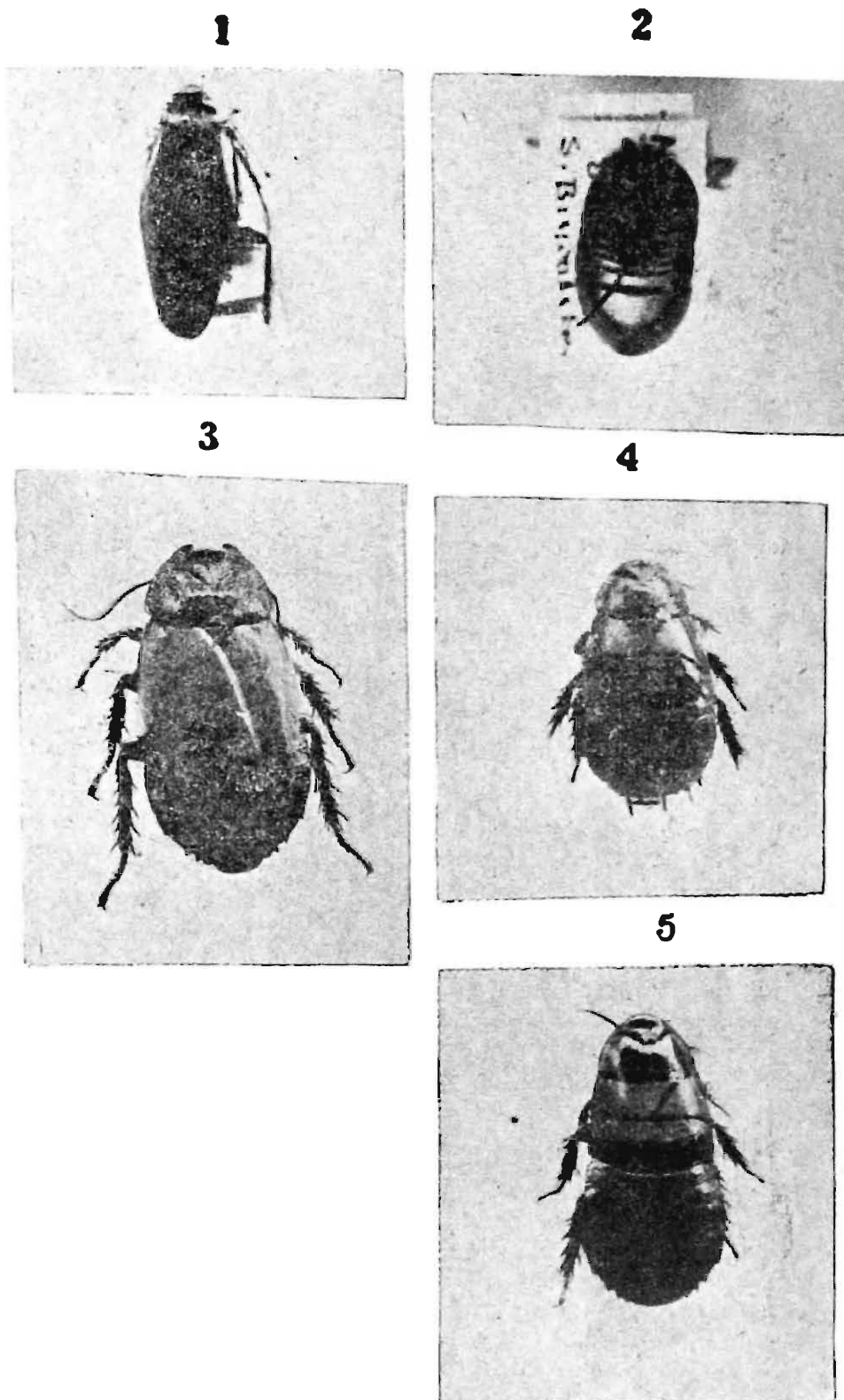
1895. *Trichoblatta sericea*, Saussure & Zehntner, *Revue suisse Zool.*, 3 : 45

1904. *Trichoblatta sericea*, Kirby, *Syn. Cat. Orth.*, 1 : 191

1964. *Trichoblatta sericea*, Princis, *Orthopterorum Catalogus*, Part 6 : 208

Material examined : 3 exs., size 19 mm. long, Zero Camp, Namdapha, 8.iv.81 ; Hornbill, Namdapha, 13.iv.81 ; Firm base, Namdapha, 19.iv.81.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh, West Bengal, Orissa, Tamil Nadu, Karnataka and Gujarat.



Figs. 1-5. 1. Showing dorsal view of *Periplaneta-australasiae* (Fabricius).
 2. Showing dorsal view of *Trichoblatta sericea* (Sauss.)
 3. Showing dorsal view of *Panesthia flavipennis* Wood.Mason.
 4. Showing dorsal view of *Panesthia stellata* Sauss.
 5. Showing dorsal view of *Panesthia laevicollis* Sauss,

Family : PERISPHAERIIDAE
Subfamily : GYNINAE

3. *Paranauphoeta indica* Saussure & Zehntner

1895. *Paranauphoeta indica* Saussure & Zehntner, *Revue suisse Zool.*, 3 : 16
1904. *Paranauphoeta indica*, Kirby, *Syn. Cat. Orth.*, 1 : 179
1964. *Paranauphoeta indica*, Princis, *Orthopterorum Catalogus*, Part 6 : 249

Material examined : 1 ex., Hornbill, Namdapha, 11.iv.81.

Distribution : INDIA : Sikkim, Assam and Arunachal Pradesh.

Family : EPILAMPRIDAE
Subfamily : EPILAMPRINAE

4. *Stictolampra plicata* (Navàs)

1904. *Opisthoplatia plicata* Nava's, *Bol. Soc. aragon. Cienc. nat.*, 3 : 130
1910. *Rhcnoda plicata*, Shelford, *Genera Insect.*, 101 : 9
1967. *Stictolampra plicata*, Princis, *Orthopterorum Catalogus*, part II : 683

Material examined : 1 ex., Hornbill, Namdapha, 11.iv.81.

Distribution : INDIA : Gujarat, Madhya Pradesh, Punjab, Bihar, West Bengal, Assam, Arunachal Pradesh, Orissa and Tamil Nadu.

Family : PANESTHIIDAE

5. *Panesthia flavipennis* Wood-Mason (Fig. 3)

1876. *Panesthia flavipennis* Wood-Mason, *J. Asiat. Soc. Bengal*, 45 : 190
1965. *Panesthia flavipennis*, Princis, *Orthopterorum Catalogus*, part 7 : 315

Material examined : 1 ex. (39 mm long), Hornbill, Namdapha, 14.iv.81.

Distribution : INDIA : Assam, Arunachal Pradesh and Nagaland.

6. *Panesthia stellata* Saussure (Fig. 4)

1895. *Panesthia stellata* Saussure, *Revue suisse Zool.*, 3 : 307, 313
1965. *Panesthia stellata*, Princis, *Orthopterorum Catalogus*, part 7 : 313

Material examined : 5 exs. (27 mm long), Deban, 2.4.81 ; Hornbill, Namdapha, 11.iv.81 ; Hornbill, Namdapha, 14.iv.81.

Distribution : INDIA : Sikkim, Arunachal Pradesh and West Bengal. Burma.

7. *Panesthia laevicollis* Saussure

(Fig. 5)

1873. *Panesthia laevigollis* Saussure, *Me'm. Soc. Gene've*, 23 : 1511865. *Panesthia laevicollis*, Princis, *Orthopterorum Catalogus*, part 7 : 313

Material examined : 2 exs. (32 mm long), Deban, 24 km. from Miao, Tirap distt., 7.iv.81 ; Deban, Namdapha, 27.iv.81.

Distribution : INDIA : Sikkim, Arunachal Pradesh, Assam and West Bengal. Australia.

8. *Panesthia angustipennis* (Illiger)1801. *Blatta angustipennis* Illiger, *Mag. Insektenkde*, 1 : 1851838. *Panesthia angustipennis*, Burmeister, *Handb. Ent.*, 2 (2) : 5131965. *Panesthia angustipennis*, Princis, *Orthopterorum Catalogus*, part 7 : 310

Material examined : 1 ex. (44 mm long). Deban North, Namdapha, 28. iv. 81.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh and Andaman & Nicobar Islands. China, Burma, Indonesia, Malakka, Philippines, Vietnam, Zanzibar and Australia.

9. *Salganea passaloides* Walker1968. *Salganea passaloides* Walker, *Cat. Blatt. Brit. Mus.*, London : 221904. *Salganea passaloides*, Kirby, *Syn. Cat. Orth.*, 1 : 2001965. *Salganea passaloides*, Princis, *Orthopterorum Catalogus*, Part 7 : 321

Material examined : 11 exs., Miao, 4.iv.81 ; Zero Camp, Namdapha, 9.iv.81 ; Hornbill, Namdapha, 11.4.81 and 13.iv.81.

Distribution : INDIA : Arunachal Pradesh and Andaman. Sri Lanka.

Remarks : It is black and thickly punctured. Head smooth ; face thinly punctured 'd' with a testaceous band near the mouth. Antennae reddish, sometimes piceous towards the base. Abdomen roughly punctured, dark reddish in the disk beneath. Legs short and thick ; tarsal joints from the first to the fourth redish beneath.

Family : ECTOBIIDAE

Subfamily : THEGANOPTERYGINAE

10. *Hemithyrsocera palliata* (Fabricius)1798. *Blatta palliata* Fabricius, *Entomologia systematica*, 2 Suppl : 1861907. *Hemithyrsocera palliata*, Shelford in Wytzman, *Genera Insect.*, 55 : 141971. *Hemithyrsocera palliata*, Princis, *Orthopterorum Catalogus*, Part 14 : 1124

Material examined : 1 ex., Gibbonland, Namdapha, 19.iv.81.

Remarks : This species has shining dark castaneous to black tegmina. Wings with the intercalated field slightly prominent. Subcostal vein nearly reaching the median point. Radial vein forking mesad and sending eleven to twelve branches to the anterior margin. Median and cubital vein unbranched. The whole wing has a brownish tinge, except the strongly darkened anterior field.

Distribution : A widely distributed species in Asia.

Family : PYCNOSCELIDIDAE

11. *Pycnoscelis surinamensis* (Linnaeus)

1758. *Blatta surinamensis* Linnaeus, *Syst. naturae* 1 : 424

1903. *Pycnoscelus surinamensis*, Rehn, *Trans. Am. ent. Soc.*, 29 : 131, 136

1964. *Pycnoscelis surinamensis*, Princis, *Orthopterum Catalogus*, Part 6 : 264

Material examined : 3 ex., Hornbill, Namdapha, 13.iv.81 ; Namdapha, 21.iv.81 ; Deban North, Namdapha, 28.iv.81.

Remarks : The surinam Cockroach is a large dark-brown lubberly insect, about the size of the American Cockroach, but with wings only one-third the length of the body which is distinctly oval in outline. The species shows much variation in shell characters.

Distribution : A cosmopolitan species in distribution.

Family : BLATTELLIDAE

Subfamily : BLATTELLINAE

12. *Blattella humbertiana* (Saussure)

1863. *Polyzosteria humbertiana* Saussure, *Me'm. Soc. Gene've*, 17 : 131

1904. *Phyllodromia humbertiana*, Kirby, *Syn. Cat. Orth.* 1 : 90

1950. *Blattella humbertiana*, Princis, *Ark. Zool.*, (2) 1 : 27

Material examined : 2 exs., Hornbill, Namdapha, 13.iv.81 ; Namdapha Camp, 22. iv. 81.

Remarks : It is a small brown species, the prothorax marked with black and light brown bands. It is perhaps the most common field species.

Distribution : A fairly well distributed species throughout the oriental region.

13. *Blattella germanica* (Linnaeus)

1767. *Blatta germanica* Linnaeus, *Syst. naturae*, 1 (2) : 688

1846. *Phyllodromia germanica*, Fischer v waldheim *Entomogr. Russie* 4 (Orth. Russie), Moscou, : 76

1969. *Blattella germanica*, Princis, *Orthopterorum Catalogus*, Part 13 : 807

Material examined : 2 exs., Hornbill, Namdapha, 13.iv.81. Namdapha Camp, 22. iv. 81.

Remarks : The small tan German Cockroach is about 10 mm long and boat shaped in appearance. General colour pale yellowish brown. Pronotum provided with two parallel, longitudinal dark strips. Tegmina and wings extend beyond the abdomen. Legs elongated and spiny. The last ventral segment is entire in both sexes.

Distribution : A world-wide distributed species.

SUMMARY

The Blattarian fauna of Arunachal Pradesh is still unexplored. The present paper is based on a small collection from several localities of Namdapha. It comprises altogether 34 examples distributed over 9 genera 13 species and 8 families. Photographs of five species are given.

ACKNOWLEDGEMENT

Authors are thankful to Dr. B. K. Tikadar, Director, Zoological Survey of India for providing laboratory facilities. Thanks are also due to Dr. Shyamrup Biswas, Zoologist, Zoological Survey of India for the painful collections of those specimens, and to Dr. A. K. Ghosh, Deputy Director of the same organization for kindly placing the materials to the authors.

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INSECTA : ORTHOPTERA

By

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INTRODUCTION

(With 8 Figures)

Bolivar (1902 & 1918), Hancock (1912, 1913 & 1915), Kirby (1914), Hebard (1929), Uvarov (1929), Henry (1940), Singh & Kevan (1965), Chopard (1969), Tandon & Shishodia (1969 & 1972), Biswas *et al.* (1975), Tandon & Khera (1978), have dealt with the taxonomy on Indian grasshoppers and crickets (Orthoptera) but Fauna of Namdapha, Tirap district of Arunachal Pradesh has not been studied so far. Present paper deals with 36 species, out of which 9 species are new record for the area. Some of the species are identified upto the generic level only, either due to their nymphal stage, or damaged condition or lack of sufficient material. Distributional record of every species has been provided.

Present study will add to our knowledge of the fauna of Orthoptera recorded from Arunachal Pradesh. We feel that there may still be a number of species of Orthoptera occurring in Namdapha area which have not been collected and described as yet.

SYSTEMATIC ACCOUNT

Suborder : CAELIFERA

Superfamily : ACRIDOIDEA

Family : PYRGOMORPHIDAE

1. *Tagasta indica* Bolivar

1905. *Tagasta indica* Bolivar, *Bol. Soc. esp. Hist. nat.*, 5 : 112, 113.

Material examined : 1 ♂, Deban, 27 kms. east of Miao, 10.xii. 1982 ; 2 ♂ ♂, Gibbon's land, 16 kms. east of Miao, 25.xii.1982.

Distribution : India ; Bhutan.

In India this species has also been studied from West Bengal, Assam, Manipur and Tripura.

Remarks : The present material agrees well with the description provided by Kirby (1914).

2. *Atractomorpha burri* Bolivar

1905. *Atractomorpha burri* Bolivar, *Bol. Soc. esp. Hist. nat.*, 5 : 197, 203.

1969. *Atractomorpha burri*, Kevan & Chen, *Zool. J. Linn. Soc.*, 48 : 158, 160, 193.

Material examined : 1 ♀, Hornbill, 11.iv.1981 ; 1 ♀, Gibbon's land, 10th milepost from Miao, 2.v.1981 ; 1 ♀, Miao, 21.xii.1982 ; 1 ♂, Gibbon's land, 20.xii.1982 ; 1 ♀, Gibbon's land, 16 kms. east of Miao, 26.xii.1982.

Distribution : South East Asia including east Nepal, Bhutan, Bangladesh, North East India, to Malaya, Indo-China and probably South East China ; Mergui Island.

In India this species has also been studied from Sikkim, Assam, Manipur and West Bengal.

Remarks : Body form broad, stout and rather short than the other species of the genus ; lateral pronotal lobe without a membranous area ; postocular tubercles distinct and regularly arranged ; posterior margin of pronotal disc angular ; external face of posterior femora convex and strongly keeled.

Family : ACRIDIDAE

3. *Acrida exaltata* (Walker)

1859. *Truxalis exaltata* Walker, *Ann. Mag. nat. Hist.*, (3) 4 : 222.

1914. *Acrida exaltata*, Kirby, *Fauna British India, Orthoptera, Acridiidae* : 99.

Material examined : 1 ♀, Miao, 4.xii.1982.

Distribution : South Asia.

In India this species is recorded from Uttar Pradesh, Arunachal Pradesh, Bihar, Rajasthan, Jammu and Kashmir, Kerala and Tamil Nadu. It is also studied from Himachal Pradesh, Punjab, West Bengal, Sikkim, Assam, Meghalaya, Madhya Pradesh, Gujarat, Orissa, Maharashtra, Andhra Pradesh, Manipur in India and from Bangladesh.

Remarks : A very common species found in and around cultivated fields, bare grounds, grassy lands etc., but never in thick forest.

4. *Phlaeoba infumata* Brunner

1893. *Phlaeoba infumata* Brunner, *Annali Mus. Civ. Stor. nat. Giacomo Doria*, 33 : 124.

1914. *Phlaeoba infumata*, Kirby, *Fauna British India, Orthoptera, Acridiidae*, : 103.

Material examined : 1 ♂, 1 ♀, Deban, 2.iv.1981 ; 1 ♂, Deban, 24 kms. from Miao, 7.iv.1981 ; 1 ♂, 1 ♀, Hornbill, 14.iv.1981 ; 1 ♂, Miao

(at light), 5.v.1911 ; 1 ♂, 1 ♀, Miao Reserve Forest, Miao, 1.xii.1982 ; 1 ♂, Deban, 27 kms. east of Miao, 8.xii.1982 ; 1 ♀, Gibbon's land, 21.xii.1982.

Distribution : India ; Burma.

In India it is recorded from Madhya Pradesh, Arunachal Pradesh, and West Bengal.

It is also studied in India from Himachal Pradesh, Haryana, Punjab, Uttar Pradesh, Orissa, Tripura, Meghalaya and Mizoram and also from Bangladesh.

Remarks : A very common species found generally in or around cultivated fields. Antennae of the species are unicoloured and the wings have smoky colouration at apex.

5. *Phlaeoba antennata* Brunner

1893. *Phlaeoba antennata* Brunner, *Annali Mus. Civ. Stor. nat. Giacomo Doria*, 33 : 125, pl. 5, fig. 49.

1914. *Phlaeoba antennata*, Kirby, *Fauna British India, Orthoptera, Acridiidae*, : 102.

Material examined : 1 ♂, 1 ♀, Miao Reserve Forest, Miao, 1.xii.1982.

Distribution : India (Assam, Arunachal Pradesh, Rajasthan) ; Bangladesh ; Burma ; Malaya Peninsula ; Andalus ; Kalimantan.

It has also been studied from Uttar Pradesh, West Bengal, Assam in India.

Remarks : This species generally occurs in or around thick forest. A broad yellow band runs from the vertex to the end of the elytra, at least in the male.

6. *Phlaeoba assama* Ramme

(Fig. 1)

1941. *Phlaeoba assama* Ramme, *Mitt. zool. Mus. Berl.*, 25 (1940) : 9.

Material examined : 1 ♀, Miao, 30.xi.1982, 3 ♀ ♀, Zero Camp, 30 kms. North East of Miao, 14.xii.1982.

Distribution : India (Assam).

Remarks : Recorded here for the first time from Arunachal Pradesh. This species closely resembles with *Phlaeoba sikkimensis* Ramme but differs by the fastigium which is longer than broad and acutely rounded in front, no other carina on the fastigium except the median carina, antennae more longer and flat at basal part, extension of elytra and wings upto the apex of posterior femora.

7. ***Ceracris nigricornis* Walker**

(Fig. 2)

1870. *Ceracris nigricornis* Walker, *Cat. Derm. Salt. British Museum nat. Hist. Part IV* : 791.

Material examined : 2 ♂ ♂, Miao Reserve Forest, Miao, 1.xii.1982.

Distribution : India (West Bengal, Arunachal Pradesh, Uttar Pradesh).

This has also been studied from Himachal Pradesh, Haryana, Sikkim, Meghalaya, Manipur and Tripura in India.

Remarks : Face and pronotum coarsely punctured ; posterior femora externally with a narrow, distinct blackish fascia just before the pre-apical pale ring ; elytra brown, with the anal field green, or brownish-green.

8. ***Trilophidia annulata* (Thunberg)**

1815. *Gryllus annulatus* Thunberg, *Mem. Acad. Sci. St-Petersb.*, 5 : 234.

1873. *Trilophidia annulata*, Stål, *Recensio Orthopterorum*, 1 : 131.

1914. *Trilophidia annulata*, Kirby, *Fauna British India, Orthoptera, Acridiidae* : 149.

Material examined : 2 ♂ ♂, 1 ♀, Deban, 27 kms east of Miao, 10 & 14.xii.1982 ; 2 ♂ ♂, 1 ♀, Gibbon's land, 16 kms. east of Miao, 17.xii.1982 ; 1 ♂, 1 ♀, Gibbon's land, 20.xii.1982 ; 1 ♂, 2 ♀ ♀, Gibbon's land, 16 kms. east of Miao, 26.xii.1982.

Distribution : Distributed in Oriental and Palaearctic Regions. In India, it is widely distributed throughout.

Remarks : Carina of pronotum deeply cut by two grooves and when viewed sideways, is strongly bilobed in front ; wings not yellow at the base.

9. ***Sphingonotus indus* Saussure**

(Fig. 3)

1884. *Sphingonotus indus* Saussure, *Mem. Soc. Geneve*, 28 (9) : 204.

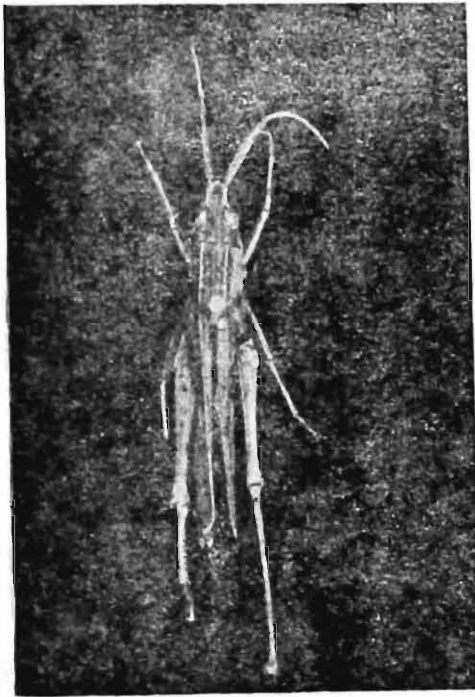
1914. *Sphingonotus indus*, Kirby, *Fauna British India, Orthoptera, Acridiidae* : 156.

Material examined : 1 ♂, 1 ♀, Deban, 27 kms. east of Miao, 13.xii.1982 ; 1 ♂, Zero Camp, 30 kms. north east of Miao, 14.xii.1982.

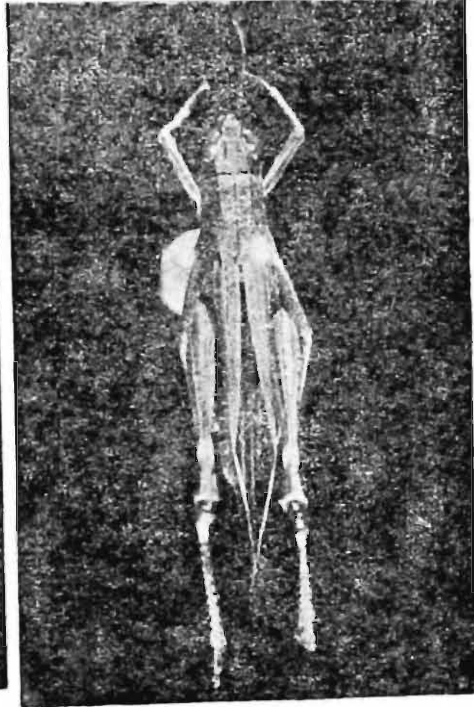
Distribution : India (Himalayan region).

The specimens of this species has also been studied from Jammu and Kashmir, Uttar Pradesh (Dehra Dun & Saharanpur distt.) in India.

Remarks : This species is very similar to *Sphingonotus longipennis* Saussure, but differs in having smaller size and the narrow dark brown band which extends from the costa to anal angle.



1



2



3



4

Figs. 1-4. 1. *Phlaeoba assama* Ramme, Dorsal View.
2. *Ceracris nigricornis* Walker, dorsal view.
3. *Sphingonotus indus* Saussure, dorsal view.
4. *Scapteriscus* sp., dorsal view.

Family : HEMIACRIDIDAE

10. *Gesonula punctifrons* (Stål)

1860. *Acridium (Oxya) punctifrons* Stål. *Kongl. Svens. Fregatten Eugenies Res Omkring Jorden*, 3 : 336.
 1963. *Gesonula punctifrons*, Bei-Bienko & Mishchenko, *Locusts and Grasshoppers of the U.S.S.R. and adjacent countries*, Catantopinae, : 172.

Material examined : 1 ♀, Gibbon's land, 16 kms. east of Miao, 26.xii.1982.

Distribution : India (Assam, Kerala, Tamil Nadu, Goa, West Bengal, Arunachal Pradesh) ; Bangladesh ; Sri Lanka ; Burma ; China ; Japan ; Taiwan ; Tongking ; Thailand ; Malacca ; Philippines ; Kalimantan ; Java.

It has also been studied from Maharashtra, Punjab, Assam, Manipur, Tripura, Meghalaya and Delhi in India.

Remarks : A very common species found near water tank, pond etc. It is reported as a pest of *Colocasia antiquorum* (Water Hyacinth).

Gesonula punctifrons resembles with the species of the genus *Oxya* Serville in appearance and colouration but the former differentiates from the latter by the shape of the fastigium which is acutely rounded in front.

11. *Spathosternum prasiniferum prasiniferum* (Walker)

1871. *Heteracris (?) prasinifera* Walker, *Cat. Derm. Salt. Brit. Mus.*, 5 suppl. : 65.
 1914. *Spathosternum prasiniferum*, Kirby, *Fauna British India, Orthoptera, Acridiidae* : 208.
 1963. *Spathosternum prasiniferum prasiniferum*, Bei-Bienko & Mishchenko, *Locusts and Grasshoppers of U.S.S.R. and adjacent countries*, Part I (Translated from Russian) : 160.

Material examined : 1 ♀, Gibbon's land, 6.iv.1981 ; 1 ♀, Miao, 4.xii.1982 ; 1 ♂, 1 ♀, Deban, 13.xii. 1982 ; 1 ♂, Gibbon's land, 16 kms. east of Miao, 21.xii.1982.

Distribution : India (widely distributed) ; Bangladesh ; Sri Lanka ; Burma ; Thailand ; Indo-China ; China ; and Viet-Nam.

Remarks : A very common grasshopper species found in and near the cultivated fields, grassyland and on the outside periphery of the thick forest. It can be easily identified by the shape of fastigium, peculiar marking on the lateral side of head and pronotum, specific dark brown spots on the elytra and spathulate type of prosternal tubercle.

Family : CATANTOPIDAE

12. *Eucoptacra praemorsa* (Stål)

1860. *Acridium* (*Catantops* ?) *praemorsum* Stål, *Eugenies Resa.*, *Orth.*, 330.
 1902. *Eucoptacra praemorsa*, Bolivar, *Annl.*, *Soc. ent. Fr.*, 70 : 623.
 1914. *Eucoptacra praemorsa*, Kirby, *Fauna British India*, *Orth.*, *Acridiidae*, : 240.

Material examined : 1 ♀, Deban, 24 kms. from Miao, 7.iv.1981 ; 2 ♂ ♂, 2 ♀ ♀, Hornbill, 13 & 14.iv.1981 ; 2 ♀ ♀, Deban North, 28.iv.1981 ; 1 ♂, Miao Reserve Forest Miao, 1.xii.1982 ; 2 ♂ ♂, 1 ♂, Miao, 2.xii.1982 ; 2 ♀ ♀, Deban, 27 kms. east of Miao, 8 & 10.xii.1982.

Distribution : India (Maharashtra, Tamil Nadu and S. Malabar) ; Burma ; China ; Taiwan.

Remarks : Size large ; elytra with a faint indication of a white callous stripe near the middle ; posterior femora without distinct black spot in or near the middle of superio-external area ; subgenital plate of female with the hind margin broadly rounded or triangularly expanded.

13. *Catantops pinguis innotabilis* (Walker)

1870. *Acridium innotabile* Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 629.
 1925. *Catantops innotabilis*, Uvarov, *Mission Babault Inde*, *Acrididae*—Paris : 30.
 1953. *Catantops pinguis innotabilis*, Dirsh & Uvarov, *Tijdschr. Ent.*, 96 : 233.

Material examined : 1 ♀, Miao (at light), 5.v.1981.

Distribution : India (Assam, Kerala, Tamil Nadu, West Bengal, Arunachal Pradesh, Uttar Pradesh), S. Tibet ; Sri Lanka ; Burma ; Thailand ; Malaya ; Indo-China ; Yunnan ; Philippines ; Kalimantan ; Andalus ; Java ; and New Guinea.

This species has also been studied by one of the authors (M.S. Shishodia) from Himachal Pradesh, Manipur, Maharashtra and Karnataka in India.

Remarks : Lateral lobe of pronotum in the middle without or with very light coloured spot or stripe ; male cerci with widened slightly hammer-shaped apex and it is more curved with more broadened apex ; external surface of posterior femora on the lower margin of upper carina without the black median spots ; elytra exceeds the apex of posterior femora by more than the length of pronotum.

14. *Xenocatantops humilis humilis* (Serville)

1839. *Acridium humile* Serville, *Ins. Orth.*, : 662.
 1873. *Catantops humilis*, Stål, *Rec. Orth.*, 1 : 71.
 1953. *Xenocatantops humilis humilis*, Dirsh & Uvarov, *Tijdschr. Ent.*, 96 : 237.

Material examined : 1 ♂, Miao, 4.iv.1981 ; 1 ♂, Gibbon's land 6.iv.1981 ; 1 ♂, 1 ♀, Deban, Miao, 7.iv.1981 ; 1 ♂, 1 ♀, Zero Camp, 9.iv.1981 ; 4 ♂ ♂, 2 ♀ ♀, Hornbill, 11 & 13.iv.1981 ; 2 ♂ ♂, Hornbill, 14.iv.1981, 2 ♀ ♀, Hornbill Camp, 15 kms. North of Deban, 16.iv.1981 ; 1 ♀, Firm Base, 18.iv.1981 ; 1 ♀, Deban, 27.iv.1981 ; 1 ♀, Miao Reserve Forest, Miao, 1.xii.1982 ; 1 ♀, Miao, 2.xii.1982 ; 2 ♀ ♀, Deban, 27 kms. east of Miao, 10.xii.1982 ; 3 ♀ ♀, Gibbon's land, 16 kms. east of Miao, 25 & 26.xii.1982.

Distribution : India (Assam, Kerala, Tamil Nadu, West Bengal, Arunachal Pradesh, Uttar Pradesh) ; S. Tibet ; Sri Lanka ; Burma ; Thailand ; Malaya ; Indo-China ; Yunnan ; Philippines ; Kalimantan ; Andalus ; Java ; and New Guinea.

This species has also been studied by one of the authors (M.S. Shishodia) from Himachal Pradesh, Manipur, Maharashtra, Meghalaya and Mizoram in India and also from Bangladesh.

Remarks : Body large and slender than the other subspecies ; frons in profile straight, moderately sloping backwards ; pronotum slightly constricted in the middle and without any marks laterally ; prosternal tubercle conical ; male cercus simple, with rounded apex ; supra-anal plate simple, triangular ; external surface of posterior femora yellowish, with two dark brown fasciae, broadening towards the lower margin and fused with the dark brown lower margin of the femora ; posterior tibiae red.

15. *Chondracris rosea* (De Geer)

1773. *Acrydium roseum* De Geer, *Memoires pour servir a'l' histoire des insectes*, Stockholm, 3 : 488.

1923. *Chondracris rosea*, Uvarov, *Bull. ent. Res.*, 14 : 39.

Material examined : 1 ♂, Deban, 27 kms. east of Miao, 11.xii.1982.

Distribution : India (Arunachal Pradesh, Assam, Bihar, Madhya Pradesh, Manipur, Tripura, Uttar Pradesh, West Bengal, Sikkim, Kerala, and Tamil Nadu) ; Bhutan ; Bangladesh ; Thailand ; Indonesia ; Korea ; Japan ; Vietnam ; China ; Java ; Tainan ; Philippines ; Manchuria ; Hainan Islands.

Remarks : Large sized body ; pale-green colouration ; tectiform pronotum ; and rose coloured basal area of hind wing.

16. *Choroedocus robustus* (Serville)

1839. *Acridium robustum* Serville, *Ins. Orth.* : 647.

1921. *Choroedocus robustus*, Uvarov, *Trans. ent. Soc. Lond.*, 69 : 109.

Material examined : 1 ♀, Miao, 2.xii.1982.

Distribution : India (Assam, Arunachal Pradesh) ; Bangladesh.

This species has also been studied from West Bengal, Manipur and Meghalaya.

Remarks : Large and robust in size ; fastigium rounded in front ; antennae longer than head and pronotum ; a broad dark brown stripe runs medially from the anterior margin of head to the posterior margin of pronotum and another narrow but distinct yellow coloured stripe runs on either side of this dark brown stripe from the superior margin of eyes to the posterior margin of pronotum which extends nearly upto the middle of elytra and then run unitedly backwards ; posterior tibiae red.

17. *Apalacris varicornis* Walker

1870. *Apalacris varicornis* Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 642.

1957. *Apalacris varicornis*, Willemse, *Publties natuurh Genoot Limburg*, Reeks X : 453.

Material examined : 1 ♂, 27 kms. east of Miao, 14.xii. 1982.

Distribution : India (West Bengal, Assam) ; Bangladesh ; Burma ; China ; Yunnan ; Tonkin ; Annam ; Perak ; Malaya ; Andalus ; Anai-kloof ; Java ; Kalimantan and Japan.

This species has also been studied from Sikkim in India.

Remarks : The yellow spot on the lateral lobe of pronotum longer, nearly reaching the humeral angle ; antennae light yellow or dirty white at apex ; posterior femora yellow or yellowish brown, with oblique transverse black bands ; posterior tibiae red ; wings bluish and the apex infumated.

Superfamily : TRIDACTYLODEA

Family : TRIDACTYLIDAE

18. *Tridactylus* sp.

Material examined : 3 ♂ ♂, 2 ♀ ♀, Miao (at light), 5.v. 1981.

Distribution : Africa ; Australia ; Asia ; Europe ; and Southern Soviet Union.

Remarks : These specimens resemble in size and other characters with *Tridactylus thoracicus* Guerin but the colouration is dark brown. Being damaged specimens, the identification could not be done upto the specific level.

Superfamily : TETRIGOIDEA

Family : TETRIGIDAE

19. **Scelimena india** Hancock

(Fig. 5)

1907. *Scelimena india* Hancock, *Trans. R. ent. Soc. Lond.*, 219.

Material examined : 1 ♂, 1 ♀, Miao, 5.iv.1981 ; 8 ♂♂, 6 ♀♀, Hornbill, 16.iv.1981 ; 2 ♂♂, Gibbon's land, 3.v.1981 ; 1 ♀, Miao Reserve Forest, 1.xii.1982.

Distribution : India (Assam).

Remarks : This species is closely related with *Scelimena producta* (Serville) but can be easily separated from it by the stouter stature ; and presence of tubercles in the middle of the anterior margin of pronotum.

20. **Thoradonta nodulosa** (Stål)

1860. *Tetrix nodulosa* Stål, *Eugenies Resa Orth.*, : 346.

1970. *Thoradonta nodulosa*, Steinmann, *Acta zool. hung.*, 16 : 225.

Material examined : 1 ♀, Gibbon's land, 3.v.1981.

Distribution : India ; Sri Lanka ; Singapore ; Java ; Andalus ; Kalimantan ; and Hainan.

Remarks : *Thoradonta nodulosa* (Stål) is allied to *Thoradonta apiculata* Hancock, but it can be separated from the latter by the narrower vertex ; lesser extension of pronotum beyond the apex of posterior femora ; and presence of a series of nodules on the upper marginal and paginal areas of posterior femora.

21. **Loxilobus assamus** Hancock

1907. *Loxilobus assamus* Hancock, *Trans. R. ent. Soc. Lond.*, : 223.

Material examined : 1 ♂, Miao, 2.i.1983.

Distribution : India (Assam and West Bengal).

Remarks : *Loxilobus assamus* Hancock can be easily separated from all other regional species of the genus by the shorter and broader stature ; slightly narrow vertex ; granulose and tuberculose dorsum ; sinuated and interrupted median carina of pronotum ; extension of pronotal process upto the apices of posterior femora and pointed first and second pulvilli of first segment of posterior tarsi.

22. *Xistrella inermis* (Hancock)

1915. *Bolotettix inermis* Hancock, *Rec. Indian Mus.*, **11** : 77-78.

1939. *Xistrella inermis*, Günther, *Abh. Ber. Mus. Tierk. Völk. Dresden*, **20(A)** zool. (N. F.) **BD 1** : 151.

Material examined : 1 ♂, Gibbon's land, 3.v. 1981.

Distribution : India (West Bengal).

Remarks : This species is characterised by the shortness of body ; convexity of dorsum between the shoulders ; depression and compresso-elevation of the median carina between and behind the shoulders ; and presence of an oblique lateral line on either side of median carina.

23. *Hyboella dilatata* (De Haan)

1842. *Acridium (Tetrix) dilatatum* De Haan, *Temminck. Verhandel.*, Orth. : 167, 169, pl. 22, fig. 12.

1915. *Hyboella dilatata*, Hancock, *Rec. Indian Mus.*, **11** : 107.

Material examined : 1 ♀, Miao, 2.i.1981, 1 ♀, Gibbon's land, 2.v.1981.

Distribution : Burma ; Java. It is recorded here for the first time from India.

Remarks : *Hyboella dilatata* (De Haan) has very close resemblance with *H. tentata* Hancock, but in the former the posterior angles of lateral lobes of pronotum is less dilated, less directed outwards, more or less roundly truncate and oblique, and the antero-superior margin of lobe not sharply pointed.

24. *Hyboella obesa* Hancock

1915. *Hyboella obesa* Hancock, *Rec. Indian Mus.*, **11** : 107-108.

Material examined : 2 ♂♂, Deban, 24 kms. from Miao, 7.iv.1981 ; 1 ♀, Near 34th. mile on M.B. Road, 23.iv.1981 ; 1 ♂, Deban, 27 kms. east of Miao, 10.xii.1982.

Distribution : India (West Bengal and Sikkim).

Remarks : *Hyboella obesa* Hancock has similarity with *Hyboella dilatata* (De Haan), in regard to the posterior angles of lateral lobes of pronotum which is dilated and roundly truncate behind, but differs from the latter by the wider and flat vertex which is superficially depressed on either side ; deeply depressed dorsum behind the shoulders and compresso-elevated median carina in front of shoulders,

SUBORDER : ENSIFERA

Superfamily : GRYLLOIDEA

Family : GRYLLOTALPIDAE

25. *Gryllotalpa africana* Beauvois1805. *Gryllotalpa africana* Beauvois, *Ins. Afr. Amer.*, : 229, tab. 2c, fig. 6.1869. *Gryllotalpa fossor* Scudder, *Mem. Peabody. Ac. Sc.*, 1 : 21 pl. 1. figs. 11, 28, 29.1924. *Gryllotalpa africana*, Chopard, *Rec. Indian Mus.*, 26 : 181.

Material examined : 1 ♂, 10th mile post from Miao, 2.v.1981, 2 ♂ ♂, Miao, 5.v.1981 ; 2 ♂ ♂, Miao, 5.xii.1982.

Distribution : India (Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, Meghalaya, Orissa, Tamil Nadu, Kerala, Karnataka and Arunachal Pradesh), Bhutan ; Pakistan ; Nepal ; Sri Lanka ; Burma ; Malaya ; S. Africa ; S. Espagne ; Madagascar ; Iran ; Australia.

It has also been collected in India from Rajasthan, Assam, Manipur, Maharashtra and Madhya Pradesh.

Remarks : *Gryllotalpa africana* Beauvois is a very common species in India.

26. *Scapteriscus* sp.

(Fig. 4)

Material examined : 1 ♂, Miao, 5.v.1981.

Distribution : India (Arunachal Pradesh) ; America.

Remarks : The present species resembles with *Scapteriscus siagensis* Tandon & Shishodia 1972. However, being a damaged specimen, the present material could not be identified upto the specific level.

Family : GRYLLIDAE

27. *Brachytrypes* sp.

Material examined : 1 ♂, (nymph), Miao (at light), 5.v.1981.

Distribution : Tropical Asia, Africa and Sicily.

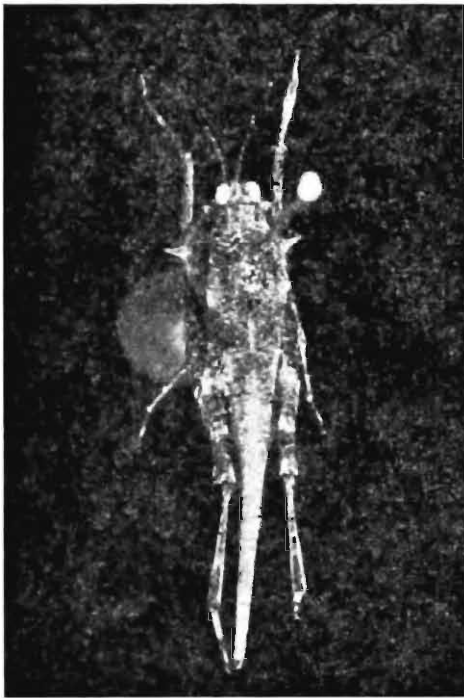
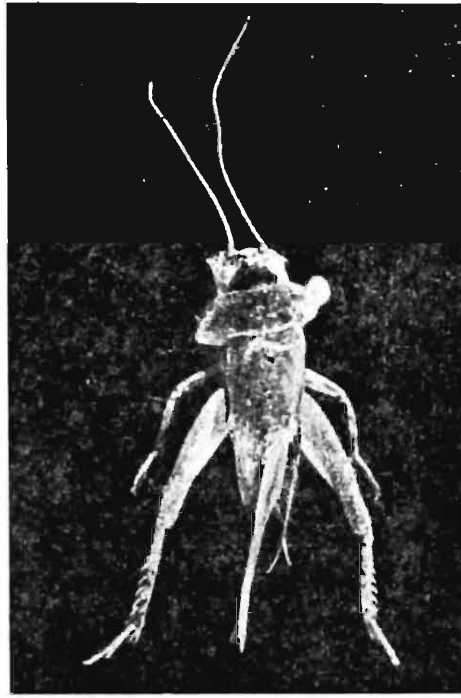
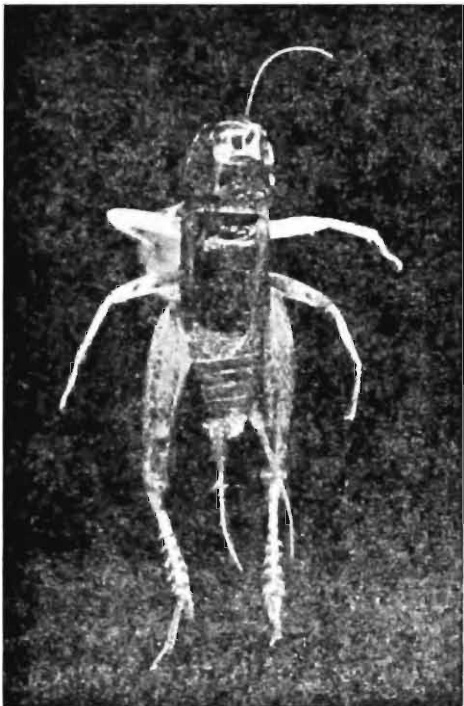
Remarks : Being a nymph, the specimen could not be identified upto the specific level.

28. *Modicogryllus confirmatus* (Walker)1859. *Acheta confirmata* Walker, *Ann. Mag. nat. Hist.*, (3) 4 : 221.1964. *Modicogryllus confirmatus*, Randell, *Can. Ent.*, 96 : 1584.

Material examined : 1 ♀, Gibbon's land, 10th mile post from Miao, 2.v.1981.

Distribution : Tropical Asia ; from Israel to Philippines.

In India this species is recorded from Uttar Pradesh, Maharashtra, Bihar, West Bengal, Assam, Orissa, Karnataka, Tamil Nadu, Andaman

**5****6****7****8**

- Figs. 5-8. 5. *Scelimena india* Hancock, dorsal view.
6. *Modicogryllus* sp., dorsal view.
7. *Velarifictorus* sp., dorsal view.
8. *Scleropterus* sp., dorsal view.

Islands, Madhya Pradesh, Rajasthan, Meghalaya, Manipur and Himachal Pradesh.

Remarks : Small sized specimen with elongato-convex body ; head with a transverse yellow band between the ocelli and also adorned light yellow marks on the occiput ; veins of the lateral field of elytra distant and strongly curved.

29. *Modicogryllus* sp.

(Fig. 6)

Material examined : 1 ♂, Miao (at light), 5.v.1981.

Distribution : Tropical Asia ; from Israel to Phillippines.

Remarks : Size small ; head dark brown and adorned with five yellow marks ; face brown ; ocelli not connected with yellow band ; pronotum dark brown, transverse with anterior and posterior margins straight ; lateral lobes blackish in superior three fourth parts and yellowish in inferior one fourth parts except the marginal line which is dark brown ; abdomen dark brown ; legs light rufous, the posterior femora not darkened at apex ; anterior tibiae with a large, oval external tympanum ; posterior tibiae armed with 4 internal and 5 external spines ; elytra a little shorter than the abdomen, brownish in colour ; mirror slightly longer than its width and divided by a curved vein behind the middle ; 2 oblique veins present ; apical yield with 5 veins ; lateral field brown with 4 to 5 widely separated veins and the Sc. bearing one branch ; wings caudate.

This specimen closely resembles with *Midicogryllus blennus* (Saussure).

30. *Gryllodes* sp.

Material examined : 1 ♀, (nymph), Deban, 27 kms. east of Miao, 10.xii. 1982.

Distribution : Cosmopolitan in tropical regions.

Remarks : Being in a nymphal stage, the specimen could not be identified upto the specific level.

31. *Velarifictorus* sp.

(Fig. 7)

Material examined : 2 ♂ ♂, Gibbon's land, 10th mile post from Miao, 2.v. 1981.

Distribution : Tropical Africa and Asia ; Madagascar ; Japan.

Remarks : Size larger ; head dark brown above, adorned with 5 to 6 yellow lines on the occiput and a yellow band between the ocelli ; mandibles large ; disk of pronotum varied with brown and yellowish ; elytra shorter than the abdomen and somewhat little dark brown ; mirror as large as broad and divided by a curved vein before the middle ; 2 oblique veins present ; apical field small to large with 4 to 6 veins ; lateral field almost transparent with 5 veins which are placed distant from one another : Sc. bearing 2 branches ; wings caudate ; genitalia with superior bridge divided into three parts, the median short with rounded angles at apex, the other two are lateral and a little prolonged ; the inferior part of genitalia broad and flat upto the middle and narrow beyond the middle, the narrow part knob like at apex and directed outwardly.

32. *Loxoblemmus* sp.

Material examined : 1 ♂, Miao (at light), 5.v. 1981.

Distribution : Southern Asia ; Philippines ; Japan ; Queensland ; Madagascar ; and Tropical Africa.

Remarks : Size small ; head dark brown ; occiput adorned with short longitudinal yellow lines ; frontal rostrum with a transverse yellow band between the ocelli ; face flattened with a little concavity ; first joint of the antennae without any denticulation ; elytra extending upto the apex of abdomen ; mirror longer than its width and not divided ; 2 oblique veins ; apical field with 3 veins which are irregularly reticulated ; lateral field with 3 to 4 branches ; Sc. bearing one branch ; wings caudate.

This specimen is nearer to *Loxoblemmus detectus* (Serville).

33. *Pteronemobius taprobanensis* (Walker)

1869. *Trigonidium taprobanense* Walker, *Cat. Derm. Salt. Br. Mus.*, 1 : 102.

1925. *Pteronemobius taprobanensis*, Chopard, *Ann. Mag. nat. Hist.*, (9) 15 : 507.

Material examined : 1 ♂, Miao 4.xii. 1982.

Distribution : India (Assam, Bihar, West Bengal, Orissa, Tamil Nadu, Arunachal Pradesh, Karnataka, Maharashtra) ; Bangladesh ; Burma ; Sri Lanka ; Malaya ; Indo-China ; and Andalus.

This species has also been collected in India from Uttar Pradesh, Arunachal Pradesh, and Meghalaya.

Remarks : Present specimen agrees in characters with the species given by Chopard (1969).

34. *Pteronemobius csikii* (Bolivar)

1901. *Nemobius csikii* Bolivar, *Zichy zool. Ergebn.*, 2 : 243.

1925. *Pteronemobius csikii*, Chopard, *Ann. Mag. nat. Hist.*, (9) 15 : 5 & 7, fig. 1.

Material examined : 2 ♀ ♀, Deban, 24 kms. from Miao, 7.iv. 1981.

Distribution : India (Assam, Bihar, Arunachal Pradesh, Madhya Pradesh, Uttar Pradesh, Haryana, Rajasthan, Karnataka and Tamil Nadu) ; Bhutan ; Sri Lanka ; Burma ; China ; and Siberia.

It is also collected in India from West Bengal and Maharashtra.

Remarks : *Pteronemobius csikii* is very similar to *P. fascipes* (Walker), but it differs from the latter in having the 4th and 5th joints of maxillary palpi testaceous-brownish at apex.

Family : SCLEROPTERIDAE

35. *Scicropterus* sp.

(Fig. 8)

Material examined : 1 ♂, Miao (at light), 5.v. 1981.

Distribution : South Asia and Japan.

Remarks : Being a female specimen it could not be identified upto the specific level, though it closely resembles with *Scleropterus punctatus* Brunner.

Family : ENEOPTERIDAE

36. *Madasumma* sp.

Material examined : 1 ♀, Deban, 13.xii. 1982.

Distribution : Madagascar ; S. Asia ; Philippine Islands ; and Australia.

Remarks : Being a female specimen, the identification could not be done upto the specific level.

Size smaller ; colouration light brown and less uniform ; elytra without conspicuous white spots.

SUMMARY

Present paper reports 36 species, including new records of Orthoptera from the Namdapha Wild Life Sanctuary of Tirap District, Arunachal Pradesh. Distributional and morphological data, helpful in identification, have also been provided.

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INSECTA : MANTODEA

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INTRODUCTION

The study of Mantid fauna in India made practically no head-way except a few by Wood-Mason (1889), Giglio-Tos (1927) and Mukherjee and Hazra (1982), But there appears to be no previous report on these insects from Arunachal Pradesh.

SYSTEMATIC ACCOUNT

ORDER : MANTODEA

Family : MANTIDAE Burmeister 1838

Subfamily : MANTINAE Kirby 1904

Tribe : MANTINI Beier 1964

1. *Hierodula (Hierodula) saussurei* Kirby 1904

1869. *Hierodula simulacrum*, Saussure, *Mt. Schweiz. ent. Ges.*, 3 : 68.

1904. *Hierodula (Hierodula) saussurei*, Kirby, *Cat. Orth. Brit. Mus.* 1 : 245.

General description : Body green ; stout frontal sclerite, higher than width, bicarinate. Head large, eyes round. Pronotum strong.

2. *Hierodula (Hierodula) sp.*

General description : Body greenish with a light tinge of yellow. Pronotum long, metazona three times longer than prozona ; metazona with almost parallel margin. Elytra broad, a little longer than abdomen ; costal area greenish yellow, becoming suddenly very narrow towards apex. Stigma pale. Abdomen broad. Anterior coxa with 9-10 spines originating from free border. The 1st and 3rd discoidal spines of anterior femur black ; the bigger internal spines are blackish.

Measurements : ♀ : Body 67.0 mm ; Pronotum 25.0 mm. Metazona 17.5 mm ; Ant. coxa 15.0 mm. ; Ant. femur 19.0 mm. Ant. tibia 10.0 mm. ; Elytra 43.0 mm.

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Material examined : 1 ♂, Zero, 38 Km NE of Miao, 21.xii.83.

Remarks : This specimen has much similarity with *Hierodula* (*Hierodula*) *vitreoides* G.T. 1912 but has some characters of *H. (H.) vitrea* (Stoll) 1813 as well as *H. (H.) ventralis* G.T. 1912. It seems more to be a variation of *H. (H.) ventralis* G.T. 1912.

3. *Statilia nemoralis* (Sauss) 1870

1870. *Pseudomantis nemoralis* Saussure, Mt. Schwaiz. ent. Ges. 3 : 229.

1870. *Mantis orientalis* Saussure, ibid. : 233.

1877. *Statilia nemoralis* Stal, Bih. Svenska Ak., 4 (10) : 55.

General description : ♀ : Body greenish. Superior border of frontal sclerite sinuated on both sides. Stigma of elytra without any black dot. Prosternum not black. The internal spines of anterior femur encircled by black rings at bases.

Measurements : ♀ (damaged) : Pronotum 16.5 mm., Elytra 27.5 mm.

Material examined : 1 ♀, Deban, 27 Km. East of Miao, 9.xii.83.

4. *Statilia maculata* (Thunb.) 1784

1784. *Mantis maculata* Thunberg, Nov. Ins. Spec. 3 : 61.

1897. *Statilia maculata* Bolivar, Ann. Soc. ent. France, 66 : 309.

General description : Identified by the presence of black band at coxal joint of prosternum and smoky wings. Two examples are damaged.

Materials examined : Sex unknown, Deban, 27 Km East of Miao, 3.xii. 83 & 7.xii.83.

5. *Statilia apicalis* (Sauss.) 1871.

1871. *Mantis apicalis* Saussure, Mem. Soc. Geneve, 21 : 291.

1877. *Statilia apicalis* Stal, Bih. Svenska Ak. 4 (1) : 55.

General description : One example damaged. Identified by greyish body and black patch on basal part of prosternum ; stigma with black dot. Anterior coxa internally near base with a black band. Another black band internally on femur posterior to claw groove.

Measurements : Sex unknown. Pronotum—15.0 mm, Ant. coxa—10.0 mm ; Ant. femur—13.0 mm, Ant. tibia—4.5 mm.

Material examined : 1 ex., Gibbon's Land, Miao, 2.i.84.

6. *Statilia* sp.

Material examined : 1 ♂ nymph, Zero, 28 KM NE of Miao, 22.xii.83.

7. *Tenodera* sp.

Material examined : 1 ♀ nymph, Farmbase, Miao. 17.xii.83.

Subfamily : DEROPLATINAE Giglio-Tos 1919

Tribe : PARABLEPHARINI Beier 1964

8. *Parablepharis kuhlii* (Haan) 1842

1842. *Mantis* (*Blepharis*) *Kuhlii* Haan, *Verh. nat. Gesch Nederl. Bezitt. Ins.* : 93 t. 18 f. 3.

1870. *Parablepharis kuhlii* Saussure, *Mt. Schweiz ent. Ges.* 3 : 223.

General description : ♂ : Blackish body. Pronotum proper with good supra coxal widening ; metazona constricted in the middle. Lamellar portion of prozona with few obtuse dents on margins ; this widening proceeds upto middle of anterior half of metazona. The basal part of metazona devoid of this lamella but laterally with 5-6 dents. Frontal sclerite smooth, superior edge wide angled, terminate in two minute conical points. Eyes big, round ; ocelli big.

Anterior coxa with dorsal ridge, with 4-5 swollen portion at posterior edge. Similar 7 lobules at anterior edge.

Anterior femur with 4 external and 4 discoidal spines ; its anterior edge sinuated by the formation of a lamellar portion.

Anterior tibia well broad, dorsally round, with about 16 external spines.

Middle and posterior coxa with small elongated lamellae ; femora with ventral lobules.

Elytra and wings well developed ; longer than body. Costal area of elytra opaque, discoidal area hyaline with blackish veins. Wings opaque but costal area, distal portion of discoidal area and anal area blackish brown.

Measurements : ♂ : Body-60.0 mm ; pronotum (wide/length-9.5/16.0 mm.) ; Ant. coxa-11.0 mm. ; Ant. femur-14.0 mm. Ant. tibia-7.0 mm. ; Elytra-55.0 mm.

Material examined : 1 ♂ ; 40 KM NE of Miao, 11.xii.83.

Subfamily : AMELINAE Giglio-Tos 1919

Tribe : AMELINI Beier 1964

9. *Cimantis fumosa* Giglio-Tos 1915

1915. *Cimantis fumosa* Giglio-Tos, *Bull. Soc. ent. Ital.*, 46 : 154.

General description : Dirty brown body ; small in size. Frontal sclerite a little wider than high, bicarinate, superior margin a little arched, feebly wavy in the middle ; upper half blackish. The vertex and pronotum blackish. Pronotum is little elongated ; the narrow median carina is blackish. Prosternum black. Margins of pronotum setaceous. Elytra long extending beyond abdomen, smoky ; stigma with black patch at both ends. Transverse veinules are black at one end. Wings hyaline, a little smoky at apex. Anterior coxa pale, with 2-3 blackish spots externally—that of distal end is more black. Internally the distal edge is black.

Anterior femora entirely black, indistinctly divided into 3 blocks at upper edge. All the spines are black. Discoidal and external spines are 4 in each cases. Anterior tibia similarly black, indistinctly triannulated. First segment of anterior tarsi black. There are 9-10 external spines on anterior tibia. The posterior metatarses are a little longer than the rest of the segments.

Measurements : Body : ♂ 20 mm, ♀ , 17 mm ; Pronotum : ♂ , 4.5 mm ; ♀ , 4.5 mm ; Metazona : ♂ 2.2 mm, ♀ , 2.1 mm, Elytra : ♂ , 2.1 mm, ♀ , 7 mm, Anterior coxa : ♂ 5.5 mm. ♀ , 3.5 mm., Anterior femur : ♂ , 6 mm, ♀ 4 mm, Anterior Tibia : ♂ , 3 mm, ♀ , 2 mm.

Materials examined : 1 ♂ , Zero Camp, 30 KM, N. E. of Miao, 14.xii.1982, 1 ♀ , Gibbon's land, 16 KM. East of Miao, 30.iv.1981.

Distribution : INDIA ; Annamalai Hills.

10. *Cimantis* sp.

Materials examined : 2 ♀ ♀ , nymphs, Hornbill, 30 KM. N. E. of Miao, 11.xii.83 and 13.xii.S3 ; 1 ♂ , nymph, above locality, 16.xii.83.

11. *Amantis* sp.

Materials examined : 2 ♂ ♀ , Hornbill, 30 km. N. E. of Miao, 13.xii.83 ; 1 ♂ , Zero, 27 KM. N. E. of Miao, 22.xii.83.

Family : HYMENOPODIDAE Chopard 1949
Subfamily : ACROMANTINAE Giglio-Tos 1919
Tribe : ACROMANTINI Beier 1964

12. *Acromantis montana* Giglio-Tos 1915

1915. *Acromantis montana* Giglio-Tos, *Boll. Mus. Torino*, 30 : 7.

General description : Tubercle of vertex very small, spiniform. Prosternum black ; the lateral border of pronotum presents very small blackish tubercles. Elytra with oblique veins a little curved near base. Distinct deep brown patch is not apperant in the elytra, but the distal 1/3 of costal area is reddish brown. Discoidal cells are big and elongated. Wings with deep reddish costal area in the distal 1/3 of the tip. Apex of wings truncated. Superior border of anterior femora without any hump (as in *A. insularis* Giglio-Tos) ; its discoidal and bigger internal spines are entirely black. Ant. coxa with 5-6 smaller spines.

Measurements : ♂, Body 25 mm ; Pronotum 8 mm, Elytra 20 mm.

Material examined : 1 ♂, Miao R. F., 3,xii.1982.

Remarks : This species is nearer to *A. gestri* Giglio-Tos, but distinguished by the vertex tubercle which is very small in *montana* Giglio-Tos. as also by the nature of pronotum and longitudinal veins of elytra.

Distribution : INDIA, JAVA.

13. *Anaxarcha graminea* Stal 1877

1877. *Anaxarcha graminea*, Stal, *Bih. Svenska AK.*, 4 (10) : 87.

General description : Green small mantid ; Frontal sclerite transverse, terminates in a sharp point. Pronotum with oval elongated dialation. Border with black line a short length of prozona and metazona. Anterior coxa with few denticles. Bigger internal spines of anterior fermur black.

Measurements : ♂ : Body : 32.0 mm ; Pronotum.11.0 ; Metazona 7.0 mm ; Ant. coxa-7.0, Ant. femur-9.0 mm, Ant. tibia-5.0 mm., Elytra-26.5 mm.

Material examined : 1 ♂, Hornbill, 30 K.M. N.E. of Miao, 12.xii.83 ; 1 ♂, Deban, 27 K.M. East of Miao, 4.xii.83.

Distribution : ORIENTAL INDIA.

14. *Nemotha metallica* (Westw.) 1843

1843. *Mantis metallica*, Westwood, Arcana ent., 2 : 51 t. 62 f. 3.

1871. *Micromantis metallica* Saussure, Mem. Soc. Geneve, 21 : 33.

1889. *Nemotha metallica* Westwood, Revis Mantid. 42.

General description : Small blackish blue mantids, Juxtacular lobes of vertex prominent. Frontal sclerite narrow, transverse, obtuse-angled ; clypeus elevated with a median ridge. Pronotum well developed ; good supra coxal dialation, margins constricted in the metazona ; borders finely denticulated ; a broad black transverse band on supra-coxal junction.

Anterior femur with 4 external spines. All the legs are totally black. Anterior tibia with 13 internal spines.

All abdominal segments bear a white narrow streak at their posterior margins.

Elytra deep green and densely reticulated.

Measurements : Body ♂, 18 mm, ♀, 26.5 mm ; Pronotum : ♂ 6.0 mm. ♀, 7.3 mm. ; Ant. coxa : ♂ 5 mm. ♀ 6 mm. ; Ant. femur : ♂ 6.0 mm, ♀ 7.5 mm. ; Elytra : ♂ 14 mm., ♀ 19.5 mm.

Material examined : 2 ♂ ♀, Hornbill, 30 K.M. N.E. of Miao, 13.xii.83.

Distribution : INDIA : Assam, Arunachal Pradesh.

Subfamily : HYMENOPODINAE Giglio-Tos 1919

15. *Creobroter laevicollis* (Sauss.) 1870.

1870. *Creobotra laevicollis* Saussure, Mt. Schiweiz. ent. Ges. 3 : 242.

1927. *Creobroter laevicollis*, Giglio-Tos, Das Tierreich 50 Lief : 557.

General description : ♂, Vertex with a minute spine on a swollen base. Eye conical, reaching beyond the level of vertex. Frontal sclerite pentagonal, with a deep concavity. Anterior coxa with 6-7 minute spines. Elytra green, densely reticulate, oval yellow band placed in front of middle and contains one black dot. Anal area of wings smoky in the middle.

Measurements : ♂ (damaged) : Pronotum-8.0 mm. Ant. coxa-9.0 ; Ant. femur-10.5 ; Ant. tibia-5 mm. Elytra-37.0 mm.

Materials examined : 2 ♂ ♂, Deban, 27 KM east of Miao, 3.xii.83 and 7.xii.83.

Distribution : JAVA, INDIA.

SUMMARY

The present paper deals with 10 species of Mantodea distributed over 10 genera and 2 families. These are recorded for the first time from Arunachal Pradesh.

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INSECTA : DERMAPTERA

By

G. K. SRIVASTAVA

Zoological Survey of India, Calcutta

(With 19 Figures)

INTRODUCTION

The present paper is based on a small collection of Dermaptera from Namdapha National Park in Tirap Dist. It comprises 14 species (including two identified up to generic level since represented either by ♀ or nymphs only) belonging to 12 genera. Of these, two species viz., *Anisolabis deplanata* and *Adiathetus metallicus* are described as new to science. Besides, *Proreus weisi* (Burr), hitherto known from Vietnam and South China is reported for the first time from India, giving some additional information since the original description is brief.

SYSTEMATIC ACCOUNT

PYGIDICRANIDAE

PYGIDICRANINAE

Cranopygia sp.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Namdapha Camp, 1 ♀, 21.iv.1981 ; Firmbase, 1 nymph, 19.iv.1981 ; Zero Camp, 3 km. N of Deban Miao, 2 nymphs, 19.iv.1981.

ECHINOSOMATINAE

Echinosoma convolutum Hincks

Echinosoma convolutum Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 152 (♂, ♀ ; Burma and Tonkin (Vietnam)).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Hornbill, 2 ♂ ♂, 14.iv.1983, Miao, 1 nymph, 4.iv.1983 ; Gibbon Lands, 2 ♀ ♀, 1 nymph, 3.v.1981.

Distribution : India, Burma and Vietnam.

Echinosoma dentiferum Borelli

Echinosoma dentiferum Borelli, 1912, *Bull. Mus. Hist. nat. Paris.*, 18 : 223 (♂ ; Bhutan).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Gibbon Lands, 1 ♀, 3.v.1981.

Distribution : Bhutan.

CARCINOPHORIDAE

CARCINOPHORINAE

Aborolabis pervicina (Burr)

Anisolabis pervicina Burr, 1913, *Rec. Indian Mus.*, 8 (2) : 137 (♂, ♀ ; India, Assam).

Aborolabis pervicina : Srivastava, 1969, *Entomologists Rec. J. Var.*, 81 : 246.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Deban, 24 km. from Miao, 1 ♀ , 7.iv.1981 ; Hornbill, 1 ♂ , 1 ♀ , 11.iv.1981.

Distribution : N. E. Himalayas in India, Nepal and Bhutan.

Paralabis aborensis (Burr)

Euborellia aborensis Burr, 1913, *Rec. Indian Mus.*, 8 (2) : 137 (♂, ♀ ; Assam).

Paralabis aborensis : Srivastava, 1968, *Entomologists Rec. J. Var.*, 80 : 289 ; Srivastava, 1971, *Entomologists Rec. J. Var.*, 83 : 22 ; Srivastava and Roychowdhury, 1975, *Newsl. zool. Surv. India*, 1 (2) : 22.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Hornbill, 1 ♂ , 2 ♀ ♀ , 14.iv.1981 ; Firmbase, 1 ♂ , 2 ♀ ♀ , 19.iv.1981 ; Namdapha Camp, 3 ♀ ♀ , 22.iv.1981.

Remarks : So far recorded only from N.E. Himalayas, India.

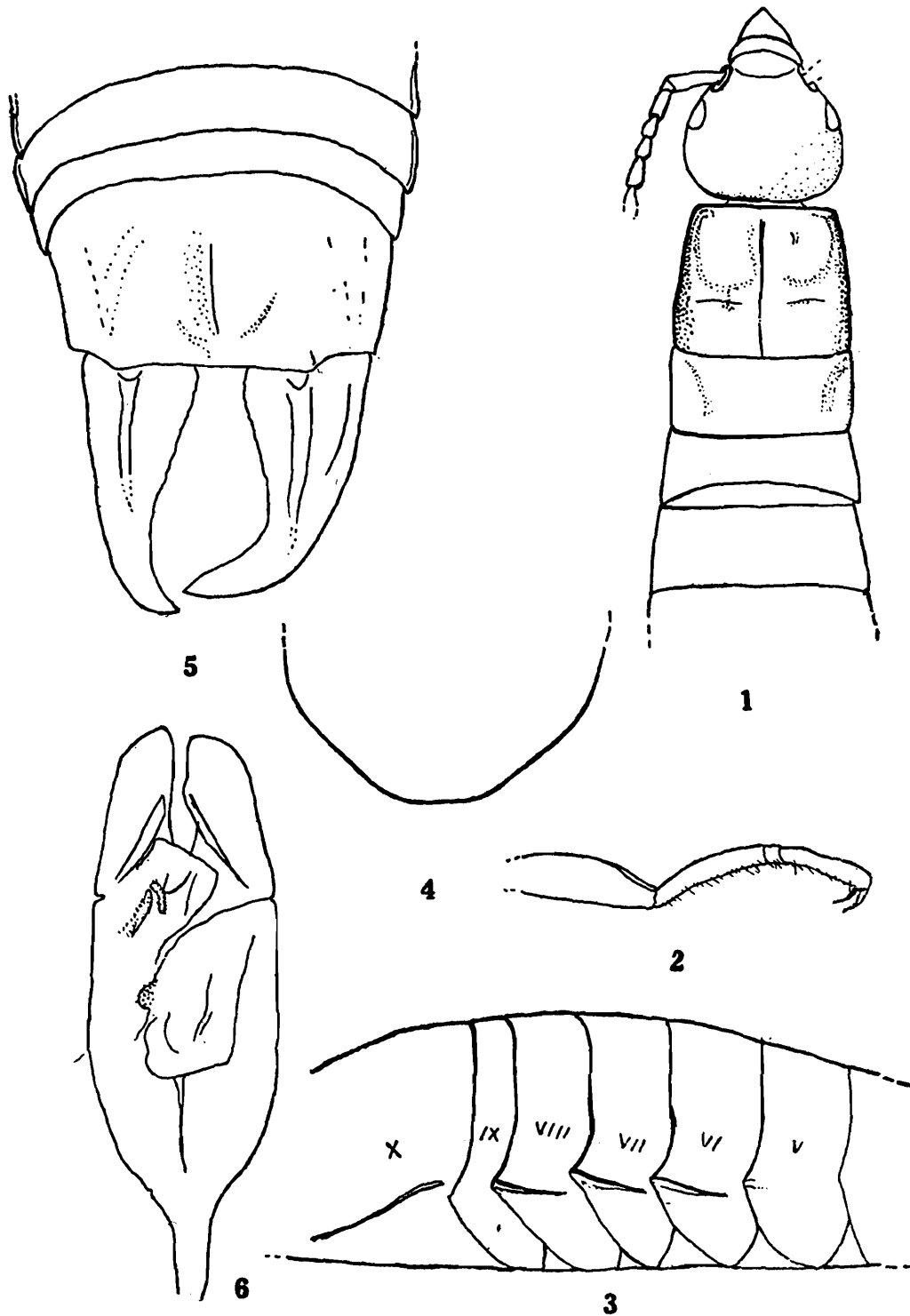
Anisolabis deplanata sp. n.

(Figs. 1-6)

♂ : General colour brownish black. Antennae brownish black but lighter than the body colour, 2nd yellowish, apical 4 or 5 segments dirty white. Pronotum yellow laterally along the border. Legs yellow, femora banded with brownish black in basal half. Posterior margin of abdominal tergites lighter in colour.

Head cordiform, smooth, slightly longer than broad, feebly narrowed posteriorly behind eyes, hind margin almost straight, frons convex, sutures obsolete. Eyes small, about half as long as the post-ocular length. Antennae 13-segmented, 1st stout, expanded apically, about as long as the distance between antennal bases ; 2nd about as long as broad ; 3rd long and slender ; 4th and 5th subequal, shorter than 3rd ; 6th onwards gradually increasing in length but stouter and expanded apically, a few apical segments shorter and almost globular. Pronotum smooth, about as long as broad, gently widened posteriorly, all margins straight, sides feebly reflexed, median sulcus faint, prozona moderately raised and metazona depressed. Meso-and metanotum transverse,

smooth, former posteriorly truncate and latter broadly concave. Thoracic sternites typical for the genus, mesosternum with hind margin lightly convex and metasternum posteriorly truncate. Legs typical for the genus, hind tarsi with 1st segment slightly longer than the third,



Figs. 1-6. *Anisolabis deplanata* sp. n., Holotype ♂ ; 1. Anterior portion of body ; 2. Hind tarsi, 3. Sides of abdominal segments, 4. Posterior margin of penultimate sternite. 5. Ultimate tergite and forceps and 6. Genitalia.

claws without arolium. Abdomen covered with fine, short pubescence, spindle shaped, moderately convex, tergites finely punctulate, sides of segments 5th to 9th acute posteriorly, rugosely punctulate and with

an oblique ridge on segments 6th to 8th whereas a faint tubercle only present on segments 4th and 5th posteriorly. Penultimate sternite transverse, obscurely punctulate, posteriorly in middle truncate; manubrium slightly over three times longer than the length of the sternite, apex forming a narrow elongated loope. Ultimate tergite transverse, obscurely punctulate, shining, disc in middle feebly depressed with a short median sulcus, hind margin straight between the branches of forceps and laterally oblique. Forceps with branches subcontiguous and trigonal in basal one third; the upper ridge distinct in basal one third, afterwards depressed and tapering apically, incurved in apical one third, right branch more strongly curved, apices pointed. Genitalia with parameres about half as long as pro-parameres and three times longer than broad; distal lobes with small denticulated pads (fig. 6).

♀ : Unknown.

Measurements : (in mm)

	Holotype	Paratypes
	♂	♂ ♂
Length of body	7.5	6.9 – 7.2
Length of forceps	1.0	0.9 – 0.7

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Nampapha, Hornbill, Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen), Paratype 1 ♂, same data 11.iv.1981, S. Biswas; West Bengal, Darjeeling Dist., Sivoke, Paratype 1 ♂ (genitalia mounted between two coverslips and pinned with the specimen), ex sweeping over wild vegetation, 10.iv.1978, A. R. Bhowmik; deposited in the National Zoological Collections at the Zoological Survey of India, Calcutta.

Remarks : In India genus *Anisolabis* Fieber is recorded by *A. gaudens* Burr (1904); *A. maritima* (Bonelli) (Burr, 1914 and Steinmann, 1981).

Although *A. gaudens* was recorded on a ♂ but it was later found to be a ♀ (Burr, 1910). Subsequently, Biswas *et al* (1973) recorded this species from Meghalaya on male and females. The material referred to by them was examined and is represented by nymphs only which in the absence of adult ♂ is difficult to place accurately. For this reason its taxonomic position remains still doubtful.

The material referred to by Burr (1914) doubtfully and Steinmann (1981) under *A. maritima* from South India is represented by a female and two nymphs, respectively which perhaps belong to any of the species of *Epilabis* Burr, from the area.

The described species on the basis of males, can be easily discriminated from the other known Oriental species of the genus by being smaller in size (7.8-8.5 mm including length of forceps); in having sides of abdominal 4th to 9th acute angled, with a median oblique carina on segments 6th to 9th only and a vestige of carina at extreme posterior angle on 4th and 5th and characteristic genitalia.

LABIDURIDAE

LABIDURINAE

Labidura riparia (Pallas)

Labidura riparia Pallas, 1973, *Reise Russ. Reichs.*, 2 : 727 (Shores of Irtysh River, Western Siberia).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Deban, 1 nymph, 2.iv.1981 ; Miao, 1 ♀, 5.v.1981.

LABIIDAE

LABIINAE

Labia lutea (Bormans)

Spongophora lutea Bormans, 1894, *Annali Mus. Civ. Stor. nat. Giacomo Doria*, 2 (14) : 386 (♂, ♀ ; Burma).

Labia lutea : Srivastava, 1975, *Newsl. zool. Surv. India*, 1(4) : 80.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Hornbill, 2 ♂♂, 11.iv.1981.

Labia curvicauda (Motschulsky)

Labia curvicauda Motschulsky, 1863, *Bull. Soc. Imp. Nat. Moscou*, 34(2) : 2, pl. 1, fig. 1 (♂, ♀ ; Nura Ellia Mountains, Ceylon).

Material examined : INDIA : Tirap Dist., Miao, 1 ♂, 1 nymph, 4.iv.1981 ; 2 ♀♀, 21.iv.1981 ; Deban North, 1 ♂, 28.iv.1981 ; Gibbon Lands, 1 ♂, 1 ♀ and 1 nymph, 3.v.1981.

Remarks : Almost world wide in distribution.

CHELISOCHIDAE

CHELISOCHINAE

Chelisoche brevipennis Borelli

Chelisoche brevipennis Borelli, 1923, *Boll. Musei zool. Anat. Comp. R. Uniu. Torino*, 38 (13) : 12.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Near

34th mile on M. B. Road, 1 ♂, 1 ♀ 23.iv.1981 ; Namdapha Camp, 55 km. from Miao, 1 ♂, 21.iv.1981.

Remarks : This species was reported from India for the first time by Srivastava (1977).

***Proreus weisi* (Burr)**

(Figs. 7-13)

Mecomera weisi Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 302 (1 ♂ ; Tonkin, Central environs de Tuyen-Quan).

Proreus weisi : Burr, 1911, *Gen. Insec.*, 122 : 64.

