



Fauna of Conservation Areas No. 10

FAUNA OF VALMIKI TIGER RESERVE

Published in Commemoration of the 50th Anniversary of India's Independence



ZOOLOGICAL SURVEY OF INDIA

1998

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Edited by

The Director, Zoological Survey of India.
Calcutta



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Calcutta

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FOREWORD

The Valmiki Tiger Reserve is located in the West Champaran district of Bihar. It represents a varied physiography like hills, bhabar and terai containing streams, nullahs, swamps and marshes. These diverse ecological features of the Reserve have resulted in rich floral and faunal diversity with tiger at the apex of the food chain. However, during recent years due to various anthropogenic factors, the ecosystem of the Reserve has become so fragile that the faunal diversity is now threatened. This has necessitated urgent remedial measures to restore the ecological condition of the Reserve in general and to conserve wildlife in particular. This requires a well drawn management programme for which basic prerequisites are the knowledge about the species composition, population dynamics of important species and the effects of fragmentation of natural habitats. The current state of knowledge on both, ecosystem and fauna of the Reserve is inadequate.

Realising the importance of the problem and paucity of information, scientists of the Zoological Survey of India have conducted faunistic surveys in this Tiger Reserve from 1993 to 1996 to ascertain the current faunal composition with special reference to the status and distribution of important species and to identify factors responsible for the damage to the ecosystem and wildlife.

The present volume, which is the result of these studies, highlights the important faunal elements of the Reserve and the socio-economic condition of the area. It is expected that the baseline information presented here will provide the background for formulating any rational management policy for conserving biodiversity in the Valmiki Tiger Reserve.

I wish to express my sincere thanks to the Chief Wildlife Warden, Bihar and the Director, Valmiki Tiger Reserve, for providing active co-operation and support to the Zoological Survey of India parties during the survey.

Calcutta
August, 1998

Dr. J. R. B. Alfred
Director
Zoological Survey of India

FAUNA OF VALMIKI TIGER RESERVE

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FAUNAL COMPOSITION WITH SPECIAL REFERENCE TO MAMMALS

S. CHAKRABORTY, T. P. BHATTACHARYYA & J. K. DE

Zoological Survey of India, Calcutta

INTRODUCTION

The Valmiki Tiger Reserve (Fig. 1) is located in the West Champaran district of Bihar. It is surrounded by the river Gandak on western side and Royal Chitwan National Park (Nepal) on northern side. It covers an area of about 840 Sq. km. of which 336 Sq. km. is marked as core area. The entire area of the Valmiki Tiger Reserve has a good natural Sal forests, Khair–Sisso forests, cane, eastern wet alluvial grass land, barringtonia swamp forests, canals and perennial rivers. The impenetrable dense cane cover provides very good shelter and breeding ground to tigers (Plate Ia). Other ecological zones have also given rise to a rich and diversified fauna. The area was declared as Wildlife sanctuary in the year 1978. Subsequently, considering the biological significance of the area, it was declared as Tiger Reserve in the year 1990. However, except for a few scattered reports (Shahi 1977, Forest Survey of India 1993, Das gupta 1993, Anon. 1990, 1993, Ghosh 1993, D. Z. S. I. 1993), no detail information on the faunal composition of this Tiger Reserve is available. As a part of the fauna of conservation areas project, Z.S.I. has conducted three faunistic surveys in this Tiger Reserve. During these surveys attempts have been made to identify the existing faunal composition along with ecological data, population trend and factors affecting them. For the purpose, in addition to the systematic field observations and permitted collection of specimens, necessary discussion with the local people as well as management people was made. In the present paper an account of the faunal composition with special reference to mammals of the Valmiki Tiger Reserve along with ecological conditions have been given.

SURVEYS

Altogether three surveys during the following periods have been undertaken.

1. 26 May – 16 June, 1993.
2. 19 October – 9 November, 1994
3. 2 January – 21 January, 1996.

CAMPS

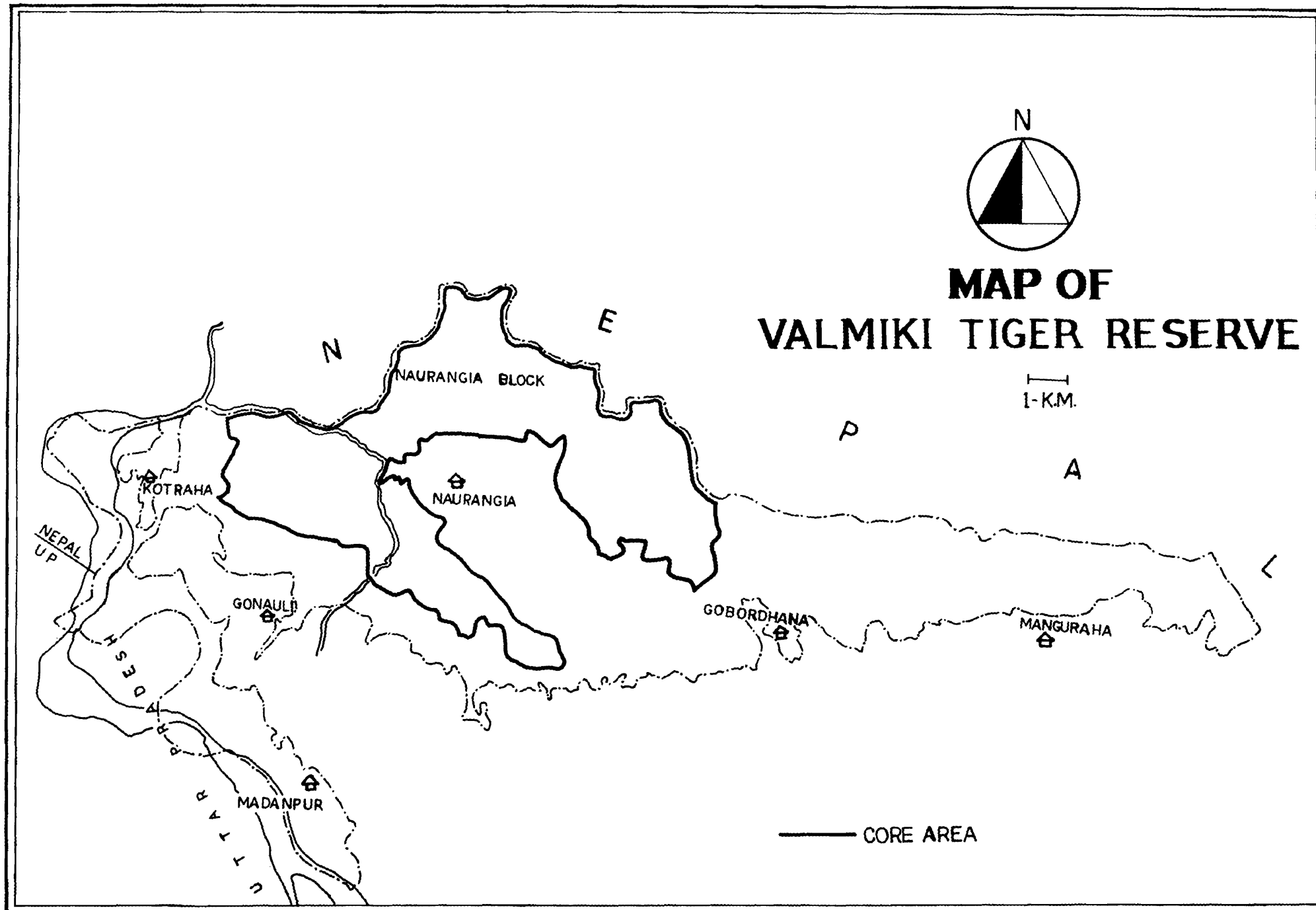
Kotraha : A small village within the forest proper. About 104 Km North West of Bettiah. Camp days – 26.05.1993 to 02.06.1993 and 04.01.1996 to 09.01.1996.

Ganauli : A large, well-developed village with extensive sugarcane, rice, wheat and mustard cultivations. It is adjacent to the forest and lies at about 90 Km North West of Bettiah and 15 Km East of Bagha–Valmiki Nagar Road. Camp days – 03.06.1993 to 10.06.1993 and 10.01.1996 to 14.01.1996.

Madanpur : A small village within the forest and busy with construction of railway line. About 70 Km North West from Bettiah, just by the side of Bagha–Valmiki Nagar Road. Camps days – 11.06.1993 to 16.06.1993 and 15.01.1996 to 18.01.1996.

Manguraha : A large well-developed village by the side of the forest. Sugarcane is the main agricultural product. There are a number of stone-crushing factories in the area resulting noise and dust pollution. Railway Station is about 2 Km south of the village and lies at about 25 Km north of Narkatiaganj. Camp days – 21.10.1994 to 24.10.1994.

Govardhana : A small agricultural village by the side of the forest. About 22 Km North of Harinagar Railway Station (on Valmiki Nagar – Narkatiaganj



TEXT. FIG-1

Railway line). Camp days – 26.10.1994 to 31.10.1994.

Naurangia : Well-established agricultural village at about 25 Km North West of Govardhana and lies within the naurangia block and Harnatar range of the reserve. Camp days – 01.11.1994 to 05.11.1994.

PHYSICAL FEATURES

Valmiki Tiger Reserve includes a part of the outer Siwaliks, a few low hills and valleys which merge gradually with the flat alluvial plains in the south. The tract is broken and undulating often showing highly friable geological formations in steep ravines, knife edge ridges and precipitous walls formed by land slips and soil erosion. The whole of Madanpur Range is alluvial plains, a large part of which has been formed by shifting of the Gandak river from east to west. The drainage is imperfect in the tract resulting a number of swamps.

The reserve is mainly occupied by alluvial soil, which is again of two types – older alluvium and newer alluvium. Older alluvium stretches over most of the Bhabar region, while Terai region is mainly occupied by newer alluvium. Sheet of erosion is common and there is almost no humus on surface soil.

Three well-developed seasons, viz., summer (mid March to mid May), monsoon (mid May to mid October) and winter (mid October to mid March) could be recognised. Forested tract of the Reserve gets more precipitation than the annual average (142 cm) of the district Champaran. Average rainfall recorded as 205 cm in the north western part (Valmiki Nagar) of the Tiger Reserve.

Water supply during rains and winter remains adequate. During summer water shrinks underground in smaller rivers and streams except near foot hills. However, water is available in swamps, nullahs, canals, and some streams throughout the year.

FLORA AND FOREST COMPONENTS

Based on floral composition, the Valmiki Tiger

Reserve may be divided into seven forest compartments.

I. Bhabar Dun Sal Forest

It occupies the gentle lower slopes of the hills and adjoining flat grounds of Tribeni Block. Best quality of Sal along with following associates provide the characteristics of this forest.

Top canopy : *Lannea coroman*, *Terminalia tomentosa*, *T. belerica*, *Albizia procera*, *Salmalia malabarica*, *Ficus* spp.

Middle storey : *Careys arberia*, *Mitragyna pavifolia*, *Caruga pinnata*, *Syzygium cumini*, *Terminelia chebula*, *Eugenia operculata*, *Kydia calyeina*.

Underwood : *Dillenia pentagyna*, *Millusa velutina*, *M. tomentosa*, *Malletus philippensis*, *Casearia tomentosa*, *C. graveolens*, *Bauhinia malabarica*, *Symplocos recamosa*.

Ground cover : *Clerodendron viscesum*, *Indigofera pulchella*, *Randia longispina*, *Asparagus* sp., *Flacuntia indica*, *Phoenix humilis*.

Grasses : *Imperata cylindrica*, *Typha elephanta*, *Erianthus munia*.

Climbers : *Bauhinia vahlii*, *Butia parviflora*, *Acacia pinnata*, *Similax parviflora*.

II. Dry Siwalik Sal Forest

This includes valley Sal and hill Sal. It occupies the rising ground on the hills and spurs and the ridges where on account of rapid sub-soil drainage, dry conditions prevail. The associates of Sal may be classed as under :

Top Canopy : *Buchanania lanzan*, *Anogeissus latifolia*, *Terminalia tomentosa*.

Under Storey : *Dillenia aurea*, *Samecarpus anacardius*, *Terminelia chedula*, *Embelica officinalis*, *Madhuka indica*.

Ground Cover : *Gardenia turgida*, *Randia longispina*, *Holarrhenna antidysentica*, *Indigofera pulchella*.

Shrubs : *Phoenix humilis*, *P. acaulis*, *Clausena pentaphylla*.

Gresses : *Eulaliopsis linata*, *Heteropogon contortus* and Kush.

Climbers : *Bauhina binata*, *Acacia pinnata*.

III. West Gangetic Moist Mixed Deciduous forest

It is an edaphic formation of fresh alluvium in Madanpur Block. The tract is liable to inundation each year and soil remains immature perpetually and unfit for supporting good quality of Sal. The main species are classified as follows :

Top Canopy : *Adina cordifolia*, *Terminalia tomentosa*, *T. Belerica*, *T. chebula*, *Lannea coromondelica*, *Angeissus latifolia*, *Garuga pinnata*, *Salmalia malabarica*, *Albizia procera*, *A. lebbek*.

Middle Story : *Lagestroemina parviflora*, *Syzygium oumini*, *Egenia operculata*, *Mitragyna parviflora*, *Eridelia retusa*, *Salmalia malabarica*, *Raudia uliginosa*, *Cassia fistula*, *Delbergia latifolia*, *Acacia catechu*, *Ficus sp.*

Ground cover : *Clerodendron viscosus*, *Litsea sp.*, *Grevia holerifolia*.

Climbers : *Acacia pinnata*, *Millotia auriculata*, *Butea parviflora*, *Osasalpinia digyna*.

IV. Khair Sisso Forest

Found along the Gandak river and its tributaries in Madanpur Block. This tract is also liable to inundation and soil is not mature enough to sustain Sal. Grasses like *Tamarix dicica* comes first on alluvial deposits followed successfully by *Acacia catechu*, Sisso, *Salmelia malabarica*, *Adina cordifolia*. etc.

V. Cane Brakes

This type occurs in wet hollows and depressions along the various tributaries of the river Gandak in Rehua, Baljora, Chamania compartments of Madanpur Block and some compartments of Tribeni Block. Here soil remains moist almost throughout the year and relatively rich in humus. Cane (*Clamus tenuis*) occurs under large sized trees and rises to a height up to 18 meters.

VI. Eastern Wet Alluvial Grass Land

This type of grassland occupies considerable area in almost all compartments of Madanpur and few compartments of Tribeni. It supports tall and luxuriant grasses like *Phragmites karka*, *Erianthus murya*, *Saccharum spontaneum*, *Typha elephantina*, etc. along with few scattered Khair and Simul tress.

VII. Barringtonia Swamp Forest

It is confined to only one, viz., Madanpur-19 compartment by the side of the river Gandak. This horseshoe shape compartment is a low level marsh, almost flat and ill drained. Naturally occurring species are *Salix tetrasperma*, *Erringtinta acutangula*, *Rischofia iavanica*, etc., along with some Sisso, Khair, Simul on relatively raised ground. This swamp is now mostly reclaimed naturally as well as through plantation.

FAUNAL COMPOSITIONS

Differences in the elevations, soil composition, floral composition along with a number of rivers, swamps, have provided great range of variations in respect of micro and macro ecosystem within the Valmiki Tiger Reserve. These ecosystems in turn resulated a very rich, both qualitative as well as quantitative, fauna in Valmiki Tiger Reserve. Based on actual sightings, actual collection during surveys and local reports, an account of the fauna is given below. During the survey works no actual estimates of the populations of different species were done but attempts have been made to quantify some major species of mammals.

Following abbreviations have been used in the text : *apf.* length of anterior palatine foramina; *b.* length of bulla; *c¹-c¹.* distance between outer surfaces of upper canines; *cb.* condylobasal length; *cw.* cranial width; *d.* length of diastema; *E.* length of ear; *Fa.* length of forearm; *F & cl.* length of foot and claw; *Hb.* Head and body length; *Hf.* length of hind foot; *iw.* interorbital width; *l.* length of skull; *m¹m¹.* distance between first upper molars; *mtr.* length of maxillary tooth row; *n.* nasal legth; *on.* occipitonasal length; *pl.* palatal length; *Tb.* length of tibia; *Tl.* length of tail; *Tr.* length of

tragus; zw. zygomatic width.