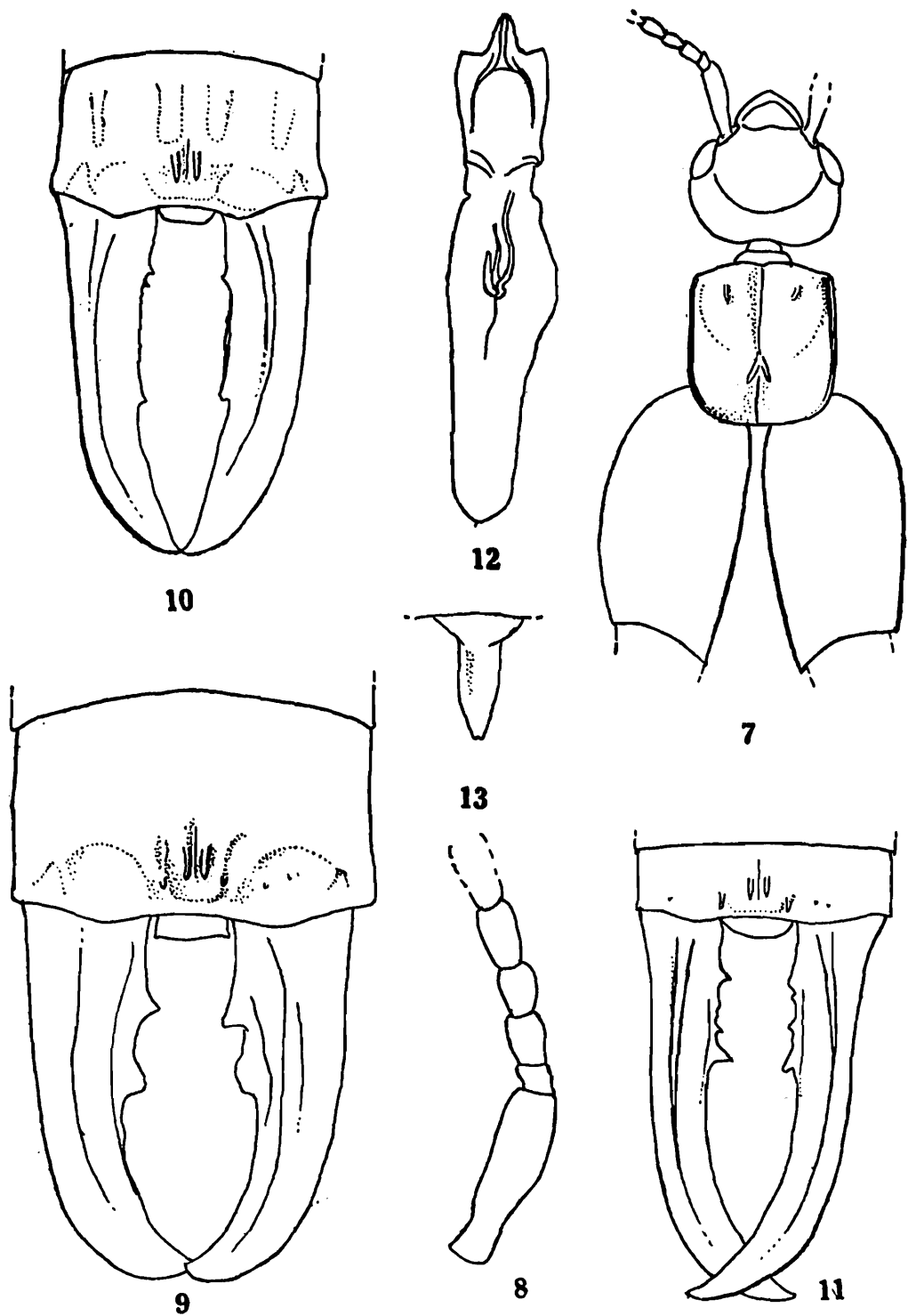
Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Hornbill, 2 ♂ ♂ (genitalia mounted between two coverslips and pinned with the specimen), 1 ♂, 16.iv.1981.

The original description being brief following additional information will be useful in recognising the species :

General colour black. Legs with tarsi brownish black. Some of the abdominal tergites posteriorly, ultimate tergite and forceps reddish but shaded with black in parts. Form depressed. Head micro-reticulate. Pronotum finely punctulate in posterlor half only. Elytre and wings punctulate, finely pubescent. Abdomen strongly punctate, punctures coalescing. Ultimate tergite with longitudinal stripes of smooth and punctate areas alternating.

Head with occiput weakly raised and sutures marked by faint depression, hind margin emarginate in middle. Antennae 18-segmented, 1st stout, slightly longer than the distance between antennal bases ; 3rd slender ; 4th stout, slightly shorter than the preceding ; 5th onwards segments gradually increasing in length and thinning. Pronotum slightly longer than broad, hind margin rounded, sides straight. Elytra and wings well developed, former with external margin convex in middle and hind margin concave posteriorly. Legs typical, tibia sulcate in apical half, hind tarsi with 1st segment slightly longer than the 3rd which is compressed. Penultimate sternite broadly convex posteriorly with a faint concavity in middle. Ultimate tergite transverse, posteriorly in middle with a rectangular depression bearing a pair of compressed tubercles, area corresponding base of forceps with low tumid, rugose elevations. Pygidium vertical, quadrate, convex above, hind margin almost straight, postero-lateral angle with minute point. Forceps punctate and striate in f. brachylabia short, stout, internal margin ventrally with two triangular tubercles roughly in middle ; in f.

macrolabio forceps more elongated and internal margin in basal half crenulate. Genitalia as seen in fig. 12.



Figs. 7-13. *Proreus weisi* (Burr) ♂ ; 7. Anterior portion of body, 8. A few basal antennal segments, 9-11. Forceps showing micro-, meso- and macrolabial forms 12. Genitalia ; *Adiathetus glaucopterus* (Bormans) ♀. 13. Pygidium.

Measurements : (in mm)

		♂ ♂
Length of body	—	8.0—11.0
Length of forceps	—	2.5—4.0

Distribution : Hitherto known from Vietnam and S. China the present record is new to India. Besides, Borelli (1916) refers to 1 ♀ doubtfully under this species from Philippines.

Remarks : On the basis of male genitalia this species comes close to *Proreus dentatus* Srivastava (1976) from Philippines but differs in having more heavily punctuate abdominal tergites ; ultimate tergite with inner pair of compressed tubercles in posterior depression more closely placed ; forceps with different inner armature and parameres with external angle broader and narrowed apical portion more elongated.

***Adiathetus metallicus* sp. n.**

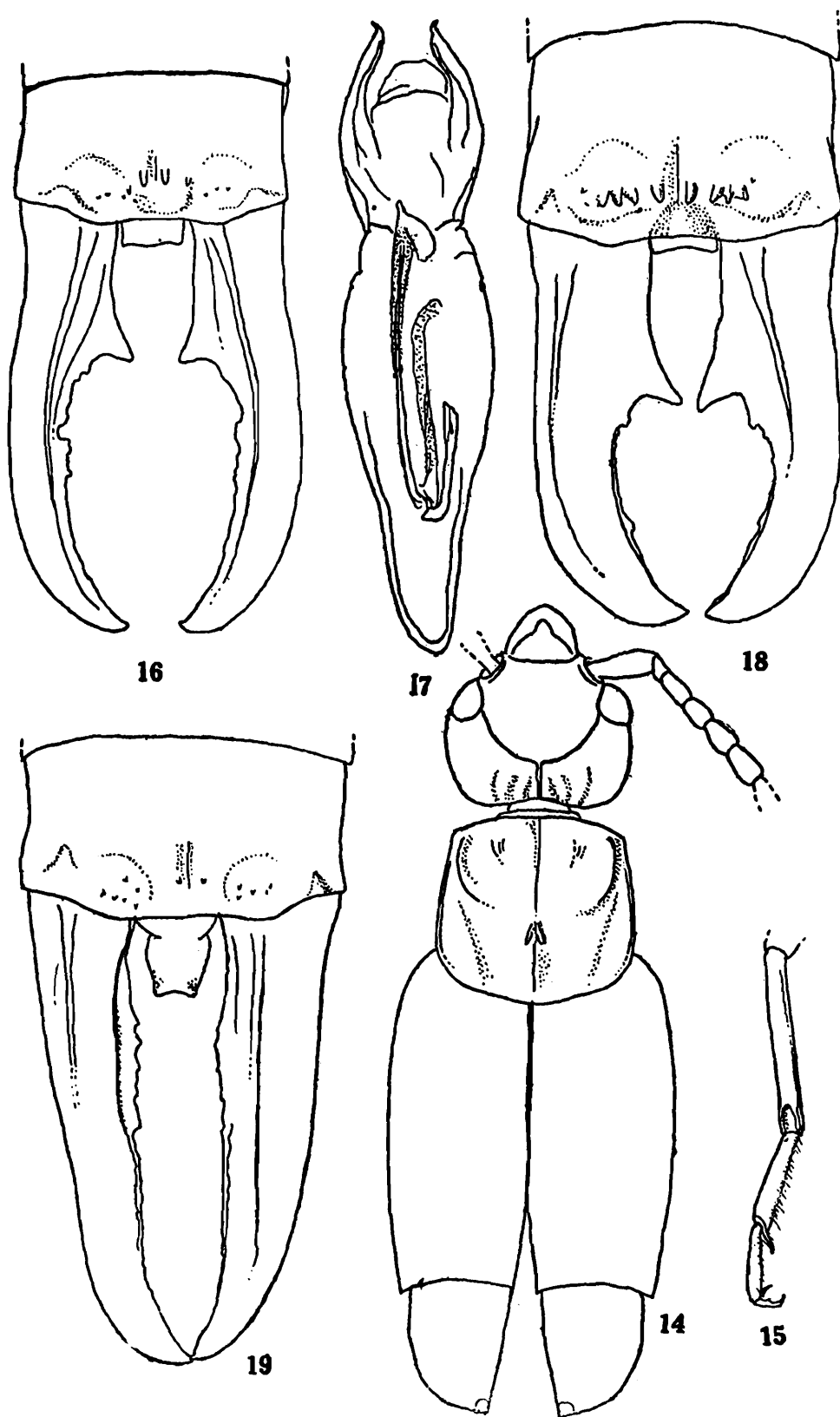
(Figs. 14-19)

Adiathetus glaucopterus (nec Bormans) ; Burr, 1913, *Rec. Indian Mus.*, 8 (2) : 144 (excluding 1 ♂, 1 ♀ from Sadiya, Regd. Nos. 2300-1/19 and 1 ♀ from Rotung Reg. No. 2161/19) ; Srivastava, 1979, *Proc. Sym. zool. Surv. India*, 1 : 63 (excluding fig. 7A).

♂ : Head, antennae, fore legs, tibiae and tarsi of middle and hind legs and ultimate tergite black. Antennae with one or two preapical segments complete or half brown. Pronotum, elytra and wings with a bluish-green metallic sheen. Femora of hind and middle legs and forceps brown. Abdominal tergites brown but shaded with black in parts. Often tarsi of middle and hind legs shaded with brown.

Head smooth, slightly longer than broad, frons and occiput raised, sutures fine but distinct, hind margin emarginate. Eyes not prominent, about half as long as the length behind eyes. Antennae (partly broken) 18-segmented or more, basal segment expanded apically, about as long as the distance between antennal bases ; 2nd small, only slightly longer than broad ; 3rd long and slender ; 4th stouter, slightly shorter than the 3rd and 5th, remaining gradually increasing in length but apical ones thin. Pronotum about as long as broad, smooth, gently widened posteriorly, sides straight, hind angles and margin rounded, median sulcus distinct, prozona convex with faint depression on either side of middle line, metazona depressed. Elytra and wings well developed, smooth, former with humeral angles prominent and hind margin obliquely concave. Legs typical for the genus, tibiae sulcate at extreme apex, hind tarsi with 1st segment almost equal to 3rd. Abdomen almost parallel sided, moderately convex, punctulate, lateral tubercles on 3rd and 4th tergites well marked. Penultimate sternite transverse, broadly rounded posteriorly, scarcely emarginate in middle. Ultimate tergite

transverse, punctate and smooth stripes alternating, disc a little before hind margin raised and the area in the middle with a faint depression, tumid above the bases of forceps and bearing faint compressed tubercles,



Figs. 14-19. *Adiatetus metallicus* sp.n., Holotype ♂, 14. Anterior portion of body, 15. Hind tibia and tarsi, 16. Ultimate tergite and forceps, 17. Genitalia, Paratype ♂, 18. Ultimate tergite and forceps, heavier form Paratype ♀, 19. Ultimate tergite and forceps.

on the posterior extremity of posterior median depression, a pair of compressed folds present, separated by a short median sulcus, hind margin trisinate, laterally oblique. Pygidium vertical, trapezoidal, hind margin convex, postero-lateral angle with a minute point. Forceps remote, stout and depressed, in f. macrolabia elongated and regularly curved, internally armed with a sharp triangular tooth at a little before middle, afterwards finely crenulate; in f. cyclolabia internal margin with a strong tooth at about middle, distal portion shortened, stouter and strongly incurved. Genitalia as seen in fig. 17.

♀ : Agrees with male in most characters except that the base and knee joints of middle and hind femora black; lateral tubercles on 3rd and 4th tergites less prominent; ultimate tergite with minute tubercles in the middle of median depression and on prominences corresponding bases of forceps; pygidium basally vertical, afterwards laminate, only slightly longer than broad, sides convex, narrowed posteriorly, hind margin concave with angles prominent; forceps simple and straight, internal margin finely crenulate.

Measurements : (in mm)

	Holotype	Paratypes	
	♂	2 ♂ ♂	1 ♀
Length of body	15.0	17.0-18.0	17.5
Length of forceps	5.0	5.0-5.5	6.0

Material examined.—INDIA : Arunachal Pradesh, Tirap Dist., Hornbill, Holotype ♂ (f. macrolabia; genitalia mounted between two coverslips and attached with the specimen); Paratypes 1 ♂ (f. cyclolabia), 1 ♀, 14.iv.1981; paratype 1 ♂ (f. cyclolabia) same data, 11.iv.1981, S. Biswas and party; deposited in the National Collections at the Zoological Survey of India, Calcutta.

Remarks : This species comes close to *Adiathetus glaucopterus* (Bormans) known from India, Burma and South China, in general external characters but differs by general body colour in having the head, fore legs, basal and apical portion of femore and whole of tibia and tarsi of middle and hind legs black (vs. uniform dark brown in *A. glaucopterus*); forceps stouter (vs. slender); ♀ pygidium with laminate portion only slightly longer than broad and scarcely narrowed posteriorly with sides convex in middle and hind margin concave (vs. about twice as long as broad, lanceolate with hind margin truncate or pointed).

Burr (1913) and Srivastava (1979) confused this species with *A. glaucopterus*.

FORFICULIDAE

ALLODAHLINAE

Allodahlia scabriuscula (Serville)

Forficula scabriuscula Serville, 1839, *Histoire Naturelle des Insectes Orthopteres* : 38(♀).
Allodahlia scabriuscula : Verhoeff, 1902, *Zool. Anz.*, 665 : 194.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Ziro Camp 3 ♂♂, 5 ♀♀, 8.iv.1981 ; Firm base, 1 ♂, 19.iv.1981 ; Miao, 1 ♀, 5.v.1981.

Distribution : Occurs in various mountains of the Oriental Region.

OPISTHOCOSMIINAE

Opithocosmia sp.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Near 34th mile on M. B. Road, 1 ♀, 23.v.1981.

Remarks : In the absence of a ♂ it not possible to determine it up to specific level.

SUMMARY

Altogether 14 species, including two new to science viz., *Anisolabis deplanata* and *Adiathetus metallicus*, belonging to 10 genera are dealt with from Namdapha Wildlife Sanctuary, Tirap Dist., Arunachal Pradesh, India. *Proreus weisi* (Burr) is recorded for the first time from India.

ACKNOWLEDGEMENT

I am thankful to Dr. B. K. Tikader, Director, Zoological Survey of India, Calcutta for providing necessary facilities during the course of present work.

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INSECTA : ISOPTERA

By

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(With 5 Figures)

INTRODUCTION

The eastern region of the Indian subcontinent is very rich and diverse faunistically. The termites of this part have been studied somewhat extensively (Roonwal and Chhotani, 1962 ; Chhotani, 1975, 1976 ; Chhotani and Das, 1983 ; Mathur and Thapa, 1965 ; Sen-Sarma and Thakur, 1979 ; and Lahiri and Ghosh, 1980) and as many as 49 species have been reported from the eastern states of the Indian Union. In the present paper, thirteen species belonging to eleven genera under three families are reported and one of these is new to science.

Family I. KALOTERMITIDAE

1. *Neotermes* sp.

Material examined : One imago, Miao, 5.v.1981.

Remarks : The single imago cannot be referred to any known imagos of the *Neotermes* species. Due to non-availability of associated soldiers it is not identified up to species level.

2. *Glyptotermes tikaderi* sp. n.

(a) *Description*

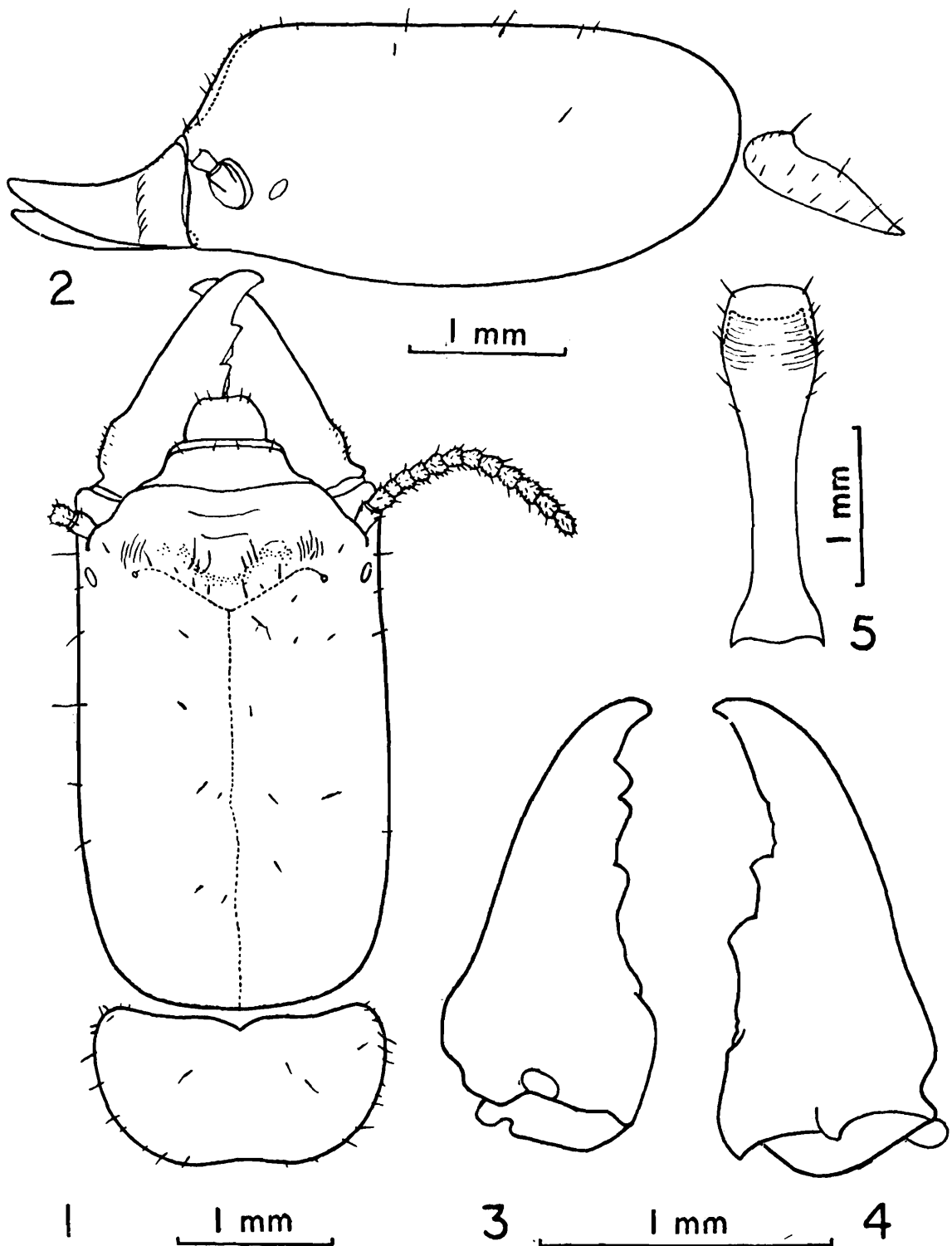
1. IMAGO.—Not known.

2. SOLDIER (Figs. 1-5).—

Head-capsule dark brown, somewhat paler posteriorly ; antennae brownish ; labrum dark brown ; mandibles blackish ; pronotum, mesonotum and metanotum brownish ; abdominal tergites pale brown, sternites creamish. Head and body sparsely hairy. Total body-length c 10.0-11.2 mm.

Head-capsule subrectangular, much longer than wide ; length 1.7 to 1.84 times that of width ; when viewed laterally upper margin straight ; frons sharply inclining in front and with faint striations ; a weak tubercle present on either side in middle at beginning of slope ; Y-suture present. Eyes translucent, small, elongately oval. Ocelli minute, dot-

like, situated at end of lateral suture, one on either side. Antennae short, with 14-15 segments ; segment 1 long, cylindrical and strongly sclerotised ; 2 cylindrical, shorter than 1 ; 3 or 4 shortest ; onwards segments gradually becoming larger and broadly pyriform in shape ; last segment short, ovate. Mandibles thick, short and stout, apically weakly incurved ; outer margin near base swollen, with a few short hairs. Left mandible with 4 marginal teeth ; 1st and 2nd marginals



Figs. 1-5. *Glyptotermes tikaderi* sp. n. Soldier.

1. Head and pronotum, in dorsal view ;	2. Ditto, in side view ;
3. Left mandible, in dorsal view ;	4. Ditto, right mandible ;
5. Postmentum, in ventral view.	

close to each other, latter with a long posterior margin ; 3rd with a long, curved posterior margin ; 4th short. Right mandible with two marginal teeth in middle. Postmentum long, club-shaped ; anterior broader portion with faint grooves and a few bristles, sometimes faintly bilobed ; waist long and narrow, width at waist less than half to about half of maximum width. Pronotum flat, much wider than long and almost as wide as head ; anterior margin deeply incurved ; posterior margin faintly incurved. Meso- and metanota narrower than pronotum ; latter only slightly wider than former. Legs short and stout ; apical tibial spurs 3 : 3 : 3 ; tarsi 4-jointed. Abdomen elongate ; cerci 2-jointed ; styli single-jointed, finger-like.

TABLE 1. Measurements (in mm), etc., of soldier of *Glyptotermes tikaderi* sp. n.

Body-parts	Range (5 examples)	Holotype
1. Total body-length	10.00-11.20	10.50
2. Length of head to lateral base of mandibles	3.20-3.50	3.50
3. Maximum width of head	1.90-2.05	1.93
4. Maximum height of head	1.68-1.80	1.75
5. Head index I (width/length)	0.54-0.59	0.55
6. Head index II (height/width)	0.88-0.92	0.91
7. Head index III (height/length)	0.48-0.55	0.50
8. Maximum length of labrum	0.28-0.35	0.35
9. Maximum width of labrum	0.45-0.50	0.48
10. Length of mandibles (from upper base of condyle to tip) :		
Left mandible	1.48-1.58	1.53
Right mandible	1.48-1.55	1.50
11. Head-mandibular length index (left mandible-length/head-length)	0.44-0.46	0.44
12. Maximum diameter of eye	0.23-0.28	0.25
13. Median length of postmentum	2.15-2.60	2.60
14. Maximum width of postmentum	0.60-0.65	0.65
15. Width of postmentum at waist	0.28-0.33	0.30
16. Maximum length of pronotum	1.05-1.08	1.08
17. Maximum width of pronotum	1.93-2.03	1.93
18. Pronotum-head index (pronotum width/head-width)	0.95-1.05	1.00
19. Pronotum index (length/width)	0.53-0.56	0.56
20. Maximum width of mesonotum	1.55-1.63	1.63
21. Maximum width of metanotum	1.60-1.75	1.65

3. PSEUDOWORKER.—

Head creamish white ; mandibles creamish with dark brown toothed margins ; pro-meso- and metanota pale yellowish brown ; abdomen

creamish, paler than head. Head and body sparsely hairy. Total body—length c 7.0-9.5 mm.

Head subcircular, slightly wider than its length to base of mandibles. Antennae 14 to 15 segmented ; segments 3-6 or 7 short, ring-like ; 8 onwards broadly pyriform. Eye-spots translucent or faintly greyish, round. Labrum broad, dome-like. Mandibles typically *Glyptotermes*-type. Pronotum semi-lunar ; anterior margin deeply incurved ; slightly narrower to slightly wider than head. Legs and abdomen as in soldier.

<i>Measurements (in mm) :</i>	<i>Range (5 examples)</i>
1. Total body-length	7.00-9.50
2. Length of head to tip of labrum	1.60-1.80
3. Length of head to lateral base of mandibles	1.35-1.53
4. Maximum width of head	1.50-1.58
5. Maximum length of pronotum	0.88-0.95
6. Maximum width of pronotum	1.40-1.60

(b) *Type specimens*

Holotype soldier (Z. S. I. Reg. No. 2915/H 11) and paratypes (3 paratype soldiers and several paramorphotype pseudoworkers and nymphs, Z. S. I. Reg. No. 2916/H 11), in separate vials ; Hornbill, Namdapha (Tirap District, Arunachal Pradesh), coll. *S. Biswas and party*, 14.iv.1981, from wood ; deposited in National Zoological collections, Zoological Survey of India, Calcutta. One paratype soldier and two paramorphotype pseudoworkers, with the same data, each deposited in Entomological collections, Forest Research Institute, Dehra Dun (Uttar Pradesh, India) and in American Museum of Natural History, New York (U. S. A.).

(c) *Affinities*

The soldier of *G. tikaderi* can be separated from all the other known species of the genus from the oriental region for its larger size. It is closest to that of *G. ceylonicus* Holmgren but is generally larger (Head-length to base of mandible 3.2-3.5 vs. 2.67-3.00 mm ; head-width 1.90-2.05 vs. 1.5-1.67 mm), and for having more (14 to 15 vs. 12) number of antennal segments and comparatively thinner and differently dentate mandibles.

Family II. RHINOTERMITIDAE

3. *Coptotermes heimi* (Wasmann)

1902. *Arrhinotermes heimi* Wasmann, *Zool. Jb. (Syst.)*, 17(1) : 104.

1962. *Coptotermes heimi* (Wasmann) ; Roonwal and Chhotani, *Indian Species of Termite Genus Coptotermes* : 9, 38-57, 72-73, 76, pls. 11-14. (Indian Counc. Agric. Res., Ent. Monogr. No. 2)

Material examined : Soldiers and workers from : Gibbon's Land (10th mile post from Miao), 2.v.1981 ; Zero Camp, 3 km North of Deban, 8.iv.1981, under bark ; and Deban, 24 km from Miao, 7.iv.1981 (mixed lot of *C. heimi*, *Odontotermes obesus* and *Pericapritermes dunensis*).

Distribution : It is a very widely distributed species on the Indian subcontinent.

4. *Reticulitermes assamensis* Gardner

1944. *Reticulitermes assamensis* Gardner, *Indian J. Ent.*, 6 : 105-106.

1983. *Reticulitermes assamensis* Gardner ; Chhotani and Das, *Rec. zool. Surv. India*, 80 : 315-317.

Material examined : Imagos, soldiers and workers, Namdapha, 24.iv.1981.

Distribution : It is fairly common in North-eastern India and is reported from Assam, Meghalaya, Arunachal Pradesh, Sikkim and West Bengal in India and from Bhutan.

5. *Reticulitermes tirapi* Chhotani & Das

1983. *Reticulitermes tirapi* Chhotani and Das, *Rec. zool. Surv. India*, 80 : 316, 324-327.

Material examined : Soldiers and workers from Hornbill, Namdapha, 13.iv.1981 (in 2 vials).

Distribution : It is described from Nampong, Tirap District and this happens to be the second record from the same district of Arunachal Pradesh.

6. *Parrhinotermes khasii* Roonwal & Sen-Sarma

1956. *Parrhinotermes khasii* Roonwal and Sen-Sarma, *Indian J. Agric. Sci.*, 26(1) : 6-11.

Material examined : Soldiers and workers from Chiria Camp, 40th mile on Miao-Vijayanagar Road, 24.iv.1981,

Distribution : *P. khasii* was described from Khasi Hills, Meghalaya and it is a record from Tirap District of Arunachal Pradesh. This species is also reported from China (Huang, 1980).

Family III. TERMITIDAE

7. *Pericapritermes dunensis* (Roonwal & Sen-Sarma)

1960. *Capritermes dunensis* Roonwal and Sen-Sarma, *Contrib. Syst. Orient. Termites* (Indian Counc. Agric. Res., Ent. Monogr. No. 1) : 28-33.

Material examined : One soldier and one worker, Deban, 24 km from Miao, 7.iv.1981 (mixed with *Coptotermes heimi* and *Odontotermes obesus*).

Distribution : *P. dunensis* was described from Dehra Dun (U. P.) and has later been reported from this region (Meghalaya) and Bhutan.

8. *Macrotermes khajurii* Roonwal & Chhotani

1962. *Macrotermes khajurii* Roonwal and Chhotani, *Proc. natnl. Inst. Sci. India*, (B) 28(4) : 329-334.

Material examined : Soldiers (major and minor) and workers, Near Zero Camp, 3 km N. of Deban, 8.iv.1982 (two vials, one with a soldier major mixed with *Odontotermes feae* and the other with soldier minor and workers).

Distribution : This species has earlier been recorded from Meghalaya in India and from Bhutan.

9. *Odontotermes feae* (Wasmann)

1896. *Termes feae* Wasmann, *Ann. Mus. Civ. Stor. Nat. Genova*, (2) 16(36) : 625-626.

Material examined : Soldiers and workers in 7 vials, thus : Hornbill, Namdapha, 14.iv.1981 and 16.iv.1981 (2 vials) ; Gibbon's Land, 10th milepost from Miao, 2.v.1981 (one vial) ; Miao Reserve Forest, 5.iv.1981 (one vial) ; Miao, 4.iv.1981 (2 vials, one a mixed lot of *O. feae*, *Hypotermes xenotermitis* and *Ancistrotermes pakistanicus*) ; Near Zero camp, 3 km N. of Deban, 8.iv.1981, (one vial, a mixed lot of *O. feae* and *Macrotermes khajurii*).

Distribution : It is a widely distributed species and is known from India, Bangla Desh, Bhutan, Burma, Thailand and Vietnam.

10. *Odontotermes obesus* (Rambur)

1842. *Termes obesus* Rambur, *Histoire Naturelle des Insectes, Nevroptères* : 304.

Material examined : Soldiers and workers in 2 vials, thus : Hornbill, Namdapha ; 11.iv.1981 and Deban, 7.iv.1981 (mixed lot of *O. obesus*, *Pericapritermes dunensis* and *Coptotermes heimi*).

Distribution : It is the most common termite on the subcontinent.

11. *Hypotermes xenotermitis* (Wasmann)

1896. *Termes xenotermitis* Wasmann, *Ann. Mus. Civ. Stor. Nat. Genova*, (2) 16 (36) : 628.

Material examined : Two vials with soldiers and workers from : Zero Camp, 3 km N. of Deban, 9.iv.1981 and Miao, 4.iv.1981 (mixed lot of *Odontotermes feae*, *H. xenotermitis* and *Ancistrotermes pakistanicus*).

Distribution : This species is reported from Burma, North-eastern India, Bangla Desh, Thailand and Malaysia : Sabah.

12. *Ancistrotermes pakistanicus* (Ahmad)

1955. *Microtermes pakistanicus* Ahmad, *Biologia*, Lahore, 1(1) : 25-27.

Material examined : Soldiers and workers from Miao, 4.iv.1981 (mixed lot of *Odontotermes feae*, *Hypotermes xenotermitis* and *Ancistrotermes pakistanicus*).

Distribution : It was described as a species of genus *Microtermes* and has recently been assigned to *Ancistrotermes* (Akhtar and Hussain, 1980). It is a very wide spread species and is reported from Bangla Desh, India, Burma, Thailand, Malaysia (Malacca), Singapore and Indonesia (Sumatra, Java).

13. *Nasutitermes garoensis* Roonwal & Chhotani

1962. *Nasutitermes garoensis* Roonwal and Chhotani, *Proc. natnl. Inst. Sci. India*, (B) 28 (4) : 379-384.

Material examined : Soldiers, workers and nymphs in 7 vials, thus : Deban, 24 km from Miao, 7.iv.1981 (2 vials) ; Miao Reserve Forest, 5.iv.1981 (2 vials) ; Gibbon's Land, 10 km post on Miao-Vijayanagar Road, 6.iv.1981, ex. tree trunk (one vial) ; Near Zero Camp, 8.iv.1981 (one vial) ; and Zero Camp, 9.iv.1981 (one vial).

Distribution : This species is quite common in North-eastern India and is also reported from Bhutan.

SUMMARY

Thirteen species belonging to the families Kalotermitidae (2), Rhinotermitidae (4) and Termitidae (7) are reported from a collection of termites from Namdapha, Tirap District, Arunachal Pradesh. Of these, a Kalotermitid species, *Glyptotermes tikaderi*, has been found to be new to science and described here.

ACKNOWLEDGEMENTS

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INSECTA : ODONATA

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(with 6 Figures)

INTRODUCTION

Odonate fauna of Eastern India including Bangladesh and Bhutan has been worked out by a number of workers, e.g. Fraser (1933, 1934, 1936), Bhasin (1953), Lahiri (1975, 1976, 1977a), Mitra (1975), Mitra and Sen (1975) and Lieftinck (1977a, b). But, till date, our knowledge regarding the odonate fauna of Arunachal Pradesh has remained rather poor. Lahiri (1977b, 1979) reported the occurrence of 19 odonate species in Arunachal Pradesh based on collections from several localities of Siang and Subansiri districts. The present collection comprising of a total of 11 species under 10 genera including one species new to science, provides the first account of the odonate fauna not only of the Namdhapa, but also that of the Tirap district. Six of the species (marked with* in the text) are new additions to the odonate fauna of Arunachal Pradesh. Necessary collection data for all the species together with notes about morphological variation and distributional pattern for some of them have been provided in the systematic account.

SYSTEMATIC ACCOUNT

Order : ODONATA

Family : CHLOROCYPHIDAE

***1. *Rhinocypha quadrimaculata* (Selys)**

1853. *Rhinocypha quadrimaculata* Selys, *Syn. Cal.*, : 60.

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Gibbons land, 2.v.1981, coll. *S. Biswas*.

Distribution : Northern and eastern India ; Burma ; Nepal.

Family : CALOPTERYGIDAE

***2. *Vestalis gracilis gracilis* (Rambur)**

1842. *Calopteryx gracilis* Rambur, *Hist. nat. Ins. Nevrop.*, : 224.

1934. *Vestalis gracilis gracilis* (Rambur) : Fraser, *Fauna Brit. India, Odon.*, 2 : 126.

Material examined : 3 exs, INDIA : Arunachal Pradesh : Namdhapa

* The species is named after and in memory of my mother.

sanctuary, coll S. Biswas, 28.iv.1981 (2 ♂ ♂, Deban north ; 1 ♀, Nr. Labal).

Distribution : Burma ; India ; Malaysia ; Thailand ; Vietnam.

Family : LESTIDAE

***3. *Lestes dorothea* Fraser**

1924. *Lestes dorothea* Fraser, *Rec. Indian Mus.*, 26 : 484 ; 1933, *Fauna Brit. India, Odon.*, 1 : 35.

Material examined : 5 ♂ ♂, 5 ♀ ♀, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Gibbons land, 10 kms on M. U. road, 5-6.iv. 1981, coll S. Biswas.

Specimens studied have fewer postnodal cross veins (♂ : forewing : 11-13, hindwing : 11-12 ; ♀ : forewing : 11-14, hindwing : 11-13) than what was recorded by Fraser (1933) for the species.

Distribution : Eastern India and Nepal.

Family : PLATYCNEMIDIDAE

4. *Calicnemis eximia* (Selys)

1863. *Calicnemis eximia* Selys, *Bull. Acad. r. Belg. cl. Sci.* (2), 16 : 160.

Material examined : 1 ♀, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Burmanala, 24.iv.1981, coll S. Biswas.

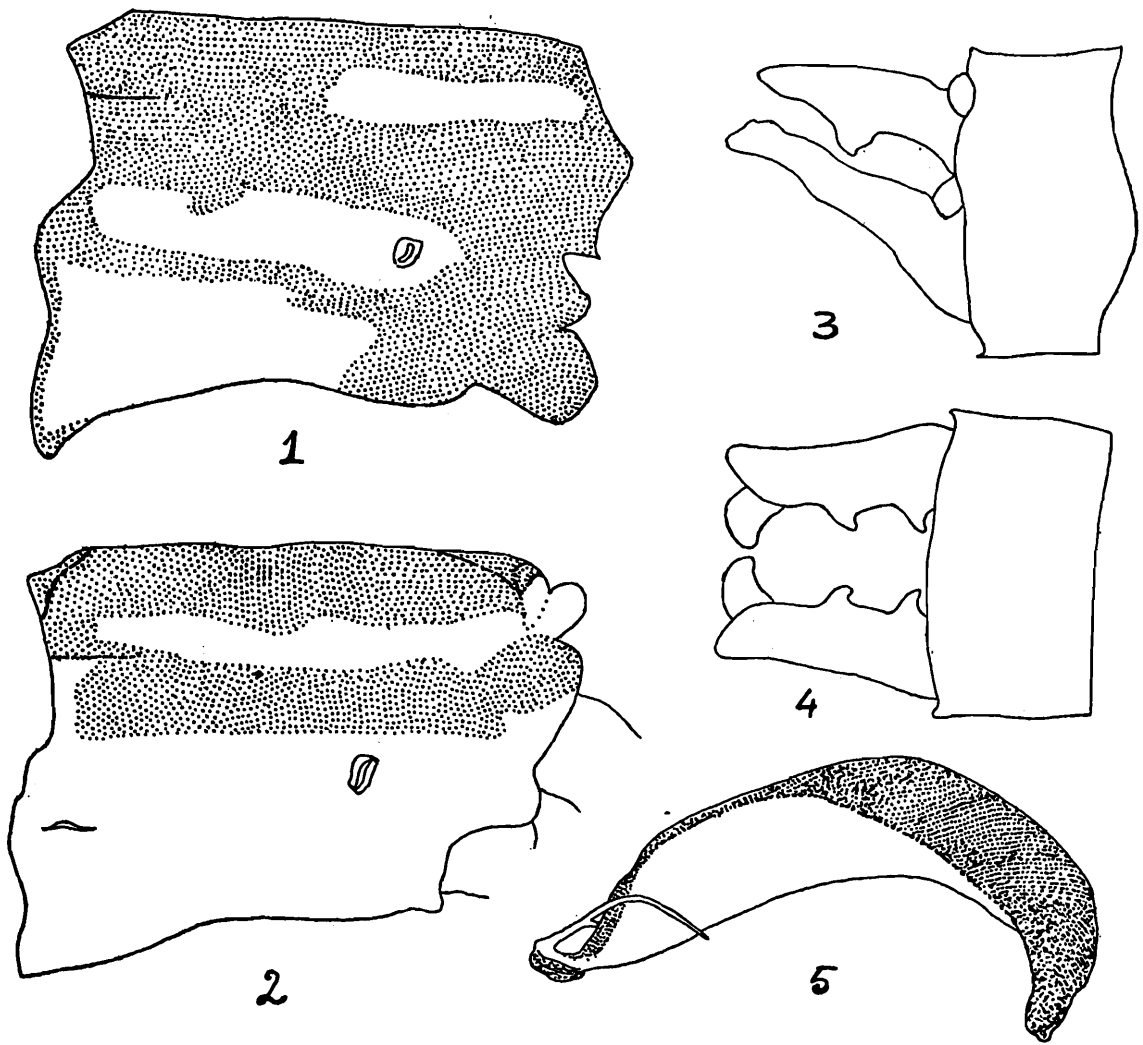
Distribution : Northern and eastern India ; Burma ; Nepal ; Vietnam.

5. *Coelicia prakritii* sp. nov.*

Material examined : Holotype ♂, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Gibbons land, 10th milepost from Miao, 2.v.1981, coll S. Biswas (Regd. No. 3876/H₁₃) ; Paratypes, 3 ♂ ♂, same data as Holotype (Regd. Nos. 3877/H₁₃, 3878/H₁₃ and 3879/H₁₃). All types deposited in the National Zoological Collection, Zoological Survey of India, Calcutta.

Description : Male : Blue marked with black, the blue ground colour faded or yellowish in immature specimens. Labium, bases of mandibles genae, an oval spot in apposition with posterior ocellus and stretching towards bases of antenna and a larger postocular spot on either side, blue ; rest of head black, but a narrow bluish line between

frons and vertex in more mature specimens ; eyes dark brown in preserved specimens. Prothorax black, the middle lobe entirely yellowish in immature specimens ; posterior lobe simple and rounded, broad medially, narrowed on either side. Thorax black, marked with blue as follows : a humeral stripe, slightly swollen at its rear end, extending over the anterior half of thorax ; the mes- and metepimeron ; beneath thorax also blue, but this falling well short of legs by a broad black belt ; the blue of mes- and metepimeron separated by a narrow



Figs. 1 to 5. *Coeliccia prakritii* sp. nov., male ; Figs. 1 and 2, thorax of Holotype and one of the Paratypes, showing nature of markings ; Figs. 3 and 4, anal appendages ; Fig. 3, right lateral view, Fig. 4, dorsal view ; Fig. 5, penile organ in lateral view ;

black line, but that of metepimeron and beneath thorax confluent in lower half ; in immature specimens, the blue is faded or replaced by pale yellowish, the humeral stripe is complete and lower half of thorax completely unmarked with black. Legs black ; coxae and trochanter bluish ; broad stripe on either side of femora and extensor surfaces of tibiae blue. Wings hyaline ; pterostigma nearly as long as broad, black

margined with yellow and enclosed in thick black nervures ; only two postquadrangular antenodal cells ; 18-20 postnodal cross veins in forewing, 16-21 in hindwing.

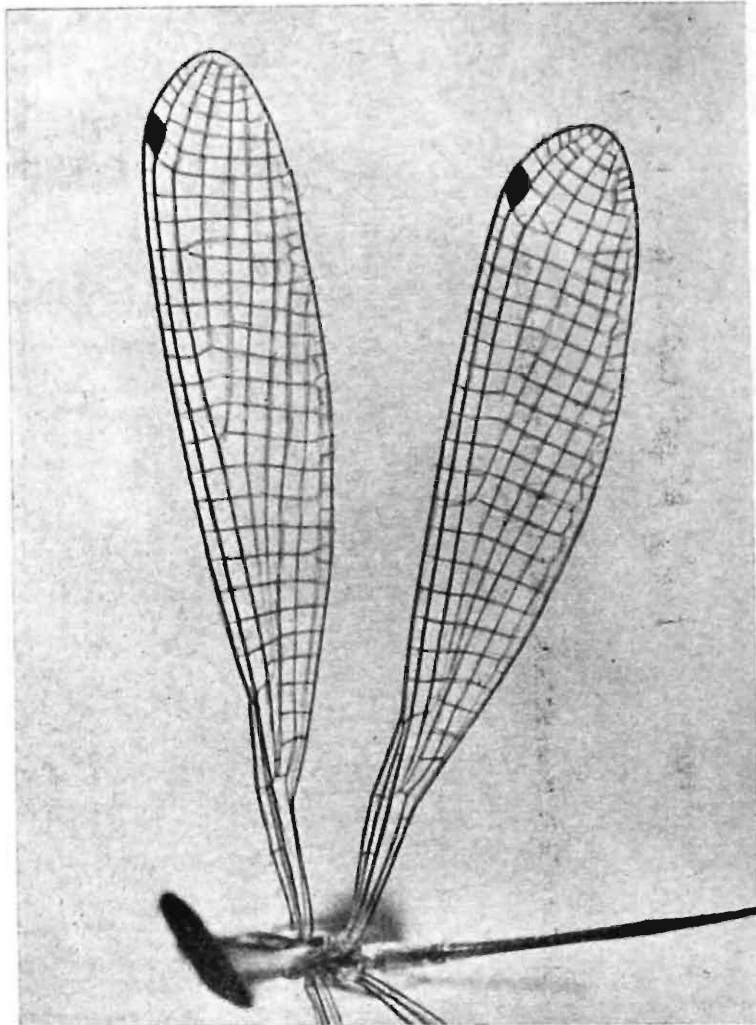


Fig. 6. Fore- and hind wings.

Abdomen : Black marked with yellowish as follows : beneath abdomen ; apical third of segment 9 and whole of segment 10 when viewed from above ; sides of segment 1 broadly and that of segment 2 at lower half ; dorsal black with narrow basal constriction on segment 3 and somewhat broader subapical constrictions on segments 3 to 6 due to invading yellow from venter. Anal appendages as shown in Figs. 3 and 4 ; superiors a little longer than segment 10, gently narrowed apically, the apices bluntly rounded and slightly divergent ; inner margin with a small sub-basal and a larger median tooth ; the former visible only when seen from dorsum, the later visible also laterally ; inferiors a little longer than superiors, unguate, broad at base, narrowing and sloping upwards apically. Penis as shown in Fig. 5, apical lobe produced into a pair of moderately long flagella.

Remarks : *Coeliccia prakritii* sp. nov. differs from all other species of the genus in respect of thoracic markings and the nature of male anal appendages.

Distribution : Eastern India : Arunachal Pradesh.

Family : COENAGRIONIDAE

***6. *Ceriagrion azureum* (Selys)**

1891. *Pseudagrion azureum* Selys, *Ann. Mus. civ. Genova* (2), 10(30) : 513.

1933. *Ceriagrion azureum* (Selys) : Fraser, *Fauna Brit. India, Odon.*, 1 : 328.

Material examined : 2 ♂♂, 1 ♀, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Gibbons land : 10th km milepost, 6.iv.1981, coll S. Biswas.

Distribution : Eastern India ; Burma ; Fukien ; Nepal.

***7. *Argiocnemis obscura* Laidlaw**

1914. *Argiocnemis obscura* Laidlaw, *Rec. Indian Mus.*, 8 : 346.

Material examined : 5 exs, INDIA : Arunachal Pradesh : Namdhapa sanctuary, coll S. Biswas (2 ♂♂, Gibbon land, 2.v.1981 ; 2 ♂♂, 1 ♀, Vijiny, 6.iv.1981).

Distribution : Eastern India.

Family : LIBELLULIDAE

***8. *Hylaeothemis fruhstorferi* (Karsch)**

1889. *Tetrathemis fruhstorferi* Karsch, *Ent. Nachr.*, 15 : 321.

1909. *Hylaeothemis fruhstorferi* (Karsch) : Ris, *Cat. Coll. Selys*, 9 : 64.

Material examined : 2 ♂♂, INDIA : Arunachal Pradesh : Namdhapa Sanctuary : Gibbons land, 2.v.1981, coll S. Biswas.

This species, known so far from Ceylon and Western India, has been recorded here for the first time from Eastern India. It is interesting to note that one of the males under study varies from the descriptions of the species provided by Fraser (1936) in having discoidal cell of either hindwing entire.

Distribution : Ceylon ; India.

9. *Orthetrum glaucum* (Brauer)

1865. *Libellula glauca* Brauer, *Verh. zool. -bot. Ges. Wien.*, 15 : 1020.

1890. *Orthetrum glaucum* (Brauer) : Kirby, *Syn. Cat. Neur. Odon.*, : 39.

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Deban north, 28.iv.1981, coll S. Biswas.

Distribution : India to China and the Philippines.

10. *Orthetrum triangulare triangulare* (Selys)

1878. *Libellula triangularis* Selys, *Mitth. Mus. Dresden.*, : 314.

1909. *Orthetrum triangulare triangulare* (Selys) : Ris, *Cat. Coll. Selys*, 9 : 244.

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Gibbon land : 2.v.1981, coll S. Biswas.

Distribution : Burma ; Ceylon ; India ; Nepal ; Vietnam.

11. *Trithemis festiva* (Rambur)

1842. *Libellula festiva* Rambur, *Hist. nat. Ins. Ne'vro'p.*, : 92.

1868. *Trithemis festiva* (Rambur) : Brauer, *Verh. zool. -bot. Ges. Wien.*, 18 : 736.

Material examined : 2 ♂ ♂, INDIA : Arunachal Pradesh : Namdhapa sanctuary : Gibbon land, 2.v.1981, coll. S. Biswas.

Distribution : Africa ; Turkey ; all over the oriental countries ; Philippines ; Taiwan.

SUMMARY

Coelicia prakritii sp. nov. has been described and another 10 odonate species, e.g. *Rhinocypha quadrimaculata* (Selys), *Vestalis g. gracilis* (Rambur), *Lestes dorothea* Fraser, *Calicnemia eximia* (Selys), *Ceriagrion azureum* (Selys), *Argiocnemis obscura* Laidlaw, *Hylaeothemis fruhstorferi* (Karsch), *Orthetrum glaucum* (Brauer), *Orthetrum t. triangulare* (Selys) and *Trithemis festiva* (Rambur) have been recorded for the first time from the Namdhapa sanctuary and Tirap district of Arunachal Pradesh, India.

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INSECTA : NEUROPTERA

By

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INTRODUCTION

The neuropteran material includes only two species (Fam. Ascalaphidae) which are little known. A larval specimen, collected during the survey, has, however, been excluded from the present account due to the non-confirmation upto the relevant taxal levels on the basis of a single specimen. All the measurements are given in millimeters for the material deposited with Z. S. I.

SYSTEMATIC ACCOUNT

1. *Protidricerus elwesi* (McL.)

1891. *Idricerus elwesi* MacLachlan, *Trans. ent. Soc. Lond.*, 1891 : 512.

1908. *Protidricerus elwesi*, van der Weele, *Coll. Zool. Edm. Selys Longc.*, 8 : 63.

Diagnostic characters : Head : with dense black hairs but vertex grey-haired posteriorly. Thorax : yellow to grey but the ridges grey brown. Legs : reddish brown ; spur of hind tibia almost equal to the length of first two tarsal segments taken together. Wings : hyaline with axillary angle blunt but not prominent ; pterostigma yellowish to brown with 3-4 crossveins in forewing and 4-5 in hindwing ; apical field with 3 rows of cells. Abdomen : dorsally black but ventrally yellow.

Morphometric measurements : Length of antenna, 27.5 ; forewing, 46 ; hindwing, 40 ; abdomen, 24.

Material examined : 1 ♀ : INDIA : Arunachal Pradesh, Tirap Dist., Namdapha, Gibbonland, 2.v.1981, *S. Biswas and party* coll.

Distribution : INDIA : Meghalaya (Khasi Hills) ; Arunachal Pradesh (Namdapha).

Remarks : The species, amongst a few others known from the Asiatic Continent, is hitherto represented only by females from the Khasi Hills of North-East India (*vide* van der-Weele, 1908). The

examined material exhibits rather little difference from those, as earlier known, in form, facies and morphometric measurements.

2. *Suhpalacsa orsedice* Banks

1914. *Suhpalacsa orsedice* Banks, *Proc. Acad. nat. sci. Philad.*, 66 : 617 [nec *Suhpalasca*, in Banks (1914)].

Diagnostic characters : Head : hairs grey below antenna but almost black above it. Antennae : short, reaching about 4 cells from pterostigma. Legs : black ; femur yellowish at least near base. Wings : apical field with two rows of cells ; forewing : pterostigma scarcely longer than high and with four veinlets ; 4 crossveins before Rs which arises much beyond cubital fork ; hindwing : only two crossveins before Rs. Abdomen : Black.

Morphometric measurements : Length of antenna, 22 ; forewing, 30 ; hindwing, 25 ; abdomen, 18.

Material examined : 1 ♀ : INDIA : Arunachal Pradesh, Tirap Dist., Namdapha, Gibbon land, 30.iv.1981, *S. Biswas and party* coll.

Distribution : INDIA : West Bengal (Darjeeling) ; Arunachal Pradesh (Namdapha).

Remarks : The species, amongst several others from the Ethiopian, Oriental and Australo-Papuan regions of the globe, is hitherto confined in Darjeeling, West Bengal (*Vide* Banks, 1914). The present record of this species from Arunachal Pradesh is interesting because of its further extension of the distributional range in the area concerned.

SUMMARY

The article incorporates a brief taxonomical account coupled with new records of distribution of two species of Neuroptera belonging to the family Ascalaphidae from Arunachal Pradesh.

ACKNOWLEDGEMENTS

The author is indebted to Dr. B. K. Tikader, Director, Zoological Survey of India, Calcutta for providing laboratory facilities and to Sri D. K. Mandal, Asstt. Zoologist of the same Department, for suggestions.

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INSECTA : LEPIDOPTERA

PART I. PAPILIONIDAE

By

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Zoological Survey of India, Calcutta

INTRODUCTION

The Lepidoteran fauna of the region appears to be very rich. This report deals only with the family Papilionidae. The material comprises 21 species and subspecies distributed over 5 genera under three tribes, of which *Dabasa g. gyas* (Westwood) (rare) is a new record for Arunachal Pradesh, while *Graphium* (G.) *bathycles chiron* (Wallace). *G. (G.) doson axion* (C. & R. Felder), *G. (Pathysa) macareus indicus* (Rothschild), *Papilio e. epycides* Hewitson (rare), *P. paradoxa telearchus* Hewitson (rare), *P. r. rhetenor* Westwood, *P. paris decorosa* Fruhstorfer, *Parides (Atrophaneura) polla* (de Nicéville) (very rare), *P. (A) philoxenus polyeuctes* (Doubleday) and *P. (A) aidoneus* (Doubleday) (rare) are new records for the Tirap district. Other species and subspecies, incorporated in this paper, are either common or not rare in status except *Parides (Atrophaneura) dasarada barata* (Rothschild), which is considered as rare by Evans (1932).

Betts (1950) reported 25 papilionid species and subspecies from Arunachal Pradesh. Later, Varshney and Chanda (1971) and Arora and Mondal (1981) also studied the material from this area. In the present paper, the author records for the first time 11 more species and subspecies either from Tirap district or Arunachal Pradesh as a whole.

SYSTEMATIC ACCOUNT

Fam. PAPILIONIDAE Leach

Subfam. PAPILIONINAE Swainson

Tribe LEPTOCIRCINI

Genus **Lamproptera** Gray

1832. *Lamproptera* Gray, In Griffith's *Cuvier's Anim. Kingdom*, 15, pl. 102, fig. 4.

One form under this genus is presently dealt with hereunder.

1. **Lamproptera curius curius** (Fabricius)

1787. *Papilio curius* Fabricius, *Mant. Ins.*, 2 : 9.

1939. *Lamproptera curius curius*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 244.

Material examined : Four ♂♂, Namdapha, 21.iv.1981, 6 ♂♂, Hornbill, 13, 14, 15.iv.1981 (S. Biswas and Party Coll.). Wing exp. 42-44 mm.

Distribution : INDIA : Assam, Arunachal Pradesh. (Siang and Tirap districts); Burma; Java and Philippines; Palawan. Reported also from Sundaland.

Remarks : The species is popularly known as 'The White Dragon Tail'. The subspecies known only from the North Eastern region of India where it is not rare.

Genus **Graphium** Scopoli

1777. *Graphium* Scopoli, *Introd. Hist. nat.*, p. 433.

Seven forms under this genus are, presently, dealt with.

Subgenus **Graphium** Scopoli

1961. *Graphium* (*Graphium*), Munroe, *Canad. Ent.*, Suppl., 17 : 19.

Three forms under this subgenus are dealt with hereunder.

2. **Graphium** (**Graphium**) **bathycles chiron** (Wallace)

1831. *Papilio bathycles* Zinken-Sommer, *Nov. Act. Ac. Nat. Cur.*, p. 157, pl. 14, figs 6-7.

1865. *Papilio chiron* Wallace, *Trans., Linn. Soc. Lond.*, 25 : 66.

1939. *Graphium bathycles chiron*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 228.

1981. *Graphium* (*Graphium*) *bathycles chiron*, Arora and Mondal, *Rec. zool. Surv. India, Occ. Paper*, No- 29, pp. 11-12.

Material examined : Five ♂♂, 1 ♀, Namdapha, Hornbill, 11, 13, 14.iv.1981, 1 ♂, Deban North, 28.iv.1981 (S. Biswas and Party coll.). Wing exp. 72-84 mm.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh (Kameng, Siang and Lohit districts); Burma and Vietnam, Tong-King, Annam.

Remarks : The species commonly known as 'The Veined Jay'. The subspecies is not rare from Sikkim to Burma and is reported for the first time from Tirap district of Arunachal Pradesh.

3. **Graphium** (**Graphium**) **doson axion** (C. & R. Felder)

1864. *Papilio doson* C. & R. Felder, *Verh. Zool. bot. Ges. Wien.*, 14 : 305.

1864. *Papilio axion* C. & R. Felder, *Verh. zool. bot. Ges. Wien.*, 14 : 305.

1939. *Graphium doson axion*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 223-224.

1981. *Graphium* (*Graphium*) *doson axion*, Arora and Mondal, *Rec. zool. Surv. India, Occ. Paper*, No. 29, pp. 10-11,

Material examined : One ♂, Namdapha, Hornbill, 15.iv.1981 (S. Biswas and Party coll.), Wing exp. 80 mm.

Distribution : INDIA : Kumaon (U.P.), Assam, Arunachal Pradesh (Kameng and Siang districts) ; Burma ; Thailand ; Vietnam : Tong-King, Annam, Cochin-China and South China, Hainan.

Remarks : The species is popularly known as 'The Common Jay'. The subspecies is common in the Indian region and is a new record for Tirap district of Arunachal Pradesh.

4. *Graphium (Graphium) sarpedon luctatius* Fruhstorfer

1758. *Papilio sarpedon* Linnaeus, *Syst. Nat.*, ed. 10 : 461.

1907. *Graphium sarpedon luctatius* Fruhstorfer, *Ent. Zeit.*, 21 (30) : 183.

1981. *Graphium (Graphium) sarpedon luctatius*, Arora and Mondal, *Rec. zool. Surv. India*, Occ. Paper No. 29, pp. 8-9.

Material examined : Two ♂♂, Namdapha, Hornbill, 14, 16.iv.1981, 1♂, Deban, 8.iv.1981 (S. Biswas and Party coll.). Wing exp. 80-82 mm.

Distribution : INDIA : Kashmir to Arunachal Pradesh (Kameng, Siang and Tirap districts) ; Burma ; Indonesia ; Lombok ; Vietnam ; Tong-King, Sundaland ; Borneo, Natuna Is. ; Philippines and Malaya.

Remarks : The species is popularly known as 'The Common Blue Bottle'. The subspecies is common in the Indian subregion and has been recorded from almost all the districts of Arunachal Pradesh except Subansiri and Lohit.

Subgenus *Pathysa* Reakirt

1864. *Pathysa* Reakirt, *Proc. ent. Soc. Phil.*, 3 : 503.

1961. *Graphium (Pathysa)*, Munroe, *Canad. Ent.*, Suppl. 17 : 21.

Four forms under this subgenus are dealt with hereunder.

5. *Graphium (Pathysa) agetes agetes* (Westwood)

1843. *Papilio agetes* Westwood, *Arc. Entom.*, 2 : 23, pl. 55, figs. 1,2 (♂).

1909. *Papilio agetes agetes*, Jordan *Macrolep. World*, 9 : 87.

1939. *Graphium agetes agetes*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 206.

1961. *Graphium (Pathysa) agetes*, Munroe, *Canad. Ent.*, Suppl. 17 : 42.

Material examined : Two ♂♂, Namdapha, 22.iv.1981, 6♂♂, 2♀♀ Hornbill, 13, 14, 16.iv.1981 (S. Biswas and Party coll.). Wing exp. 68-80 mm.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh, (Tirap district) ; Burma ; Vietnam, Tong-King, Annam and S. China, Hainan.

Remarks : The species commonly known as 'The Fourbar Sword-tail', is not rare from Sikkim to Burma. Varshney & Chanda (1971) reported only one example from Namchik, Tirap district and mentioned its status as rare.

6. *Graphium (Pathysa) antiphates pompilius* (Fabricius)

1775. *Papilio antiphates* Cramer, *Pap. Exot.*, 1 : 13, pl. 72, figs. A, B.

1787. *Papilio pompilius* Fabricius, *Mant. Ins.*, 2 : 8.

1939. *Graphium antiphates pompilius*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 215.

1981. *Graphium (Pathysa) antiphates pompilius*, Arora and Mondal, *Rec. Zool. Surv. India*, Occ. Paper, No. 29. p. 15.

Material examined : Three ♂♂, Namdapha, Hornbill, 13, 14, 16.iv.1981 (S. Biswas and Party coll.). Wing exp. 78-84 mm.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh (Lohit and Tirap districts) ; Burma ; Thailand ; Vietnam ; Annam and S. China, Hainan.

Remarks : 'The Fivebar Swordtail', as the species is popularly known, is common in Sikkim to Burma. The subspecies is recorded from two districts of Arunachal Pradesh including Tirap.

7. *Graphium (Pathysa) macareus indicus* (Rothschild)

1819. *Papilio macareus* Godart, *Encl. Math.*, 9 : 76.

1895. *Papilio macareus indicus* Rothschild, *Novit. zool.*, 2 : 457.

1939. *Graphium macareus indicus*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 233, fig. 65.

1981. *Graphium (Pathysa) macareus indicus*, Arora and Mondal, Occ. Paper, No. 29, pp. 17-18.

Material examined : One ♂, Namdapha, Hornbill, 13.iv.1981. (S. Biswas and Party coll.). Wing exp. 90 mm.

Distribution : INDIA : Sikkim, Arunachal Pradesh (Subansiri and Lohit districts).

Remarks : 'The Lesser Zebra', as the species is commonly known, is a good mimic of *Danaus aplea* (Cramer). This subspecies is recorded for the first time from Tirap district of Arunachal Pradesh. Talbot (1939) mentioned the males of this subspecies as not rare in Sikkim.

8. *Graphium (Pathysa) xenocles* (Doubleday)

1842. *Papilio xenocles* Doubleday, In Gray, *Zool. Misc.*, p. 74.

1961. *Graphium (Pathysa) xenocles*, Munroe, *Canad. Ent.*, Suppl. 17, p. 42.

Material examined : Four ♂♂, 1 ♀, Namdapha, Hornbill, 14, 15, 16.iv.1981 (S. Biswas and Party coll.). Wing exp. 90-104 mm.

Distribution : INDIA : Assam, Arunachal Pradesh (Tirap district) ; Burma ; Thailand and S. China, Hainan.

Remarks : The species is popularly known as 'The Great Zebra' and is common in status in Assam and Arunachal Pradesh. The females mimic *Danaus melaneus* (Cramer) very much. The species has earlier been recorded only from Tirap district of Arunachal Pradesh.

Genus *Dabasa* Moore

1888. *Dabasa* Moore, *Descrip. New Ind. Lep. Ins. Coll. Atkinson*, (3), p. 283.

One form under this genus is dealt with hereunder.

9. *Dabasa gyas gyas* (Westwood)

1841. *Papilio gyas* Westwood, *Arc. Entom.*, 1 : 41, Pl. 11., fig. 1(♂).

1903. *Dabasa gyas*, Moore, *Lep. Indica*, 6 : 49, pl. 484., figs. 1, 1a, 1b (♂ ♀).

1939. *Graphium gyas gyas*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 240-241.

1961. *Dabasa gyas*, Munroe, *Canad. Ent.*, Suppl. 17, p. 42.

Material examined : One ♂, Namdapha, 21.iv.1981. (S. Biswas and Party coll.).

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh (Tirap district) and Burma.

Remarks : The species is commonly known as 'The Brown Gorgon'. The subspecies is rare in status and recorded for the first time from Arunachal Pradesh (Tirap district).

Tribe PAPILIONINI

Genus *Papilio* Linnaeus

1758. *Papilio* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 458.

Eight forms under this genus are dealt with hereunder.

10. *Papilio epycides epycides* Hewitson

1862-66. *Papilio epycides* Hewitson, *Exot. Butt.*, 3, pl. 6, fig. 16.

1895. *Papilio epycides epycides* Rothschild, *Novit. zool.*, 2 : 361.

Material examined : Two ♂♂, Namdapha, 21.iv.1981. 4 ♂♂, 3 ♀♀, Hornbill 11, 14, 16.iv.1981 (S. Biswas, and Party coll.). Wing exp. 78-82 mm.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh (Kameng district) and North Burma.

Remarks : The species is commonly known as 'The Lesser Mime'. The subspecies is recorded for the first time from Tirap district of Arunachal Pradesh and is rare in the Indian subregion.

11. *Papilio paradoxa telearchus* (Hewitson)

1832. *Papilio paradoxa* Zinken-Sommer, *Nov. Act. Ac. Nat. Cur.*, 15 : 162, pl. 15, figs. 9,10.

1852. *Papilio telearchus* Hewitson, *Trans. ent. Soc. Lond.*, (N. S.) 2 : 22, 2 pls.

1907. *Papilio paradoxus telearchus*, Bingham, *Fauna Brit. India, Butterflies*, 2 : 78.

1981. *Papilio paradoxa telearchus*, Arora and Mondal, *Rec. zool. Surv. India, Occ. Paper*, No. 29, pp. 24-25.

Material examined : One ♂, Namdapha, Hornbill, 15.iv.81 (S. Biswas and Party coll.). Wing exp. 110 mm.

Distribution : INDIA : Assam, Arunachal Pradesh (Kameng district) ; Burma ; Thailand and Vietnam, Tong-King.

Remarks : The species is commonly known as 'The Great Mime'. This subspecies, rare in status, mimics *Euploea diocletiana* (Fab.), and is recorded for the first time from Tirap district of Arunachal Pradesh.

12. *Papilio castor castor* Westwood

1842. *Papilio castor* Westwood, *Ann. Mag. Nat. Hist.*, 9 : 37.

1895. *Papilio castor castor*, Rothschild, *Novit. Zool.*, 2 : 357.

Material examined : One ♂, Namdapha, 22.iv.81, 4 ♂♂, 1 ♀, Hornbill, 13, 14, 16.iv.81 and Deban 2 ♂♂, 1 ♀, 7, 8.iv.81 (S. Biswas and Party coll.). Wing exp. 98-105 mm.

Distribution : INDIA : Assam, Arunachal Pradesh (Tirap and Kameng districts) and North Burma.

Remarks : The species, popularly known as 'The Common Raven', mimics *Euploea core* (Cramer). The subspecies is recorded from Arunachal Pradesh and is not rare in this region.

13. *Papilio rhetenor rhetenor* Westwood

1841. *Papilio rhetenor* Westwood, *Arc. Ent.*, 59, pl. 16, fig. 1a.

1909. *Papilio rhetenor rhetenor*, Jordan, In Seitz's *Macrolep. World.*, 9 : 76, pl. 296.

Material examined : One ♂, Namdapha, Hornbill, 13.iv.81 (S. Biswas and Party coll.). Wing exp. 110 mm.

Distribution : INDIA : Kumaon to Arunachal Pradesh (Kameng and Siang districts) and Burma, upto Karen Hills.

Remarks : The species, commonly known as 'The Red Breast', mimics *Parides dasarada* (Moore) and *P. philoxenus* (Cramer). The subspecies, not rare in status, is a new record for Tirap district.

14. *Papilio helenus helenus* Linnaeus

1758. *Papilio helenus* Linnaeus, *Syst. Nat.*, ed. 10 : 459.

1895. *Papilio helenus helenus*, Rothschild, *Novit. zool.*, 2 : 284.

Material examined : One ♂, Namdapha, Hornbill, 14.iv.81. (S. Biswas and Party coll.). Wing exp. 104 mm.

Distribution : INDIA : Uttar Pradesh, Mussoorie, Assam, Arunachal Pradesh, (Kameng, Subansiri, Siang and Tirap districts) ; Burma ; Thailand and Malay Peninsula.

Remarks : The species is popularly known as 'The Red Helen'. The subspecies is recorded from almost all the districts of Arunachal Pradesh including Tirap and is common in status.

15. *Papilio chaon chaon* Westwood

1845. *Papilio chaon* Westwood, *Arc. Ent.*, 2 : 97, pl. 72, fig. 1.

1909. *Papilio chaon chaon*, Jordan, In Seitz's *Macrolep. World*, 9 : 53 ; pl. 22, b.c.

Material examined : One ♂, Namdapha, Hornbill, 11.iv.81 (S. Biswas and Party coll.). Wing exp. 102 mm.

Distribution : INDIA : Orissa, Assam, Arunachal Pradesh (Kameng, Siang and Tirap districts) ; Nepal and North Burma.

Remarks : The species is popularly known as 'The Yellow Helen'. The subspecies has earlier been recorded from Kameng, Siang and Tirap districts of Arunachal Pradesh and is common in status.

16. *Papilio protenor euprotenor* Fruhstorfer

1775. *Papilio protenor* Cramer, *Pap. Exot.*, 1 : 77, pl. 49, figs. A, B.

1908. *Papilio protenor euprotenor* Fruhstorfer, *Ent. Zeit. Stutt.*, 22(11) : 46.

Material examined : Two ♂♂, Namdapha, Hornbill, 15.iv.81, 1 ♂, Gibbon Land, 6.iv.81, 3 ♂♂, Deban, 7, 8.iv.81 (S. Biswas and Party coll.). Wing exp. 100-115 mm.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh ; North Burma ; and Vietnam, Tong-King.

Remarks : The species is commonly known as 'The Spangle'. The subspecies is recorded from all the districts of Arunachal Pradesh and is not rare in status.

17. *Papilio paris decorosa* Fruhstorfer

1758. *Papilio paris* Linnaeus, *Syst. Nat.*, ed. 10 : 459.

1909. *Papilio paris decorosa* Fruhstorfer, *Ent. Zeit.*, 23(25) : 116.

Material examined : One ♂, Namdapha, Hornbill, 11.iv.81, 1 ♂ Gibbon Land, 6.iv.81, 1 ♂, Deban, 7.iv.81 (S. Biswas and Party coll.).

Distribution : INDIA : Uttar Pradesh, Kumaon, Sikkim, Assam, Arunachal Pradesh, Orissa and Burma, Tenasserim.

Remarks : The species is popularly known as 'The Paris Peacock'. The subspecies is a new record for Tirap district of Arunachal Pradesh and is common in the Indian region but rare in the Tenasserim of S. Burma.

Tribe TROIDINI

Genus *Parides* Hubner

1819. *Parides* Hubner, *Verz. bek. Schmett.*, p. 87.

Subgenus *Atrophaneura* Reakirt

1864. *Atrophaneura* Reakirt, *Proc. ent. Soc. Phil.*, 3 : 446.

1961. *Atrophaneura* (*Atrophaneura*), Munroe, *Canad. Ent.*, Suppl., 17 : p. 34.

Four forms under this subgenus are dealt with hereunder.

18. *Parides* (*Atrophaneura*) *polla* (De Niceville)

1897. *Byasa polla* De Niceville, *J. Asiat. Soc. Bengal*, 66(2) : 565, pl. 4, Fig. 28.

1961. *Parides* (*Atrophaneura*) *polla*, Munroe, *Canad. Ent.*, Suppl., 17, p. 46.

Material examined : Three ♂ ♂, Namdapha, Hornbill, 15.iv.1981 (S. Biswas and Party coll.). Wing exp. 130-138.

Distribution : INDIA : Assam, Arunachal Pradesh, Manipur, Nagaland and Burma, Northern Shan States, N. Chin Hills, and Bernardmyo.

Remarks : The species, commonly known as 'The De Niceville's Windmill', is very rare in status and is recorded for the first time from Tirap district of Arunachal Pradesh.

19. *Parides (Atrophaneura) philoxenus polyeuctes* (Doubleday)

1831. *Papilio philoxenus* Gray, *Zool. Misc.*, 1 : 32.
 1842. *Papilio polyeuctes* Doubleday, *Zool. Misc.*, p. 74.
 1909. *Papilio Philoxenus polyeuctes*, Jordan, in Seitz's *Macrolep. World*, 9 : 32.
 1981. *Parides (Atrophaneura) philoxenus polyeuctes*, Arora and Mondal, *Rec. zool. Surv. India*, Occ. Paper, No. 29, pp. 48-49.

Material examined : Two ♂♂, Namdapha, Deban, 7.iv.1981, 1 ♂, Zero Camp, 9.iv.1981 (S. Biswas and Party coll.). Wing exp. 110-130 mm.

Distribution : INDIA : Sikkim, Assam, Arunachal Pradesh ; Burma ; Thailand ; Vietnam, Annam, Tong-King and S. China, Yunnan.

Remarks : The species is popularly known as 'The Common Wind-Mill'. The subspecies is common in status and is recorded for the first time from Tirap district of Arunachal Pradesh.

20. *Parides (Atrophaneura) dasarada barata* (Rothschild)

1857. *Papilio dasarada* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 96.
 1895. *Papilio philoxenus* ab. *barata* Rothschild, *Novit. zool.*, 2 : 266. (part).
 1908. *Papilio dasarada barata* Rothschild, *Novit. zool.*, 15 : 168.
 1981. *Parides (Atrophaneura) dasarada barata*, Arora and Mondal *Rec. zool. Surv. India*, Occ. Paper. No. 29, P. 50.

Material examined : One ♀, Namdapha, 21.iv.1981, 2 ♂♂, Hornbill, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 120-135 mm.

Distribution : INDIA : Arunachal Pradesh (Siang and Tirap districts) ; Burma, Shan states, Tenasserim and Vietnam, Tong-King.

Remarks : The species is commonly known as 'The Great Wind-Mill'. The subspecies has been recorded recently by Arora *et al* (1981) from Arunachal Pradesh as well as from India for the first time. Evans (1932) recorded the subspecies from Burma and considered it as rare.

21. *Parides (Atrophaneura) aidoneus* (Doubleday)

1845. *Papilio aidoneus* Doubleday, *Ann. Mag. Nat. Hist.*, 16 : 178.
 1961. *Parides (Atrophaneura) aidoneus*, Munroe. *Canad. Ent.*, Suppl. 17 : 46.

Material examined : One ♀, Namdapha, Zero Camp, 9.iv.1981, 1 ♀, Miao, 4.iv.1981 (S. Biswas and Party coll.). Wing exp. 125-130 mm.

Distribution : INDIA : Garhwal (U. P.), Sikkim, Assam, Arunachal Pradesh (Lohit district) ; Burma ; Shan States ; Vietnam ; Tong-King ; Hainan and South China.

Remarks : The species commonly known as 'The Lesser Batwing', is rare in India, except Sikkim where it is considered as not rare. The species is recorded for the first time from Tirap district, Arunachal Pradesh.

SUMMARY

The paper incorporates a systematic account of 21 species and subspecies of Papilionidae of which all are new records for Namdhapa including 10 from the Tirap district and one from the entire Arunachal Pradesh.

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INSECTA : LEPIDOPTERA
PART II. NYMPHALIDAE

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INTRODUCTION

The present paper deals with the material belonging to the family Nymphalidae (Part I deals with Papilionidae). It includes 31 species and subspecies in 18 genera of which *Dilipa morgiana* (Westwood), *Penthema l. lisarda* (Doubleday), *Limenitis zulema* Doubleday are very rare, *Chersonesia risa* (Doubleday), *Calinaga buddha brahma* Butl., *Neptis ananta ochracea* Evans, *Neptis magadha khasiana* Moore, *Pantoporia s. selenophora* (Koll.), *P. pravara acutipennis* Fruh., *P. r. ranga* (Moore), *Neurosigma d. doubledayi* (Westwood), *Limenitis danava* Moore, *Symbrenthia n. niphanda* Moore and *Euthalia franciae rajah* Felder are rare and the remaining 17 species and subspecies are either common or not rare in status.

Betts (1950) reported 66 species and subspecies of Nymphalidae mainly from Subansiri division of Arunachal Pradesh. Later, Varshney and Chanda (1971) also recorded two species and subspecies, viz. *Charaxes polyxena hierax* (Fd.) from Miao, Tirap district and *Cyrestis t. thyodamas* Boisd. from 'somewhere in NEFA', without specific locality.

In the present paper all the 31 species and subspecies, as dealt with are new records from Namdapha region, of which 29 species and subspecies from Tirap District alone and 14 species and subspecies from the entire Arunachal Pradesh are also recorded for the first time.

SYSTEMATIC ACCOUNT

Family NYMPHALIDAE

Genus **Kallima** Doubleday

1849. *Kallima* Doubleday, *Westw. & Hew. Gen. Di. Lep.*, p. 324, pl. 52.

Out of a total of two species and subspecies known under this genus from Arunachal Pradesh, one is represented here. The other species is *K. alompra* Moore which is locally common.

1. *Kallima inachus inachus* (Boisduval)

1836. *Paphia inachus* Boisduval, *Cuv. Reg. Anim. Ins.*, 2, pl. 139, fig. 3 ♀.

1932. *Kallima inachus inachus*, Evans, *Identif. Indian Butterfl.*, p. 175.

Material examined : One ♂, Deban North, Namdapha, 28.iv.1981 (S. Biswas and Party coll.). Wing exp. 110 mm.

Distribution : India : Himalayas, Kashmir to Sikkim, Pachmarhi (M. P.), South Bihar, Orissa, Eastern Ghats upto river Godavari, Assam, Arunachal Pradesh and Burma, Tenasserim.

Remarks : The subspecies commonly known as 'The Orange Oak Leaf', is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh. Its status has been described as not rare.

Genus *Dilipa* Moore

1857. *Dilipa* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 201.

The only species known under this monotypical genus is dealt with hereunder.

2. *Dilipa morgiana* (Westwood)

1851. *Apatura morgiana* Westwood, *Westw. & Hew. Gen. Di. Lep.*, 2 : 355.

1957. *Dilipa morgiana*, Wynter-Blyth, *Butterf. Indian Reg.*, p. 152, pl. 21, figs. 5-6.

Material examined : One ♀, Hornbill, Namdapha, 15.iv.1981 (S. Biswas and Party coll.). Wing exp. 74 mm.

Distribution : India : Kashmir, Dharmsala (H. P.), Sikkim, Assam, and Burma.

Remarks : The species is commonly known as 'The Golden Emperor'. Males are rare and females are very rare in status Wynter-Blyth (1957). It is recorded for the first time from Namdapha, Tirap district as well as from the entire Arunachal Pradesh.

Genus *Penthema* Doubleday

1847. *Penthema* Doubleday, *Westw. & Hew. Gen. Di. Lep.*, pl. 39.

One species with subspecies under this genus is dealt with hereunder.

3. *Penthema lisarda lisarda* (Doubleday)

1845. *Diadema lisarda* Doubleday, *Ann. Mag. Nat. Hist.*, (1) 16 : 233.

1932. *Penthema lisarda lisarda*, Evans, *Identif. Indian Butterfl.*, p. 149.

Material examined : One ♀, Gibbon land, Namdapha, 2.v.1981 (S. Biswas and Party coll.). Wing exp. 116 mm.

Distribution : India : Sikkim, Assam, Manipur and also from Chin Hills, Upper Burma.

Remarks : The subspecies, commonly known as 'The Yellow Kaiser', is the largest among Indian Nymphalids and is rare in status. This is the first record of the subspecies from Namdapha, Tirap district as well as from the entire Arunachal Pradesh.

Genus *Cethosia* Fabricius

1807. *Cethosia* Fabricius, *Illig. Mag.*, 6 : 280.

Out of a total of two species and subspecies known under this genus from Arunachal Pradesh one is represented here. The other species is *C. cyane* Drury which is not very common in status.

4. *Cethosia biblis tisamena* (Fruhstorfer)

1770. *Papilio biblis* Drury, *Ill. Ex. Ent.*, 1, pl. 4, fig. 2♂.

1912. *Cethosia biblis tisamena* Fruhstorfer, In Seitz's *Macrolep. World*, 9 : 499.

Material examined : Two ♂♂, 2 ♀♀, Burma Nala, Namdapha, 24.iv.1981 (S. Biswas and Party coll.). Wing exp. 72-80 mm. ♂, 82 mm. ♀.

Distribution : India : Sikkim, Assam, Arunachal Pradesh also Nepal, Bhutan and Burma.

Remarks : The subspecies, popularly known as 'The Red Lecewing', is common in status. This is the first report of the subspecies from Namdapha, Tirap district, Arunachal Pradesh.

Genus *Cyrestis* Boisduval

1832. *Cyrestis* Boisduval, *Voy. Astrolabe*, p. 117.

One species with subspecies under this genus is dealt with hereunder.

5. *Cyrestis thyodamas thyodamas* Boisduval

1836. *Cyrestis thyodamas* Boisduval, *Cuv. Reg. Anim. Ins.*, 2 ; pl. 138, fig. 4.

1932. *Cyrestis thyodamas thyodamas*, Evans, *Idnetif. Indian Butterfl.*, p. 173.

Material examined : One ♂, 7 ♀ ♀, Hornbill, Namdapha, 11, 13, 14.iv.1981 (S. Biswas and Party coll.). Wing exp. 55-64 mm.

Distribution : India : Kashmir, Garhwal (H. P.), Kumaon (U. P.), Coorg (Karnataka), Trivandram (Kerala), Nilgiri Hills, Palnis (Tamil Nadu), Assam, Arunachal Pradesh, also Burma, Tenasserim, China and Japan.

Remarks : The subspecies is popularly known as 'The Common Map'. This is the first specific report of the species from Namdapha, Tirap district, Arunachal Pradesh. Evans (1932) reported that the subspecies is common in status but Varshney and Chanda (1971) recorded it from 'somewhere in NEEA' as not rare.

Genus *Chersonesia* Distant

1883. *Chersonesia* Distant, *Rhop. Malay*, p. 142.

One species under this genus is represented here.

6. *Chersonesia risa* (Doubleday)

1850. *Cyrestis risa* Doubleday, *Westw. & Hew. Gen. Di. Lep.*, 2 : 262, pl. 32, fig. 4.

1957. *Chersonesia risa*, Wynter-Blyth, *Butterfl. Indian Reg.*, pp. 199-200, pl. 34, fig. 2.

Material examined : One ♂, Deban North, Namdapha, 28.iv.1981 (S. Biswas and Party coll.). Wing exp. 42 mm.

Distribution : India : Kumaon (U. P.) to Sikkim, Assam, Arunachal Pradesh also Bhutan, Burma and Tenasserim.

Remarks : The species, popularly known as 'The Common Maplet', is rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh. The species is fairly common in Subansiri division of Arunachal Pradesh (Betts, 1950).

Genus *Stibochiona* Butler

1868. *Stibochiona* Butler, *Proc. zool. Soc. Lond.*, p. 614.

The only species and subspecies known from India under this genus is represented here.

7. *Stibochiona nicea nicea* (Gray)

1833-46. *Adolia nicea* Gray, *Lep. Ins. Nepal*, p. 13, pl. 12, fig. 1.

1932. *Stibochiona nicea nicea*, Evans, *Identif. Indian Butterfl.*, p. 150.

Material examined : One ♂, Deban, 7.iv.1981, 1 ♂, Deban North, 28.iv.1981 (S. Biswas and Party coll.). Wing exp. 68 mm.

Distribution : India : Kulu (H. P.) to Sikkim, Assam, Arunachal Pradesh also Burma, Tenasserim to W. China.

Remarks : The subspecies, commonly known as 'The Popinjoy', is not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

Genus *Hestina* Westwood

1850. *Hestina* Westwood, *Westw. & Hew. Gen. Di. Lep.*, p. 281.

The genus is represented by only one species from India which is dealt with hereunder.

8. *Hestina nama* Doubleday

1845. *Diadema nama* Doubleday, *Ann. Mag. Nat. Hist.*, 16 : 232.

1957. *Hestina nama*, Wynter-Blyth, *Butterfl. Indian Reg.*, p. 160, pl. 23, fig. 3.

Material examined : Two ♀ ♀, Hornbill, Namdapha; 14, 16.iv.1981. (S. Biswas and Party coll.). Wing exp. 94 mm.

Distribution : India : Simla (H. P.) to Assam, Sikkim, Darjeeling (W. B.), Arunachal Pradesh also Burma, Tenasserim, Malay Peninsula, Sumatra, Thailand and West China.

Remarks : The species is commonly known as 'The Circe', and is not rare in status. It mimics the chestnut tiger, *Danaus tytia* (Gray). The species is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh. Betts (1950) described the species as fairly common in Subansiri division.

Genus *Calinaga* Moore

1857. *Calinaga* Moore, *Cat Lep. Mus. E. I. C.*, 1 : 162.

Only a single species along with three subspecies are known, from this area, under this genus, of which one subspecies is presently dealt with. The other subspecies, *C. b. buddha* Moore was recorded from Subansiri division by Betts (1950), while *C. b. aborica* Tyt. is known from Abor Valley.

9. *Calinaga buddha brahma* Butler

1857. *Calinaga buddha* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 163, pl. 3a, fig. 5♂.
 1885. *Calinaga brahma* Butler, *Ann. Mag. Nat. Hist.*, (5) 14 : 309.
 1932. *Calinaga buddha brahma*, Evans, *Identif. Indian Butterfl.*, p. 149, pl. 21.

Material examined : Two ♂♂, 1 ♀, Hornbill, Namdapha, 11, 14.iv.1981 (S. Biswas and Party coll.). Wing. exp. 100 mm ♂, 108 mm ♀.

Distribution : India : Assam to Manipur, and N. Burma.

Remarks : The subspecies commonly known as 'The Freaks', is rare in status. Due to its close resemblance with chesnut tiger, *Danaus tytia* (Gray), some confusion generally arises in the identification of the species. The main difference lies in the thorax which is partly or entirely covered with orange hairs in the present subspecies. It is for the first time recorded from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus *Apatura* Fabricius

1807. *Apatura* Fabricius, *Illig. Mag.*, p. 280.

Out of a total of three species and subspecies known under this genus from Arunachal Pradesh, one species with subspecies is represented here. The other species and subspecies are *A. chevana* Moore and *A. p. parisatis* Westwood which were recorded from Subansiri division by Betts (1950).

10. *Apatura ambica ambica* Kollar

1844. *Apatura ambica* Kollar, *Hugel's Kaschmir*, 4(2) : 431.
 1932. *Apatura ambica ambica*, Evans, *Identif. Indian Butterfl.*, p. 146, pl. 18.

Material examined : One ♂, 1 ♀ Hornbill, Namdapha, 13.iv.1981. (S. Biswas and Party coll.). Wing exp. 70 mm.

Distribution : India : Kashmir, Simla (H. P.), Mussouri (U. P.), Darjeeling (W. B.), Sikkim, Assam and Arunachal Pradesh also Pakistan, Chitral ; Burma and Thailand.

Remarks : The subspecies is commonly known as 'The Indian Purple Emperor', and is not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh. According to Betts (1950) the subspecies is very common in status in Subansiri Division.

Genus *Neptis* Fabricius

1807. *Neptis* Fabricius, *Illig. Mag.*, 6 : 282.

Five species with subspecies under this genus are dealt with hereunder, all of which are recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh. Three more species with subspecies are also known from this area viz., *Neptis columella ophiana* Moore, *Neptis sankara quilta* Swin. and *Neptis radha radha* Moore.

11. *Neptis hordonia hordonia* (Stoll)

1791. *Papilio hordonia* Stoll, *Cramer's Pap. Exot. Suppl.*, pl. 33, fig. 4, 4D.

1932. *Neptis hordonia hordonia*, Evans, *Identif. Indian Butterfl.*, p. 172.

Material examined : One ♂, Hornbill, Namdapha, 13.iv.1981, (S. Biswas and Party coll.). Wing. exp. 46 mm.

Distribution : India : Dehra Dun (U. P.), to Assam, and South India also Burma, Tenasserim and Malayan subregion.

Remarks : The subspecies, popularly known as 'The Common Larcar', is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh. Its status is common.

12. *Neptis nandina susruta* Moore

1857. *Neptis nandina* Moore, *Cat. Lep. Mus., E. I. C.*, 1 : 168.

1872. *Neptis susruta* Moore, *Proc. zool. Soc. Lond.*, p. 563, pl. 32, fig. 4♂.

1932. *Neptis nandina susruta*, Evans, *Identif. Indian Butterfl.*, p. 167.

Material examined : One ♂, Deban North, 28.v., 2 ♂♂, 3 ♀♀, Hornbill, 11, 13.iv, 1 ♂, Namdapha, 22.iv.1981 (S. Biswas and Party coll.). Wing exp. 50-56 mm. ♂, 60 mm. ♀.

Distribution : India : Assam, Khasi Hills, Sikkim and Burma.

Remarks : The subspecies, popularly known as 'The Clear Sailer', is common in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the whole of Arunachal Pradesh.

13. *Neptis ananta ochracea* Evans

1857. *Neptis ananta* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 166, pl. 4a, fig. 3.

1932. *Neptis ananta ochracea* Evans, *Identif. Indian Butterfl.*, p. 168.

Material examined : One ♂, 1 ♀, Hornbill, Namdapha, 11, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 60-64 mm.

Distribution : India : Sikkim to Assam, also Dawnas, Burma.

Remarks : The subspecies commonly known as 'The Yellow Sailer', is rare in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the whole of Arunachal Pradesh.

14. *Neptis vikasi pseudovikasi* (Moore)

1829. *Neptis vikasi* Horsfield, *Cat. Lep. Mus. E. I. C.*, pl. 5, fig. 2, 2a.

1886. *Bimbisara pseudovikasi* Moore, *Lep. Ind.*, 2 : 7, pl. 291, figs. 1, 1a-1c, ♂, ♀.

1932. *Neptis vikasi pseudovikasi*, Evans, *Identif. Indian Butterfl.*, p. 168.

Material examined : One ♂, 1 ♀, Hornbill, Namdapha, 11, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 60 mm.

Distribution : India : Kumaon (U. P.) to Assam, Sikkim, and Bhutan.

Remarks : The subspecies, popularly known as 'The Dingy Sailer', is not rare in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

15. *Neptis magadha khasiana* Moore

1867. *Neptis magadha* Felder, *Novara Reise Lep. Rhop.*, p. 427.

1872. *Neptis khasiana* Moore, *Proc. zool. Soc. Lond.*, p. 562, pl. 32, fig. 7♂.

1932. *Neptis magadha khasiana*, Evans, *Identif. Indian Butterfl.*, p. 165.

Material examined : One ♂, Hornbill, Namdapha, 15.iv.1981 (S. Biswas and Party coll.). Wing exp. 58 mm.

Distribution : India : Assam, also Bhutan and Burma.

Remarks : The subspecies, rare in status, is commonly known as 'The Spotted Sailer'. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus *Pantoporia* Hubner

1816. *Pantoporia* Hubner, *Verz. bek. Schmett.*, p. 44.

Four species with subspecies under this genus are dealt with here-under. Betts (1950) recorded two species and subspecies from Subansiri division viz. *Pantoporia asura asura* Moore and *Pantoporia perius* Linn.

16. *Pantoporia selenophora selenophora* (Kollar)

1844. *Liminitis selenophora* Kollar, *Hugel's Kashmir*, 4(2) : 426, pl. 7, figs. 1, 2♂.

1932. *Pantoporia selenophora selenophora*, Evans, *Identif. Indian Butterfl.*, p. 162.

Material examined : Two ♀ ♀, Hornbill, Namdapha, 11, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 60 mm.

Distribution : India : Mussouri (U. P.) to Assam, also Burma.

Remarks : The subspecies, commonly known as 'The Staff Sergeant', is rare in status Wynter-Blyth (1957). It is recorded for the first time from Namdapha, Tirap district and also from the entire Arunachal Pradesh.

17. *Pantoporia pravara acutipennis* Fruhstorfer

1857. *Athyma pravara* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 173, pl. 5a, fig. 4♂.

1906. *Pantoporia acutipennis* Fruhstorfer, *Verh. zool. bot. Ges. Wien.*, 56 : 401.

1932. *Pantoporia pravara acutipennis*, Evans, *Identif. Indian Butterfl.*, p. 164.

Material examined : One ♂, Hornbill, Namdapha, 11.iv.1981 (S. Biswas and Party coll.). Wing exp. 55 mm.

Distribution : India : Assam, also Burma, Tenasserim.

Remarks : The subspecies, rare in status, is popularly known as 'The Unbroken Sergeant'. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

18. *Pantoporia ranga ranga* (Moore)

1857. *Athyma ranga* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 175, pl. 5a, fig. 6♂.

1932. *Pantoporia ranga ranga*, Evans, *Identif. Indian Butterfl.*, p. 163.

Material examined : Three ♂ ♂, 1 ♀, Hornbill, Namdapha, 11, 13, 16.iv.1981 (S. Biswas and Party coll.). Wing exp. 60-62 mm.

Distribution : India : Sikkim, Assam, Arunachal Pradesh, also Bhutan, Burma, Tenasserim.

Remarks : The subspecies, commonly known as 'The Black Vein Sergeant', is rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

19. *Pantoporia zeroce* (Moore)

1872. *Athyma zeroce* Moore, *Proc. zool. Soc. Lond.*, p. 564 ♂.

1957. *Pantoporia zeroce*, Wynter-Blyth, *Butterfl. Indian Reg.*, p. 185, pl. 30, fig. 1♂.

Material examined : One ♂, 2 ♀ ♀, Hornbill, Namdapha, 11.iv.1981 (S. Biswas and Party coll.). Wing exp. 58-60 mm.

Distribution : India : Kumaon (U. P.), Sikkim, Assam, also Bhutan, and Burma, Tenasserim.

Remarks : The species, not rare in status, is commonly known as 'The Small Staff Sergeant'. It is recorded for the first time from Namdapha, Tirap district and also from the entire Arunachal Pradesh.

Genus *Cirrochroa* Doubleday

1848. *Cirrochroa* Doubleday, Westw. Hew. Gen. Di. Lep., 1 : 157.

Out of a total of two species and subspecies known from Arunachal Pradesh under this genus, only one is represented here. The other is *Cirrochroa tyche mithila* (*mytila*) Moore reported from Subansiri division (Betts, 1950).

20. *Cirrochroa aoris aoris* Doubleday

1848. *Cirrochroa aoris* Doubleday, Westw. Hew. Gen. Di. Lep., 1 : 157, pl. 21, fig. 2 ♀.

1932. *Cirrochroa aoris aoris*, Evans, Identif. Indian Butterfl., p. 188.

Material examined : Ten ♂♂, Hornbill, 11, 13, 14, 2 ♂♂, Namdapha, 22.iv.1981 (S. Biswas and Party coll.). Wing exp. 80-90 mm.

Distribution : India : Sikkim, Calcutta (W. B.), Cachar, Khasi and Naga Hills, Assam, Arunachal Pradesh, also Bhutan.

Remarks : The nominotypical subspecies *aoris*, commonly known as 'The Large Yeoman', is not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

Genus *Neurosigma* Butler

1868. *Neurosigma* Butler, Proc. zool. Soc. Lond., p. 615.

The nominotypical species with subspecies *doubledayi* under this genus is represented here.

21. *Neurosigma doubledayi doubledayi* (Westwood)

1848. *Acontia doubledayi* Westwood, Cab. Orient. Ent., p. 76, pl. 37, fig. 4 ♀.

1932. *Neurosigma doubledayi doubledayi*, Evans, Identif. Indian Butterfl., p. 155, pl. 21.

Material examined : Four ♂♂, Hornbill, Namdapha, 13-16, 1 ♀, Burma Nala, 24.iv.1981 (S. Biswas and Party coll.). Wing exp. 80-90 mm.

Distribution : India : Sikkim, Assam, and Chittagong, Bangladesh.

Remarks : The subspecies commonly known as 'The Panther', is rare in status. It is recorded for the first time from Namdapha, Tirap district and also from the whole of Arunachal Pradesh. Betts (1950) mentioned that he (*loc. cit*) has 'seen' the species from Subansiri division.

Genus *Limenitis* Fabricius

1807. *Limenitis* Fabricius, *Illig. Mag.*, 6 : 281.

Out of a total of six species and subspecies known from this area under this genus, presently, four are dealt with hereunder. The other two species are *Limenitis zayla* Db. and Hew. and *Limenitis austeria austeria* Moore recorded from Subansiri division of which the last one was 'seen' by Betts as mentioned by him (1950).

22. *Limenitis daraxa* Doubleday

1850. *Limenitis daraxa* Doubleday, *Westw. Hew. Gen. Di. Lep.*, 2 : 276, pl. 34, fig. 4.

1957. *Limenitis daraxa*, Wynter-Blyth, *Butterfl. Indian Reg.*, p. 179.

Material examined : One ♂, 2 ♀♀, Hornbill, Namdapha, 11, 14.iv.1981 (S. Biswas and Party coll.). Wing exp. 60 mm.

Distribution : India : Kumaon (U. P.), Sikkim, Cachar, Naga and Khasi Hills, Assam, Arunachal Pradesh, also Bhutan, Burma, Tenasserim and Malay Peninsula.

Remarks : The species commonly known as 'The Green Commodore', is not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

23. *Limenitis procris procris* (Cramer)

1777. *Papilio procris* Cramer, *Pap. Exot.*, 2, pl. 106, figs. E. F. ♀.

1932. *Limenitis procris procris*, Evans, *Identif. Indian Butterfl.*, p. 161.

Material examined : Two ♂♂, 1 ♀, Hornbill, Namdapha, 11, 16.iv.1981 (S. Biswas and Party coll.). Wing exp. 64-66 mm.

Distribution : India : Dehra Dun (U. P.) West Bengal, Assam, Arunachal Pradesh and Burma.

Remarks : The subspecies, not rare in status, is popularly known as 'The Commander'. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

24. *Limnitis zulema* Doubleday

1850. *Limnitis zulema* Doubleday, *Westw. Hew. Gen. Di. Lep.*, 2 : 276, pl. 34, fig. 1.
 1957. *Limnitis zulema*, Wynter-Blyth, *Butterfl. Indian Reg.*, p. 180, pl. 28, fig. 3.

Material examined : One ♂, Hornbill, Namdapha, 11.iv.1981 (S. Biswas and Party coll.). Wing exp. 68 mm.

Distribution : India : Sikkim, Assam, also Bhutan, Burma and Tenasserim.

Remarks : The species commonly known as 'The Scarce White Commodore', is very rare in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

25. *Limnitis danava* Moore

1857. *Limnitis danava* Moore, *Cat. Lep. Mus. E. I. C.*, 1 : 180, pl. 6a, fig. 2, ♂ ♀.
 1905. *Auzakia danava*, Bingham, *Fauna Brit. India Butterflies*, 1 : 300-301.
 1957. *Limnitis danava*, Wynter-Blyth, *Butterfl. Indian Reg.*, p. 178, pl. 28, fig. 1♂.

Material examined : One ♂, Hornbill, Namdapha, 16.iv.1981 (S. Biswas and Party coll.). Wing exp. 84 mm.

Distribution : India : Simla (H. P.), Naga Hills, Assam, also Burma.

Remarks : The species, rare in status, is popularly known as 'The Commodore'. It is recorded for the first time from Namdapha and also from the entire Arunachal Pradesh.

Genus *Charaxes* Ochseneimer

1816. *Charaxes* Ochseneimer, *Schmett. Eur.*, 4 : 18.

Out of a total of three species known from this area, under this genus, one species with subspecies is represented here. The other two species are *Charaxes marmax* Westwood and *Charaxes polyxena psaphon* Westwood, recorded from Subansiri division where it is common in status.

26. *Charaxes polyxena hierax* (Felder)

1779. *Papilio polyxena* Cramer, *Pap. Exot.*, 1 : pl. 54, figs. A. B. ♀.
 1867. *Charaxes hierax* Felder, *Navara Reise Lep. Rhop.*, p. 442.
 1932. *Charaxes polyxena hierax*, Evans, *Identif. Indian Butterfl.*, p. 141.

Material examined : One ♂, Namdapha, 22.iv.1981 (S. Biswas and Party coll.). Wing exp. 80 mm.

Distribution : India : Sikkim, Assam, Manipur, Arunachal Pradesh, also Sylhet, Bangladesh ; Bhutan ; Burma and Tenasserim.

Remarks : The subspecies popularly known as 'The Tawny Rajah', is recorded for the first time from Namdapha. There are some differences of opinion regarding the status of the subspecies. Evans (1932) mentioned that it is common while Varshney and Chanda (1971) recorded it from Miao, Tirap district and regarded it as rare in status.

Genus *Symbrenthia* Hubner

1816. *Symbrenthia* Hubner, *Verz. bek. Schmett.*, p. 43.

Three species with subspecies under this genus are dealt with hereunder.

27. *Symbrenthia hippoclus khasiana* Moore

1886. *Symbrenthia hippoclus* de Niceville, *Butt. Ind.*, 2 : 240.

1874. *Symbrenthia khasiana* Moore, *Proc. zool. Soc. Lond.*, p. 569.

1932. *Symbrenthia hippoclus khasiana*, Evans, *Identif. Indian Butterfl.*, p. 180.

Material examined : One ♂, Deban, 6.iv., 1 ♂, Hornbill, Namdapha, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 46 mm.

Distribution : India : Kulu (H. P.) to Assam and Arunachal Pradesh also Burma.

Remarks : The subspecies, common in status, is popularly known as 'The Common Jester'. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

28. *Symbrenthia niphanda niphanda* Moore

1872. *Symbrenthia niphanda* Moore, *Proc. zool. Soc. Lond.*, p. 559.

1932. *Symbrenthia niphanda niphanda*, Evans, *Identif. Indian Butterfl.*, p. 181.

Material examined : Two ♀ ♀, Hornbill, Namdapha, 13, 14.iv.1981 (S. Biswas and Party coll.). Wing exp. 56 mm.

Distribution : India : Sikkim, Assam and Arunachal Pradesh.

Remarks : 'The Blue Tail Jester', as the subspecies is commonly known, is rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

29. *Symbrenthia hypselis cotanda* (Moore)

1823. *Vanessa hypselis* Godart, *Encycl. Meth.*, 9 : (Suppl.) : 818.
 1874. *Symbrenthia cotanda* Moore, *Proc. zool. Soc. Lond.*, p. 569, pl. 66, fig. 9♂.
 1932. *Symbrenthia hypselis cotanda*, Evans, *Identif. Indian Butterfl.*, p. 181, pl. 24, fig. 38.

Material examined : Two ♀ ♀, Hornbill, Namdapha, 11, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 48-50 mm.

Distribution : India : Kumaon (U. P.), Sikkim, Assam, Arunachal Pradesh and Burma.

Remarks : The subspecies commonly known as 'The Spotted Jester', is not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

Genus *Euthalia* Hubner

1816. *Euthalia* Hubner, *Verz. bek. Schmett.*, p. 41.

Out of a total of nine species and subspecies known from this area under this genus, only two are represented here. Other species and subspecies are *Euthalia jahnu jahnu* Moore, *E. lubentina indica* Fruh., *E. telchinia* Men., *E. duda* Stg., *E. s. sahadeva* Moore, *E. phemius* Db. and Hew. and *E. f. franciae* Gray.

30. *Euthalia julii* (Bougainville)

1837. *Nymula julii* Bougainville, *Voy. Thetis.*, 2 : 345, pl. 44, figs. 4, 4 bis. ♀.
 1957. *Euthalia julii*, Wynter-Blyth, *Butterfl. Indian Reg.*, p. 164, pl. 24, fig. 5♀.

Material examined : One ♀, Hornbill, Namdapha, (S. Biswas and Party coll.). Wing exp. 76 mm.

Distribution : India : Kumaon (U. P.) to Sikkim, Assam, Arunachal Pradesh and Burma.

Remarks : The species is popularly known as 'The Common Earl'. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh. The status of the species is common. The subspecies could not be determined due to the damaged condition of the specimen. Betts (1950), however, recorded the subspecies *E. julii appiades* Mon. from Subansiri division, Arunachal Pradesh.

31. *Euthalia franciae rajah* Felder

1846. *Adolias franciae* Gray, *Lep. Ins. Nep.*, p. 12, pl. 14.

1860. *Euthalia raja* Felder, *Wien. Ent. Mon.*, 4 : 397.

1932. *Euthalia franciae rajah*, Evans, *Identif. Indian Butterfl.*, p. 155, pl. 20, fig. 18/18.

Material examined : One ♀, Burma Nala, 24.iv.1981 (S. Biswas and Party coll.). Wing exp. 80 mm.

Distribution : India : Assam, and Burma.

Remarks : The subspecies, commonly known as 'The French Duke', is rare in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

SUMMARY

The paper incorporates a systematic account of 31 species and subspecies of Nymphalidae from Namdapha Wild Life Sanctuary, Tirap district, Arunachal Pradesh, all of which are new records from this area. 29 species and subspecies from Tirap district alone and 14 species and subspecies from the entire Arunachal Pradesh are also recorded for the first time.

ACKNOWLEDGEMENT

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INSECTA : LEPIDOPTERA
PART III. PIERIDAE, DANAIDAE, SATYRIDAE
AND LYCAENIDAE

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INTRODUCTION

The present study is the continuation of the faunistic work on the different families of lepidopterous insects collected from the Namdapha Wild Life Sanctuary, Tirap district, Arunachal Pradesh, by Dr. S. Biswas and party during the year 1981. The paper deals with the four families of butterflies viz. Pieridae, Danaidae, Satyridae and Lycaenidae, including 11 species and subspecies in 8 genera, 4 species and subspecies in 2 genera, 7 species and subspecies in 4 genera and 10 species and subspecies in 10 genera respectively.

Evans (1912) for the first time reported a list of butterflies over the Abor expedition mainly from north Assam and the south Siang division of Arunachal Pradesh. This includes 10 species of Pieridae, 5 species of Danaidae, 8 species of Satyridae and 22 species of Lycaenidae, together with 7 species of Papilionidae, 20 species of Nymphalidae, one species of Erycinidae and 2 species of Hesperiiidae. Betts (1950) recorded 16 species and subspecies of Pieridae, 7 species and subspecies of Danaidae and 39 species and subspecies of Satyridae from the Bali-para, Frontier Tract and Subansiri division of Arunachal Pradesh in North-East India.

Varshney and Chanda (1971) reported 6 species of Pieridae, 2 species of Danaidae and 1 species of Lycaenidae from Arunachal Pradesh.

Presently, 11 species and subspecies of Pieridae are recorded for the first time from Namdapha Wild Life Sanctuary of which 6 species and subspecies are new records from the entire Arunachal Pradesh viz. *Delias belladonna lugens* Jordan, *D. thysbe pyramus* (Wallace), *Pieris napi montana* Verity, *P. canidia indica* Evans, *P. brassicae nepalensis* Doubleday and *Eurema hecabe contubernalis* (Moor).

The family Danaidae deals with 4 species and subspecies viz. *Danaus hamata septentrionis* (Butler), *D. sita sita* f. *tytia* (Gray), *Euploea mulciber*

mulciber (Cramer) and *E. diocletianus diocletianus* (Fabricius), all of which are recorded for the first time from Namdapha Wild Life Sanctuary.

Out of 7 species and subspecies of the family Satyridae recorded from Namdapha Wild Life Sanctuary, 3 species and subspecies are reported for the first time from the entire Arunachal Pradesh viz. *Ypthima baldus baldus* (Fabricius), *Y. methora methora* Hewitson and *Ragadia crisilda crito* de Niceville, while one species and subspecies, *Lethe verma stenopa* Fruhstorfer is recorded for the first time from India.

The family Lycaenidae comprises 10 species and subspecies of which all are recorded for the first time from Namdapha Wild Life Sanctuary, while 9 species and subspecies are new reports for the entire Arunachal Pradesh, viz. *Pithecops fulgens* Doherty, *Anthene emolus emolus* (Godart), *Zizeeria maha maha* (Kollar), *Lampides boeticus* (Linnaeus), *Heliophorus epicles indicus* (Fruhstorfer), *Rapala scintilla* de Niceville, *Curetis dentata dentata* Moore, *Castalius elna noliteia* Fruhstorfer and *Chliaria othona* (Hewitson).

SYSTEMATIC ACCOUNT

Family : PIERIDAE

Subfamily : PIERINAE Swainson

Genus : **Delias** Hubner

1819. *Delias* Hubner, *Verz. bek. Schmett.*, p. 91.

Three species and subspecies are known from Arunachal Pradesh under this genus, viz. *Delias belladonna lugens* Jordan, *D. aglaia aglaia* (Linn.) and *D. thysbe pyramus* (Wallace), of which the last one is a new record from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh. The subspecies *lugens* for the species *belladonna*, is also recorded for the first time from this area.

Delias belladonna lugens Jordan

1925. *Delias belladonna lugens* Jordan, *Nov. zool.*, 32 : 286.

1939. *Delias belladonna lugens*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 341.

Material examined : 2 ♀ ♀, Namdapha, 21.iv., 1 ♂, Hornbill, 11.iv., 1 ♂, Zero Camp, 9.iv. and 2 ♂ ♂, Burma Nala, 24.iv.1981 (S. Biswas and party coll.).

Wing exp. : 82-90 mm.

Distribution : India : Sikkim, Assam and Arunachal Pradesh ; also Bhutan and Northern Burma.

Remarks. The subspecies commonly known as 'The Hill Jezebel', is not rare in status. Betts (1950) reported the species *belladonna* from north-east India without mentioning the subspecies. In the present work the subspecies *lugens* is recorded for the first time for the species *belladonna* from Arunachal Pradesh.

***Delias thysbe pyramus* (Wallace)**

1867. *Thyca pyramus* Wallace, *Trans. Ent. Soc. Lond.*, (3)4, pt. 3 : 301-415, pls. 6-9.

1939. *Delias thysbe pyramus*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 345-347, fig. 130 a, b.

Material examined : One ♀, Namdapha, Hornbill, 16.iv.1981 (S. Biswas and party coll.).

Wing. exp.—80 mm.

Distribution : India : Simla (H. P.), Assam ; Eastern Ghats, Sikkim ; also Nepal ; Bhutan ; Western Yunnan and Western Thailand.

Remarks : The subspecies commonly known as 'The Redbreast Jezebel', is not rare in status except in the Eastern Ghats of India where it is very rare. It is recorded for the first time from Namdapha, Tirap district as well as from the entire Arunachal Pradesh.

Genus *Hebomoia* Hubner

1819. *Hebomoia* Hubner, *Verz. bek. Schmett.*, p. 95.

One species with subspecies is known to occur in Arunachal Pradesh under this genus which is represented here.

***Hebomoia glaucippe glaucippe* (Linn.)**

1758. *Papilio glaucippe* Linnaeus, *Syst. Nat.*, ed. 10, p. 469.

1939. *Hebomoia glaucippe glaucippe*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 476-477.

Material examined : One ♂, Namdapha, Gibbon land, 6.iv.1981 (S. Biswas and Party coll.). **Wing exp.** 80 mm.

Distribution : India : Sikkim, Assam, Arunachal Pradesh also Nepal and Burma.

Remarks : The subspecies popularly known as 'The Great Orange Tip', is common in status. It is recorded for the first time from Namdapha Wild Life Sanctuary, Tirap district. Evans (1912) reported the species from Siang division, while Betts (1950) recorded the species from Subansiri division.

Genus *Ixias*

1819. *Ixias* Hubner, *Verz. bek. Schmett.*, p. 95.

One species with two subspecies are known to occur from this area under this genus of which one is represented here. The other subspecies is *pirenassa* Wallace recorded from Assam.

Ixias pyrene latifasciata Butler

1871. *Ixias latifasciata* Butler, *Lep. Exot.*, 8 : 252, pl. 19, fig. 3.

1939. *Ixias pyrene latifasciata* Talbot, *Fauna Brit. India, Butterflies*, 1 : 447.

Material examined : One ♂, Namdapha, Zero Camp, 9.iv., 8 ♂♂, Hornbill. 13-16.iv.1981 (S. Biswas and Party coll.). Wing exp. 55-58 mm.

Distribution : India : Assam, Arunachal Pradesh ; Northern Burma to the Dawna Range, S. Burma.

Remarks : The subspecies popularly known as 'The Yellow Orange Tip', is common in status. It is recorded for the first time from Namdapha, Tirap district.

Genus *Appias*

1819. *Appias* Hubner, *Verz. bek. Schmett.*, p. 91.

Three species with subspecies are known under this genus from this area, of which one is represented here. The other two species and subspecies are *A. l. lalage* (Moore) and *A. i. indra* (Moore).

Appias lyncida eleonora (Boisduval)

1836. *Pieris eleonora* Boisduval, *Spec. Gen. Lep.*, 1 : 481.

1939. *Appias lyncida eleonora* Talbot, *Fauna Brit. India, Butterflies*, 1 : 398-400, fig. 146.

Material examined : Three ♂♂, Namdapha, Hornbill, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 60-65 mm.

Distribution : India : Sikkim, Assam, Arunachal Pradesh ; Burma ; Hainan ; Tong King ; Thailand and Annam.

Remarks : The subspecies popularly known as 'The Chocolate Albatross', is common in status (Talbot, 1939). Varshney and Chanda (1971) described the subspecies as not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

Genus **Prioneris** Wallace

1867. *Prioneris* Wallace, *Trans. ent. Soc. Lond.*, (3)4(3) : 383.

Only one species with subspecies is known to occur under this genus from Arunachal Pradesh as well as from India, which is represented here.

Prioneris thestylis thestylis (Doubleday)

1842. *Pieris thestylis* Doubleday, *Gray's Zool. Miscell.*, p. 76.

1939. *Prioneris thestylis thestylis*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 373-375.

Material examined : One ♂, Namdapha, Deban, 8.iv. and 1 ♀, Hornbill, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 70-80 mm.

Distribution : India : Mussoorie (U. P.) to Assam, Arunachal Pradesh ; Burma ; Hainan and South China.

Remarks : The subspecies commonly known as 'The Spotted Sawtooth', is not rare in status. The subspecies particularly the females mimic the Hill Jezebel, *Delias belladonna* (Fabr.) of the same family. It is recorded from Namdapha for the first time.

Genus **Cepora** Billberg

1820. *Cepora* Billberg, *Enumer. Insec. Mus. Billberg*, p. 76.

Out of two species and subspecies known from this area under this genus, one is represented here. The other species is *Cepora nerissa* (Fab.) recorded by Betts (1950) from north east India.

Cepora nadina nadina (Lucas)

1852. *Pieris nadina* Lucas, *Rev. Mag. Zool.*, (2)4 : 333.

1939. *Cepora nadina nadina*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 369-371, fig. 137♂.

Material examined : Four ♂♂, Namdapha, Hornbill, 13, 14, 16.iv., 5 ♂♂, Deban, 8, 27.iv. and Deban North, 28.iv.1981 (S. Biswas and Party coll.). Wing. exp. 58-64 mm.

Distribution : India : Sikkim, Assam, Arunachal Pradesh and Burma.

Remarks : The subspecies commonly known as 'The Lesser Gull', is not rare in status. It is recorded for the first time from Namdapha Wild Life Sanctuary.

Genus **Pieris** Schrank

1801. *Pieris* Schrank, *Fauna boica*, 2 : 152, 161.

Three species and subspecies are known to occur, under this genus, from this area, all of which are represented here.

Pieris napi montana Verity

1908. *Pieris melete* var. *montana* Verity, *Rhop. Palaearc.*, p. 141, pl. 31, figs. 20, 21 ♂ ♀.

1939. *Pieris napi montana*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 420-421, fig. 149 ♀.

Material examined : One ♂, Namdapha, Firm base, 19.iv.1981 (S. Biswas & Party coll.). Wing exp. 54 mm.

Distribution : India : Sikkim, Assam and Burma upto Southern Shan States.

Remarks : The subspecies commonly known as 'The Green Veined White', is not rare in status. It is recorded for the first time from Namdapha, Tirap district and also from the entire Arunachal Pradesh.

Pieris canidia indica Evans

1926. *Pieris canidia indica* Evans, *J. Bombay nat. Hist. Soc.*, 31 : 712.

Material examined : One ♂, Namdapha, Deban, 2.iv. and 1 ♂, Hornbill, 16.iv.1981 (S. Biswas & Party coll.). Wing exp. 60 mm.

Distribution : India : Kumaon (U. P.) to Assam ; Dawna range, Burma ; North Baluchistan and Chitral, Pakistan.

Remarks : The subspecies popularly known as 'The Indian Cabbage White', is very common in status. It is recorded for the first time from Namdapha, Tirap district as well as from the entire Arunachal Pradesh. Evans (1912) recorded the species *canidia* from Kobo, South Siang division of Arunachal Pradesh.

Pieris brassicae nepalensis Doubleday

1846. *Pieris brassicae* var. *nepalensis* Doubleday, *Lep. Ins. Nepal*, p. 9, pl. 6, figs. 1-3 (imago).

1939. *Pieris brassicae nepalensis*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 427-428.

Material examined : One ♂, Namdapha, Gibbon land, 6.iv.1981 (S. Biswas & Party coll.). Wing exp. 72 mm.

Distribution : India : Northern India upto Assam, plains of the Himalays ; Tibet ; Yunnan ; Baluchistan and Chitral, Pakistan.

Remarks : The subspecies popularly known as 'The Large Cabbage White', is very common in status. It is recorded for the first time from Namdapha, Tirap district as well as from the entire Arunachal Pradesh.

Subfamily : COLIADINAE Aurivillius

Genus **Eurema** Hubner

1819. *Eurema* Hubner, *Verz. bek. Schmett.*, p. 96.

One species and subspecies in know to occur under this genus from Arunachal Pradesh which is represented here.

***Eurema hecabe contubernalis* (Moore)**

1886. *Terias contubernalis* Moore, *J. Linn. Soc. Lond.*, (Zool.), 21 : 46.

1939. *Eurema hecabe contubernalis*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 527-530, fig. 177a-e ♂ ♀.

Material examined : One ♂, Namdapha, Hornbill, 11.iv.1981 (S. Biswas & Party coll.). Wing exp. 42 mm.

Distribution : India : West Bengal, Assam, Sikkim ; also Burma and Malay Peninsula.

Remarks : Popularly known as 'The Common Grass Yellow', the subspecies is very common in status. It is recorded for the first time from Namdapha, Tirap district as well as from the entire Arunachal Pradesh. Evans (1912) reported the species *hecabe* from Siang division.

Family : DANAIDAE

Subfamily : DANAINAE Bates

Genus **Danaus** Kluk

1802. *Danaus* Kluk, *Zwierzat Hist. nat. poez. gospod.*, 4 : 84 (part).

Out of five species and subspecies known from Arunachal Pradesh, under this genus, two are dealt with hereunder. The other three are *D. aglea melanoides* (Moore), *D. melaneus* (Cram.) and *D. genutia* (Cram.).

Danaus hamata septentrionis (Butler)

1874. *Danaus septentrionis* Butler, *Ent. Mon. Mag.*, **11** : 163.
 1932. *Danaus melissa septentrionis*, Evans, *Identif. Indian Butterfl.*, p. 88.
 1947. *Danaus hamata septentrionis*, Talbot, *Fauna Brit. India*, Butterflies, **2** : 34-35, fig. 11.

Material examined : One ♂, Namdapha, 21.iv., 1 ♀, Deban, 7.iv. and 1 ♀, Charia Camp, 23.iv.1981 (S. Biswas & Party coll.). Wing exp. 100 mm.

Distribution : India : The Himalayas, Kulu (H. P.) to Assam and Arunachal Pradesh ; Bhutan ; Burma ; Afghanistan ; Yunnan ; China ; Taiwan ; Hainan ; Tong King ; Thailand ; Malaya and Sumatra.

Remarks : The subspecies popularly known as 'The Dark Blue Tiger', is common in status. This species is well known as *melissa* Stoll (1781), but according to Talbot (1947) as this name is preoccupied for *Papilio melissa* Fabricius (1775) the next oldest name *hamata* McLeay for *melissa* is used.

Danaus sita sita (Kollar) f. *tytia* (Gray)

1844. *Danaus sita* Kollar, In Hugel's *Kaschmir und das Reich der Siek*, **4**(2) : 424, pl. 6.
 1846. *Danaus tytia* Gray, *Lep. Ins. Nepal*, p. 9, pl. 9, fig. 2 (♂).
 1947. *Danaus sita sita* f. *tytia*, Talbot, *Fauna Brit. India*, Butterflies, **2** : 45-47.

Material examined : One ♂, 1 ♀, Namdapha, Burma Nala, 24.iv., 1 ♂, Zero camp, 9.iv. and 1 ♀, Deban, 7.iv.1981 (S. Biswas & party coll.). Wing exp. 94-100 mm.

Distribution : India : Kashmir to Sikkim, Assam and Arunachal Pradesh ; Bhutan ; Afghanistan ; Upper Burma ; Mishmi Hills ; Yunnan, South-East Tibet, Hainan, China ; Tong King and Thailand.

Remarks : The form commonly known as 'The Chestnut Tiger', is not rare in status. It is fairly common in the hills between 1050 mts. and 2800 mts. and mimics *Chilasa agestor* (Gray) and *Hestina nama* (Doubleday). It is recorded for the first time from Namdapha as well as from the Tirap district of Arunachal Pradesh.

Genus **Euploea** Fabricius

1807. *Euploea* Fabricius, *Mag. f. Insektenk.*, **6** : 280.

Two species with subspecies under this genus are known from Arunachal Pradesh which are dealt with hereunder.

Euploea mulciber mulciber (Cramer)

1777. *Papilio mulciber* Cramer, *Pap. Exot.*, 2 : 45, pl. 127, figs. C, D.

1947. *Euploea mulciber mulciber*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 83-85.

Material examined : One ♂, Namdapha, 21.iv., 1 ♂, Hornbill, 16.iv. and 1 ♂, Gibbon land, 1.v.1981 (S. Biswas & Party coll.). Wing exp. 98-100 mm.

Distribution : India : Simla (H. P.), Mussouri, Kumaon (U. P.) to Assam and Arunachal Pradesh also Nicobar Island and migratory to Andaman Islands ; Nepal ; Burma ; China ; Tong King and Malaya.

Remarks : The subspecies popularly known as 'The Striped Blue Crow', is common in status. It is sexually dimorphic in character. In females, the hind wing is with narrow white streaks in the cell and in area beyond it ; submarginal white spots are also slightly elongated. It mimics the Satyrid, *Elymnias malelas* (Hew.) in both sexes.

Euploea diocletianus diocletianus (Fabricius)

1793. *Papilio diocletianus* Fabricius, *Ent. Syst.*, 3(1) : 40.

1947. *Euploea diocletianus diocletianus*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 104-105.

Material examined : One ♂, Namdapha, Deban, 29.iv.1981 (S. Biswas & Party coll.). Wing exp. 84 mm.

Distribution : India : Assam, Arunachal Pradesh ; Burma to Indo-China, Malaya and Sumatra.

Remarks : The subspecies popularly known as 'The Magpie Crow', is common in status. Betts (1950) and Wynter Blyth (1957) described the species as very common in parts of North-East India between 350 mts. to 1400 mts. during the rainy season and in Autumn. It mimics *Papilio paradoxa* f. *danisepa* (Butl.) and the Nymphalid *Euripus halitherses* f. *isa* (Moore).

Family SATYRIDAE

Genus **Mycalesis** Hubner

1818. *Mycalesis* Hubner, *Zuttr. Samn. Exot. Schmett.*, 1 : 110-113.

Out of six species and subspecies known under this genus, from this area one species with subspecies is represented here.

Mycalesis mestra vetus Fruhstorfer

1911. *Mycalesis mestra vetus* Fruhstorfer, In Seitz's *Macrolep. World*, 9 : 348.

Material examined : One ♂, Namdapha, Deban, 6.iv.1981 (S. Biswas & Party coll.). Wing exp. 58 mm.

Distribution : India : Assam, Arunachal Pradesh, Sikkim, also from Bhutan.

Remarks : The subspecies commonly known as 'The White-Edged Bush Brown', is rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh.

Genus Ypthima Hubner

1818. *Ypthima* Hubner, *Zutr. Samml. exot. Schmett.*, 1 : 17.

Five species with subspecies are known under this genus from North-eastern region of India of which two are new records from Arunachal Pradesh which are represented here. The other two are *Y. sakra austeni* (Moore) and *Y. nareda newara* Moore. Evans (1912) recorded another species *affectata* from Rotung, South Siang division, Arunachal Pradesh.

Ypthima baldus baldus (Fabricius)

1775. *Papilio baldus* Fabricius, *Syst. Ent.*, (3)1 : 829.

1947. *Ypthima baldus baldus* Talbot, *Fauna Brit. India, Butterflies*, 2 : 337-338.

Material examined : Two ♂♂, Namdapha, Zero Camp, 9.iv, 2 ♂♂, Burma Nala, 24.iv.1981 (S. Biswas & Party coll.). Wing exp. 40-44 mm.

Distribution : India : Chamba (H. P.) to Assam and Burma.

Remarks : The subspecies popularly known as 'The Common Five Ring', is very common in status. It is recorded for the first time from Namdapha as well as from the entire Arunachal Pradesh. Evans (1912) recorded the species from 'Abor Expedition' without specific locality.

Ypthima methora methora Hewitson

1865. *Ypthima* (sic) *methora* Hewitson, *Trans. ent. Soc. Lond.*, (3)2 : 291, pl. 18, fig. 20, 21.

1947. *Ypthima methora methora*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 341.

Material examined : One ♂, Namdapha, Zero Camp, 9.iv., 1 ♀,

Burma Nala, 24.iv. and 1 ♀, Chiria Camp, 25.iv. 1981 (S. Biswas & Party coll.). Wing exp. 50-55 mm.

Distribution : India : Sikkim and Assam.

Remarks : The subspecies commonly known as 'The Variegated Five Ring', is rare in status. It is recorded for the first time from Namdapha as well as from the entire Arunachal Pradesh.

Genus *Ragadia* Westwood

1851. *Ragadia* Westwood, *Gen. Diurn. Lep.*, 2 : 376.

One species with subspecies under this genus is known to occur in North-Eastern India which is represented here.

Ragadia crisilda crito de Niceville

1890. *Ragadia crito* de Niceville, *J. Bombay Nat. Hist. Soc.*, 5 : 199, pl. D, figs. 1 ♂, 2 ♀.

1947. *Ragadia crisilda crito*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 356.

Material examined : One ♂, Namdapha, Hornbill. 15.iv., 1 ♂, Gibbons Land, 2.v.1981 (S. Biswas & Party coll.). Wing exp. 50 mm.

Distribution : India : Assam and Manipur also Bhutan.

Remarks : The subspecies commonly known as 'The Striped Ringlet', is rare in status. It is recorded for the first time from Namdapha as well as from the entire Arunachal Pradesh.

Genus *Lethe* Hubner

1819. *Lethe* Hubner, *Verz. bek. Schmett.*, p. 56.

Out of eighteen species and subspecies known under this genus from North Eastern India, three species and subspecies are represented here.

Lethe vindhya (C. Felder)

1859. *Debis vindhya* C. Felder, *Wien. Ent. Mon.*, 3 : 402.

1947. *Lethe vindhya*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 222-223.

Material examined : One ♀, Namdapha, Burma Nala, 24.iv.1981 (S. Biswas & Party coll.). Wing exp. 68 mm.

Distribution : India : Sikkim, Assam, Arunachal Pradesh also Bhutan ; Burma ; Malaya and Tong King.

Remarks : The species commonly known as 'The Black Forester', is not rare in status. It is recorded for the first time from Namdapha, Tirap district. Betts (1950) recorded the species from Subansiri division as rare in status.

***Lethe verma stenopa* Fruhstorfer**

1908. *Lethe verma stenopa* Fruhstorfer, *Ent. Zeit.*, 22 : 127.

Material examined : One ♀, Namdapha, Hornbill, 15.iv.1981 (S. Biswas & Party coll.). Wing exp. 60 mm.

Distribution : Burma ; Thailand ; Tong-King and Hainan.

Remarks : The subspecies popularly known as 'The Straight-Banded Treebrown', is common in status. It is recorded for the first time from Namdapha, Arunachal Pradesh as well as from the entire Indian region.

***Lethe verma sintica* Fruhstorfer**

1911. *Lethe verma sintica* Fruhstorfer, In Seitz's *Macrolep. World*, Butterfly, 9 : 324.

Material examined : One ♂, Namdapha, Burma Nala, 24.iv.1981 (S. Biswas & Party coll.). Wing exp. 62 mm.

Distribution : India : Sikkim to Assam ; Nepal and North Burma.

Remarks : The subspecies popularly known as 'The Straight-Banded Treebrown', is common in status. Betts (1950) recorded the subspecies from north-eastern India, Balipara and Subansiri area. The present record of the subspecies from Namdapha is a new record from this area as well as from Tirap district also.

Family : LYCAENIDAE

Subfamily : LYCAENINAE

Genus ***Pithecop***s Horsfield

1829. *Pithecop*s Horsfield, *Cat. Lep. Mus. E. I. C.*, p. 66.

Out of two species and subspecies known under this genus, one species is represented here which is a new record from Namdapha as well as from the entire Arunachal Pradesh.

***Pithecop*s fulgens Doherty**

1889. *Pithecop*s fulgens Doherty, *J. Asiat. Soc. Beng.*, p. 127, pl. 10, fig. 6.

Material examined : One ♂, 1 ♀, Namdapha, Hornbill ; 14.iv.,

1 ♀, Zero Camp, 9.iv.1981 (S. Biswas & Party coll.). Wing exp. 24-26 mm.

Distribution : India : Assam.

Remarks : The species commonly known as 'The Blue Quaker', is rare in status. So far, its distribution was known from Assam only. In the present study the species is recorded for the first time from Namdapha as well as from the entire Arunachal Pradesh.

Genus *Anthene* Doubleday

1847. *Anthene* Doubleday, *List. Spec. Lep. Ins., Brit. Mus.*, 2 : 27.

Out of two species and subspecies known from this area under this genus, one species with subspecies is represented here.

Anthene emolus emolus (Godart)

1823. *Polyommotus emolus* Godart, *Encycl. Meth.*, 9 : 656.

1962. *Anthene emolus emolus*, Cantlie, In *Lycaenidae Portion Evans' Identification Indian Butterflies*, p. 66.

Material examined : One ♂, Namdapha, Hornbill, 11.iv.1981 (S. Biswas & party coll.). Wing exp. 30 mm.

Distribution : India : Sikkim, Assam, West Bengal, Bihar, Orissa, South India ; also Nepal and Burma.

Remarks : The species popularly known as 'The Ciliate Blue', is common in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus *Zizeeria* Chapman

1910. *Zizeeria* Chapman, *Trans. ent. Soc. Lond.*, p. 480-482.

One species with subspecies under this genus is represented here.

Zizeeria maha maha (Kollar)

1848. *Lycaena maha* Kollar, In *Hugel's Kaschmir*, 4 : 422.

1962. *Zizeeria maha maha*, Cantlie, In *Lycaenidae Portion Evans' Identification Indian Butterflies*, p. 64.

Material examined : One ♀, Namdapha, Hornbill, 11.iv.1981 (S. Biswas & Party coll.). Wing exp. 30 mm.

Distribution : India : Sikkim, Assam also Burma ; Nepal and Baluchistan, Kurran, Pakistan,

Remarks : The species popularly known as 'The Grass Blues', is very common in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus **Lampides** Hubner

1816. *Lampides* Hubner, *Verz. bek. Schmett.*, p. 70.

One species under this genus is represented here.

Lampides boeticus (Linnaeus)

1767. *Papilio boeticus* Linnaeus, *Syst. Nat.*, ed. 12, p. 789.

1962. *Lampides boeticus*, Cantlie, *Lycaenidae Evans' Identification Indian Butterflies*, p. 69.

Material examined : Two ♀ ♀, Namdapha, Hornbill, 11.iv.1981 (S. Biswas & Party coll.). Wing exp. 30 mm.

Distribution : India : Throughout Indian region, including Andamans and Nicobar Islands ; Nepal and Pakistan.

Remarks : The species popularly known as 'The Pea Blue', is common in status except Andamans and Nicobar where it is rare. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus **Castalius** Hubner

1816. *Castalius* Hubner, *Verz. bek. Schmett.*, p. 70.

One species with subspecies under this genus from Arunachal Pradesh is represented here. Evans (1912) reported the species *rosimon* from Sadiya, Assam and also from 'Abor expd.' (without specific locality).

Castalius elna noliteia Fruhstorfer

1918. *Castalius noliteia* Fruhstorfer, *Tijdscher. Ent.*, 61 : 37.

1962. *Castalius elna noliteia*, Cantlie, In *Lycaenidae Portion Evans' Identification Indian Butterflies*, p. 32.

Material examined : One ♀, Namdapha, Hornbill, 16.iv.1981 and 1 ♀, Deban North, 28.iv.1981 (S. Biswas & Party coll.). Wing exp. 32 mm.

Distribution : India : Orissa, Sikkim to Assam, Andaman and Burma,

Remarks : The subspecies commonly known as 'The Elbowed Pierrot', is not rare in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh. Evans (1912) recorded the species *elna* from Sadiya, Assam and Kobo, Siang division of Arunachal Pradesh.

Genus *Celastrina* Tutt.

1906. *Celastrina*, Tutt, *Ent. Rec.*, 18 : 131.

One species with subspecies under this genus is represented here.

Celastrina limbata placida (de Niceville)

1883. *Cyaniris placida* de Niceville, *J. Asiat. Soc. Beng.*, 52 : 68, pl. 1, fig. 8♂.

1962. *Celastrina limbata placida*, Cantlie, In *Lycaenidae Evans' Identification Indian Butterflies*, p. 47.

Material examined : One ♂, Namdapha, Deban, 8.iv., 1 ♂, Hornbill, 13.iv.1981 (S. Biswas & Party coll.). Wing exp. 30-34 mm.

Distribution : India : Dehra Dun (U. P.), Sikkim, Sibsagar, Khasi Hills, Assam ; also Nepal ; Burma and Penang, Malay Peninsula.

Remarks : Commonly known as 'The Plain Hedge Blue', the subspecies is not rare in status. It is recorded for the first time from Namdapha, Tirap district, Arunachal Pradesh. Evans (1912) recorded the species and subspecies from Kobo, Siang division of Arunachal Pradesh.

Genus *Heliophorus* Geyer

1832. *Heliophorus* Geyer, In Hubner, *Zutr. z. Samml. exot. Schmett.*, 4 : 40.

One species with subspecies under this genus is represented here.

Heliophorus epicles indicus (Fruhst.)

1908. *Ilerda epicles indicus* Fruhstofer, *I. Ent. Zeitschr.*, 22 : 46.

1962. *Heliophorus epicles indicus*, Cantlie, *Lycaenidae Evans' Identification Indian Butterflies*, p. 85.

Material examined : Two ♂♂, Namdapha, Hornbill, 11, 13.iv.1981 (S. Biswas and Party coll.). Wing exp. 28-34 mm.

Distribution : India : Kumaon (U. P.) to Dawnas, Burma also Middle Andaman and Nepal.

Remarks : The subspecies popularly known as 'The Purple Sapphire', is common in status. It is recorded for the first time from Namdapha as well as from the entire Arunachal Pradesh. Evans (1912) recorded the species *epicles* from Kobo and Rotung, Siang division, Arunachal Pradesh.

Subfamily : THECLINAE

Genus **Rapala** Moore

1881. *Rapala* Moore, *Lep. Ceylon* 1(3) : 105.

One species under this genus is represented in the present study.

Rapala scintilla de Niceville

1890. *Rapala scintilla* Niceville, *Butt. India*, 3 : 461.

1962. *Rapala scintilla*, Cantlie, *Lycaenidae* In Evans' *Identification Indian Butterflies*, p. 149.

Material examined : One ♀, Namdapha, Hornbill, 14.iv. 1981 (S. Biswas & Party coll.). Wing exp. 32 mm.

Distribution : India : Sikkim to Assam ; Nepal and Burma.

Remarks : The species commonly known as 'The Scarce Slate Blue', is rare in status. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus **Curetis** Hubner

1816. *Curetis*, Hubner, *Verz. bek. Schmett.*, p. 102.

One species with subspecies under this genus is represented in the present study.

Curetis dentata dentata Moore

1879. *Curetis dentata* Moore, *Proc. zool. Soc. Lond.*, p. 137.

1962. *Curetis dentata dentata*, Cantlie, *Lycaenidae* Evans' *Identification Indian Butterflies*, p. 104.

Material examined : One ♂, Namdapha, Deban North, 28.iv.1981 (S. Biswas & Party coll.). Wing exp. 46 mm.

Distribution : India ; Pachmarhi (M. P.), Kulu (H. P.) to Kumaon (U. P.), Sikkim, Assam, South India ; Nepal and Burma.

Remarks : The subspecies popularly known as 'The Toothed Sunbeam', is common in status. It is recorded for the first time from

Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

Genus *Chliaria* Moore

1884. *Chliari* Moore, *J. Asiat. Soc. Beng.*, 5(1), pt. 2 : 32.

One species under this genus is represented in the present study.

Chliaria othona (Hewitson)

1865. *Hypolycaena othona* Hewitson, *Ill. Diurn. Lep.*, p. 50, pl. 22, figs. 17, 18.

1962. *Chliaria othona*, Cantlie, *Lycaenidae Evans' Identification. Indian Butterflies*, p. 140.

Material examined : One ♂, Namdapha, Hornbill. 11.iv.1981 (S. Biswas & Party coll.). Wing exp. 24 mm.

Distribution : India : Kumaon (U. P.), Sikkim, Calcutta (W. B.), Assam, Bombay, South India and Andamans ; also Bhutan, Bangladesh and Burma.

Remarks : The species commonly known as 'The Orchard Tit', is not rare in status, except in Andamans where it is very rare. It is recorded for the first time from Namdapha, Tirap district, as well as from the entire Arunachal Pradesh.

SUMMARY

The paper deals with the systematic account of four families of butterflies Pieridae, Danaidae, Satyridae and Lycaenidae collected from the Namdapha Wild Life Sanctuary, Tirap district, Arunachal Pradesh. Out of 11 species and subspecies of Pieridae, 4 species and subspecies of Danaidae, 7 species and subspecies of Satyridae and 10 species and subspecies of Lycaenidae all of which are recorded for the first time from Namdapha Wild Life Sanctuary, 6 species and subspecies of Pieridae, 3 species and subspecies of Satyridae and 9 species and subspecies of Lycaenidae are new records for the entire Arunachal Pradesh. While one species and subspecies of Satyridae has been reported for the first time from India.

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INSECTA : COLEOPTERA
CARABIDAE & CICINDELIDAE (PART I)

By

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(With 1 Figure)

INTRODUCTION

This is the first part of the result of study on the Carabid fauna of the Namdhapa National Park, Tirap District of Arunachal Pradesh (India). This is also the first record of the Carabid fauna from this area. The material consists of 60 examples belonging to 22 species under 16 genera, 9 tribes and 2 subfamilies.

The carabidae fauna recorded from this area is very similar to that of Burma. Out of 22 species recorded from here 17 species are known from Burma.

Taxonomic list has been prepared according to present understanding of classification e. g. Ball (1960), Lindorth (1961-69) and Kryzhanovsky (1976). Divisions of 'Ball' and Supertribes of Kryzhanovsky are not considered. However one Cicindelid dealt here is considered as belonging to the family Cicindelidae because of tradition (Ball 1960). Tribes previously belonging to the subfamily Harpalinae are placed under Carabinae (s. l.) and all the tribes are arranged according to Sloane (1920) and Andrewes (1930). Genera and species arranged alphabetically under the tribes and genera respectively to which they belong.

TAXONOMIC ACCOUNT

Family : CICINDELIDAE

Subfamily : COLLYRINAE

1. *Tricondyla macrodera* Chaudoir

1860. *Tricondyla macrodera* Chaudoir, *Bull. Soc. Imp. Nat. Moscou*, 1 : 300.

Material examined : 1 ex., Deban North, 28.iv.1981, S. Biswas coll,

Distribution : India : W. Bengal : Darjeeling, Mungphu ; Sikkim : Gopaldhara ; Assam : Gauhati, Sibsagar, Cachar ; Arunachal Pradesh : Namdhapa ; Bhutan, Tonkin.

This species is first time recorded from Arunachal Pradesh.

Remarks : This is rather a common species in north eastern India. It varies considerably in length, gibosity and sculpture of elytra. The apical part of elytra in the specimen before us is rather distinctly punctured to the apex.

Family : CARABIDAE

Subfamily : CARABINAE

Tribe : SCARTINI

2. *Clivina arunachalensis* sp. nov.

(Fig. 1a and b)

Length 7.5 mm.

Colour black ; palpi, antennae, middle and hind legs dark red. *Head* wide ; labrum 6-setose, mandibles short and stout, mentum, shallowly sinuate with a cup-shaped median tooth shorter than lateral lobes ; clypeus truncate, bordered, median part fused with the wings, the latter extend a little forwards and obtusely angulate in front ; frontal plates separated from the clypeal wings by a notch, surface convex, margin rounded ; clypeal ridge slight, suture prominent ; frontal impression deep, fascial carinae short, ending far below frontal plates, fascial sulcus insignificant in front ; surface of head almost smooth and impunctate, a shallow horse shoe shaped impression on the middle of vertex and some fine punctures on sides behind ; neck constriction obsolete ; antennae short and moniliform, joint 2 distinctly longer than ; eyes small and depressed, greatly covered by the clypeal wings and genae.

Prothorax (1.7 × 2.0 mm.) convex, subquadrate, slightly transverse and narrowed in front with the angles a little advanced, median line joining the front transverse sulcus which is uninterrupted and not reaching the margin at extremities, surface with a few faint transverse striations across the median line before middle and near base.

Elytra (3.5 × 2.0 mm.) convex, parallel, somewhat pointed at apex, less than twice as long as wide and as wide as prothorax ; striae deep, finely crenulate, scutellary striae obsolete, striae 1-3 free at base, 4, 5 and 6 joining together, and 7 ending behind shoulder ; intervals convex,

3 without pore and 8 without forming any carina. *Sternum* ; prosternal ridge narrow, not sulcate. *Venter* shallowly rugose-punctate on sides, last segment with two pores widely distant. *Lcgs* with protibae finely sulcate, 4-dentienlate, mesotibae rather densely fringed with bristles.

Holotype, India : Arunachal Pradesh : Tirap district, Namdhapa, 21.iv, 1981, S. Biswas coll. Reg. No. 10050/84A.

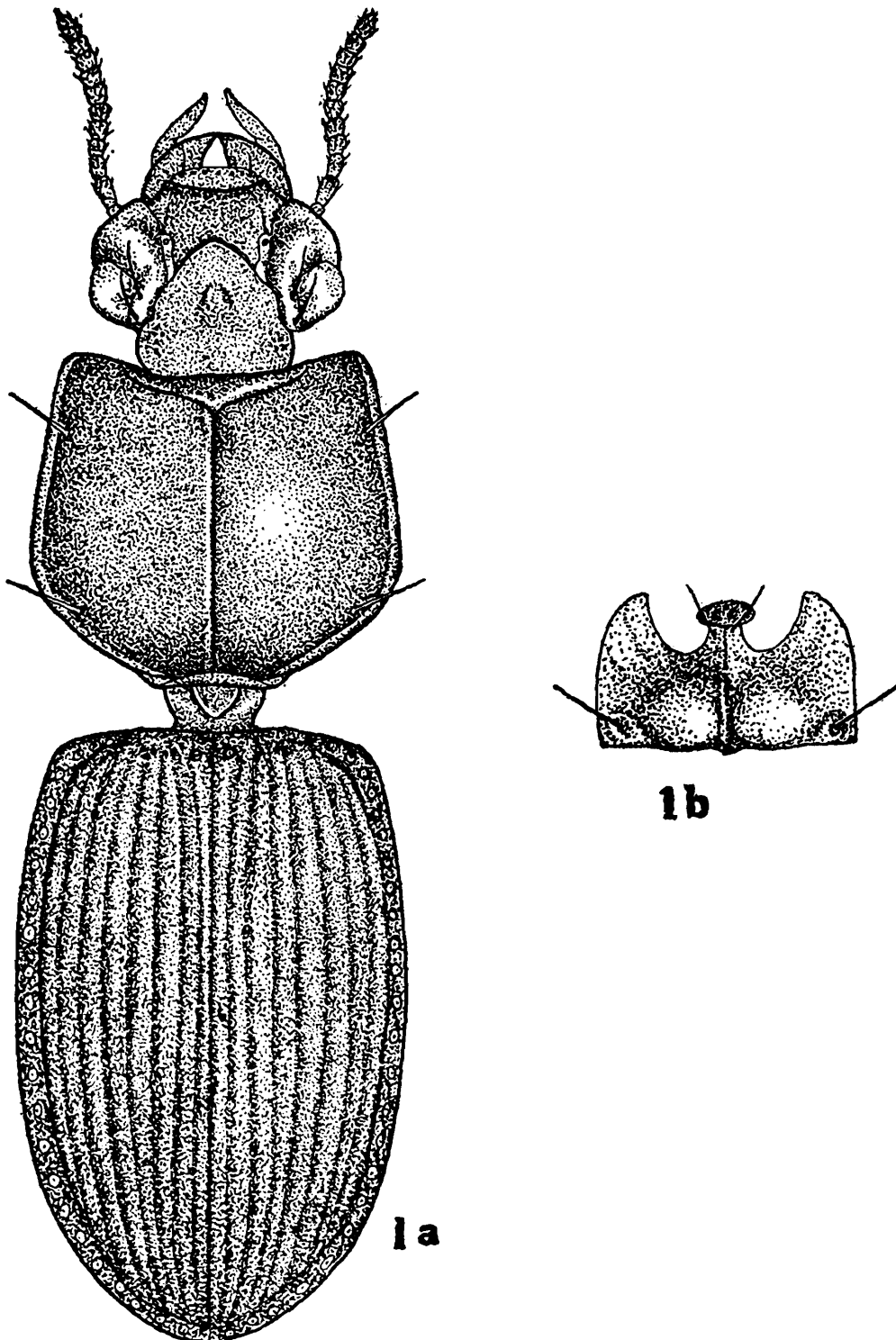


Fig. 1. a. Dorsal view and b. mentum of *Clivina arunacha lensis* sp. nov.

Paratype 1 ex, same data as holotype, Reg. No. 1051/84A. Both deposited in the National Zoological Collection, Zoological Survey of India, Calcutta.

Discussion : This species is close to both *memnonia* Dejean and *assamensis* Putz. by its general body form, by the clypeus with its wings fused with median part by and the elytra with interval 3 without pore. It approaches more to *assamensis* by the cup-shaped median tooth of mentum and smooth head but this species can easily be distinguished from both of the above species by the (i) small eyes, (ii) absence of neck constriction and scutellary striole, (lii) by the posternal ridge without sulcus and (iv) uninterupted transverse sulcus of the prothorax.

3. *Clivina memnonia* Dejean

1831. *Clivina memnonia* Dejean, *Sp. Gen. Col.*, 5 : 503 ; 1929. Andr. *Fauna Brit. India*, 1 : 354 and 362, fig. 53.
 1846. *Clivina indica* Putz., *Mem. Liege*, 2 : 588.
 1856. *Clivina rugosifrons* Nietn., *J. Asiat. Soc. Beng.*, 25 : 390.
 1858. *Clivina recta* Walk., *Ann. Mag. nat. Hist. Soc.*, (3)2 : 203.

Material examined : 2 exs., Namdhapa, 21.iv.1981, S Biswas coll.

Distribution : India, Srilanka, Burma, Indo-China, Sumatra, Java and Borneo.

4. *Clivina westwoodi* Putz.

1863. *Clivina castanea* Putz., (not Westwood) *Mem. Liege*, 18 : 35 (part).
 1867. *Clivina westwoodi* Putz. *Ann. Soc. ent. Belgique*, 10 : 109.

Material examined : 1 ex., Namdhapa, 21.iv.1981, S. Biswas coll.

Distribution : India : U. P. : Dehra Dun ; Maharashtra : Belgaum, Nagpur ; Arunachal Pradesh : as above. Srilanka : Colombo ; Japan.

This species is first time recorded from North-East India.

5. *Scarites indus* Oliver

1795. *Scarites indus* Oliv. *Ent. Hist.:Insect.*, 3 : 39. tab. 1, fig. 2 ; 1929. Andr., *Fauna Brit. India*, Carabidae 1, Carabinae, 29, fig. 8b, 232 and 260, fig. 42.
 1813. *Scarites mancus* Bonelli, Obs. Ent. ii, *Mem. Acad. Sci. Turin*. 20 : 473.
 1921. *Scarites terricola*, Andr. (not Bonelli), *Rec. Indian Mus.*, 22 : 339.

Material examined : 1 ex., Deban, 24.iv.1981, S. Biswas coll.

Tribe : PTEROSTICHINI

6. *Caelostomus inermis* (Bates)

1892. *Stomonaxus inermis* Bates, *Ann. Mus. Civ. Nat. Genova* 32 : 351.

1930. *Caelostomus innermis*, Andr. *Catalogue of Indian Insects*. Part 18-Carabidae : 56.

Material examined : 1 ex., Namdhapa, Firm base, 18.iv.1981, S. Biswas coll.

Distribution : India : Arunachal Pradesh : Namdhapa. Burma : Tenasserim : Teinzo, Thagata, Patkai Hills.

This species is first time recorded from India.

7. *Morion orientale* Dejean

1825. *Morion orientale* Dejean, *Sp. Gen. Col.*, 1 : 432 ; 1880. Chaudoir, *Bull. Soc. Imp. Nat. Moscou*, 1 : 338 ; 1924. Andr. *Ann. Mag. Nat. Hist. Soc.*, 16(9) : 591.

1873. *Morion walkeri* Putz., *Ann. Mus. Civ. Nat. Genova* : 216.

1880. *Morion subconvexum* Chaud., *Bull. Soc. Imp. Nat. Moscou*, 1 : 340.

Material examined : 1 ex., Namdhapa, 19.iv.1981, S. Biswas coll.

Distribution : Throughout South East Asia.

Tribe : HARPALINI

8. *Dioryche torta* Macleay

1825. *Dioryche torta* Macleay, *Ann. Jav.* : 21 ; 1935. Hope, *Col. Man.*, tab. 2, fig. 4 ; 1926. Andr., *Ent. month. Mag.* : 68.

1829. *Platymetopus amoena* Dejean, *Sp. Gen. Col.*, 4 : 73 ; 1924. Andr. *Ann. Mag. Nat. Hist. Soc.* (9)15 : 59.

1889. *Platymelopus laetula* Bates, *Ann. Soc. Ent. France* : 270 ; 1921. Andr. *Trans. ent. Soc. London* : 177.

Material examined : 3 exs., Gibbonland, 29.iv.1981, S. Biswas coll. ; 1 ex., Zero Camp, 8.iv.1981.

Distribution : India, Srilanka, Burma, Malay Peninsula, Java, Sumatra, Borneo, Indo-China and Formosa.

9. *Harpalus (Perdileus) indicus* Bates

1891. *Harpalus indicus* Bates, *Comp. Soc. Ent. Belgique* : 332. 1926. Andr. *Ent. month. Mag.* : 68.

1930. *Ophonus (Perdilens) indicus*, Andr., *Cat. Ind. Insects*. Part 18.—Carabidae : 244.

Material examined : 1 ex., Namdhapa, 19.iv.1981, S. Biswas coll.

Distribution : Andrewes (1930) recorded its distribution as throughout Himalayan tract from Kashmir to Bhutan. This species is first time recorded from Arunachal Pradesh and with this record its distribution is extended to the remote east of India.

Remarks : Andrewes (1930) placed this species under the genus *Ophonus* with the subgenus *Perdileus*. Habu (1973) placed the subgenus *Perdilens* under *Harpalus* and considers, [as also Ball & Anderson 1962] *Ophonus*, which is characterised by the ciliate labrum, mandibles and eyes, as the subgenus of *Harpalus*.

9. *Harpalus* (? *Harpalus*) *karenius* Bates

1892. *Harpalus karenius* Bates, *Ann. Mus. Civ. Nat. Genova*, 32 : 341 ; 1930. Andr. *Cat. Indian Insects*. Part 18.—Carabidae : 197.

Material examined : 2 exs., Gibbon land, 29.ix.1981, S. Biswas coll ; 7 exs., Namdhapa, 22.iv.1981, S. Biswas coll. ; 1 ex., Deban, 6.iv.1931, S. Biswas coll.

Distribution : India : Meghalaya : Shillong, Khasi Hills ; Arunachal Pradesh : Rotung, Yambung and as above ; Himachal Pradesh : Simla. Burma : Karen Hills, Ruby Mines ; Tonken, Cambodia.

Remarks : Bates (1892) placed this species under the genus *Harpalus* with doubt. Andrewes (*in lit.*) placed this species under *Harpalus s. str.* But this species appears to belong to some unknown subgenus by having extended frontal impression and glabrous pasaglossae. The generic status of this species will be dealt with in some other paper.

10. *Stenolophus* (*Egadroma*) *smaragdulus* (F.)

1798. *Carabus smaragdulus* Fabricius, *Suppl. Ent. Syst.* : 60.

1829. *Stenolophus smaragdulus*, Dejean, *Sp. Gen. Col.*, 14 : 418.

1930. *Stenolophus smaragdulus*, Andr., *Cat. Indian Insects*, Part 18,—Carabidae : 318.

1973. *Stenolophus* (*Egadroma*) *smaragdulus*, Habu, *Fauna Japonica*, Carabidae : Harpilini : 377.

Material examined : 2 exs., Miao, 5.v.1981, S. Biswas coll.

Distribution : Throughout the whole of South East Asia, extending from Japan in the North to Queensland in the South.

Remarks : This is very common and widely distributed species. Many names have been assigned to it by different authors which will be seen in Andrewes' (1930) Catalogue and are not repeated here.

Tribe : PANAGAEINI

12. *Craspedophorus gracilipes* Bates1892. *Epicosmus gracilipes* Bates, *Ann. Mus. Civ. Nat. Genova*, 32 : 302.1930. *Craspedophorus gracilipes* Andrewes, *Cat. Indian Insects*. Part 18.—*Carabidae* : 135.*Material examined* : 1 ex., Zero Camp, 8.ix.1981, S. Biswas coll.*Distribution* : India : Assam : Sadiya ; Arunachal Pradesh : Noa Dehing and Namdhapa. Burma : Bhamo ; Yunnan.

Tribe : CHLAENIINI

13. *Chlaenius (Chlaenioctenus) eneides* Bates1892. *Chlaenius (Chlaenioctenus) eneides* Bates, *Ann. Mus. Civ. Nat. Genova*, 32 : 310 (note).1930. *Chlaenius (chlaenioctenus) eneides*, Andrewes, *Cat. Indian Insects*., Part 18.—*Carabidae* : 91.*Material examined* : 1 ex., Zero Camp, 8.iv.1981, S. Biswas coll.*Distribution* : India : 'Assam' ; Arunachal Pradesh : Namdhapa.*Remarks* : This species is first time recorded after its description.

Tribe : LEBIINI

14. *Catascopus elegans* Weber1801. *Elarphus elegans* Weber, *Obs. Ent.* : 45.1801. *Carabus elegans* F., *Syst. Eleuth.*, 1 : 184.1938. *Catascopus elegans*, Hope, *Col. Man.* 2 : 78.*Material examined* : 1 ex., Gibbon land, 3.v.1981, S. Biswas coll.*Distribution* : India : Meghalaya : Khasi Hills ; West Bengal : Sundarbans ; Andaman and Nicobar Islands ; Arunachal Pradesh : as above and Sikkim : Rajabhat Kawa. Indo-China, Thailand, Malaya, Australia, Solomon Is., Burma (Thagata).

This is a new record from Arunachal Pradesh.

15. *Catascopus facialis* Wiedmann1819. *Carabus facialis* Wied., *Zool. Mag.*, 1 : 165.1825. *Catascopus facialis*, Dejean, *Sp. Gen. Col.*, 1 : 329.1846. *Catascapus facialis*, Schm. Goeb., *Faun. Col. Birm.* : 81.*Material examined* : 1 ex., Zero Camp, 8.iv.1981, S. Biswas coll.

Distribution : India : Throughout North East India and Andaman Is. Malaya, Thailand, Yunnan, Sarawaw, Malacca, and Indo-China.

Remarks : This is a widely spread species and many name including some varieties have been assigned to it by different authors which will be seen in Andrewes' (1930) Catalogue and are not repeated here.

16. *Catascopus regalis* Schm. Goeb.

1846. *Catascopus regalis* Schm. Goeb. *Faun. Col. Birm.* : 84.

1923. *Catascopus regalis*, Andr., *Trans. ent. Soc. London* : 49 ; 1930. Ibid, *Catalogue of Indian Insects. Part 18.—Carabidae* : 79.

Material examined : 5 exs., Hornbill, 16.iv.1981, S. Biswas coll.

Distribution : India : Meghalaya : Khasi Hills ; Nagaland : Naga Hills ; Arunachal Pradesh : Dikrang, Silonibari, Dejeo, Rotung, Kobo. Bengal : Lower Tondu ; Sikkim : Gopaldhara ; Andaman and Nicobar Is. Bangladesh : Sylhet ; Burma : Karen Hills, Tharrawddy, Thagata, Tavoy ; Laos and Tonkin.

17. *Catascopus violaceus* Schm. Goeb.

1846. *Catascopus violaceus* Schm. Goeb., *Faun. Col. Birm.* : 82.

1854. *Catascopus cyanipennis* Chaudoir, *Bull. Soc. Imp. Nat. Moscou*, 1 : 30.

Material examined : 2 exs., Zero camp, 8.iv.1981, S. Biswas coll. ; 1 ex., Gibbon land, 3.v.1981, S. Biswas coll.

Distribution : India : W. B. : Rajabhatkawa ; Sikkim and Assam. Throughout Burma and Malay Peninsula.

18. *Coptodera ? interrupta*, Schm. Goeb.