Vertebrate species included in the Schedule I and Schedule II of the Indian Wildlife (Protection) Act 1972 are marked with * and ** respectively.

Class MAMMALIA

Order INSECTIVORA

Family SORICIDAE

1. *Suncus murinus caerulescens* (Shaw)

1796. *Sorex pilorides* Shaw. *Mus. Lever.* 2 : 31. Not of Pallas 1779, which is undeterminable.

1800. *Sorex caerulescens* Shaw, *Genl. Zoo. Mamm.*, 1 : 533.

Common names : House Shrew (Eng.)
Chuchundar (Hin.).

Material examined : 1♂, Kotraha, 1. VI. 1993, S. Chakraborty coll. ; 4♂, Ganauli, 8-9. VI 1993, S. Chakraborty coll.; 1♀, Tribeni, II Km NE of Ganauli, 10. VI. 1993, S. Chakraborty coll. ; 3♂, 5♀, Manguraha, 23-25. X. 1994, T. P. Bhattacharyya coll.; 6♀, Govardhana, 28-30. X. 1994, T. P. Bhattacharyya coll.; 1♂, Naurangia, 4. XI. 1994, T. P. Bhattacharyya coll.

Measurements : External : 6♂, : Hb 117-140 (133); Tl 77-86 (82); Hf 20-21 (20.6); E 12-15 (13.8). 7♀ : Hb 116-152 (122); Tl 75-83 (78); Hf 17-24 (20.4); E 12-15 (13.5). Cranial : 1♂, : l 37.3 ; cb 35.2; pl 17.1; n 11.7; cw 13.0. 1♀ : l 36.0; cb 34.3; pl 16.8; n. 11.3; cw 12.8.

Distribution : Throughout India particularly in residential areas.

Remarks : Most common specially in and around houses, stores and fringe areas of the forest. Nests were found by the side of the drains, bushes, garbage, under stones and even in the hole of a wooden electric pole. Nests are made of straw, leaves, papers, polythene, clothes, etc. Breeding females were found both in pre and post monsoon period.

Much variations in size, colour, nature of fur and shape of tail have been noticed in the present series. Some of these variations may be attributed

to the sex and seasons, but in all probability there is much interbreeding with other subspecies which are transported through human agency.

Order CHIROPTERA

Family PTEROPODIDAE

2. *Rousettus leschenaulti leschenaulti*
(Desmarest)

1820. *Pteropus leschenaulti* Desmarest, *Encycl. Meth. Mammal.*, 1 : 110 (Pondicherry, India).

Common name : Indian Fulvous Fruit Bat (Eng.).

Distribution : Widely distributed throughout the Indian mainland. Pakistan, Sri Lanka, Nepal, Bhutan, Myanmar, China, Hongkong, Thailand, Laos, possibly Cambodia and Vietnam.

Remarks : Not very common. Visits orchards of the villages and in all probability roosts in the small caves or crevices of low hills of the reserve.

3. *Pteropus giganteus giganteus* (Brunnich)

1782. *Vespertilio gigantea* Brunnich. *Dyrenes Histories.* 1 : 45 (Bengal, India).

Common names : Indian Flying Fox (Eng.) :
Gadal, Barbagal, Badur (Hin.).

Distribution : Widely distributed in India including Andaman Islands. Pakistan, Sri Lanka, Nepal, Bangladesh and Myanmar.

Remarks : Fairly common in the Reserve but not in the dense part of the forest. Roosts of 16 to 35 animals have been observed in and around villages in peepul, Tamarind and other trees. In the evening they were found foraging in the villages as well as in the forest for wild fruits. Youngs attached with the mother have been observed during May-June.

Little boys of the villages often hunt them for flesh.

Causes considerable damage of Lichi, Guava, Mango and other fruits during summer.

4. *Cynopterus sphinx sphinx* (Vahl)

1797. *Vespertilio sphinx* Vahl, *Syr. Nat Selsk. Copenhagen*, 4(1) : 123 (Tranquebar, Tanjavur, Tamil Nadu, India).

Common names : Short-nosed Fruit Bat (Eng.)
: Chota Badur (Hin.)

Material examined : 5 ♂, 10 ♀, Kotraha, 27. V. 1993, S. Chakraborty coll. ; 1 ♂, 1 ♀, Ganauli, 5. VI. 1993, S. Chakraborty coll.; 1 ♂, 1 ♀, Madanpur, 14. VI. 1993, S. Chakraborty coll. ; 1 ♂, 2 ♀, Manguraha, 22. X. 1994, T. P. Bhattacharyya coll.; 7 ♂, 3 ♀, Govardhana, 28. X. 1994, T. P. Bhattacharyya coll.; 2 ♂, Naurangia, 3. XI. 1994, T. P. Bhattacharyya coll.

Measurements : External : 14 ♂ : Fa 66.9-76.1 (72.5) ; Tb 22.5-33 (27.0); E 19.3-23.0 (21.6); F & cl 11.5-18.6 (14.5). 13 ♀ : Fa 68.2-79.7 (73.6); Tb 25.7-31.6 (28.3); E 19.7-24.3 (22.4); F & cl 12.6-17.0 (14.0). Cranial : 1 ♂, : l 32.4 ; cr 9.6; mtr 10.4; c¹c¹ 7.5; m¹m¹ 9.6; iw 6.2. 1 ♀ : l 34.1; cr 10.1; mtr 11.1; c¹c¹ 7.0; m¹m¹ 9.0; iw 6.3.

Distribution : Throughout the mainland of India. Pakistan, Sri Lanka, Nepal, Bangladesh, Myanmar.

Remarks : Most common throughout the Reserve. Roosts of 1 to more than 30 animals were observed in the innerfold of palm leaves, deserted house, well, cowsheds and various other man made structures. Large number of them visit almost all the orchards immediately after sunset causing serious damage of crops. A lot of them may easily be captured by placing mist nets in the foraging ground in the evening. Undigested seeds of different plant species are found in their faecal matter. In all probability they play an important role in the natural pollination and seed dispersal in the forest ecosystem.

Sexual dimorphism could easily be observed in the adult animals; males having distinct brownish tinge in the throat and chest. Moreover, females appear to be slightly larger on average than the males in body measurements, which is also obvious from the measurements given by

Sinha (1986) and Agrawal *et al.* (1992). Pregnant, lactating females, juveniles were observed both in pre and post monsoon periods.

Family EMBALLONURIDAE

5. *Taphozous longimanus longimanus* Hardwicke

1925. *Taphozous longimanus* hardwicke, *Trans. Linn. Soc. Lond.*, 14 : 525 (Calcutta, West Bengal, India).

Common name : Long-armed Sheath-tailed Bat (Eng.).

Distribution : Widely distributed in southern India, northwards to Gujarat, Rajasthan (Sinha 1976), Tripura in the east (Agrawal & Bhattacharyya 1977). Sri Lanka, Nepal, Bangladesh, Myanmar and possibly Thailand and Cambodia.

Remarks : Fairly common, roosts in caves and rock fissures and also in various less disturbed man made structures. At Madanpur, two animals were found roosting in the walls of a discarded well. Sinha (1986) recorded this species from Narkatiaganj of West Champaran district.

Family MEGADERMATIDAE

6. *Megaderma lyra lyra* Geoffroy

1801. *Megaderma lyra* Geoffroy, *Ann. Mus. Hist. nat. Paris*, 15 : 190 (Possibly Madras, Tamil Nadu, India).

Common name : Indian False Vampire (Eng.)

Material examined : 1 ♀, Kotraha, 29. v. 1993, S. Chakraborty coll.; 3 ♂, 1 ♀, Manguraha, 22. x. 1994, T. P. Bhattacharyya coll.

Measurements : External : 2 ♀ : Fa 63.0, 66.6 ; Tb 34.0, 35.2 ; E 35.0, 35.3 ; F & cl 20.0, 19.8 ; Tr 17.0,—

Distribution : Almost throughout the mainland of India. Afghanistan, Pakistan, Sri Lanka, Nepal and Bangladesh.

Remarks : Fairly common in the localities, roosts of 6 to more than 30 animals were noticed

in the cowsheds, deserted quarters, godowns, among the standing logs and various other man made, less used structures. In addition to the roosts, this species used other partly covered space like *varandha*, deserted huts, etc. for temporary roosting and feeding during night. A diplidated room of forest department at Kotraha was regularly visited during May-June, 1993, by a group of them at night. Every morning we could find faecal matter as well as partly eaten lizards, frogs, mouse, beetles, etc. from the floor of that room. Present specimen of Kotraha was collected by a butterfly net from that room. The specimen was pregnant, containing one foetus in a moderately advance stage of development.

Family RHINOLOPHIDAE

7. *Hipposideros* sp.

Remarks : Common. Specimens were observed regularly flying around the vapour lamps amongst the trees on the roadside at Valmikingar after 20.00 hours. Specimens were also observed irregularly flying through the *varandha* of Madanpur Forest Rest House for about an hour from 22.00 to 23.00 hours on 11th and 12th June 1993. In rest of the camp days they could not be observed. Specific identification was not possible.

Family VESPERTILIONIDAE

8. *Pipistrellus coromandra coromandra* (Gray)

1838. *Scotophilus coromandra* Gray, *Mag. zool. Bot.*, 1 : 498 (Pondicherry, India).

Common name : Indian Pipistrelle (Eng.).

Distribution : Widely distributed in southern India, north to Jammu and Kashmir, East to North Eastern States including Tripura. Afghanistan, Pakistan, Sri Lanka, Nepal.

Remarks : Very common and easily could be seen in the dusk while they are flying over the canal, swamps and other open areas. Small roosts of 2-4 individuals were found in holes and crevices of rocks, trees, walls, ceilings, bamboos, logs and many places even within the very busy human habitations.

9. *Pipistrellus minus* Wroughton

1899. *Pipistrellus minus* Wroughton, *J. Bombay nat. Hist. Soc.*, 12 : 722 (Maheskatri, Dangs, Gujarat, India).

Common name : Indian Pygmy Pipistrelle (Eng.).

Material examined : 1 ♀, Manguraha, 23. x. 1994, T. P. Bhattacharyya coll.

Measurements : External : 1 ♀ : Fa 27.9 ; Tb 11.7 ; E 10.5 ; F & cl 4.4. Cranial : 1 ♀ : l 11.3 ; mtr 3.5 ; c¹c¹ 3.5 ; cw 6.5 ; m³m³ 5.3.

Distribution : Widely distributed throughout the mainland of Indian region. Afghanistan, Pakistan, Sri Lanka, Nepal, Myanmar, Thailand, Vietnam.

Remarks : Very common, particularly in the residential areas. Roosts in any dark place in close association with the human beings. Roost of this species as well as of *P. coromandra* was noticed in the same wooden pillar of a hut but at different holes.

10. *Scotozous dormeri* Dobson

1875. *Scotozous dormeri* Dobson. *Proc. zool Soc. Lond.*, 373 (Bellary Hills, Bellary, Karnataka, India).

Common name : Dormer's Bat (Eng.).

Material examined : 2 ♂, 2 ♀, 1 Juv, Kotraha, 27, 28. V. 1993, S. Chakraborty coll. ; 2 ♂, Ganauli, 5, 7. VI. 1993, S. Chakraborty coll.; 1 ♂, 1 Juv., Madanpur, 13, 14. VI. 1993, S. Chakraborty coll. ; 1 ♂, Manguraha, 24. x. 1994, T. P. Bhattacharyya coll.

Measurement : External : 5 ♂ : Fa 33.8-35.2 (34.2) ; Tb 12.4-13 (13.2) ; E 10.4-14.3 (12.8) ; F & cl 5.4-7.0 (6.00). 1 ♀ : Fa 34.2 ; Tb 12.8 ; E 11.6 ; F & cl 5.7. Cranial : 3 ♂ : l 13.5, 14.1, 14.9 ; c¹c¹ 4.6, 4.8, 5.2 ; mtr 5.0, 5.5, 5.5 ; cw 6.9, 7.4, 7.8 ; m³m³ 6.6, 6.8, 7.0.

Distribution : Widely distributed from Jammu and Kashmir in the north to at least Karnataka in the south ; Gujarat in the West to West Bengal in the east. Pakistan (Roberts 1977), possibly Taiwan.

Remarks : Most common. Roosts were noticed in the various man made structures in the village, as well as deep in the forest in rock crevices, tree holes, etc. Examinations of stomach contents of two specimens revealed hard parts of insects (Probably Coleoptera) in good amount; partly chewed dipteran fly was also found in the oral cavity of a freshly killed specimen.

11. *Scotophilus heathi heathi* (Horsfield)

1831. *Nycticeius heathi* Horsfield, *Proc. zool. Soc. Lond.*, 113 (Madras, Tamil Nadu, India).

Common name : Greater Yellow Bat (Eng.).

Material examined : 2 ♂, Kotraha, 27. V. 1993, 1 VI. 1993, S. Chakraborty coll. ; 1 ♂, 4 ♀, Ganauli, 5. VI. 1993, S. Chakraborty coll.; 5 ♂. Manguraha, 22, 23. w.f. 1994, T. P. Bhattacharyya coll.; 2 ♂, Naurangia, 2. XI. 1994, T. P. Bhattacharyya coll.

Measurements : External : 10 ♂ : Fa 60.5-64.1 (62.3) ; Tb 25.2-28.8 (26.8) ; E 17.0-19.3 (17.8) ; F & cl 10.6-12.8 (11.6). 5 ♀ : Fa 61.4-62.5 (61.9) ; Tb 24.0-26.7 (25.8) ; E 16.7-18.0 (17.5) ; F & cl 9.3-11.4 (10.8). Cranial : 2 ♂ : l 23.7, 24.1 ; c¹c¹ 7.0, 7.5 ; mtr 8.0, 8.2 ; cw 10.6, 11.7 ; m³-m³ 10.0, 10.4. 1 ♀ : l 23.3 ; c¹-c¹ 7.1 ; mtr 7.2 ; cw 11.5 ; m³-m³ 10.3.

Distribution : Widely distributed throughout India. Afganistan, Pakistan, Sri Lanka, Nepal, Bangladesh and Myanmar.

Remarks : Most common. Large number of them roost in small groups of 2 to 6 in different parts of less used man made structure like Forest Rest House, deserted buildings, and also in caves and crevices of rocks. At Ganauli Forest Rest House separate roosts of males and females were found during June and colony of females contained young animals (Plate Ib). However, during January males and females were found occupying the same hole in that rest house.

Order PRIMATES

Family CERCOPITHECIDAE

12. *Macaca mulatta mulatta* (Zimmermann) **

1780. *Cercopithecus mulatta* Zimmermann, *Gesch. Mensch.*, 2 : 195 (India)

Common names : Rhesus Macaque (Eng.) ; Bandar (Hin.).

Distribution : From Jammu and Kashmir in the north to Andhra Pradesh in the south, and Gujarat in the west to Arunachal Pradesh in the east. Bhutan, Bangladesh, Myanmar, China and Thailand.

Remarks : Fairly common in the forested areas, particularly in the hilly region. Occasionally raids the orchards and vegetable gardens. Altogether 17 troops, 10 in Division I and 7 in Division II were observed. Troop size varies from 12 to more than 26 animals. Local migration of most of the troops has been reported. Juveniles and youngs were noticed both in summer and winter.

13. *Presbytis entellus entellus* (Dufresne) **

1797. *Simia entelius* Dufresne, *Bull Soc. Philon. Paris*, 1 (7) : 49 (Bengal).

Common names : Hanuman Langur (Eng.) ; Hanuman, Langur (Hin.).

Distribution : Jammu and Kashmir, Gujarat, Panjab, Haryana, Himachal Pradesh, Rajasthan, Delhi, Uttar Pradesh, Bihar, West Bengal, Orissa, Madhya Pradesh. Bangladesh.

Remarks : Plenty in the fringe areas of the forest, regularly invading the agricultural crops as well as orchards. Some of the troops move around a large area during the day for foraging. Large troops of 20-45 animals of different ages were noticed at Kotraha, Ganauli, Madanpur, Manguraha, and also along the roads from Bagha to Valmiki Nagar.