1846. *Coptodera interrupta* Schm. Goeb., *Fauna Col. Birm.* : 53 ; 1892. Bates, *Ann. Mus. Civ. Nat. Genova*, 32 : 411.

1846. *Coptodera elegantula* Schm. Goeb. *Fauna Col. Birm.* : 54 ; 1923. Andr. *Trans. ent. Soc. London* : 30.

Material examined : 13 exs., Hornbill, 14.iv.1981, S. Biswas coll.

Distribution : India : W. B. : Darjeeling dist., Pashok, Nomsoo, Nurbong, Mirik ; U. P. : Dehra Dun, Kali valley (Almora) ; Tamilnadu Nilgiri Hills ; Arunachal Pradesh : Namdapha. S. Srilanka : Matale : Anuradhapura, Horawupotana. Burma : Teinzo, Shwegu, Palon, Pinwe, Tharrawaddy, Kawkareik ; Malay Pen., Laos, Tonkin and Sarawak.

This is a new record from Arunachal Pradesh.

Remarks : The specimens before us quite agree with the description of Schmidt-Goebel (1846) and provisionally placed under *interrupta* with some hesitation. As we have not yet seen any specimen of *interrupta* this determination could not be confirmed.

19. *Mochtherus tetraspilosus* Macleay

1825. *Dromius tetraspilosus* Macleay, *Ann. Jav.* : 25.

1869. *Mochtherus tetraspilosus*, chandoir, *Ann. Soc. ent. Belgique*, 12 : 241.

Material examined : 1 ex., Hornbill, 14.iv.1981, S. Biswas coll.

Distribution : Throughout India (including Andaman Is.), Ceylon and Burma. This is also recorded from Malay Peninsula and Archipelago, Philippine Is. Java, Sumatra, Tonkin, Laos and Formosa.

Remarks : This is a widely spread species. Other names attributed to this species are not repeated here.

20. *Peripristus ater* (Cast.)

1835. *Thyreopterus ater* Cast, *Etud. Ent.* : 149 ; 1846. Schm. Gaeb., *Fauna Col. Birm.* : 79.

1869. *Peripristus ater*, Chaudoir, *Ann. Soc. ent. Belgique*, 12 : 136.

Material examined : 1 ex., Namdhapa, 21.iv.1981, S. Biswas coll.

Distribution : India : Arunachal Pradesh : Kobo and above W. B. : Kalimpong, Poshok ; Sikkim : Gopaldhara, Tamilnadu, Nilgiri and Anaimalai Hills ; Kerala : Cochin, Parombikulam ; Nicobar Is. Burma : Bhamo, Katha, Shwegu, Shwegyin, Malewoon, Karen Hills, Thagata, Tena Serrim. Malay Penin, Thailand, Vietnam, Sumatra, Java and Borneo.

Tribe : HELLIJONINI

21. *Macrocheilus trimaculatus* (Oliver)

1790. *Carabus 3-maculatus* Oliv., *Enc. Meth.* : 347, tab. 179, fig. 11.

1919. *Macrocheilus trimaculatus*, Andrewes, *Trans. ent. Soc. London* : 129.

Material examined : 2 exs., Zero Camp, 8.iv.1981, S. Biswas coll.

Distribution : Throughout India, Ceylon and Burma. Laos, Tonkin, Philippine Is., Hong Kong.

Remarks : This is also common and widely distributed species.

Longlist of synonyms given in Andrewes' (1930) Catalogue are not repeated here.

Tribe : ORTHOGONINI

22. *Hexachaetus angulatus* (Schm. Goeb.)

1846. *Orthogonius angulatus* Schm. Goeb. *Fauna Col. Birm.* : 58 ; Bates, *Ann. Mus. Civ. Nat. Genova*, 32 : 401.
 1871. *Hexachaetus angulatus*, Chaudoir, *Ann. Soc. ent. Belgique*, 16 : 110.

Material examined : 1 ex., Gibbon land, 2-5.v.1981, S. Biswas coll.

Distribution : India : Arunachal Pradesh : Namdhapa. Burma : Karen Hills, Maymyo, Tenasserim, Derak, Penang ; Laos, Tonkin.
 This species and genus is first time recorded from India.

SUMMARY

All the 22 species of Carabidae (incl. Cicindelidae) are first time recorded from Namdhapa (Arunachal Pradesh). *Clivina arunachalensis* is described as new to science. Genus *Hexachaetus* Chaudoir with the species *H. angulatus* (Schm. Goeb.) and the species *Caelostomus innermis* (Bates) are first time recorded from India. The species *Tricondyla macrodera* Chaudoir, *Clivina Westwoodi* Dejean, *Harpalus* (Perdileus) *indicus* Bates, *Catascopus elegans* (F.) and *Coptodera interrupta* are first time recorded from Arunachal Pradesh.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. B. K. Tikader, Director, Zoological Survey of India, for providing laboratory facilities to carry out this work. They also express their thanks to Dr. A. K. Ghosh, Deputy Director and Principal Investigator of the Project "Faunal assessment of Namdhapa proposed Biosphere Reserve", for placing the material at our disposal.

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INSECTA : COLEOPTERA : HISTERIDAE

By

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(With 1 Figure.)

The present paper deals with the material collected from and around Namdapha National Park, Tirap district, Arunachal Pradesh. Specimens were collected from dungs of various animals, decaying wood and under bark of dead trees. Altogether 54 examples belonging to 18 species of 12 genera under 5 subfamilies have been reported here. One species, *Trypeticus namdaphaicus* has been described as new. 3 species namely, *Apobletes marginicollis* Lewis, *Atholus duodecimstriatus* Schm, and *Hypocaccus sinae* Marseul are new record for India.

Selected references, specimens examined and geographical distribution have been mentioned under individual species. Types and all other materials are deposited in the collection of Zoological Survey of India, Calcutta.

LIST OF SPECIES

Family : HISTERIDAE

Subfamily : HOLOLEPTINAE

1. *Hololepta elongata* Erichson

Subfamily : TRYPETICINAE

2. *Trypeticus namdaphaicus* sp. nov.

Subfamily : HISTERINAE

3. *Apobletes planidorsum* Bickhardt
4. *Apobletes marginicollis* Lewis
5. *Platylister cambodjensis* (Marseul)
6. *Platylister strialis* (Marseul)
7. *Platysoma confucii* Marseul
8. *Pachylister chinensis* (Quensel)
9. *Hister* sp. nr. *scissifrons* Marseul
10. *Hister* sp.

11. *Atholus duodecimstriatus* Schrank
12. *Atholus* sp. nr. *philippinensis* Marseul

Subfamily : SAPRININAE

13. *Saprinus* sp. nr. *chalcites* Illiger
14. *Hypocaccus sinae* Marseul

Subfamily : DENDROPHILINAE

15. *Paromalus babaulti* Cooman
16. *Paromalus teibodae* Marseul
17. *Paromalus* sp. nr. *babaulti* Cooman

Subfamily : ABRAEINAE

18. *Acritus pascuarum* Cooman

SYSTEMATIC ACCOUNT

Family : HISTERIDAE

Subfamily : HOLOLEPTINAE

Genus 1. *Hololepta* Paykull

1. *Hololepta elongata* Erichson

1834. *Hololepta elongata* Erichson, in Klug, *Jahrb. Ins.* p. 92.
 1853. *Ho olepta elongata*, Mars. *Mon.*, p. 190, t. 4, f. 6.
 1913. *Hololepta elongata*, Bickhardt, *Rec. Indian Mus.*, 8 : 121.

Material examined : 4 exs., Zero camp, 8.v.1981 ; 2 exs, Namdapha, 21.iv,1981 ; 1 ex, Gibbonland, 30.iv.1981, S. Biswas coll.

Distribution : The species occurs in India and Malayan Archipelago. In India the species was recorded from Kobo and Sadiya of N. E. Assam and now it is being recorded from Namdapha, Tirap district, Arunacnal Pradesh. Specimens have been collected under bark of rotten wood.

Genus 2. *Trypeticus* Marseul

2. *Trypeticus namdaphaicus* sp. nov.

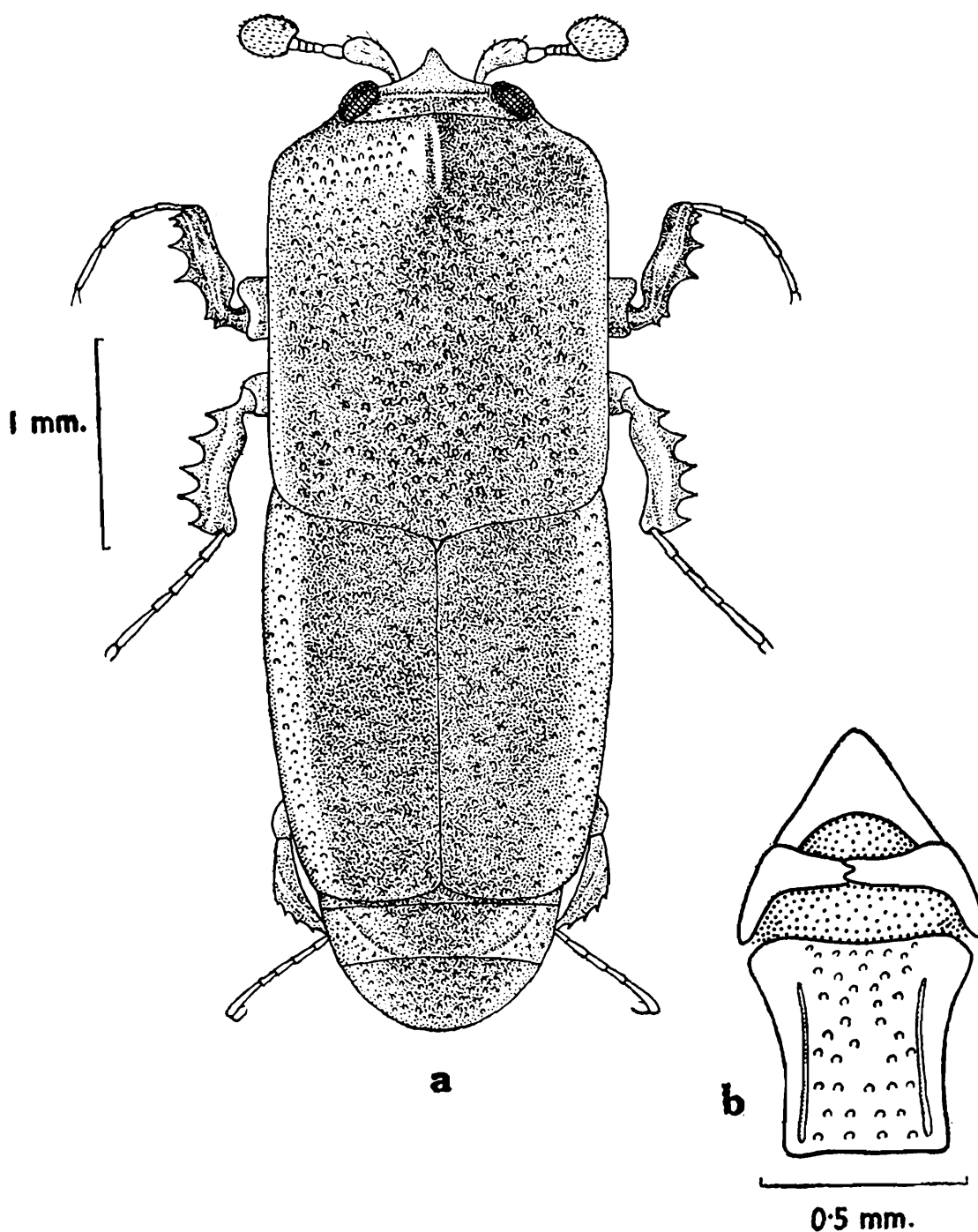
(Figs. 1a. b)

Body (Fig. 1a) elongate, cylindrical, blackish-brown, shining, legs and antennae rusty brown.

Length 4.85 mm, breadth 1.75 mm.

Head finely and rather sparsely punctate with a fine microreticulation, epistome concave, triangular apically. Antennal scape large, with long hairs ; antennal club lighter, subcircular, tomentose.

Pronotum 2,2 times as long as broad, with a short antero-median ridge, parallel sided and narrowed anteriorly, broadly emarginate medially, coarsely and densely punctate, fine punctures sparsely intermixed laterally and anteriorly, marginal stria complete, a little finely marked anteriorly, posterior margin angularly drawn out towards scutellum.



Text-fig. 1. *Trypeticus namdaphaicus* sp. nov. : a. Dorsal view ; b. Head and prothorax, Ventral view.

Elytra 1.1 times as long as broad, as wide as pronotum at base and a little wider towards middle, puncturation finer and sparser than on pronotum. Scutellum minute, indistinct.

Propygidium moderately long, puncturation moderately coarse and dense. Pygidium convex, puncturation slightly denser than on propygidium.

Prosternum flat, bistriate, striae nearly parallel but not united apically, posterior margin slightly sinuate.

Mesosternum depressed, covered with sparse elongate punctures intermixed with fine punctures; median projection long, blunt and apically straight, marginal stria interrupted anteriorly. Meso-metasternal suture indistinct, median line on metasternum deep and long, metasternum with fine sparse punctures.

First abdominal ventrite rather densely punctate. Legs paler than body; front tibiae with 5 teeth, middle ones with 5 teeth, and hind tibiae with 4 spinules at outer margin.

This species resembles *T. nemorivagus* Lewis but can be distinguished by its prothorax longer than elytra, pronotum with short antero-median ridge; epistome elongate, apex dorsally recurved and not bifid; marginal striae on prosternum interrupted apically (Fig. 1b).

Holotype : Zero camp, 8.iv.1981, S. Biswas coll.

Paratypes : 4 exs, data same as holotype; 1 ex, 40th Mile camp, (Chiria camp). 24.iv.1981, S. Biswas coll. All types are deposited in the Zoological Survey of India, Calcutta. (Reg. No. 1052-1057/H4 A).

Subfamily : HISTERINAE

Genus : 3. *Apobletes* Marseul

3. *Apobletes planidorsum* Bickhardt, 1912

1912. *Apobletes planidorsum* Bickhardt, *Tijdschrift v. Entomol.* 55 : 219.

1913. *Apobletes planidorsum*, Bickhardt, *Rec. Indian Mus.*, 8 : 122.

Material examined : 2 exs, Zero camp, 8.iv.1981, 6 exs, Namdapha, 21.iv.1981, S. Biswas coll.

Distribution : The species was described from Borneo by Bickhardt and in 1913 he recorded the species for the first time in India from Sadiya, Assam. Now the species is being recorded for the first time from Namdapha, Arunachal Pradesh.

4. Apobletes marginicollis Lewis

1888. *Apobletes marginicollis* Lewis, *Ann. Mus. Civ. Stor. Nat. Genova* (2) 6 : 633.

Material examined : 1 ex, Deban, 28.iv.1981 ; 1 ex, Miao, 5.v.1981, S. Biswas coll.

Distribution : The species was described from Burma. This is the first time the species is recorded from India in Namdapha Wild Life Sanctuary in Arunachal Pradesh.

Genus : 4. Platylister Lewis**5. Platylister cambodjensis (Marseul)**

1864. *Platysoma cambodjensis* Marseul, *Abeille*, 1. p. 300.

1913. *Platysoma (Platylister) cambodjensis*, Bickhardt. *Rec. Indian Mus.*, 8 ; 122.

1973. *Platylister cambodje isis*, Therond, *Entomologica Basiliensia*, 1 : 169.

Material examined : 8 exs, Zero camp, 14.iv.1981, 3 exs, 21.iv.1981, S. Biswas coll.

Distribution : The species is known from Thailand, Vietnam, Formosa, Burma, Bhutan and India. In India it was recorded from Kobo, Rotung, Sadiya (N. E. Assam) and Andaman Island. Now it is being recorded from Namdapha Wild Life Sanctuary, Tirap district, Arunachal Pradesh.

6. Platylister strialis (Marseul)

1864. *Platysoma strialis* Marseul, *Abeille*, 1 : 301.

1898. *Platysoma suturale* Lewis, *Ann. Mus. Civ. stor. Nat. Genova*, (2) 6 : 634.

1973. *Platylister strialis*, Therond, *Entomologica Basiliensia*, 1 ; 169.

Material examined : 1 ex, Hornbill, 16.iv.1981, S. Biswas coll.

Distribution : The species was known from Celebes, Vietnam, Borneo, Sumatra, Sumba, Island, Nepal and Bhutan. This is the first time the species is recorded from India.

Genus : 5. Platysoma Leach**7. Platysoma confucii Marseul**

1857. *Platysoma confucii* Marseul, *Mon.*, p. 404, t. 11, fig. 9.

1890. *Platysoma confucii*, Schmidt, *Notes Lcyden Mus*, 12, p. 10.

1913. *Platysoma (s. str.) confucii*, Bickhardt, *Rec. Indian Mus.*, 8 : 123.

Material examined : 1 ex, Hornbill, 16.iv.1981, S. Biswas coll.

Distribution : The species occurs in Philippines, Sumatra, China, Burma, Sri Lanka and India. In India the species was known from Andaman Island and Kobo, Rotung and Sadiya in N. E. India. The species is now recorded from Namdapha Wild Life Sanctuary in Tirap district, Arunachal Pradesh.

Genus : 6. **Pachylister** Lewois

8. **Pachylister chinensis** (Quense) 1806

1806. *Hister chinensis* Quense, in Schonh., *Syn. Ins.*, 1, p. 88.
 1807. *Hister dlstorsus* Illiger, *Mag.*, 6, p. 29.
 1834. *Hister incisus* Erichson, in Klug, *Jahrb. Ins.* p. 34.
 1904. *Pachylister chinensis*, Lewis, *Ann. Mag. Nat. Hist.*, (7), 14: 146.
 1971. *Pachylister chinensis*, Therond, *Ent. Scand. Suppl.*, 1: 255.

Material examined : 1 ex, Deban, 7.iv.1981, S. Biswas coll.

Distribution : The species occurs in China and India. In India the definite locality record is not available. This is the first time the species is recorded from Namdapha Wild Life Sanctuary, Tirap district, Arunachal Pradesh.

Genus : 7. **Hister** Linnaeus

9. **Hister** sp.nr. **scissifrons** Marseul

Material examined : 1 ex, Zero camp, 9.iv.1981, S. Biswas coll.

10. **Hister** sp.

Material examined : 2 exs, Hornbill, 14.iv.1981, S. Biswas coll.

Genus : 8. **Atholus** Thomson

11. **Atholus duodecimstriatus** (Schrank)

1781. *Hister duodecimstristus* Schrank. *Faun. Inst. Austr.*, : 39.
 1852. *Atholus duodecimstriatus* Thomson, *Scandin. Coleopt.* 4: 230.
 1860. *Hister quinuestrigtus* Motschulsky, *Etud. Ent.*, 9: 13.
 1967. *Atholus duodecimstriatus*, Therond, *Ann. Soc. Ent. Fr. (N.S.)*, 3(4): 1097.

Material examined : 3 exs, Hornbill, 14.iv.1981 ; 1 ex, Zero camp, 9.iv.1981 ; 2 exs, Chiria camp, 25.iv.1981, S. Biswas coll.

Distribution : The species was recorded from China, Japan, Mongolia, Siberia, Turkestan, Iran and Afghanistan. This is the first time the species is recorded from India.

12. *Atholus* sp. nr. *philippinensis* Marseul

Material examined : 2 exs, Zero camp, 8.iv.1981, S. Biswas coll.

Subfamily : SAPRINAE

Genus 9. *Saprinus* Erichson, 1834

13. *Saprinus* sp. nr. *chalcites* Illiger

Material examined : 1 ex, Hornbill, 14.iv.1981, S. Biswas coll.

Genus 10. *Hypocaccus* Thomson

14. *Hypocaccus* *sinae* (Marseul)

1862. *Saprinus sinae* Marseul, *Mon.* : 496, t.17, f.52.

1941. *Hypocaccus sinae*, Reichardt. *Faune de l'u. R. S. S.*, Hister : 312.

1969. *Hypocaccus sinae*, Therond, *Acta Mus. Moraviae* 54 : 195.

Material examined : 1 ex. Deban, 7.iv.1981, 1 ex, Zero camp, 8.iv.1981, S. Biswas coll.

Distribution : The species was known from Australia, China and Sri Lanka. This is the first time the species is recorded from India in Namdapha Wild Life Sanctuary in Arunachal Pradesh.

Subfamily : DENDROPHILINAE

Genus 11. *Paromalus* Erichson

15. *Paromalus* *babaulti* (Cooman)

1935. *Microlomalus babaulti* Cooman, *Rev. Franc. Ent.*, 2 : 177.

1948. *Paromalus babaulti*, Cooman, *Notes Ent. Chin. Mus.*, Heude, 12 : 135.

1978. *Paromalus babaulti*, Therond, *Senckenbergiana biol.* 59(3-4) : 238.

Material examined : 3 exs, Zero camp, 8.iv.1981 ; 1 ex, Namdapha camp, 21.iv.1981, S. Biswas coll.

Remark : The species is known in India from Kashmir (Pahalgam). This is the first time the species is recorded from Namdapha Wild Life Sanctuary, Tirap district, Arunachal Pradesh.

16. *Paromalus* *teibodae* Marseul

1879. *Paromalus teibode* Marseul, *Ann. Mus. Civ. stor. Nat, Genova*, 14 : 278.

1913. *Paromalus teibodae*, Bickhardt, *Rec. India Mus.*, 8 : 125.

Material examined : 2 exs, Namdapha camp, 21.iv.1981, S. Biswas coll.

Distribution : The species was known from Java. This is the first time the species is recorded from India in Namdapha Wild Life Sanctuary in Tirap district, Arunachal Pradesh.

17. *Paromalus* sp.

Material examined : 2 exs, Namdapha camp, 21.iv.1981, S. Biswas coll.

Remarks : The specimens are larger in size and punctures on pronotum larger and rugulose at sides.

Subfamily : ABREINAE

Genus 12. *Acritus* Le Conte

18. *Acritus pascuaram* Cooman

1947. *Acritus pascuarum* Cooman, *Notes d'Entomologie chinoise*, 1(9) : 422, fig. I.

1976. *Acritus pascuarum*, Gomy, *Bull. Soc. Ent. France*. 81 : 362.

Material examined : 1 ex, Namdapha, 21.iv. 1981, S. Biswas coll.

Distribution : The species is known from China and India. In India it was recorded from Madarihat, Jalpaiguri district, West Bengal. This is the first time the species is recorded from Namdapha Wild Life Sanctuary, Tirap District, Arunachal Pradesh.

SUMMARY

Altogether 18 species under 12 genera of 5 subfamilies of Histerid beetles have been dealt with. One species, *Trypeticus namdaphaicus* has been described as new. Several species are new record to Arunachal Pradesh.

ACKNOWLEDGEMENTS

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INSECTA : COLEOPTERA : STAPHYLINIDAE

ON A COLLECTION OF STAPHYLINIDAE (INSECTA :
COLEOPTERA) FROM NAMDAPHA, WILD LIFE
SANCTUARY, TIRAP DISTRICT, ARUNACHAL
PRADESH, INDIA

By

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Zoological Survey of India, Calcutta

The present paper deals with the material collected from Namdapha Wild Life Sanctuary (at present National Park and Tiger Reserve) of Tirap district, Arunachal Pradesh, India. The material under report consists of 70 examples belonging to 26 species under 12 genera, 6 tribes and 2 subfamilies. Of these species reported here one species *Holusus tirapensis* has been described as new and four species, namely *Priochirus (Cephalomerus) sanguinosus* (Mots.), *Osorius peguanus* Bernh. *O. punctipennis* Fauvel and *Philonihus poephagus* Cameron have been recorded for the first time from India.

Selected reference, material studied and geographical distribution have been included.

All the material including type have been deposited in the collection of Zoological Survey of India, Calcutta.

SYSTEMATIC ACCOUNT

Family : STAPHYLINIDAE

Subfamily : OXYTELINAE

Tribe : PIESTINI

1. *Eupiestus feae* Fauvel

1895. *Eupiestus feae* Fauvel, *Rev. d'Ent.*, 14, : 187.

1930. *Eupiestus feae*, Cameron, *Fauna Brit. India*. Col. Staph. 1 : 37-38.

Material examined : 1 ex., Arunachal Pradesh, Namdapha Wild Life Sanctuary. 14.v.1981, S. Biswas coll.

Distribution : Earlier reported from India and Burma. In India it is recorded from Abor country and Namdapha, Arunachal Pradesh.

2. *Holosus* sp. (nr. *fossulatus* Motschulsky)

Material examined : 2 exs., Arunachal Pradesh, Namdapha Wild Life Sanctuary, 14.iv.1981, S. Biswas coll.

Distribution : India ; Arunachal Pradesh, Namdapha.

3. *Holosus tirapensis*, sp. nov.

Reddish brown, shining and subparallel, thorax with large deep fossa at the posterior angles, transversely impressed before the base which is connected at the fossa, in the middle with fine longitudinal sulcus. Elytra deeply bisulcated along the suture. Antennae ferrugineous. Legs reddish testaceous.

Head small and narrower than thorax, moderately closely and finely punctured, on each side of the anterior portion of head vertically impressed. Antennae small, segment 3 slightly longer than broad, segments 2 and 4-7 as long as broad, segments 8-10 slightly transverse. Thorax slightly transverse, sides rather parallel, anterior angles broadly rounded and posterior angles angulated, surface densely and distinctly punctured. Elytra distinctly longer and broader than thorax, sides slightly rounded, a 'u' shaped deep sulcus along the suture and a ridge on the middle of the sulcus, near the lateral margins a broad and shallow impression from the anterior margin to posterior margin, puncturations fine and close. Abdomen finely punctures.

Measurements of holotype : Total length 2.10 mm, width of head across the eyes 0.35 mm ; length of thorax 0.35 mm and width of thorax 0.45 mm ; length of elytra 0.50 mm and width of elytra 0.50 mm.

Holotype : 1 ex. India : Arunachal Pradesh, Namdapha Wild Life Sanctuary, Tirap dist., 21.iv.1981, S. Biswas coll.

Distribution : India (Arunachal Pradesh).

Remarks : The new species is closely related to *Holosus feveolatus* Motschulsky but can be easily separated from the latter species by its base of thorax devoid of four foveae and elytra near suture a 'u'-shaped sulcus with a vertical ridge on the middle of the sulcus, puncturations on thorax coarser. Regd. No. 10041/H4A.

4. *Lispinus quadrinotatus* Fauvel

1904. *Lispinus quadrinotatus* Fauvel, *Rev. d'Ent.*, 23, : 80.

1930. *Lispinus quadrinotatus* Cameron, *Fauna Brit. India*, Col. Staph. I : 54.

Material examined : 4 exs., Namdapha Wild Life Sanctuary, 21.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Perak, Java, Celebes and India. In India it is recorded from Arunachal Pradesh : Abor country, Namdapha.

Tribe : ELEUSIINI

5. *Eleusis humilis* Erichson

1840. *Eleusis humilis* Er., *Gen. Spcc. Staph.*, : 839

1930. *Eleusis humilis*, Cameron. *Fauna Brit. India*. Col. Staph. I : 83-84.

Material examined : 1 ex., Namdapha Wild Life Sanctuary, 5.iv.1981, S. Biswas coll.

Distribution : Generally distributed throughout the tropics. In India it is recorded from Andamans, Tamil Nadu, Uttar Pradesh and Arunachal Pradesh (Present record).

6. *Eleusis* sp. (nr. *Vermicular* Fauvel)

Material examined : 1 ex., Namdapha Wild Life Sanctuary, 21.iv.1981, S. Biswas coll.

Tribe : LEPTOCHIRINI

7. *Leptochirus (Strongylochirus) quadridens* Motschulsky

1857. *Leptochirus quadridens* Motschulsky, *Bull. Mosc.*, 30(4), p. 501.

1930. *Leptochirus (Strongylochirus) quadridens*, Cameron, *Fauna Brit. India* Col. Staph 1 : 91.

Material examined : 21 exs., 3 exs., Namdapha, Mina Reserve Forest, 5.iv.1981, S. Biswas coll. ; 2 exs., Chiria camp., 5.iv.1981, S. Biswas coll., 6 exs., Hornbill, 14.iv.1981, S. Biswas coll., 7 exs., Namdapha, 21.iv.1981, S. Biswas coll., 3 exs., Deban, 28.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Sumatra, Java, Borneo, Burma and India. In India it is recorded from Nagaland, Meghalaya and Arunachal Pradesh (Present record).

8. *Leptochirus (Strongylochirus) laevis* Cast.

1840. *Leptochirus laevis* Cast., *Hist. Nat.*, 1, p. 186.

1930. *Leptochirus (Strongylochirus) laevis*, Cameron, *Fauna Brit. India* Col. Staph. I : 91.

Material examined : 2 exs., 1 ex., Namdapha, Hornbill, 14.iv.1981, S. Biswas coll., 1 ex., Namdapha Wild Life Sanctuary, 21.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Singapore, Sumatra, Java, Lombok, Borneo, Thailand and India. In India it is recorded from Nagaland, Meghalaya and Arunachal Pradesh (present record).

9. *Leptochirus (Strongylochirus) atkinsoni* Fauvel

1895. *Leptochirus atkinsoni* Fauvel, *Rev. d'Eni.*, 14, : 182.

1930. *Leptochirus (Strongylochirus) atkinsoni*, Cameron, *Fauna Brit. India*. Col. Staph. I : 92.

Material examined : 3 exs., 2 exs., Namdapha, Hornbill, 14.iv.1981, S. Biswas coll., 1 ex., Deban, 23.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma, Thailand and India. In India it is recorded from Meghalaya and Arunachal Pradesh (present record).

10. *Borolinus sikkimensis* Bernhauer

1919. *Borolinus sikkimensis* Bernhauer, *Deut. ent. Zeit.* : 359.

1930. *Borolinus sikkimensis*, Cameron, *Fauna Brit. India*. Col. Staph. 1 : 94.

Material examined : 3 exs., 1 ex., Namdapha, 21.iv.1981, S. Biswas coll., 2 exs., Deban, 24.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma and India. In India it is recorded from Sikkim and Arunachal Pradesh (present record).

11. *Borolinus minutus* (Cast.)

1840. *Leptochirus minutus* Cast., *Hist., Nat.* 1, 186.

1930. *Borolinus, minutus*, Cameron, *Fauna Brit. India*. Col. Staph. I : 94-95.

Material examined : 1 ex., Namdapha, Deban, 28.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma, Thailand, Sumatra, Java, Lombok, Borneo and India. In India it is recorded from Nagaland, Sikkim and Arunachal Pradesh.

12. *Priochirus (Triacanthochirus) bipunctatus* (Fauvel)

1895. *Leptochirus bipunctatus* Fauvel, *Rev.d'Ent.*, 9, p. 180.

1930. *Priochirus (Triacanthochirus) bipunctatus*, Cameron, *Fauna Brit. India. Col. Staph. I* : 97-98.

Material examined : 4 exs., 1 ex., Namdapha, Hornbill, 14.iv.1981, S. Biswas coll., 2 exs., Deban, 21.iv.1981, S. Biswas coll., 1 ex., Giffonland, 30.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma and India. In India it is recorded from Sikkim and Arunachal Pradesh (present record).

13. *Priochirus (Triacanthochirus) tridens* (Motschulsky)

1857. *Leptochirus tridens* Motschulsky, *Bull. Mosc.*, 30(2), 502.

1930. *Priochirus (Triacanthochirus) tridens*, Cameron, *Fauna Brit. India. Col. Steph. I* : 99.

Material examined : 3 exs., Namdapha, 8.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma, Malay Peninsula, Java, Sumatra and India. In India the species is recorded from Nagaland and Arunachal Pradesh (Namdapha).

14. *Priochirus (Cephalomerus) rubiginosus* Cameron

1930. *Priochirus (Cephalomerus) rubiginosus* Cameron, *Fauna Brit. India. Col. Staph. I*, 105-106.

Material examined : 3 exs., 1 ex., Namdapha, Zero Camp, 9.iv.1981, S. Biswas coll., 2 exs., Hornbill, 13.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Sikkim, Nagaland. Now it is being recorded from Arunachal Pradesh (present record).

15. *Priochirus (Cephalomerus) sanguinosus* (Motschulsky)

1857. *Leptochirus sanguinosus* Motschulsky, *Bull. Mosc.*, 30(4) ; : 501.

1930. *Priochirus (Cephalomerus) sanguinosus*, Cameron, *Fauna Brit. India. Col. Staph. I* : 103.

Material examined : 1 ex., Namdapha Wild Life Sanctuary, 14.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma. Now it is being recorded from Arunachal Pradesh (Namdapha).

Tribe : OXYTELINI

16. *Oxytelus* (*Tanykraerus*) sp. (nr. *dohertyi* cam.)

Material examined : 1 ex., Namdapha Wild Life Sanctuary, 19.iv.1981, S. Biswas coll.

Distribution : India : Arunachal Pradesh, Namdapha.

17. *Platystethus crassicornis* Motschulsky

1857. *Platystethus crassicornis*, Motschulsky, *Bull. Mosc.*, 30(4), : 506.

1930. *Platystethus crassicornis*, Cameron, *Fauna Brit. India*. Col. Staph. I : 269.

Material examined : 1 ex., Namdapha Wild Life Sanctuary, Deban, 6.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Srilanka, Perak and India. In India it is recorded from Tamil Nadu, Uttar Pradesh and Arunachal Pradesh (present record).

Tribe : OSORIINI

18. *Osorius callifrons* Bernhauer

1926 *Osorius callifrons* Bernhauer, *Wien ent. Zt.*, 43 : 24.

1930. *Osorius callifrons*, Cameron, *Fauna Brit. India*. Col. Staph. 1 : 293.

Material examined : 1 ex., Namdapha, Gibbonland, 30.iv.1981, S. Biswas coll.

Distribution : The species recorded from Assam and Arunachal Pradesh (present record).

19. *Osorius peguanus* Bernhauer

1914. *Osorius peguanus* Bernhauer, *W. Z. B.*, 64, : 87.

1930. *Osorius peguanus*, Cameron, *Fauna Brit. India*. Col. Staph. I : 298.

Material examined : 3 exs., Namdapha, Hornbill, 14.iv.1981, S. Biswas coll.

Distribution : Earlier known from Pegu. Now it is being recorded from India in Arunachal Pradesh (Namdapha).

20. *Osorius kempi* Bernhauer

1926. *Osorius kempi* Bernhauer, *Wien. ent. Zt.*, 43 : 24.

1930. *Osorius kempi*, Cameron. *Fauna Brit. India*. Col. Staph. I : 299-300.

Material examined : 2 exs., Namdapha, Hornbill, 13.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Assam. Now it is recorded from Arunachal Pradesh.

21. **Osorius** sp. (nr. **kempi** Bernhauer)

Material examined : 1 ex., Namdapha, Hornbill, 13.iv.1981, S. Biswas coll.

22. **Osorius** sp. (nr. **calvus** Epp.)

Material examined : 1 ex., Namdapha, Firm Base, 14.iv.1981, S. Biswas coll.

23. **Osorius punctipennis** Fauvel

1895. *Osorius punctipennis* Fauvel, *Rev. d'Ent.*, 14 : 195.

1930. *Osorius punctipennis*, Cameron, *Fauna Brit. India*. Col. Staph., I : 300.

Material examined : 1 ex., Namdapha Wild Life Sanctuary, 24.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Burma. Now it is being recorded from Arunachal Pradesh (Namdapha).

Subfamily : STAPHYLININAE

Tribe : STAPHYLININI

24. **Philonthus poephagus** Cameron

1928. *Philonthus poephagus* Cameron, *Ann. Mag. Nat. Hist.*, 10(2) : 562.

1932. *Philonthus poephagus* Cameron, *Fauna Brit. India*. Col. Staph. 3 : 80.

Material examined : 1 ex., Namdapha Wild Life Sanctuary, 21.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Tibet. It is now being recorded from Arunachal Pradesh (Namdapha).

25. **Philonthus fimetarius** (Gr.)

1802. *Staphylinus fimetarius* Gr., *Col. Micr. Brunsv.* : 210.

1932. *Philonthus fimetarius*, Cameron. *Fauna Brit. India*. Col. Staph. 3 : 92-93.

Material examined : 2 exs., Namdapha, Miao, 5.v.1981, S. Biswas coll.

Distribution : Widely distributed in Europe. In India it was known from Uttar Pradesh and now it is being recorded from Arunachal Pradesh.

26. *Thoracostrongylus elegans* (Cameron)

1920. *Amichrotus elegans* Cameron, *Ent. Month. Mag.* 56 : 218.

1932. *Thoracostrongylus elegans* Cameron, *Fauna Brit, India Col. Staph.* 3 : 214-215.

Material examined : 1 ex, Namdapha, Miao, 5.iv.1981, S. Biswas coll.

Distribution : Earlier reported from Tamil Nadu. Now it is being recorded from Arunachal Pradesh.

SUMMARY

This paper records the systematic account of twenty six species of staphylinidae from Arunachal Pradesh. Among them *Holosus tirapensis* has been described as new and four species namely, *Priochirus* (*Cephalomerus*) *sanguinosus* (Motschulsky), *Osorius peguanus* Bernhauer, *O. punctipennis* Fauvel, *Philonthus poephagus* Cameron are recorded for the first time from India and fifteen species namely, *Eupiestus feae* Fauvel, *Lispinus quadrinotatus* Fauvel, *Eleusis humilis* Erichson, *Leptochirus* (*Strongylochirus*) *quadridens* Motschulsky, *L. (S.) laevis* Cast., *L. (S.) atkinsoni* Fauvel, *Borolinus sikkimensis* Bernhauer, *Priochirus* (*Triacanthochirus*) *bipunctatus* (Fauvel), *P. (T.) tridens* (Motschulsky), *P. (Cephalomerus)* *rubiginosus* Cameron, *Platystethus crassicornis* Motschulsky, *Osorius callifrons* Bernhauer, *O. kempi* Bernhauer, *Philonthus fimetarius* (Gr.) and *Thoracostrongylus elegans* (Cameron) are also recorded for the first time from Arunachal Pradesh.

ACKNOWLEDGEMENT

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- CAMERON, M. 1932. *The fauna of British India including Ceylon and Burma. Coleoptera : Staphylinidae*, Vol 3. Taylor and Francis, London.

INSECTA : COLEOPTERA : SCARABAEIDAE : COPRINAE

By

S. BISWAS AND S. K. CHATTERJEE

Zoological Survey of India, Calcutta

(With 7 Figures)

INTRODUCTION

The present paper deals with the material collected from Namdapha wild life sanctuary (at present Namdapha National Park and also a Tiger Reserve Forest), Tirap district, Arunachal Pradesh. The area includes varied ecological zones from the snow-capped nival areas in the top of the mountains, through alpine and subalpine area in the upper reaches of high lands down to thick-cover of tropical rain forest tract in the lower slopes and valleys extending into plains.

Species dealt with here are coprophagous in nature and have been collected from dung of various wild animals, such as elephant, gaur, different varieties of deer, tiger, leopard, bear, wild cats, domestic cattle and human faeces. A few specimens have been collected from decaying vegetable matters and moist fungusy dead tree trunk.

Altogether 55 species under 13 genera are included in this paper of which 7 species have been described as new to science and 48 species are recorded for the first time from Arunachal Pradesh, besides 3 species of *Onthophagus* which also probably belong to undescribed species but at present have not been named due to lack of more materials. Field observations on biological aspects of the individual species have been incorporated under relevant species wherever possible.

Illustrations and detail descriptions of the new species have been provided. Synonymies for the species have been cited wherever necessary. Types of the species described here have been deposited in the Zoological Survey of India, Calcutta.

SYSTEMATIC ACCOUNTS

Genus 1. *Gymnopleurus* Illiger 18031. *Gymnopleurus sinuatus* (Oliver)

1789. *Scarabaeus sinuatus* Oliver, *Entomologiae*, 1 : 3, pl. 10, fig. 93, pl. 21, fig. 189.
 1886. *Gymnopleurus morosus* Fairmaire, *Ann. Soc. ent. France*, (6)6 : 319.
 1890. *Gymnopleurus assamensis* Waterhouse, *Ann. Mag. nat. Hist.*, (6)5 : 411.
 1914. *Gymnopleurus* (*Paragymnopleurus*) *sinuatus*, Garreta, *Bull. Soc. ent. France.*, p. 52.
 1931. *Gymnopleurus sinuatus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 62-63.
 1963. *Gymnopleurus* (*Paragymnopleurus*) *sinuatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region* (Coleoptera : Lamellicornia) 1 : 218-220.

Material examined : 1 ex., Hornbill, 15.iv.1981, S. Biswas coll.

Distribution : Burma ; Nepal ; India : Tamil Nadu, Maharashtra (Kanara), United province, Sikkim, West Bengal (Darjeeling dist.), Nagaland, Arunachal (Pataki hills).

Genus 2. *Sisyphus* Latreille 18072. *Sisyphus indicus* Hope

1831. *Sisyphus indicus* Hope, Gray's zool. Misc., p. 22.
 1848. *Sisyphus Kaschmirensis* Redtenbacher, Hugel's *Kaschmir*, 4(2) : 516.
 1927. *Sisyphus indicus*, Arrow, *Ann. Mag. nat. Hist.*, (9)19 : 456-465.
 1931. *Sisyphus indicus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 75-76.

Material examined : 10 exs., (1 ex., Miao, 22.iv.1981 ; 4 exs., Deban, 7.iv.1981 ; 5 exs., Firmbase, 18.iv.1981), S. Biswas coll.

Distribution : Nepal, India : Orissa, Assam, Punjab, Kashmir and West Bengal, Arunachal Pradesh (Namdapha).

Genus 3. *Synapsis* Bates, 18683. *Synapsis birmanicus* Gillet

1907. *Synapsis birmanicus* Gillet, *Ann. Mus. Civ. Stor. Nat. Genova*, p. 600.
 1963. *Synapsis birmanicus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region* (Coleoptera : Lamellicornia) 1 : 293.

Material examined : 1 ex., Hornbill, 14.iv.1981, S. Biswas coll.

Distribution : Burma ; India : Arunachal (Namdapha).

Genus 4. **Catharsius** Hope 18374. **Catharsius molossus** (Linnaeus)

1758. *Scarabaeus molossus* Linnaeus, *Syst. Nat.*, edlo, p. : 347.
1801. *Copris ursus* Fabricius, *Syst. Eleuth.*, 1 : 43.
1931. *Catharsius molossus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 94-95.
1963. *Catharsius* (s. str.) *molossus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region* (Coleoptera : Lamellicornia), 1 : 307-309.

Material examined : 4 exs., Miao, 5.v.1981, S. Biswas, coll.

Distribution : Srilanka ; India : Assam, Bihar, Orissa, Uttar Pradesh, Maharastra, Himachal Pradesh, Karnataka, Kerala, West Bengal, Andaman Island & Arunachal Pradesh (Namdapha).

Remarks : It is a widely distributed species in India. Sexual dimorphism is very clear in both sexes.

Genus 5. **Copris** Geoffroy 17625. **Copris corpulentus** Gillet

1910. *Copris corpulentus* Gillet ; *Notes. Leyden Mus.*, 32 : 118.
1931. *Copris corpulentus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 118-119.
1963. *Copris* (S. Str.) *Corpulentus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia) 1 : 363-364.

Material examined : 3 exs., Hornbill, 15.iv.1981, S. Biswas coll.

Distribution : Burma ; Vietnam ; India : Assam, Arunachal Pradesh (Namdapha Wild Life Sanctuary).

6. **Copris siangensis** Biswas

1979. *Copris* (s. str.) *siangensis* Biswas, *J. Bombay nat. Hist. Soc. Bombay*, 76(1) : 339.

Material examined : 1., Firmbase, 19.iv.1981, S. Biswas coll.

Distribution : India : Arunachal Pradesh, Siang, Tirap (Namdapha Wild Life Sanctuary).

Remarks : The specimen under report is a male minor and except in the size of thoracic and cephalic horns agrees well with the original description of the species. The specimen was collected from elephant dung.

7. *Copris punctulatus* Wiedemann

1823. *Copris punctulatus* Wiedemann, *Zool. Mag.*, 2(1) : 11.
 1931. *Copris punctulatus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 126-127.
 1963. *Copris* (*Paracopris*) *punctulatus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 370.

Material examined : 1 ex., Namdapha, 21.iv.1981, S. Biswas coll.

Distribution : Burma ; Indochina ; Malay Peninsula ; Indonesia, Sulawesi (Celebes), India : Assam, Arunachal Pradesh (Namdapha).

8. *Copris furciceps* Felsche

1910. *Copris furciceps* Felsche, *Dt. ent. Z.*, p. 348.
 1931. *Copris furciceps*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 130-131.
 1963. *Copris* (*Paracopris*) *furciceps*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 372.

Material examined : 4 exs, (1 ex, Deban, 21.iv.1981, 3 exs., Hornbill, 16.iv.1981) S. Biswas coll.

Distribution : Burma ; India : Meghalaya, Arunachal Pradesh (Namdapha).

Genus 6. *Phacosoma* Boucomont 19149. *Phacosoma obscurum* Boucomont

1920. *Phacosoma obscurum* Boucomont, *Ann. Soc. ent. France*, 88 : 307.
 1931. *Phacosoma obscurum*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 354-355.
 1963. *Phacosoma obscurum*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 272-273.

Material examined : 1 ex., Hornbill, 16.4.1981, S. Biswas coll.

Distribution : Burma ; India : Arunachal Pradesh (Namdapha).

Remarks : The single specimen was collected from human faeces near a hill stream. The species was known from Burma. This is the first time the species is being recorded from India proper.

Genus 7. *Drepanocerus* Kirby 182810. *Drepanocerus striatulus* Paulian

1945. *Drepanocerus striatulus*, Paulian, *Col. Scarab. de l' indochine*, p. 140.
 1963. *Drepanocerus striatulus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 69.

Material examined : 1 ex., North bank of Deban river, Deban, 7.iv.1981, S. Biswas coll.

Distribution : The species was described from N. Vietnam. Biswas (1978) recorded the species from Meghalaya, Manipur and Assam. This is the first time the species is being recorded from Arunachal Pradesh (Namdapha)

11. *Drepanocerus falsus* (Sharp)

1875. *Oniticellus falsus* Sharp, *Col. Hefte.*, 13 : 52.

1875. *Oniticellus exul* Sharp, *Col. Hefte.*, 13 : 53.

1931. *Drepanocerus exul*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 385-386.

1963. *Drepanocerus falsus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 66.

Material examined : 3 exs ; Hornbill, 15.iv.1981, S. Biswas coll.

Distribution : Thailand ; Laos ; India : Assam, Arunachal Pradesh (Namdapha).

Remarks : The species is considered to be very rare. Specimens under report have been collected from human faeces at the base of a hill near a stream.

Genus 8. *Liatongus* Reitter 1893

12. *Liatongus phanaeoides* (Westwood)

1840. *Onthophagus phanaeoides* Westwood, *Royle's Himalaya, Entomology*, 55, pl. 9, fig. 3.

1848. *Onthophagus excavatus* Redtenbacher, *Hiigel's Kaschmir*, 4(2) : 523.

1860. *Phanaeus mlnutus* Motschulsky, *Etudes Entom.*, 9 : 13.

1931. *Liatongus phanaeoides*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 364-465.

1963. *Liatongus* (s. str.) *phanaeoides*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 92-93, fig. 45.

Material examined : 4 exs., (1 ex, Zero camp, 11.iv.1981, 3 ex, Hornbill, 14.iv.1981), S. Biswas coll.

Distribution : Pakistan ; Burma ; Indochina ; S. China ; Japan and India : In India the species was known from United province and West Bengal. This is the first time the species is recorded from Arunachal Pradesh (Namdapha Wild Life Sanctuary).

13. *Liatongus gagatinus* (Hope)

1831. *Liatongus gagatinus* Hope, Gray's Zool. Misc., 122.
 1848. *Onthophagus brama* Redtenbacher, Hiigel's Kashmir, 4(2) : 521.
 1931. *Liatongus gagatinus*, Arrow, Fauna Brit. India (Coleoptera : Lamellicornia), 3 : 365-366.
 1963. *Liatongus* (s. str.) *gagatinus*, Balthasar, Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia), 2 : 104.

Material examined : 2 exs, Deban, 7.iv.1981, S. Biswas coll.

Distribution : Burma ; Nepal India ; In India, the species is known from United Province, Sikkim, West Bengal, Assam, Meghalaya, Nagaland and Arunachal Pradesh (Namdapha).

Remarks : The species is a restricted to the hilly regions and found mainly in cattle dung. This is the first time the species is being recorded from Arunachal Pradesh.

14. *Liatongus mergacerus* (Hope)

1831. *Onthophagus mergacerus* Hope, Cray's Zool. Misc., 22.
 1874. *Oniticellus mergacerus* Harold, Col. Hefte, 12 : 94.
 1931. *Liatongus mergacerus*, Arrow, Fauna Brit. India (Coleoptera : Lamellicornia), 3 : 369-370.
 1963. *Liatongus* (s. str.) *mergacerus*, Balthasar, Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia), 2 : 96-97.

Material examined : 21 exs ; (11 exs, Deban, 7.iv.1981, 8 exs, Zerocamp, 13.iv.1981, 2 exs, Hornbill, 16.iv.1981), S. Biswas coll.

Distribution : Nepal ; Bhutan ; India : In India the species is recorded from Sikkim ; West Bengal, United Province and Arunachal Pradesh (Namdapha).

Genus 9. *Oniticellus* Serville 182515. *Oniticellus namdaphaensis* sp. nov.

(Fig. 1)

Female—length 14 mm ; breadth 5.5 mm ; Elongate oval, covered with uniformly minute pale setae above (except head) and irregularly below. Pale brown with head, a spear shaped marking on the antero-median region of pronotum and four spots near apex of elytra and two patches on posterior end of metasternum dark.

Head : Clypeal margin almost straight in front, a little hollowed behind front margin, clypeal disc thickened and convex, front depressed

and flat, vertex with two strong triangular projections, clypeo-ocular meeting point marked with a short carina. Eyes narrow with a ridge on upper surface.

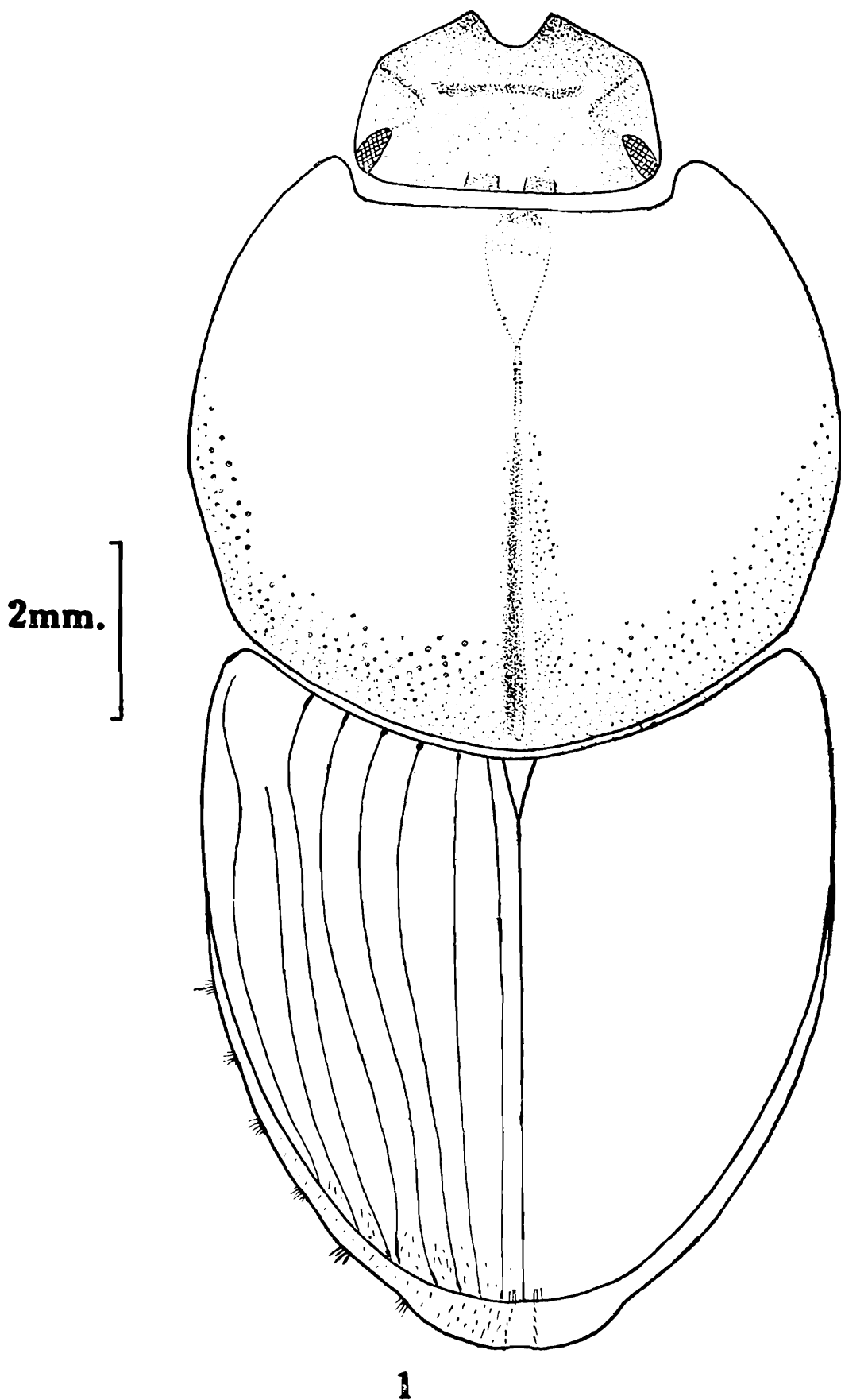


Fig. 1. *Oniticellus namdaphaensis* sp. nov., female.

Pronotum longer than broad, broadest beyond middle, margined

in front and at sides, a deep longitudinal groove in the middle, running beyond middle, covered with setigerous asperale punctures.

Elytral striae shallow, elytral intervals very convex behind, striae interval microscopically sculptured.

Pygidium covered with pale setigerous punctures, flat near apical margin, with two prominences in the middle separated by a broad shallow groove.

Front tibiae with four external teeth, middle and hind tibial spin long. Metasternum large with a fine groove in the middle, metasternal shield finely punctured in the middle, a little strongly at the sides. Abdominal sternite separated with fine suture, covered with microscopical sculpture.

Holotype : ♀ Namdapha, 21.iv.1981, *S. Biswas* collected from an elephant dung near a flat land near of Noadihing river.

Type deposited in Zoological Survey of India.

The present species resembles to *O. pallipes* and *O. pallens* by the presence of cephalic armature but can be separated by its large size and colouration.

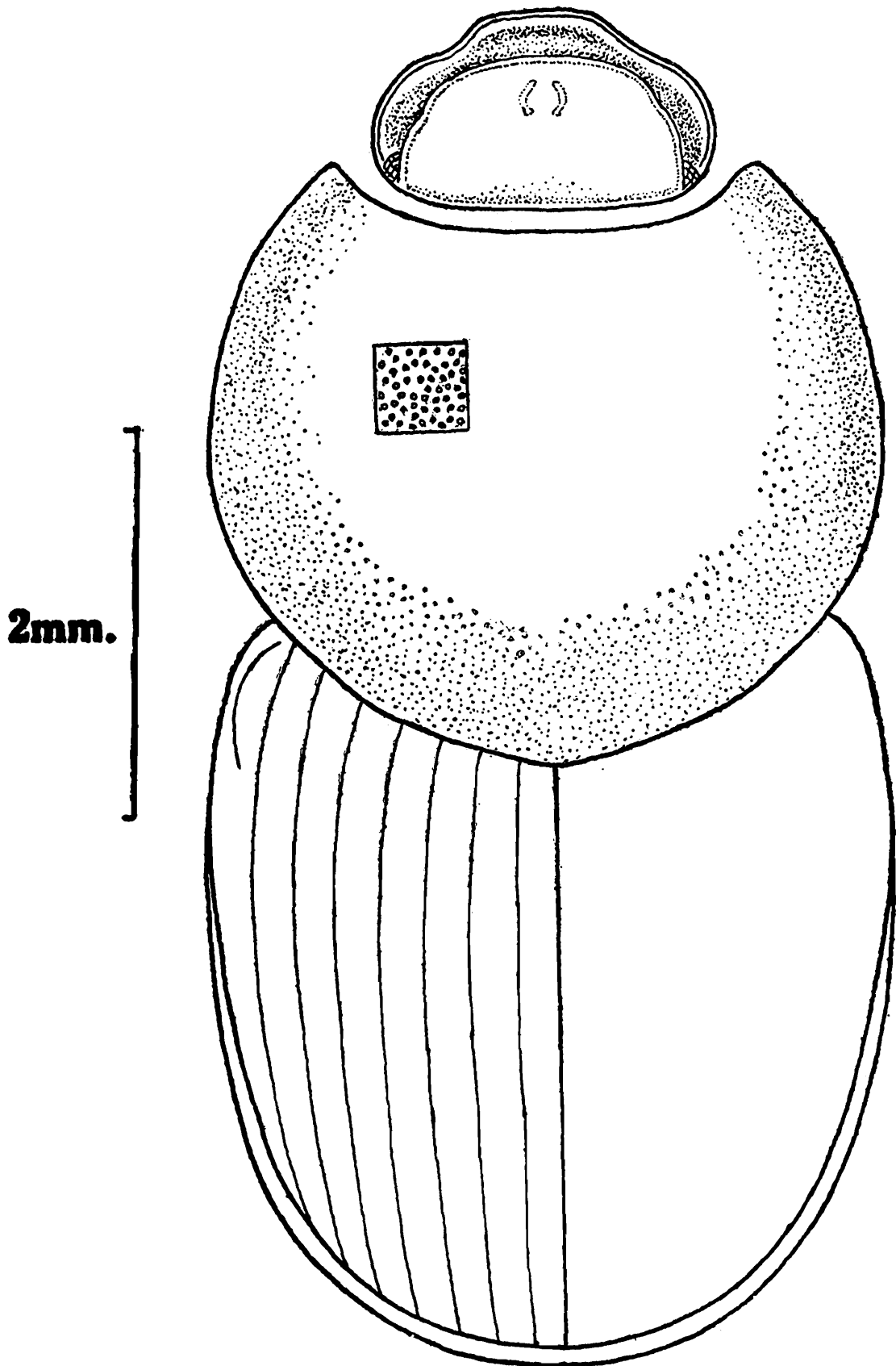
16. *Oniticellus subhendui* sp. nov.

(Fig. 2)

Male : Length 7 mm ; breadth 3 mm. Brown with anterior part and vertex of head, pro and mesosternum and a patch in the middle of pygidium black. Elongated oval shape.

Head narrowed in front, moderately strongly and uniformly clypeus margined in front and at sides, separated from frons by a strong curved carina, clypeal disc convex and flat and less strong punctured, frons depressed in the middle two small pea shaped prominences at the anterior end of depression. Vertex strongly raised. Pronotum with a groove in the middle near base, uniformly and moderately strongly punctured, margined laterally, front angle blunt, hind angle obtuse, lateral margin rounded in front, sinuate behind. Elytra very lightly striate, striae interval covered with minute setigerous punctures. Pygidium without margin at base, opaque, covered with fine setigerous punctures, punctures a little stronger near base. Metasternal shield smooth in the middle, finely and rugosely punctured at sides. Last ventral segment immarginate in the middle. Front tibia with four external teeth, basal one smallest.

Female without clypeo frontal carina and there is no pea shaped frontal prominence, last ventral segment uniformly broad.



2

Fig. 2. *Oniticellus subhendui* sp. nov., male.

Holotype : ♂, collected elephant dung, Namdapha, 20.iv.1981, S. Biswas coll.

Paratypes : 9 exs., (4 ♂ ♂, 5 ♀ ♀, collection data and collector as holotype).

The species comes near to *Oniticellus pallens* but differ in colouration same and cephalic armatures in male.

17. **Oniticellus gayeni** sp. nov.

(Fig. 3)

Male : Length 7.5 mm ; breadth 3.5 mm. Uniformly black with a slight greenish tinge on head ; lateral margins of pronotum, apical margins of elytra, pygidium except basal part, major part of femur, metasternum and abdominal sternites pale. Antennal and mouth parts brownish. Elongate oval in shape.

Head without any armature, clypeus almost uniform rounded, depressed in the middle near front margin and covered with a row of moderately strong punctures. Clypeal disc and frons very finely and almost imperceptibly and vertex sparsely punctured ocular lobe with few strong punctures. Pronotum moderately strongly punctured at the sides almost imperceptibly in the middle, with a longitudinal impressed line in the middle. Front angles rounded, hind angles obsolete, lateral margin feebly rounded. Elytra deeply striate, striae strongly punctured, intervals feebly convex and minutely punctured and tuberculate near lateral margins. Pygidium with a broad transverse prominence in the middle, covered with pale short setae and rugosely punctured except near base which is smooth. Metasternal shield with a median impressed line in the middle very minutely punctured. Sides of metasternum strongly rugosely punctured. Front tibia with four external teeth.

Female : Last abdominal sternite not emarginate in the middle.

Holotype : ♂, collected from elephant dung near bank of Nodihing river at Namdapha, 28.iv.1981, S. Biswas coll.

Paratypes : 9 exs., (5 ♂ ♂, 4 ♀ ♀, data same as holotype).

The species comes to *O. cinctus* (F.) but can be easily identified by the pronotal puncturation, lateral margins of elytra being tuberculate and the presence of prominence in the middle of pygidium.

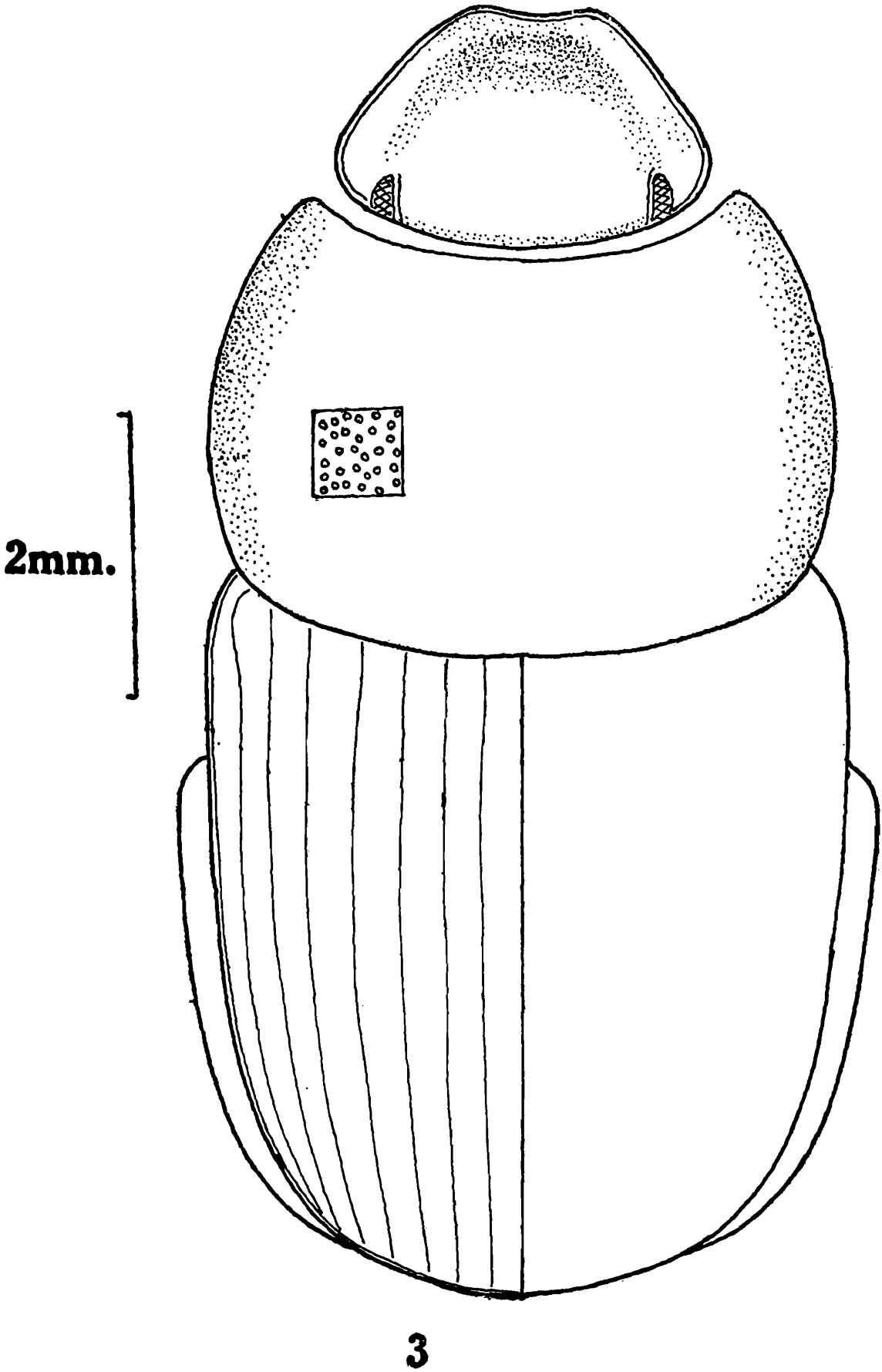


Fig. 3. *Oniticellus gayeni* sp. nov., male.

18. *Oniticellus cinetus* (Fabricius)

1775. *Scarabaeus cinetus* Fabricius, *Syst. Ent.*, 30.
 1931. *Oniticellus cinetus*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 379-380.
 1963. *Oniticellus* (s. str.) *cinetus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 77.

Material examined : 3 exs., (1 ex., Deban, 7.iv.1981, 2 exs., Namdapha, 19.iv.1981), S. Biswas coll.

Distribution : Burma ; Malay Peninsula ; Siam ; Annam ; S. China ; Bangladesh and India : In India the species is known from Uttar Pradesh, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, West Bengal, Assam and Arunachal Pradesh (Namdapha). The species is being recorded for the first time from Arunachal Pradesh.

Genus 10. *Onitis* Fabricius 179819. *Onitis excavatus* Arrow

1931. *Onitis excavatus* Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 391, Pt. xii, fig. 19.
 1963. *Onitis excavatus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 37-38.

Material examined : 3 exs., (1 ex., Gibbonland, 3.v.1981, 2 exs., Miao, 5.v.1981), S. Biswas coll.

Distribution : Burma ; S. China and India : In India the species is known from Assam and Arunachal Pradesh (Namdapha). The species is recorded for the first time Arunachal Pradesh.

20. *Onitis falcatus* (Wulfen)

1786. *Scarabaeus falcatus* Wulfen, *Descr. cap. Ins.*, 14. pl. 2, fig. 17.
 1875. *Onitis falcatus* Lansberge, *Ann. Soc. ent. Belg.*, 18 : 126.
 1848. *Onitis himaleyicus* Redtenbacher, *Hiigel's Kaschmir*, 4(2) : 518.
 1913. *Onitis falcatus*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 392-393.
 1963. *Onitis falcatus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 33-34.

Material examined : 5 exs., Miao, 5.v. 1981, S. Biswas coll.

Distribution : The species is known from Philippine Island ; Malay Peninsula ; S. China ; Burma ; Bangladesh and India. In India, the species is known from Uttar Pradesh, Maharashtra, Tamil Nadu, Kerala, Bihar, West Bengal and Arunachal Pradesh (Namdapha).

Genus 11. **Paraphytus** Harold 187721. **Paraphytus hindu** Arrow

1913. *Paraphytus hindu* Arrow, *Rec. Indian Mus.*, 8 : 193.
1931. *Paraphytus hindu* Arrow, *Fauna Brit. India*, (Coleoptera : Lamellicornia), 3 : 418-419.
1963. *Paraphytus hindu*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 283-284, fig. 115.

Material examined : 3 exs., 12.iv.1981, S. Biswas coll.

Distribution : The species is known from Meghalaya and Arunachal Pradesh in India.

Remarks : The specimens under report were collected under bark from decaying tree trunk, fallen near a hill stream.

Genus 12. **Caccobius** Thomson 186322. **Caccobius inermis** Arrow

1931. *Caccobius inermis* Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 147.

Material examined : 1 ex., Hornbill, 14.iv.1981, S. Biswas coll.

Distribution : The species is known from Ceylon and India. In India the species is recorded from Uttar Pradesh, Maharashtra, Sikkim, West Bengal and Arunachal Pradesh (Namdapha).

Genus 13. **Onthophagus** Latreille 180223. **Onthophagus crassicollis** Boucomont

1883. *Onthophagus nanus* Lansberge, (nac. Waterhouse), *Notes. Leyd Mus.*, 5 : 67.
1914. *Onthophagus crassicollis* Boucomont, *Ann. Soc. ent. France*, 83 : 280.
1931. *Onthophagus crassicollis*, Arrow, *Fauna Brit. India*, (Coleoptera : Lamellicornia), 3 : 170-171, fig. 15.
1963. *Onthophagus* (*Onthophagiellus*) *crassicollis*, Balthasar, *Monographic der Scarabaeidae und Aphidiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 320-321.

Material examined : 6 exs., (1 ex., Zerocamp, 9.iv.1981 ; 1 ex., Miao, 22.iv.1981 ; 1 ex., Hornbill, 16.iv.1981 ; 2 exs., Firmbase 19.iv.1981 ; 1 ex., Chiricamp, 29.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma ; Malay Peninsula ; Indonesia and India. In India the species is recorded from Arunachal Pradesh (Namdapha).

Distribution : Specimens under report were collected from human faeces and faecal matter of Carnivora animals. This is the first time the species is being recorded from India.

24. *Onthophagus laevis* Harold

1880. *Onthophagus laevis* Harold, *Notes Leyden Mus.*, P. 194.
 1931. *Onthophagus laevis*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 171-172.
 1963. *Onthophagus* (s. str.) *laevis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)* 2 : 412-413.

Material examined : 2 exs., (1 ex., Namdapha, 28.iv.1981 ; 1 ex., Miao, 22.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma ; Indonesia ; W. China and India : In India the species is known from Uttar Pradesh, West Bengal, Sikkim and Arunachal Pradesh (Namdapha).

Remarks : Specimens under report agrees with the variety *O. laevis* var. *asiaticus*. Specimens were collected from human faeces.

25. *Onthophagus pacificus* Lansberge

1885. *Onthophagus pacificus* Lansberge, *Notes Leyden Mus.*, 7 : 17.
 1914. *Onthophagus pacificus* var. *peguanus* Boucomont, *Ann. Mus. Civ. Stor. Nat. Genova*, 46 : 215.
 1931. *Onthophagus pacificus*, Arrow, *Fauna Brit. India, (Coleoptera : Lamellicornia)*, 3 : 172-173.
 1963. *Onthophagus* (s. str.) *pacificus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 465.

Material examined : 7 exs., (2 exs, Deban, 7.iv.1981 ; 1 ex, Zerocamp, 9.iv.1981 ; 2 exs, Firmbase, 17.iv.1981 ; 1 ex, Namdapha camp, 21.iv.1981, 1 ex, Chiria camp, 28.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma ; Bangladesh ; Indochina ; Thailand ; Malay Peninsula ; Indonesia and India : In India the species is known from Kanara, Nilgiri hills, Uttar Pradesh, Meghalaya and Namdapha.

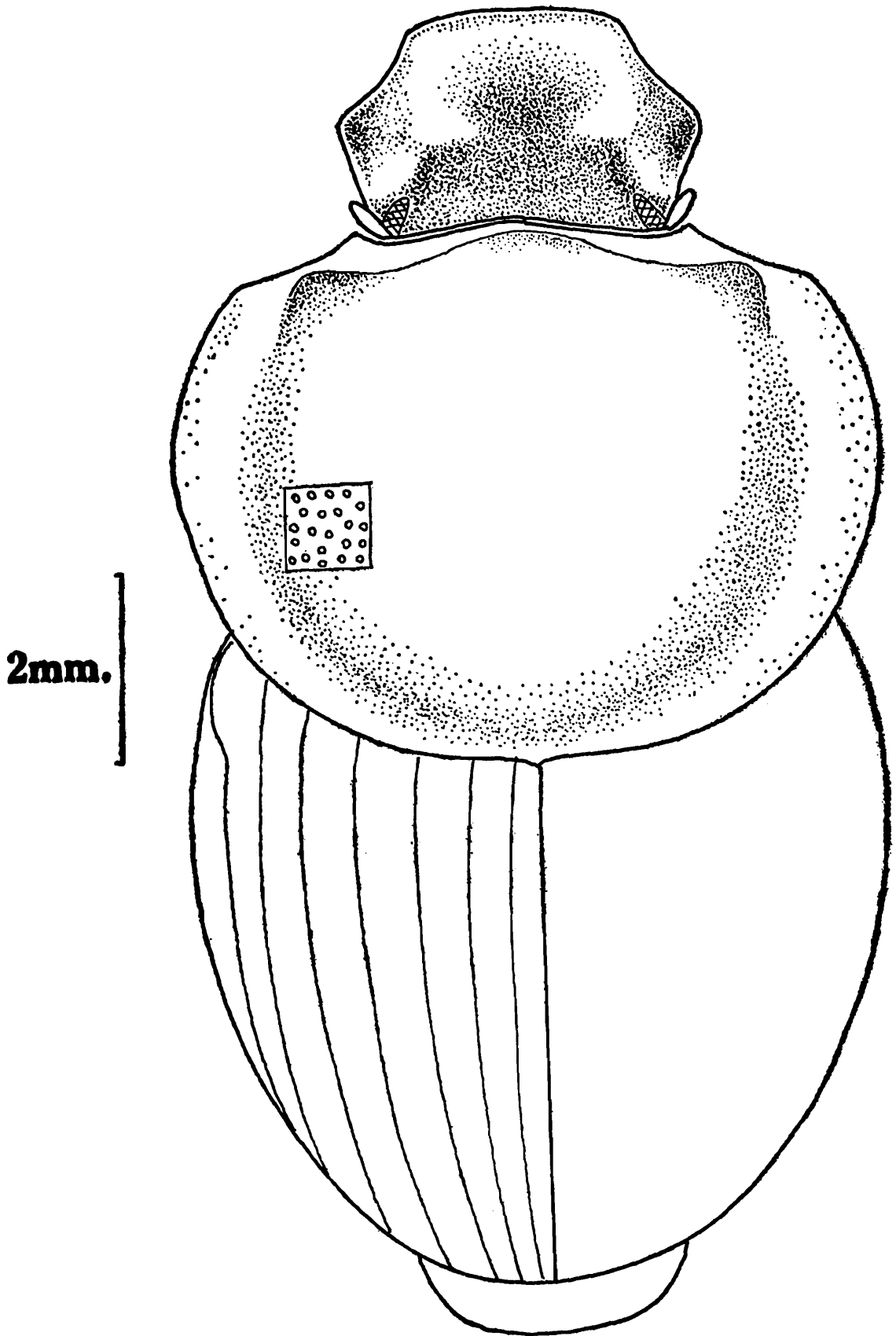
26. *Onthophagus tirapensis* sp. nov.

(Fig. 4)

Male major—Length 13 mm ; braedth 7 mm. Black above and beneath ; antennae, mouthorgans, tarsi deep brown, legs and lower surface covered with pale hairs, a luft of golden hairs above the apical tibial spur.

Elongated oval, highly convex ; Head broadly rounded infront, gently sinuate at sides giving rise to prominent process infront

of ocular lobe, which almost straight behind. Clypeus feebly rounded in front with a rounded obsolete ridge just behind the front margin ;



4

Fig. 4. *Onthophagus tirapensis* sp. nov., male.

very closely and rugosely punctured, clypeo-frontal carina absent.

Frontal region closely but less rugosely punctured, convex, risen gradually from clypeal and ocular surface. Vertex with a strong and broad lamina, directed, upward and backwardly and split in the middle, two finger like process behind the eyes. Pronotum highly convex, anterior declivity prominent, upper edge of declivity with a bisinuate carina, angulate in the middle and at sides ; minutely but almost uniformly punctured, middle of basal region more minutely and sparsely punctured ; front angle bluntly produced, sides almost straight but gradually sloping upwards anteriorly and sinuate behind ; hind angles obsolete, base a little produced in the middle. Elytra not strongly striate, striae minutely and sparsely punctured, elytral interval microscopically sculptured and minutely punctured. Pygidium sparsely punctured. Metasternal shield with a longitudinal groove in the middle and minutely punctures, sides of metasternum more strongly punctured and covered with hairs. Anterior tibiae with four external teeth and a prominent tuft of hairs, hind margin of hind tibiae with three distinct lobe.

Male minor—Ridge just behind the front margin of clypeus more strongly developed, vertex without lamina and process, only with a strong straight carina. Anterior declivity on pronotum reduced.

Female—Similar to male minor.

Holotype : ♂ major, Deban, Arunachal Pradesh, 7.iv.1981, *S. Biswas* coll.

Paratypes : 4 exs., (1 ♀, Hornbill, 9.iv.1981. 2 ♂♂, Chiria camp. 29.iv.1981, 1 ♂, Firmbase, 17.iv.1981), *S. Biswas* coll.

The species is unlike any other described species of the imperator group of species and can be separated by the presence of paired horns in the male and absence of horns in the female.

27. *Onthophagus arunachalensis* sp. nov.

(Fig. 5)

Male—Length 7 mm ; breadth 3.5 mm.

Black and shining above ; antennae, mouthorgans, femora, tibiae, tarsi and metasternum pitchy ; Legs, upper and lower surface covered with pale setae. Setae shorter on upper surface.

Head narrow in front ; clypeus produced and strongly reflexed anteriorly. Uniformly punctured ; clypeo frontal carina absent, ocular lobe rounded, uniformly punctured and devoid of any suture

or carina in between eyes two prominent tubercles present, behind these tubercles a depressed smooth area. Pronotum with a large

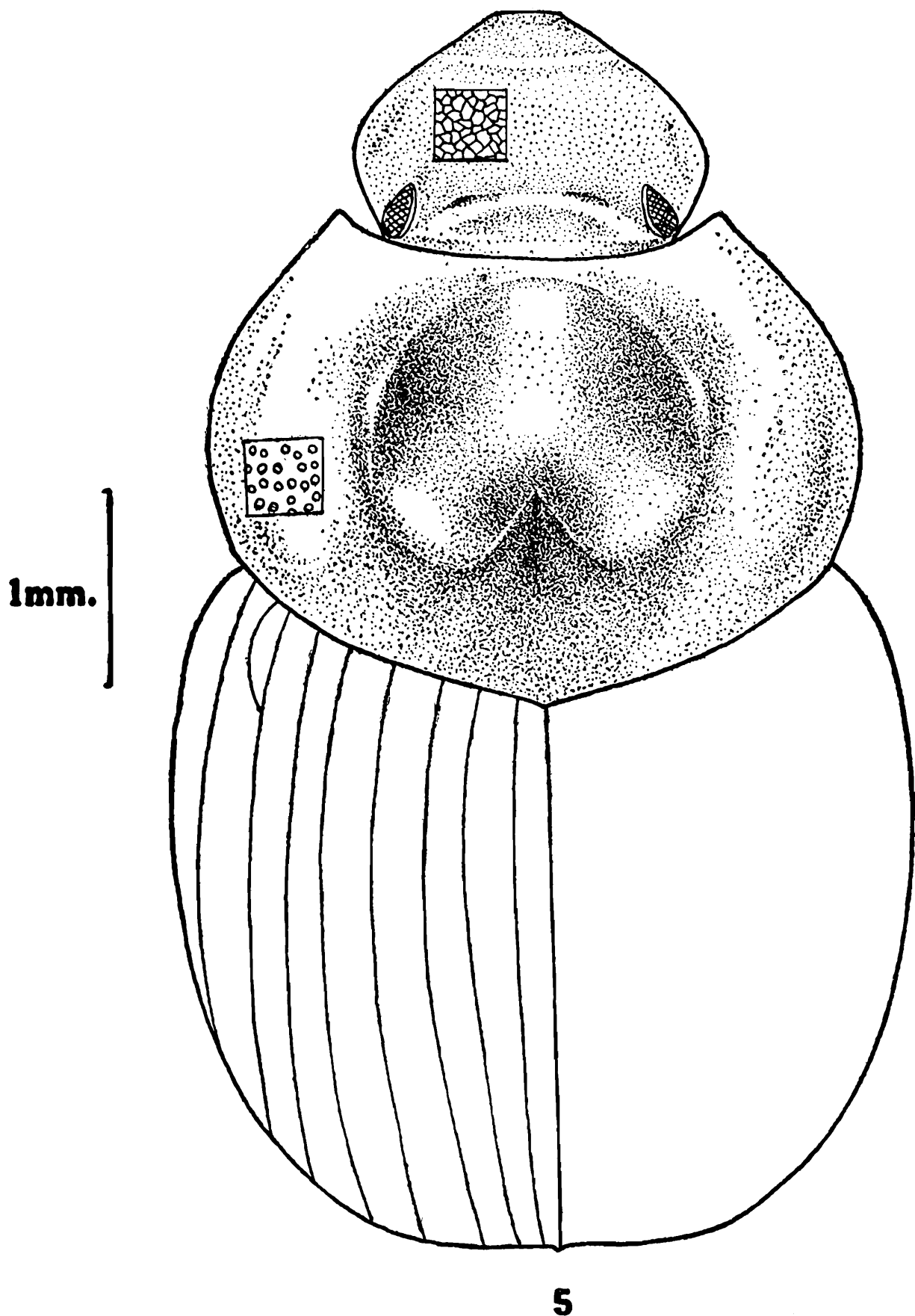


Fig. 5. *Onthophagus arunachalensis* sp. nov., male.

central depression and extending a little behind there is one on each

side of this central depression. Upper margin of central depression with a strong conical process. Front angles produced, lateral margin almost straight in front, rounded in the middle and feebly sinuate behind, base almost rounded on the middle. Pronotum moderately strong punctured, punctures fewer more minute in the depression. Elytra shallowly striate, striae sparsely and minutely punctured. Elytral intervals uniformly and minutely punctured. Metasternal shield minutely punctured in the middle; more strongly punctured and covered with setae in front and at sides. Pygidium uniformly punctured. Front tibiae with four external teeth and extremity of hind tibiae produced into three lobes externally.

Female—Clypeal margin straight in middle anteriorly; a strong straight clypeo frontal carina running across, another shorter transverse carina behind pronotum without and depression and process.

Holotype : ♂ major, Hornbill, Arunachal Pradesh, 14.iv.1981, S. Biswas coll.

Paratype : 11 exs., (1 ♂, 1 ♀, Miao, 4.v.1981; 1 ♀, Deban, 7.iv.1981; 1 ♂, 1 ♀, Zero camp, 8.iv.1981; 1 ♂, 1 ♀, Hornbill, 14.iv.1981; 1 ♂, 1 ♀, Firmbase, 19.iv.1981; 1 ♀, Namdapha, 21.iv.1981; 1 ♀, Chiria camp, 28.iv.1981) S. Biswas coll.

The species resembles *O. badeni* Harold in the nature of pronotal armature but can be easily separated by its much smaller size and nature of cephalic armature.

28. *Onthophagus rudis* Sharp

1875. *Onthophagus rudis* Sharp, Col. Hefte, 14 : 58.

1877. *Onthophagus foveolatus* Harold, Ann. Mus. Civ. Stor. Nat. Genova, 10 : 68.

1931. *Onthophagus rudis*, Arrow, Fauna Brit. India (Coleoptera : Lamellicornia), 3 : 185.

1963. *Onthophagus* (s. str.) *rudis*, Balthasar, Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia), 2 : 505.

Material examined : 10 exs., (1 ex., Zero camp, 9.iv.1981; 1 ex., Namdapha, 21.iv.1981; 2 exs., Miao, 4.v.1981; 1 ex., Hornbill, 14.iv.1981; 1 ex., Firmbase, 19.iv.1981; 1 ex., Chiria camp, 29.iv.1981; 3 exs., Deban 7.iv.1981), S. Biswas coll.

Distribution : The species is known from Indonesia; Burma and India. In India the species is recorded from Assam (Patkai hills) and Arunachal Pradesh (Namdapha).

Remarks : Earlier distributional record from Assam seems to be a place not in the Assam state as stands now. As Patkai hills area may be either in Manipur or Nagaland, both of which once were within Assam.

29. *Onthophagus jucundus* Arrow

1931. *Onthophagus jucundus* Arrow, *Fauna Brit. India*, (Coleoptera : Lamellicornia), 3 : 188.
1963. *Onthophagus* (s. str.) *jucundus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 398-399.

Material examined : 4 exs., Deban, 7.iv.1981, S. Biswas coll.

Distribution : The species is known from Burma and India. In India the species is recorded from Manipur and Arunachal Pradesh (Namdapha).

Remarks : The species agrees well with the description of *O. jucundus* Arrow in general but specimens under report differs in clypeal margin almost rounded, truncate in *jucundus* Arrow and clypeal disc region of head, rugosely punctured instead of grannuler. Pronotum is little hollowed in front and upper margin with two not very distantly placed tubercles.

30. *Onthophagus orientalis* Harold

1868. *Onthophagus orientalis* Harold, *Col. Hefte*, 4 : 83.
1931. *Onthophagus orientalis*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 213-214.
1963. *Onthophagus* (s. str.) *orientalis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Oriental ischen Region* (Coleoptera : Lamellicornia), 2 : 463-464.

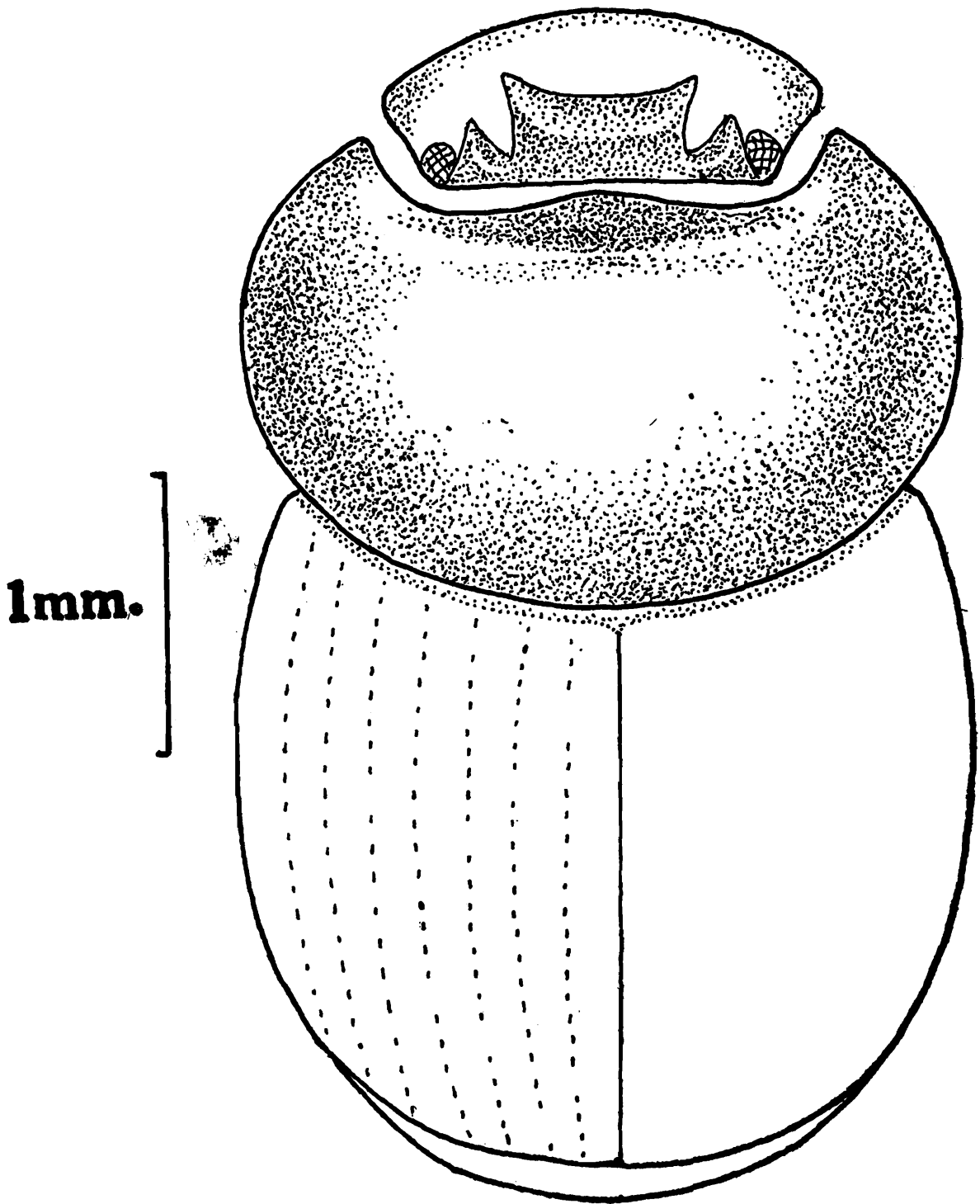
Material examined : 7 exs., Deban, 7.iv.1981, 3 exs., Firmbase, 18.iv.1981, S. Biswas coll.

Distribution : The species is known from Burma ; Bangladesh ; Malay-Peninsula ; S. China and India. In India the species is recorded from Uttar Pradesh, Bihar, Sikkim, Manipur, Meghalaya, Assam and Arunachal Pradesh (Namdapha).

Remarks : The species shows considerable variations in size and sexual characters. Tubercles of asperites elytral intervals are indistinct in some specimens.

31. *Onthophagus songsokensis* sp. nov.

(Fig. 6)

**6**Fig. 6. *Onthophagus songsokensis* sp. nov., male.

Male : Length 4 mm ; breadth 3 mm. Black, not very shining, elytra at shoulder prominence and at apex, tarsi and mouthorgans reddish ; antennae black. Body short and compact, convex.

Head rounded, clypeus very feebly emarginate in the middle, clypeal disc strongly punctured anteriorly forms strongly but sparsely

punctured ; clypeofrontal carina absent. Vertex with a strong transverse carina, abruptly narrowed and leaving one strong angular process on each side near base and bifurcate at apex, forming horn like projections.

Pronotum strongly punctured, punctures appearing umblicate but incomplete in front or in the sides, front angle blunt, hind angle obsolete, base feebly margined and a little angular in the middle, lateral margin straight in front, rounded behind. Elytra fairly strongly striate, striae closely punctured, striae intervals convex, shining and asperately punctured. Front tibiae short, with 4 external teeth. Metasternum feeble punctured in the middle, strongly in front and at sides and a small compressed prominence in the middle towards apex. Pygidium fairly strongly punctured with umblicate punctures.

Female : Similar to male but (i) lamina on vertex replaced by a transverse carina, (ii) presence of a rounded clypeofrontal carina (iii) clypeal disc more strongly punctured and (iv) last abdominal sternite emerginate in the middle.

Holotype : ♂ Miao, 6.iv.1981, *S. Biswas* coll.

Paratypes : 15 exs., (3 ♂ ♂, 2 ♀ ♀, Zero camp, 8.iv.1981 ; 6 ♀ ♀, Miao, 2.iv.1981 ; 1 ♂, Namdapha, 21.iv.1981 ; 3 ♂ ♂, Hornbill, 14.iv.1981) *S. Biswas* coll.

The species comes near to *O. troglodyta* (F.) but may be separated from the former by black colour being more predominant and punctures of pronotum being almost umblicate.

32. *Onthophagus rugulosus* Harold

1886. *Onthophagus rugulosus* Harold, *Dt. ent. Z.* 30 : 289.

1891. *Onthophagus expansicollis* Fairmaire, *C. R. Soc. ent. Belg.* 35 : 193.

1931. *Onthophagus rugulosus*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 227-228.

1963. *Onthophagus* (s. str.) *rugulosus*, Belthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 507.

Material examined : 3 exs, Zero camp, 9.iv.1981 ; *S. Biswas* coll.

Distribution : The species is known from South China ; and India. In India the species is recorded from Meghalaya and Arunachal Pradesh (Namdapha).

Remarks : This is the first time the species is being recorded from Namdapha Will Life Sanctuary, Tirap district, Arunachal Pradesh.

33. *Onthophagus ramosellus* Bates

1891. *Onthophagus ramosellus* Bates, *Entom.*, 24 : 11.
 1831. *O. capella* Hope, Gray's *Zool. Misc.*, P. 22.
 1931. *O. ramosellus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 217-218.
 1963. *O. (s, str.) ramosellus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 277-278.

Material examined : 7 exs., (5 exs, Zero camp, 9.iv.1981 ; 2 exs., Chiria camp, 27.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma ; Vietnam ; Philippine Island ; Indonesia and India. In India the species is recorded from Assam and Arunachal Pradesh (Namdapha).

34. *Onthophagus rectecornutus* Lansberge

1883. *Onthophagus rectecornutus* Lansberge, *Notes Leyd. Mus.*, 5 : 49.
 1931. *Onthophagus rectecornutus*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 233-234.
 1963. *Onthophagus (Serrophorus) rectecornutus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 498-499.

Material examined : 2 exs., Zero camp, 9.iv.1981, S. Biswas coll.

Distribution : The species is known from Vietnam ; Bangladesh ; Burma ; Sri Lanka ; Bhutan and India. In India the species is recorded from Nagaland, Bihar, Nilgiri hills, Malabar, Bangalore and Arunachal Pradesh (Namdapha).

Remarks : Specimens under report were collected from elephant dung.

35. *Onthophagus manipurensis* Arrow

1907. *Onthophagus manipurensis* Arrow, *Ann. Mag. nat. Hist.*, (7) 19 : 426.
 1931. *Onthophagus manipurensis*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 242-243, Pl. xiii, fig. 7, 8.
 1963. *Onthophagus (Digitonthophagus) manipurensis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 431, Pl. xiii, fig. 6.

Material examined : 1 ex, Miao, 3.iv.1981, ; S. Biswas coll.

Distribution : The species is known from Burma and India. In India the species is recorded from Manipur, Meghalaya and Arunachal Pradesh.

Remark : This is the first time the species is being recorded from Arunachal Pradesh (Tirap dist. Miao).

36. *Onthophagus rubricollis* Hope

1831. *Onthophagus rubricollis* Hope, Gray's Zool. Misc., P. 22.
1931. *Onthophagus rubricollis*, Arrow, Fauna Brit. India (Coleoptera : Lamellicornia), 3 : 244-245.
1963. *Onthophagus* (*Digitonthophagus*) *rubricollis*, Balthasar, Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia), 2 : 503-504, Pl. xiv, fig. 4.

Material examined : 1 ex., Namdapha camp, 20.iv.1981 ; S. Biswas coll.

Distribution : The species is known from Nepal and India. In India the species is recorded from Uttar Pradesh, Sikkim, Meghalaya and Arunachal Pradesh (Namdapha).

Remarks : A single specimen was collected in dense forest from carnivora dung. This is the first time the species is being recorded from Arunachal Pradesh.

37. *Onthophagus mauritii* Boucomont

- 1919 (1920). *Onthophagus mauritii* Boucomont, Ann. Soc. ent. France, P. 311.
1931. *Onthophagus mauritii*, Arrow, Fauna Brit. India (Coleoptera : Lamellicornia), 3 : 267-268.
1963. *Onthophagus* (S. Str.) *mauritii*, Balthasar, Monographic der Scarabaeidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia) 2 : 434.

Material examined : The species is known from India was recorded from Tamilnadu, Maharastra and Bihar. This is the first time the species is recorded from Arunachal Pradesh.

38. *Onthophagus* sp. I

A single specimen collected from Miao, Tirap district of Arunachal Pradesh on 4.iv.1981. The specimen belongs to gemma group but does not belong to any species known from India and most likely belongs to an undescribed species. As there is only one specimen description of the species is not attempted .

39. *Onthophagus* sp. 2.

A single specimen was collected from Miao, Tirap district of Arunachal Pradesh on 5.iv.1981. The specimen comes closer to *O. questus* Sharp but differs from that species by total absence of fronto-cypeal carina and punctures on pronotum also being stronger.

40. *Onthophagus* sp. 3.

Single specimen belonging to Mopsus group (length 10 mm ; breadth 6 mm) probably belongs to an undescribed species. The large size and pronotal shape are not met with any of the species known from Indian region. So, more specimens are needed for further study.

41. *Onthophagus rubripennis* Arrow

1907. *Onthophagus rubripennis* Arrow, *Ann. Mag. Nat. Hist.* (7) 19 : 419.
 1931. *Onthophagus rubripennis*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 271-272.
 1963. *Onthophagus* (s. str.) *rubripennis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 504.

Material examined : 3 exs., (1 ex., Deban, 4.iv.1981 ; 1 ex., Hornbill, 15.iv.1981 ; 1 ex, Namdapha camp, 19.iv,1981), S. Biswas coll.

Distribution : The species is known from Bhutan ; Burma and India. In India the species is recorded from Sikkim, West Bengal, Meghalaya and Arunachal Pradesh (Namdapha).

Remarks : Besides typical one two other varieties of these species are recognised, variety *O. subcristatus* is characterised by more denser and rugose sculpture on pronotum and variety *vespilo* by entire body is black. Specimens under report agree with variety *subcristatus* in pronotal sculpture and one of the specimens is almost black. The species is being recorded for the first time from Arunachal Pradesh.

42. *Onthophagus furcicollis* Arrow

1931. *Onthophagus furcicollis* Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 276-277, fig. 32.
 1963. *Onthophagus* (s. str.) *furcicollis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 359.

Material examined : 5 exs., Namdapha, 22.iv.1981, S. Biswas coll.

Distribution : The species is known from India and recorded from Uttar Pradesh, Sikkim and Arunachal Pradesh.

43. *Onthophagus dama* (Fabricius)

1798. *Copris dama* Fabricius, *Ent. Syst. Suppl.* : 32.
 1898. *Onthophagus dama*, d'orbigny, *L'Abeille*, 29 : 217.
 1931. *Onthophagus dama*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 280-281.
 1963. *Onthophagus* (s. str.) *dama*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 325-326, Pl.xii, fig. 6.

Material examined : 2 exs, Miao, 30.iii.1981 ; Deban, 7.iv.1981, S. Biswas coll.

Distribution : The species is known from Srilanka ; Nepal ; Bhutan and India. In India the species is recorded from West Bengal, Bihar, Uttar Pradesh, Maharashtra, Madhyapradesh, Karnataka, Tamilnadu and Arunachal Pradesh (Namdapha).

44. *Onthophagus triceratops* Arrow

1913. *Onthophagus triceratops* Arrow, *Rec. Indian Mus.*, 8 : 195.
 1931. *Onthophagus triceratops*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 301-302, fig. 36.
 1963. *Onthophagus* (s. str.) *triceratops*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 559.

Material examined : 12 exs, (2 exs, Miao, 30.iii.1981 ; 2 exs, Deban, 7.iv.1981 ; 2 exs, Zero camp, 8.iv.1981 ; 2 exs, Hornbill, 14.iv.1981 ; 1 ex, Firmbase, 19.iv.1981 ; 2 exs, Namdapha camp, 21.iv.1981 ; 1 ex, Chiria camp, 29.ix.1981), S. Biswas coll.

Distribution : The species is known only from India and is recorded from Assam and Arunachal Pradesh (Namdapha).

45. *Onthophagus armatus* Blanchard

1853. *Onthophagus armatus* Blanchard, *Voy. au Pole Sud*, P. 98, Pl. vii, figs. 9 & 10.
 1883. *Onthophagus luzonicus* Lansberge, *Notes Leyden Mus.*, 5 : 51.
 1931. *Onthophagus armatus*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 293-294.
 1963. *Onthophagus* (s. str.) *armatus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 277-278.

Material examined : 3 exs, (1 ex, Firmbase, 18.iv.1981 ; 1 ex, Namdapha, 22.iv.1981 ; 1 ex, Chiria camp, 28.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma ; Vietnam ; Philippine Is. ; Indonesia and India. In India the species is recorded from Assam and Arunachal Pradesh (Namdapha).

46. *Onthophagus luridipennis* Boheman

1858. *Onthophagus luridipennis* Boheman, *Eagenies Resa* : 45.
 1914. *Onthophagus fuscopuhctulatus* Boucomont, *Ann. Soc. ent. France*, 88 : 292-293.
 1931. *Onthophagus luridipennis*, Arrow, *Fauna Brit. India, (Coleoptera : Lamellicornia)*, 3 : 317-318.
 1963. *Onthophagus* (s. str.) *luridipennis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 424-425.

Material examined : 19 exs. (2 exs, Miao, 22.iv.1981 ; 10 exs, Zero camp, 11.iv.1981 ; 3 exs., Firmbase, 19.iv.1981 ; 4 exs., Namdapha, 21.iv.1981), S. Biswas coll.

Distribution : The species is known from Philippines Island ; S. China ; Indonesia ; Indochina ; Burma ; Bangladesh and India. In India the species is known from Uttar Pradesh, Assam and Arunachal Pradesh (Namdapha).

47. *Onthophagus remotus* Harold

1879. *Onthophagus remotus* Harold, *Col. Hefte*, 26 : 226.

1931. *Onthophagus remotus*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 318-319.

1963. *Onthophagus* (s. str.) *remotus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Oriental Region (Coleoptera : Lamellicornia)*, 2 : 500-501.

Material examined : 11 exs., (5 exs., Debau, 7.iv.1981 ; 4 exs., Chiria camp, 27.iv.1981 ; 2 exs., Hornbill. 16.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma and India. In India the species is being recorded for the first time from Arunachal Pradesh (Namdapha).

48. *Onthophagus porcus* Arrow

1931. *Onthophagus porcus* Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 325.

1963. *Onthophagus* (s. str.) *porcus*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 482.

Material examined : 3 exs., Firmbase, 18.iv.1981, S. Biswas coll.

Distribution : The species is known from Bangladesh and India. In India the species is recorded for the first time from Arunachal Pradesh (Namdapha).

49. *Onthophagus royi* sp. nov.

(Fig. 7)

Male : Length 5-6 mm., breadth 3-3.5 mm. Body short, not very convex, upper surface black, lower surface blackish brown, covered with short reddish setae, antennal club dark.

Head semicircular, clypeal margin uniformly rounded, ocular lobe rounded, little angulate in front of eyes ; clypeus separated from

forehead by a curved carina and from ocular lobes by a carinate suture ; clypeal disc closely punctured with large, medium and sinuate, punctures,

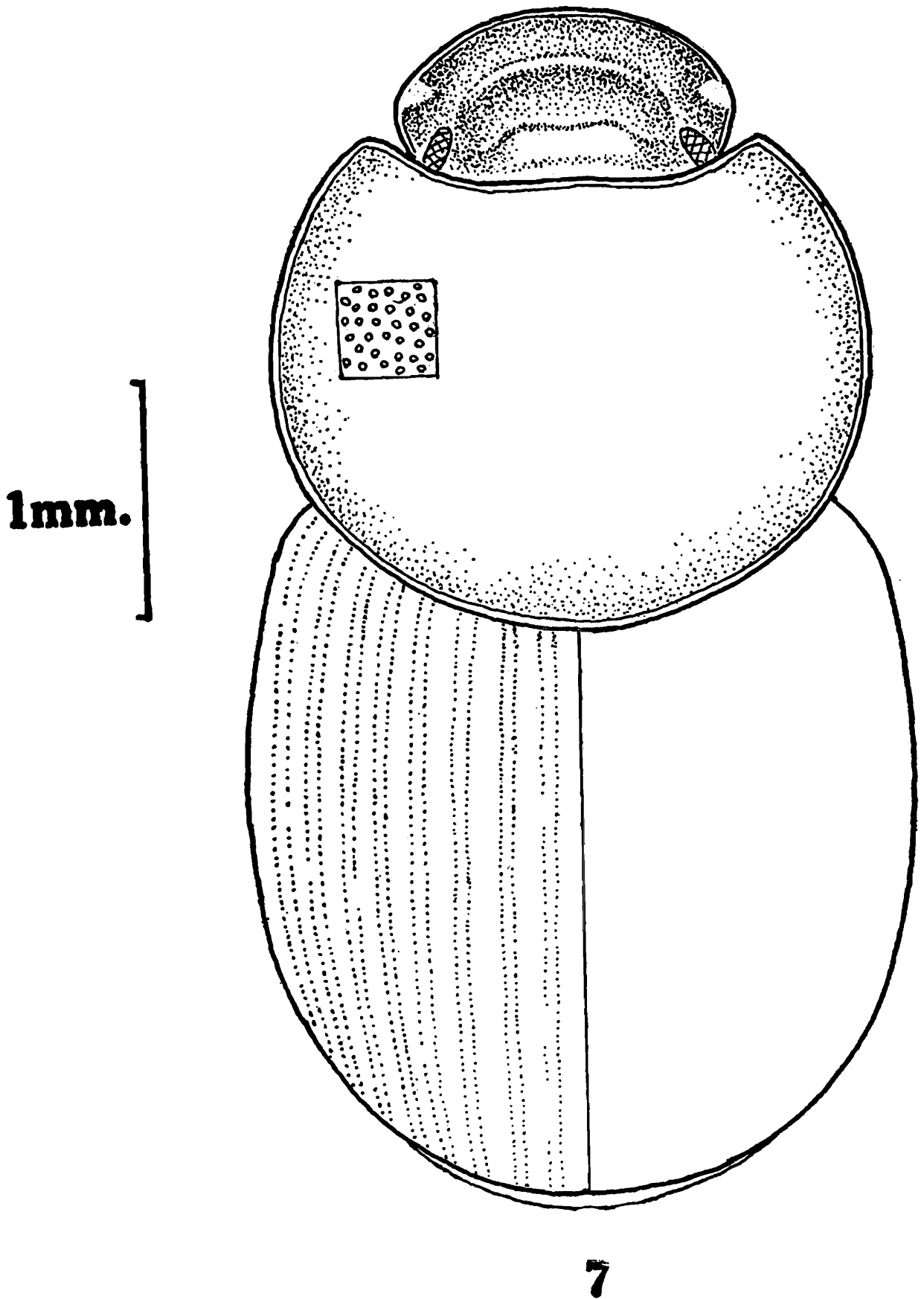


Fig. 7. *Onthophagus royi* sp. nov., male.

ocular lobes less closely punctured by large and medium punctures, large punctures being fewer in numbers ; forehead bounded posteriorly by a

straight carina, little elevated in the middle and punctured as in ocular lobe. Antennae 9 segmented, basal segment carinate at anterior margin but not serrated. Pronotum not very convex, a little depressed longitudinally in the middle towards base, uniformly and moderately closely and strongly punctured, punctures simple, each with a seta at middle, space between punctures appear shining, lateral margins rounded in front, a little sinuate behind. Elytra strongly striate, striae feebly punctured, punctures being connected by longitudinal streak; elytral intervals covered with numerous setigerous punctures, arranged in two rows, except sutural interval which show a single row of puncture; space between punctures minutely sculptured in most of the parts, shining only postero-medially. Front tibiae provided with 4 external teeth, which are serrated at base. Metasternal shield narrowly grooved in the middle, thinly punctured with large punctures. Abdominal sternite with a single row of large setigerous punctures, not very closely placed. Last sternite emarginate in the middle to receive pygidium. Pygidium not margined at base and moderately strongly punctured.

Female: Same as male except the clypeal disc more strongly punctured, last ventral sternite emarginate in the middle.

Holotype: 1 ex., ♂ (Regd. No. A1/4552) collected from dog faeces, Shillong, Khasi hills, 18.vi.1973, *S. Biswas* coll.

Paratypes: 6 ♂ ♂, 4 ♀ ♀, (Regd. No. A1/4553), Khasi hills, 6.vii.1974, *S. Biswas* coll., 1 ♂, 1 ♀, (Regd. No. A1/4554) from human faeces, Shillong, Khasi hills, 9.v.1973, *S. Biswas* coll., deposited at present in the collection of Zoological Survey of India, Shillong, 2 ♂ ♂, Deban Namdapha, 21.iv.1981, *S. Biswas* coll.

The species comes closer to *O. orientalis* Harold but can be separated by the absence of cephalic horn in both sexes, upper surface being smooth.

50. *Onthophagus deflexicollis* Lansberge

1883. *Onthophagus deflexicollis* Lansberge, *Notes Leyden Mus.*, 5 : 72.

1883. *Onthophagus mutabilis* Lansberge, *Notes Leyden Mus.*, 5 : 72.

1931. *Onthophagus deflexicollis*, Arrow, *Fauna Brit. India (Coleoptera : Lamellicornia)*, 3 : 331-332.

1963. *Onthophagus* (s. str.) *deflexicollis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region (Coleoptera : Lamellicornia)*, 2 : 327-328.

Material examined: 3 exs., (1 ex., Zero camp, 10.iv.1981; 1 ex., Firmbase, 18.iv.1981; 1 ex., Chiria camp, 28.iv.1981), *S. Biswas* coll.

Distribution : The species is known from Indonesia ; Vietnam ; Malay Peninsula ; Burma and India. In India the species is recorded from Uttar Pradesh, Sikkim, West Bengal, Assam, Meghalaya and Arunachal Pradesh (Namdapha).

51. *Onthophagus phanaeiformis* Boucomont

1914. *Onthophagus phanaeiformis* Boucomont, *Ann. Mus. Civ. Stor. Nat. Genova*, 46 : 224.
1931. *Onthophagus phanaeiformis*, Arrow, *Fanna Brit. India* (Coleoptera : Lamellicornia), 3 : 335-336.
1963. *Onthophagus* (*Paraphaneimorphus*) *phanaeiformis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 478.

Material examined : 3 exs., Namdapha camp, 22.iv.1981, S. Biswas coll.

Distribution : The species is known from Burma and India. In India the species is recorded for the first time from Namdapha Wild Life Sanctuary, Tirap dist., Arunachal Pradesh.

Remarks : Specimens under report were collected from human faeces. The species was known only by male, this is the first time the female of the species is described here.

52. *Onthophagus centricornis* Fabricius

1798. *Copris centricornis* Fabricius, *Ent. Syst., Suppl.*, P. 33.
1823. *Copris luteipennis* Wiedemann, *Zool. Mag.*, 2(1) : 20.
1858. *Onthophagus minutus* Motschulsky, *Etudes Ent.*, 7 : 54.
1931. *Onthophagus centricornis*, Arrow, *Fauna Brit. India*, (Coleoptera : Lamellicornia), 3 : 343-344.
1963. *Onthophagus* (s. str.) *centricornis*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 305-306.

Material examined : 2 exs., (1 ex. Hornbill, 17.ix.1981 ; 1 ex., Chiria camp, 26.iv.1981), S. Biswas coll.

Distribution : The species is known to occur in Ceylon and India. In India the species is recorded from Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, Meghalaya and Arunachal Pradesh (Namdapha).

53. *Onthophagus vaulogerii* Boucomont

1923. *Onthophagus vaulogerii*, Boucomont, *Bull. Soc. ent. Fr.* P. 10.
1931. *Onthophagus vaulogerii*, Arrow, *Fauna Brit. India* (Coleoptera : Lamellicornia), 3 : 344-345.
1963. *Onthophagus* (s. str.) *vaulogerii*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 576-577.

Material examined : 5 exs., (1 ex., Namdapha, 21.iv.1981 ; 1 ex., Miao, 22.iv.1981 ; 1 ex., Hornbill, 16.iv.1981, 1 ex., Firmbase, 19.iv.1981 ; 1 ex., Chiria camp, 27.iv.1981), S. Biswas coll.

Distribution : This species is known from Indo-China ; Burma and India. In India the species is recorded from Uttar Pradesh, Meghalaya and Arunachal Pradesh (Namdapha).

54. *Onthophagus duporti* Boucomont

1914. *Onthophagus duporti* Boucomont, *Ann. Mus. Civ. Stor. Nat. Genova*, 46 : 228.

1931. *Onthophagus duporti*, Arrow, *Fauna Brit India*, (Coleoptera : Lamellicornia), 3 : 353.

1963. *Onthophagus* (s. str.) *duporti*, Balthasar, *Monographic der Scarabaeidae und Aphodiidae der palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 337-338.

Material examined : 6 exs., (2 exs., Zero camp, 11.iv.1981 ; 1 ex., Namdapha, 20.iv.1981 ; 2 ex., Miao, 23.iv.1981 ; 1 ex., Firmbase, 19.iv.1981), S. Biswas coll.

Distribution : The species is known from Burma and India. In India the species is recorded from Bihar, Tamil Nadu (Nilgiri hills), Karnataka (Kanara) and Arunachal Pradesh (Namdapha).

55. *Onthophagus bengali* Gordon & Oppenheimer

1975. *Onthophagus* (*Onthophagus*) *bengali* Gordon & Oppenheimer *Oriental Insects*, 9(4) : 497-498.

Material examined : 5 exs., (1 ex., Deban ; 8.iv.1981 ; 1 ex., Zero camp, 18.iv.1981 ; 2 exs., Namdapha, 21.iv.1981 ; 1 ex., Chiria camp, 27.iv.1981), S. Biswas coll.

Distribution : The species is known only from West Bengal. This is the first time the species is recorded from Arunachal Pradesh.

SUMMARY

This paper records 55 species belonging to 13 genera of subfamily Coprinae under family Scarabaeidae from Namdapha Wild Life Sanctuary, now Namdapha Tiger Reserve, Tirap dist., Arunachal Pradesh. 7 species namely, *Oniticellus namdaphaensis*, *O. subhendui*, *O. gayeni*, *Onthophagus tirapensis*, *O. songsokensis*, *O. arunachalensis*, *O. royi*, are described as new to science. Distributional records of all the species included in the paper have been provided on the basis of literature and collections present in Zoological Survey of India.

ACKNOWLEDGEMENTS

We are grateful to Dr. B. K. Tikader, Director, Zoological Survey of India, Calcutta for providing working facilities. We are also thankful to Dr. A. K. Ghosh, Deputy Director and Dr. T. Sengupta for encouragements. Our thanks are also due to Sri A. R. Bhowmik for going through the manuscript and Sri S. N. Aich for helping in illustration.

INSECTA : COLEOPTERA : PASSALIDAE AND LUCANIDAE

By

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INTRODUCTION

Passalid beetles are usually found in decaying wood and larvae of both Passalidae and Lucanidae develop in decaying wood. Abundance of dead tree and decaying wood in Namdapha forest has made it a very suitable home for members of these two families.

In this paper, altogether 144 examples belonging to 16 species under 9 genera have been dealt with, of these 11 species under 7 genera are from Passalidae and 5 species under 2 genera are from Lucanidae. Specific identity of a species has not been attempted due to lack of more material. References and synonymies for the species have been cited wherever necessary.

SYSTEMATIC ACCOUNT

Subfamily : AULACOCYCLINAE

Genus 1. *Aulacocyclus* Kaup 1868

1. *Aulacocyclus bicuspis* Kaup

1868. *Aulacocyclus bicuspis* Kaup, *Col. Hefte*, 3 : 5.

1914. *Taeniocerus bicuspis* Gravely, *Mem. Indian Mus.*, 3 : 210, pl. 11, fig. 9.

1949. *Aulacocyclus bicuspis*, Arrow *Fauna Brit. India*, 4 : 243-244.

Material examined : 19 exs., (9 exs., 40th Mile camp, 24.iv.1981 ; 7 exs., Hornbill, 13.iv.1981, 13.iv.1981 ; 3 exs., Namdapha, 23.iv.1981), S. Biswas coll.

Distribution : Malacca ; Burma ; India ; West Bengal (Darjeeling dist.), Assam. Now it is being recorded for the first time from Arunachal Pradesh (Namdapha).

Genus 2. *Ceracupes* Kaup 1871

2. *Ceracupes fronticornis* (Westwood)

1842. *Passalus fronticornis* Westwood, *Ann. Mag. nat. Hist.*, 8 124.

1914. *Ceracupes fronticornis* Gravely, *Mem. Indian Mus.*, 3 : 277.

1949. *Ceracupes fronticornis*, Arrow, *Fauna Brit. India*, 4 : 245.

Material examined : 1 ex., Firmbase, 18.iv.1981, S. Biswas coll.

Distribution : Burma, Thailand, Vietnam and India : West Bengal, Uttar Pradesh and Assam. Now it is being recorded for the first time from Arunachal Pradesh (Namdapha).

Subfamily : PASSALINAE

Genus 3. **Leptaulax** Kaup 1868

3. **Leptaulax dentatus** (Fabricius)

1792. *Passalus dentatus* Fabricius, *Ent. Syst.*, 1(2) : 241.

1914. *Leptaulax dentatus* Gravely, *Mem. Indian Mus.*, 3 : 252, pl. 13, fig. 52.

1949. *Leptaulax dentalus*, Arrow, *Fauna Brit. India*, 4 : 247-248.

Material examined : 14 exs., (7 exs., Gibbon's land, 30.iv.1981 ; 1 ex., Namdapha, 21.iv.1981 ; 5 exs., Zero camp, 9.iv.1981 ; 1 ex., Gibbon's land, 2.v.1981), S. Biswas coll.

Distribution : Burma, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Sulawesi, Indonesia and India : West Bengal, Assam, Andaman, Islands and Arunachal Pradesh (Namdapha).

4. **Leptaulax cyclotaenius** Kuw

1891. *Leptaulax cyclotaenius* Kuw., *Dt. ent. Z.*, p. 188.

1949. *Leptaulax cyclotaenius*, Arrow, *Fauna Brit. India*, 4 : 248.

Material examined : 17 exs., (4 exs., Chiria camp, 25.iv.1981 ; 1 ex., Deban, 27.iv.1981 ; 2 ex., Namdapha, 21.iv. & 23.iv.1981 ; 5 ex., 40th Mile camp, 24.iv.1981 ; 5 exs., Hornbill, 13.iv. & 14.iv.1981), S. Biswas coll.

Distribution : Burma, Vietnam, Malaysia, Sulawesi, Indonesia and India : In India the species was known from Assam. Now it is being recorded from Arunachal Pradesh (Namdapha).

5. **Leptaulax bicolor** (Fabricius)

1801. *Passalus bicolor* Fabricius, *Syst. Eleuth.*, 2 : 256.

1918. *Leptaulax bicolor*, Gravely, *Mem. Indian Mus.*, 7 : 114.

1949. *Leptaulax bicolor*, Arrow, *Fauna Brit. India*, 4 : 249.

Material examined : 2 exs., Hornbill, 13.iv.1981, S. Biswas coll.

Distribution : Burma, Vietnam, Thailand, Hainan, Malaysia, Indonesia, Philippine, Sulawesi, Gilolo, New Guinea and India : West Bengal, Assam, Madras, Nicobar Islands, Arunachal Pradesh (Namdapha).

6. *Leptaulax roepstorffi* Kuw

1898. *Leptaulax roepstorffi* Kuw., Nov. Zool., 5 : 288.

1849. *Leptaulax roepstorffi*, Arrow, *Fauna Brit. India*, 4 : 249-250.

Material examined : 1 ex., Namdapha, iv.1981, S. Biswas coll.

Distribution : Burma and India : Assam, Andaman Islands and Arunachal Pradesh (Namdapha).

Genus 4. *Tiberioides* Gravely 19137. *Tiberioides austeni* Gravely

1914. *Tiberioides austeni* Gravely, *Mem. Indian Mus.*, 3 : 216, pl. 11, fig. 15.

1949. *Tiberioides austeni*, Arrow, *Fauna Brit. India*, 4 : 254.

Material examined : 1 ex., Hornbill, 12.iv.1981, S. Biswas coll.

Distribution : Burma and India : Assam, Arunachal Pradesh (Namdapha).

Genus 5. *Episphenus* Kaup 18718. *Episphenus* sp. near *indicus* (Stoliczka)

Material examined : 1 ex., Namdapha, 21.iv.1981, S. Biswas coll.

Remarks : The specimen agrees in general with *E. indicus* whose known distribution is only in South India. As we have a single teneral specimen with us, we have not named the species.

9. *Episphenus neelgheriensis* (Percheron)

1841. *Passalus neelgheriensis* Percheron, *Mag. Zool.*, 11 : 4, pl. 41, fig. 1.

1914. *Episphenus neelgheriensis*, Gravely, *Mem. Ind. Mus.*, 3 : 222, pl. 11, fig. 21.

1949. *Episphenus neelgheriensis*, Arrow, *Fauna Brit. India*, 4 : 256.

Material examined : 6 exs., Namdapha, 21.iv.1981, S. Biswas coll.

Distribution : The species was known from South India and it is being recorded from Arunachal Pradesh (Namdapha).

Genus 6. *Aceraius* Kaup 186810. *Acearius helferi* Kuw

1891. *Aceraius helferi* Kuw., *Dt. ent. Z.*, p. 163.

1914. *Aceraius tavoyanus* Gravely, *Mem. Indian Mus.*, 3 : 237.

1949. *Aceraius helferi*, Arrow, *Fauna Brit. India*, 4 : 261.

Material examined : 17 exs., (9 exs., Hornbill, 11, 14, 16.iv.1981 ; 3 exs., Namdapha, 22, 23.iv.1981 ; 5 exs., Gibbonland, 29.iv.1981) S. Biswas coll.

Distribution : Burma, Vietnam, Thailand, Malaysia and India : West Bengal, Assam, Sikkim and Arunachal Pradesh (Namdapha).

Genus 7. **Macrolinus** Kaup 186811. **Macrolinus sikkimensis** (Stoliczka)1873. *Basilianus sikkimensis* Stoliczka, *Journ. Asiat. Soc. Bengal* 62(2) : 161.1914. *Macrolinus sikkimensis* Gravelly, *Mem. Indian Mus.*, 3 : 243.1949. *Macrolinus sikkimensis*, Arrow, *Fauna Brit. India*, 4 : 266.

Material examined : 59 exs., (30 exs., Hornbill, 11, 14.iv.1981 ; 2 exs., Zero camp, 9.iv.1981 ; 10 exs., Namdapha, 22, 23.iv.1981 ; 3 exs., 40th Mile camp, 24.iv.1981 ; 2 exs., Chiria camp, 25.iv.1981 ; 3 ex., Deban, 28.iv.1981 ; 9 exs., Gibbon, 29, 30.iv.1981), S. Biswas coll.

Distribution : N. E. Burma, Indochina and India : West Bengal, Assam, Arunachal Pradesh (Namdapha).

Family : LUCANIDAE

Subfamily : LUCANINAE

Genus 1. **Dorcus** Macleay 18191. **Dorcus curvidens** (Hope)1841. *Lucanus curvidens* Hope, *Trans. linn. Soc. Lond.*, 18 : 589.1845. *Dorcus dehaani* Hope, *Trans. linn. Soc. Lond.*, 19 : 106.1913. *Dorcus curvidens* Boil., *Trans. Ent. Soc. Lond.*, p. 253.1949. *Dorcus curvidens*, Arrow, *Fauna Brit. India*, 4 : 88-90.

Material examined : 1 ex., Miao, 6.v.1981, S. Biswas coll.

Distribution : Indonesia, Bhutan and India : West Bengal, Arunachal Pradesh (Namdapha).

2. **Dorcus occipitalis** (Hope & Westwood)1845. *Lucanus occipitalis* Hope & Westwood, *Cat. Luc. Col.*, p. 13.1847. *Cladognathus marginatus* Burmister, *Handb. Ent.*, 5 : 369.1913. *Metopadontus occipitalis* Boil., *Trans. Ent. Soc. Lond.*, p. 226.1935. *Cladognathus marginatus* Arrow, *Trans. R. ent. Soc. Lond.*, 83 : 107.1949. *Dorcus occipitalis*, Arrow, *Fauna Brit. India*, 4 : 147-149.

Material examined : 1 ex., Namdapha, iv.1981, S. Biswas coll.

Distribution : Burma, Malaysia, Indonesia, Philippines and India : Andaman Islands, Arunachal Pradesh (Namdapha).

3. **Dorcus oweni** (Hope & Westwood)1845. *Lucanus oweni* Hope & Westwood, *Cat. Luc. Col.*, p. 14.1864. *Cladognathus oweni* Parry, *Trans. Ent. Soc. Lond.*, 2(3) : 82.1913. *Prosopocoelus oweni* Boil., *Cat. Luc. Col.*, p. 229.1949. *Dorcus oweni*, Arrow, *Fauna Brit. India*, 4 : 151-153.

Material examined : 1 ex., Hornbill, 11.iv.1981, *S. Biswas* coll.

Distribution : Vietnam, Bhutan and India : West Bengal, Assam, Arunachal Pradesh (Namdapha).

4. *Dorcus foveatus* (Hope)

1841. *Lucanus foveatus* Hope, *Trans. linn. Soc. Lond.*, **18** : 590.

1845. *Lucanus fraternus* Hope & Westwood, *Cat. Luc. Col.*, p. 12.

1869. *Cladognathus impressus* Wat., *Trans. Ent. Soc., Lond.*, p. 17.

1870. *Metopodontus impressus* Parry, *Trans. Ent. Soc. Lond.*, p. 78, pt. 3, fig. 1.

1913. *Metopodontus foveatus* Boil, *Trans. Ent. Soc. Lond.*, p. 224.

1949. *Dorcus foveatus*, Arrow, *Fauna Brit. India*, **4** : 165-167.

Material examined : 2 exs., (1 ex., Miao, 2.iv.1981 ; 1 ex., Miao, 6.v.1981), *S. Biswas* coll.

Distribution : Burma, Bhutan and India : West Bengal, Assam, Manipur, Andaman Islands and Arunachal Pradesh (Namdapha).

Genus 2. *Calcodes* Westwood, 1834

5. *Calcodes siva* (Hope & Westwood)

1845. *Lucanus siva* Hope & Westwood, *Cat. Luc. Col.*, p. 16.

1885. *Odontolabis siva* Leuthner, *Trans. Zool. Soc. Lond.*, p. 436, pl. 86, fig. 1-7.

1937. *Calcodes siva* Arrow, *Trans. R. ent. Soc. Lond.*, **86** : 241, pl. 1, fig. 2.

1949. *Calcodes siva*, Arrow, *Fauna Brit. India*, **4** : 200-201.

Material examined : 1 ex., Miao, 5.v.1981, *S. Biswas* coll.

Distribution : Vietnam, Bangladesh and India : West Bengal, Assam, Arunachal Pradesh (Namdapha).

SUMMARY

16 species under 9 genera of Lamellicorn beetles of families Passalidae and Lucanidae have been recorded. Of these 7 genera and 11 species are of Passalidae and 2 genera and 5 species are of Lucanidae. *Macrolinus sikkimensis* is the most common species of the area.

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- GRAVELY, F. H. 1918. A contribution towards the revision of the Passalidae of the world. *Mem. Indian Mus.*, 7 : 1-144.

INSECTA : COLEOPTERA : CUCUJIDAE :
LAEMOPHLOEINAE

By

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(With 2 Figures)

INTRODUCTION

The representatives of the family Cucujidae are commonly known as "flat bark beetles" and belongs to the largest superfamily Cucujoidea under the section Clavicornia. Classification and characterisation of the family has hitherto been unsatisfactory, as a result of which there has been a tendency to use it as dumping ground. At present, it includes two subfamilies viz. Cucujinae and Laemophloeinae. They are usually found to live under bark of logs or dead standing trees, haystacks, vegetable garbage, leaf litter etc. and some are pests of stored grains and their products. Of the family Cucujidae, so far Indian Cucujinae is represented by two genera viz. *Cucujus* F. and *Pediacus* Shuck. and Laemophloeinae by ten genera.

The paper presents the results of the study based on a collection of Cucujidae collected during Namdapha Survey. The Cucujidae fauna from Arunachal Pradesh was hitherto unrecorded. This includes one genus of Cucujinae and seven genera of Laemophloeinae and all the species are recorded here for the first time from Arunachal Pradesh with the first record of the genus *Xylolestes* Lefkovitch from India.

SYSTEMATIC ACCOUNT

Subfamily : (A) CUCUJINAE

1. *Pediacus bhutanicus* Sengupta

1978. *Pediacus bhutanicus* Sengupta, *Entomologica Basiliensia*, 3 : 219-222.

Material examined : 24 ex., India : Arunachal Pradesh : Deban, 27 km. E. of Miao in Tirap dist., 11-13.ii.1982, *S. Biswas & Party*, under bark.

Distribution : India ; Arunachal Pradesh, Bhutan.

Remarks : Sengupta (1978) has described this species from Bhutan. In the present study it is being recorded for the first time from India,

2. *Pediacus rufipes* Grouvelle

1908. *Pediacus rufipes* Grouvelle, *Annls. Soc. ent. Fr.*, 77 : 461, t. 9, f. 7.

Material examined : 1 ex., India : Arunachal Pradesh ; Deban, 27 km. E. of Miao in Tirap dist., 11.xii.1982, S. Biswas & Party, under bark.

Distribution : India : Tamil Nadu, Arunachal Pradesh.

Remarks : This species was earlier recorded only from Nilgiri hills (Tamil Nadu), now it is being recorded for the first time from Arunachal Pradesh.

Subfamily : (B) LAEMOPHLOEINAE

3. *Placonotus proximus* (Grouvelle)

1908. *Laemophloeus proximus* Grouvelle, *Annls. Soc. ent. Fr.*, 77 : 476, 472.

1977. *Placonotus proximus* (Grouvelle) : Mukhopadhyay and Sengupta, *Oriental Insects*, 11(4) : 555-566.

Material examined : 32 ex., India : Arunachal Pradesh : Gibbon land, 3.v.1981, S. Biswas & Party ; 1 ex., Arunachal Pradesh ; Tirap : Deban north, 28.iv.1981, S. Biswas & Party, decaying wood ; 18 ex., Arunachal Pradesh : Namdapha, 21.iv.1982, S. Biswas & Party, decaying wood.

Distribution : India : Tamil Nadu, Meghalaya, Arunachal Pradesh.

Distribution : Grouvelle (1908) described this species under the genus *Laemophloeus* from Nilgiri hills (Tamil Nadu). In 1977, Mukhopadhyay & Sengupta transferred this species from the genus *Laemophloeus* to *Placonotus*. Though this species is well represented in India, upto now it is recorded only from Tamil Nadu, Meghalaya (Songsak) and Arunachal Pradesh.

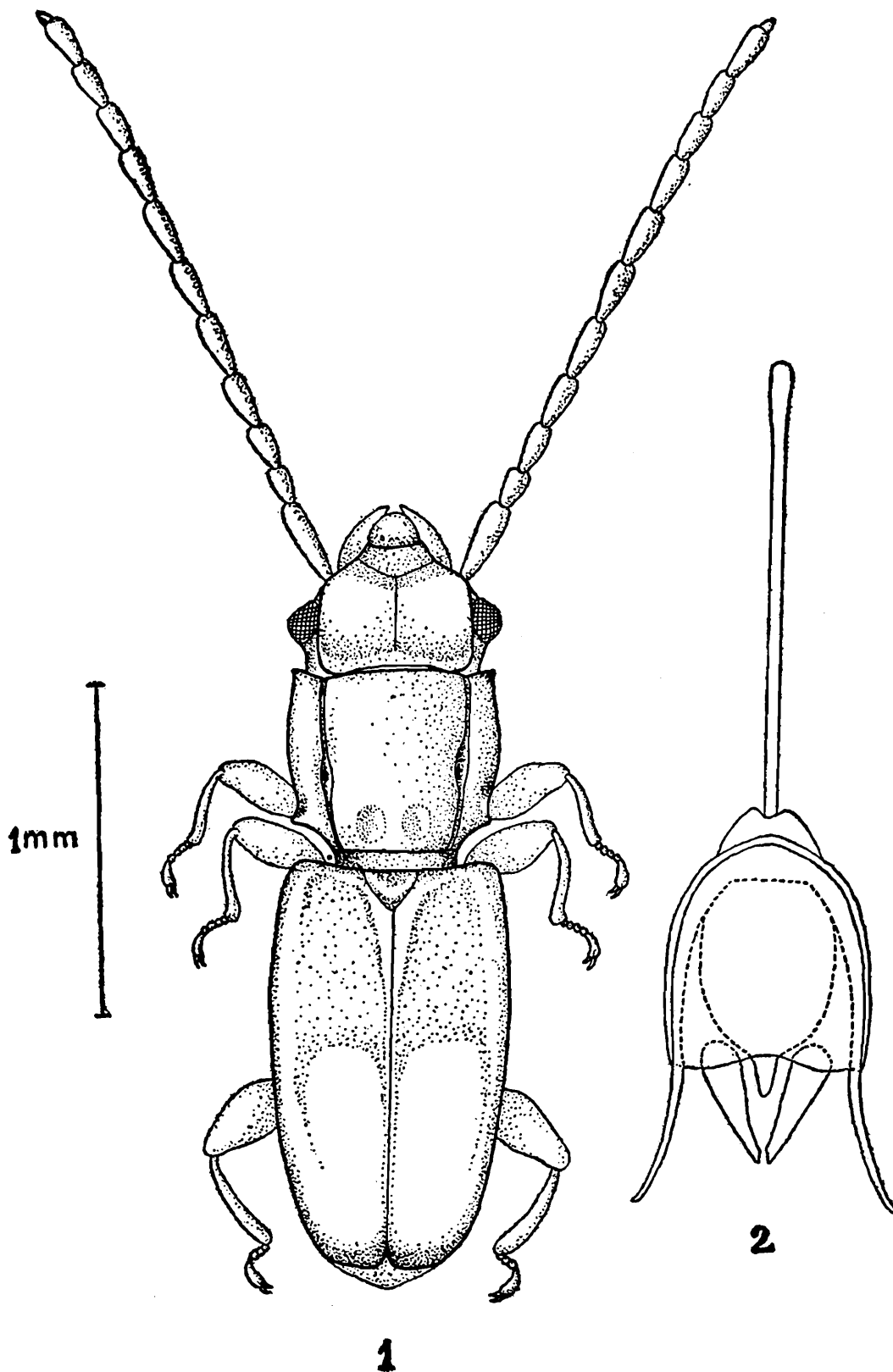
4. *Placonotus debanus* sp. nov.

(Figs. 1-2)

General appearance (Fig. 1) small, narrowly elongated, somewhat parallel sided, head and pronotum deep brownish black, elytra pale yellowish brown.

Head 1.7 times wider than long, apical margin of clypeus concave, fronto-clypeal suture distinctly curved, median line on vertex distinct and extending up to fronto-clypeal suture from base, vertex at middle elevated and punctation on it fine and dense. Eyes small, black, slightly projected and finely faceted, a line below the eye present.

Antenne reddish brown, extending more than $\frac{2}{3}$ rd. length of its body, scape narrowly elongated pedicel slightly shorter than segment 3, segment 4 slightly shorter than segments 5-8 which are subequal, segments 9-11 form a loose weak elongated club. Prothorax about as



Figs. 1-2. *Placonotus debanus* sp. nov. 1, Dorsal view ; 2, Aedeagus.

long as broad, lateral margin parallel-sided up to middle and then distinctly outwardly curved, lateral line on pronotum extending up to

base and with a distinct deep pit at middle, two small rounded depression present at base, front angle slightly projected, hind angle projected, with rounded apex, puncturation on pronotum fine and dense. Scutellum brownish black, triangular and densely punctured. Elytra 1.7 times longer than wide, a small part of pygidium exposed, humeral angle rounded, apical angle subtruncate, puncturation on it finely and irregularly arranged. Aedeagus (Fig. 2) with short exophallic apodeme, broadened at apex, phallobase about as long as broad and its lateral margin parallel-sided, parameres elongated and narrowed at apex.

Measurements : Total length of holotype 2.50 mm., width of head across the eyes 0.64 mm., length of antenna 2.00 mm., length and width of prothorax 0.60 mm., 0.60 mm., length of elytra 1.2 mm., width of elytra across middle 0.70 mm.

Holotype : ♂, 7 ♂ ♀, paratypes India : Arunachal Pradesh : Deban, 11.xii.1982, S. Biswas and Party, under bark.

Distribution : India : Arunachal Pradesh.

Remarks : This species is closely related to *Placonotus proximus* (Grouvelle) but can be easily distinguished by its lateral margin of pronotum being curved outwardly below the middle, vertex elevated at middle and with two rounded depression spots at base, parameres elongated and narrowed at apex. (Fig. 2).

5. *Placonotus testaceus* (F.)

1787. *Cucujus testaceus* Fabricius, *Mantissa Insectorum* 1 : 166.

1849. *Laemophloeus suberis* Lucas, *Expl. Sci. Algerie Crustacis, Arachnidès, Myriapodes et Hexapodes*, 2 : 479.

1917. *Laemophloeus notatithorax* Obenberger, *Arch. Naturgesch*, A (4) 82 : 25.

1959. *Placonotus testaceus* (Fabricius) : 1959b, *Trans. R. ent. Soc. Lond.*, 111(5) : 95-118.

Material examined : 7 ex., India : Arunachal Pradesh : Deban, 11.xii.1982, S. Biswas and Party, under bark.

Distribution : India : Arunachal Pradesh, Bhutan, Europe, Italy.

Remarks : This is a distinct species and distributed in all Zoogeographical regions. Besides the colouration of the species, the general form of pronotum is very characteristic and can be readily separated from all other species so far described.

6. *Cryptolestes pusillus* (Schönh.)

1791. *Cucujus minutus* Olivier, *Encycl. Meth.*, 6 : 243, nec Fourcroy, 1785.
 1817. *Cucujus pusillus* Schönherr, *Synonymia Insectorum*, 1(3) : 55.
 1831. *Cucujus testaceus* Stephens, *Ill. Brit. Ent. Mandib.*, 4 : 224.
 1839. *Cucujus crassicornis* Waltl, *Isis, Jena*, 3 : 225.
 1843. *Laemophloeus longicornis* Mannerheim, *Bull. Soc. Nat. Mosc.* 16 : 303.
 1850. *Laemophloeus* (sic) *brevis* Fairmaire, *Rev. Mag. Zool.*, (2) 2 : 56.
 1851. *Laemophloeus parallelus* Smith, *List of Coleoptera in the British Museum*, 1 : 7
 1899. *Laemophloeus pauper* Sharp, *Biol. C. Amer. Col.*, 2(1) : 530.

Material examined : 13 ex., India : Arunachal Pradesh : Gibbon land, 3.v.1981, S. Biswas & Party, under bark ; 4 ex., Arunachal Pradesh : Tirap : Deban north, 28.iv.1981, S. Biswas & Party, decaying wood.

Distribution : India : West Bengal, Arunachal Pradesh, Bhutan, Africa, Arab, Europe, Réunion and Mauritius.

Remarks : This is a cosmopolitan species and occur both in stored grains as well as under bark.

7. *Cryptolestes* sp.

Material examined : 1 ex., India : Arunachal Pradesh : Tirap, Deban, 28.v.1981, S. Biswas and Party, under bark.

Remarks : I am not attempting to describe the species at present due to lack of sufficient material for studies. This species has somewhat resemblances with *Cryptolestes ferrugineus* (Steph.) but can be easily separated by its antenna being longer in male than female and its outer margin of mandible with transverse elevation.

8. *Laemophloeus neglectus* Grouvelle

1883. *Laemophloeus neglectus* Grouvelle, *Ann. Mus. Genova*, 18 : 282.

Material examined : 1 ex., India : Arunachal Pradesh : Gibbon land, 3.v.1981, S. Biswas & Party ; 1 ex., Arunachal Pradesh : Deban, 11.xii.1982, S. Biswas & Party.

Distribution : India : Tamil Nadu, Arunachal Pradesh.

Remarks : Grouvelle (1883) described this species from Nilgiri hills : Tamil Nadu. Present study recorded this species as new from Arunachal Pradesh.

9. *Microlaemus* sp.

Material examined : 2ex., (1 ex. partly damaged), INDIA : Arunachal

Pradesh ; Tirap ; Deban north, 28.iv.1981, S. Biswas & Party, decaying wood.

Remarks : This species can be distinguished from any other species so far described under this genus by its two lateral line on pronotum. This species will be described elsewhere.

10. *Leptophloeus incertus* (Grouvelle) Comb. n.

1888. *Laemophloeus incertus* Grouvelle, *Ann. Mus. Genova*, (2) 6 : 627.

General appearance elongated, flattened, shiny, head and pronotum deep reddish brown, elytra slightly pale reddish brown in colour.

Head transverse, apical margin of clypeus truncate, fronto-clypeal suture indistinct, median line on vertex short and extending up to middle, lateral line at the inner margin of eyes weakly carinated and extending up to base, a short lateral line below the eye present, puncturation on vertex moderately large and densely arranged, specially along the side margin. Eyes small, black, moderately coarsely faceted and slightly advance from base. Antenna reddish brown, its length slightly longer than head and pronotum together, scape moderately large, pedicel slightly larger than segment 3, segments 4-8 subequal, segments 9-11 transverse and distinctly form club. Prothorax about as long as broad, slightly narrowed posteriorly, one lateral line on each side, front angle rounded, hind angle little projected, puncturation similar as on head. Scutellum deep reddish brown, transverse, finely and densely punctured. Elytra two times longer than its width, lateral margin slightly narrowed posteriorly, humeral and apical angle rounded, each elytron with three cells, each cell with irregularly arranged fine puncture.

Material examined : 1 ex., INDIA : Arunachal Pradesh : Gibbon land, 3.5.1981, S. Biswas & Party ; 1 ex., Arunachal Pradesh : Deban, 11.xii.1981, S. Biswas & Party.

Remarks : Grouvelle (1888) described this species from Burma and latter he recorded the same species from India : Tamil Nadu : Nilgiri hills. This species is closely related to *Leptophloeus janeti* (Grouv.) but can be easily separated by its apical angle of elytra being rounded and single lateral line on pronotum.

11. *Leptophloeus janeti* (Grouvelle)

1899. *Laemophloeus janeti* Grouvelle, *Ann. Soc. ent. Fr.*, 68 : 177.

1959. *Leptophloeus janeti* (Grouvelle) : Lefkovitch, *Trans. R. ent. Soc. Lond.*, 111 : 95-118.

Material examined : 2 ex., INDIA : Arunachal Pradesh : Tirap : Deban north, 21.iv.1981, S. Biswas & Party, decaying wood ; 1 ex., Arunachal Pradesh : Deban, 27 km. E. of Miao in Tirap dist., 13.xii.1982, S. Biswas & Party ; 1 ex., Arunachal Pradesh : Gibbon land, 3.v.1981, S. Biswas & Party.

Distribution : India : Tamil Nadu, Arunachal Pradesh, Africa, Europe.

Remarks : Grouvelle (1899) described this species from Nilgiri hills (Tamil Nadu) under the genus *Laemophloeus*. Lefkovitch (1959) during the revision of European Laemophloeinae transferred the species *janeti* from the genus *Laemophloeus* to *Leptophloeus*. In the present study this species is being further recorded from Arunachal Pradesh (India).

12. *Xylophloeus* sp.

Material examined : 1 ex., India : Arunachal Pradesh : Deban, 11.xii.1982, S. Biswas & Party, under bark.

Remarks : While examining the Laemophloeinae collection of Zoological Survey of India I came across few examples of Laemophloeinae labelled as *Laemophloeus miles* Grouvelle, though it is not published so far. Actually this is a distinct species belonging to the genus *Xylophloeus* Lefkovitch, details of which will be published elsewhere. The present single example also belongs to the same species under the genus *Xylophloeus*. During the revision of African Laemophloeinae, Lefkovitch (1962) erected the genus *Xylophloeus* for the species *Laemophloeus patens* Grouvelle including six new species under it. Till 1978, this genus remained unrecorded from India. Incidentally, Mukhopadhyay & Sengupta (1978) recorded the genus for the first time by one species from India (West Bengal & Uttar Pradesh) and by one species from Bhutan.

13. *Xylolestes ovalis* (Grouvelle)

1883. *Laemophloeus ovalis* Grouvelle, *Ann. Mus. Genova*, 18 : 281.

1978. *Xylolestes ovalis* (Grouvelle) : Mukhopadhyay & Sengupta, *Entomologica Basiliensia*, 3 : 224-225.

Material examined : 4 ex., India : Arunachal Pradesh : Namdapha camp, 21.iv.1981, S. Biswas & Party, decaying wood.

Remarks : Grouvelle (1883) described this species under the genus *Laemophloeus* from Borneo. During the revision of African Laemophloeinae Lefkovitch (1962) erected the genus *Xylolestes* for the species

Laemophloeus unicolor Grouvelle. Mukhopadhyay & Sengupta (1978) transferred the species *ovalis* (Grouvelle) from the genus *Laemophloeus* to *Xylolestes* and recorded the genus for the first time from Bhutan. In the present study the genus *Xylolestes* is being recorded for the first time from India.

SUMMARY

124 examples of Cucujidae collected from Namdapha : Tirap district has been identified. These belong to two subfamilies of the Cucujidae viz. Cucujinae and Laemophloeinae. Of the two subfamilies, the Cucujinae is represented by two species of the genus *Pediacus* Shuck and Laemophloeinae represented by eleven species belonging to the genera viz. *Placonotus*, *Cryptolestes*, *Laemophlous*, *Microlaemus*, *Leptophloeus*, *Xylophloeus*, and *Xylolestes*. Of these one species, *Placonotus debanus* is described as new to science and all other species of both the subfamilies have been recorded for the first time from Namdapha : Arunachal Pradesh with the first record of the genus *Xylolestes* from India.

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INSECTA : COLEOPTRA : SILVANIDAE

By

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INTRODUCTION

The Insect material collected from Namdapha contained 69 examples of Silvanidae which were made available to the author for study. This collection represents 8 species under 5 genera. All these species except *Uleiota spinicollis* (Guérin-Méneville) are recorded for the first time from Arunachal Pradesh, of which *Silvanus robustus* Halstead and *Silvanus cribricollis* (Grouvelle) are recorded first time from India. Pal, Sengupta and Crowson 1984 described *Uleiota alticola* from Meghalaya, and in the present study this species is also recorded from Arunachal Pradesh.

Family : SILVANIDAE

Subfamily : SILVANINAE

1. *Silvanus difficilis* Halstead

Silvanus difficilis Halstead, 1973, *Bull. Br. Mus. nat. Hist. (Ent.)* 29, (2) : (Keruing, Malay) : Pal and Sengupta, 1977, *Oriental Insects* 11 (2) : 279-80.

So far this species is recorded from several far east countries, Australia, West Africa. Though *S. difficilis* was recorded from South India and Uttar Pradesh but was not recorded from N. E. India. In the present study 3 examples have been recorded from Hornbill Camp of Namdapha. This species is characterized by its eyes about half as long as head, temple as long as 1.5 eye facets and its tip not pointed, elongated prothorax with anterior spines about half as long as eye, aedeagus with apical projection of median lobe short and blunt, apex of each paramere bilobed, one lobe with a long seta and other with two short setae. Length 2.20-2.82 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Hornbill Camp, 35 km from Miao, 3 ex., 14.iv.1981. *S. Biswas* coll., under bark.

Distribution : India : Tamil Nadu, Kerala, Karnataka, Uttar Pradesh, Arunachal Pradesh ; Sri Lanka ; Vietnam ; Taiwan ; Malaysia ; Singapore ; Indonesia ; Philippines ; Moluccas ; New Guinea ; I. Delcas ; Solomon Is., Samoa Is. ; Australia ; New Ireland ; West Africa.

2. *Silvanus robustus* Halstead

Silvanus robustus Halstead, 1973, *Bull. Br. Mus. nat. Hist. (Ent.)* 29(2) : 71 (Johore, Malaya).

This species so far remains recorded from South-East Asian countries and unrecorded from India. In the present study this species is recorded for the first time from North-east India. This species resembles *S. difficilis* but can be distinguished by its prothorax somewhat elliptical with anterior spines slightly curved inwardly, antennal segment 9 elongated, hind trochanter in male with a spine ; aedeagus with apical projection of median lobe elongated and its tip pointed. Length-3.00 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Namdapha Camp, 1 ex., 21.iv.1981, *S. Biswas* coll.. under bark.

Distribution : India : Arunachal Pradesh ; Malaysia ; Singapore ; Indonesia ; Philippines.

3. *Protosilvanus lateritius* (Reitter)

Silvanus lateritius Reitter, *Verh. zool-bot. Ges. Wien* 28 : 194 (Sri Lanka).

Silvanus (Protosilvanus) lateritius : Grouvelle, 1912, *Annls Soc. ent. Fr.* 81 : 336.

Protosilvanus lateritius : Halstead, 1973, *Bull. Br. Mus. nat. Hist. (Ent.)* 29(2) : 96.

This is one of the common species in India as well as other Oriental countries and found under bark of various trees. This can be easily recognised by its antennal segments 9 and 10 with apical spines ; short, prominent anterior spines of prothorax and pronotum flat ; 7th elytral interstice carinate ; aedeagus with median lobe tapered at apex, each paramere with a few apical setae, of which three are longer than others. Length-2.94-4.64 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Deban North, 14 ex., 28.iv.1981, *S. Biswas* coll. ; Deban, 10 ex., 28.v.1981, *S. Biswas* coll., under bark ; Gibbon land, 360 m, 12 ex., 3.v.1981, *S. Biswas* coll., under bark.

Distribution : Widely distributed in Oriental region.

Silvanoides cribricollis (Grouvelle) Comb. nov.

Silvanus cribricollis Grouvelle, 1897, *Annali Mus. civ. Stor. nat. Giacomo Doria* 38 : 397 (Engano, Sumatra : Indonesia).

Neosilvanus cribricollis (Grouvelle) : Grouvelle, 1912, *Annls Soc. ent. Fr.* 81 : 324.

Grouvelle (1897) described this species under the genus *Silvanus* Latreille and latter (1912) transferred to the genus *Neosilvanus* Grouvelle. But due to the following character this species is placed

in *Silvanoides* Halstead : antennal segments 4-8 about as long as broad to slightly transverse, anterior spines of prothorax situated beneath the level of its anterior margin, ventrite 1 with femoral lines opened. Length 2.6 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Miao, 1 ex., 5.v.1981, S. Biswas coll., under bark.

Distribution : India : Arunachal Pradesh ; Indonesia (Sumatra).

Subfamily : PSAMMOECINAE

5. *Psammoecus trimaculatus* Motschulsky

Psammoecus trimaculatus Motschulsky, 1858, *Etud. Ent.* 7 : 45 (Sri Lanka).

Cucujus incommodus Walker, 1859, *Ann. Mag. nat. Hist.* (3) 3 : 53.

Telephanus cruciger Waterhouse, 1876, *Entomologists' mon. Mag.* 13 : 125.

This species was recorded from some South-east Asian countries and Madagascar. Pal and Sengupta (1979) recorded it from Bhutan. This species shows similarity with *P. impressicollis* Grouvelle and can be distinguished by the presence of longitudinal sutural spot on elytra ; prothorax less transverse and transverse depression near posterior margin indistinct, lateral teeth hardly twice longer than wide ; aedeagus with median lobe long, gradually narrowed and pointed at apex, parameres long and slender, each paramere with a long apical seta and few short setae along its inner margin, a few short and rather dense setae along the broad base of paramere. Length 2.23-2.94 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Chiri Camp, 1 ex., 25.iv.1981, S. Biswas coll.

Distribution : India : Arunachal Pradesh ; Bhutan ; Sri Lanka ; Burma ; Malaysia ; Japan ; Madagascar.

6. *Psammoecus harmandi* Grouvelle

Psammoecus harmandi Grouvelle, 1912. *Bull. Mus. Paris* 28 : 413 (Darjeeling, India).

This species so far remains recorded only from Darjeeling (West Bengal) and is recorded for the first time from Arunachal Pradesh. This species is closely related to *P. lepidus* Grouvelle and can be separated by its teeth on lateral margin of prothorax minute and indistinct, sides of pronotum more or less depressed with lateral margins slightly rounded and narrowed behind middle ; antennal segments 9 and 10 blackish ; aedeagus with median lobe broad, gradually narrowed and slightly constricted above apex, parameres

broadly elongated, each paramere with a few short setae on its surface and two long setae near apex, small glandular punctures on parameres. Length 2.85 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Chiri Camp, 1 ex., 25.iv.1981, S. Biswas coll.

Distribution : India : West Bengal (Darjeeling), Arunachal Pradesh.

Subfamily : ULEIOTINAE

7. *Uleiota spinicollis* (Guérin-Méneville)

Brontes spinicollis Guérin-Méneville, 1829-44, *Iconographie du Règne Animal de G. Cuvier. Insectes* : 205 (Java).

Hyliota atrata Reitter, 1877, *Mitt. Munch. Ent. Ver.* 1 : 247.

Hyliota spinicollis (Guérin-Méneville) : Arrow, 1901, *Trans. ent. Soc. Lond.* 4 : 596

Guérin-Méneville (1829-44) described this species from Java and Arrow (1901) synonymised *Hyliota atrata* Reitter with this species. Pal, Sengupta and Crowson 1984 recorded this species from Arunachal Pradesh and Meghalaya. This is a distinct species and can be easily recognised by its lateral sides of prothorax with large and distinct teeth, antennal segments 5-10 about as broad as scape ; other distinguishing characters : aedeagus with median lobe broadly elongated, parameres slender and elongated, each paramere with a few long apical setae and short setae on its surface. Length 9.37-11.56 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Hornbill Camp, 35 km from Miao, 5 ex. 21.iv.1981, S. Biswas coll., under bark.

Distribution : India : Arunachal Pradesh, Meghalaya ; Indonesia (Java).

8. *Uleiota alticola* Pal, Sengupta and Crowson

Uleiota alticola Pal, Sengupta & Crowson, 1984, *Oriental Insects* 18 : 221-222 (Shillong, Meghalaya).

Pal, Sengupta and Crowson 1984 described this species from Meghalaya. This species resembles Ceylonese species *U. serricollis* Candeze but can be distinguished by its elytral interstices distinctly narrower than rows of punctures, transverse depression on vertex absent, temple about as long as 4-5 eye facets ; aedeagus with median lobe broadly elongated and tapered at apex, parameres short and slender, each paramere with a single long apical seta and a few short setae on inner margin. Length 5.4-6.0 mm.

Material examined : Arunachal Pradesh, Namdapha Survey 1981, Hornbill Camp, 35 km from Miao, 15 ex., 14.iv.1981, *S. Biswas* coll., under bark ; Namdapha Camp, 5 ex., 21.iv.1981, *S. Biswas* coll. ; Deban, 1 ex., 28.v.1981, *S. Biswas* coll., under bark.

SUMMARY

69 specimens collected from Namdapha (Arunachal Pradesh) comprise 8 species under 5 genera. All these species except *Uleiota spinicollis* (Guérin-Ménéville) are first time recorded from Arunachal Pradesh. *Silvanus robustus* Halstead and *Silvanoides cribricollis* (Grouvelle) comb. nov. are recorded for the first time from India. *Uleiota alticola* Pal, Sengupta & Crowson is also recorded.

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INSECTA : COLEOPTERA : CHRYSOMELIDAE

By

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INTRODUCTION

(With 10 Figures)

This report is based on the collection of Chrysomelidae (Subfamilies Criocerinae, Cryptocéphalinae, Eumolpinae, Galerucinae, Chrysomelinae, Alticinae, Hispinae and Cassidinae) from Namdhapa in Tirap District of Arunachal Pradesh by S. Biswas & party.

This collection comprises 56 species under 35 genera of which 2 species are new to science and are described below. 3 species viz. *Atysa gigantea* Maulik was earlier known from Burma, *Lema westwoodi* Jacoby from Sri Lanka and *Psylliodes balyi* Jacoby from China, Sumatra etc., are now being recorded from India for the first time. Besides, 37 species are new records from Arunachal Pradesh which are marked with asterisks. The specimens dealt with in this paper are deposited in the Zoological Survey of India, Calcutta.

SYSTEMATIC ACCOUNT

Order COLEOPTERA

Family CHRYSOMELIDAE

Subfamily CRIOCERINAE

*1. *Lema castanea* Jacoby

1908. *Lema castanea* Jacoby, *Fauna Brit. India, Coleoptera, Chrysomelidae*, 1 : 37.

Material examined : 1 ex., Horn Bill, 14.iv. 1981.

Distribution : India : Assam, Arunachal Pradesh.

2. *Lema* sp. (nr. *castanea* Jacoby)

Material examined : 1 ex., Zero Camp, 9.iv.1981.