Order CARNIVORA

Family CANIDAE

14. *Canis lupus pallipes* Sykes *

1831. *Canis pallipes* Sykes, *Proc. zool. Soc. Lond.* 101 (Deccan, India).

Common names : Wolf (Eng.) ; Bheriya (Hin.).

Distribution : Gujarat, Rajasthan, Uttar Pradesh, Bihar, West Bengal, Assam, Orissa,

Madhya Pradesh, Andhra Pradesh, Karnataka, Maharashtra. Arabian Peninsula, Iran, Pakistan.

Remarks : Local people reported Wolf as common and cited several examples of lifting of domestic stocks. However, during our visit we could meet the Wolf only on two occasions, one at Tribeni block in summer and other in the dry bed of main Tirhut canal near Bherihar during winter. At Tribeni, it was observed singly, while at Tirhut in pairs. We also could not find any record of recent lifting of the domestic stock by the Wolf. It appears that its population in the Reserve is not much high.

15. *Canis aureus indicus* Hodgson **

1833. *Canis aureus indicus* Hodgson, *Asiat. Res.*, 18, 2 : 237 (Nepal).

Common names : Asiatic Jackal (Eng.) : gidar, Shial (Hin.).

Distribution : Bihar, West Bengal, Northeastern states including Tripura, Bhutan, Bangladesh, Myanmar, Thailand.

Remarks : Frequently observed in the fringe areas of the forest, but more in villages and particularly in the cultivated fields. Mostly the jackal was seen singly, but occasionally found in pairs also. It often comes out of the shelter even in day time. Juvenile individuals were observed more during summer.

It was reported to be most common in the villages even during the beginning of the last decade causing considerable damage of the poultry and other domestic stocks. However, its number has dwindled severely due to improved irrigation system along with random use of pesticides for protection of crops.

16. *Vulpes bengalensis* (Shaw) **

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

Common names : Bengal Fox (Eng.) ; Lomri (Hin.).

Distribution : Practically throughout India from the Himalayan foot hills to Kanya Kumari in the

south. Pakistan, Nepal, Bangladesh.

Remarks : Fairly common in the reeds and grass jungles along the banks of rivers and canals, in the paddy and sugarcane fields, but not deep in the forest. Lives in small colonies. Burrow systems were observed inside the grass jungles, harvested fields and also in the open wasteland. Each burrow system has a number of openings and covers surface area of about 2 to 10 sq. m. It comes out of the burrows at dusk with repeated chattering bark and moves almost throughout the night in and around the villages in search of food.

It has been reported that some professional hunters from outside regularly visit the area for the collection of this animal by indigenous method. These hunters seal all the openings of the burrow system except two. Then they sent pungent smoke through one opening, and kill the animal with a stick while it tries to come out through the other opening. Random use of pesticides also affected the fox populations and now a days they are wiped out from some of the villages within the Reserve.

17. *Cuon alpinus primaevus* (Hodgson) **

1833. *Canis primaevus* Hodgson, *Asiat. Res.*, 18, 2 : 221 (Nepal).

Common names : Dhole, Indian Wild Dog (Eng.) ; Dhole, Junglee Kutta (Hin.).

Distribution : Uttar Pradesh, Bihar, Sikkim, West Bengal, Nepal, Bhutan.

Remarks : Very rare, only once in June a pack of five animals was observed near the Ganauli observatory. It's call was also not heard anywhere in the Reserve.

Family URSIDAE

18. *Melursus ursinus ursinus* (Shaw) *

1791. *Bradypus ursinus* Shaw, *Nat. Misc.*, 2 (unpaged), pls. 58-59 (Patna, Bihar, India).

Common names : Sloth Bear (Eng.) ; Richh, Bhalu (Hin.).

Distribution : Peninsular India to Uttar Pradesh

and in the east up to Arunachal Pradesh. Bangladesh.

Remarks : Moderately common, solitary individuals are met within the forests, particularly in the Division II. Though it lived a solitary life, but during winter a number of them raid the mature crop fields neighbouring the forest. This species possesses a serious threat to the villagers. Incidence of human moulding by this animal is a regular feature in the reserve.

Sloth bear lives in the natural caves among the rocks deep in the forest as well as near human habitation. Foot marks or markings of it could be noticed throughout the forest.

Family MUSTELIDAE

19. *Lutra perspicillata perspicillata* I. Geoffroy **

1826. *Lutra perspicillata* I. Geoffroy, *Dict. Class. Hist. Nat.*, 9 : 519 (Sumatra).

Common names : Smooth-coated Indian otter (Eng.) ; Udbilao (Hin.).

Distribution : Widely distributed in Peninsular India, West to Gujarat, north to Uttar Pradesh, east of Arunachal Pradesh. Bangladesh, Myanmar, China, Vietnam, Malaysia, Sumatra.

Remarks : Reported to be common in the bush and rocks along the rivers, canals and other water bodies even inside the villages causing certain amount of damage to the fish crop. However, we could observe only two troops one of six and the other of three animals in Manor nullah (near Ganauli) and Baghai nullah (Kosil Block) respectively. Pug marks were also observed near Nanad-Vouji pond at Ganauli.

In spite of reported fish damage habit, there is no hunting pressure on this species.

Family VIVERRIDAE

20. *Viverra zibetha zibetha* Linnaeus **

1758. *Viverra zibetha* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 44 (India).

Common names : Large Indian Civet (Eng.); Mach Bhondar, Bagdos (Hin.).

Distribution : Madhya Pradesh, Bihar, Sikkim, West Bengal, Assam, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh. Bangladesh, Myanmar, Thailand, Vietnam, Malaysia, Singapore.

Remarks : Rare in the Reserve. Occurrence of this civet was reported at Shibnata, Santipur villages, and Naurangia block. Solitary in nature, lives in scrub or bush jungles near human localities and often attacks poultry and other live stocks. We could not observe any specimen, but fresh faecal matter probably of this species containing hairs and huge amount of seeds were observed at Naurangia.

21. *Viverricula indica indica* (Desmarest) **

1817. *Viverra indica* Desmarest, *Nouv. Dict. Hist. Nat. Paris*, 7 : 170 (India).

Common names : Small Indian Civet (Eng.) ; Mashk billa, Khattus (Hin.).

Distribution : Almost throughout the mainland of India. Pakistan, Sri Lanka, Bhutan and Bangladesh.

Remarks : Very common in the Reserve, particularly in and around human habitations and grassy or bushy areas along the rivers, canals and other water bodies. Lives singly or in pairs. Takes shelter in various places like self made holes in the bushes, under the rocks, natural holes of the trees, as well as in the roof or false ceiling of the relatively less-used houses. Quite a good number of them were observed foraging in the campus and surroundings of Madanpur and Ganauli Forest Rest Houses ; mostly move through the branches of the trees.

Youngs were noticed during October-November.

Analysis of faecal matter revealed mostly vegetative matter, only occasionally hairs, scales and other animal matter.

22. *Paradoxurus hermaphroditus* (Pallas) **

1777. *Viverra hermaphrodita* Pallas, In Schreber, *Dic. Säugethiere*, 3 : 426 (India).

Common names : Common Plam Civet, Toody Cat (Eng.) ; Lakati, Chingar, Khattus (Hin.).

Distribution : Throughout India. Pakistan, Afghanistan, China, Indonesia, Malaysia, Phillipines, Myanmar, Andalus.

Remarks : Common in forest as well as in the villages, taking abode in the holes of tree trunks, top of palm trees as well as thatched roof of houses. One or more animals may be found in the same tree or house. Comes out of the hiding place immediately after evening and follows a particular route through the branches of the trees, electric wires, etc. to the foraging ground. It causes considerable damage of the poultry as well as vegetable gardens.

Family HERPESTIDAE

23. *Herpestes auropunctatus auropunctatus* (Hodgson)

1836. *Mangusta auropunctata* Hodgson, *J. Asiat. Soc. Bengal.*, 5 : 235 (Nepal).

Common names : Small Indian Mongoose (Eng.) ; Neula (Hin.).

Distribution : Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, North-eastern States. Nepal, Bhutan.

Remarks : Most common in and around villages but not in the actual forests. Lives in small colony making burrows in the bushes particularly along the canals, drains, tanks, bunds, etc. Troops of 6-12 individuals were observed in all the villages. Each troop forages in a particular area of cultivated or wasteland and follows a particular route from roosting place to foraging ground and back. Preys mainly upon small birds, lizards, amphibians, insects and occasionally damages poultry.

Juveniles were found foraging with the adults during June, October and November. This species receives protection from the villagers for its so called snake control habit. Some villagers were found who kept this animal as pet.

24. *Herpestes edwardsi nyula* (Hodgson)

1836. *Mangusta (Herpestes) nyula* Hodgson, *J. Asiat. Soc. Beng.*, 5 : 236 (Nepal).

Common names : Indian Grey Mongoose (Eng.); Neula (Hin.).

Distribution : Ranges from Gujarat to Assam including Orissa and Sikkim. Nepal, Bangladesh.

Remarks : Fairly common in the villages as well as in the open areas of the forest. Lives in hole as well as under rock and trunk of large fallen trees or under any other suitable cover. Hunts singly or in small troops of 3-6 animals.

Family HYAENIDAE

25. *Hyaena hyaena hyaena* (Linnaeus)

1758. *Canis hyaena* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 40 (Benna mountains, Laristan, Iran).

Common names : Striped Hyaena (Eng.) ; Lakar Baggha (Hin.).

Distribution : Almost throughout India in suitable habitats ; the eastern limit being West Bengal. Nepal, North Africa, Arabia, Iran, Iraq, Afghanistan, Pakistan, Transcaucasia and Turkestan.

Remarks : Moderately common in the ravine grass jungle and rocky areas, but solitary individual could be observed in the cultivated fields as well as in the open areas of the forest even in the day time.

Family FELIDAE

26. *Felis chaus affinis* Gray **

1830. *Felis affinis* Gray, *Illustr. Ind. Zool.*, 1, pl. 3 (Gangotri, Uttar Pradesh, India).

Common names : Jungle Cat (Eng.) ; Junglee billi (Hin.).

Distribution : Himalayas from Jammu and Kashmir to North-eastern states. Nepal, China.

Remarks : Fairly common in scrub jungle, reedy and grassy banks of rivers and canals. This cat also takes abode in other suitable places such

as deserted houses, godowns, etc. within the villages. It is regarded as a menace to the poultry but there is no hunting pressure. It is reported to give birth of 3–4 youngs even in the rafter of the houses, stack of logs or other suitable places in the vicinity of human habitation.

27. *Panthera pardus fusca* (Meyer) *

1794. *Felis fusca meyer*, *Zool. Ann.*, 1 : 394 (Bengal).

Common names : Indian Leopard, Panther (Eng.); Tenduwa (Hin.).

Distribution : Throughout India in suitable habitat. Sri Lanka, Bangladesh, Myanmar, China.

Remarks : Moderately common in the deeper parts of the forests, but frequently visits the open areas in search of prey species. Its occasional visit to the villages for cattle lifting has also been reported. Pug marks and scats could be seen around all the water sources in Madanpur, Ganauli, Manguraha and Naurangia Ranges.

28. *Panthera tigris tigris* (Linnaeus) *

1758. *Felis tigris* Linnaeus. *Syst. Nat.*, 10th ed., 1 : 41 (Bengal).

Common names : Tiger (Eng.); Bagh (Hin.).

Distribution : In the forested tracts throughout India. Nepal, Bangladesh, Myanmar.

Remarks : Miscellaneous forests, interspersed with cane brakes, swamps and open grass land provide an ideal habitat for the tiger. Before the declaration of this forest as Tiger Reserve, Shahi (1977) reported that twelve tigers reside permanently in this area. However, 1989 and 1993 census by the forest Department reported 81 and 51 tigers respectively (Srivastava 1993, *pers. comm.*). From our survey works, both 81 and 51 appeared as much on the higher side. We could found pug marks of 3 adult male, 2 adult female and one sub adult during May–June, 1993; 2 adult male, 3 adult female during January 1996 in Madanpur Ganauli Range. Actual animal could not be seen. It has been felt that due to several construction works and movement of heavy vehicles in the Reserve, tigers are rapidly losing their ground in this tract of north Bihar and

individuals are migrating to the neighbouring forests of Nepal.

Order ARTIODACTYLA

Family SUIDAE

29. *Sus scrofa cristatus* Wagner

1939. *Sus cristatus* Wagner, *Munch. Gelehrt. Anz.*, 9:435 (possibly Malabar Coast, India).

Common names : Indian Wild Boar (Eng.); Suor (Hin.).

Distribution : Throughout India, in forested tracts. Pakistan, Sri Lanka, Nepal, Bangladesh, Myanmar, Indonesia, Malaysia, Vietnam.

Remarks : Fairly common, particularly throughout the Division II. Large herds of 40–60 animals of different ages were observed during all the periods of the survey. Due to its crop raiding habit, there is certain amount of hunting pressure during harvesting months.

Intergrading with the domestic stock has been reported as common.

Family CERVIDAE

30. *Muntiacus muntjak vaginalis* (Boddaert)

1785. *Cervus vaginalis* Boddaert, *Elench. Anim.*, 1:136 (Bengal).

Common names : Indian Muntjac, Barking Deer (Eng.); Kakar (Hin.).

Distribution : Uttar Pradesh, Bihar, West Bengal, Assam, Arunachal Pradesh, Sikkim, Tripura, Meghalaya. Bhutan, Bangladesh, Myanmar, Yunan and Vietnam.

Remarks : Rare and confined only to the wooded part of the Reserve, but occasionally solitary individual visits the open areas in the dry river beds. Its cackling bark was frequently heard in the forest of the Madanpur and Manguraha range.

31. *Axis porcinus porcinus* (Zimmermann)

1777. *Cervus porcinus* Zimmermann, *Spec. Zool. Geogr.*, 532 (Bengal).

Common names : Hog Deer (Eng.); Para (Hin.).

Distribution : Punjab to north-eastern states, Nepal, Sri Lanka (introduced).

Remarks : This species was thought to be wiped out from Bihar due to hunting and habitat destruction. Shahi (1977) observed Hog Deer in Champaran forest. At present it is rare, found in the grassy banks of Gandak river, canals and scrub jungles particularly in the Madanpur range. Occasionally visit the cultivated fields. Solitary individual and a small herd of 6 animals were observed in Division II on one occasion in 1993.

32. *Axis axis axis* (Erxleben)

1777. *Cervus axis* Erxleben, *Syst. Regn. Anim.*, 312 (Bank of Ganges, Bihar, India).

Common names : Spotted Deer (Eng.); Chital (Hin.).

Distribution : In the forested tracts from Peninsular India to Kumaon in Uttar Pradesh and Sikkim in the north, eastward to Meghalaya. Sri Lanka, Nepal and Bangladesh.

Remarks : Very common, lives in herds. Large herds of more than 30 animals frequently visit the campus of the rest houses in Division II. During winter, these herds often raid the cultivated fields and villagers have to guard their fields. In the process, many of the deer are killed or injured. In addition to this, there is considerable amount of hunting pressure on them. Antlers and skins were noticed in many of the houses but we could not find them in the local market for commercial purpose.

33. *Cervus unicolor niger* Blainville

1816. *Cervus niger* Blainville, *Bull. Soc. Philom Paris*, 76 (According to Ellerman, 1951 type-locality is somewhere in north India).

Common names : Sambar (Eng., Hin.).

Distribution : Peninsular India including Goa to Himachal Pradesh in the north, West Bengal in the east. Nepal, Bangladesh.

Remarks : Moderately common in the forested

part, but frequently visits neighbouring crop fields. During our visit (May–June, 1993) we could find a hide of a freshly killed specimen, seized by the Forest Department at Ganauli (Plate 2a). It appears that there is considerable hunting pressure for its flesh.

Family BOVIDAE

34. *Bos gaurus* Smith *

1827. *Bos gaurus* Smith, Griffith's *Cuvier Anim. Kingd.*, 4:399 (Mainpat, Sarguja, Madhya Pradesh, India).