Remarks : The specific identity could not be ascertained due to the non-availability of the required literatures.

3. **Lema sp. (nr. assamensis Jacoby)**

Material examined : 1 ex., Hornbill, 11.iv.1981.

Remarks : This is probably a new species but it could not be confirmed due to the non availability of the required literatures.

*4. **Lema femorata Guerin**

1844. *Lema femorata* Guerin, *Icon. Regne Anim., Ins.* : 259.

1908. *Lema femorata* : Jacoby : 56

Material examined : 1 ex., Deban, 6.iv.1981.

Distribution : India : Assam, Arunachal Pradesh.

*5. **Lema westwoodi Jacoby**

1899. *Lema westwoodi* Jacoby. *The Entomologist*, 32 : 68.

1908. *Lema westwoodi* : Jacoby : 64-65

Material examined : 2 exs., Zero Camp, 9.iv. 1981.

Distribution : India : Arunachal Pradesh.

Remarks : This species is being recorded here for the first time from India.

*6. **Lema nigricollis Jacoby**

1891. *Lema nigricollis* Jacoby, *The Entomologist*, Suppl. : 31

1908. *Lema nigricollis* : Jacoby : 69-70.

Material examined : 1 ex., Firm base, 17.iv.1981.

Distribution : India : Assam and Arunachal Pradesh.

Subfamily CRYPTOCEPHALINAE

*7. **Cryptocephalus exsulans Suffrian**

1854. *Cryptocephalus exsulans* Suffrian, *Linn. Ent. Monogr.*, 9 : 149.

1908. *Cryptocephalus exsulans* : Jacoby : 195-196.

Material examined : 1 ex., Deban, 6.iv.1981.

Distribution : Meghalaya and Arunachal Pradesh.

Subfamily EUMOLPINAE

*8. **Nodina indica Jacoby**

1895. *Nodina indica* Jacoby, *Ann. Soc. Ent. Belg.*, 39 : 271.

1908. *Nodina indica* : Jacoby : 292.

Material examined : 3 exs., Firm base, 17.iv.1981.

Distribution : India : Maharashtra and Arunachal Pradesh.

Remarks : This species was, so far, recorded from Maharashtra and now it is being recorded here for the first time from North Eastern India (Arunachal Pradesh).

***9. Basilepta viridipenne (Motschulsky)**

1860. *Nodostoma viridipenne* Motschulsky, in Schrenck, *Reise Amur.*, : 177.

1967. *Basilepta viridipenne* : Kimoto, *Esakia* (6) : 69.

Material examined : 12 exs., Firm base, 17-20.iv.1981.

Distribution : India : Arunachal Pradesh and Himachal Pradesh.

Remarks. Jacoby (1908) mentioned that Motschulsky's material was labeled as "Hab. India".

***10. Basilepta hirsutum Jacoby New combination**

1908. *Nodostoma hirsutum* Jacoby : 343.

Material examined : 2 exs., Firm base, 19.iv.1981.

Distribution : India : Assam and Arunachal Pradesh.

11. Basilepta sp. :

Material examined : 1 ex., Gibbon land, 8.v.1981.

12. Colasposoma sp. (nr. auripenne Motschulsky)

Material examined : 1 ex., Gibbon land, 8.v.1981.

Subfamily GALERUCINAE

***13. Oides pectoralis (Clark)**

1865. *Rhomopalpa pectoralis* Clark, *Ann. Mag. Nat. Hist.*, (3) 15 : 144.

1936. *Oides pectoralis* : Maulik : 114-116.

Material examined. 1 ex., Firm base. 19.iv.1981.

Distribution : India : Sikkim, West Bengal, Meghalaya, Arunachal Pradesh and Manipur.

***14. Merista fraternalis (Baly)**

1879. *Leptarthra fraternalis* Baly, *Cist. Eni.*, 2 : 455.

1936. *Merista fraternalis* : Maulik : 146-147.

Material examined : 1 ex., Hornbill, 10.iv.1981.

Distribution : India : Meghalaya, Arunachal Pradesh and Manipur.

***15. *Aulacophora almora* Maulik**

1936. *Aulacophora almora* Maulik : 170-171.

Material examined : 1 ex., Horn bill, 15.iv.1981.

Distribution : India : Meghalaya, Assam, Arunachal Pradesh, West Bengal and Uttar Pradesh.

***16. *Aulacophora bicolor* (Weber)**

1801. *Galleruca bicolor* Weber, *Obs. Ent.*, : 56.

1936. *Aulacophora bicolor* : Maulik : 187-189.

Material examined : 1 ex., Deban, 7.iv.1981.

Distribution : India : Meghalaya, Arunachal Pradesh and West Bengal.

***17. *Atysa gigantea* Maulik**

1936. *Atysa gigantea* Maulik : 248-249.

Material examined : 1 ex., Zero Camp, 8.iv.1981.

Distribution : India : Arunachal Pradesh.

Remarks : This species was recorded earlier from Burma and now it is being recorded for the first time from India.

***18. *Miltina dilatata* Chapuis**

1875. *Miltina dilatata* Chapuis, *Gen. col.*, 11 : 173.

1936. *Miltina dilatata* : Maulik : 316.

Material examined : 2 exs., Gibbon land, 30.iv.1981 ; 1 ex., Gibbon land, 2.v.1981.

Distribution : India : Assam, Manipur, Arunachal Pradesh and Sikkim.

19. *Cneorinae* sp. (nr. *fulvicornis* Jacoby)

Material examined : 1 ex., Horn bill, 16.iv.1981.

***20. *Dercetina flavocincta* (Hope)**

1831. *Galleruca flavocincta* Hope, in Gray, *Zool. Miscell.*, : 29.

1967. *Dercetina flavocincta* : Kimoto, *Esakia* (6) : 70.

Material examined : 2 exs., Deban, 7.iv.1981.

Distribution : India : West Bengal, Assam, Arunachal Pradesh, Sikkim and Himachal Pradesh.

***21. *Dercetina shona* (Maulik)**

1936. *Dercetis shona* Maulik : 361-362.

1967. *Dercetina shona* : Kimoto, *Esakia* (6) 71.

Material examined : 2 exs., Horn bill, 15.iv.1981.

Distribution : India : West Bengal, Sikkim, Assam, Arunachal Pradesh and Himachal Pradesh.

***22. *Dercetina subcaerulea* (Jacoby) New combination**

1891. *Antipha subcaerulca* Jacoby, *Entomologist* (Suppl.) 24 : 33.

1936. *Dercetis subcaerulea* : Maulik : 364-365.

Material examined : 2 exs., Gibbonland, 30.iv.1981.

Distribution : India : Assam, Meghalaya, Arunachal Pradesh and Manipur.

***23. *Monolepta signata* (Olivier)**

1808. *Galeruca signata* Olivier, *Entomologist*, : 6 : 665.

1963. *Monolepta signata* : Gressitt & Kimoto : 633-634.

Material examined : 1 ex., Deban, 7.iv.1981.

Distribution : India : Assam and Arunachal Pradesh.

24. *Monolepta* sp.

Material examined : 3 exs., Horn bill, 11.iv.1981.

25. *Mandarella nagpurensis* Duvivier

1892. *Mandarella nagpurensis* Duvivier, *An. Soc. Ent. Belg.*, 36 : 434.

1936. *Mandarella nagpurensis* : Maulik : 459.

Material examined : 1 ex., Horn bill, 12.iv.1981.

Distribution : India : Bihar and Arunachal Pradesh.

26. *Hoplasomedia* sp. (nr. *sarata* Maulik)

Material examined : 1 ex., Deban, 7.iv.1981.

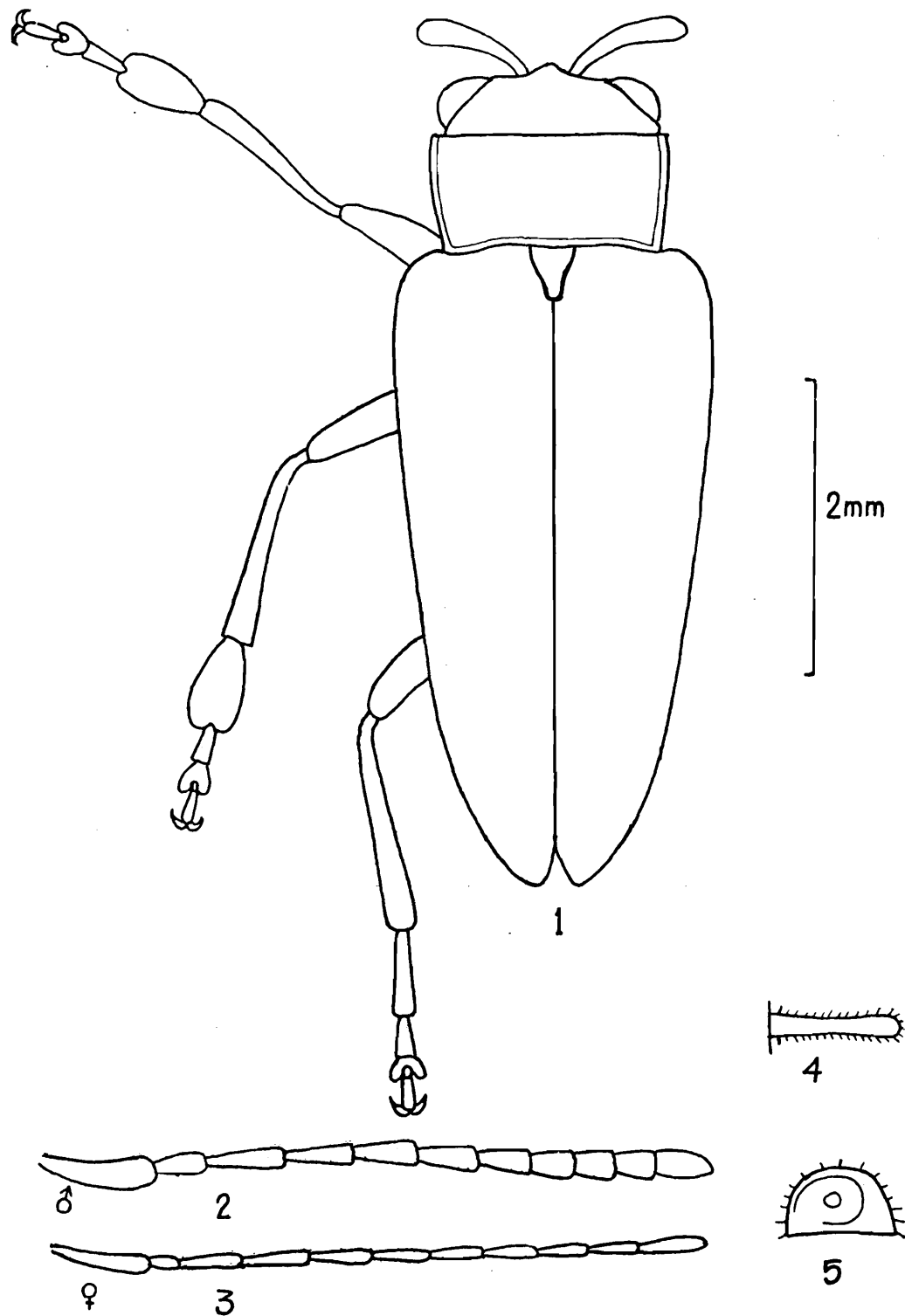
Remarks : The specific identity could not be ascertained as the specimen was not in a good condition.

27. *Hoplasomedia arunachalensis* sp. nov.

(Fig. 1-5)

Entirely yellowish brown, head and pronotum shining, elytra dull.

Head with vertex smooth and impunctate, clypeal carina sharp ; antennae reaching beyond the middle of elytra ; in ♀ (Fig. 3) filiform, segment 1 long and club shaped, segment 2 small and rounded, segments 3-10 gradually shorter, segment 11 longer ; in ♂ (Fig. 2) apical



Figs. 1-5. *Hoplasomedia arunachalensis* sp. nov., 1. Dorsal view, 2. Antennae of ♂, 3. Antennae of ♀. 4. Abdominal Process, 5. Cross sectional view of antennal segment.

segments modified and thickened, segment 1 long and club shaped, segment 2 small, segment 3 much longer than segment 2, segments 3-7 subequal, segments 8-11 shorter and thicker, under side of segments 6-11 flat (as if longitudinally cut off along the middle, a cross sectional diagram (Fig. 5) of epical end of segment 9 is given). *Prothorax* twice as broad as long, broadened anteriorly, anterior margin nearly straight, posterior margin slightly sinuate, lateral margins nearly straight, surface indistinctly punctate at sides with a broad transverse depression along middle. *Scutellum* triangular with the apex rounded and its surface smooth and impunctate. *Elytra* narrowed apically, basal area behind scutellum slightly convex, whole surface finely and confusedly punctate. Tarsal segment 1 of anterior two pairs of legs dilated in male and its abdomen with a single process (Fig. 4).

Measurements of holotype : Total length 6.00 mm, width of head across eyes 1.50 mm, length of antennae 4.70 mm, width of prothorax across middle 1.60 mm, length of elytra 5.00 mm and width of elytra across middle 2.20 mm.

Holotype ♂ and *paratype* ♀, INDIA : Arunachal Pradesh : Namdapa, Hornbill, 14.iv.1981, S. Biswas.

Remarks : This species is near *H. rasha* Maulik but can be easily separated by the following characters : Entirely yellowish brown ; under side of segments 6-11 in male flat as if longitudinally cut off along the middle ; prothorax twice as broad as long, surface minutely punctate at sides ; first tarsal segment of anterior two pairs of legs in male strongly dilated.

28. *Minastra* sp. (nr. *arcuata* Baly)

Material examined : 1 ex., Firmbase, 18.iv.1981.

Remarks : The specimen was damaged.

*29. *Sphenoraia* (*Sphenoraoides*) *rutilans* (Hope)

1831. *Eumolpus rutilans* Hope, in Gray, *Zool. Miscell.*, : 30

1963. *Sphenoraia* (*Sphenoraoides*) *rutilans* : Gressitt & Kimoto, *Pac. Ins. Monogr.*, 1 B : 657.

Material examined : 1 ex, Hornbill, 14.iv.1981.

Distribution : India : West Bengal, Bihar, Assam, Meghalaya, Arunachal Pradesh, Sikkim, Uttar Pradesh, Himachal Pradesh and Kashmir.

30. Aplosonyx chalybaeus (Hope)

1831. *Galleruca chalybaeus* Hope, in Gray, *Zool. Miscell.*, : 28.

1963. *Aplosonyx chalybaeus* : Gressitt & Kimoto : 653-654.

Material examined : 12 exs., Gibbon land, 2.v.1981 ; 13 exs., Deban 2.iv.1981.

Distribution : India : Sikkim, Assam and Arunachal Pradesh.

***31. Aplosonyx scutellatus Baly**

1879. *Haplosonyx scutellatus* Baly, *Cist. Ent.*, 2 : 452.

1936. *Aplosonyx scutellatus* : Maulik : 616

Material examined : 5 exs., Hornbill, 14.iv.1981.

Distribution : India : Assam and Arunachal Pradesh.

***32. Gallerucida limbata (Baly)**

1878. *Eustetha limbata* Baly, *Cist. Ent.*, 2 : 462

1936. *Gallerucida limbata* : Maulik : 550.

Material examined : 1 ex., Gibbon land, 2.v.1981.

Distribution : India : Assam and Arunachal Pradesh.

Subfamily CHRYSOMELINAE

***33. Agroteomela indica indica (Hope)**

1831. *Chrysomela indica* Hope, in Gray, *Zool. Misc.*, : 29.

1963. *Agroteomela indica indica* : Gressitt & Kimoto : 331

Material examined : 1 ex., Namdhapa Camp, 21.iv.1981.

Distribution : India : West Bengal, Arunachal Pradesh, Nagaland, Manipur, Sikkim and Uttar Pradesh.

***34. Humba cyanicollis (Hope)**

1831. *Chrysomela cyanicollis* Hope, in Gray, *Zool. Misc.*, : 29

1963. *Humba cyanicollis* : Gressitt & Kimoto : 333

Material examined : 5 exs., Namdhapa Camp, 23.iv.1981.

Distribution : India : Sikkim, West Bengal, Assam, Arunachal Pradesh and Manipur.

Subfamily ALTICINAE

***35. Psylliodes balyi Jacoby**

1884. *Psylliodes balyi* Jacoby, *Notes Lyden Mus.*, 6 : 30

1969. *Psylliodes balyi* : Scherer : 237

Material examined : 19 exs., Miao, 5.iv.1981.

Distribution : India : Arunachal Pradesh.

Remarks : This species is recorded here for the first time from India.

36. *Hespera* sp.

Material examined : 1 ex., Namdhapa Camp, 23.iv.1981.

Remarks : The specimen was damaged.

37. *Hespera biswasi* sp. nov.

(Fig. 6-10)

Oblong, entirely dark brown to blackish with yellowish brown pubescence.

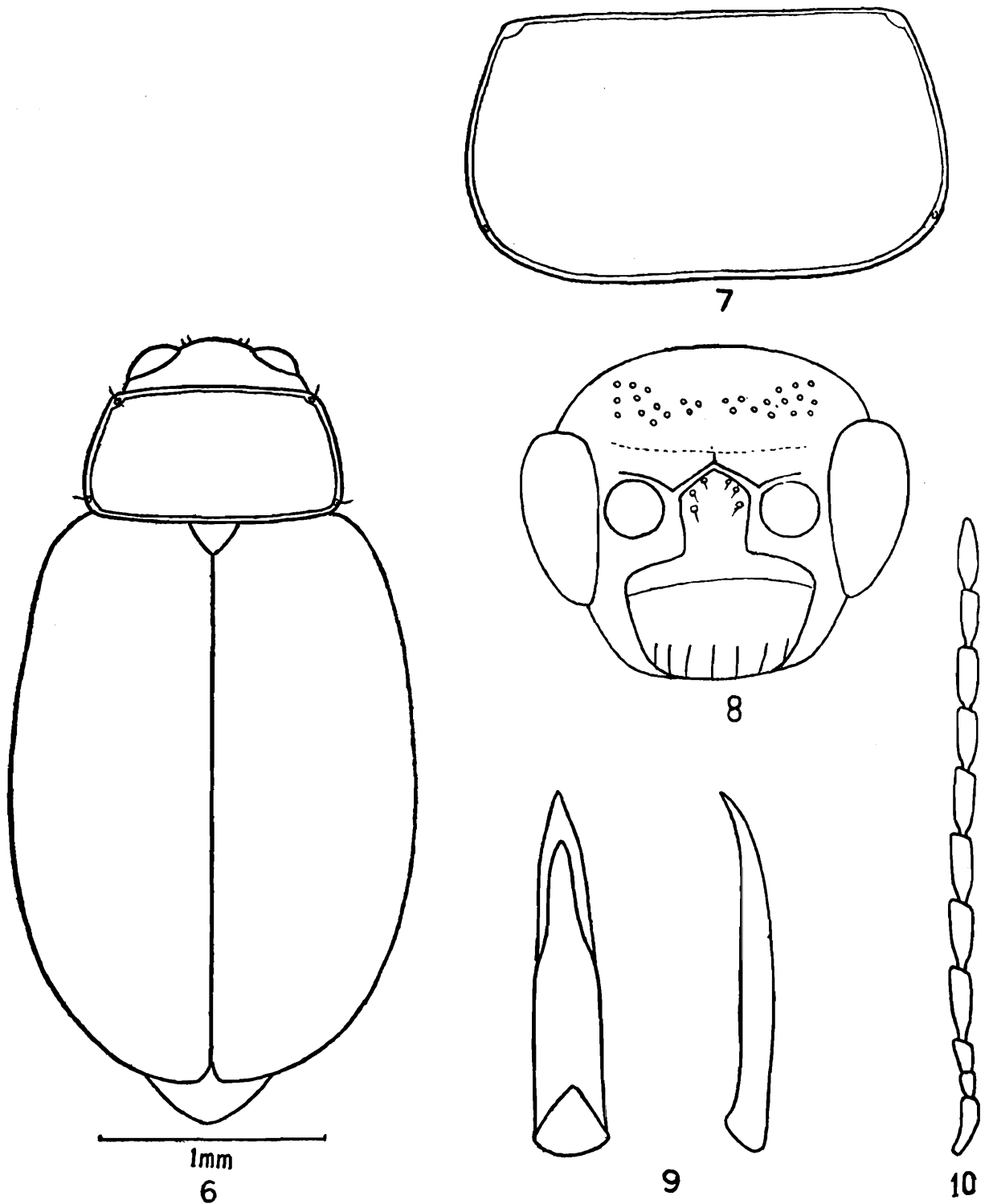
Head (Fig. 8) convex with surface finely granulate and with scattered strong punctures, not covered with pubescence, clypeal longitudinal carina strongly raised, antennal calli prominent and transverse. **Antennae** (Fig. 10) extending beyond the middle of elytra, segment 1 long and club-shaped, segment 2 small and rounded, segment 3 slightly longer than segment 2, segments 4-11 subequal and each of them longer than segments 2 and 3 combined and also thicker. **Prothorax** (Fig. 7) about one and half times broader than long, slightly narrowed anteriorly, sides almost straight, posterior angles widely rounded, surface granulose-punctate and covered with pubescence. **Scutellum** triangular and granulate. **Elytra** almost parallel sided, granulose punctate and covered with pubescence. **Aedeagus** as figured (Fig. 9).

Measurements of Holotype : Total length 3.30 mm, width of head across eyes 0.75 mm, length of antennae 2.50 mm, width of prothorax across middle 0.90 mm, length of elytra 2.40 mm and width of elytra across middle 1.90 mm.

Paratypes range from 2.75 mm to 4.0 mm in length.

Holotype ♂ and **Paratypes** 5 ♀ ♀ ♂ ♂, India ; Arunachal Pradesh : Tirap Div., Namdhapa, Miao, 5.iv.1981, S. Biswas

Remarks : This species is near *H. kumaonensis* Scherer but can be easily separated by the following characters : Entirely dark brown ; head without pubescence and with scattered strong punctures, antennal calli moderately broad, antennal segments 4-11 subequal and each of them longer than segments 2 and 3 combined ; elytral granulated surface having equal rugosity with that of pronotum ; size larger (upto 4.0 mm).



Figs. 6-10. *Hespera biswasi* sp. nov., 6. Dorsal view, 7. Prothorax, 8. Front view of head, 9. Ventral and lateral views of aedeagus, 10. Antennae.

***38. *Eudolia nila* Maulik**

1926. *Eudolia nila* Maulik : 200-201

1969. *Eudolia nila* : Scherer : 95

Material examined : 2 exs., Namdhapa Camp, 23.iv.1981.

Distribution : India : Assam, Arunachal Pradesh and Manipur.

***39. Hyphasis indica Baly**

1879. *Hyphasis indica* Baly, *Cist. Ent.*, 2 : 442.

1969. *Hyphasis indica* : Scherer : 180

Material examined : 3 exs., Deban North, 28.iv.1981.

Distribution : India : West Bengal, Sikkim, Assam, Arunachal Pradesh and Manipur.

40. Clitea sp. (nr. metallica Chen)

Material examined : 1 ex., Zero Camp, 8.iv.1981.

41. Nisotra sp. (nr. viridipennis Mots.)

Material Examined : 1 ex., Firmbase, 21.iv.1981.

42. Sphaeroderma sp.

Material examined : 1 ex., Firmbase, 19.iv.1981 ; 17 exs., Namdhapa Camp, 21-24.iv.1981 ; 6 exs., Hornbill, 16.iv.1981.

Remarks : The above material contain four species and will be included in the Author's next work the Indian species of *Sphaeroderma* which is in progress.

***43. Hemipyxis lusca (Fabricius)**

1801. *Crioceris lusca* Fabricius, *Syst. Eleuth.*, 1 : 456.

1963. *Hemipyxis lusca* : Gressitt & Kimoto : 843

Material examined : 1 ex., Miao, 2.iv.1981.

Distribution : India : Assam and Arunachal Pradesh.

***44. Hemipyxis brevicollis Jacoby New Combination**

1903. *Sebaethe brevicollis* Jacoby, *Ann. Soc. Ent. Belg.*, 47 : 106.

Material examined : 1 ex., Hornbill, 14.iv.1981.

Distribution : India : Tamil Nadu and Arunachal Pradesh.

Remarks : This species was recorded, so far, from Southern India and now it is being recorded for the first time from North Eastern India.

45. Hemipyxis sp. (nr. brevicollis Jacoby)

Material examined : 1 ex., Gibbon land, 30.iv.1981.

Remarks : The specific identity could not be confirmed due to the bad condition of the specimen.

46. **Hemipyxis** sp. (nr. *ioscopa* Maulik)

Material examined : 1 ex., Hornbill, 16.iv.1981.

Remarks : The species may be a new one but could not be established at the present moment.

Subfamily HISPINAE

*47. **Dactylispa doriae** (Gestro)

1890. *Hispa doriae* Gestro, *Ann. Mns. Civ. Genova*, 30 : 256.

1919. *Dactylispa doriae* : Maulik : 172-173.

Material examined : 1 ex., Hornbill, 16.iv.1981.

Distribution : India : Sikkim, West Bengal, Assam and Arunachal Pradesh.

*48. **Dactylispa bindusara** Maulik

1919. *Dactylispa bindusara* Maulik : 193-194

1981. *Dactylispa bindusara* : Kimoto and Takizawa, *Ent. Rev. Japan*, 35 (1/2) : 65.

Material examined : 2 exs., Namdhapa Camp, 23.iv.1981.

Distribution : India : Uttar Pradesh, Sikkim, West Bengal, Meghalaya and Arunachal Pradesh.

49. **Dactylispa** sp.

Material examined : 1 ex., Firmbase, 20.iv.1981.

Remarks : The specimen was damaged.

Subfamily CASSIDINAE

*50. **Epistictina viridimaculata** Boheman

1850. *Epistictia viridimaculata* Boheman, *Mon. Cassid.*, 1 : 15.

1972. *Epistictina viridimaculata* : Vazirani : 150.

Material examined : 1 ex., Hornbill, 15.iv.1981.

Distribution : India : Sikkim, West Bengal, Assam, Arunachal Pradesh and Manipur.

***51. *Aspidomorpha sanctaecrucis* (Fabricius)**

1792. *Cassida sanctaecrucis* Fabricius, *Ent. Syst.*, 4 : 446.

1963. *Aspidomorpha sanctaecrucis* : Gressitt & Kimoto : 953-954.

Material examined : 1 ex., Miao, 1.iv.1981.

Distribution : India : Sikkim, West Bengal, Assam, Meghalaya, Arunachal Pradesh, Karnataka, Kerala and Tamil Nadu.

***52. *Aspidomorpha chandrika* Maulik**

1919. *Aspidomorpha chandrika* Maulik : 331-332

1963. *Aspidomorpha chandrika* : Gressitt & Kimoto : 949

Material examined : 1 ex., Gibbonland, 2.v.1981.

Distribution : India : West Bengal and Arunachal Pradesh.

***53. *Aspidomorpha furcata* (Thunberg)**

1789. *Cassida furcata* Thunberg, *Nov. Ins. Spec.*, 5 : 87.

1963. *Aspidomorpha furcata* : Gressitt & Kimoto : 950-952

Material examined : 1 ex., Deban, 6.iv.1981.

Distribution : India : Sikkim, West Bengal, Assam, Arunachal Pradesh, Orissa, Karnataka and Kerala.

***54. *Lacoptera quadrimaculata* (Thunberg)**

1789. *Cassida quadrimaculata* Thunberg, *Nov. Ins. Spec.*, 5 : 86.

1972. *Lacoptera quadrimaculata* : Vezirani : 150

Material examined : 3 exs., Deban North, 28.iv.1981.

Distribution : India : Sikkim, Assam, Arunachal Pradesh, Meghalaya, West Bengal, Uttar Pradesh, Karnataka, Kerala and Andaman Island.

55. *Cassida occursans* Spaeth

1914. *Cassida occursans* Spaeth, *Deut. Ent. Zeits.*, : 560.

1972. *Cassida occursans* : Vazirani : 148-149.

Material examined : 2 exs., Hornbill, 14.iv.1981.

Distribution : India : West Bengal, Assam and Arunachal Pradesh.

***56. *Cassida catenata* (Boheman)**

1855. *Coptocycla catenata* Boheman, *Mon. Cassid.*, 3 : 262.

1919. *Cassida catenata* : Maulik : 406

Material examined : 1 ex., Namdhapa Camp, 22.iv.1981.

Distribution : India : West Bengal, Arunachal Pradesh and Uttar Pradesh.

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SUMMARY

Fifty-six species belonging to thirty-four genera distributed in eight subfamilies are reported in this paper. Two species namely *Hoplasmia arunachalensis* and *Hespera biswasi* are new to science. Three species are new records from India, thirty-seven species are new records from the state (Arunachal Pradesh). Of the species dealt with in this paper, twenty-five species are endemic to North East India, three species are extended to Southern India and thirty-two species limited to Himalayan region.

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INSECTA : COLEOPTERA : CERAMBYCIDAE

By

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INTRODUCTION

The present paper deals with the material collected from Namdapha, Tirap district, Arunachal Pradesh between 1981 to 1983. The material consists of 12 species under 11 genera of the subfamilies Prioninae, Cerambycinae and Lamiinae. From the available literature dealing on the taxonomy of Cerambycidae of India and her neighbouring countries, namely Gahan (1906), Stebbing (1914), Beeson (1941) and Rondon and Breuning (1970), it has been observed that they do not report any species from Arunachal Pradesh. Consequently all the species in this communication are the first record from that State. All the specimens examined have been deposited in the collections of Zoological Survey of India.

SYSTEMATIC ACCOUNT

Subfamily : PRIONINAE

Tribe : CALLIPOGONINI

1. *Aegosoma ornaticolle* White

1853. *Aegosoma ornaticolle* White, *Cat. Coleopt. B. M.*, Longic. p. 30.

1853. *Aegosoma ornaticolle* White, *Proc. zool. Soc. London*, p. 27.

1906. *Aegosoma ornaticolle*, Gahan, *Fauna Brit. India*, Vol. I. Cerambycidae. p. 45.

Material examined : 1 ex, Miao, 6.v.1981, S. Biswas coll.

Distribution : This species is known from Burma and India. In India it is found in Assam, Manipur and Arunachal Pradesh (Namdapha). This species is being recorded for the first time from Arunachal Pradesh.

Subfamily : CERAMBYCINAE

Tribe : CERAMBYCINI

2. *Dialeges pauper* Pasc.

1856. *Dialeges pauper*, Pascoe, *Trans. ent. Soc.* (2), iv, p. 47, pl. 16, fig. 7.

1869. *Dialeges tenuicornis*, Pascoe, *Trans. ent. Soc.*, (3), iii, p. 522.

1906. *Dialeges pauper*, Gahan, *Fauna Brit. India*, Vol. I, Cerambycidae, p. 142.

1914. *Dialeges pauper*, Stebbing, *Indian Forest Insects, Coleoptera*, p. 336.

Material examined : 1 ex, Deban, 13.xii.1982, S. Biswas coll.

Distribution : This species is found in India, Perak, Penang, Singapore and Borneo. In India it is known from Allahabad, Darjeeling, Assam : Patkai Mts. (Doherty), Goalpara and Arunachal Pradesh (Namdapha). The species is being recorded for the first time from Arunachal Pradesh.

Tribe : MOLORCHINI

3. *Merionoeda nigriceps* White

1855. *Merionoeda nigriceps* White, *Cat. Col. B. M. Longic*, p. 181, pl. 5, fig. 1.

1906. *Merionoeda nigriceps*, Gahan, *Fauna Brit. India*, Vol. I, Cerambycidae, p. 173.

Material examined : 4 exs, Gibbon's land, 10 m from Miao, 2.v.1981, S. Biswas coll.

Distribution : This species is known from Burma and India. In India it is recorded from Patkai mountains of Assam and Arunachal Pradesh (Namdapha). This species is being recorded for the first time from Arunachal Pradesh.

Remarks : The beetle was collected from the newly constructed rest camp where it used to come during day time almost everyday.

Tribe : COMPSOCERINI

4. *Rosalia decempunctata* (Westwood)

1848. *Purpuricenrus decempunctata* Westwood, *Cab. Or. Ent.* p. 59, pl. 29, fig. 2.

1906. *Rosalia decempunctata*, Gahan, *Fauna Brit. India*, Cerambycidae. p. 179.

Material examined : 4 ex, (1 ex, Gibbon's land, 30.iv.1981 ; 1 ex, 40th Mile camp, 24.iv.1981, 2 exs, Hornbill, 13.iv.1981) S. Biswas coll.

Distribution : This species is known from India, Java and Borneo. In India it is recorded from Sikkim, Darjeeling, Pedong, Assam and Arunachal Pradesh (Namdapha). This species is being recorded for the first time from Arunachal Pradesh.

Remarks : All the specimens were collected in flying condition, during day time.

5. *Rosalia formosa* (Saund.)

1839. *Cerambyx formosa* Saund., *Trans. ent. Soc. Lond.* ii, p. 178, pl. 16, fig. 4.

1906. *Rosalia formosa*, Gahan, *Fauna Brit. India*, Vol. I, Cerambycidae. p. 180.

Material examined : 1 ex, Hornbill, 30 km N. E. of Miao, 18.xii.1983, S. Biswas coll.

Distribution : In India it has been recorded from the Himalayas, Sikkim, Darjeeling, Barrackpore, Assam and Arunachal Pradesh (Namdapha). This species is being recorded for the first time from Arunachal Pradesh.

Tribe : CLYTINI

6. *Caloclytus annularis* Fab.

1787. *Callidium annularis* Fab., *Mant. Ins-i*, p. 156.
 1801. *Clytus annularis* Fab., *Syst. Eleuth*, ii, p. 352.
 1841. *Clytus annularis* Lap et Gory, *Hist. Nat. et Iconogr. des Ins. Coleopt* (Mon. du genere *Clytus*) p. 102, pl. 19, fig. 121.
 1863. *Chlorophorus annularis* Chev., *Mem. Soc. R. Sci. de Liege*, xviii, p. 290.
 1906. *Caloclytus annularis*, Gahan, *Fauna Brit. India*, Vol. I, *Cerambycidae*, p. 261.

Material examined : 4 exs, (2 exs, Hornbill, 14.iv.1981 ; 2 exs, Gibbons land, 2.v.1981) S. Biswas coll.

Distribution : It is found in Northern India from the North-West to Assam and Arunachal Pradesh (Namdapha). Besides it occurs in Burma, Thailand, China, Japan, Malaya and New Guinea. This species is being recorded for the first time from Arunachal Pradesh.

Subfamily : LAMIINAE

Tribe : MONOCHAMINI

7. *Monochamus bimaculatus* Gahan

1888. *Monochamus bimaculatus* Gah., *Ann. Mag. Nat. Hist. Ser. 6*, 2 : 260.
 1925. *Monochamus bimaculatus* Gressitt, *Longicornia* 2 : 393.
 1970. *Monochamus bimaculatus*, Rondon and Breuning *Pac. Ins. Mon.* 24 : 315-571.

Material examined : 1 ex, Deban North, 28.v.1981, S. Biswas coll.

Distribution : In general the species is found in the Oriental region. In India it is known from E. Himalaya, Sikkim, Darjeeling, Uttar Pradesh : Dehra Dun and Arunachal Pradesh (Namdapha). This species is being recorded for the first time from Arunachal Pradesh.

Tribe : BATOCERINI

8. *Batocera titana* Thoms.

1859. *Batocera titana* Thoms., *Mon. Arcan. Nat.* p. 82.
 1914. *Batocera titana*, Stebbing, *Indian Forest Insects, Coleoptera*, p. 367.

Material examined : 7 exs, Hornbill, 30 km NE of Miao, 14.xii. 1983, S. Biswas coll.

Distribution : Burma and India. In India it is found in Chicacole, Ganjam, Madras and Arunachal Pradesh (Namdapha). This species is being recorded for the first time from Arunachal Pradesh.

Remarks : This species was collected from the trees felled the previous year to make a clearing for Forest Department Range Office. Both larvae and adult were found in the same tree. The larvae were being consumed by the local porters accompanying the tour party.

Tribe : RHODOPINI

9. *Diboma* sp.

Material examined : 1 ex, Zero Camp, 8.v.1981, S. Biswas coll.

Remarks : This species comes close to *Diboma tranquilla* Thoms. in general facies, pubescence and punctures but differs from it in that the frons of the head in the former is more concave and the median groove is very fine and indistinct. Due to non-availability of more material, identification has been possible upto generic level only.

Tribe : DORCASHEMATINI

10. *Olenecamptus* sp.

Material examined : 1 ex, Miao, 6.v.1981, S. Biswas coll.

Remarks : The specimen does not agree with any of the known species under this genus. This is an interesting specimen and more materials are necessary for its specific identity.

Tribe : PTEROPLINI

11. *Pterolophia* sp.

Material examined : 1 ex, Gibbon's land, 16 km East of Miao, 17.xii.1982, S. Biswas coll.

Remarks : *Pterolophia* sp. comes close to *Pterolophia tibialis* Breun. except that the protuberances and ridges on the pronotum and elytra are more prominent. In the National Zoological Collections there is also a specimen from North Sikkim determined by E. F. Gilmour as *Pterolophia* sp. Both specimens probably belong to an undescribed species and requires further studies,

Tribe : PHYTOCEINI

12. *Oberea nigriventris* Bat.1873. *Oberea nigriventris* Bates, *Ann. Mag. Nat. Hist.*, (4) xii, p. 389.1961. *Oberea nigriventris*, Breuning, *Frustula Entomologica*, Part 2, p. 93.*Material examined* : 1 ex, Deban, 28.v.1981, S. Biswas coll.*Distribution* : This species is known from Burma, Japan, China, North Vietnam, Laos and India (Present record). In India this species is being recorded for the first time from Arunachal Pradesh.*Remarks* : The specimen was collected from dead branch of an Orange tree. Orange trees, which are being newly introduced in the area, are extensively damaged by some longicorn borers. This may be one of the species responsible for such damage.

SUMMARY

This paper reports on the Cerambycidae collected from Namdapha Wild Life Sanctuary which consists of 12 species under 11 genera of which 9 species are first record from Arunachal Pradesh. Selected reference, specimen examined and geographical distribution of the species are provided.

ACKNOWLEDGEMENT

We are thankful to Dr. B. K. Tikader, Director, Zoological Survey of India for the laboratory facilities provided.

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INSECTA : HYMENOPTERA

By

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Zoological Survey of India, Calcutta.

INTRODUCTION

The present account based on the collection in Namdhapa, Arunachal Pradesh deals with 161 examples* comprising of 28 species and 5 subspecies distributed over 21 genera in 11 families : Apidae (5 genera, 7 species), Halictidae (1 genus, 2 species), Xylocopidae (1 genus, 1 species, 1 subspecies), Sphecidae (4 genera, 4 species), Scoliidae (1 genus, 1 species, 1 subspecies), Mutillidae (1 genus, 1 species), Pompilidae (1 genus, 1 species), Eumenidae (1 genus, 1 species), Vespidae (4 genera, 7 species, 3 subspecies), Chrysididae (1 genus, 2 species), Chalcididae (1 genus, 1 species). All the species are reported here for the first time from this region. All the material are deposited in the collection of Zoological Survey of India, Calcutta.

SYSTEMATIC ACCOUNT

Family : APIDAE

1. *Apis indica* Fabricius

1798. *Apis indica* Fabr., *Ent. Syst. Suppl.*, (1798) : 274.

1897. *Apis indica* : Bingham, *Fauna British India, Hym.*, 1 : 558, ♀ ♂ ♀ [Syns.].

Material examined : 16 ♀ ♀. INDIA : Arunachal Pradesh : Namdhapa, 7 ♀ ♀, 22.iv.1981 ; Hornbill, 6 ♀ ♀, 13.iv.1981 ; Deban, 2 ♀ ♀, 27.iv.1981, 1 ♀, 2.v.1981.

Distribution : Throughout India, Burma, Sri Lanka ; extending through the Malayasia on the east and to the Madagascar on the west.

2. *Apis (Megapis) dorsata* Fabricius

1793. *Apis dorsata* Fabr., *Ent. Syst.*, 2 : 328.

1897. *Apis dorsata* : Bingham, *Fauna British India, Hym.*, 1 : 557, ♀ ♂ ♀ [Syns.].

1904. *Apis (Megapis) dorsata* : Ashmead, *Proc. Ent. Soc. Wash.*, 6 : 120.

* All the collection were made by Dr. Shyamrup Biswas and party, Zoological Survey of India, Calcutta.

Material examined : 75 ♀ ♀. INDIA : Arunachal Pradesh : Namdhapa, 18 ♀ ♀, 21-22.iv.1981 ; Hornbill, 7 ♀ ♀, 13.iv.1981 ; Deban, 45 ♀ ♀, 27.iv.1981 ; Gibbon land, 5 ♀ ♀, 2.v.1981.

Distribution : Widely distributed throughout India, Burma, Sri Lanka ; extending upto China and Indonesia through Malayasia.

3. *Apis (Micrapis) florea* Fabricius

1787. *Apis florea* Fabr., *Mant. Insect.*, 1 : 305.

1897. *Apis florea* : Bingham, *Fauna British India*, Hym., 1 : 559, ♂ ♀ ♀ [Syns.].

1904. *Apis (Micrapis) florea* : Ashmead, *Proc. Ent. Soc. Wash.*, 6 : 122.

Material examined : 7 ♀ ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : India, Sri Lanka, Burma ; extending in the Malayan region as far as Indonesia.

4. *Crocisa emarginata* Lepeletier

1841. *Crocisa emarginata* Lepel., *Hist. Nat. Ins. Hym.*, 2 : 449, ♀ ♂.

1897. *Crocisa emarginata* : Bingham, *Fauna British India*, Hym., 1 : 517, ♀ ♂ [Syns.].

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : Throughout India, Sri Lanka, Burma ; extending to South Africa on the west and China and Malaya Archipelago on the east.

5. *Anthophora zonata* (Linnaeus)

1758. *Apis zonata* Linn., *Syst. Nat.* (Ed. 10), 1 : 576.

1897. *Anthophora zonata* : Bingham, *Fauna British India*, Hym., 1 : 527, ♂ ♀ [Syns.].

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : Throughout India, Burma, Sri Lanka ; extending from Malayasia to Australia.

6. *Bombus orientalis* Smith

1854. *Bombus orientalis* Smith, *Cat. Hym. Brit. Mus. London*, 2 : 402, ♀.

1897. *Bombus orientalis* : Bingham, *Fauna British India*, Hym., 1 : 555, ♀ ♂ ♀ [Syns.].

Material examined : 2 ♀ ♀. INDIA : Arunachal Pradesh : Namdhapa : Chiria Camp, 1 ♀, 25.iv.1981 ; Gibbon land, 1 ♀, 2.v.1981.

Distribution : Throughout India (mainly found in Darjeeling, Sikkim and Arunachal Pradesh).

7. *Trigona ventralis* Smith

1858. *Trigona ventralis* Smith, *J. Proc. Linn. Soc. Zool.*, 2 : 50, ♀

1897. *Melipona ventralis* : Bingham, *Fauna British India, Hym.*, 1 : 562, ♀ [Syns.].

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa, 22.iv.1981.

Distribution : India, Burma, Indonesia.

Family : HALICTIDAE

8. *Nomia (Rhopalomelissa) aurifrons* Smith

1875. *Nomia aurifrons* Smith, *Trans. Ent. Soc. London*, (1875) : 43, ♀.

1897. *Nomia aurifrons* : Bingham, *Fauna British India, Hym.*, 1 : 455, ♀ [Syns.].

1965. *Nomia (Rhopalomelissa) aurifrons* : Michener, *Bull. Amer. Mus. Nat. Hist.*, New York, 130 : 159.

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa, 22.iv.1981.

Distribution : India, Burma, Bangladesh.

9. *Nomia (Curvinomia) albofasciata* Smith

1875. *Nomia albofasciata* Smith, *Trans. Ent. Soc. London*, (1875) : 57, ♀.

1897. *Nomia albofasciata* : Bingham, *Fauna British India, Hym.*, 1 : 452, ♀ [Syns.].

1965. *Nomia (Curvinomia) albofasciata* : Michener, *Bull. Amer. Mus. Nat. Hist.*, New York, 130 : 154.

Material examined : 15 ♂♂, 2 ♀♀, INDIA : Arunachal Pradesh : Namdhapa : Hornbill, 13.iv.1981.

Distribution : India, Burma, Indonesia.

Family : XYLOCOPIDAE

10. *Xylocopa (Zonohirsuta) collaris binghami* Cockerell

1841. *Xylocopa collaris* Lepel., *Hist. Nat. Ins.*, *Hym.*, 2 : 189, ♀.

1897. *Xylocopa collaris* : Bingham, *Fauna British India, Hym.*, 1 : 543, ♀ ♂ [Syns.].

1938. *Xylocopa (Zonohirsuta) collaris binghami* : Maa, *Rec. Ind. Mus. Calcutta*, 40 : 301, ♀.

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa, 20.iv.1981.

Distribution : India, Sri Lanka, Burma ; extending into the Malayan region and Siam.

Family : SPHECIDAE

11. Sceliphron (Prosceliphron) formosum (Smith)

1856. *Pelopoeus formosum* Smith, *Cat. Hym. Brit. Mus.*, 4 : 230, ♀.
 1897. *Sceliphron formosum* : Bingh., *Fauna British India, Hym.*, 1 : 239, ♀ [Syns.].
 1976. *Sceliphron (Prosceliphron) formosum* : Bohart and Menke, (a revisionary work on Sphecidae), *Univ. California Press* : 106 [Syns.].

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : India, Burma, China, Indonesia, Australia, New Guinea.

12. Psen rufiventris Cameron

1890. *Psen rufiventris* Cam., *Mem. Manch. L. Ph. Soc.*, (4) 3 : 267, ♀.
 1976. *Psen rufiventris* : Bohart and Menke, (a revisionary work on Sphecidae), *Univ. California Press* : 167.

Material examined : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa : Deban, 6.iv.1981.

Distribution : India (Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Arunachal Pradesh).

13. Liris (Leptolarra) jaculator (Smith)

1856. *Larrada jaculator* Smith, *Cat. Hym. Brit. Mus.*, 4 : 279, ♀.
 1976. *Liris (Leptolarra) jaculator* : Bohart and Menke, (a revisionary work on Sphecidae), *Univ. California Press* : 246 [Syns.].

Material examined : 2 ♀ ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : India, Burma.

14. Ectemnius (Metacrabro) chrysites (Kohl)

1892. *Crabro chrysites* Kohl, *Ann. Naturhist Hofmus. Wien.*, 7 : 197.
 1976. *Ectemnius (Metacrabro) chrysites* : Bohart and Menke, (a revisionary work on Sphecidae), *Univ. California Press* : 425 [Syns.].

Material examined : 1 ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban, 6.iv.1981.

Distribution : India, Japan, Korea, Taiwan, Ryukyus, Philippines, U.S.S.R.

Family : SCOLIIDAE

15. *Megascolia (Regiscolia) azurea chistiana* (Guglia and Betrem)

1958. *Scolia (Triscolia) azurea chistiana* Guglia and Betrem, *Ann. Mus. Civico St. Nat.*, 70 : 96.

1964. *Megascolia (Regiscolia) azurea chistiana* Betrem and Bradley, *Zool. Meded.*, 39 : 443 (new comb.).

Material examined : 3 ♀ ♀ , INDIA : Arunachal Pradesh : Namdhapa : Chiria Camp, 25.iv.1981.

Distribution : India, Burma, Sri Lanka.

Family : MUTILLIDAE

16. *Mutilla gribodoi* Magr.

1892. *Mutilla gribodoi* Magr., *Ann. Mus. Civ. Gen.*, (2) 12 : 229, ♂.

1897. *Mutilla gribodoi* : Bingham, *Fauna British India, Hym.*, 1 : 46, ♂.

Material examined : 2 ♀ ♀ , INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : India, Burma.

Family : POMPILIDAE

17. *Pompilus bioculatus* Bingham

1896. *Pompilus bioculatus* Bingham, *J. Proc. Linn. Soc. Zool.*, 25 : 431.

1897. *Pompilus bioculatus* : Bingham, *Fauna British India, Hym.*, 1 : 167, ♀ ♂.

Material examined : 1 ♀ , INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : India, Burma, China, Japan.

Family : EUMENIDAE

18. *Odynerus fraternus* Bingham

1897. *Odynerus fraternus* Bingham, *Fauna British India, Hym.*, 1 : 366, ♀.

Material examined : 1 ♂ , INDIA : Arunachal Pradesh : Namdhapa : Hornbill, 11.iv.1981.

Distribution : India, Burma.

Family : VESPIDAE*

19. *Polistes* (*Megapolistes*) *olivaceus* (De Geer)

1773. *Vespa olivacea* De Geer, *Mem. Hist. Insect*, 3 : 582, fig.

1897. *Polistes hebraeus* : Bingham, *Fauna British India, Hym.*, 1 : 398, ♀ or ♂ [Syns.].

1983. *Polistes* (*Megapolistes*) *olivaceus* : Das and Gupta, *Oriental Ins.*, 17 : 407 [Syns.].

Material examined : 1 ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban, 2.iv.1981.

Distribution : India, Nepal, Burma, Sri Lanka, South China, Taiwan, Philippines, Thailand, Vietnam, Malayasia, North Africa, Fiji, Tahiti, Japan, Mauritius, Australia, New Zealand.

20. *Polistes* (*Nygmpolistes*) *tenebricosus sulcatus* Smith

1852. *Polistes sulcatus* Smith, *Trans. Ent. Soc. London*, (2) 2 : 38, ♂ ♀.

1983. *Polistes* (*Nygmpolistes*) *tenebricosus sulcatus* : Das and Gupta, *Oriental Ins.*, 17 : 406 [Syns.].

Material examined : 1 ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban, 2.iv.1981.

Distribution : India, Nepal, China, Japan.

21. *Vespa* (*Vespa*) *basalis* Smith

1852. *Vespa basalis* Smith, *Trans. Ent. Soc. London*, (2) 2 : 46, ♀.

1983. *Vespa* (*Vespa*) *basalis* : Das and Gupta, *Oriental Ins.*, 17 : 438 [Syns.].

Material examined : 2 ♀ ♀. INDIA : Arunachal Pradesh : Namdhapa : Deban, 1 ♀, 28.iv.1981 ; Gibbon land, 1 ♀, 2.v.1981.

Distribution : India, Burma, Sri Lanka, Nepal, Indo-China, Taiwan, Thailand, China.

22. *Vespa* (*Vespa*) *tropica tropica* (Linnaeus)

1758. *Sphex tropica* Linn., *Syst. Nat.* (Ed. 10), 1 : 571, ♀.

1897. *Vespa cincta* : Bingham, *Fauna British India, Hym.*, 1 : 402, ♀ or ♂ [Syns.].

1983. *Vespa* (*Vespa*) *tropica tropica* : Das and Gupta, *Oriental Ins.*, 17 : 443 [Syns.].

Material examined : 1 ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban More, 28.iv.1981.

Distribution : India, Burma, Sri Lanka, Indo-China, Malayasia, Indonesia, Australia, Central Asia, South America.

* Das and Gupta (1983) may be referred for detailed synonymy.

23. *Vespa (Vespa) mandarinia magnifica* Smith

1852. *Vespa magnifica* Smith, *Trans. Ent. Soc. London*, (2) 2 : 45.

1983. *Vespa (Vespa) mandarinia magnifica* : Das and Gupta, *Oriental Ins.*, 17 : 440.

Material examined : 2 ♀ ♀ . INDIA : Arunachal Pradesh : Namdhapa : Hornbill, 11-13.iv.1981.

Distribution : India, Nepal, Burma, Sri Lanka, South Asia, Taiwan, South China.

24. *Provespa anomala* (Saussure)

1853. *Vespa anomala* Sauss., *Mon. Guep. Soc.*, 2 : 112, ♀ , pl. xiv, fig. 2.

1897. *Vespa dorylloides* : Bingham, *Fauna British India, Hym.*, 1 : 400, ♀ ♂ [Syns.].

1983. *Provespa anomala* : Das and Gupta, *Oriental Ins.*, 17 : 433 [Syns.].

Material examined : 4 ♀ ♀ . INDIA : Arunachal Pradesh : Namdhapa, 1 ♀ , 18.iv.1981 ; Gibbon land, 2 ♀ ♀ , 2.v.1981 ; Miao, 1 ♀ , 5.v.1981.

Distribution : India, Burma, Indonesia, Malayasia.

25. *Parapolybia varia* (Fabricius)

1787. *Vespa varia* Fabr., *Mant. Insect.*, 1 : 293.

1897. *Polybia orientalis* : Bingham, *Fauna British India, Hym.*, 1 : 383, ♂ [Syns.].

1983. *Parapolybia varia* : Das and Gupta, *Oriental Ins.*, 17 : 430 [Syns.].

Material examined : 6 ♂ ♂ , 7 ♀ ♀ . INDIA : Arunachal Pradesh : Namdhapa : Deban, 4 ♂ ♂ , 2-7.iv.1981 ; 7 ♀ ♀ , 27.iv.1981 ; 1 ♂ , 28.iv.1981 ; Chiria camp, 1 ♂ , 25.iv.1981.

Distribution : India, Nepal, Burma, Luichow Is., Philippines, Malayasia, China, Japan.

Family : CHRYSIDIDAE

26. *Chrysis (Trichrysis) imperiosa* Smith

1874. *Chrysis imperiosus* Smith, *Trans. Ent. Soc. London*, (1874) : 460.

1959. *Chrysis (Trichrysis) imperiosa* : Linsenmaier, *Mitt. Schweiz. ent. Ges.*, 32(1) : 170.

Material examined : 1 ♀ , INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.

Distribution : India, Sri Lanka, Burma.

27. **Chrysis (Hexachrysis) principalis** Smith1874. *Chrysis principalis* Smith, *Trans. Ent. Soc. London*, (1874) : 461, ♀1968. *Chrysis (Hexachrysis) principalis* : Linsenmaier, *Mitt. Schweiz. ent. Ges.*, 41 : 122.*Material examined* : 1 ♂, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.*Distribution* : India, Burma, Sri Lanka.

Family : CHALCIDIDAE

28. **Brachymeria lasus** (Walker)1841. *Chalcis lasus* Walker, *Entomologist*, (1841) : 219.1973. *Brachymeria lasus* : Joseph, Narendran and Joy, *Zool. Mon. No. 1, Univ. of Calicut, Calicut* : 29, fig. 1 [Syns.].*Material examined* : 1 ♀, INDIA : Arunachal Pradesh : Namdhapa : Deban, 27.iv.1981.*Distribution* : India, Sri Lanka, Burma.

SUMMARY

The paper deals with 161 examples, collected from Namdhapa, Arunachal Pradesh, comprising of 28 species, 5 subspecies distributed over 21 genera in 11 families. All the species are reported here for the first time from this region.

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INSECTA : DIPTERA

By

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(With 3 Figures)

INTRODUCTION

After a long time since the Abor expedition 1911-1912, the Zoological Survey of India alone or in collaboration with other organizations in India and abroad conducted a number of faunistic surveys since 1961 in order to investigate the faunal compositions in a remote North-Eastern State, Arunachal Pradesh (erstwhile N.E.F.A.). Our knowledge on the Dipterous fauna of the State is mainly concerned with the contributions by Brunetti (1913), Philip (1970), Joseph and Rao (1972a, b), Joseph and Parui (1973, 1977), Stone and Philip (1974), Joseph and Ray (1976), Datta and Das (1978), and Datta (1980).

The Dipterous material collected during the Namdapha exploration includes families : Tipulidae, Stratiomyidae, Tabanidae, Syrphidae, Micropezidae, Diopsidae, Celyphidae, Muscidae, Calliphoridae and Sarcophagidae dealt with in the paper.

The type-specimens are deposited in the National Zoological Collections of the Zoological Survey of India, Calcutta.

SYSTEMATIC ACCOUNT

Family : TIPULIDAE

1. *Holorusia fulvolateralis* (Brunetti)

1911. *Tipula fulvolateralis* Brunetti, *Rec. Indian Mus.*, 6 : 249.

1912. *Tipula fuivolateralis* Brunetti : Brunetti, *Fauna Brit. India*, Diptera, 1 : 304.

1973. *Holorusia fulvolateralis* (Brunetti) : Alexandre and Alexander, *A Catalog of Diptera of the Oriental Region*, 1 : 27.

Material examined : 1 ♀ (ZSI Reg. No. 6908/H₆), Namdapha, 22.iv. 1981.

Remarks : The species originally described from Assam and Uttar Pradesh, has been recorded from Arunachal Pradesh, Sikkim and West Bengal (Brunetti, 1912 ; Joseph and Parui, 1977) in India. This has

also been reported from Burma and Nepal (Alexander and Alexander, 1973).

2. *Holorusia* sp.

Material examined : 1 ♀ (ZSI Reg. No. 6909/H₆), Miao Reserve forest, 5.iv. 1981.

Remarks : The single female specimen is left undetermined for lack of associated male specimens.

Family : STRATIOMYIDAE

3. *Sargus metallinus* Fabricius

1805. *Sargus metallinus* Fabricius, *Syst. Antliat.*, : 258.

1920. *Sargus metallinus* Fabricius : Brunetti, *Fauna Brit. India, Diptera*, 2 : 82.

1975. *Sargus metallinus* Fabricius : James, *A Catalog of Diptera of the Oriental Region*, 2 : 21.

Material examined : 1 ♀ (ZSI Reg. No. 6910/H₆), Deban, 27.iv.1981.

Remarks : This is a widespread Oriental species (James, 1975). The species originally described from Bihar and Uttar Pradesh in India, has so far been reported from Aru islands, Borneo, Celebes, Java, Moluccas, Rangoon, Singapore, Shanghai and Sri Lanka (Brunetti, 1920 ; James, 1975). This is, however, recorded for the first time from Arunachal Pradesh.

4. *Stratiosphecomyia variegata* Brunetti

1913. *Stratiosphecomyia variegata* Brunetti, *Rec. Indian Mus.*, 9 : 261.

1920. *Stratiosphecomyia variegata* Brunetti : Brunetti, *Fauna Brit. India, Diptera*, 2 : 37.

1975. *Stratiosphecomyia variegata* Brunetti : James, *A Catalog of Diptera of the Oriental Region*, 2 : 41.

Material examined : 1 ♂, 1 ♀ (ZSI Reg. Nos. 6911/H₆-6912/H₆), Gibbon Land, 3.v.1981.

Remarks : This species originally described from Darjeeling (West Bengal), has been recorded from Meghalaya and Sikkim (Brunetti, 1920 ; James, 1975). This is recorded for the first time from Arunachal Pradesh. This is the only known species under the genus from the Oriental region. The thoracic and abdominal colour variations may be regarded intraspecific at present (*cf.* Brunetti, 1920).

Family : TABANIDÆ

5. *Tabanus (Tabanus) namdaphaicus* sp. nov.

(Figs. 1-A, B, C)

A medium-sized brownish species having subquadrate basal and spindle-shaped median callosities, dark red antenna, slender sickle-shaped palpus, black legs with partly yellowish tibiae and pale median spot on first abdominal tergite.

Female.—Length 12-13 mm. *Head* : Eyes bare, uniformly buff-grey, unbanded (relaxed). Frons (Fig. 1-A) gradually divergent above ; index 1 : 5.5, distinctly yellow pollinose anteriorly and darker posteriorly, entirely black pilose ; vertex greyish. Basal callosity subquadrate, rugose, dark grey, resting on subcallus but not touching eye-margins ; median callus nearly spindle-shaped, rugose, black, an inverted v-shaped depression above median callus on frons. Subcallus greyish, yellow

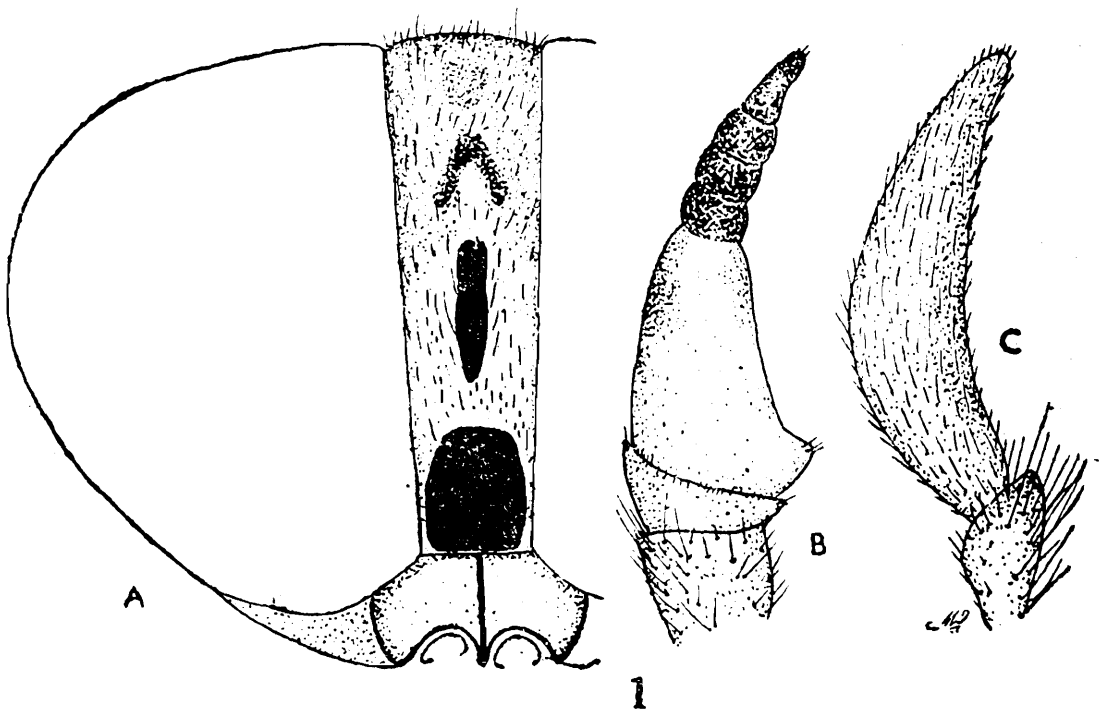


Fig. 1. *Tabanus (Tabanus) namdaphaicus* sp. nov.

pollinose ; face and parafacials also greyish, yellow pollinose ; face with a few black and brown hairs at upper corners only ; parafacials with a few short dark hairs and many long hairs. Antenna (Fig. 1-B) rather short, dark red with black style ; scape and pedicel black-haired ; plate of flagellum rather broad, little excised, tooth low, obtuse, with two or three black hairs ; ultimate annulus of flagellum narrower than others. Palpus (Fig. 1-C) rather slender, sickle-shaped, brown, densely black-haired. *Thorax* : Notum shiny black with reddish

prealar calli, with inconspicuously incomplete median stripe and complete broader lateral stripes ; dorsum black-haired and prealar calli with mixed yellow and black hairs ; Scutellum shiny black with black hairs and a few brown hairs apically. Pleura reddish brown with yellow hairs ; sternopleuron with long brown hairs. *Wing* : 12-13 mm. long, clear, a little smoky costally ; cell R_5 open but slightly narrower posteriorly ; spur vein absent ; basicosta black setose. *Legs* : Fore coxa brownish ; mid and hind coxae black ; femora and tarsi black ; basal half of fore tibia and one-fifth each of mid and hind tibiae yellowish, rest black. Halteres dark.

Abdomen : Broad, brownish black on basal 2 tergites, rest black ; corners of tergite 1, sides of other tergites, across incisures, more prominently at tergite 1 and pale median spot on tergite 1 with bright yellow hairs, rest with black hairs. Venter also brownish black ; all incisures with bright yellow hairs.

Material examined : *Holotype* ♀ (ZSI Reg. No. 6630/H₈), INDIA : Arunachal Pradesh, Tirap District, Namdapha, Gibbon Land, 3. v. 1981, Coll. S. Biswas. *Paratype* ♀ (ZSI Reg. No. 6631/H₈), Arunachal Pradesh, Tirap District, Namdapha, Deban, 27, iv. 1981, Coll. S. Biswas.

Remarks : This new species is apparently close to *Tabanus* (*Tabanus*) *hirtipalpis* Ricardo, 1911, described from Nepal and *T. (T.) scutellus* Philip, 1970, described from Arunachal Pradesh and Sikkim, India. Independent of the shape and size of the callosities these three species differ among others in the characters enumerated below :

<i>namdaphaicus</i>	<i>hirtipalpis</i>	<i>scutellus</i>
1. Brownish black species of 12-13 mm.	Black species of 9 mm.	Brownish species of 9.5-10.5 mm.
2. Antenna dark red with black style	Antenna reddish yellow with black style	Antenna entirely red
3. Palpus slender, sickle-shaped, black-haired	Palpus stout, ending in a fine short point, mainly pale-haired	Palpus stout, gradually ending in a point, black-haired
4. Thorax black with inconspicuous stripes	Thorax black, unstriped	Thorax black, unstriped
5. Wing without spur vein	Wing without spur vein	Wing with short spur vein

<i>namdaphaicus</i>	<i>hirtipalpis</i>	<i>scutellus</i>
6. Fore coxa brown, others black	All black	All pale yellow
7. Abdomen with pale median spot on tergite 1	Abdomen without such median spot on tergite 1	Abdomen without such median spot on tergite 1

6. *Tabanus (Tabanus) shyamarupi* sp. nov.

(Figs. 2-A, B, C)

A medium-sized dull black species having broad frons with short club-shaped frontal callosity, mainly dark antenna, yellowish palpus with gradually narrowing end, mainly blackish legs and abdomen with inconspicuous reddish lateral spots.

Female.—Length 16-17 mm. *Head* : Eyes bare, uniformly buff-grey, unbanded (relaxed). Frons (Fig. 2-A) slightly wider above ; index 1 : 5.8, brown pollinose, darkening above and black pilose more at vertex. Callosity dark grey ; basal callus nearly square ; club-shaped linear extension occupying only half length of frons, without touching subcallus and eye-margins. Subcallus greyish, brown pollinose ; face

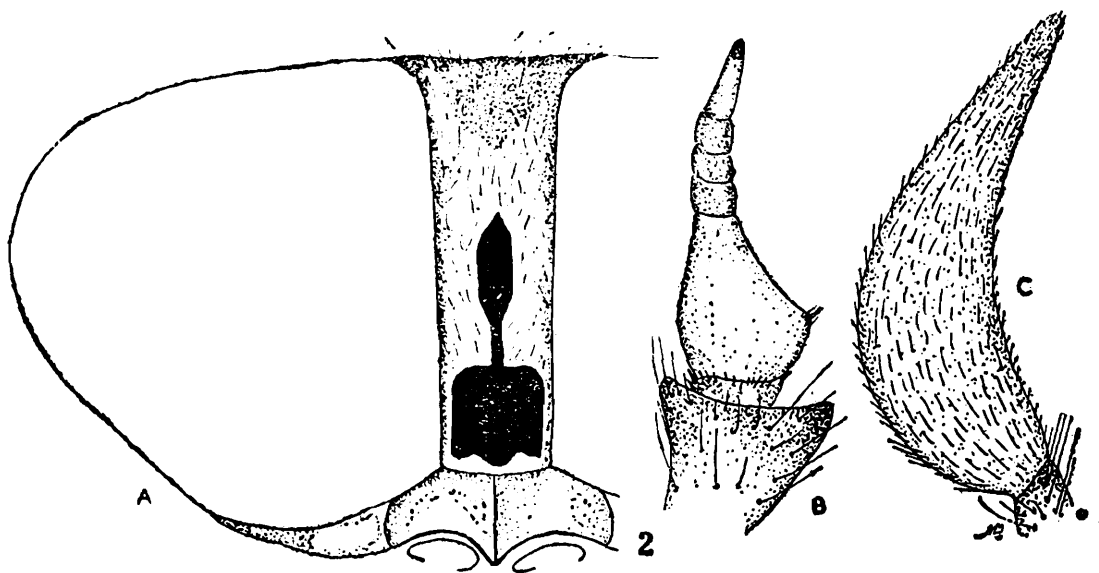


Fig. 2. *Tabanus (Tabanus) shyamarupi* sp. nov.

and parafacials also greyish, brown pollinose and black-haired. Antenna (Fig. 2-B) nearly 2.5 mm. long, scape much enlarged and almost concealing pedicel, both black with black hairs ; flagellum dark red, plate short, slightly longer than wide, last annulus longer and narrower ; tooth distinct with a few black hairs. Palpus (Fig. 2-C) large, yellowish, black haired, broad base gradually ending in an acute point.

Thorax : Notum black with dark red prealar and postalar calli ; dorsum with recumbent yellow hairs and erect long black hairs, sides black-haired. Scutellum concolourous with scutum, with long black hairs. Pleura and sternopleuron black with black hairs. **Wing :** 15-16 mm. long, clear, cell R_5 open but slightly constricted distally, spur vein absent ; basicosta black setose. **Legs :** All black except dark red basal half of fore tibiae, nearly basal two-thirds of mid and hind tibiae, black-haired. Halteres reddish brown. **Abdomen :** Entirely black with inconspicuous reddish lateral spots on tergites 2, 3 and 4, black-haired except yellow-haired incisures medially. Venter black with white-haired incisures.

Material examined : *Holotype* ♀ (ZSI Reg. No. 6632/ H_6), India : Arunachal Pradesh, Tirap District, Namdapha, Deban, 8.iv.1981, Coll. S. Biswas. *Paratype* ♀ (ZSI Reg. No. 6633/ H_6), Arunachal Pradesh, Tirap District, Namdapha, Deban, 27.iv.1981, Coll S. Biswas.

Remarks : This new species is named after the Collector in concurrence with the Sanskrit word "Shyamarup" for its blackish appearance. *Tabanus (Tabanus) inobservatus* Ricardo, 1911, described from Sumatra resembles this species in its black appearance but differs among other characters in having very narrow frons, entirely black antenna, palpi and legs, and brownish tinged wings.

7. *Tabanus (Tabanus) miniatus* Datta & Biswas

1977. *Tabanus miniatus* Datta & Biswas, *Proc. Indian Acad. Sci. (B)*, 86 : 130.

Material examined : 5 ♀ ♀ (ZSI Reg. Nos. 6635/ H_6 -6639/ H_6), Namdapha, Deban, 27.iv.1981 ; 1 ♀ (ZSI Reg. No. 6640/ H_6), Namdapha, Gibbon Land, 29.iv.1981 ; 1 ♀ (ZSI Reg. No. 6641/ H_6), Namdapha, Gibbon Land, 3.v.1981.

Remarks : This has originally been described from Garo hills of Meghalaya, India. This is for the first time recorded from Arunachal Pradesh.

8. *Tabanus (Tabanus) rubicundus* Macquart

1846. *Tabanus rubicundus* Macquart, *Dipt. exot. suppl.*, 1 : 33 (160).

1911. *Tabanus rubicundus* Macquart : Ricardo, *Rec. Indian Mus.*, 4 : 172.

1975. *Tabanus (Tabanus) rubicundus* Macquart : Stone, *A Catalog of Diptera of the Oriental Region*, 2 : 67.

Material examined : 5 ♀ ♀ (ZSI Reg. Nos. 6642/ H_6 -6646/ H_6),

Namdapha, Deban, 27.iv.1981 ; 1 ♀ (ZSI Reg. No. 6647/H₆), Namdapha, Deban, 28.iv.1981 ; 1 ♀ (ZSI Reg. No. 6648/H₆), Namdapha, Gibbon Land, 29.iv.1981 ; 2 ♀ ♀ (ZSI Reg. Nos. 6649/H₆-6650/H₆), Namdapha, Gibbon Land, 3.v.1981.

Remarks : This has been described from India, most probably from Assam. This is recorded for the first time from Arunachal Pradesh. This species also occurs in Bangladesh, Burma and Java (Stone, 1975).

9. *Tabanus (Tabanus) monotaeniatus* (Bigot)

1892. *Atylotus monotaeniatus* Bigot, *Mém. Soc. zool. Fr.*, 5 : 655.

1911. *Tabanus monotaeniatus* (Bigot) : Ricardo, *Rec. Indian Mus.*, 4 : 159.

1975. *Tabanus (Tabanus) monotaeniatus* (Bigot) : Stone, *A Catalog of Diptera of the Oriental Region*, 2 : 64.

Material examined : 1 ♀ (ZSI Reg. No. 6634/H₆), Namdapha, Deban, 27.iv.1981.

Remarks : This has originally been described from Assam and Meghalaya (Ricardo, 1911). Joseph and Rao (1972b) recorded it from Arunachal Pradesh. This species occurs also in Burma, China and Java (Stone, 1975).

10. *Tabanus (Tabanus) tenuifrons* sp. nov.

(Figs. 3-A, B, C)

A medium-sized reddish brown species having extremely narrow frons with linear frontal callus, entirely reddish brown antenna, acutely ended palpus, mainly reddish brown legs and unspotted abdomen.

Female.—Length 15-16 mm. *Head* : Eyes bare, uniformly buff-grey, unbanded (relaxed). Frons (Fig. 3-A) extremely narrow, anteriorly half as wide as at vertex ; index 1 : 12, yellow pollinose and black pilose, more at vertex ; vertex greyish. Frontal callus dark grey, narrow, with a long linear extension upward to more than two-thirds of frontal height, much above subcallus and without touching eye-margins. Subcallus greyish, yellow pollinose ; face and parafacials nearly black, yellow pollinose ; face with erect black hairs and parafacials with long brown and black hairs. Antenna (Fig. 3-B) about 2.8 mm long, entirely reddish brown ; scape and pedicel with black hairs ; plate of flagellum very long with distinct tooth ; tooth with some black hairs. Palpus (Fig. 3-C) large, yellowish, densely black-haired, ending in an acute point. *Thorax* : Notum black with reddish

prealar calli, three inconspicuous stripes—lateral stripes apparently wider; dorsum yellow-haired and shoulders long black-haired. Scutellum black with slightly reddish apex, mostly long, black-haired. Pleura greyish, mostly with long brown hairs; sternopleuron entirely with long brown hairs. *Wing*: 16-17 mm long, fumose anteriorly; cell R_5 open but slightly narrower posteriorly; spur vein dot-like; basicosta black-setose.

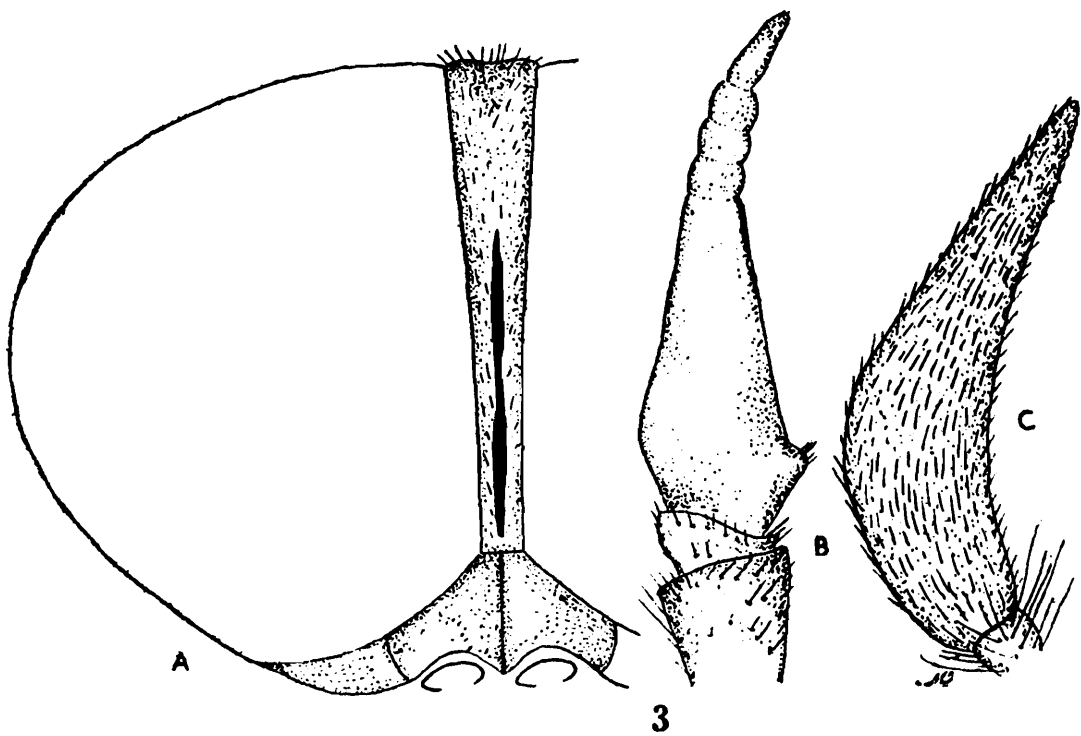


Fig. 3. *Tabanus (Tabanus) tenuifrons* sp. nov.

Legs: All coxae blackish brown; femora reddish brown; fore tibia reddish brown with dark tip; mid and hind tibiae entirely reddish brown; fore tarsus black; mid and hind tarsi black with reddish brown first tarsomeres; hind tibial fringe black, inner hairs yellowish. Halteres reddish brown.

Abdomen: Broad, reddish brown, darker apically; dorsum entirely covered with black recumbent hairs. Venter reddish brown with black hairs; incisures yellow-haired, sides mainly with black hairs.

Material examined: *Holotype* ♀ (ZSI Reg, No. 6628/H₆), INDIA: Arunachal Pradesh, Tirap District, Namdapha, Deban, 28. iv. 1981, Coll. S. Biswas. *Paratype* ♀ (ZSI Reg. No. 6629/H₆), Arunachal Pradesh, Tirap District, Namdapha, Deban, 28. iv. 1981, Coll. S. Biswas.

Remarks : This new species resembles *Tabanus (Tabanus) fumifer* Walker, 1857, described from Borneo and subsequently recorded from Java, Sumatra, Celebes and Nias island (all in Indonesia) and from Malaysia, in having extremely narrow frons with linear frontal callus but differs in acutely ended palpus, essentially reddish brown legs and unspotted abdomen.

11. ***Tabanus (Tabanus)* sp.**

Material examined : 1 ♀ (ZSI Reg. No. 6651/H₆), Namdapha, Deban, 27. iv. 1981, Coll. S. Biswas.