Common names : Bison (Eng.); Gaur (Hin.).

Distribution : Only in certain protected areas of Peninsular India including Goa, Madhya Pradesh, Bihar, West Bengal, Assam. Nepal, Bangladesh.

Remarks : Shahi (1977) reported Gaur only in two districts of Bihar, viz. in Palamau and Singhbhum. However, though rare, but it still occurs in Valmiki Tiger Reserve. We could find a herd of eight animals including two calves in Ganauli Forest. Local people reported that there are few more small herds in the deeper part of the forest. Apparently there is no hunting pressure, but random cattle grazing may prove to be fatal to the Gaur population by the infection of foot and mouth disease.

35. *Boselaphus tragocamelus* (Pallas)

1766. *Antilope tragocamelus* Pallas, *Misc. Zool.*, 5 (Plains of Peninsular India).

Common names : Nilgai, Blue Bull (Eng.); Nil, Nilga, Nilgai (Hin.).

Distribution : From the base of Himalayas to Karnataka excluding north-eastern states. Pakistan, Afghanistan.

Remarks : Rare, scatterly distributed in both the Divisions, Avoids forested tract, single as well as herd of four animals were observed in the harvested fields of both the Divisions. This animals is regarded as sacred and there is no hunting pressure. Sometimes causes damage to the cultivated crops.

36. *Tetracerus quadricornis* (Blainville) *

1816. *Cerophorus (Cervicapra) quadricornis* Blainville, *Bull. Soc. Philom. Paris*, 75, 78 (Plains of Peninsular India).

Common names : Four-horned Antelope (Eng.); Chousingha, Chouka, Doda (Hin.).

Distribution : Gujarat, Rajasthan, Uttar Pradesh, Himachal Pradesh, Madhya Pradesh, Bihar, Orissa, Andhra Pradesh, West Bengal, Sikkim, Assam, Meghalaya, Nagaland, Tripura, Nepal, Bangladesh.

Remarks : Fairly common both in the forest as well as scrubby or bushy areas within the villages. Adults as well as young were observed both in pre and post monsoon periods. There is tremendous hunting pressure on this species for its meat. People were observed with indigenous traps and other weapons moving in the forest in search of this poor animal throughout the year.

Order RODENTIA

Family SCIURIDAE

37. *Petaurista petaurista phillipensis* (Elliot) **

1839. *Pteromys phillipensis* Elliot, *Madras J. Litt. Sci.*, 10 : 217 (Near Madras, Tamil Nadu, India).

Common names : Common Giant Flying Squirrel (Eng.); Ural Gilheri (Hin.).

Distribution : Northern, Western, Southern India, Bihar and West Bengal in Eastern India, Nepal.

Remarks : Strictly arboreal, fairly common in the deep as well as fringe areas of the forest. At night while moving along the forest road they could easily be seen gliding from one tree to other.

38. *Funambulus pennanti* Wroughton

1905. *Funambulus pennanti* Wroughton, *J. Bombay nat. Hist. Soc.*, 16 : 411 (Mandvi Taluka, Surat, Gujarat, India).

Common names : Northern Palm Squirrel, Five-striped Squirrel (Eng.); Gilheri (Hin.).

Material examined : 1 ♂, Ganauli, 10. VI. 1993, S. Chakraborty coll.; 1 ♂, Mahadewa, 9 Km NE of Ganauli, 9. VI 1993, S. Chakraborty coll.; 1 ♀, Govardhana, 26. X. 1994, T. P. Bhattacharyya coll.

Measurements : External : 2 ♂, : Hb 145, 148; TI 132, 140; Hf 37.5, 38.0; E 17, 18. Cranial : 1 ♂ : On 38.9; pl 19.1; n 12.3; mtr 7.6; iw 10.3; b 8.0.

Distribution : From Maharashtra and Madhya Pradesh to Jammu and Kashmir in the north, Meghalaya in the east, Andaman Islands, Iran, Pakistan, Nepal, Bangladesh.

Remarks : Most common in the villages and roadsides, but not in the actual forest. Responsible for the damage of the orchards.

Family HYSTRICIDAE

39. *Hystrix indica indica* Kerr

1792. *Hystrix cristata* var *indica* Kerr, *Anim. Kingd.*, 213 (India).

Common names : Indian crested Porcupine (Eng.); Sahi (Hin.).

Distribution : Throughout India, except North-Eastern States. Syria, Iraq, S. Arabia, Iran, Russian Turkestan, Pakistan, Sri Lanka, China.

Remarks : Reported to be common, causing considerable damage to the tuberous crops. Quills were also seen in the collection of the villagers. However, we could find only two burrows on the hilly slopes in the Ganauli forest. From the amount of quills in the different houses, it appears that there is certain hunting pressure.

Family MURIDAE

40. *Vandeleuria oleracea dumeticola* (Hodgson)

1845. *Mus dumeticola* Hodgson, *Ann. Mag. nat. Hist.*, 15 : 268 (Nepal).

Common names : Indian Long-tailed Mouse (Eng.).

Distribution : Uttar Pradesh, Bihar, Orissa, West Bengal, Sikkim, North-Eastern States, Nepal, Myanmar.

Remarks : Fairly common in the villages and fringe areas of the forest but avoids the houses. Almost arboreal species, nests are built mainly with leaves in the tree holes, electric poles, termite mound and many other places.

41. *Millardia meltada meltada* (Gray)

1837. *Golunda meltada* Gray, *Mag. N. H.* 1 : 586 (Dharwar, Karnataka, India).

Common names : Soft-furred Field Rat, Metad (Eng.) ; Chuha (Hin.).

Material examined : 1 ♂, Ganauli, 14.1.1996, A. K. Poddar coll.

Measurements : 1 ♂ : Hb 146 ; T1 130; Hf 25 ; E 24.

Distribution : Mahdy Pradesh to Bihar in the east, and Tamil Nadu in the South. Sri Lanka.

Remarks : Fairly common, confined in and around cultivated fields making extensive burrows mainly along the bunds.

42. *Rattus rattus rufescens* (Gray)

1837. *Mus rufescens* Gray, *Ann. Mag. nat. Hist.* 1 : 35 (Dharwar, Karnataka, India).

Common names : House Rat (Eng.) ; Kala Chuha (Hin.).

Material examined : 1 sub. ad. ♂, Kotraha, 2. VI. 1993, S. Chakraborty coll. ; 4 ♂, 3 ♀, 1 sub. ad. ♀ Manguraha, 23, 24. X. 1994, T. P. Bhattacharyya coll. ; 1 ♂, 1 ♀, Govardhana, 3. XI. 1994, T. P. Bhattacharyya coll.

Measurements : External : 5 ♂ : Hb 137-175 (151) ; T1 180-230 (178.5) ; Hf 29-33 (31); E 20-25 (22). 4 ♀ : Hb 132-180 (150) ; T1 187-235 (215) ; Hf 29-30.5 (30) ; E 19-25 (21). Cranial : 1 ♂ : *on* 42.4 ; *pl* 22.1 ; *n* 14.6 ; *apf* 7.3 ; *mtr* 6.3 ; *b* 7.7 ; 1 ♀ : *on* 41.7 ; *pl* 21.6 ; *n* 14.1 ; *apf* 7.1 ; *mtr* 6.4 ; *b* 7.6.

Distribution : Almost throughout India in the major cities as well as in villages. Pakistan, Thailand, Malaysia.

Remarks : Most common in the residential areas particularly in shops and godowns.

Considered as a serious pest. Not found in the forest.

43. *Rattus rattus brunneus* (Hodgson)

1845. *Mus brunneus* Hodgson, *Ann. Mag. nat. Hist.*, 15 : 266 (Nepal).

Common names : House Rat (Eng.) ; Kala Chuha (Hin.).

Material examined : 2 ♂, 1 sub. ad. ♂, 1 ♀, 1 sub. ad. ♀ Kotraha, 28-30. V. 1993, S. Chakraborty coll. ; 2 ♀ Madanpur, 13-15. VI. 1993, S. Chakraborty coll.

Measurements : External : 3 ♂ : Hb 154, 184, 185, T1 185, 203, 210 ; Hf 28 32, 34 ; E 21, 24, —. 3 ♀ : Hb 174, 181 ; T1 200, 211, 213 ; Hf 32 33, 33.5 ; E 24, 25, —. Cranial : 2 ♂ : *on* 39.3, 41.8 ; *pl* 20.7, 22.1 ; *n* 14.6, 14.8 ; *apf* 6.6, 6.8 ; *mtr* 6.8, 7.1 ; *b* 7.5, 7.7. 1 ♀ : *on* 42.9 ; *pl* 23.2 ; *n* 15.5 ; *apf* 7.5 ; *mtr* 7.3 ; *b* 8.8.

Distribution : Bihar. Nepal.

Remarks : Fairly common in Division II, being confined in the border of the village and forest. Collected from the trees as well as ground.

Present series constitute the first record of this subspecies from Indian territory and probably transported from Nepal through human agency.

44. *Rattus rattus arboreus* (Horsfield)

1851. *Mus arboreus* (Buchanan-Hamilton) Horsfield, *Cat. E. India Co. Mus.* 141 (Bengal).

Common names : House Rat (Eng.) ; Gora Chuha (Hin.).

Material examined : 1 ♂, 1 juv. ♂, 2 ♀, 1 sub. ad. ♀, Kotraha, 28. 29. V. 1993. 2. VI. 1993, S Chakraborty coll. ; 1 ♀ Manguraha, 21, X. 1994. T. P. Bhattacharyya coll. ; 1 ♀ Govardhana, 29. X. 1994, T. P. Bhattacharyya coll. 1 ♂, 1 ♀ Naurangia, 3, 4. X. 1994 T. P. Bhattacharyya coll.

Measurements : External : 3 ♂ : Hb 160, 170, 195 ; T1 180, 185, 213 ; Hf 33, 35, 36 ; E 23, 24, 25. 3 ♀ : Hb 172, 185, 185 ; T1 197,

203, 210 ; Hf 30.5, 31, 34 ; E 24, 25, 25.5. Cranial : 1 ♂ : *on* 44 ; *pl* 23.7 ; *n*. 15.7 ; *apf* 8 ; *mtr* 6.9 ; *b* 7.8. 1 ♀ : *on* 42.3 ; *pl* 23.3 ; *n* 16.1 ; *apf* 7.6 ; *mtr* 7 ; *b* 7.2.

Distribution : Uttar Pradesh, Bihar, Orissa, West Bengal. Nepal.

Remarks : Most common in the residential areas particularly in the houses, and also moderately represented in the forest. Nests were observed in different places of the houses, cowsheds, poultry, grannery, *etc.* but always a little above the ground level. Nests were also found in trees like Amla, Ficus, Mango *etc.*

One specimen of the present series has distinct darkish patch in the midventral region. It appears that intergradation between white and dark-bellied forms are being taken place in this region.

Considered as a most serious pest of stored grains and poultry.

Mammae : 1 + 2 + 3 + 12

45. *Mus musculus castaneus* Waterhouse

1843. *Mus castaneus* Waterhouse, *Ann. Mag. nat. Hist.*, 12 : 134 (Phillipines).

Common names : House mouse (Eng.) ; Musi, Chuhi (Hin.).

Material examined : 1 ♀, Kotraha, 30, V. 1993, S. Chakraborty coll. ; 1 ♂, Ganauli, 8. VI. 1993, S. Chakraborty coll.

Measurements : External : 1 ♂ : Hb 77 ; T1 95 ; Hf 17 ; E 12.5. 1 ♀ : Hb 70 ; T1 68 ; Hf 14.5 ; E 11. Cranial : 1 ♂ : *on* 21.8 ; *pl* 10.9 ; *n* 8.4 ; *apf* 4.7 ; *mtr* 3.3 ; *b* 3.7 ; *d* 5.4.

Distribution : Almost throughout India. Sri Lanka. Myanmar, China, Thailand, Malaysia, Phillipines, New Guinea.

Remarks : Most common in the houses, shops, godowns but not in the forest. Considered as most serious pests of house hold goods and articles of merchandise.

Distribution of this subspecies is modified by human agency.

46. *Mus musculus homourus* Hodgson

1845. *Mus homourus* Hodgson, *Ann. Mag. nat. Hist.*, 15 : 268 (Nepal).

Common names : House Mouse (Eng.) ; Musi, Chuhi (Hin.).

Material examined : 1 ♂, Manguraha, 25. X. 1994, T. P. Bhattacharyya coll. ; 1 ♂, 1 juv. ♂, 1 juv. ♂, 3 ♀, Govardhana, 29, 30. X. 1994, T. P. Bhattacharyya coll.

Measurements : External : 2 ♂ : Hb 57, 72 ; T1 64, 64 ; Hf 14, 16 ; E 10.5, 13.2.2 : Hb 71, 80 ; T1 60, 70 ; Hf —, 16 ; E 12, 14.5. Cranial : 1 ♂ : *on* 20.5 ; *pl* 10.7 ; *n* 8.4 ; *apf* 4.2 ; *mtr* 3.3 ; *d* 5.7.

Distribution : Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, Bihar, Northeastern States, West Bengal, Sikkim, Tamil Nadu. Nepal, Myanmar, China, Formosa, Vietnam, Java.

Remarks : Most common in the residential areas, but also collected from cultivated fields as well as forest. Nests are made in the small burrows, and also in various other places like rainwater pipe, ventilator, bookshelf, wooden drawers, *etc.*

A specimen collected in October contained 10 foetus in very early stage of development.

Considered as serious pest of house hold goods, particularly of papers and clothes.

Present series constitutes the first record of this subspecies from Bihar.

47. *Mus Cervicolor cervicolor* Hodgson

1845. *Mus cervicolor* Hodgson, *Ann. Mag. nat. Hist.*, 15 : 268 (Nepal).

Common name : Fawn-coloured Mouse (Eng.).

Material examined : 1 ♂, 1 unsexed, Kotraha, 29. V. 1993, 1. VI. 1993, S. Chakraborty coll. ; 2 ♀. Mahadewa, 9 km NE of Ganauli, 9. VI. 1993, S. Chakraborty coll. ; 1 ♂, Manguraha, 25. X. 1994, T. P. Bhattacharyya coll.

Measurements : External : 2 ♂ : Hb 76, 80 ; T1 79, 90 Hf 17, 17 ; E 13.5, 15.2 ; ♀ : Hb 71,

82 ; T1 80, 88 ; Hf 16, 16 ; E 13, 13.5. Cranial: 1 ♂ : *on* 21.7 ; *pl* 10.8 ; *n* 8.9 ; *apf* 4.9 ; *mtr* 3.2 ; *d* 5.7. 2 ♀ : *on* 21.3, 22.2 ; *pl* 10.5, 11.2 ; *n* 8.2, 8.6 ; *apf* 4.3, 4.6 ; *mtr* 3.2, 3.6 ; *d* 5.4, 6.3.

Distribution : West Bengal, Bihar. Nepal.

Remarks : Common in the harvested fields as well as neighbouring wasteland.

According to extant literature (Ellerman 1963, Mandal 1990, Agarwal *et. al.* 1992) this species was not reported from Bihar. Thus the present series extends its range to Bihar and in all probability reached from Nepal.

48. *Mus booduga booduga* (Gray)

1837. *Leggada booduga* Gray, *Charlesworth's Mag. nat. Hist.*, 1 : 586 (Southern Mahratta country, India).

Common names : Little Indian Field Mouse (Eng.); Chuhi (Hin.).

Material examined : 1 ♀, Kotraha, 30. V. 1993, S. Chakraborty coll.; 1 ♀, Madanpur, 14. VI. 1993, S. Chakraborty coll.

Measurements : External : 2 ♀ : Hb 65, 69 ; T1 59, 61; Hf 13.8, 13.8 ; E 10.1, 11.5. Cranial : 1 ♀ : *on* 18.6 ; *pl* 9.7 ; *n* 7.4 ; *apf* 4.0 ; *mtr* 3.3 ; *d* 5.1.

Distribution : Practically throughout India. Bangladesh.

Remarks : Most abundant in the cultivated fields and grannaries and grassy banks of rivers. Large number of burrows could be observed in the dry field after the harvesting is over. Sort of local migration from field to the neighbouring grannaries during monsoon and back during dry period has also been reported.

Certain amount of stored grains were found in some of the burrows, still it is not considered as a serious pest by the farmers.

49. *Golunda ellioti ellioti* Gray

1837. *Golunda ellioti* Gray, *Charlesworth's Mag. nat. Hist.*, 1 : 586 (Dharwar, Karnataka, India).

Common name : Indian Bush Rat (Eng.).

Material examined : 1 ♀, Kotraaha, 1. VI. 1993, S. Chakraborty coll.

Measurements : External : 1 ♀ : Hb 133 ; T1 105 ; Hf 24 ; E 17. Cranial : 1 ♀ : *on* 33.6 ; *pl* 17.2 ; *n* 12.8 ; *apf* 5.7 ; *mtr* 6.7 ; *b* 6.2.

Distribution : Pubjab, Himachal Pradesh, Uttar Pradesh, Peninsular India, Madhya Pradesh, Bihar, West Bengal, Assam. Afghanistan, Pakistan, Nepal, Sri Lanka.

Remarks : A diurnal species of rat. Fairly common in the bushes and grassland in the forest as well as villages. Depends mainly on wild seeds and fruits. Nests are made in the bushes, little above the ground.

Consitutes the most important diet of *Herpestes* sp.

50. *Bandicota bengalensis bengalensis* (Gray)

1833. *Arvicola bengalensis* Gray, *Ill. Indian Zool.*, 2 : pl. 21 (Bengal).

Common names : Lesser Bandicoot Rat (Eng.); Chota Ghous (Hin.).

Material examined : 1 ♂ Kotraha, 31. V. 1993, S. Chakraborty coll.

Measurements : External : 1 ♂ : Hb 146 ; T1 120 ; Hf 34 ; E 23. Cranial : 1 ♂ : *on* 30.5 ; *pl* 21.0 ; *n* 10.2 ; *apf* 6.5 ; *mtr* 7.4 ; *b* 8.4.

Distribution : Throughout India. Pakistan, Nepal, Bhutan, Sri Lanka, Bangladesh, Myanmar.

Remarks : Most common in and around cultivated fields as well as in the godowns, shops, grannaries. Large number of complex burrow system could be found in the bunds and harvested paddy fields. Huge amount of grains are found stored in each burrow system during winter months. Seasonal migration from field to grannaries and back is a regular phenomenon. Responsible for considerable damage of crops in the fields as well as in stores.

51. *Bandicota incica nemorivaga* (Hodgson)

1836. *Mus (Rattus) nemorivagus* Hodgson, *J. Asiat. Soc. Beng.*, 5 : 234 (Nepal).

Common names : Large Bandicoot Rat (Eng.); Ghous (Hin.).

Distribution : Bihar, West Bengal, Assam, Manipur, Meghalaya, Sikkim. Nepal, Bangladesh, Thailand, Formosa.

Remarks : Common. Mainly confined to the banks of canals, ponds and other marshy areas in the village as well as in forest, but often visits the houses and grannaries. Omnivorous and readily goes to the water in search of fish, molluses, crabs, etc.

52. *Nesokia indica indica* (Gray)

1832. *Arvicola indica* Gray, *Ill. Indian Zool.*, pl. 11. (India).

Common name : Short-tailed 'Mole Rat' (Eng.).

Distribution : Pubjab, Haryana, Himachal Pradesh, Rajasthan, Uttar Pradesh, Bihar, West Bengal. Iran, Afghanistan, Pakistan, Bangladesh.

Remarks : Strictly fossorial, makes extensive tunnels and spends most of the time under the ground. Burrow openings are covered with piles of earth. Prefers forested tract in the fringe of cultivated field. During the survey, no specimen could be trapped or seen, but one burrow system at the base of a Khair tree near a nullah at Madanpur was noticed. Appears to be not very common.

53. *Tatera indica indica* (Hardwicke)

1807. *Dipus indicus* Hardwicke, *Trans. Linn. Soc. London.*, 2 : 144, pl 26 (Between Varanasi and Hardwar, Uttar Pradesh, India).

Common names : Indian Antelope Rat (Eng.) ; Harna Musa, Gora Chuba, Safed Chuha (Hin.).

Material examined : 1 sub ad ♂ 2 ♀ 1 sub ad ♀, Govardhana, 30, 31. X. 1994, T. P. Bhattacharyya coll.

Measurements : External : 2 ♀ : Hb 173, 178; T1 195, 200 ; Hf 40, 43 ; E 25, 25.

Distribution : Jumma and Kashmir in the north to Karnataka in the south and West Bengal in the east. Iran. Afghanistan, Pakistan, Nepal.

Remarks : Very common in and around the bushes of the relatively dry agricultural fields, occasionally visits the poultries and grannaries. Not found in the forest.

Class AVES

Order PELECANIFORMES

Family PHALACROCORACIDAE

1. *Phalacrocorax niger* (Vieillot)

1817. *Hydrocorax niger* Vieillot, *Nouv. Dict. Hist. Nat.*, 8 : 88 (East India = Bengal).

Common names : Little Coromorant (Eng.); Pan Kowwa, Jograbi (Hindi).

Remarks : Common. Found throughout the reserve near water sources. At Manguraha about fifty individuals were found roosting in a Mango Tree.

2. *Ardeola grayii grayii* (Sykes)

1832. *Ardesa grayii* Skyes, *Proc. zool. Soc. London.*, : 158 (Dukhun).

Common names : Indian Pond Heron, Paddy bird (Eng.) ; Bagla (Hindi).

Remarks : Common. Distributed throughout the reserve near water bodies and ponds.

3. *Bubulcus ibis coromandus* (Boddaert)

1783. *Cancroma coromanda* Boddaert, *Table PL. enlum.*, : 54 (Coromandel).

Common names : Cattle Egret (Eng.) ; Gai bagla (Hindi).

Remarks : Fairly common. Distributed throughout the reserve and usually found moving with grazing village cattle, forest glades far away from water and in paddy fields.

Order CICONIIFORMES

Family ARDEIDAE

4. *Ardea alba modesta* J. E. Gray

1831. *Ardea modesta* J. E. Gray, *Zool. Misc.*, : 19 (India).

Common names : Eastern Large Egret (Eng.); Tar Bagla, Bada Bagla (Hindi).

Remarks : Common. Found in the Paddy fields and Water bodies throughout the reserve.

5. *Ixobrychus cinnamomeus* (Gmelin)

1789. *Ardea cinnamomea* Gmelin, *Syst. Nat.*, 1(2) : 643 (China).

Common names : Chestnut Bittern (Eng.) ; Lal bagla (Hin.).

Remarks : Moderately common. Seen only at Kotraha and Madanpur near irrigation canal and river.

Family CICONIIDAE

6. *Anastomus oscitans* (Boddaert)

1783. *Ardea oscitans* Boddaert, *Table PL. enlum.*, 55 (Pondicherry)

Common names : Openbill Stork (Eng.) ; Gungla, Ghungil, ghonghila (Hin.).

Remarks : Moderately common. Found throughout the reserve in cultivated fields. Apart from local shifts directly influenced by water conditions of performs regular migratory movement.

Order FALCONIFORMES

Family ACCIPITRIDAE

7. *Milvus migrans govinda* Sykes

1832. *Milvus govinda* Sykes, *Proc. zool. Soc. Lond.*, : 81 (Dukhun).

Common names : Periah Kite (Eng.) ; Cheel (Hin.).

Remarks : Moderately common. Found throughout the reserve near villages and human habitations.

8. *Haliastur indus indus* (Boddaert)

1783. *Falo Indus* Boddaert, *Table Pl. enlum.*, : 25 (Pondicherry).

Common names : Brahminy Kite (Eng.) ; Snakar Cheel, Dhobia Cheel, Brahmini cheel (Hin.).

Remarks : Rare. A single specimen was seen inside forest at Madanpur.

9. *Accipiter badius dussumieri* (Temminck)

1824. *Falco dussumieri* Temminck, *Pl. Col. Livr.*, 52 : Text to pl. 308 (India).

Common names : Indian Shikra (Eng.) ; Sikra, Chipka, Cheepak (Hin.).

Remarks : Moderately common. Found throughout the reserve.

10. *Accipiter nisus nisosimilis* (Tickell) *

1833. *Falco nisosimilis* Tickell, *J. Asiat Soc. Beng.*, 2 : 571 (Marcha, Boradhun, India).

Common names : Asiatic Sparrow—Hawk (Eng.) ; Basha, Bashin (Hin.).

Remarks : Rare. Winter visitor. Two specimens were seen—one at Kotraha and the other at Govardhana.

11. *Hieraaetus pennatus* (Gmelin)

1788. *Falco pennatus* Gmelin, *Syst. Nat.*, 1(1) : 272 (No type locality given).

Common names : Booted Hawk —Eagle (Eng.); Baghati, Fumiz, gilehri mar (Hin.).

Remarks : Rare. Partly resident ; chiefly winter visitor. Specimen was seen at Kotraha and Manguraha.

12. *Sarcogyps calvus* (Scopoli)

1786. *Vultur calvus* Scopoli, *Del. Faun. et. flor. Insubr.*, 2 : 85 (Pondicherry).

Common names : Black or King Vulture (Eng.); Raj gidh, Mulla gidh, Bhaonra (Hin.).

Remarks : Rare. Two specimens were seen near human habitation — one at Kotraha and the other at Manguraha.

13. *Gyps indicus indicus* (Scopoli)

1786. *Vultur indicus* Scopoli, *Del. Faun. et. flor. Insubr.*, 2 : 85 (India).

Common names : Indian Long-billed Vulture (Eng.);Gidh (Hin.).

Remarks : Moderately common. Distributed

throughout the reserve on outskirts of villages. About 20 individuals were found around an animal carcass at Ganauli.

14. *Gyps bengalensis* (Gmelin)

1788. *Vultur bengalensis* Gmelin, *Syst. Nat.*, 1 (1) : 245 (Bengal).

Common names : Indian white backed Vulture (Eng.) ; Gidh (Hin.).

Remarks : Moderately common. Specimens were found roosting on Palm trees near villages at Manguraha and Govardhana.

15. *Circus aeruginosus aeruginosus* (Linnaeus)

1758. *Falco aeruginosus* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 91 (Sweden).

Common names : Marsh harrier (Eng.) ; Kutar, Kulesir, Safed Sira (Hin.).

Remarks : Rare. A winter visitor. One specimen was seen near Gandak River at Balmikinagar and the other at Govardhana.

16. *Circaetus gallicus gallicus* (Gmelin)

1788. *Falco gallicus* Gmelin, *syst. Nat.* 1(1) : 259 (France).

Common names : Short-toed Eagle (Eng.) ; Saapmaar (Hin.).

Remarks : Rare. A single specimen was seen inside the forest at Naurangia while feeding on a snake.

17. *Pandion haliaetus haliaetus* (Linnaeus) *

1758. *Falco haliaetus* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 91 (Sweden).

Common names : Osprey (Eng.) ; Machhlimar, Machhariya, Machhmanga (Hin.).

Remarks : Rare. Winter visitor. A single specimen was seen at Manguraha.

Family FALCONIDAE

18. *Falco biarmicus jugger* J. E. Gray

1834. *Falco Jugger* J. E. Gray, in *Hardwicke's Ill. Ind. zool.*, 2 : pl 26 (India).

Common names : Laggar Falcon (Eng.)
Laggar, Jaggar (Hin.).

Remarks : Rare. A single specimen was seen resting on a tree branch inside forest at Naurangia.

Order GALLIFORMES

Family PHASIANIDAE

19. *Fracolinus francolinus asiae* Bonaparte

1856. *Fracolinus asiae* Bonaparte. *Compt. Rend. Acad. Sci. Paris.*, 42 : 882 (Asia).

Common names : Indian Black Partidge (Eng.) ; Kala teetar (Hin.).

Remarks : Rare. Two specimens were seen inside the forest at Naurangia.

20. *Fracolinus pondicerianus interpositus*
Hartert

1917. *Fracolinus pondicerianus interpositus* Hartert. *Novit zool.*, 24 : 288 (Oudh).

Common names : North India Grey Partridge (Eng.) ; Teetar, Ran teetar, Safeed teetar, Gorateetar (Hin.).

Remarks : Moderately common. Specimens were seen inside the forest at Ganauli, Madanpur and Manguraha.

21. *Coturnix coturnix coturnix* (Linnaeus)

1758. *Tetrao coturnix* Linnaeus, *Syst. Nat.* ed. 10. 1 : 161 (Sweden).

Common names : Grey Quail (Eng.); Bater, Bada bater, Ghagus bater (Hin.).

Remarks : Rare. A pair was seen deep inside the forest at Naurangia.

22. *Gallus gallus murghi* Robinson & Kloss

1920. *Gallus ferrugineus murghi* Robinson & Kloss, *Rec. Ind. Mus.*, 19 : 14, 15 (Chirala, Gaya district, Bihar).

Common names : Indian Red Junglefowl (Eng.) ; Jangli Murgha, Ban Murgha, Lal Murgha ♂, Jangli Murghi, Ban Murgi ♀ (Hin.).

Remarks : Very common. Found throughout the reserve inside forests.

23. *Pavo cristatus* Linnaeus*

1758. *Pavo cristata* Linnaeus, *Syst. nat.*, ed 10, 1:156 (India).

Common name : Indian peafowl (Eng.) ; Mor, Manjur, Mayura (Hin.).

Remarks : Moderately common. found throughout the forests of the reserve.

Order GRUIFORMES

Family TURNICIDAE

24. *Turnix sylvatica dussumier* (Temminck)

1828. *Hemipodius dussumier* Temminck, *Pl. col., livr.* 76, Pl 454, f.2 (Bengal).

Common names : Little Bustard - Quail (Eng.); Ginwa lowwa, Chhota lowwa, Dabki (Hin.).

Remarks : Rare. A pair was seen in a scrub jungle bordering cultivation at naurangia.

Family RALLIDAE

25. *Gallinula chloropus indica* Blyth

1842. *Gallinula chloropus?* var. *indicus* Blyth, *J. Asiat. Soc. Beng.*, 11:887 (Calcutta).

Common names : Indian Moorhen (Eng.) ; Jal Murghi, pani Murghi (Hin.).

Remarks : Moderately common. Shifts locally with water conditons. Specimens were found in river beds at Madanpur, Manguraha and Govardhana.

26. *Porphyrio porphyrio poliocephalus* (Latham)

1801. *Gallinula poliocephala* Latham, *Index Orn.*, Suppl. : 68 (India).

Common names : Indian purple Moorhen (Eng.); Kaim, Kalim, Kharim, Khima (Hin.).

Remarks : Moderately common. A flock of eight was seen in the river at Madanpur and a flock of six was seen at Manguraha.

27. *Fulica atra atra* Linnaeus

1758. *Fulica atra* Linnaeus, *Syst. Nat.*, ed. 10, 1:152 (Sweden).

Common names : Coot (Eng.); Dasari, Dasarni, Aari, Thekari, Khuskul (Hin.).

Remark : Rare. Two specimens were seen at Govardhana near a water hole, deep inside the forest.

Order CHARADRIIFORMES

Family JACANIDAE

28. *Hydrophasianus chirurgus* (Scopoli)

1786. *Tringa chirurgus* Scopoli, *Del. Flor. et. Faun. Insubr.*, fasc, 2:92 (Nova Guiana).

Common names : Pheasant-tailed Jacana (Eng.); Piho, Pihuya (Hin.).

Remarks : Rare. A pair was seen in a village tank at Govardhana.

29. *Metopidius indicus* (Latham)

1790. *Parra indica* Latham. *Index Orn.*, 2:765 (India).

Common names : Bronzewinged Jacana (Eng.); Pipi, Kundai (Hin.).

Remarks : Moderately common. Found throughout the reserve near water bodies.

Family CHARADRIIDAE

30. *Vanellus indicus indicus* (Boddaert)

1783. *Tringa indica* Boddaert, *Table Pl. enlum.*, :150 (Goa).

Common names : Redwattled Lapwing (Eng.); Titeeri, Titai, Titi, Titori (Hin.).