Remarks : This is very close to, if not merely a variant of, *T. (T.) miniatus* Datta and Biswas, 1977 : the former appears to differ at least in having entirely red antenna. This is not, however, described for its partially damaged condition.

12. ***Haematopota annandalei* Ricardo**

1911. *Haematopota annandalei* Ricardo, *Rec. Indian Mus.* 4: 335.

1958. *Chrysozona annandalei* (Ricardo) : Liu, *Acta zool. Sin.*, 10 : 152.

1975. *Haematopota annandalei* Ricardo : Stone, *A Catalog of Diptera of the Oriental Region*, 2 : 73.

Material examined : 1 ♀, (ZSI Reg. No. 6653/H₆), Namdapha, Gibbon Land, 29. iv. 1981 ; 4 ♀♀ (ZSI Reg. Nos. 6654/H₆-6657/H₆), Namdapha, Gibbon Land, 2. v. 1981 ; 1 ♀, (ZSI Reg. No. 6658/H₆), Namdapha, Gibbon Land, 3. v. 1981, Coll. S. Biswas.

Remarks : This has originally been described from Meghalaya and subsequently recorded from Assam and Maharashtra, India (Stone and Philip, 1974). This species is recorded here for the first time. This species also occurs in Burma and ?China (Liu, 1958).

Family : SYRPHIDAE

13. ***Allograpta javana* (Wiedemann)**

1824. *Syrphus javanus* Wiedemann, *Analecta Ent.*, : 34.

1923. *Sphaerophoria javana* (Wiedemann) : Brunetti, *Fauna Brit. India, Diptera*, 3 : 100.

1975. *Allograpta javana* (Wiedemann) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 308.

Material examined : 4 ♂♂, 1 ♀ (ZSI Reg. Nos. 6851/H₆-6855/H₆), Namdapha, 22. iv. 1981.

Remarks : The species originally described from Java, has been subsequently reported from Arunachal Pradesh, Karnataka, Meghalaya, Tamil Nadu in India and from Australia, Borneo, China, Fiji, Guadalcanal, Hawaii, Japan, Korea, Malaya, New Guinea, Philippines, Sumatra, Sri Lanka, Taiwan and Thailand (Brunetti, 1923 ; Joseph and Rao, 1972b ; Joseph and Parui, 1973 ; and Knutson, Thompson and Vockeroth, 1975).

14. *Asarkina (Asarkina) ericetorum* (Fabricius)

1781. *Syrphus ericetorum* Fabricius, *Spec. Insect.*, 2 : 425.

1923. *Asarcina ericetorum* (Fabricius) : Brunetti, *Fauna Brit. India*, Diptera, 3 : 63.

1975. *Asarkina (Asarkina) ericetorum* (Fabricius) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 309.

Material examined : 2 ♂♂ (ZSI Reg. Nos. 6857/H₆-6858/H₆), Namdapha, 22. iv. 1981 ; 1 ♂ (ZSI Reg. No. 6859/H₆), Deban, Namdapha, 2 iv. 1981 ; 3 ♀♀ ; (ZSI Reg. Nos. 6860/H₆-6862/H₆), Hornbill, Namdapha, 11-13. iv. 1981 ; 1 ♀ (ZSI Reg. No. 6863/H₆), Deban, 27. iv. 1981.

Remarks : The species has been reported to occur throughout the Oriental region and has also been recorded from Australia, Fiji, Moluccas, New Guinea and Samoa (Brunetti, 1923 ; Joseph and Rao, 1972 ; Joseph and Parui, 1973, 1977 ; Knutson *et al.* ; 1975 ; Joseph and Ray, 1976 ; and Datta and Chakraborti, 1983). The species has originally been described from Africa.

15. *Citrogramma* sp.

Material examined : 1 ♀ (ZSI Reg. No. 6905/H₆), Namdapha, 22. iv. 1981.

Remarks : This species is left for confirmation in future when male specimens will be available for studies.

16. *Episyrphus balteatus* (De Geer)

1776. *Musca balteata* De Geer, *Mém. pour surv. Hist. Ins.*, 6 : 116.

1923. *Syrphus balteatus* (De Geer) : Brunetti, *Fauna Brit. India*, Diptera, 3 : 82.

1975. *Episyrphus balteatus* (De Geer) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 314.

Material examined : 1 ♀ (ZSI Reg. No. 6856/H₆), Hornbill, Namdapha, 11. iv. 1981,

Remarks : The species is widely distributed throughout the Oriental region and occurs also in Australia, Bonin islands, Ethiopian and Palaearctic regions (Burnetti, 1923 ; Joseph and Rao, 1972 ; Joseph and Parui, 1973 ; Knutson *et al.*, 1975 ; Joseph and Ray, 1976 ; and Datta and Chakraborti, 1983). This has been described from European material.

17. *Metasyrphus* (*Metasyrphus*) *confrater* (Wiedemann)

1830. *Syrphus confrater* Wiedemann, *Aussereurop zweifl. Insekt.*, 2 : 120.
 1923. *Syrphus confrater* Wiedemann : Brunetti, *Fauna Brit. India*, Diptera, 3 : 92.
 1975. *Metasyrphus* (*Metasyrphus*) *confrater* (Wiedemann) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 317.

Material examined : 1 ♀ (ZSI Reg. No. 6864/H₈), Deban, Namdapha, 8.iv.1981 ; 1 ♀ (ZSI Reg. No. 6865/H₈), Deban North, 28.iv.1981.

Remarks : The species has been reported to occur throughout the Oriental region and has subsequently been recorded from Japan (Joseph and Rao, 1972a ; Knutson *et al.* (1975). This has originally been described from China (Knutson *et al.*, *op. cit.*).

18. *Syrphus isaaci* Bhatia

1933. *Syrphus isaaci* Bhatia, *Indian J. agric. Sci.*, 2 : 566.
 1975. *Syrphus isaaci* Bhatia : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 319.

Material examined : 1 ♂, 1 ♀ (ZSI Reg. Nos. 6866/H₈-6867/H₈), Hornbill, Namdapha, 13. iv. 1981 ; 1 ♀ (ZSI Reg. No. 6868/H₈), Deban, 2. iv. 1981.

Remarks : This is distributed in Assam, Bihar and Uttar Pradesh in India and in Nepal (Knutson *et al.*, 1975). This is recorded for the first time from Arunachal Pradesh. The species has been left unplaced along with certain other species of *Syrphus* Fabricius by Knutson *et al.* (*op. cit.*).

19. *Melanostoma orientale* (Wiedemann)

1824. *Syrphus orientalis* Wiedemann, *Analecta Ent.*, : 36.
 1923. *Melanostoma orientale* (Wiedemann) : Brunetti, *Fauna Brit. India*, Diptera, 3 : 48.
 1975. *Melanostoma orientale* (Wiedemann) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 325.

Material examined : 1 ♀ (ZSI Reg. No. 6869/H₆), Deban, 7.iv.1981.

Remarks : The species has been reported to occur throughout the Oriental region (Knutson *et al.*, 1975) but has so far been recorded from Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Meghalaya, Uttar Pradesh and West Bengal in India and in Bhutan, Pakistan and Sri Lanka (Brunetti, 1923 ; Joseph and Rao, 1972b ; Joseph and Parui, 1973, 1977 ; Joseph and Ray, 1976 ; and Datta and Chakraborti, 1983). The species has been originally described from India (Knutson *et al.*, *op. cit.*).

20. *Chrysotoxum baphyrus* Walker

1849. *Chrysotoxum baphyrus* Walker, *List Dipt. Br. Mus.*, 3 : 542.

1923. *Chrysotoxum baphyrus* Walker : Brunetti, *Fauna Brit. India*, Diptera, 3 : 296.

1975. *Chrysotoxum baphyrus* Walker : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 326.

Material examined : 1 ♂ (ZSI Reg.No. 6870/H₆), Deban, 27.iv.1981.

Remarks : This species originally described from West Bengal, has been reported to occur in Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir, Kerala, Meghalaya, Tamil Nadu and Uttar Pradesh in India (Brunetti, 1923 ; Joseph and Rao, 1972b ; Joseph and Parui, 1973 ; Joseph and Ray, 1976 ; and Datta and Chakraborti, 1983). It has also been recorded from Indochina, ? Java, Laos, Nepal and Sri Lanka (Knutson *et al.*, 1975).

21. *Volucella trifasciata* Wiedemann

1830. *Volucella trifasciata* Wiedemann, *Aussereurop. Zweifl. Insekt.*, 2 : 196.

1923. *Volucella trifasciata* Wiedemann : Brunetti, *Fauna Brit. India*, Diptera, 3 : 147.

1975. *Volucella trifasciata* Wiedemann : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 336.

Material examined : 1 ♂ (ZSI Reg. No. 6871/H₆), Chiria Camp, 25.iv.1981.

Remarks : The species has originally been described from Java and has subsequently been recorded from Borneo, Burma, Celebes, China, India (Meghalaya and Sikkim), Malaya, Philippines and Taiwan (Brunetti, 1923 ; Knutson *et al.*, 1975). This is recorded for the first time in Arunachal Pradesh.

22. *Spheginobaccha macropoda* (Bigot)

1883. *Sphegina macropoda* Bigot, *Annls Soc. ent. Fr.* (6) 3 : 331.
 1923. *Spheginobaccha macropoda* (Bigot) : Brunetti, *Fauna Brit. India*, Diptera, 3 : 112.
 1975. *Spheginobaccha macropoda* (Bigot) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 339.

Material examined : 1 ♀ (ZSI Reg. No. 6877/H₈), Deban, 27.iv.1981.

Remarks : The species originally described from Burma, has subsequently been recorded from Anambas islands, Borneo, India (Meghalaya and West Bengal), Java, Laos, Malaya and Vietnam (Brunetti, 1923 ; Thompson, 1974 ; Knutson *et al.*, 1975). This is recorded here for the first time.

23. *Azpeytia bifascia* Brunetti

1907. *Azpeytia bifascia* Brunetti, *Rec. Indian Mus.*, 1 : pl. 13, figs. 1-5.
 1908. *Azpeytia bifascia* Brunetti : Brunetti, *Rec. Indian Mus.*, 2 : 84.
 1923. *Azpeytia bifascia* Brunetti : Brunetti, *Fauna Brit. India*, Diptera, 3 : 221.
 1975. *Azpeytia bifascia* Brunetti : Knutson, Thompson and Vockeroth, *A Catalog of the Diptera of the Oriental Region*, 2 : 340.

Material examined : 1 ♀ (ZSI Reg. No. 6906/H₈), Deban, 2.iv.1981.

Remarks : This has so far been recorded from India (Assam and West Bengal) and Laos (Brunetti, 1923 ; Knutson *et al.*, 1975). This is recorded for the first time from Arunachal Pradesh.

24. *Catacores cyanea* (Brunetti)

1913. *Axona cyanea* Brunetti, *Rec. Indian Mus.*, 9 : 272.
 1923. *Axona cyanea* Brunetti : Brunetti, *Fauna Brit. India*, Diptera, 3 : 223.
 1975. *Catacores cyanea* (Brunetti) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 347.

Material examined : 1 ♂ (ZSI Reg. No. 6907/H₈), Hornbill, Namdapha, 13.iv.1981.

Remarks : This has so far been reported from Meghalaya and West Bengal in India (Brunetti, 1923 ; Knutson *et al.*, 1975). This is recorded for the first time from Arunachal Pradesh.

25. *Eristalinus arvorum* (Fabricius)

1787. *Syrphus arvorum* Fabricius, *Mantissa Insect.*, 2 : 335.
 1923. *Eristalis arvorum* (Fabricius) Brunetti, *Fauna Brit. India*, Diptera, 3 : 181.
 1975. *Eristalinus arvorum* (Fabricius) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 347.

Material examined : 2 ♀ ♀ (ZSI Reg. Nos. 6872/H₆-6873/H₆), Gibbon Land, 29.iv.1981 ; 1 ♀ (ZSI Reg. No. 6874/H₆), Deban, 27.iv.1981 ; 2 ♀ ♀ (ZSI Reg. Nos. 6875/H₆-6876/H₆), Gibbon Land, 2-3.v.1981.

Remarks : The species originally described from China, has been reported to occur throughout the South-East Asia (Knutson *et al.*, 1975). Joseph and Rao (1972b) have already recorded it from Arunachal Pradesh. It has also been reported from Australia, Hawaii, Japan and Micronesia (Knutson *et al.*, *op. cit.*).

26. *Phytomia* (*Phytomia*) *zonata* (Fabricius)

1787. *Syrphus zonatus* Fabricius, *Mantissa Insect.*, 2 : 337.
 1923. *Megaspis zonatus* (Fabricius) : Brunetti, *Fauna Brit. India*, Diptera, 3 : 203.
 1975. *Phytomia* (*Phytomia*) *zonata* (Fabricius) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 357.

Material examined : 6 ♀ ♀ (ZSI Reg. Nos. 6878/H₆-6883/H₆), Hornbill, 11.iv.1981-13.iv.1981 ; 1 ♀ (ZSI Reg. No. 6884/H₆), Deban, 27.iv.1981.

Remarks : The species originally described from China, has been reported to occur throughout the South-East Asia and has also been recorded from Japan, Korea and Manchuria (Knutson *et al.*, 1975). The species has so far been recorded from Arunachal Pradesh, Assam, Karnataka, Kerala, Meghalaya, Sikkim, Tamil Nadu and West Bengal in India (Brunetti, 1923 ; Joseph and Parui, 1973 ; Joseph and Ray, 1976).

Family : MICROPEZIDAE

27. *Mimegralla* sp.

Material examined : 1 ♀ (ZSI Reg. No. 6913/H₆), Deban North, Namdapha, 28.iv.1981.

Remarks : The female specimen is left undetermined until the associated male specimen is available for studies.

Family : DIOPSIDAE

28. *Cyrtodiopsis whitei* (Curran)

1936. *Diopsis whitei* Curran, *Am. Mus. Novit.*, 833 : 1.

1977. *Cyrtodiopsis whitei* (Curran) : Steyskal, *A Catalog of Diptera of the Oriental Region*, 3 : 33.

Material examined : 2 ♂♂, 1 ♀ (ZSI Reg. Nos. 6659/H₈-6661/H₈), Hornbill, 11.iv.1981.

Remarks : The species originally described from Bihar, has been recorded from Assam (Steyskal, 1977). This is recorded for the first time from Arunachal Pradesh.

Family : CELYPHIDAE

29. *Celyphus (Celyphus) obtectus* Dalman

1818. *Celyphus obtectus* Dalman, *K. Vetensk. Akad. Handl.*, 39 : 73.

1977. *Celyphus (Celyphus) obtectus* Dalman : Tenorio, *A Catalog of Diptera of the Oriental Region*, 3 : 217.

Material examined : 1 ♀ (ZSI Reg. No. 6914/H₈), M. B. Road, Arunachal Pradesh, 25.iv.1981.

Remarks : The species originally described from ? Assam, has subsequently been recorded from Arunachal Pradesh and Kerala (Tenorio, 1972 ; Joseph and Parui, 1977). This has also been recorded from Burma, Celebes, China, Java, Malaya, Nepal, Philippines, Sri Lanka, Sumatra, Thailand and Vietnam (Tenorio, 1977).

Family : MUSCIDAE

30. *Musca (Viviparomusca) bezzii* Patton and Cragg

1913. *Musca bezzii* Patton and Cragg, *Indian J. med. Res.*, 1 : 19.

1965. *Musca (Viviparomusca) bezzii* Patton and Cragg : Emden, *Fauna India, Diptera*, 7 : 83.

1977. *Musca (Viviparomusca) bezzii* Patton and Cragg : Pont, *A Catalog of Diptera of the Oriental Region*, 3 : 461.

Material examined : 1 ♀ (ZSI Reg. No. 6915/H₈), Hornbill, 13.iv.1981.

Remarks : The species originally described from Tamil Nadu, has subsequently been recorded from Assam, Himachal Pradesh, Kashmir, Meghalaya, Punjab, Uttar Pradesh and West Bengal in India and also from Nepal and possibly Malaya. This has also been reported from

Eastern Palaearctic region (Emden, 1965 ; Joseph and Rao, 1972b ; Joseph and Parui, 1977 ; Pont, 1977). This is recorded for the first time from the State.

31. *Musca (Viviparomusca) convexifrons* Thomson

1869. *Musca convexifrons* Thomson, *K. Fregatten Eugenies Resa, Zool., Diptera*, : 547.
 1913. *Musca gibsoni* Patton and Cragg, *Indian J. med. Res.*, 1 : 14.
 1965. *Musca (Viviparomusca) gibsoni* Patton and Cragg : Emden, *Fauna India, Diptera*, 7 : 86.
 1977. *Musca (Viviparomusca) convexifrons* Thomson : Pont, *A Catalog of Diptera of the Oriental Region*, 3 : 461.

Material examined : 1 ♀ (ZSI Reg. No. 6916/H₈), Deban, 27.iv.1981.

Remarks : The species originally described from China, has been recorded from Arunachal Pradesh, Assam, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal in India and has also been reported to occur in Borneo, Burma, Java, Malaya, Sri Lanka and Taiwan (Emden, 1965 ; Joseph and Rao, 1972a ; Joseph and Ray, 1976 : Pont, 1977).

32. *Orthellia coerulea* (Wiedemann)

1819. *Musca coerulea* Wiedemann, *Zool. Mag.*, 3 : 23.
 1965. *Orthellia coerulea* (Wiedemann) : Emden, *Fauna India, Diptera*, 7 : 124.

Material examined : 4 ♀ ♀ (ZSI Reg. Nos. 6917/H₈—6919/H₈ and 6926/H₈), Tirap District., 16.iv.1981-28.iv.1981.

Remarks : The species originally described from Java, has been reported to occur in Arunachal Pradesh, Assam, Bihar, Sikkim, South India and Uttar Pradesh in India and also in Burma, China, Indonesia to Australia, Japan, Malaya, Nepal, Siam, Solomon Islands, Sri Lanka and Taiwan (Emden, 1965 ; Joseph and Rao, 1972b ; Joseph and Parui, 1973 ; 1977 ; Joseph and Ray, 1976),

33. *Atherigona* sp.

Material examined : 4 ♀ ♀ (ZSI Reg. Nos. 6927/H₈-6930/H₈). Hornbill, 11.iv.1981.

Remarks : The species is left undetermined for lack of associated male material.

Family : CALLIPHORIDAE

34. *Catapicephala splendens* Macquart

1851. *Catapicephala splendens* Macquart, *Mém. Soc. Sci. Agric. Lille*, 1851 : 210 (1850 : 237).
 1940. *Catapicephala splendens* Macquart : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 106.
 1977. *Catapicephala splendens* Macquart : James, *A Catalog of Diptera of the Oriental Region*, 3 : 532.

Material examined : 4 ♀ ♀ (ZSI Reg. Nos. 6931/H₈-6934/H₈), Deban, 7.iv.1981.

Remarks : The species originally described from Java, is recorded for the first time from Arunachal Pradesh in India. This has also been reported to occur in Burma, Borneo, Malaya and Singapore (Senior-white *et al.*, 1940 : James, 1977).

35. *Lucilia papuensis* Macquart

1842. *Lucilia papuensis* Macquart, *Mém. Soc. Sci. Agric. Lille*, 1842 : 298 (1843 : 141).
 1940. *Lucilia papuensis* Macquart : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 52.
 1977. *Lucilia papuensis* Macquart : James, *A Catalog of Diptera of the Oriental Region*, 3 : 534.

Material examined : 1 ♂, 1 ♀ (ZSI Reg. Nos. 6935/H₈-6936/H₈), Deban, 27.iv.1981 ; 1 ♀ (ZSI Reg. No. 6937/H₈), Hornbill, 13.iv.1981.

Remarks : The species originally described from Papua, has been reported to occur throughout the Oriental region, Micronesia and Moluccas (James, 1977). This is, however, recorded for the first time from Arunachal Pradesh besides the earlier record from the Malabar Coast in India (Senior-White *et al.*, 1940).

36. *Chrysomya defixa* (Walker)

1856. *Musca defixa* Walker, *J. Proc. Linn. Soc. Lond. Zool.*, 1 : 24.
 1940. *Chrysomya defixa* (Walker) : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 146.
 1977. *Chrysomya defixa* (Walker) : James, *A Catalog of Diptera of the Oriental Region*, 3 : 542.

Material examined : 2 ♂ ♂ (ZSI Reg. Nos. 6938/H₈-6939/H₈), Hornbill, 16.iv.1981 ; 1 ♀ (ZSI Reg. No. 6940/H₈), Hornbill, 14.iv.1981.

Remarks : The species originally described from Singapore, is recorded for the first time from India. This may also occur in Philippines (James, 1977).

37. *Chrysomya megacephala* (Fabricius)

1784. *Musca megacephala* Fabricius, *Syst. Ent.*, 4 : 317.
 1940. *Chrysomyia megacephala* (Fabricius) : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 138.
 1977. *Chrysomya megacephala* (Fabricius) : James, *A Catalog of Diptera of the Oriental Region*, 3 : 542.

Material examined : 3 ♂♂, 11 ♀♀ (ZSI Reg. Nos. 6941/H₈-6954/H₈), Hornbill, 13-14.iv.1981.

Remarks : The species is very common in the Oriental and Australian regions. The species has already been recorded from Arunachal Pradesh in India (Joseph and Rao, 1972a, b ; Joseph and Parui, 1973 ; 1977). According to Senior-White *et al.* (*op. cit.*) the type-locality "Guinea" is an error.

38. *Chrysomya pinguis* (Walker)

1858. *Lucilia pinguis* Walker, *Trans. ent. Soc. Lond. (n. Ser.)* 4 : 213.
 1940. *Chrysomyia pinguis* (Walker) : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 144.
 1977. *Chrysomya pinguis* (Walker) : James, *A Catalog of Diptera of the Oriental Region*, 3 : 542.

Material examined : 1 ♂, 1 ♀ (ZSI Reg. Nos. 6955/H₈-6956/H₈), Hornbill, 13.iv.1981.

Remarks : The species has been reported to occur in Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Tamil Nadu and West Bengal in India and also in China, Java, Malaya, Moluccas, Philippines, Sri Lanka and Thailand (Senior-White *et al.*, 1940 ; Joseph and Ray, 1976 ; James, 1977). The type-locality of the species is India.

Family : SARCOPHAGIDAE

39. *Bercaea haemorrhoidalis* (Fallén)

1816. *Musca haemorrhoidalis* Fallén, *Vetensk. Acad. Handl.*, : 237.
 1940. *Sarcophaga haemorrhoidalis* (Fallén) : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 276.
 1977. *Bercaea haemorrhoidalis* (Fallén) : Lopes, Kano, Shinonaga and Kurahashi, *A Catalog of Diptera of the Oriental Region*, 3 : 564.

Material examined : 2 ♂♂ (ZSI Reg. Nos. 6957/H₈—6958/H₈), Dist. Tirap, 16. iv. 1981.

Remarks : The species has been reported to occur in Africa, Europe, Hawaii, India (Arunachal Pradesh to Himachal Pradesh), Korea,

Nepal, North America and Sheychelles (Senior-White *et al.*, 1940 ; Joseph and Rao, 1972b ; Lopes *et al.*, 1977). The species has originally been described from Sweden.

40. *Parasarcophaga (Parasarcophaga) albiceps* (Meigen)

1826. *Sarcophaga albiceps* Meigen, *Syst. Besch. europ. zweifl. Insekt.*, 5 : 22.
 1940. *Sarcophaga albiceps* Meigen : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 242.
 1977. *Parasarcophaga (Parasarcophaga) albiceps* (Meigen) : Lopes, Kano, Shinonaga and Kurahashi, *A Catalog of Diptera of the Oriental Region*, 3 : 570.

Material examined : 2 ♂♂, 3 ♀♀ (ZSI Reg. Nos. 6659/H₈—6963/H₈), Deban, 27. iv. 1981 ; 1 ♂ (ZSI Reg. No. 6964/H₈), Gibbon Land, 29. iv. 1981 ; 1 ♂ (ZSI Reg. No. 6965/H₈), Dist. Tirap, 16. iv. 1981.

Remarks : This species has been reported to occur throughout the Oriental region and has also been recorded from Bismarck Archipelago, Europe, Hawaii, Japan, Korea, New Britain, New Guinea and Solomon islands (Senior-white *et al.*, 1940 ; Joseph and Rao, 1972b ; Lopes *et al.*, 1977). The type-locality of the species is Europe.

41. *Sarcorohdendorfia flavinervis* (Senior-White)

1859. *Sarcophaga basalis* Walker, *J. Proc. Linn. Soc. Lond., Zool.*, 3 : 129.
 1924. *Sarcophaga flavinervis* Senior-White, *Rec. Indian Mus.*, 26 : 229.
 1940. *Sarcophaga basalis* Walker : Senior-White, Aubertin and Smart, *Fauna Brit. India, Diptera*, 6 : 223.
 1977. *Sarcorohdendorfia flavinervis* (Senior-White) : Lopes, Kano, Shinonaga and Kurahashi, *A Catalog of Diptera of the Oriental Region*, 3 : 574.

Material examined : 1 ♂, 1 ♀ (ZSI Reg. Nos. 6966/H₈-6967/H₈), Deban, 27.iv.1981 ; 1 ♀ (ZSI Reg. No. 6969/H₈), Namdapha, Zero Camp, 9.iv.1981.

Remarks : The species has been reported to occur in Arunachal Pradesh, Assam and Bihar in India and has also been reported from Java and Moluccas (Senior-White *et al.*, 1940 ; Lopes *et al.*, 1977).

SUMMARY

The paper deals with 126 examples comprising 41 species belonging to 10 families of Diptera from the Namdapha Wild Life Sanctuary in Arunachal Pradesh, India. Of these, 14 species are new records from

Arunachal Pradesh and 1 species new to India. The family Tabanidae contains 8 species of which 3, viz., *Tabanus (Tabanus) namdaphicus*, *T. (T.) shyamarupi* and *T. (T.) tenuifrons* are described as new to science.

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IXODIDAE (ACARINA : METASTIGMATA)

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INTRODUCTION

Ixodid ticks are important from economic point of view as most of these ticks are known as carrier of diseases in man and domestic animals. The first attempt to study the ixodid tick fauna of Arunachal Pradesh was made by Nuttall and Warburton (1915). Later through the works of Sharif (1928), Dhanda and Rao (1964), Hoogstraal *et al.* (1970) and De and Gupta (1978) a total number of sixteen species belonging to seven genera were reported from Kameng, Lohit, Siang and Subansiri districts of Arunachal Pradesh.

The present collection is represented by ten species belonging to five genera, of these three species under two genera are reported here for the first time from Arunachal Pradesh and others are the first record from Tirap district. In addition to the economic importance, the data on the recorded hosts and distribution of the species in India are included here. All the collections are deposited in the National Collections of Zoological Survey of India, Calcutta.

1. *Amblyomma testudinarium* Koch, 1844

Material examined : 1 ♀, 2 ♂♂, Arunachal Pradesh, Gibbon's land, 16 kms east of Miao, Tirap district, from unknown host, 20.xii. 1982, coll. S. Biswas.

Hosts in India : Buffalo, bullock, cattle, mithan (a wild bovine), goat, dog, deer, tapir, rhinoceros, horse, wild bear, wild pig (*Sus cristatus*), tiger, tree shrew (*Tupaia glis versurae*), red jungle fowl (*Gallus gallus*), man, vegetation.

Distribution in India : Arunachal Pradesh, Assam, Karnataka, Maharashtra, Orissa, Sikkim, West Bengal.

Remarks : The species was reported for the first time from Kameng, Siang, Subansiri and Lohit districts of Arunachal Pradesh by

Dhanda and Rao (1964). Krijgsman and Ponto (1932) stated that *A. testudinarium* transmits piroplasmosis and anaplasmosis. Sharif (1938) also considered this species as a vector of diseases.

2. *Aponomma pattoni* Neumann, 1910

Material examined : 4 ♀ ♀ , Arunachal Pradesh, Miao, Tirap district from unknown host, 2.xii. 1982, coll. *S. Biswas* ; 4 ♀ ♀ , Arunachal Pradesh, Zero camp, 30 kms north-east of Miao, Tirap district, from sambar, 15.xii. 1982, coll. *S. Biswas*.

Hosts in India : Reptiles, sambar.

Distribution in India : Arunachal Pradesh, Tamilnadu.

Remarks : The species is reported here for the first time from Arunachal Pradesh. The chief hosts are reptiles of different types. But the present collection data shows that few specimens were collected from dead sambar so it is assumed that the sambar was killed by snake. This species is not much important from economic aspect.

3. *Boophilus microplus* (Canestrini, 1887)

Material examined : 6 ♀ ♀ , Arunachal Pradesh, Miao, Tirap district, from unknown host, 5.xii.1982, coll. *S. Biswas*.

Hosts in India : Buffalo, cattle, goat, horse, mithan, sheep.

Distribution in India : Almost all the states.

Remarks : *B. microplus* was previously reported from Arunachal Pradesh by Dhanda and Rao (1964). This tick species is known to transmit the disease producing organisms such as *Coxiella burnetti*, *Babesia* sp., *Theileria* sp., *Borrelia* spp., *Anoplasma* sp. and *Haematoxenus veliferus* to cattle.

4. *Haemaphysalis (Alloceraea) aponommoides* Warburton, 1913

Material examined : 2 ♂ ♂ , Arunachal Pradesh, Zero camp, 30 kms north-east of Miao, Tirap district, from sambar, 15.xii.1982, coll. *S. Biswas*.

Hosts in India : Cattle, horse, man, vegetation.

Distribution in India : Arunachal Pradesh, Sikkim, West Bengal.

Remarks : Dhanda and Rao (1964) recorded this species for the first time from Kameng district of Arunachal Pradesh. Hoogstraal

(1967) reported that biting and crawling on man by this species cause Himalayan haemorrhagic infection.

5. *Haemaphysalis (Haemaphysalis) birmaniae* Supino, 1897

Material examined : 5 ♀ ♀ , 2 ♂ ♂ , Arunachal Pradesh, Zero camp, 30 kms north-east of Miao, Tirap district, from sambar, 15.xii.1982, coll. S. Biswas ; 1 ♀ , 1 ♂ , Arunachal Pradesh, Gibbon's land, 15 kms east of Miao, Tirap district, from unknown host, 20.xii.1982, coll. S. Biswas.

Hosts in India : Antelope, Indian muntjac, chital, domestic zhum, serow, goral, cow, man.

Distribution in India : Arunachal Pradesh, West Bengal.

Remarks : The first record of this species from India was made by Dhanda and Rao (1964) and the specimens were collected from Lohit district of Arunachal Pradesh. The economic importance of this species is not much known.

6. *Haemaphysalis (Kaiseriana) bispinosa* Neumann, 1897

Material examined : 1 ♀ , Arunachal Pradesh, Gibbon's land, 16 kms east of Miao, Tirap district, from cow, 19.xii.1982, coll. S. Biswas.

Hosts in India : Buffalo, cattle, goat, spotted deer, donkey, pony, horse, sheep, dog, tiger, cat, monkey.

Distribution in India : Almost all states.

Remarks : Dhanda and Rao (1964) reported this species for the first time from Kameng, Lohit, Siang and Subansiri districts of Arunachal Pradesh. This common species is a carrier of KFD virus and important pest of domestic animals.

7 *Haemaphysalis (Kaiseriana) cornigera shimoga* Trapido and Hoogstraal, 1964

Material examined : 4 ♂ ♂ , Arunachal Pradesh, Zero camp, 30 kms north-east of Miao, Tirap district, from sambar, 15.xii.1982. coll. S. Biswas.

Hosts in India : Bison, cattle, sambar deer, vegetation.

Distribution in India : Arunachal Pradesh, Karnataka, Kerala, Meghalaya.

Remarks : This species is reported here for the first time from Arunachal Pradesh. This species is recognized as the vector of KFD virus.

8. *Haemaphysalis (Kaiseriana) davis* Hoogstraal, Dhanda and Bhat, 1970

Material examined : 66 ♀ ♀, 14 ♂ ♂, 10 NN, Arunachal Pradesh, Zero camp, 30 kms north-east of Miao, Tirap district, from sambar, 15.xii.1982, coll. S. Biswas.

Hosts in India : Cattle, goat, horse, mule, sheep, sambar, deer, barking deer, gour, hog hadger, tiger.

Distribution in India : Arunachal Pradesh, Sikkim.

Remarks : *H (K) davis* was first recorded from Arunachal Pradesh by Hoogstraal *et al.* (1970) and this species is very common in different districts of this state. Economically this species is less important.

9. *Haemaphysalis (Kaiseriana) spinigera* Neumann, 1897

Material examined : 1 N, Arunachal Pradesh, Gibbon's land, 16 kms east of Miao, Tirap district, from rat, 28.xii.1982, coll. S. Biswas.

Hosts in India : Crow-pheasant, jungle babbler, red-vented bulbul, almost all mammals.

Distribution in India : Andaman and Nicobar islands, Andhra Pradesh, Arunachal Pradesh, Foot hills of central and eastern himalayan region, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamilnadu, West Bengal.

Remarks : This species is reported here for the first time from Arunachal Pradesh. It is mostly a forest inhabiting tick and carries KFD virus which causes deadly disease in birds and mammals.

10. *Hyalomma marginatum isaaci* Sharif, 1928

Material examined : 1 N, Arunachal Pradesh, Empen village, 15 kms east of Miao, Tirap district, from wild rabbit, 16.xii.1982, coll. S. Biswas.

Hosts in India : Migratory birds, buffalo, domestic cattle, goat, sheep, hare, dog, horse, camel, man,

Distribution in India : Andhra Pradesh, Arunachal Pradesh, Bihar, Gujarat, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamilnadu, Uttar Pradesh, West Bengal.

Remarks : Dhanda and Rao (1964) collected one nymph of this tick species from horse and that was the first report of *H. marginatum isaaci* from Arunachal Pradesh (Kameng district). It is thus reported here for the second time from the state. This species has got medical and veterinary importance as pest and vector of diseases. Grobov (1946) isolated the Crimean haemorrhagic fever virus from the nymphs of this species.

SUMMARY

Ixodid tick fauna represented by ten species in this communication are the first record from Tirap district and among these two genera and three species are new to Arunachal Pradesh.

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SCORPIONS (ARACHNIDA)

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INTRODUCTION

The Himalaya, a young tertiary mountain system as a whole, serves very wide distributional ground for two families of scorpions namely CHAERILIDAE and VAEJOVIDAE. (Tikader and Bastawade, 1983). These two families are almost restricted to the high altitude habitats and thus too for their limited speciation. Studies on the scorpion collection from Namdapha, reveal following three species belonging to above mentioned two families. All the collections were made in December 1983—January 1984 in Namdapha area.

Key to the Families

1. Carapace narrowed in front and anterior margin transversely truncated. A pair of lateral eyes with an amber coloured spot on ventro-lateral portion. Trichobothrial pattern on pedipalp of 'B' Type	...	...	CHAERILIDAE
2. Carapace not narrowed in front and anterior margin with a deep median notch and not truncated. Generally three pairs of lateral eyes without an amber coloured spot on ventrolateral portion. Trichobothrial pattern on pedipalp of 'C' type.	...	...	VAEJOVIDAE

SYSTEMATIC ACCOUNT

Family I : CHAERILIDAE

Characters : Carapace narrowed in front with transversely truncated anterior margin. A pair of lateral eyes provided with an amber coloured spot on ventrolateral portion. Movable and immovable fingers of chelicera provided with minute teeth on ventral inner margins. Trichobothrial pattern on pedipalp is of 'B' Type, i.e. femur with 9 trichobothria, patella with 14, manus with 7 and immovable finger with 7 trichobothria. Maxillary processes of 1 pair of legs expanded on anterior margin. Vesicle without any annular ring at the base of aculeus.

There are seven species so far reported from whole of Himalayan ranges out of which only three have been recorded from Eastern part

of Himalaya. Namdapha represents this family with the only record of *Chaerilus tricostatus* Poc. from Miao Reserve Forest, Tirap District, Arunachal Pradesh.

***Chaerilus tricostatus* Pocock**

1899. *Chaerilus tricostatus* Pocock, *J. Bombay nat Hist. Soc.*, 12 : 266.

1983. *Chaerilus tricostatus* : Tikader and Bastawade, *Fauna of India, Scorpions*, : 320

Characters : Reddish brown scorpion of medium body size ranging from 45 mm to 60 mm in length. Body surface entirely granular and more coarsely granular on carapace. A pair of lateral eyes provided with much prominent ambar-coloured spot on ventro-lateral portion. Median eyes situated anteriorly in the ratio 1 : 1.8-1.9. Both the cheliceral fingers provided with minute dentition on ventral surface, arranged in series. Pedipalp elongated with manus twice as long as wide, six carinae, out of which three carinae placed on dorsal surface. Dentition on movable finger with 10-11 teeth in outer row. Trichobothrial pattern on pedipalp of 'B' type. Legs smooth. Pectinal teeth well developed and 5/5 in number. Cephalothoracic sternum pentagonal.

Tergites granular with weak lateral carinae. Sternites smooth.

Cauda four times as long as carapace. All carinae granular, segment V slightly shorter than carapace, anal rim of this segment granular. Telson longer than carapace and vesicle more than twice as long as aculeus.

Distribution : India : Sadiya, Assam, Khanna hills, Meghalaya and Miao, Tirap Dist., Arunachal Pradesh.

Family II : VAEJOVIDAE

Characters : Carapace with a deep median notch on anterior margin and provided generally with three pairs of lateral eyes without an ambar coloured spot on ventro-lateral portion. Immobile finger of chelicera without any tooth on ventral surface. Trichobothrial pattern on pedipalp of 'C' type, i.e. femur with 3 trichobothries. Patella with 28-47, manus with 16-24 and immobile finger with 8 trichobothria. Vesicle provided with a depression or an annular ring at the base of aculeus.

Under this family one sub-family, two genera and three sub-genera have been reported from India. The sub-genus *Euscorpions* has restricted only to NE India i.e. Assam, Meghalaya and Arunachal

Pradesh. The following two species have been reported from Namdhapa, Arunachal Pradesh.

2. *Scorpiops (Euscorpiops) asthenurus* Pocock

1900. *Scorpiops asthenurus* Pocock, *Fauna Brit. India, Arachn.* 73.
 1980. *Scorpiops (Euscorpiops) asthenurus* : Vachon, *Bull. Mus. nat. Hist. nat. Paris*, 4(2) : 143.
 1983. *Scorpiops (Euscorpiops) asthenurus* : Tikader and Bastawade, *Fauna of India, Scorpions*, : 458.

Characters : Dark black scorpion of small to medium size body ranging between 30 to 50 mm in length. Entire surface of carapace coarsely granular, lateral ocular tubercles granular with three pairs of eyes. Median ocular tubercles smooth and eyes situated anteriorly in the ratio 1 : 2.25. Anterior margin deeply notched in the middle. Chelicera with six minute teeth on inner margin of movable finger. Patella thick, femur and patella longer than carapace and manus longer than femur. Manus with eight carinae. All carinae coarsely granular. Trichobothria of 'C' type and of patella provided with 9 ventral and 10-11 *estand et* trichobothries. Legs weakly granular and spine formula on I-IV : $\frac{8}{8}$, $\frac{8}{8}$, $\frac{10}{10}$ & $\frac{10}{11}$. Pectines well developed, 1.75 times longer than wide with 6/7 teeth.

Tergites granular and monocarinated. Sternites smooth except granular sternite V.

Cauda almost three times as long as carapace. All segments carinated, inferior carinae smooth, dorsal carinae II, III & IV not much elevated and ending abruptly. Segment V shorter than carapace, granular, carinated, carinae sparsely granular. Anal rim of this segment evenly crenulated. Telson longer than segment V but shorter than carapace, smooth, provided with an annular ring at the base of aculeus. Aculeus less than as long as vesicel, less curved.

Distribution : India : Kalimpong, Darjeeling Dist., West-Bengal and Tirap Dist., Arunachal Pradesh.

3. *Scorpiops (Euscorpiops) longimanus* Pocock

1893. *Scorpiops longimanus* Pocock, *Ann. Mag. nat. Hist.*, 12(b) : 326.
 1980. *Scorpiops (Euscorpiops) longimanus* : Vachon, *Bull. Mus. nat. Paris*, 4(2) : 143.
 1983. *Scorpiops (Euscorpiops) longimanus* : Tikader and Bastawade, *Fauna of India, Scorpions*, : 464.

Characters : Black scorpion of small to medium body size ranging from 35 to 50 mm in length, body granular. Carapace more thickly

granular with prominent ocular tubercles and a deep median notch in the middle of anterior margin. A pair of median eyes situated anteriorly in the ratio 1 : 2.00. Chelicera with a series of five to six minute teeth on inner margin of movable finger. Pedipalp dorso-ventrally flat, stout and elongated on manus. Femur almost longer than carapace. Patella slightly shorter than femur. Anterior or inner surface with a pair of stout, dentiform tubercles. Manus longer than femur or carapace, much flat and wide, five carinae well developed. All carinae granular. Trichobothrial pattern of 'C' type and patella with 10 ventral and 4 *est* and 4 *et* trichobothries. Legs smooth, carinated on femur and patella. Spine formula on legs I-IV : $\frac{6}{6}$, $\frac{7}{7}$, $\frac{8}{8}$ & $\frac{9}{9}$. Pectines well developed and with 7/7 teeth in male.

All tergites coarsely granular with obsolete median carina on posterior portion of I-VI. All sternites smooth except two pairs of granular carinae on sternite V.

Cauda almost three and a half times as long as carapace. Segment I-IV with granular, carinae except inferior smooth to weakly granular. Segment V shorter than carapace. Carinae granular but inferior median much granular. Anal rim of this segment evenly crenulated. Telson longer than carapace in ♂ but shorter in ♀. Vesicle elongated, longer than segment IV but shorter than segments V. Aculeus less curved, shorter than half the vesicular length in ♂ but slightly longer in ♀.

Distribution : India : Assam, Tirap Dist., Arunachal Pradesh and Bangla-Desh : Sylhet.

SUMMARY

A small collections of Scorpions from Namdapha reveals that three species are characteristically of himalayan distribution.

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MOLLUSCA

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INTRODUCTION

North-Eastern India, with many hill-streams, ample rainfall and rich wet evergreen forests, accounts for over one third of the total number of species of land and freshwater molluscs, known from India.

From malacological point of view, the Namdapha area has an added importance as it borders India with Burma, as, these area is well known to be the type locality of a number of Indian species of land and freshwater molluscs.

Besides the Fauna of British India (Mollusca) series, works of Godwin-Austen (1876, 1876a, 1914-1918), Blanford and Godwin-Austen (1908), Ghosh (1913), Gude (1914, 1915, 1921), Preston (1915, 1915a) are the important contributions which have dealt with the land and freshwater molluscs of these areas in particular.

The present report deals with the first two lots of molluscs collected during 1981 & 1982, it includes 23 species (18 land and 5 freshwater) involving 20 genera and 10 families, which include 10 new records for Arunachal Pradesh and one new record for India.

SYSTEMATIC ACCOUNT

A. *Land Molluscs*

Class : GASTROPODA

Order : MESOGASTROPODA

Family : CYCLOPHORIDAE

Genus *Alycaeus* Gray, 1850

1. *Alycaeus burti* Godwin-Austen

Alcaeus burti Godwin-Austen, 1874, *J. Asiat. Soc. Beng.*, 43(2) : 149, pl. 3, fig. 9.

Alycaeus burti Godwin-Austen : Gude, 1911, *Fauna of British India, Mollusca* III, p. 206.

Material examined : 2 exs., Deban, 9.xii.82.

Distribution : India : Arunachal Pradesh, Assam.

Elsewhere : Bhutan.

Remarks : Thick, turbinate, openly umbilicate ; with well marked ribbing on the swelling of last whorl and finely costulate at the apex. Whorls 5, spire conoid, aperture oblique, laterally oval, angular on inner upper margin.

2. *Alycaeus daflaensis* Godwin-Austen

Alycaeus daflaensis Godwin-Austen, 1876, *J. Asiat. Soc. Beng.*, 45(2) : 176, pl. 7, figs. 12, 12a, 12b.

Alycaeus daflaensis Godwin-Austen, 1921, *Fauna of British India, Mollusca*, III, p. 245.

Material examined : 1 ex., Deban, 15.xii.82.

Distribution : Arunachal Pradesh.

Remarks : It strongly resembles *A. digitatus* from Darjeeling but differs in having a single peristome, instead of double as in *A. digitatus*.

3. *Alycaeus khasiacus* Godwin-Austen

Alycaeus khasiacus Godwin-Austen, 1871, *J. Asiat. Soc. Beng.*, 40(2) : 90, pl. 3, figs. 4, 4a & 4b.

Alycaeus khasiacus Godwin-Austen : Gude, 1921, *Fauna of British India, Mollusca* III, p. 257.

Material examined : 1 ex., Gibbons land, 21.xii.82.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Manipur.

Elsewhere : Burma.

Remarks : Though known to occur in North-eastern region, this species is for the first time recorded from Arunachal Pradesh.

Genus *Cyclophorus* Montfort, 1810

4. *Cyclophorus aurantiacus* (Schumacher)

Turbo volvulus Chemnitz, 1786, *Conch. Cab.*, 10(2) : 57, pl. 123, figs. 1064, 1065.

Annularia aurantiaca Schumacher, 1817, *Essai Nouv. Syst. Vers. Test.*, p. 196.

Cyclophorus aurantiacus Schumacher : Gude, 1921, *Fauna of British India, Mollusca*, III, p. 71.

Material examined : 5 exs., Deban, 15.xii.82.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Kerala,
Elsewhere : Burma, Malay Peninsula.

Remarks : Shell moderately large, solid, depressedly turbate, spirally striate, whorls $5\frac{1}{2}$, flatly convex, body whorl large, obsoletely angulate ; Aperture circular, oblique, umbilicus deep and wide.

It is recorded for the first time from Arunachal Pradesh.

Genus *Leptopoma* Pfeiffer, 1847

5. *Leptopoma sericatum* Pfeiffer

Cyclostoma (Leptopoma) sericatum Pfeiffer, 1851, *Proc. Zool. Soc. Lond.*, p. 244.

Material examined : 2 exs., Gibbons land, 26.xii.82.

Distribution : India : Arunachal Pradesh.

Elsewhere : Borneo.

Remarks : This species is for the first time from India (Arunachal Pradesh).

Genus *Pterocyclus* Benson, 1832

6. *Pterocyclus parvus* (Pearson)

Spiraculum parvus Pearson, 1833, *J. Asiat. Soc. Beng.*, 2 : 592, pl. 20, fig. 7.

Pterocyclus parvus Pearson : Gude, 1921, *Fauna of British India, Mollusca*, III : 108-109.

Material examined : 3 exs., Gibbons land, 22.xii.82.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Nagaland.

Elsewhere : Burma, Bangladesh.

Remarks : Shell convexly depressed, openly umbilicate, spire scarcely raised, apex blunt, whorls $4\frac{1}{2}$, sutures impressed, last whorl descending near the aperture, peristome thickened, double, slightly reflected. A sinus like oblique opening (breathing tube), formed by an interruption of the peristome, situated just at a point where the outer lip comes in contact with the penultimate whorl.

Genus *Theobaldius* Nevill, 1878

7 *Theobaldius phaenotopicus* (Benson)

Cyclostoma phaenotopicus Benson, 1851, *Anna. Mag. Nat. Hist.*, (2)8 : 190.

Theobaldius phaenotopicus Benson : Gude, 1921, *Fauna of British India, Mollusca*, III, p. 40.

Material examined : (i) 1 ex., Miao, 2.xii.82 (ii) 1 ex., Gibbons land, 22.xii.82

Distribution : India : Arunachal Pradesh, Sikkim, West Bengal.

Remarks : This species is very much similar to *T. annulatum* Pfeiffer and *T. stenostoma* Sowerby. But it can easily be recognised by its sharp scabrous sculpture, as well as narrower umbilicus. It is recorded for the first time from Arunachal Pradesh.

Order : STYLOMMATOPHORA

Family : CORILLIDAE

Genus *Plectopylis* Benson, 1860

8. *Plectopylis affinis* Gude

Plectopylis affinis Gude, 1897, *Science Gossip*, N. S. 3 : 276, fig. 41.

Material examined : 1 ex., Deban, 1.xii.81.

Distribution : Arunachal Pradesh, Meghalaya.

Remarks : The shell is very coarsely sculptured and covered by a thick, prominently plaited cuticle. It is restricted to North-eastern India only.

Family : FERRUSSACIDAE

Genus *Glessula* Von Martens, 1850

9. *Glessula dikrangense* Godwin-Austen

Glessula illustris Godwin-Austen, 1876, *J. Asiat. Soc. Beng.*, 45(2) : 315.

Glessula dikrangense Godwin-Austen, 1920. *Land and Freshwater molluscs of India*, 3(1) : 26, pl. 160, fig. 7.

Material examined : 1 ex., Deban, 15.xii.82

Distribution : Arunachal Pradesh, Karnataka, Kerala and Maharashtra.

Remarks : Shell elongate, glossy, whorls $8\frac{1}{2}$, rather convex, with fine microscopic striae. Apex obtuse, aperture vertical, columella arched.

While working out a collection, of terrestrial molluscs from Dapla Hills, Godwin-Austen (1876a) had mistakenly placed a few shells of *Glessula* under *G. illustris*. But a thorough re-examination of the material at later date (1920) prompted him to erect a new species (*G. dikrangense*) and include them under this.

Family : SUBULINIDAE

Genus **Opeas** Albers, 1850

10. **Opeas gracile** (Hutton)

Bulinus ? no 5 Hutton, 1834, *J. Asiat. Soc. Beng.*, 3 : 84.

Opeas gracile (Hutton) : Tonapi and Mulherker, *J. Bombay nat. Hist. Soc.*, 60(1) : 113.

Material examined : 1 ex. Gibbons land, 25.xii.82

Distribution : INDIA : Andhra Pradesh, Andaman & Nicobar Island, Assam, Arunachal Pradesh (new record), Bihar, Kashmir, Maharastra, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal.

Elsewhere : Pakistan, Sri Lanka, Bangladesh, Burma, Malay Peninsula and Archeipelago, Japan, China, Philippines and Polynesia.

Remarks : Shell turreted, thin, transparent or whitish ; spire gradually tapering, apex blunt ; whorls 8-12, very slightly convex, sutures moderately impressed ; aperture higher than broad, semiovate.

Commonly known as garden snail, this cosmopolitan species causes considerable damage to various vegetable plants.

Family : TROCHOMORPHIDAE

Genus **Trochomorpha** Albers, 1850

11. **Trochomorpha castra** (Benson, 1852)

Helix castra Benson, 1852, *Ann. Mag. Nat. Hist.*, (2)10 : 349.

Trochomorpha (*Sivella*) *castra* Benson : Gude, 1924, *Fauna of British India, Mollusca*, 2 : 3.

Material examined : 7 exs., Deban 10.xii.82.

Distribution : INDIA : Assam, Arunachal Pradesh, Meghalaya, Sikkim, West Bengal.

Elsewhere : Burma, Pennang, Malay Peninsula.

Remarks : Shell thin, depressedly conoid, acutely keeled, rather strongly, obliquely striate, whorls 6, a little convex, sutures shallow.

Family : ARIOPHANTIDAE

Genus **Kaliella** Blanford, 1863

12. **Kaliella barrackporensis** (Pfeiffer)

Helix barrackporensis Pfeiffer, 1852, *Proc. Zool. Soc. Lond.*, p. 156.

Kaliella barrackporensis Pfeiffer : Blanford & Godwin-Austen, 1908, *Fauna of British India, Mollusca*, p. 258.

Material examined : 2 exs., Gibbons land, 17.xii.82.

Distribution : INDIA : Arunachal Pradesh (new record), Bihar, Jammu and Kashmir, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Madagascar, Sri Lanka, Bangladesh, Burma, Pegu.

Remarks : Shell subperforate, thin, trochiform with oblique striations above. Whorls 6, convex, slowly increased and the last whorl keeled ; suture impressed ; peristome simple, thin, straight ; columellar margin slightly oblique, reflected.

Genus **Khasiella** Godwin-Austen, 1899

13. **Khasiella serrula** (Benson)

Helix serrula Benson, 1836, *J. Asiat. Soc. Beng.*, 5 : 352.

Material examined : (i) 1 ex., Miao, 2.xii.82 (ii) 1 ex., Deban 10.xii.82.

Distribution : Arunachal Pradesh (new record), Himachal Pradesh, Jammu and Kashmir, Meghalaya.

Remarks : The body whorl possesses a strong keel, serrated by transverse plications. This is an intermediate form between the nearly rounded *K. vidua* and the acutely keeled *K. hyba* from Western Himalayas.

Genus **Macrochlamys** Gray, 1847

14. **Macrochlamys dikrangensis** Godwin-Austen

Macrochlamys dikrangensis Godwin-Austen, 1910, *Land and freshwater molluscs of India*, supplement to Theobald & Hanleys, *Conch. Indica*, 2 : 267, pl. 131, fig. 5.

Material examined : 1 ex., Gibbons land, 27.xii.82

Distribution : Arunachal Pradesh.

Remarks : Shell depressedly conoid, sculptured with distinct fine longitudinal irregular striations ; whorls $6\frac{1}{2}$, irregularly increasing ; aperture oblique ; peristome thickened ; lower margin sinuated ; columellar margin very oblique.

This species is known from Arunachal Pradesh only.

15. *Macrochlamys vesica* Godwin-Austen

Macrochlamys vesica Godwin-Austen, 1910, *Land and freshwater molluscs of India*, Supplement to Theobald & Hanleys, *Conch. Indica*, 2 : 248, pl. 118, figs. 2-2c.

Material examined : (i) 4 exs., Deban, 15.xii.82 (ii) 4 exs., Gibbons land, 22.xii.82

Distribution : INDIA : Arunachal Pradesh (new record), Assam, Meghalaya.

Elsewhere : Bangladesh.

Remarks : This species shows much variations in shell characters Godwin-Austen (1910) mentioned that the shells from different localities differ very much which is very apparent to eye, but not easy to define.

Genus *Staffordia* Godwin-Austen, 190716. *Staffordia daflaensis* Godwin-Austen

Helix lubricus Benson ? : Godwin-Austen, 1876, *J. Asiat. Soc., Beng.*, 45(2) : 311, pl. 8, fig. 9.

Staffordia daflaensis Godwin-Austen, 1907, *Moll. India*, 2 : 185, pl. 113, fig. 1-11.

Staffordia daflaensis Godwin-Austen, Blanford & Godwin-Austen, 1908, *Fauna of British India, Mollusca* : 296.

Material examined : 1 ex., Gibbons land, 21.xii.82.

Distribution : The genus *Staffordia* has so far not been recorded from anywhere outside Arunachal Pradesh.

Remarks : Shell is very similar to that of *Macrochlamys*. Caudal gland at the extremity of the foot absent, sole of foot not divided.

Family : CAMAEINIDAE

Genus : *Amphidromus* Albers, 185017. *Amphidromus masoni* (Godwin-Austen)

Bulimus masoni Godwin-Austen, 1876, *J. Asiat. Soc. Bang.*, 45 : 316.

Amphidromus masoni (Godwin-Austen) : Gude, 1914, *Fauna of British India, Mollusca*, II, p. 181.

Material examined : 1 ex., Gibbons land, 21.xii.82

Distribution : INDIA : Arunachal Pradesh, Assam.

Remarks : Shell sinistral, elongate, microscopically striate. greenish-white, whorls 7, with rather flat sides, body whorl angulate,

columella and lips dark purple, a very narrow band of same color encircles the shell just below the sutures. Aperture oval ; angular above, lip moderately reflected.

Genus **Landouria** Godwin-Austen, 1918

18. **Landouria huttoni** (Pfeiffer)

Helix orbicula Hutton, 1838, *J. Asiat. Soc. Bang.* 7 : 217.

Helix huttoni Pfeiffer, 1842, *Symb. Hist.*, 2 : 82.

Plectotropis huttoni Pfeiffer : Gude, 1974, *Fauna of British India*, II : 211.

Landouria huttoni (Pfeiffer) : Godwin-Austen, 1918, *Rec. Indian Mus.*, 8 : 605, text figs. 2A. A and 3.

Material examined : (i) 2 exs., Miao, 3.xii.82 (ii) 2 exs., Deban, 13.xii.82.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Nagaland, West Bengal.

Elsewhere : Burma, China.

Remarks : Shell orbiculate, whorls 6, slightly convex, the body whorl angulate and scarcely descending ; aperture oblique, roundly lunate ; columellar margin slightly reflected ; peristome simple.

B. *Freshwater Molluscs*

Order : MESOGASTROPODA

Family : THIARIDAE

Genus **Brotia** H. Adams, 1866

19. **Brotia costula** (Rafinesque)

Melania costula Rafinesque, 1833, *Atlantic J.* no. 5, p. 166.

Melania variabilis Benson, 1836, *J. Asiat. Soc. Beng.*, 5 : 746.

Material examined : 14 exs., Gibbons land, 22.xii.82

Distribution : INDIA : Arunachal Pradesh (new record), Assam, Uttar Pradesh, West Bengal.

Elsewhere : Pakistan, Burma, Sumatra.

Remarks : This species shows much variation in shell characters, which has resulted in a large number of varieties and subvarieties being named by different authors. However, these varieties are not constant and regularly intergrade into each other.

Genus **Paludomus** Swainson, 1840

20. **Paludomus conica** Gray

Melania conica Gray, 1850, *Griff. ed Cuvier Moll.*, pl. 14, fig. 5.

Material examined : (i) 1 ex. Em Pen, 27.xii.81 (ii) 5 exs., Em Pen, 27.xii.82 (iii) 5 exs., Miao, 2.xii.82.

Distribution : INDIA : North-eastern India.

Elsewhere : Bhutan, Bangladesh.

Remarks : This species shows considerable variation in shell characters. Among the material studied, five shells from Miao differ from others by possessing rather conspicuous umbilical pore and slightly broader aperture.

Collected from streams with muddy substratum.

Order : BASOMMATOPHORA

Family : LYMNAEIDAE

Genus **Lymnaea** Lamarck, 1911

21. **Lymnaea (Pseudosuccinea) acuminata f. typica** (Lamarck)

Limnaea acuminata Lamarck, 1822, *Hist. nat. Anim. Sans. Vert.*, 6(20) : 160.

Limnaea acuminata Lamarck : Annandale & Rao, 1925, *Rec. Indian Mus.*, 27 : 177.

Material examined : 5 exs., Em Pen, 19.xii.82

Distribution : INDIA : Widely distributed.

Elsewhere : Pakistan, Bangladesh, Burma.

Remarks : Shell thin, ovate, spire short, acuminate, body whorl much inflated a little angular, with a large aperture, columella twisted.

Collected from a small stream with a little flow of water and muddy substratum.

Family : PLANORBIDAE

Genus **Segmentina** Fleming, 1817

22. **Segmentina calatha** (Benson)

Planorbis calatha Benson, 1850, *Ann. Mag. Nat. Hist.*, (2)5 : 348.

Planorbis (Segmentina) calatha (Benson) : Preston, 1915, *Fauna of British India, Mollusca (Freshwater)* p. 127.

Segmentina calatha (Benson) : Germain, 1923, *Rec. Indian Mus.*, 21 : 168.

Material examined : 5 exs., Gibbons land, 27.xii.82

Distribution : INDIA : Arunachal Pradesh, Bihar, Himachal Pradesh, Manipur, Uttar Pradesh, West Bengal.

Elsewhere : Sri Lanka and Burma.

Remarks : This species is for the first time recorded from Arunachal Pradesh.

Collected from stagnant water with ample aquatic vegetations.

Class : BIVALVIA

Order : UNIONOIDA

Family : UNIONIDAE

Genus **Parreysia** Conard, 1853

23. **Parreysia (Radiatula) lima** Simpson

Nodularia (Radiatula) lima Simpson, 1900, *Proc. U. S. nat. Mus.*, 22 : 820.

Nodularia (Radiatula) lima Simpson : Preston, 1955, *Fauna of British India, Mollusca (Freshwater)*, p. 147.

Indonata lima (Simpson) : Prashad, 1921, *Rec. Indian Mus.*, 22 : 60.

Material examined : 2 valves, from a stream near Gibbons land, 26.xii.82

Distribution : Arunachal Pradesh (new record), Assam, Sikkim, West Bengal.

Remarks : Shell variable in form and sculpture. The corrugations in some cases are confined to umbonal region whereas in others these are extended over the whole surface of the shell. Shape varies from trapezoidal to ovate.

Collected from streams with muddy substratum.

SUMMARY

Out of the 18 species of land molluscs studied, 10 species, viz. *Alycaeus burti* Godwin-Austen, *A. daflaensis* Godwin-Austen, *A. khasicus* Godwin-Austen, *Leptopoma sericatum* Pfeiffer, *Pterocyclus affinis* Gude, *Glessula dikrangense* Godwin-Austen, *Macrochlamys dikrangensis* Godwin-Austen, *M. vesica* Godwin-Austen, *Staffordia daflaensis* Godwin-Austen and *Amphidromus masoni* Godwin-Austen, are restricted to North-Eastern India. Four species among these, (*A. daflaensis*, *L. sericatum*, *M. dikrangense* and *S. daflaensis*) are confined to Arunachal Pradesh alone. The genus *Staffordia* is endemic to Arunachal Pradesh.

Eight species viz., *A. khasiacus* Godwin-Austen, *C. aurantiacus* (Schumacher), *L. sericatum* Pfeiffer, *Theobaldius phaenotopicus* (Benson), *Opeas gracile* (Hutton), *K. serrula* (Benson), *K. barrackporensis* (Pfeiffer) and *M. vesica* Godwin-Austen are new records for the state of Arunachal Pradesh. Incidentally, the species *L. sericatum* is, for the first time, recorded from India.

Of the 5 species of freshwater molluscs, *Parreysia (Radiatula) lima* Simpson, a bivalve, was hitherto known from the eastern states of Assam, Sikkim and West Bengal and is a new record from Arunachal Pradesh. All the remaining 4 species have a wide range of distribution throughout India.

ACKNOWLEDGEMENTS

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PISCES

By

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INTRODUCTION

This report is based on the fish fauna collected from Namdapha National Park. The fish material comprises 255 examples belonging to 7 families, 19 genera under 28 species. Three species form the new record and four new species have been described. While identifying the species of this locality all the existing literature (Chaodhury, 1913 ; Jayaram and Majumdar, 1964 ; Srivastava, 1966 and Chaodhuri and Sen, 1977), on the fish fauna of Arunachal Pradesh (formerly NEFA) have been consulted. The species are detailed systematically citing important synonymies, number of examples examined with date of collection and its geographical distributions.

FISH FAUNA OF NAMDAPHA NATIONAL PARK, TIRAP DISTRICT, ARUNACHAL PRADESH, INDIA.

The material consists of 255 examples comprising 28 species belonging to 19 genera and 7 families as recorded below. The systematic account is arranged as per that of Greenwood, Rosen, Weitzman and Myers (1966).

Class	—	PISCES
Subclass	—	TELEOSTOMI
Order	—	CYPRINIFORMES
Family I	—	CYPRINIDAE
Genus (1)	—	Danio Hamilton

1. **Danio (Danio) aequipinnatus** (McClelland)

1839. *Perilampus aequipinnatus* McClelland, *Asiat. Res.*, 19(2) : 393 (type-locality : Assam).
1878. *Danio aequipinnatus*, Day, *Fish. India*, : 596, pl. 150, fig. 6.
1934. *Danio (Danio) aequipinnatus*, Hora and Mukerji, *Rec. Indian Mus.*, 36 : 134 (synoptic table to species of the subgenus *Danio*).

Material examined : 72 exs., 24.0 mm-85.0 mm S. L. ; 12.iv.81.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Thailand and China.

Remarks : This species is provided with a backwardly directed spinous process at the anterior rim of the orbit. The earlier Indian workers seem to have overlooked the presence of this bony structure derived from the lachrymal bone of the orbit. It was first pointed out by Vinciguerra (1889-90 : 304) and later confirmed by Myers (in Herre and Myers, 1937 : 57) that in this species there is a preorbital spinous process as in *Danio* (*Danio*) *regina* Fowler.

2. *Danio* (*Danio*) *dangila* (Hamilton)

1822. *Cyprinus dangila* Hamilton, *Fish. Ganges*, 321, 309 (type-locality : mountain streams of Monghyr, Bihar)

1878. *Danio dangila*, Day, *Fish. India*, : 596, pl. 150, fig. 3.

Material examined : 47 exs., 42.0 mm.-72.0 mm. S. L. ; 11.iv.81.

Distribution : INDIA : Assam, Meghalaya, Arunachal Pradesh, Nagaland, Manipur, West Bengal, Bihar, Madhya Pradesh, Uttar Pradesh, Bangladesh, Nepal, Burma.

Remarks : There is a gradual tendency towards the reduction of anal fin rays (14-15 vs. 17-18) and body depth comparatively shorter in these specimen of this locality.

3. *Danio* (*Brachydanio*) *horai* Barman

1983. *Danio* (*Brachydanio*) *horai* Barman, *Curr. Sci.*, 52(4) : 177-178 (type-locality : Namdapha river, Tirap dist., Arunachal Pradesh).

Material examined : 10 exs., 21.0 mm.-28.0 mm. S. L. ; 12.iv.81.

Distribution : INDIA : Arunachal Pradesh.

Remarks : This species attains to a length of 28.0 mm. in standard length.

4. *Danio* (*Danio*) *neilgherriensis* (Day)

1867. *Paradanio neilgherriensis* Day, *Proc. Zool. Soc. Lond.*, 296 (type-locality : Nilgiri Hills, S. India).

1878. *Danio neilgherriensis* Day, *Fish. India*, : 597, pl. 150, fig. 2.

1934. *Danio* (*Danio*) *neilgherriensis*, Hora and Mukerji, *Rec. Indian Mus.*, 36(1) : 134 (synoptic table to species of the subgenus *Danio*).

Material examined : 4 exs., 40.0mm.-52.0mm. S. L. ; 11.iv.81.

Distribution : INDIA : Tamil Nadu, Arunachal Pradesh.

Remarks : Day (1867) described *Danio neilgherriensis* from the rivers of the Nilgiri Hills, Tamil Nadu. After Day, no record of this species is known from anywhere in India. This faunastic survey has emanates the presence of this species in that locality. This discontinuous distribution of this species in that locality is of great zoogeographical interest because its presence in that locality indicates its range of distribution to North-Eastern India. Moreover, the present record of this species is the second record subsequent to Day (1867) in India.

5. *Barilius bendelisis* (Hamilton)

1807. *Cyprinus bendelisis* Hamilton, *Journey Mysore*, 3 : 345, pl. 32 (type-locality : rivers of Mysore).

1889. *Barilius bendelisis*, Day, *Fauna Brit. India, Fish*, 1 : 347.

Material examined : 18 exs., 46.0 mm.---118.0 mm S.L., 18.iv.81.

Distribution : Throughout India, Nepal, Pakistan, Bangladesh, Sri Lanka.

6. *Barilius vagra* (Hamilton)

1822. *Cyprinus vagra* Hamilton, *Fish. Ganges*, : 269, 385 (type-locality : Ganga river at Patna).

1889. *Barilius vagra*, Day, *Fauna Brit. India, Fish*, 1 : 345.

Material examined : 3 exs., 43.0 mm.-51.0 mm. S.L., 11.iv.81.

Distribution : INDIA : North India (Indus, Ganga, Yamuna and Brahmaputra river system). Nepal, Bangladesh, Sri Lanka, Pakistan.

7. *Semiplotus semiplotus* (McClelland)

1839. *Cyprinus semiplotus* McClelland, *Asiat. Res.*, 19 : 274 (type-locality : Brahmaputra at Upper Assam).

1881. *Semiplotus semiplotus*, Jayaram, *Freshwater Fishes of India*, : 96 (distribution and key to species).

Material examined : 4 exs., 90.0 mm.-250.0 mm. S.L. ; 18.iv.81.

Distribution : INDIA : Assam, Meghalaya, Arunachal Pradesh.

8. *Puntius hexastichus* (McClelland)

1839. *Barbus hexastichus* McClelland, *Asiat. Res.*, 19 : 269, 333 (type-lacality : Assam).

1981. *Puntius hexastichus*, *Freshwater Fishes of India*, : 105 (key to the species).

Material examined : 2 exs., 112.0 mm.-130.0 mm. S. L. ; 18.iv.81.

Distribution : INDIA : Himalayan foot hill rivers, from Kashmir to Sikkim and Assam.

9. *Puntius stivensonii* (Day)

1870. *Barbus stivensonii* Day, *Proc. zool. Soc. Lond.*, : 100 (type-locality : Hills near Akyab, Burma).
 1981. *Puntius stivensonii*, Jayaram, *Freshwater Fishes of India*, : 106 (key to the species).

Material examined : 24 exs., 36.0 mm.—43.0 mm. S. L. ; 12.iv.81.

Distribution : INDIA : Arunachal Pradesh. Hills near Akyab, Burma.

Remarks : Recorded for the first time in Arunachal Pradesh.

10. *Labeo dero* (Hamilton)

1822. *Cyprinus dero* Hamilton, *Fish. Ganges*, : 277 (type-locality : the Brahmaputra).
 1981. *Labeo dero*, Jayaram, *Freshwater fishes of India*, : 119 (key to the species).

Material examined : 8 exs., 120.0 mm.—300.0 mm. S.L. ; 18.iv.81.

Distribution : INDIA : Assam, Darjeeling (West Bengal), Eastern Himalayas, Punjab, Uttar Pradesh, Western Himalayas, Pakistan, China.

11. *Labeo pangusia* (Hamilton)

1822. *Cyprinus pangusia* Hamilton, *Fish Ganges*, : 285, 386 (type-locality : River Kosi).
 1981. *Labeo pangusia*, Jayaram, *Freshwater Fishes of India*, : 119 (key to the species).

Material examined : 1 ex., 140 mm. S.L. ; 11.iv.81.

Distribution : INDIA : Hymalayan range and generally throughout Sind, the Deccan, N.W. Provinces to Bengal, Cachar and Assam (Day, 1878)

12. *Acrossocheilus hexagonolepis* (McClelland)

1839. *Barbus hexagonolepis* McClelland, *Asiat. Res.*, 19 : 270, 336 (type-locality : Upper Assam).
 1981. *Acrossocheilus hexagonolepis*, Jayaram, *Freshwater Fishes of India*, : 122 (diagnostic characters).

Material examined : 11 exs., 55.0 mm.—245.0 mm. S.L. ; 11.iv.81.

Distribution : INDIA : Assam, West Bengal, Eastern Himalayas, Bangladesh, Pakistan, Malaya, Burma, Nepal, Thailand.

13. **Tor khudree** (Sykes)

1841. *Barbus khudree* Sykes, *Trans. zool. Soc. London*, 2 : 357 (type-locality : Mutha Mula river, Poona).
1981. *Tor khudree*, Jayaram, *Freshwater fishes of India*, : 126 (key to species).

Material examined : 1 ex., 210.0 mm. S.L. ; 18.iv.81.

Distribution : INDIA : Rivers of Western Ghat viz. Godavary, Krishna, Cauvery and their tributaries.

14. **Tor putitora** (Hamilton)

1822. *Cyprinus putitora* Hamilton, *Fish. Ganges*, : 303, 388 (type-locality : eastern parts of Bengal).
1981. *Tor putitora*, Jayaram, *Freshwater fishes of India*, : 125 (key to the species).

Material examined : 1 ex., 252.0 mm. S.L. ; 18.iv.81.

Distribution : INDIA : Assam, Eastern Himalayas, West Bengal, Punjab, Uttar Pradesh, Western Himalayas, Pakistan, Bangladesh, Nepal, Burma, Thailand.

15. **Crossocheilus latius latius** (Hamilton)

1822. *Cyprinus latius* Hamilton, *Fish. Ganges*, : 345, 393 (type-locality : the Tista).
1981. *Crossocheilus latius latius*, Jayaram, *Freshwater Fishes of India*, : 134 (key to the species).

Material examined : 25 exs., 62.0 mm.—135.0 mm. S. L. ; 18.ix.81.

Distribution : INDIA : Bihar, West Bengal, Uttar Pradesh, Andhra, Pradesh, Maharasthra, Karnataka, Pakistan, Bangladesh.

16. **Garra nasuta** Datta and Barman

1838. *Platycara nasuta* McClelland, *J. Asiat. Soc. Beng.*, 7(2) : 947 (type-locality : Khasi Hills, Assam).
1964. *Garra nasuta*, Menon, *Mem. Indian Mus.*, 14 : 239 pl. 13, figs. 11-12 (Revision).

Material examined : 1 ex., 110.0 mm. S.l. ; 21.iv.81.

Distribution : INDIA : Assam, Burma, South China and Indo-China.

17. **Garra tirapensis** Datta and Barman

1984. *Garra tirapensis* Datta and Barman, *Bull. zool. Surv. India*, 6 (1-3) : 283-287 (type-locality : Namdapha wildlife sanctuary, Tirap district, Arunachal Pradesh).

Material examined : 11 exs., 55.0 mm.—135.0 mm. S. L. ; 18.iv.81.

Distribution : INDIA : Arunachal Pradesh.

Family II : COBITIDAE

Genus (10) **Aborichthys** Choudhuri

18. **Aborichthys elongatus** Hora

1821. *Aborichthys elongatus* Hora, *Rec. Indian Mus.*, 22(5) : 735 (type-locality : Reang River, Darjeeling, Alt, 20008).
 1981. *Aborichthys elongatus* Jayaram, *Freshwater Fishes of India*, : 146 (distribution).

Material examined : 1 ex., 65.0 mm. S. L. ; 18.iv.81.

Distribution : INDIA : Darjeeling Himalaya.

Genus (11) **Noemacheilus** van Hasselt

19. **Noemacheilus arunachalensis** Datta and Barman

1984. *Noemacheilus arunachalensis* Datta and Barman, *Bull. zool. Surv. India*, 6 (1-3) : 275-277 (type-locality : Namdapha wildlife sanctuary, Tirap district, Arunachal Pradesh).

Material examined : 3 exs., 34.0 mm.—55.0 mm. S. L. ; 11.iv.81.

Distribution : INDIA : Namdapha River, Tirap dist., Arunachal Pradesh.

20. **Noemacheilus botia** (Hamilton)

1822. *Cobitis botia* Hamilton, *Fish. Ganges*, : 350, 394 (type-locality : rivers of north-eastern parts of Bengal).
 1878. *Noemacheilus botia*, Day, *Fish. India*, : 614, pl. 156, fig. 5.

Material examined : 3 exs., 20.0 mm.—55.0 mm. S. L. ; 18.iv.81.

Distribution : INDIA : Throughout northern India. Bangladesh, Pakistan, Burma, Sri Lanka.

Genus (12) **Somileptis** Swinson

21. **somileptis gongota** (Hamilton)

1822. *Cobitis gongota* Hamilton, *Fish. Ganges*, : 351, 394 (type locality : rivers of northern Bengal towards the mountains).
 1878. *Somileptis gongota*, Day, *Fish. India*, : 608, pl. 155, fig. 2.

Material examined : 2 exs., 82.0 mm.—104.0 mm. S. L. ; 11.iv.81.

Distribution : INDIA : Assam, Bihar, West Bengal, Bangladesh.

Genus (13) **Lepidocephalus** Bleeker

22. **Lepidocephalus (Lepidocephalichthys) guntea** (Hamilton)

1822. *Cobitis guntea* Hamilton, *Fish. Ganges*, 353, 394 (type-locality : ponds and rivers of Bengal).
 1981. *Lepidocephalus (Lepidocephalichthys) guntea*, Tilak and Husain, *Rec. zool. Surv. India, Oce. Paper no. 32* : 7 (Revision).

Material examined : 6 exs., 56.0 mm.—67.0 mm. S. L. ; 11.iv.81.

Distribution : North India, Pakistan, Nepal, Bangladesh.

Genus (14) **Acanthopsis** van Hasselt

23. **Acanthopsis choirorhynchus** (Bleeker)

1854. *Cobitis choirorhynchus* Bleeker, *Nat. Tijdschr. Ned. Indie*, 7 : 95 (type-locality : Palembang, Sumatra)
 1878. *Acanthopsis choirorhynchus*, Day, *Fish. India*, : 608 (Redescription).

Material examined : 1 ex., 192.0 mm. S. L. ; 12.iv.81.

Distribution : INDIA : Arunachal Pradesh, Burma, Malayasia, Sumatra, Borneo, Java, Vietnam and Thailand.

Remarks : The monotypic cobitid genus *Acanthopsis* van Hasselt with its type species *A. choirorhynchus* (Bleeker) is known hitherto only from Burma, Malayasia, Sumatra, Borneo, Java, French Indo-China (Vietnam), Thailand (Smith, 1945). This faunistic survey of fish fauna of Arunachal Pradesh has revealed a female specimen of *A. choirorhynchus*. The existing literature on the fish fauna of Arunachal Pradesh also indicate that this species is not so far known from Arunachal Pradesh and from rest of the other states of India also. The present record of this species from Namdapha Wildlife Sanctuary. Tirap district, Arunachal Pradesh, therefore, extends its distributional range west-ward to the Indian mianland.

Order : SILURIFORMES

Family III : BAGRIDAE

Genus (15) **Batasio** Blyth

24. **Batasio tengana** (Hamilton)

1822. *Pimelodus tengana* Hamilton, *Fish. Ganges*, : 176, 377 (type-locality : R. Brahmaputra).
 1941. *Batasio tengana*, Hora and Law, *Rec. Indian Mus.*, 43 : 36 (Revision).

Material examined : 2 exs., 80.0 mm.—95.0 mm. S. L. ; 18.iv.81,

Distribution : INDIA : E. Himalayas, Assam, North Bengal, Bangladesh, Burma, Malayasia, Thailand.

Family IV : SILURIDAE

Genus (16) **Kryptopterus** Bleeker

25. **Kryptopterus indicus** sp. nov.

The new species is being described in *Bull. zool. Surv. India*.

Material examined : 1 ex., 190.0 mm. S. L. ; 11.iv.81.

Distribution : INDIA : Namdapha river, Tirap dist., Arunachal Pradesh.