Remarks : Moderately common. Found throughout the reserve in open fields and cultivated lands.

31. *Vanellus malabaricus* (Boddaert)

1783. *Charadrius malabaricus* Boddaert, *Table Pl. enlum.*, :53 (Malabar Coast).

Common names : Yellow-wattled Lapwing (Eng.); Zirdi (Hin.).

Remarks : Rare. A pair was seen in a cultivated field at Govardhana.

32. *Tringa glareola* Linnaeus

1758. *Tringa glareola* Linnaeus, *Syst. Nat.*, ed. 10, 1:149 (Sweden).

Common names : Wood or Spotted Sandpiper (Eng.); Chupka, Chobaha, Titvari (Hin.).

Remarks : Rare. Winter visitor. Two specimens were seen in river beds one at Manguraha and the other on way to harnatar from Naurangia.

Order COLUMBIFORMES

Family COLUMBIDAE

33. *Treron phoenicoptera phoenicopters* (Latham)

1790. *Columba phoenicoptera* Latham, *Index Orn.*, 2:597 (India).

Common names : Bengal Green Pigeon (Eng.); Harial (Hin.).

Remarks : Common. Found throughout the reserve.

34. *Ducula aenea sylvatic* (Tickell)

1833. *Columba sylvatica* Tickell, *J. Asiat. Soc. Beng.*, 2:581 (Borabhum).

Common names : Northern Green Imperial Pigeon (Eng.); Dunkul, Sona Kabutar, Bara harial (Hin.).

Remarks : Moderately common. Found throughout the reserve in forests only.

35. *Streptopelia decaocto decaocto* (Frisvaldszky)

1838. *Columba risoria* Linn. *Var. decaocto* Frivaldszky, *K. Magyar Tudos Tarsasag Evkonyvi*, 3:183, Pl. 8 (Turkey).

Common names : Indian Ring Dove (Eng.); Dhor fakhta, Parki, Gugi, Panduk (Hin.).

Remarks : Very Common. Found throughout the reserve in forest patches and near villages.

36. *Streptopelia chinensis suratensis* (Gmelin)

1789. *Columba suratensis* Gmelin, *Syst. Nat.* 1(2) : 778 (Surat, Galf of Canbay, India).

Common names : Indian spotted Dove (Eng.); Chitroka fakhta, Chitta fakhata, Parki, Chitta, Kangskiri, Panduk (Hin.).

Remarks : Very common. Found throughout the reserve in forests and nearby villages.

Order PSITTACIFORMES

Family PSITTACIDAE

38. *Pittacula eupatria nipalensis* (Hodgson)

1836. *Palaeornis nipalensis* Hodgson, *Asiat Res.*, 19 (1) : 177 (Nepal)

Common names : Large Indian Parakeet, Alexandrine Parakeet (Eng.); Rai tota, Hiraman tota (Hin.).

Remarks : Moderately common. Found throughout the reserve in different habitats.

39. *Pittacula krameri manillensis* (P.L.S. Muller)
(Plate 2b)

1776. *Pittacus fasciatus* P.L.S. Miller, *Natursyst.*, Suppl. : 74 (Pondicherry)

Common names : Roseringed Parakeet (Eng.); Tota, Lybar tota (Hin.).

Remarks : Very common. Found throughout the reserve.

40. *Psittacula cyanocephala* (Linnaeus)

1766. *Psittacus cyanocephalus* Linnaeus, *Syst. Nat.*, ed. 12, 1 : 141 (Madras).

Common names : Blossomheaded Parakeet (Eng.); Tuiya tota (Hin.).

Remarks : Common. Found throughout the reserve.

Order CUCULIFORMES

Family CUCULIDAE

41. *Clamator jacobinus serratus* (Sparrman)

1786. *Cuculus seratus* Sparman, *Mus. Carls.*, fasc. 1, no. 3 and pl. (S. Africa).

Common names : Pied Crested Cucukoo (Eng.) ; Papiya, Kala papiya, Chatak (Hin.).

Remarks : Rare. Monsoon visitor. A single specimen was seen at Kotraha.

42. *Cuculus varius varius* Vahl

1797. *Cuculus varius* vahl, *Skriv. Naturhist. Selsk., Kiobenhavn.* 4(1) : 60 (Tranquebar).

Common names : Common Hawk-Cuckoo, Brainfever Bird (Eng.) ; Kapak, Upak, Papiya (Hin.).

Remarks : Moderately common. Found throughout the reserve.

43. *Cuculus micropterus micropterus* Gould

1837. *Cuculus micropterus* Gould, *Proc. zool. Soc. Lond.*, : 137 (Himalayas)

Common names : Kyphal pakka (Hin.) ; Indian Cuckoo (Eng.).

Remarks : Common. Found throughout the reserve. Easily located by its loud call.

44. *Eudynamys scolopacea* (Linnaeus)

1758. *Cuculus scolopaceus* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 111 (Malabar).

Common names : Indian Koel (Eng.) ; Koel (Hin.).

Remarks : Common. Found throughout the reserve.

45. *Taccocua leschenaultii infuscata* Blyth

1845. *Taccocua infuscata* Blyth, *J. Asiat. Soc. Beng.*, 14(1) : 200 (Terai region near Darjeeling).

Common names : Eastern Sirkeer Cuckoo (Eng.) ; Fangli tota (Hin.).

Remarks : Rare. A single specimen was seen at Manguraha inside the forest.

46. *Centropus sinensis* (Stephens)

1815. *Polophilus sinensis* Stephens, in Shaw's *Gen. Zool.*, 9(1) : 51 (China).

Common names : Crow—Pheasant, Coucal (Eng.) ; Mahoka (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Order STRIGIFORMES

Family STRIGIDAE

47. *Otus spilocephalus* (Blyth)

1846. *Ephialtes spilocephalus* Blyth, *J. Asiat. Soc. Beng.*, 15 : 8 (Darjeeling).

Common names : Spotted Scops Owl (Eng.).

Remarks : Rare. Two specimen were seen deep inside the forests—one at Kotraha and the other at manguraha.

48. *Otus bakkamoena* Pennant

1769. *Otus bakkamoena* Pennant, *Ind. Zool.*, 3, pl. 3. (Sri Lanka).

Common names : Collared Scops Owl (Eng.) ; Tharkavi Choghad (Hin.).

Remarks : Moderately common. Found throughout the reserve.

49. *Glaucidium radiatum* (Tickell)

1833. *Strix radiata* Tickell, *J. Asiat. Soc. Beng.*, 2 : 572 (Borabhum and Dholbhum).

Common names : Barred Jungle Owlet (Eng.) ; Jangli choghad (Hin.).

Remarks : Moderately common. Found throughout the reserve.

50. *Bubo zeylonensis leschenault* (Temminck)

1820. *Strix leschenault* temminck, *pl. col., livr.*, 4, pl. 20 (Chandernagore).

Common names : Brown Fish Owl (Eng.) ; Amrai ka ghughu, Ullu (Hin.).

Remarks : Rare. A single specimen was seen at Manguraha.

51. *Ninox scutulata lugubris* (Tickell)

1872. *Strix lugubris* Tickell, *J. Asiat. Soc. Beng.*, 2 : 572 (Dampara, Dholbhum, Bengal).

Common names : Indian Brown Hawk Owl (Eng.) ; Choghad basra (Hin.).

Remarks : Rare. A single specimen was seen at Kotraha.

Order CAPRIMULGIFORMES

Family CAPRIMULGIDAE

52. *Caprimulgus indicus* Latham

1790. *Caprimulgus indicus* Latham, *Index Orn.*, 2 : 588 (India).

Common names : Indian Jungle Nightjar (Eng.) ; Chhippak, Chhappa, Dabchiri, Dabnak (Hin.).

Remarks : Rare. A single specimen was seen inside the forest at Naurangia.

Order APODIFORMES

Family APODIDAE

53. *Apus affinis affinis* (J. E. Gray)

1830. *Cypselus affinis* J. E. Gray, in Gray and Hardwicke's *III. Ind. Zool.*, 1(2) pl. 35, f. 2 (Ganges).

Common names : Indian House Swift (Eng.) ; Ababell, Babeela (Hin.).

Remarks : Moderately common. Found throughout the reserve near villages.

54. *Cypsiurus parvus batasiensis* (J. E. Gray)

1829. *Cyp. (selus) batasiensis* [sic] J. E. Gray, in *Griffith's Anim. Kingdom*. 7 : 60 (India).

Common names : Indian Palm Swift (Eng.) ; Tadi abadeel, Talchatta, Patta deuli (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Order CORACIIFORMES

Family ALCEDINIDAE

55. *Ceryle rudis leucomelanura* Reichenbach

1851. *Ceryle leucomelanura* Reichenbach. *Handb. Spec. Orn.* : 21, pl. ccix b, f 3488 (Ceylon).

Common names : Indian Pied Kingfisher (Eng.) ; Machhi baag, Koryala, Kilkila (Hin.).

Remarks : Rare. A single specimen was seen near a village pond at Govardhana.

56. *Halcyon smyrnensis* (Linnaeus)

1758. *Alcedo smyrnensis* Linnaeus, *Syst. Nat.*, ed 10, 1 : 116 (Asia).

Common names : Whitebreasted Kingfisher (Eng.) ; Kilkila, Kourilla (Hin.).

Remarks : Moderately common. Found throughout the reserve near water bodies and village ponds.

57. *Alcedo atthis pallasii* Reichenbach

1851. *Alcedo pallasii* Reichenbach, *Handb. Spec. Orn.* : 3, pl. cccxcii, figs. 3043-6 (Siberia).

Common names : Central Asian Small Blue Kingfisher (Eng.) ; Chhota Kilkila, Nita or Naka machhralaa (Hin.).

Remarks : Rare. Partly resident, partly migratory. A single specimen was seen near water at Kotraha.

Family MEROPODIDAE

58. *Merops philippinus* Linnaeus

1766. *Merops philippinus* Linnaeus, *Syst. Nat.*, ed. 12, 1 : 183 (Phillipine Islands).

Common names : Bluetailed Bee-eater (Eng.) ; Bada Patringa (Hin.).

Remarks : Moderately common. Found throughout the reserve.

59. *Merops orientalis* Latham

1801. *Merops orientalis* Latham, *Index Orn., Suppl.*, : xxxiii (India).

Common names : Small Green Bee-eater (Eng.) ; Patringa, Harrial (Hin.).

Remarks : Common. Found throughout the reserve.

Family CORACIIDAE

60. *Coracius benghalensis benghalensis*
(Linnaeus)

1758. *Corvus benghalensis* Linnaeus, *Syst. nat.*, ed. 10, 1:106 (Madras).

Common names : Northern Roller, Blue Jay (Eng.) ; Nilkant, Sabzak (Hin.).

Remarks : Common. Found throughout the reserve.

Family UPUPIDAE

61. *Upupa epops* Linnaeus

1758. *Upupa epops* Linnaeus, *Syst. Nat.*, ed. 10, 1:117 (Sweden).

Common names : Hoopoe (Eng.) ; Hudhud (Hin.).

Remarks : Moderately common. Found throughout the reserve in deciduous forest biotope, nearby cultivated fields and villages.

Family BUCEROTIDAE

62. *Tockus birostris* (Scopoli)

1786. *Buceros birostris* Scopoli, *Del. Flor. et. Faun. Insubr.*, fasc. 2: 87 (Coromandel, India).

Common names : Grey Hornbill (Eng.) ; Dhanmar, Dhand, Dhanel, Lamaar, Chalotra, Dhanesh (Hin.).

Remarks : Rare. A single specimen was seen at Madanpur inside the forest.

63. *Anthracoceros coronatus* (Boddaert)

1783. *Buceros corontus* Boddaert, *Table Pl. enlum.*, : 53 (Malabar).

Common names : Malabar Pied Hornbill (Eng.) ; Dhan Chiri (Hin.).

Remarks : Common. Found throughout the reserve in forest and around villages.

Order PICIFORMES

Family CAPITONIDAE

64. *Megalaima zeylanica caniceps* (Franklin)

1831. *Bucco caniceps* Franklin, *Proc. zool. Soc. Lond.*, (1) : 121 (India).

Common names : Northern Green Barbet, Large Green Barbet (Eng.) ; Bada basanta (Hin.).

Remarks : Common. Found throughout the reserve.

65. *Megalaima viridis* (Boddaert)

1783. *Bucco viridis* Boddaert, *Table Pl. enlum.*, : 53 (India).

Common names : Small Green Barbet (Eng.) ; Chhota basantha (Hin.).

Remarks : Moderately common. Found throughout the reserve. Specimens were seen at Manguraha and Naurangia.

66. *Megalaima haemacephala indica* (Latham)

1788. *Bucco indicus* Latham, *Index Orn.*, 1 (1) : 205 (India).

Common names : Crimson-breasted Barbet, Coppersmith (Eng.) ; Katphora, Basanth lisora, Tambayat (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family PICIDAE

67. *Jynx torquilla* Linnaeus

1758. *Jynx torquilla* Linnaeus, *Syst. Nat.*, ed. 10, 1:112 (Sweden).

Common names : Wryneck (Eng.) ; Garden eyengtha (Hin.).

Remarks : Rare. Winter visitor. A single specimen was seen near village cultivation at Kotraha.

68. *Dinopium benghalense* (Linnaeus)

1758. *Picus benghalensis* Linnaeus, *Syst. Nat.*, ed. 10, 1:113 (Benghala = Chandannagore, Hugli, W. B.).

Common names : Goldenbacked Woodpecker (Eng.) ; Katphora (Hin.).

Remarks : Common. Found throughout the reserve in forests as well as in nearby villages.

69. *Picooides mahrattensis* (Latham)

1801. *Picus mahrattensis* Latham, *Index Orn., Suppl.*, xxxi (India).

Common names : Yellowfronted Pied Woodpecker, Mahratta Woodpecker (Eng.) ; Katphora (Hin.).

Remarks : Common. Found throughout the reserve in forest as well as in nearby villages.

Order PASSERIFORMES

Family PITTIDAE

70. *Pitta brachyura* (Linnaeus)

1766. *Corvus brachyurus* Linnaeus, *Syst. nat.*, ed. 12, 1:158. (Ceylon).

Common names : Indian Pitta (Eng.) ; Naorang (Hin.).

Remarks : Moderately common. Found throughout the reserve in foreststs.

Family ALAUDIDAE

71. *Mirafra javanica cantillans* Blyth

1844. *Mirafra cantillans* Blyth, *J. Asiat. Soc. Beng.*, 13:960 (Bengal).

Common names : Singing Bush Lark (Eng.) ; Agan, Agin (Hin.).

Remarks : Moderately common. Found throughout the reserve, singly or in pairs, running on the ground, picking seeds and insects.

72. *Mirafra assamica assamica* Horsfield

1839. *Mirafra assamica* Horsfield, *Proc. zool. Soc. Lond.*, : 162 (Assam).

Common names : Bengal Bush Lark (Eng.) ; Aggia, Aggin (Hin.).

Remarks : Rare. A pair was seen feeding on ground near cultivated field at Naurangia.

73. *Mirafra erythroptera erythroptera* Blyth

1845. *Mirafra erythroptera* Blyth, *J. Asiat. Soc. Beng.*, 13:958 (Northern Deccan).

Common names : Redwinged Bush lark (Eng.) ; Aggia (Hin.).

Remarks : Moderately common. Found throughout the reserve in bushes and open grounds.

74. *Eremopterix grisea* (Scopoli)

1786. *Alauda grisea* Scopoli, *Del. Flor. et. Faun. Insubr.*, 2:95 (India).

Common names : Ashycrowned Finch-Lark (Eng.) ; Diyora, Duri, Deoli, Dabak Chiri, Fothauli (Hin.).

Remarks : Common. Found throughout the reserve squatting and feeding on dusty cart-tracks.

75. *Ammomanes phoenicurus* (Franklin)

1831. *Mirafra phoenicura* Franklin, *Proc. zool. Soc. Lond.*, : 119 (Between Calcutta and Benaras).

Common names : Indian Rufoustailed Finch-Lark (Eng.) ; Aggia, Retal (Hin.).

Remarks : Moderately common. Found throughout the reserve, near cultivated fields and open grass lands.

76. *Alauda gulgula inconspicua* Severtzov

1873. *Alauda inconspicua* Severtzov. *Vertik, Turkest. Zhivotn.*, : 142 (Turkestan).

Common names : Small Sky Lark (Eng.) ; Bharat, Chandul (Hin.).

Remarks : Rare. A single specimen was seen near cultivated land bordering forest at Naurangia.

Family HIRUNDINIDAE

77. *Hirundo concolor* Sykes

1833. *Hirundo concolor* Sykes, *Proc. zool. Soc. Lond.*, : 33 (Dhkhun).

Common names : Dusky Crag Martin (Eng.) ; Chatan ababil (Hin.).

Remarks : Moderately common. Found throughout the reserve near human habitations.

Family LANIDAE

78. *Lanius excubitor lahtora* (Sykes)

1832. *Collurio lahtora* Sykes, *Proc. zool. Soc. Lond.*, : 86 (Dulchun).

Common names : Indian Grey Shrike (Eng.) ; Dudiya latora, Safed latora, Bada latora (Hin.).

Remarks : Rare. A single specimen was seen in bushes near forest at Manguraha.

79. *Lanius vittatus* Valenciennes

1826. *Lanius vittatus* Valenciennes, *Dict. Sci. Nat.*, ed. Levrault, 40:227 (Pondicherry).

Common names : Indian Baybacked Shrike (Eng.) ; Pachanak (Hin.).

Remarks : Moderately common. Found throughout the reserve.

80. *Lanius schach erythronotus* (Vigors)

1831. *Collurio erythronotus* Vigors, *Proc. zool. Soc. Lond.*, : 42 (Himalayas).

Common names : Rufousbacked Shrike (Eng.) ; Mattiya latora, Kajala latora (Hin.).

Remarks : Moderately common. Found throughout the reserve.

81. *Lanius cristatus* Linnaeus

1758. *Lanius cristatus* Linnaeus, *Syst. Nat.*, ed. 10, 1:93 (Benghala = Bengal).

Common names : Brown Shrike (Eng.) ; Kerkheta (Hin.).

Remarks : Common. Found throughout the reserve.

Family ORIOLIDAE

82. *Oriolus oriolus kundoo* Sykes

1832. *Oriolus kundoo* Sykes, *Proc. zool. Soc. Lond.*, : 87 (Dukhun).

Common names : Indian Golden Oriole (Eng.) ; Peelak (Hin.).

Remarks : Moderately common. Found throughout the reserve.

83. *Oriolus xanthornus* (Linnaeus)

1758. *Coracius xanthornus* Linnaeus, *Syst. nat.*, ed. 10, 1:108 (Bengal).

Common names : North Indian Blackheaded Oriole (Eng.) ; Peelak, Zardak (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family DICRURIDAE

84. *Dicrurus adsimilis albirictus* (Hodgson)

1836. *Bhuchanga albirictus* Hodgson, *Ind. Rev.*, 1(8) : 326 (Nepal).

Common names : North Indian Black Drongo (Eng.) ; Bhujanga, Buchanga, Kotwal, Kalkalachi (Hin.).

Remarks : Moderately common. Found throughout the reserve.

85. *Dicrurus caerulescens* (Linnaeus)

1758. *Lanius caerulescens* Linnaeus, *Syst. Nat.*, ed. 10, 1: 95 (Benghala = Bengal).

Common names : Indian Whitebellied Drongo (Eng.) ; Pahari buchanga, Dhapri (Hin.).

Remarks : Common. Found throughout the reserve.

86. *Dicrurus ramifer tectirostris* (Hodgson)

1836. *Bhringa tectirostris* Hodgson, *Ind. Rev.*, 1(8) : 325 (Nepal).

Common names : Lesser Racket-tailed Drongo (Eng.) ; Chhota bhimraj (Hin.).

Remarks : Moderately common. Found throughout the reserve.

87. *Dicrurus paradiseus grandis* (Gould)

1836. *Edolius grandis* Gould, *Proc. zool. soc. Lond.*, : 5 (Nepal).

Common names : Northern Large Racket-tailed Drongo (Eng.) ; Bhimraj, Bhringraj (Hin.).

Remarks : Moderately common. Found throughout the reserve in forest patches.

Family STURNIDAE

88. *Sturnus malabaricus* (Gmelin)

1789. *Turdus malabaricus* Gmelin, *Syst Nat.*, 1 : 816 (Malabar Coast).

Common names : Greyheaded Myna (Eng.) ; Pawei (Hin.).

Remarks : Moderately common. Found throughout the reserve.

89. *Sturnus pagodarum* (Gmelin)

1789. *Turdus pagodarum* Gmelin, *Syst. Nat.*, 1 : 816 (Malabar).

Common names : Blackheaded or Brahminy Myna (Eng.) ; Popoya Myna, Kalasir Myana, Puhai (Hin.).

Remarks : Common. Found throughout the reserve.

90. *Sturnus roseus* (Linnaeus)

1758. *Turdus roseus* Linnaeus, *Syst. Nat.*, ed. 10. 1 : 71 (Switzerland).

Common names : Rosy Starling or Rosy Pastor (Eng.) ; Gulabi Myna, Tilyer (Hindi).

Remarks : Rare. Winter visitor. Two specimens were seen once at Manguraha inside the forest.

91. *Sturnus contra* Linnaeus

1758. *Sturnus contra* Linnaeus. *Syst. Nat.* ed. 10. 1 : 167 (India).

Common names : Indian Pied Myna (Eng.) ; Ablak or Ablaki Myna (Hin.).

Remarks : Very common. Found throughout the reserve.

92. *Acridotheres tristis* (Linnaeus)

(Plate 3a)

1766. *Paradisea tristis* Linnaeus, *Syst. Nat.*, ed. 12, 1 : 167 (Phillipines).

Common names : Indian Myna (Eng.) ; Desi Myna (Hin.).

Remarks : Very common. Found throughout the reserve.

93. *Acridotheres fuscus* (Wagler)

1827. *Pastor fuscus* Wagler, *Syst. Av. pastor* sp. 6 (India).

Common names : Jungle Myna (Eng.) ; Pahari Myna, Jangli Myna (Hin.).

Remarks : Common. Found throughout the reserve.

Family CORVIDAE

94. *Cissa erythrorhyncha occipitalis* (Blyth)

1846. *Ps. (ilorhinus) occipitalis* Blyth. *J. Asiat. Soc. Beng.*, 15 : 27 (Nepal).

Common names : Himalayan Redbilled Blue Magpie (Eng.) ; Nilkanth (Hin.).

Remarks : Rare. A single specimen was seen inside the forest at Kotraha.

95. *Dendrocitta vagabunda* (Latham)

1790. *Coracias vagabunda* Latham, *Index Orn.*, 1 : 171 (India).

Common names : North eastern Tree Pie (Eng.) ; Mahalat (Hin.).

Remarks : Common. Found throughout the reserve.

96. *Corvus splendens* Vieillot

1817. *Corvus splendens* Vieillot, *Nouv. Dict. d'Hist. Nat.*, 8 : 44 (Bengal).

Common names : Indian House Crow (Eng.) ; Kowwa, Desi Kowwa (Hin.).

Remarks : Very common. Found throughout the reserve near human habitation.

97. *Corvus macrorhynchos culminatus* (Sykes)

1832. *Corvus culminatus* Sykes, *Proc. Zool. Soc. Lond.*, : 96 (Dukhun).

Common names : Indian Jungle Crow (Eng.) ; Kala Kowwa, Jangli Kowwa (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family CAMPEPHAGIDAE

98. *Tephrodornis pondicerianus* (Gmelin)

1789. *Muscicapa pondiceriana* Gmelin. *Syst. Nat.* 1 : 939. (Coromandel).

Common names : Wood Shrike (Eng.) ; Keroula (Hin.).

Remarks : Rare. A single specimen was seen in the forest at Govardhana.

99. *Coracina melanoptera sykesi* (Strickland)

1844. *Lalage sykesi* Strickland, *Ann. Mag. nat. Hist.*, 13 : 36 (Calcutta).

Common names : Blackheaded Cuckoo-Shrike (Eng.) ; Jungli Kesya (Hin.).

Remarks : Moderately common. Found throughout the reserve.

100. *Pericrocotus cinnamomeus peregrinus* (Linnaeus)

1766. *Parus peregrinus* Linnaeus, *Syst. Nat.*, ed. 12, 1 : 342 (Punjab).

Common names : Northern Small Minivet (Eng.) ; Bulalchashm, Rajalal, Rajelal (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family IRENIDAE

101. *Aegithina tiphia* (Linnaeus)

1758. *Motacilla tiphia* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 186 (Bengal).

Common names : Common Iora (Eng.) ; Shaubeega, Shaubeegi (Hin.).

Remarks : Moderately common. Found throughout the reserve.

102. *Cloropsis aurifrons* (Temminck)

1829. *Phyllornis aurifrons* Temminck. *Pl. col. D'Qis*, libr. 81, pl. 484 (Cachar).

Common names : Goldfronted Chloropsis (Eng.) ; Harewa, Sabz Harewa (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family PYCNONOTIDAE

103. *Pycnonotus melanicterus javiventris* (Tickell)

1833. *Vanga flaviventris* Tickell. *J. Asiat. Soc. Beng.*, 2 : 573 (Dholdhum).

Common names : Blackcrested yellow Bulbul (Eng.) ; Zard Bulbul (Hin.).

Remarks : Moderately common. Found throughout the reserve.

104. *Pycnonotus jocosus pyrrhotis* (Bonaparte)

1850. *Ixos pyrrhotis* 'Hodgs' = Bonaparte. *Consp. Gen. Av.*, 1 : 265 (Nepal).

Common names : Red Whiskered Bulbul (Eng.) ; Kamera Bulbul, Pahari Bulbul (Hin.).

Remarks : Very common. Found throughout the reserve.

105. *Pycnonotus cafer bengalensis* Blyth

1845. *Pycnonotus bengalensis* Blyth, *J. Asiat. Soc. Beng.*, 14 : 566 (Bengal).

Common names : Kala Bulbul, Bulbuli (Hin.) ; Redvented Bulbul (Eng.).

Remarks : Very common. Found throughout the reserve.

Family MUSCICAPIDAE

106. *Pellorneum reficeps* Swainson

1832. *Pellorneum ruficeps* Swainson. *Fauna Boreali-Americana*. : 487 (India).

Common names : Spotted Babbler (Eng.).

Remarks : Moderately common. Found throughout the reserve.

107. *Chrysomma sinense* (Gmelin)

1789. *Parus sinensis* Gmelin. *Syst. Nat.*, 1 : 1012 (China).

Common names : Yellow-eyed Babbler (Eng.) ; Gulab Chashm, Bulal Chashm (Hin.).

Remarks : Moderately common. Found throughout the reserve.

108. *Turdoides caudatus* (Dumont)
1823. *Cossyphus caudatus* Dumont. *Dict. Sci. nat.*, 29 : 268 (India).
Common names : Common Babbler (Eng.) ; Chilchil, Sor. Genga, Ddumri (Hin.).
Remarks : Moderately common. Found throughout the reserve.
109. *Turdiodes striatus* (Dumont)
1823. *Cossyphus striatus* Dumont. *Dict. Sci. nat.*, 29 : 268 (Bengal).
Common names : Jungle Babbler (Eng.) ; Satbhai, Pengya Myna (Hin.).
Remarks : Common. Found throughout the reserve.
110. *Muscicapa thalassina* Swainson
1838. *Muscicapa thalassina* Swainson, *Nat. Library. Flycatchers* 21 : 252 (India).
Common names : Verditer Flycatcher (Eng.) ; Turra (Hin.).
Remarks : Moderately common. Found throughout the reserve in forests.
111. *Rhipidura aureola* Lesson
1830. *Rhipidura aureola* Lesson, *Traite' d'orn* : 290 (Bengal).
Common names : Whitebrowed Fantail Flycatcher (Eng.) ; Machharya, Nachan, Chakdil (Hin.).
Remarks : Rare. Two specimens have been observed in bush at Manguraha.
112. *Terpsiphone paradisi* (Linnaeus)
1758. *Corvus paradisi* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 107 (India).
Common names : Indian Paradise Flycatcher (Eng.) ; Shah Bulbul, Husaini Bulbul (Hin.).
Remarks : Rare. Two specimens were seen inside the forest—One at Kotraha and the other at Manguraha.
113. *Cisticola juncidis cursitans* (Franklin)
1831. *Prinia cursitans* Franklin, *Proc. zool. Soc. Lond.*, 118 (between Calcutta and Benaras).
Common names : Streaked Fantail Fly catcher (Eng.) ; Ghaski-phutki, Ghaski-pitpisi (Hin.).
Remarks : Moderately common. Found throughout the reserve in forest patches.
114. *Prinia hodgsonii* Blyth
1844. *Prinia hodgsonii* Blyth. *J. Asiat. Soc. Beng.*, 13 : 376.
Common names : Ashy-grey Wren-Warbler (Eng.). Putki (Hin.).
Remarks : Moderately common. Found throughout the reserve in forest patches.
115. *Prinia sylvatica* Jerdon
1840. *Prinia sylvatica* Jerdon. *Madras Jour. Lit. Sci.*, 11 : 4 (Nilgiris).
Common names : Jungle Wren-Warbler (Eng.) ; Tot-rungi (Hin.).
Remarks : Moderately common. Found throughout the reserve in forest bushes.
116. *Orthotomus sutorius* (Pennant)
1769. *Motacilla sutoria* Pennant. *Ind. Zool.*, pl. 7 (Ceylon).
Common names : Indian Tailor Bird (Eng.) ; Darzee, piddi (Hin.).
Remarks : Very common. Found throughout the reserve.
117. *Megalurus palustris toklao* (Blyth)
1843. *Turdus toklao* Blyth, *J. Asiat. Soc. Beng.*, 12 : 179 (Calcutta).
Common names : Striated Marsh Warbler (Eng.) ; Takko, Fal-aggin ; (Hin.).
Remarks : Rare. A pair was seen in the forest bushes at Naurangia.
118. *Erithacus calliope* (Pallas)
1776. *Motacilla calliope* Pallas, *Reise Russ. Reichs.*, 3 : 697 (Yenisei).
Common names : Rubythroat (Eng.) ; Gangula (Hin.).
Remarks : Rare. Winter visitor. A single specimen was seen in forest bushes at Manguraha.

119. *Copsychus saularis* (Linnaeus)

1758. *Gracula saularis* Linnaeus, *Syst. Nat.*, 1 : 109 (Bengal).

Common names : Indian Magpie-Robin (Eng.) ; Dhaiyal, Dhaiyar (Hin.).

Remarks : Common. Found throughout the reserve.

120. *Copsychus malabaricus* (Scopoli)

1786. *Muscicapa malabarica* Scopoli, *Del. Flor. et Faun. Insubr.*, 2 : 96 (Malabar).

Common names : Indian Shama (Eng.) ; Shama (Hin.).

Remarks : Moderately common. Found throughout the reserve in forest patches away from human habitation.

121. *Phoenicurus ochruros rufiventris* (Vieillot)

1818. *Oenanthe rufiventris* Vieillot, *Nouv. Dict. d'hist. Nat.*, nouv. ed., 21 : 431 (Tibet).

Common names : Black Redstart (Eng.) ; Thirthira, Thirthir-kampa (Hin.).

Remarks : Rare. Summer visitor. A pair was seen at kotraha.

122. *Enicurus immaculatus* (Hodgson)

1836. *Motacilla (Enicurus) immaculatus* Hodgson, *Asiat. Res.*, 19 : 190 (Nepal).

Common name : Blackbacked Fortail (Eng.).

Remarks : Rare. A single specimen was seen near a flowing stream on way to Harnatar from Naurangia.

123. *Cercomela fusca* (Blyth)

1851. *Saxicola fusca* Blyth, *J. Asiat. Soc. Beng.*, 20 : 523 (Muttra).

Common name : Brown Rock Chat (Eng.).

Remarks : Rare. A single specimen was seen in forest bushes at Naurangia.