Family V : SISORIDAE

Genus (17) **Pseudecheneis** Blyth

26. **Pseudechenesis sulcatus** (McClelland)

1842. *Glptosternon sulcatus* McClelland, *J. Nat. Hist. Calcutta*, 2 : 587 (type-locality : Khasi Hills)

1889. *Pseudechensis sulcatus*, Day, *Fauna Brit. Ind. Fish*, 1 : 107.

Material examined : 4 exs., 50.0 mm.—140.0 mm. S. L. ; 18.iv.81.

Distribution : INDIA : Assam, West Bengal, Meghalaya, Nepal.

Order : CHANNIFORMES

Family VI : CHANNIDAE

Genus (18) **Channa** Scopoli

27 **Channa stewarti** (Playfair)

1867. *Ophiocephalus stewarti* Playfair, *Proc. zool. Soc.* : 14, pl. 3 (type-locality : Cachar, Assam).

1889. *Channa stewarti*, Day, *Fauna Brit. Ind. Fish*, 2 : 363.

Material examined : 10 exs., 55.0 mm.—110.0 mm. S. L. ; 11.iv.81.

Distribution : INDIA : Assam, Bihar, Meghalaya, West Bengal.

Order : PERCIFORMES

Family VII : NANDIDAE

Genus (19) **Badis** Bleeker

28. **Badis badis** (Hamilton)

1822. *Labrus badis* Hamilton, *Fish Ganges*, : 70, 368 (type-locality : Gangetic Provinces).

1954. *Badis badis*, Menon, *Rec. Indian Mus.*, 52 : 22 (Nepal).

Material examined : 8 exs., 30.0 mm.—46.0 mm. S. L. ; 12.iv.81.

Distribution : INDIA : Assam, Nagaland, Meghalaya, Bihar, West Bengal, Uttar Pradesh, Bangladesh, Pakistan, Burma, Nepal.

SUMMARY

The study of the fish fauna of Namdapha National Park, in Tirap district, Arunachal Pradesh is very interesting because it shows that the fishes of this area is a combination of the fish fauna of the Eastern Himalayas, Burma, Nagaland, Manipur and Assam. The present study has recorded 28 species belonging to 19 genera and 7 families. Out of the 28 species, 17 species fall under the family Cyprinidae, 6 species of the family Cobitidae and families Bagridae, Siluridae, Sisoridae, Channidae and Nandidae 1 species each.

This work has unfolded many interesting results which enable to describe four new species, viz., *Danio (Brachydanio) horai* Barman and *Garra tirapensis* Datta and Barman under the family Cyprinidae ; *Noemacheilus arunachalensis* Datta and Barman of the family Cobitidae and *Kryptopterus indicus* sp. nov. belonging to family Siluridae. Three species are new record from this area, viz., *Danio (Danio) neilgherriensis* (Day) which was described and so far known only from the Nilgiri Hills, S. India by Day (1867) ; *Puntius stevensonii* Day was so far known only from Burma ; *Acanthopsis choirorhynchus* (Bleeker) was known so far from Burma, Malaysia, Sumatra, Borneo, Java, Vietnam and Thailand.

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AMPHIBIA

By

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INTRODUCTION

The present paper is based on material collected from Namdapha National Park in Tirap district of Arunachal Pradesh, India. The material is not only rich in number (64 specimens) but also in variety, consisting of 14 species belonging to 5 genera distributed in 3 families. Two species are new to science and 12 species (9 frogs and 3 toads) are recorded for the first time from this proposed Biosphere Reserve. The amphibian fauna of the area is quite rich and has got a close similarity with that of Burmese fauna.

SYSTEMATIC ACCOUNT

Order : ANURA

Family : RANIDAE

Genus (1) **Amolops** Cope, 1865

1. **Amolops afghanus** (Gunther)

Material examined : 1 ex., Hornbill Camp (alt. 680 m.), ca. 30 km. N. E. of Miao, 11.iv.1981 ; 1 ex., Gibbons Land, 29.iv.1981.

Measurements : Snout to Vent length, 40-48 mm.

Distribution : India (Darjeeling and Khasi Hills), Nepal, Burma and South Yunnan.

Remarks : Skin of all the above specimens is quite smooth except that the posterior part of the thighs is granulated. Example from Hornbill camp is darker and having darker spots on throat and breast. Discs on toes in both the examples are much smaller than those on fingers.

Genus (2) **Rana** Linnaeus, 1766

2. **Rana kuhlii** Schlegel in Dumeril and Bibron

Material examined : 4 ex., Hornbill (alt. 680 m.), ca. 30 km. N. E.

of Miao, 11.iv.1981 ; 1 ex., Farmbase, 19.iv.1981 ; 1 ex., Namdapha (alt. 350m.), 58 km. from Miao, 21.iv.1981 ; 1 ex., Gibbons land, 29.iv.1981.

Measurements : Snout to Vent length, 23-70 mm.

Distribution : The species is widely distributed from India (Meghalaya), Burma, Southern China, Taiwan to Malaysia, Sumatra, Borneo, Java and Celebes.

Remarks : Dorsal surface brownish with broad darker spots. Ventral surface reddish brown with dark brown spots on sides, breast and throat. Skin on the outer surface of tibia, tarsus and metatarsals is thickly tuberculated. Skin throughout the rest of the body is more or less smooth.

3. *Rana limnocharis limnocharis* Boie in Wiegmann

Material examined : 2 ex., Miao (Alt. 310 m.), 4.iv.1981 ; 1 ex., Farmbase Camp (alt. 350 m.), 19.iv.1981 ; 6 ex., Namdapha Camp (Alt. 350 m.), 58 km. from Miao, 21.iv.1981 ; 2 ex., 31 miles point on M. V road, ca. 42 km. from Miao, 26.iv.1981 ; 8 ex., Deban (alt. 340 m.), ca. 27 km. E. of Miao, 27.iv.1981 ; 2 ex., Gibbons land (290 m.), 16 km. E. of Miao, 1.v.1981.

Measurements : Snout to Vent length, 24-55 mm.

Distribution : Widely distributed in India.

ELSEWHERE : Pakistan, Nepal, Sri Lanka, Burma and China to Japan.

Remarks : The frog collected from Farmbase Camp vary from other Indian examples as it possesses a thickly tuberculated dorsal skin.

Family : RHACOPHORIDAE

Genus (3) *Philautus* Gistel, 1848

4. *Philautus cherrapunjiae* Roonwal and Kripalani

Material examined : 14 ex., Gibbons land, 1.v.1981.

Measurements : Snout to Vent length, 21-24 mm.

Distribution : India (Cherrapunji).

Remarks : These are the largest of all the specimens so far recorded for this species and constitute the new locality record from Namdapha. Examples from Namdapha vary from other Indian examples (Roonwal & Kripalani, 1961 and Pillai & Chanda 1979) by possessing a

distinct and long palmer wart at the base of the first finger. They also vary by having a small (almost indistinct) inner metatarsal tubercle.

5. ***Philautus namdaphaensis* n. sp.**

(Plate I ; Figs. 1 & 2)

Material examined : 3 adult ♂♂, Farmbase Camp (alt. 350 m.) Tirap district, Arunachal Pradesh, India, 18.vi.1981 (Day, from a bush). Coll. *Shamrup Biswas*.

DESCRIPTION

Dorsum dark brown; speckled with irregular chocolate spots in holotype and one paratype (another paratype is devoid of such spots). A thin, less prominent line starts from the snout and reaches up to the vent on the mid-dorsal aspect. Upper surface of limbs dark brown, with indistinct crossbars and with a thin line originating from vent and reaching up to heel through the femur and tibia. A broad white band in between the eyes, covering the anterior part of both the upper eyelids. Lateral aspects of thigh, tibia and groin brownish, with dark blotches at places. Ventrums dirty white in all the examples.

Body short, stout and flattened.

Head : Head more or less triangular, slightly broader than long ; snout subacuminate, a little longer than the maximum diameter of the eye ; canthus rostralis not very distinct ; loreal region slightly concave ; nostril equidistant from the eye and the snout ; interorbital region broader than the breadth of the upper eyelid ; tympanum indistinct ; tongue fairly large, free and bifid behind, and without a papilla ; vomerine teeth absent.

Forelimbs : Fairly stout, with moderate fingers possessing intercalary ossicle, fingers free with distinct round discs, more or less equal to that of toes ; subarticular tubercles very distinct ; a feebly prominent long palmer wart placed laterally at the base of first finger.

Hindlimbs : Fairly stout, with moderate toes possessing intercalary ossicle ; toes nearly half-webbed, web reaches at the base of second penultimate phalange of the fourth toe and at the first penultimate phalange of the third and fifth toes ; a small feebly distinct inner metatarsal tubercle present, no outer metatarsal tubercle ; tibio-tarsal articulation reaches in between anterior part of the eye and the nostril ; subarticular tubercles not very distinct.

holotype above, Z. S. I. Reg. No. A7178 and A7179 also in Z. S. I. Collection, Calcutta.

Type-locality and distribution : India :

Type-locality : Farmbase camp, Tirap district, Arunachal Pradesh.

Distribution : Known from Type-locality only.

Comparison : *Philautus namdaphaensis* n. sp. comes close to *Philautus parvulus* (Boulenger, 1893) from Karin Bia-po, Burma but differs from it as follows :—

1. Snout subacuminate, a little longer than the diameter of the eye (vs. snout rounded, a little shorter than the diameter of the eye).
2. Canthus nostralis feebly distinct (vs. Canthus rostralis indistinct).
3. Toes moderate, half-webbed (vs. toes short, webbed at the base).
4. The tibiotarsal articulation reaches in between the anterior border of eye and nostril (vs. the tibio-tarsal articulation reaches the posterior border of eye).
5. Dark-brown above, uniform or with a broad white band between the anterior half of the eyes (vs. Greyish or brown above, uniform or with a dark bar or triangular blotch between the eyes).

Remarks : The species has been named after locality, "Namdapha".

Genus (4) **Rhacophorus** Kuhl, 1827

6. **Rhacophorus leucomystax himalayensis** Annandale

Material examined : 2 ex., 31 mile point on M. V. road, ca. 42 km. from Miao, 26.iv.1981.

Measurements : Snout to Vent length, 50-53 mm.

Distribution : India (The Eastern Himalayas, Assam) and Western China (Annandale, 1912 and Ahl, 1931).

Remarks : Skin smooth on the dorsum and throat, and granular on the belly. Colour of skin dark brown above and dull whitish beneath.

7. **Rhacophorus leucomystax sexvirgata** (Reinward)

Material examined : 1 ex., Deban (alt. 340 m.), ca. 27 km. E. of Miao, 27.iv.1981.

Measurements : Snout to Vent length, 58 mm.

Distribution : India to Malay Peninsula (Van Kampen, 1923), Sumatra, Borneo, Java, Singapore, Taiwan, Philippines,

Remarks : Four light dark longitudinal bands present on the dorsum. The inner two bands originate from above the nostrils, unite at the middle of the body and end interruptedly near the joint of the thighs with the body, and the outer two originate from the anterior side of the upper eyelids and end near the joint of thighs with the body.

8. **Rhacophorus maculatus** (Gray)

Material examined : 1 ex., Deban (alt. 340 m.), ca. 27 km. E. of Miao, 27.iv.1981.

Distribution : India (Calcutta, Tamil Nadu) and Sri Lanka.

Remarks : Damaged specimen.

9. **Rhacophorus maximus** Günther

Material examined : 1 ex., 31 mile point on M. V. road, ca. 42 km. from Miao, 26.iv.1981 ; 2 ex., Deban (alt. 340 m.), ca. 27 km. E. of Miao, 27.iv.1981.

Measurements : Snout to Vent length, 84-112 mm.

Distribution : India (Assam, Meghalaya : Khasi Hills) and Nepal.

Remarks : The frogs are bluish dorsally and brownish ventrally. Dorsal skin is smooth. Ventral skin is granular. In one example (from 31 mile point) the skin on throat is devoid of granules.

10. **Rhacophorus namdaphaensis** n. sp.

(Plate I, Figs. 3 & 4)

Material examined : 5 ex., Namdapha camp (alt., 350 m.), ca. 58 km. from Miao, Tirap district, Arunachal Pradesh, India, 21.iv.1981 (Day, from a wild banana plant). Coll. *Shamrup Biswas*.

DESCRIPTION

Dorsum reddish-brown intermixed with variable black spots. Upper surface of limbs with faint cross-bars. Under surface of hindlimbs reddish brown. A large, more or less round black spot on each side behind the armpit. Ventrums brownish.

Body short and stout.

Head : More or less triangular, slightly broader than long ; snout subacuminate, little longer than the maximum diameter of the eye ;

canthus rostralis not very distinct ; loreal region angular, slightly concave ; nostril in between the eye and tip of the snout ; interorbital region much broader than the breadth of the upper eyelid ; tympanum not very distinct, about half the diameter of the eye ; tongue fairly large, free and bifid behind, and without a papilla ; vomerine teeth in two distinct longitudinal transverse series placed in between the choanae and touching anterior inner corners of the choanae.

Forelimbs : Fairly stout, with moderately long fingers possessing intercalary ossicle ; fingers not entirely webbed, web reaches at the base of penultimate phalange (behind the disc) of the first and third fingers, and nearly the discs on the outer side of the second and inner side of the fourth fingers ; first finger shorter than the second ; discs of fingers smaller than the tympanum, and slightly larger than those of toes ; subarticular tubercles well-developed ; a very prominent long palmer wart placed laterally at the base of first finger.

Hindlimbs : Slender, with the long toes possessing inter-calary ossicle ; toes nearly entirely webbed, web reaches the discs of toes, except in fourth toe where it reaches at the middle of the penultimate phalange ; outer metatarsal separated by web at the base ; a small feebly distinct inner metatarsal tubercle present, no outer metatarsal tubercle ; subarticular tubercles of toes not very distinct ; tibio-tarsal articulation reaches mid-eye.

Skin : Skin of upper surface including that of limbs with microscopic scattered darker warts, of belly and lower surface of thighs granular, and of chest and throat smooth. A fold from posterior end of the eye to shoulder above the tympanum present ; a dermal fringe along the outer edge of fore-arm (except humerus) and fourth finger, and along that of tarsus and fifth toe present ; a transverse flap of skin above the vent and another on the heel present.

Sexes are not distinguishable externally.

Measurements : (in mm.)

			Holotype		Paratypes		
Regd. No.	...	...	A. 7180	A 7181	A 7182	A 7183	A 7184
From snout to vent	...	...	39	40	37	36	35
Head length	...	...	11	11	10	10	10
Width of head	...	...	12.5	12	11.5	11	11
Snout	...	...	6	6	5	5	5

			Holotype		Paratypes		
Snout to nostril	...	...	3	3	2.5	2.5	2.5
Eye	...	...	5.5	5	4.5	4	4
Interorbital width	...	...	4.5	4.5	4.5	4.5	4
Upper eyelid	...	...	3.5	3	3	2.5	2.5
Tympanum	...	...	3	2.5	2	2	2
Fore limb	...	...	26	25	23	23	23
First finger	...	...	5	5	4	4	4
Second finger	...	...	6	6.5	5	5	6
Third finger	...	...	8.5	9	7.5	7	7
Fourth finger	...	...	7	8	6	6	6.5
Hind limb	...	...	60	60	59	57	56
Tibia	...	...	18	18	18	17	17
Foot	...	...	14	14	13.5	13.5	13
First toe	...	...	5	5	4.5	4.5	4
Third toe	...	...	10	10	10	9.5	8
Fourth toe	...	...	13	13	12	13	12
Fifth toe	...	...	11	11.5	11	11	10.5
In. Metatarsal tub.	...	...	1	1	1	1	1
Out. Met. tub.	...	...	Absent	Absent	Absent	Absent	Absent
Tibiotarsal art.	...	...	Ant. Eye.	Mid. Eye.	Eye to nostril	Mid. Eye	Mid. Eye.
Breadth of disc on							
Fourth finger	...	...	2	2	2	2	2
Breadth of disc on							
Fifth toe	...	...	1.5	1.5	1.5	1.5	1.5

Type specimens : *Holotype :* An adult (in spirit), vide "material" above, Z. S. I. Reg. No. A7180 deposited in National Zoological Collections, Zoological Survey of India, Calcutta.

Paratypes : 4 adults (in spirit), vide same "material" that of holotype above Z. S. I. Reg. No. A7181 to A7184 also in Z. S. I. Collection, Calcutta.

Type-locality and distribution : India.

Type-locality : Namdapha camp, ca. 58 km. from Miao, Tirap district, Arunachal Pradesh.

Distribution : Known from Type-locality only.

Comparison : *Rhacophorus namdaphaensis* n. sp. is closely allied to *Rhacophorus dulitensis* (Boulenger, 1892) from Sumatra, but differs from it as follows :—

1. Tympanum almost indistinct, not more than half of the

diameter of the eye (*vs.* Tympanum distinct, more than half of the diameter of the eye).

2. Fingers not entirely webbed, web does not reach the disc of fourth finger (*vs.* Fingers almost entirely webbed, web reaches the disc of fourth finger).

3. Toes not webbed entirely (*vs.* Toes almost webbed entirely).

4. The heel reaches between the mid-eye and the nostril (*vs.* The heel reaches the tip of the snout).

Remarks : The species has been named after the place of collection, "Namdapha".

11. *Rhacophorus reinwardtii* (Boie)

Material examined : 1 ex., Chiria Camp (alt. 520 m.), ca. 64 km. E. of Miao, 24.iv.1981.

Measurements : Snout to Vent length, 70 mm.

Distribution : India (Khasi Hills), Sumatra, Banka and Java.

Remarks : Snout pointed, little longer than the upper eyelid. Upper (anterior) surface of head dull olive coloured ; dorsal surface of body, forelimbs and hindlimbs darker ; two more or less round small darker spots on the outer lateral aspects of thighs ; webs between third and fourth fingers, and fourth and fifth toes slightly blackish, and in this respect this example resembles more with those described by Jerdon (1870) from Khasi Hills (Meghalaya).

Family : BUFONIDAE

Genus (5) *Bufo* Laurenti, 1768

12. *Bufo himalayanus* Günther

Material examined : 2 ex., Chiria Camp (alt. 520 m.), 24.iv.1981.

Measurements : Snout to Vent length, 95-100 mm.

Distribution : India (Eastern Himalayas upto Arunachal Pradesh), Nepal.

Remarks : Smaller specimen is dark brown while the larger one is brownish in colouration. Dorsal surface of head and body (except Parotids) more or less smooth, with indistinct flat, porous warts scattered all over.

13. **Bufo melanostictus** Schneider

Material examined : 1 ex., Miao (alt. 310 m.), 4.iv.1981.

Measurements : Snout to Vent length, 75 mm.

Distribution : India (Common throughout the plains of the country), Nepal, Sri Lanka, Burma, Southern China to Malay Peninsula and Philippines.

14. **Bufo macrotis** (?) Boulenger

Material examined : 1 ex., Camera point (alt. 440 m.), 57 km. from Miao, on the M. V. Road, 23.iv.1981.

Measurements : Snout to Vent length, 37 mm.

Distribution : Upper Burma.

Remarks : This is a damaged specimen, both the forelimbs of which are broken. Body rough and covered with spiny warts, parotoids elongated ; dorsal surface dark brown and ventral surface brownish with darker spots. Head without bony ridges ; snout short, truncated ; interorbital space flat, a little broader than the upper eyelid ; tympanum distinct, vertically oval, more than half the diameter of the eye and close to it. Toes barely half webbed with irregular spiny tubercles beneath ; two small but distinct metatarsal tubercles present.

SUMMARY

This paper deals with the Amphibian fauna of Namdapha National Park in Tirap district of Arunachal Pradesh, India. It is consisting of 64 examples of Anurans (Frogs and Toads) belonging to three families, five genera and fourteen species, out of which two species, *Philautus namdaphaensis* and *Rhacophorus namdaphaensis*, are new to science and rest are recorded for the first time from this National Park. Six species namely, *Rana kuhlii*, *Philautus cherrapunjiae*, *Rhacophorus leucomystax sexvirgata*, *Rhacophorus maculatus*, *Rhacophorus reinwardtii* and *Bufo macrotis* are also recorded for the first time from Arunachal Pradesh, India.

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collections and to Dr. R. C. Sharma, Superintending Zoologist, of Herpetology Division, for encouragement and going through the manuscript. Thanks are also due to Dr. Shamrup Biswas, Shri S. S. Saha and other party members of Namdapha Expedition for making such an excellent collection available to us from such a difficult terrain.

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REPTILIA

By

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INTRODUCTION

The North-western and Western part, comprising only one-third of the total area of the sanctuary was surveyed during this expedition and in all 34 examples belonging to 13 species and 2 subspecies belonging to 15 genera distributed in 7 different families have been collected. All the species constitute new locality records from Arunachal Pradesh. The reptile fauna of this area bears a close similarity with that of Burmese fauna.

The earlier locality records for various species cited in this paper are based on Smith (1931, 1935, 1943), Stoliczka (1871) and Wall (1925).

Order I : TESTUDINES

Sub-order : Thecophora

Family (1) : EMYDIDAE

1. *Cyclemys mouhoti* Gray

Material examined : 1 ex., Deban, 27 km. from Miao, Tirap district. 27.iv.1981.

Measurements : Carapace length and breadth 182 and 178 mm. Plastron length and breadth 153 and 87 mm.

Distribution : Assam, Laos, Vietnam, Hainan Island.

Remarks : The head is brown with uniform yellowish reticulation. Shell dark brown.

Order II : SQUAMATA

Sub-order : SAURIA

Family (2) : GEKKONIDAE

2. *Cyrtodactylus khasiensis* (Jerdon)

Material examined : 1 ex., Hornbill (Alt. 680 m.). ca. 30 km. NE of Miao ; 13.iv.1981.

Measurements :—Length : snout to vent 53 mm., tail 60 mm.

Distribution : North-east India. Upper Burma.

Remarks : Head moderate with brown spots. Colour gray-brown above with dark edged whitish spots more or less regularly arranged. Tail with dark brown and white bands arranged alternately.

3. *Hemidactylus frenatus* Schlegel

Material examined : 3 ex., Miao (Alt. 310 m.), 5.v.1981. and 8.v.1981.

Measurements :—Length : snout to vent 12-37 mm., tail 36 mm. In one specimen tail is broken.

Distribution : The species is widely distributed from South Asia, Tropical Australia to East Africa.

Remarks : Colour grayish brown. Body with small granular scales intermixed with scattered, rounded conical tubercles. Tail covered above with small scales and series of six enlarged pointed tubercles.

4. *Cosymbotus platyurus* (Schneider)

Material examined : 1 ex., Miao (Alt. 310 m.) 4.iv.1981 ; 1 ex., Chiria camp (Alt. 520 m.) Ca. 64 km. E. of Miao, 23.iv.1981 ; 2 ex., Deban (Alt. 340 m.) ca. 27 km. E. Miao, 27.iv.1981.

Measurements :—Length : snout to vent 50-54 mm., tail 45-56 mm.

Distribution : India : Darjeeling Dist. (West Bengal), Assam, Manipur, Sikkim, Nepal, Burma, South-east Asia.

Remarks : Head moderate covered above with minute granular scales. Belly with large, smooth rounded imbricate scales ; Tail strongly depressed with denticulated lateral margin. Colour grayish brown above and yellowish below.

Family (3) : AGAMIDAE

5. *Ptyctolaemus gularis* (Peters)

Material examined : 5 ex., Hornbill (Alt. 680 m.), ca. 30 km. NE of Miao, 10-16.iv.1981 ; 1 ex., Deban (Alt. 340 m.), ca. 27 km. E. of Miao, 27.iv.1981.

Measurement :—Length : snout to vent 43-65 mm., tail 90-145 mm.

Distribution : Assam (south of Brahmaputra) ; Khasi Hills (Meghalaya).

Remarks : Head long and narrow. Dorsal scales unequal and

strongly keeled. Colour olive brown above. A dark stripe from below the eye. Yellowish-white below.

Family (4) : SCINCIDAE

6. **Sphenomorphus maculatum** (Blyth)

Material examined : 9 ex., Hornbill (Alt. 680 m.), ca. 30 km. NE of Miao, 13-16.iv.1981.

Measurements :—Length : snout to vent 33-55 mm., tail 48-100 mm.

Distribution : India : Eastern Himalayas, Assam. The Andaman and Nicobar Islands, Burma, Thailand, Combodia, Vietnam.

Remarks : Snout obtuse ; Lower eyelid scaly. Olive brown above with two dorsal series of dark brown spots ; a dark brown lateral bands spotted with whitish extends from the nose to the tail. Lower parts dirty white.

Sub-order : SERPENTES

Family (5) : TYPHLOPIDAE

7. **Typhlops diardi diardi** Smith

Material examined : 1 ex., New Itanagar, 31.iii.1981.

Measurements :—Total Length 277 mm.

Distribution : India : Dun Vally (Uttar Pradesh), Bengal, Assam, Burma, Malay, Peninsula, Thailand.

Remarks : Snout rounded. Colour blackish above, paler below. Tail ending in a small spine. 25 scales round the body 300 transverse rows of scales.

Family (6) : COLUBRIDAE

8. **Elaphe taeniura** Cope

Material examined : 1 ex., near Burma nala (Alt. 500 m.) 67 km. from Miao, on the M. V. Road, 24.iv.1981 ; 1 ex., on the M. V. road, ca. 42 km. from Miao, 26.iv.1981.

Measurements :—Length : snout to vent 1295 mm. and 1560 mm. tail 280 mm. and 377 mm.

Distribution : India : Darjeeling (West Bengal), Burma, N. Vietnam, Hong Kong, Thailand.

Remarks : Grayish above, head and neck uniform, a black stripe

on each side of the head, passing through the eye ; anterior part of the back with a vertebral series of black butterfly shaped spots, and small diamond-shaped spots on the sides. A black stripe along each side of the posterior part of the belly and along each side of the tail, separated from the upper lateral stripe by a whitish streak. Lower parts, yellowish and spotted with black.

9. *Oligodon (prox) cinereus* (Günther)

Material examined : 1 ex., on the way, 57 km. from Miao on M. V. Road, 23.iv.1981.

Measurements :—Length : snout to vent 177 mm. tail 33 mm.

Distribution : India : Assam, Burma, China, Hong Kong.

Remarks : Though the specimen appears to agree with Indian material of *Oligodon cinereus* in many details, due to the difference in many major characters and colouration, we hesitate to regard it as that species fully. This snake differ from *O. cinereus* as follows :

Scales round the middle of body in 15 rows (vs. in 17 rows) ; subcaudal scales 49 (vs. 29-42) and supralabials 7th, 3rd, 4th and 5th touching the eye (vs. 8th, 4th and 5th touching the eye).

10. *Dendrelaphis cyanochloris* (Wall)

Material examined : 1 ex., Deban (Alt. 340 m.) ca. 27 km. E. of Miao, 27.iv.1981.

Measurements :—Length : snout to vent 705 mm. tail to 350 mm.

Distribution : India : North Bengal ; Assam, Andaman and Nicobar Islands, Upper Burma and North-west Thailand.

Remarks : Bonzy-olive above, the scales black-edged ; ventral and outer scales-rows pale greenish. A black stripe on each side of the head, passing through the eye and extending on to the nape and forebody, where it broken up into spots. Lips and lower jaw yellowish.

11. *Rhabdophis himalayana* (Günther)

Material examined : 1 ex., Namdapha camp (Alt. 350 m.) 58 km. from Miao, 21.iv.1981.

Measurements :—Length : snout to vent 395 mm. tail 127 mm.

Distribution : India : Eastern Himalayas, Assam, Upper Burma.

Remarks : Blackish above with small black spots. Lower parts yellowish speckled with blackish. Labials yellowish.

12. *Natrix modesta* (Günther)

Material examined : 1 ex., Near 31st milepost on M. V. road, 24.iv.1981.

Measurements :—Length : snout to vent 320 mm. Tail 120 mm.

Distribution : India : Assam, Upper Burma, N. Thailand, Cambodia, Malay Peninsula.

Remarks : Colour darkish brown above with white spots regularly arranged and dorso-lateral series of small yellow spots form an indistinct stripe. Belly whitish with a squarish black spot near the edge of each ventral, forming a stripe from throat to the tail tip labials edged with black. Head dark brown.

13. *Pseudoxenodon macrops* (Blyth)

Material examined : 1 ex., near Camera point (Alt. 440 m.), 57 km. from Miao, on the M. V Road, 23.iv.1981.

Measurements :—Length : snout to vent 580 mm., tail 165 mm.

Distribution : India : Eastern Himalayas, Assam, Burma, Thailand, Malay Peninsula.

Remarks : Olivaceous above with a vertebral series of yellowish spots. A chevron-shaped mark on the nape. Yellowish below speckled with small black spots.

14. *Rhabdops bicolor* (Blyth)

Material examined : 1 ex., Namdapha camp (Alt. 350) 58 km. from Miao, 23.iv.1981.

Measurements :—Length : snout to vent 360 mm., tail 95 mm.

Distribution : India : Assam, Burma ; Western part of S. China.

Remarks : The black colour of the back descends on to the flanks in a series of V-shaped marks. Yellowish-white below. Head is olivaceous.

Family (7) ELAPIDAE

15. *Ophiophagus hannah* (Cantor)

Material examined : 1 ex., near Burma nala (Atl. 500 cm.) 67 km. from Miao, on the M. V road, 24.iv.1981.

Measurements :—Length : snout to vent 2210 mm. tail 475 mm.

Distribution : India : Peninsular India to Himalayas, The Andamans, Burma, Vietnam to South China. Malay Peninsula and Archipelago to the Philippines.

Remarks : Colour blackish-brown above and dirty white below. The head is moderate in size and markedly depressed. The nostril is fairly large. The eye is moderately large with round pupil. The body is fairly robust. The dorsal are in 15 rows two head lengths behind the head, 15 in midbody, and 15 two heads lengths before the vent. Caudal scales 85 1st single 2nd double, 3rd to 7th single and from 8th to rest are in double rows.

SUMMARY

This paper deals with the reptile collection from Namdapha Sanctuary, Arunachal Pradesh, India. It is based on by some recent collections made by Dr. Syamrup Biswas and Party during the year 1981. A total of 13 species and 2 sub-species belonging to 15 genera and 7 families are recorded. All the species and sub-species are recorded for the first time from Arunachal Pradesh.

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AVES

By

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The bird collection made in course of the Namdapha Expedition contained 64 species and subspecies of birds under 46 genera and 12 families. The taxonomic account of the same has been reported in this communication. Systematics etc. have been treated after Ripley (1982) and Ali & Ripley (1968-74, 1978) in general and for detailed description Baker (1922-1931) and Smytheis (1953) were consulted.

Order : FALCONIFORMES

Family : FALCONIDAE

1. *Microhierax melanoleucos* (Blyth)

Terax melanoleucos Blyth, 1943. *J. Asiat. Soc. Beng.* **12** : 179.

***Type Locality* :** Assam.

***Material examined* :** 1 ♂ taken from Deban on 28.iv.1981.

***Measurments* :** Wing 106, Tail 67, Bil 14, Tarsus 24.

Order : COLUMBIFORMES

Family : COLUMBIDAE

2. *Treron epicauda epicauda* Blyth

Treron epicauda Blyth, 1846. *J. Asiat. Soc. Beng.*, **14(2)** : 854.

***Type Locality* :** Restricted to Darjeeling.

***Material examined* :** 1 ♀ taken from Namdapha Camp on 21.iv.1981.

***Measurements* :** Wing 170, Tail 121, (Centtal Tail feather 201), Bill 22.

3. *Ducula badia griseicapilla* Walden

Ducula griseicapilla Walden, 1875. *Ann. Mag. Nat. Hist. Soc.*, (4) **16** : 228.

***Type Locality* :** Karen Hills, between 4000 and 4200 feet.

Material examined : 1 ♂, 1 ♀ taken from Firmbase on 19.iv.1981.

Measurements : Wing ♂ 244, ♀ 228, tail ♂ 187, ♀ 171, Bill ♂ 29, ♀ 30.

4. *Streptopelia chinensis edwardi* Ripley

Streptopelia chinensis edwardi Ripley, 1948. *Proc. Biol. Soc. Wash.*, 61 : 99.

Type Locality : Chabua, Lakhimpur, Dist., Assam.

Material examined : 1 ♀ taken from Gibbonsland on 1.v.1981.

Measurements : Wing 138, Tail 127, Bill 22.

5. *Chalcophaps indica indica* (Linnaeus)

Columba indica Linnaeus, 1758. *Syst. Nat.*, ed. 10, 1 : 164.

Type Locality : Indian orientali = Amboina *vide* Stresemann, 1952, *Ibis* 94 : 511.

Material examined : 1 [♀] taken from Gibbonsland on 30.iv.1981.

Measurements : Wing 139, Tail 71, Bill 24.

Order : STRIGIFORMES

Family : STRIGIDAE

6. *Otus spilocephalus spilocephalus* (Blyth)

Ephialtes spilocephalus Blyth, 1846. *J. Asiat. Soc. Beng.*, 15 : 8.

Type Locality : Darjeeling.

Material examined : 1 ♂ taken from Gibbonsland on 3.v.1981.

Measurements : Wing 142, Tail 77, Bill 18, Tarsus 27.

7. *Glaucidium brodiei brodiei* (Burton)

Noctua brodiei, Burton, 1836 (1835). *Proc. Zool. Soc. Lond.*, : 152.

Type Locality : Himalayas, restricted to Simla by Baker, 1927, *Fauna* 4 : 450.

Material examined : 1 ♀ taken from Chiria Camp on 24.ix.1981.

Measurements : Wing 88, Tail 57, Bill 15, Tarsus 19,

Order : CORACIIFORMES

Family : ALCEDINIDAE

8. *Alcedo hercules* Laubmann

Alcedo hercules Laubmann, 1917. *Verh. Orn. Ges. Bayern*, 13 : 105. New name for *Alcedo grandis* Blyth, 1845, *J. Asiat. Soc. Beng.*, 14(1) : 190.

Type Locality : Darjeeling.

Material examined : 2 ♂, 2 ♀ taken from Hornbill on 11, and 12.iv. 1982.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 99, 102	47.5, 48	58 (2)
	♀ 99, 100	47, —	56, 58

9. *Ceyx erithacus erithacus* (Linnaeus)

Alcedo erithaca Linnaeus, 1758. *Syst. Nat.*, ed. 10, 1 : 115.

Type Locality : Benghala

Material examined : 2 ♂, 2 ♀ taken from Gibbonsland on 3.v.1981 and from Miao on 4, 5.v.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 54, 55	21.5, 22	37, 40
	♀ 55, 56	22, 23	35.5, 36

10. *Halcyon coromanda coromanda* (Latham)

Alcedo coromanda Latham, 1790. *Index Orn.* I : 252.

Type Locality : Coromandel, India.

Material examined : 3 ♂, 2 ♀ taken from Deban on 28.iv.1981, from Gibbonsland on 29.iv.1981 and from Miao on 4, 5.v.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 111, 112, 114	60, 63, 64	58, 60, 62
	♀ 113, 114	63, 64	69 (2)

Order : TROGONIFORMES

Family : TROGONIDAE

11. *Harpactes erythrocephalus helenae* Mayr

Harpactes erythrocephalus helenae Mayr, 1941. *Ibis* : 495.

Type Locality : Nyetmawhka, 8500 ft. Myitkina Dist. Burma.

Material examined : 2 ♂, 1 ♀ taken from Firmbase on 17, 18.iv.1981 and from Chiria Camp on 23.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
♂	151 (2)	174, 176	20, 22
♀	152	171	20

Order : PICIFORMES

Family : PICIDAE

12. *Picumnus innominatus* subsp. ?

Material examined : 1 ♀ taken from Miao on 6.v.1981

Measurements : Wing 58, Tail 30, Bill 13.5.

Remarks : Subspecific determination required a good series and was unwise with a single female specimen.

13. *Sasia ochracea reichenowi* Hesse

Sasia ochracea reichenowi Hesse, 1911. *Orn. Monatsb.*, 19 : 181.

Type Locality : Thyetchung, Tenasserim, Burma.

Material examined : 1 ♂, 3 ♀ taken from Chiria Camp on 25.iv.1981 and from Gibbonsland on 30.iv. & 1, 2.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
♂	51	—	16
♀	54 (2), 57	22, 23, —	15 (2), 16

14. *Picus chlorolophus chlorolophus* Vieillot

Picus chlorolophus Vieillot, 1818. *Nouv. Dict. d'Hist. Nat.*, 26 : 78.

Type Locality : Bengal.

Material examined : 1 ♂ taken from Hornbill on 15.iv.1981.

Measurements : Wing 136, Tail 91, Bill 30.

15. *Gecinulus grantia grantia* (McClelland)

Picus (Chrysonotus) grantia McClelland, 1840 (1839), *Proc. Zool. Soc. Lond.*, (7) : 165.

Type Locality : Assam.

Material examined : 1 ♀ taken from Gibbonsland on 30.iv.1981.

Measurements : Wing 129, Tail 185, Bill 25.

16. **Blythipicus pyrrhotis pyrrhotis** (Hodgson)*Picus pyrrhotis* Hodgson, 1837, *J. Asiat. Soc. Beng.*, 6 : 108.*Type Locality* : Nepal.*Material examined* : 1 ♂ taken from Hornbill on 15.iv.1981.*Measurements* : Wing 146, Tail 183, Bill 51.

Order : PASSERIFORMES

Family : EURYLAIMIDAE

17. **Serilophus lunatus rubropygius** (Hodgson)*Raya rubropygia* Hodgson, 1839, *J. Asiat. Soc. Beng.*, 8 : 36.*Type Locality* : Conventionally Nepal.*Material examined* : 1 ♂ taken from Hornbill on 15.iv.1981.*Measurements* : Wing 85, Tail 167, Bill 18.18. **Psarisomus dalhousiae dalhousiae** (Jameson)*Eurylaimus dalhousiae* Jameson, 1835, *Edinburgh New Philos. J.*, 18 : 589.*Type Locality* : Northern India = Símila.*Material examined* : 1 ♂, 1 ♀ taken from Firmbase on 18.iv.1981 and from Miao on 4.v.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 100	114	22
	♀ 98	120	20

Family : ORIOLIDAE

19. **Oriolus traillii traillii** (Vigors)*Pastor traillii* Vigors, 1832, *Proc. Comm. Sci. Corr. Zool. Soc. Lond.*, pt. I : 175.*Type Locality* : Himalayas = Darjeeling *vide* Baker, 1921, *J. Bombay nat. Hist. Soc.*, 27 : 69.*Material examined* : 2 ♂ taken from Firmbase on 19.iv.1981 and from Namdapha Camp on 21.iv.1981.*Measurements* : Wing 135, 144, Tail 100, 104, Bill 31 (2).

Family : DICRURIDAE

20. **Dicrurus annectans** (Hodgson)

(*Bhuchanga*) *Annectans* Hodgson, 1836, *Ind. Rev.* I(8) : 326.

Type Locality : Nepal.

Material examined : 1 ♂ taken from Miao on 6.v.1981.

Measurements : Wing 147, Tail 124 (Central Tail feather 101), Bill 29.

21. **Dicrurus aeneus aeneus** Vieillot

Dicrurus aeneus Vieillot, 1817. *Nouv. Dict. d'Hist. Nat.*, 9 : 586.

Type Locality : Bengal, restricted to Dacca by Baker, 1924, 'Fauna' 2 : 368.

Material examined : 2 ♂ taken from Miao on 5.v.1981 and from Firmbase Camp on 19.iv.1981.

Measurements : Wing 121, 127, Tail 112 (Central Tail feather 79), 120 (Central Tail feather 88), Bill 22, 24.

22. **Dicrurus hottentottus hottentottus** (Linnaeus)

Corvus hottentottus Linnaeus, 1766, *Syst. Nat.*, ed. 12, I : 155.

Type Locality : Cape of Good Hope but after several restriction latest to Chandernagor by Stressemann, 1952, *Ibis* 94 : 517, 521.

Material examined : 2 ♀ taken from Miao on 4, 5.v.1981.

Measurements : Wing 156, 164, Tail 128, 135, Bill 41, 43.

23. **Dicrurus paradiseus grandis** (Gould)

Edolius grandis Gould, 1836, *Proc. Zool. Soc. Lond.*, : 5.

Type Locality : Nepal.

Material examined : 1 ♀ taken from Zero Camp on 9.iv.1981.

Measurements : Wing 174, Tail 426 (Central Tail feather 152), Bill 44.

Family : CORVIDAE

24. **Dendrocitta frontalis frontalis** Horsfield

Dendrocitta frontalis Horsfield, 1840, *Proc. Zool. Soc. Lond.*, 163.

Type Locality : Assam.

Material examined : 3 ♂, 3 ♀ taken from Namdapha Camp on 21, 22.iv.1981, from Chira Camp on 24.iv.1981 and from Gibbonsland 30.iv.1981.

Measurements :	Wing	Tail	Bill
♂	134, 135, 138	218, 220, 222	33(2), 34
♀	124, 126, 133	145, 203, 215	31, 32, 33

25. *Dendrocitta formosae himalayensis* Blyth

Dendrocitta himalayensis Blyth, 1865, *Ibis* : 45.

Type Locality : Himalayas restricted to Sikkim by Ticehurst, 1925, *Bull. Brit. Orn. Cl.* 46 : 22.

Material examined : 1 ♂, 1 ♀, taken from Hornbill on 14.iv.1981 and from Gibbonsland on 30.iv.1981.

Measurements :	Wing	Tail	Bill
♂	144	199	38
♀	139	203	37

Family : PYCNONOTIDAE

26. *Pycnonotus jocosus monticola* (McClelland)

Ixos monticola McClelland, 180. *Proc. Zool. Soc. Lond.*, pt. 7 : 160.

Type Locality : Kassia mountains, Assam.

Material examined : 1 ♂, 1 ♀ taken from Miao on 5.v.1981.

Measurements :	Wing	Tail	Bill
♂	91	93	23
♀	82	81	20

27. *Pycnonotus cafer stanfordi* Deignan

Pycnonotus cafer stanfordi Deignan, 1949, *J. Wash. Acad. Sci.*, 39 : 277.

Type Locality : Tare or Dalu, upper Chindwin District.

Material examined : 1 ♀ taken from Firmbase on 19.iv.1981.

Measurements :	Wing 92	Tail 81	Bill 22.

28. *Criniger flaveolus flaveolus* (Gould)

Trichophorus flaveolus Gould, 1836. *Proc. zool. Soc. London* : 6.

Type Locality : Restricted to Nepal by Koelz (1954).

34. *Stachyris chrysaea chrysaea* Blyth

Stachyris chrysaea Blyth, 1844. *J. Asiat. Soc. Beng.*, 13 : 379.

Type Locality : Nepal.

Material examined : 1 ♂, 2 ♀ taken from Firmbase on 18.iv.1981 and from Chiria Camp on 24, 25.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 52	—	14
	♀ ♀ 51 (2)	42, 48	12, 13

35. *Stachyris nigriceps coltarti* Harington

Stachyris nigriceps coltarti Harington, 1913. *Bull. Brit. Orn Cl.*, 33 : 61.

Type Locality : Margherita, Assam.

Material examined : 6 ♂, 5 ♀, taken from Zero Camp on 10.iv.1981, from Hornbill Camp on 14.iv.1981, from Firmbase on 18.iv.1981, from Namdapha Camp on 22.iv.1981, from Chiria Camp on 24, 25.iv.1981 and from Deban on 28.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 61 (5), 62	49,51 (2), 52, 53 (2)	18 (2), 18.5, 19 (2) 19.5
	♀ 57 (2), 58, 59, 60	48, 48.5, 49, 51, 52	17.5, 19 (4)

36. *Paradoxornis ruficeps bakeri* (Hartert)

Scaeorhynchus ruficeps bakeri Hartert, 1900. *Novit. Zool.* 7 : 548.

Type Locality : Hungrum, N. Cachar, Assam.

Material examined : 4 ♂, 1 ♀ taken from Chiria Camp on 24, 25.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 87, 88 (2) 89	75 (2), 77, 78, 81	16 (2), 17, 18 (2)
	♀ 86	75	18

37. *Garrulax pectoralis melanotis* Blyth

Garrulax melanotis Blyth, 1843. *J. Asiat. Soc. Beng.*, 12 : 949.

Type Locality : Arakan, Burma.

Measurements : Wing 124 Tail 121 Bill 31

G. (arrulax) patkaicus reichenow, 1913. *J. f. Orn.*, 61 : 557.

Material examined: 1 ♂ taken from Gibbonsland on 29.iv.1981.

Measurements : Wing 129 Tail 125 Bill 31

Ianthocincla gularis Horsfield, 1840. *Proc. zool. Soc. Lond.*, : 159.

Material examined : 3 ♀ taken from Hornbill Camp on 14.iv.1981.
and from Namdapha Camp on 21.iv.1981.

Measurements : Wing 97, 99, 101 Tail 87, 88, 91 Bill 29, 30, 31.

Stactocichla merulina toxostomina Keolz, 1952. *J. Zool. Soc. India*, 4 : 38.

Material Examined : 1 ♀ taken from Chiria Camp on 24.iv.1981.

Measurements : Wing 94 Tail 80 Bill 27

Mesia argentaureis vernayi Mayr & Greenway, 1938. *Proc. New England Zool. Cl.*, 17 : 3.

Material examined : 2 ♀ taken from Chiria Camp on 24, 25.iv.1981.

Measurements : Wing 71, 72 Tail 62, 63 Bill 16.5, 17

Siva cynouroptera Hodgson, 1837. *Ind. Rev.*, 2(2) : 88.

Material examined: 1 ♂ taken from Deban on 27.iv.1981.

Measurements : Wing 63 Tail 60 Bill 16

43. **Yuhina bakeri** Rothschild

Yuhina bakeri Rothschild, 1926. *Novit. Zool.*, 33 : 276. (New name for *Siva occipitalis* Blyth, 1844, *J. Asiat. Soc. Beng.*, 13 : 937).

Type Locality : Darjeeling, West Bengal.

Material examined : 1 ♂, 4 ♀ taken from Chiria Camp on 25.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 66	49	12
	♀ 67, 68, 69 (2)	47, 50, 51 (2)	12 (2), 13, 14

44. **Yuhina flavicollis rouxi** (Oustalet)

Ixulus rouxi Oustalet, 1896. *Bull. Mus. d'Hist. Nat. Paris*, 2 : 184, 186.

Type Locality . Ly-Sien-Kiang or Black River, Yunnan, Burma.

Material examined : 3 ♂, 1 ♀ taken from Deban on 24, 27, 28.iv.1981 and from Gibbonsland on 30.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 62, 63, 64	48 (3)	12, 12.5,
	♀ 63	46	13, 14

45. **Alcippe rufogularis collaris** Walden

Alcippe collaris Walden, 1874. *Ann. Mag. Nat. Hist.*, 14 : 156.

Type Locality : Sadiya, Assam.

Material examined : 3 ♂, 2 ♀ taken from Hornbill Camp on 14.iv.1981, from Firmbase on 19.iv.1981, from Gibbonsland on 29.iv.1981 and from Miao on 5.v.1981.

<i>Measurements</i> ;	Wing	Tail	Bill
	♂ 57(2), 58	43, 46, 49	14(2), 15
	♀ 56(2)	43(2)	14(2)

46. **Alcippe nipalensis commoda** Ripley

Alcippe nipalensis commoda Ripley, 1948. *Proc. Biol. Soc. Wash* 61 : 104.

Type Locality : Dening, Mishmi Hills, Arunachal Pradesh.

Material examined : 4 ♂, 6 ♀ taken from Hornbill on 12, 13.iv.1981, from Namdapha Camp on 22, 23.iv.1981 and from Chiria Camp on 25.iv.1981.

Measurements :	Wing	Tail	Bill
♂	57(2), 59(2)	53, 54, 55, 56	13, 14(3)
♀	54, 57(2), 59(3)	51 (2), 53, 54, 56, --	12.5, 13(3) 14(2)

47. *Heterophasia pulchella* (Godwin-Austen)

Sibis pulchella Godwin-Austen, 1874. *Ann. Mag. Nat. Hist.*, 13 : 160.

Type Locality : Kunhe Peak, Barail Range, Naga Hills.

Material examined : 1 ♂ 1 ♀ taken from Firmbase Camp on 17, 19.iv.1981.

Measurements :	Wing	Tail	Bill
♂	100	109	25.5
♀	93	105	25

48. *Muscicapa parva albicilla* Pallas

Muscicapa albicilla Pallas, 1811. *Zoogr. Rosso-Asiat.*, 1 : 462. Aves, pl. I.

Type Locality : Dauria.

Material examined : 3 ♂, 1 ♀ taken from Firmbase on 18, 19.iv.1981, from Namdapha Camp on 21.iv.1981 and from Deban on 28.iv.1981.

Measurements :	Wing	Tail	Bill
♂	69(2), 71	49, 51, 52	12, 13(2)
♀	68	50	12.5

49. *Muscicapa saphira* (Blyth)

Muscicapa saphira Blyth, 1843. *J. Asiat. Soc. Beng.*, 12 : 939.

Type Locality : Darjeeling.

Material examined : 1 ♂, 2 ♀ taken from Zero Camp on 10.iv.1981, from Hornbill on 14.iv.1981 and from Firmbase Camp on 19.iv.1981.

Measurements :	Wing	Tail	Bill
♂	70	55	14
♀	66, 68	50, 51	14(2)

50. *Muscicapa macgrigoriae signata* (Horsfield)

Leiothrix signata Horsfield, 1840. *Proc. Zool. Soc. Lond.*, 162.

Type Locality : Assam.

Material examined : 2 ♂, 5 ♀ taken from Zero Camp on 9.iv.1981, from Hornbill on 12, 14.iv.1981, from Namdapha Camp on 23.iv.1981 and from Chiria Camp on 24.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	♂ 65(2)	50(2)	12, 13
	♀ 61(2), 64, 65(2)	46, 49(2), 50(2)	12.5
			13(3) 14

51. *Muscicapa sundara sundara* (Hodgson)

Niltava sundara Hodgson, 1837. *Ind. Rev.* I(12) : 650.

Type Locality : Nepal.

Material examined : 2 ♂ taken from Zero Camp on 10.iv.1981.

<i>Measurements</i> :	Wing	Tail	Bill
	82(2)	65, 67	14, 15

52. *Muscicapa rubeculoides rubeculoides* (Vigors)

Phoenicurus rubeculoides Vigors, 1831. *Proc. Zool. Soc. Lond.*, : 35.

Type Locality : Darjeeling

Material examined : 1 ♂ taken from Hornbill on 14.iv.1981.

Measurements : Wing 71, Tail 65, Bill 12

53. *Muscicapa banyumas magnirostris* (Blyth)

Cyornis magnirostris Blyth, 1849. *J. Asiat. Soc. Beng.*, 18 : 814.

Type Locality : Darjeeling.

Material examined : 1 ♂ taken from Zero Camp on 10.iv.1981.

Measurements : Wing 81, Tail 60, Bill 19

54. *Terpsiphone paradisi saturator* (Solomonsen)

Tchitrea affinis saturator Solomonsen, 1933. *Ibis* : 732.

Type Locality : Buxa Duars, Bhutan.

Material examined : 2 ♂, 1 ♀, 1—taken from Namdapha Camp on 21.iv.1981 and from Miao on 5.v.1981.

Measurements :	Wing	Tail	Bill
	♂ 85, 89	98 (outer 83),	23, 23.5
	♀ 85	235 (outer 93)	
		91, (outer 84)	21
	[-] 80	80	20

55. *Phylloscopus magnirostris* Blyth

Ph. (ylloscopus) magnirostris Blyth, 1843. *J. Asiat. Soc. Beng.*, 12 : 966.

Type Locality : Calcutta.

Material examined : 1 ♂ taken from Deban on 27.iv.1981.

Measurements : Wing 65, Tail 49, Bill 13.5.

56. *Brachypteryx cryptica* Ripley

Brachypteryx cryptica Ripley, 1980. *J. Bombay nat. Hist. Soc.*, 77(1) : 1-5.

Type Locality : Chiria Camp, Namdapha, Tirap Dist., Arunachal Pradesh.

Material examined : 2 ♂, 2 ♀ taken from Chiria Camp on 25.iv.1981. and from Deban on 28.iv.1981.

Measurements :	Wing	Tail	Bill
	♂ 65, 69	53, 55	17, 18.5
	♀ 65(2)	51, 53	16, 17

Remarks : Ripley (1980) discovered and described this new bird from Namdapha obtained through the BNHS & Smithsonian joint Expedition in 1980. Ripley (1984), however synonymized this form with *Trichastoma tickelli assamense*. Pending further studies it is retained as such.

57. *Cinclidium leucurum* (Hodgson)

M. (uscisylyia) leucura Hodgson, 1845. *Proc. zool. Soc. Lond.*, : 27.

Type Locality : Nepal.

Material examined : 1 ♂ taken from Deban on 28.iv.1981.

Measurements : Wing 96, Tail 74, Bill 19

58. *Enicurus schistaceus* (Hodgson)

Motacilla (Enicurus) schistaceus Hodgson, 1836. *Asiat. Res.*, 19 : 189.

Type Locality : Nepal.

Material examined : 1 ♂, 1 — taken from Hornbill on 12.iv.1981.

Measurements :	Wing	Tail	Bill
	♂ 97	123	23
	[—] 96	113	22

59. Myiophoneus caeruleus temminckii Vigors

Myiophonus temminckii Vigors, 1832. *Proc. Zool. Soc. Lond.*, : 171.

Type Locality : Himalayan Mountains = Simla-Almora Dist.

Material examined : 1 ♂ taken from Hornbill on 16.iv.1981.

Measurements : Wing 171, Tail 119, Bill 38.

60. Zoothera marginata Blyth

Z. (oothera) marginata Blyth 1847. *J. Asiatic Soc. Beng.*, 16 : 141.

Type Locality : Arracan.

Material examined : 1 ♂, 1 ♀ taken from Hornbill on 13.iv.1981.

Measurements :	Wing	Tail	Bill
	♂ 120	71	33.5
	♀ 121	73	33.5

Family : NECTARINIIDAE

61. Aethopyga saturata assamensis (Horsfield)

Cinnyris assamensis Horsfield, 1839. *Proc. Zool. Soc. Lond.*, : 167.

Type Locality : Assam.

Material examined : 2 ♂ taken from Firmbase Camp on 18.iv.1981 and from Chiria Camp on 23.iv.1981.

Measurements :	Wing	Tail	Bill
	52, 53 ;	— (outer 39)	24, 25
		71 (outer 40) ;	

62. Arachnothera longirostris longirostris (Latham)

Certhis longirostris Latham, 1790. *Index Orn.*, I : 299.

Type Locality : Bengal.

Material examined : 1 ♂, 1 ♀, 1 — taken from Gibbonsland on 2.v.1981 and from Miao on 5.v.1981.

<i>Measurements :</i>	Wing	Tail	Bill
	♂ 66	38	39
	♀ 65	40	39
	[–] 65	37	37

63. *Arachnothera magna magna* (Hodgson)

(*Cinnyris*) *Magna* Hodgson, 1836. Ind. Rev., I(7) : 272.

Type Locality : Nepal.

Material examined : 1 ♂, 3 ♀ taken from Chiria Camp on 24, 25.iv.1981 and from Namdapha Camp on 22.iv.1981.

<i>Measurements :</i>	Wing	Tail	Bill
	♂ 87	47	46
	♀ 79, 89, 95	42, 50, 52	46, 48(2)

Family : FRINGILLIDAE

64. *Haematospiza sipahi* (Hodgson)

C. (orythus) sipahi Hodgson, 1836. *Asiat. Res.*, 19 : 151.

Type Locality : Nepal.

Material examined : 1 ♂, 1 ♀ taken from Chiria Camp on 24.iv.1981.

Measurements : ♂, ♀ Wing 101 Tail 66 Bill 22

SUMMARY

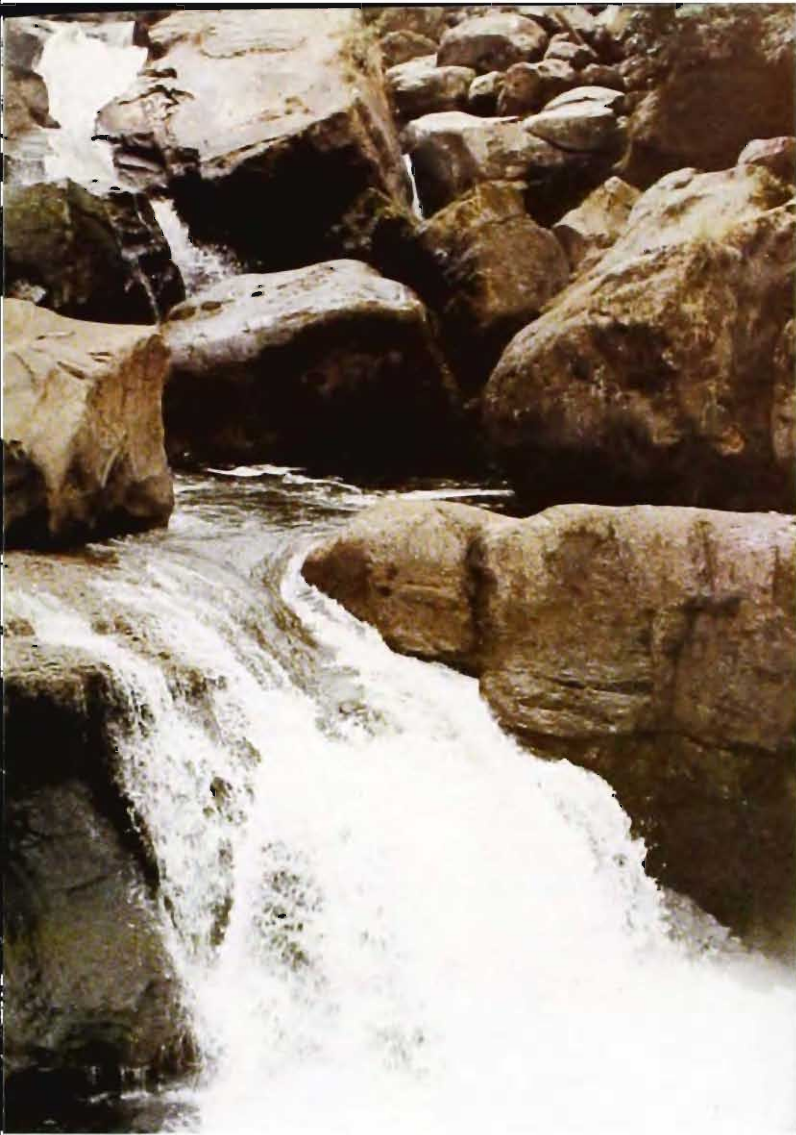
Namdapha Expedition 1981 by Zoological Survey of India obtained bird collection belonging to 64 species and subspecies under 46 genera and 12 families. The paper deals with the taxonomic account of the same.

ACKNOWLEDGEMENTS

I am thankful to Dr. B. K. Tikader, Director, Zoological Survey of India for providing me the opportunities to study and report upon the same collection. I am also thankful to my colleagues namely, Dr. Shyamrup Biswas, Shri Nemai Charan Gayan and Shri Benimadhav Ram with whom I shared pains and pleasures in course of the expedition in the Namdapha Wildlife Sanctuary.

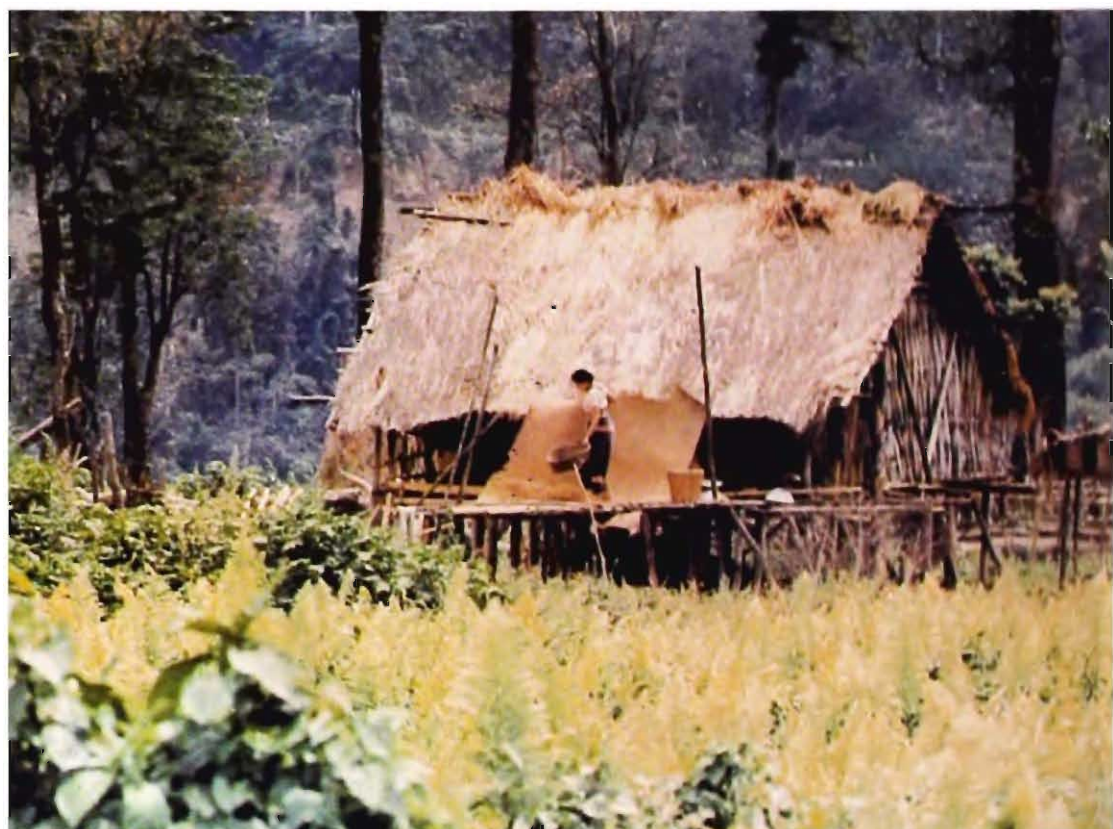
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A typical hill stream
near Burmah nallah in Namdapha.

A view of a hut of Chakma tribe
within Namdapha National Park.





Expedition team leaving for sortie service from Mohanbari, Assam.

A view of Gandhigram village.





The Namdapha Flying Squirrel, *Biswamoyaptera biswasi* Saha
a form of new genus and species, discovered from Namdapha.



A view of slow loris collected from Namdapha.

The Redheaded Parrotbill *Paradoxornis eatesi* (Sharpe), a very rare species not recorded since last century, has been rediscovered from Namdapha.



MAMMALIA

By

SUBHENDU SEKHAR SAHA

Zoological Survey of India, Calcutta

The mammal material is comprised of 20 species belonging to 15 genera and 8 families including a new genus and new species of flying squirrel, described in details elsewhere (Saha, 1982) and some interesting forms.

Classification, in general, has been adopted after Ellerman & Morrison-Scoot (1966) unless otherwise stated. External measurements, except that of the wet chiropterans, were all taken in the field.

Abbreviations used in the text are as follows :

H&B	— Head and body	Fa	— Forearm
Tl	— Tail	E	— Ear
Hf	— Hindfoot	GrWs	— Greatest Wing span

TAXONOMIC ACCOUNT

Order : INSECTIVORA

Family : SORICIDAE

1. *Suncus murinus soccatus* (Hodgson)

Sorex soccatus Hodgson, 1845. *Ann. Mag. nat. Hist.*, 15 : 270.

Type Locality : Central Nepal.

Material examined : 1 ♂, 1 ♀ ; all wet, taken from Hornbill Camp on 11.iv.1981.

<i>Measurements</i> :	♂	♀
H&B	126.5	114.3
Tl	75.5	61.5
Hf	19.5	18.1
E	10.6	10

Mammae : 3 pairs, inguinal.

Remarks ; Trapped near a hill stream.

2. *Suncus fulvocinereus* (Anderson)

Crocidura (Pachyura) fulvocinereus Anderson, 1877. *J. Asiat. Soc. Beng.*, 46 : 263.

Type Locality : Gauhati, Assam.

Material examined : 1 ♂, dry-skin and skull, taken from Deban on 8.iv.1981.

Measurements : H& B 104.5, Tl 77.5, Hf 11.5, E 14.

Remarks : Trapped near a hill stream. The specimen is not fully matured. Ossification of the cranium is thin and cusps of the teeth are much prominent and least worn. Here, it is treated as a distinct species for its incisors being altogether different from those of the *Suncus murinus* (Linnaeus), although, Ellerman & Morrison-Scott (1966) treated this form as a subspecies of that form.

Family : TUPAIIDAE

3. *Tupaia glis assamensis* Wroughton

Tupaia belangeri assamensis Wroughton, 1912. *J. Bombay nat. Hist. Soc.*, 27 : 599.

Type Locality : Mokokchung, Nagaland.

Material examined : 1 ♀; dry-skin and skull, taken from Gibbons-land on 30.iv.1981.

Measurements : H&B 168, Tl 90+, Hf 45, E 16.

Mammæ : 3 pairs, one each on thorax, abdomen and preinguinum.

Remarks : The tree shrews were fairly common in the terrain but were elusive of being confused with the diurnal squirrels that also occupied a similar niche.

Most of the recent authors considered the family Tupaiidae belonging to the order Primates and some have revived the proposition to keep it under a distinct order. Here, it is retained under the order Insectivora following Ellerman & Morrison-Scott (1966).

Order : CHIROPTERA

Family : PTEROPODIDAE

4. *Cynopterus angulatus* Miller

Cynopterus angulatus Miller, 1898. *Pave. Acad. nat. Sci. Philad.*, 316.

Type Locality ; Trang, Lower Siam.

Material examined : 22 ♂, 24 ♀ ; all wet, taken from Firmbase

Camp on 19.iv.1981, from Namdapha Camp on 22.iv.1981, from Gibbonsland on 29, 30.iv & 2.v.1981. One from Farmbase camp and two from Gibbonsland have fully grown foetus.

<i>Measurements :</i>	♂	♀
	Fa 64.3-72.2,	66.8-72.8
	E 17.7-21.3,	17 -22.4

Remarks : Miller's Short-nosed Fruit-Bat has been treated as a subspecies of *Cynopterus brachyotis* in Ellerman & Morrison-Scott (1966) but Hill & Thonglongya (1972) treated it as a subspecies of *Cynopterus sphinx*. Here, it is treated as a distinct species as has been done on earlier occasions, pending to detailed studies.

5. *Megaerops ecaudatus* (Temminck)

Pachysonia ecaudatus Temminck, 1837. *Mon. Mamm.* 2 : 94.

Type Locality : Padang, Western Sumatra.

Material examined : 2 ♀ ; wet and dry, taken from Gibbonsland on 30.iv.1981.

<i>Measurements :</i>	H&B 84, 90	Fa 59.6, 62.7
	E 18.5, 19	GrWS —, 424

Remarks : The genus and the species have been, so far, recorded from Indonesia, Malaysia, Thailand and Vietnam. Saha (in press) recorded their occurrence in Namdapha on the basis of the present material that constitute a new record for the Indian subregion and an addition to the mammalian (Chiroptera) faunal list and extending the distributional range further northwestwardly in Arunachal Pradesh in India.

6. *Sphaerias blanfordi* (Thomas)

Cynopterus blanfordi Thomas, 1891. *Ann. Mus. Ster. nat. Geneva*, 2, 10 : 884, 921-922.

Type Locality : Leito, Cheba, Karin Hill.

Material examined : 3 ♂, 5 ♀ ; wet and dry, taken from Gibbonsland on 29, 30.iv. & 2.v.1981, and from Chiria Camp on 25.iv.1981.

<i>Measurements :</i>	♂	♀
	H&B 89 — —	89.5, — — —
	Fa 555, 56(2)	51.7, 52.3, 55.2, 55.3, 60.5
	E 17.3, 18, 19	16.1, 16.4, 17.9, 18.3, 19.5
	GrWS 371, — —	414, — — — —

Remarks : Until recently, the species was known to range in Burma and Siam (=Thailand). Bhatt (1968) obtained it for the first time in Uttar Pradesh. Chakraborty (1975) reported it for the first time in Bhutan. These material add further localities in Arunachal Pradesh, India.

7. *Macroglossus minimus* (Geoffroy)

Pteropus minimus Geoffroy, 1810. *Ann. Mus. nat. Hist. Paris*, 15 : 97.

Type Locality : Java.

Material examined : 1 ♂, 3 ♀; wet and dry, taken from Gibbonsland on 29, 30.iv.1981 and from Miao on 5.v.1981.

Measurements :	♂	♀
H&B	79	84, 89, —
Tl	3.5	5.5, —, 5.2
Fa	44	52, 47, 47.5
E	16	15, 16.5, 17
GrWS	331	332, 336, —

Remarks : The species has been recorded to range from Java, Bali and adjacent islands northwestwardly through Sumatra, Malay Peninsula and Tenasserim to Darjeeling in West Bengal, India. The present finding confirms its occurrence in northeastern part of the Himalayas.

Notes : All the species of fruitbats, listed above were found to be common in Namdapha area, so much so that they foul the mist nets when set in night.

Order : CARNIVORA

Family : MUSTELIDAE

8. *Martes flavigula flavigula* (Boddaert)

Mustela flavigula Boddaert, 1785. *Elench. Anim.* 88.

Type Locality : Unknown but Pocock (1941) fixed as Nepal.

Material examined : 1 ♀; dry-skin and skull, taken from Hornbill Camp on 14.iv.1981.

Measurements : H&B 480, Tl 395, Hf 94, E 38

Mammae : 2 pairs, abdominal.

Remarks : This species has been reported to be fond of preying on the Barking Deer. This animal was found to be actually preying on a

fawn of the Barking Deer. At about 10 hours in the morning, the animal held the victim on its throat when the carotids and the windpipe got choked by the powerful canins of the predator and was killed by strangulation. This animal was collected while it was in action as stated above.

9. *Melogale moschata millsii* (Thomas)

Helictis millsii Thomas, 1923. *J. Bombay nat. Hist. Soc.*, 28 : 432.

Type Locality : Mokokchung, Nagaland.

Material examined : 1— ; Skull and skeleton (remains of a carcass), taken from Namdapha Camp on 20.iv.1981.

Remarks : The carcass of the specimen was found to be laying on the right bank of the Noa Dihing river opposite the Namdapha Camp, and about two metres away from the water line.

Family : FELIDAE

10. *Felis bengalensis horsfieldii* (Gray)

Leopardus horsfieldii Gray, 1842. *Ann. Mag. nat. Hist.*, 10 : 260.

Type Locality : Bhutan.

Material examined : 1 ♂, dry-skin and skull, taken from Gibbonsland on 29.iv.1981.

Measurements : H&B 472, Tl 272, Hf 114, E 46.

Order : ARTIODACTYLA

Family : CERVIDAE

11. *Muntiacus muntjak* (Zimmermann)

Cervus muntjak Zimmermann, 1780. *Georg. Gesch.*, 2 : 131.

Type Locality : Java.

Material examined : 1 ♂ (fawn of about two months old) ; dry-skin and skull, taken from Hornbill Camp on 14.iv.1981.

Remarks : The specimen was found to be killed by strangulation by a Yellow-throated Martin as referred under that species.

12. *Axis porcinus* (Zimmermann)

Axis porcinus Zimmermann, 1780. *Georg. Gesch.*, 2 : 131.

Type Locality : Bengal.

Material examined : A pair of shed antlers taken from Firmbase Camp on 16.iv.1981.

Order : RODENTIA

Family : SCIURIDAE

13. *Biswamoyopterus biswasi* Saha

Biswamoyopterus biswasi Saha, 1982. *Bull. zool. Surv. India*, 4(3) : 331-336.

Type Locality : Deban, Namdapha, Tirap District, Arunachal Pradesh, India.

Material examined : 1 ♂ ; dry-skin, skull and baculum, taken from Deban on 27.iv.1981. (Being the Holotype).

Measurements : H&B 405, Tl 605, Hf 78, E 46.

Remarks : The genus and the species are newly described taxa by Saha (1982). This monotypic genus is another example like *Aeromys* Robinson & Kloss, 1915, that abridges the giant flying squirrels and the smaller flying squirrels ; to the former by the presence of inter-femoral membrane and non-distichous, cylindrical tail. and with the latter by much simplified, brachydont molariform teeth. It has but several other taxonomic characters that are typical to several distinct genera, of which the presence of ear tufts and the last upper premolar being larger than first upper molar are similar to those in *Belomys* Thomas, 1908 and *Trogopterus* Heude, 1898. And it has the unique feature of the incisors being white and not red as in all other flying squirrels.

14. *Petaurista candidulus* Wroughton

Petaurista candidulus Wroughton, 1911. *J. Bombay nat. Hist. Soc.*, 20(4) : 1014, 1022.

Type Locality : Kindat, Western Burma.

Material examined : 1 ♂, 4 ♀ ; dry-skin, skull and baculum, taken from Deban on 7.iv.1981; from Zero Camp on 9.iv.1981, from Hornbill Camp on 11.iv.1981 and from Miao on 6.v.1981.

<i>Measurements</i> :	♂	♀ ♀
H&B	460	455, 485, 488, 495
Tl	570	630, 595, 612, 681
Hf	88	91, 86, 91, 96
E	51	50, 50, 51, 53

Mammae : 3 pairs.

Remarks : This flying squirrel was found to be fairly common in Namdapha area and sympatric with the Namdapha Flying squirrel, *Biswamoyopterus biswasi* Saha. This species has been treated as a subspecies of *Petaurista alborufous* Milne-Edwards, 1870 in Ellerman (1949, 1961). and in Ellerman & Morrison-Scott (1966). Here, it is treated as a distinct species following Wroughton (1911).

15. *Callosciurus erythraeus intermedius* (Anderson)

Sciurus gordonii var. *intermedia* Anderson, 1978. *Zool. Anat. Res. Yunnan* : 241.

Type Locality ; Dikrang Valley, Assam.

Material examined : 1 ♀ ; dry-skin and skull, taken from Hornbill Camp on 15.iv.1981.

Measurements : H&B 230, Tl 222, Hf 60, E 22.

Mammae : 2 pairs.

Remarks : Due to the lack of incipient black tail tip unlike in allied subspecies of the red-bellied squirrels and also due to presence of the reddish agouti on dorsal pelage including the ears, this form is readily distinguished.

16. *Callosciurus gordonii* (Anderson)

Sciurus gordonii Anderson, 1871. *Proc. Zool. Soc. Lond.*, : 140.

Type Locality : Bhamo, Upper Burma.

Material examined : 1 ♂ ; dry-skin and skull, taken from Gibbonsland on 2.v.1981.

Measurements : H&B 195, Tl 210, Hf 54, E 22

Remarks : This form has been treated as a subspecies of *Callosciurus erythraeus* (Pallas) in Ellerman (1961) and in Ellerman & Morrison-Scott (1966). Moor & Tate (1965) treated it as a subspecies of *Callosciurus flavimanus* (Geoffroy). The red bellied squirrels of the Indo-Burmese and adjacent areas require a thorough investigation with adequate field data for taxonomic purposes. Precisely, the multiple forms described from this region pose a complicated affair due to meagre knowledge of geographic distribution of each form. Pending to further studies, this form is retained here as a distinct species for its characteristic coloration, specially that of the underside.

17. **Callosciurus pygerythrus stevensi** (Thomas)

Sciurus stevensi Thomas, 1908. *J. Bombay nat. Hist. Soc.*, 18 : 246.

Type Locality : Beni Chung, Abor-Miri Hills (= Arunachal Pradesh, India).

Material examined : 2 ♂, 5 ♀ ; dry-skin, skull and baculum, taken from Firmbase Camp on 19.iv.1981, from Namdapha Camp on 20.iv.1981, from Gibbonsland on 1.v.1981, and from Miao on 4 & 6.v.1981.

<i>Measurements :</i>	♂ ♂	♀ ♀
H&B	205, 215	190, 195, 195, 200, 205
Tl	210, 185	210, 155, 205, 130, 190
Hf	50, 48	44, 41, 48, 45, 45
E	20, 22	21.5, 21, 22, 21, —

Mammae : 2 pairs.

Remarks : The reddish yellow thigh patch was present in two females taken from Miao and in summer coat. The male from Miao, which is also in summer coat and the rest of the specimens in winter coat do not possess any thigh patch. Apparently, the thigh patch may be attributed to the females in summer coat only, that is, the presence of thigh patch is both a sexual and a seasonal affair.

18. **Tamiops maclellandi maclellandi** (Horsfield)

Sciurus maclellandi Horsfield, 1839. *Proc. zool. Soc. Lond.*, 1839 : 152.

Type Locality : Assam.

Material examined : 1 ♂ ; dry-skin and skull, taken from Deban on 27.iv.1981.

Measurements : H&B 111, Tl 103, Hf 25, E 13.5.

Family : MURIDAE

19. **Rattus nitidus nitidus** (Hodgson)

Mus nitidus Hodgson, 1845. *Ann. Mag. nat. Hist.*, 15 : 267.

Type Locality : Nepal.

Material examined : 1 ♀ ; wet-skull extracted, taken from Deban on 27.iv.1981.

Measurements : H&B 166, Tl 170, Hf 34.5, E 22.

Mammae : 4 pairs.

20. *Rattus rattus tistae* Hinton

Rattus rattus tistae Hinton, 1918. *J. Bombay nat. Hist. Soc.*, 26 : 68.

Type Locality : Pashok, Darjeeling, West Bengal, India.

Material examined : 1 ♂, 2 ♀ ; wet-skull extracted and dry-skin and skull, taken from Gibbonsland on 29.iv.1981 & 2, 3.v.1981.

<i>Measurements</i> :	♂	♀ ♀
H&B	155	143, 152
Tl	180	170, 176
Hf	31	31, 31
E	21	21, 21.5

Mammae : 5 pairs.

Remarks : Apparently, this is a commensal form associated with the hutments.

SUMMARY

Mammalian Collection of the Namdapha Expedition 1981 by Zoological Survey of India belonging to 20 species, 15 genera and 8 families have been dealt with. Taxonomic account with annotations on field-notes have been furnished.

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