124. *Saxicola caprata bicolor* Sykes

1832. *Saxicola bicolor* Sykes, *Proc. zool. Soc. Lond.*, : 92 : (Dukhun).

Common names : Northern Pied Bush Chat (Eng.) ; Pidda, Kala Pidda (Hin.).

Remarks : Moderately common. Found throughout the reserve.

125. *Chaimarrornis leucocephalus* (Vigors)

1831. *Phoenicurus leucocephala* Vigors, *Proc. zool. soc. Lond.*, 28 (Himalaya).

Common names : Whitecapped Red Start, River Chat (Eng.) ; Gir-chaondia (Hin.).

Remarks : Rare. Winter migrant. One specimen was seen along the irrigation canal at Kotraha and the other near flowing river at Manguraha.

126. *Saxicoloides fulicata cambaiensis* (Latham)

1790. *Sylvia cambaiensis* Latham, *Index Orn.*, 2 : 554 (Gujarat, India).

Common names : Brownbacked Indian Robin (Eng.) ; Kalchuri (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family PARIDAE

127. *Parus major nipalensis* (Hodgson)

1837. *Parus nipalensis* Hodgson, *Ind. Rev.*, 2(1) : 31 (Nepal).

Common name : Nepal Grey Tit (Eng.).

Remarks : Moderately common. Found throughout the reserve in forest patches.

Family SITTIDAE

128. *Sitta castanea* Lesson

1830. *Sitta castanea* Lesson *Traile d'orn.*, 316 (Bengal).

Common names : Chestnutbellied Nuthatch (Eng.) ; Siri (Hin.).

Remarks : Uncommon. A single specimen was seen at Manguraha.

129. *Salpornis spilonotus* (Franklin)

1831. *Certhia spilonota* Franklin. *Proc. zool. Soc. Lond.*, : 125 (Vindhyan Hills).

Common name : Spotted Gray Creeper (Eng.).

Remarks : Uncommon. A single specimen was seen at Manguraha near forest edges.

Family MOTACILLIDAE

130. *Anthus novaeseelandiae rufulus* Vieillot

1818. *Anthus rufulus* Vieillot, *Dict. d'Hist. Nat.*, 26 : 494 (Bengal).

Common names : Indian Paddyfield Pipit (Eng.) ; Rugail, Charchari (Hin.).

Remarks : Moderately common. Found throughout the reserve.

131. *Anthus campestris* (Linnaeus)

1758. *Alauda campestris* Linnaeus, *Syst. nat.*, ed. 10, 1 : 166 (Sweden).

Common names : Tawny Pipit (Eng.) ; Chillu (Hin.).

Remarks : Rare. Winter visitor. A single specimen was seen at Kotraha near cultivated field.

132. *Anthus similis jerdoni* (Finsch)

1870. *Anthus jerdoni* Finch. *Trans. zool. Soc. Lond.*, 7(4) : 241 (Kotegurh, NW Himalaya).

Common name : Brown Rock Pipit (Eng.).

Remarks : Rare. Summer visitor. A single specimen was seen at Kotraha.

133. *Motacilla alba personata* Gould

1861. *Motacilla personata* Gould. *Bds. Asia* 4., pl 63 (Bengal).

Common name : Pied Wagtail (Eng.).

Remarks : Moderately common during summer (Visitor). Found throughout the reserve.

Family DICAIDAE

134. *Dicaeum erythrorhynchos* (Latham)

1790. *Certhia erythrorhynchos* Latham, *Index Orn.*, 1 : 299 (India).

Common names : Tickell's Flowerpecker (Eng.) ; Phoolchuki (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Family NECTARINIIDAE

135. *Nectarinia asiatica* (Latham)

1790. *Certhia asiatica* Latham, *Index Orn.*, 1 : 288 (India).

Common names : Indian Purple Sunbird (Eng.) ; Phul Soongni (Hin.).

Remarks : Common. Found throughout the reserve.

136. *Arachnothera longirostris* (Latham)

1790. *Certhia longirostra* Latham, *Index Orn.*, 1 : 299 (Bengal).

Common name : Little Spiderhunter (Eng.).

Remarks : Rare. A single specimen was seen at Kotraha.

Family ZOSTEROPIDAE

137. *Zosterops palpebrosa* (Temminck)

1824. *Sylvia palpebrosa* Temminck, *Pl. Col. d'Ois.*, 49, pl. 293, fig. 3 (Bengal).

Common names : Indian White-eye (Eng.) ; Ba'oono (Hin.).

Remarks : Common. Found throughout the reserve.

Family PLOCEIDAE

138. *Passer domesticus indicus* Jardine & Selby

1835. *Passer indicus* Jardine & Selby, *Ill. Orn.*, 3, pl. 118 (India).

Common names : Indian House Sparrow (Eng.) ; Churi, Khas Churi (Hin.).

Remarks : Very common. Found throughout the reserve near human habitation.

139. *Petronia xanthocollis* (Burton)

1838. *Fringilla xanthocollis* Burton, *Cat. Bds. Mus. Fort Pitt. Chatham.*, : 23 (India).

Common names : Indian Yellowthroated Sparrow (Eng.) ; Raji, Jungli-chiria (Hin.).

Remarks : Moderately common. Found on ground throughout the reserve, sometimes remain mixed with House Sparrow.

140. *Ploceus philippinus* (Linnaeus)

1766. *Loxia philippina* Linnaeus, *Syst. Nat.*, ed. 12. 1 : 305 (Phillipines).

Common names : Indian Baya (Eng.) ; Baya, Son-chiri (Hin.).

Remarks : Common. Found throughout the reserve.

141. *Ploceus manyar flaviceps* (Lesson)

1831. *Ploceus flaviceps* Lesson, *Traite d'Orn.*, : 435 (Pondicherry).

Common names : Indian Streaked Weaver Bird (Eng.) ; Bamani Baya (Hin.).

Remarks : Moderately common. Found throughout the reserve.

142. *Estrilda amandava* (Linnaeus)

1758. *Fringilla amandava* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 180 (Eastern India).

Common names : Red Munia, Avadavat (Eng.) ; Lal, Lal Munia (Hin.).

Remarks : Moderately common. Found throughout the reserve.

143. *Lonchura malabarica* (Linnaeus)

1758. *Loxia malabarica* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 175 (India).

Common names : Whitethroated Munia (Eng.) ; Charchara, Charga, Charakka, Pidda (Hin.).

Remarks : Moderately common. Found throughout the reserve.

144. *Lonchura punctulata* (Linnaeus)

1758. *Loxia punctulata* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 173 (Calcutta).

Common names : Indian Spotted Munia (Eng.) ; Telia Munia, Seenabaz, Sinewaz (Hin.).

Remarks : Moderately common. Found throughout the reserve.

145. *Lonchura malacca* (Linnaeus)

1766. *Loxia malacca* Linnaeus, *Syst. Nat.*, ed. 12, 1 : 302 (China, Java & Belgium).

Common names : Blackheaded Munia (Eng.) ; Nakalnor, Telia Munia, Sing-baz, Pora Munia, Nukroul (Hin.).

Remarks : Moderately common. Found throughout the reserve.

Class REPTILIA

Various ecosystems of the Reserve support a very good populations of different reptilian species. A list of reptilian species based on collection, observation and earlier reports is appended below. Collected specimens have been indentified by our departmental scientist Sri N. C. Gayen.

Family GAVILIDAE

Scientific name	Common name
1. <i>Gavialis gangeticus</i> (Gmelin) *	Gavial, Gharial

Family CROCODYLIDAE

2. <i>Crocodylus palustris</i> Lesson *	Muggar, Marsh Crocodile
---	-------------------------

Family EMYDIDAE

3. <i>Kachuga tecta</i> (Gray) *	Indian Saw back Turtle
----------------------------------	------------------------

Family GEKKONIDAE

4. <i>Gekko gekko</i> (Linnaeus)	Tokay
5. <i>Hemidactylus brooki</i> Gray	House Gekko
6. <i>Hemidactylus flaviviridis</i> Ruppel	Yellow-bellied House Gekko

Family AGAMIDAE

7. <i>Calotes versicolor</i> (Daudin)	Blood Sucker
8. <i>Psammodromus blanfordianus</i> (Stoliczka)	Dwarf Rock Lizard (Plate 3b)
9. <i>Sitana porticeriana</i> Cuvier	Fan-throated Lizard

Family SCINCIDAE

10. *Mabuya macularia* (Blyth)
 11. *Riopa punctata* (Linnaeus) Dotted Garden Skink

Family SCINCIDAE

12. *Varanus bengalensis* (Daudin) Indian Monitor
 13. *Varanus flavescens* (Gray) ** Yellow Monitor

Family TYPHLOPIDAE

14. *Ramphotyphlops braniius* (Daudin) Brahminy Blind Snake

Family BOIDAE

15. *Eryconicus* (Schneider) Russell's Sand Boa
 16. *Python molurus* Linnaeus * Indian Rock Python

Family COLUBRIDAE

17. *Ptyas mucosus* (Linnaeus) ** Rat Snake
 18. *Ahaetulla nasuta* (Linnaeus) Common Green Whip Snake
 19. *Amphiesma stolata* (Linnaeus) Striped Keel Back
 20. *Boiga trigonata* (Schneider) Indian Gamma
 21. *Enhydryis enhydryis* (Schneider) Smooth Water Snake

Family ELAPIDAE

22. *Bungarus caeruleus* (Schneider) Common Indian Krait
 23. *Bungarus fasciatus* (Schneider) Banded Krait
 24. *Naja Naja* (Linnaeus)** Indian Corba
 25. *Ophiophagus hannah* (Cantor)** King Corba

Family VIPERIDAE

26. *Vipera russelli* (Shaw)** Russell's Viper

Class AMPHIBIA

Specimens of Amphibia have been identified by our departmental scientist, Shri A. Sarkar. List of the same is given below.

Family BUFONIDAE

- | Scientific name | Common name |
|--|--------------------|
| 1. <i>Bufo stomaticus</i> Lutken | Marbled Toad |
| 2. <i>Bufo melonostictus</i> Schneider | Common Indian Toad |

Family RANIDAE

- | | |
|--|------------------|
| 3. <i>Rana liebigii</i> Gunther | — |
| 4. <i>Rana hexadactyla</i> Lesson | Pond Frog |
| 5. <i>Rana tigerina</i> Daudin | Indian Bull Frog |
| 6. <i>Rana cyanophlyctis</i> Schneider | Skipping Frog |

Family RHACOPHORIDAE

- | | |
|--|------------|
| 7. <i>Polypedates maculatus</i> (Gray) | Tree Frog. |
|--|------------|

Class PISCES

Specimens of the following species of fish have been collected from the Reserve. Identification report provided by the departmental scientist, Dr. A. Karmakar.

Family COBITIDAE

- | Scientific name | Common name |
|--|--------------|
| 1. <i>Lepidocephalus guntea</i> (Hamilton) | Guntea Loach |

Family HOMALOPTERIDAE

- | | |
|--|-------|
| 2. <i>Noemaheilus botia botia</i> (Hamilton) | Mugah |
|--|-------|

Family CHANDIDAE

- | | |
|---------------------------------|------------|
| 3. <i>Chanda nama</i> Hamilton | Glass Fish |
| 4. <i>Chanda ranga</i> Hamilton | —Do— |

Family BELONTIDAE

- | | |
|--|---|
| 5. <i>Colisa fasciatus</i> (Schneider) | — |
|--|---|

Family CYPRINIDAE

- | | |
|---|-------------------|
| 6. <i>Barilius bendelisis bendelisis</i> (Hamilton) | Hamilton's Barila |
| 7. <i>Tor tor</i> (Hamilton) | Mahaseer |
| 8. <i>Puntius chala</i> (Hamilton) | Swamp Barb |
| 9. <i>Aspidoparia morar</i> (Hamilton) | — |

Family MASTACEMBELIDAE

- | | |
|---|-----------|
| 10. <i>Mastacembelus panculus</i>
(Hamilton) | Spiny eel |
|---|-----------|

Family BAGRIDAE

- | | |
|--------------------------------------|--------------|
| 11. <i>Aorichthys aor</i> (Hamilton) | — |
| 12. <i>Mystus bleckeri</i> (Day) | Day's Mystus |

Family SCHILBEIDAE

- | | |
|---------------------------------|---|
| 13. <i>Ailia punctata</i> (Day) | — |
|---------------------------------|---|

INVERTEBRATES

Following list of invertebrate species of Valmiki Tiger Reserve has been prepared on the basis of the actual collection of the specimens. Specimens have been identified by our departmental scientists. However, some of the specimens could not be identified up to species level and detail studies are being carried out on those species. It is probable that some of them may be new to science. Detailed report on Hemiptera has been appended as a separate paper.

PHYLUM ARTHROPODA

Class CRUSTACEA

Identified by Shri S. S. Ghatak

Order DECAPODA

Family PALAEMONIDAE

- | Scientific Name | Common name |
|---|-------------|
| 1. <i>Macrobrachium dyanum</i>
(Henderson) | — |
| 2. <i>Macrobrachium altfrons</i>
(Henderson) | — |

Class INSECTA

Order COLEOPTERA

(Plate 4a)

Identified by Dr. S. Biswas and Shri S. K. Chatterjee

Family SCARABAEIDAE

Scientific Name

Common Name

- | | |
|---|---|
| 1. <i>Onticellus pallipes</i> (Fabricius) | — |
| 2. <i>Onticellus spinipes</i> Rothchild | — |
| 3. <i>Onthophagus ramosus</i> (Wiedemann) | — |
| 4. <i>Scarabaeus</i> sp. | — |
| 5. <i>Blabephorous pinguis</i> Fairmaire | — |
| 6. <i>Caccobius unicornis</i> (Fabricius) | — |
| 7. <i>Aphodius</i> sp. | — |
| 8. <i>Anomala</i> sp. | — |
| 9. <i>Catharsius</i> sp. | — |
| 10. <i>Onitis</i> sp. | — |
| 11. <i>Alissonotum</i> sp. | — |
| 12. <i>Sisyphus</i> sp. | — |
| 13. <i>Gymnopleurous</i> sp. | — |
| 14. <i>Adoretus</i> sp. | — |

Family HYBOSORIDAE

- | | |
|--------------------------|---|
| 15. <i>Hybosorus</i> sp. | — |
|--------------------------|---|

Family TROGADAE

- | | |
|---------------------|---|
| 16. <i>Trox</i> sp. | — |
|---------------------|---|

Order LEPIDOPTERA

Identified by Smt. M. Majumdar (Chowdhury)

Family DANAIDAE

- | Scientific name | Common name |
|-----------------------------------|--------------------|
| 1. <i>Euploea core</i> (Cramer) | Common Indian Crow |
| 2. <i>Danaus genulia</i> (Cramer) | Common Tiger |

Family PIERIDAE

- | | |
|--|---------------------|
| 3. <i>Leptosia nina</i> (Fabricius) | Psyche |
| 4. <i>Eurema hecabe</i> (Linnaeus) | Common Grass Yellow |
| 5. <i>Catopsilia pyranthe</i> (Linnaeus) | Mottled Emigrant |
| 6. <i>Valeria valeria</i> (Cramer) | Common Wanderer |

Family LYCAENIDAE

- | | |
|---|-----------------|
| 7. <i>Castalius rosimon</i> (Fabricius) | Common Pierrot |
| 8. <i>Pantoporia perius</i> (Linnaeus) | Common Sergeant |
| 9. <i>Zizeeria maha</i> (Kollar) | Pale Grass Blue |

Family NYMPHALIDAE

- | | |
|---------------------------------------|---------------------|
| 10. <i>Precis almana</i> (Linnaeus) | Pecock Pansy |
| 11. <i>Precis atlites</i> (Linnaeus) | Grey Pansy |
| 12. <i>Precis iphita</i> (Cramer) | Chocolate Pansy |
| 13. <i>Argynnis childreni</i> Gray | Large Silver Stripe |
| 14. <i>Phalanta phalantha</i> (Drury) | Common Leopard |

Family NOCTUIDAE

- | | |
|--|---|
| 15. <i>Nyctipao macrops</i> (Linnaeus) | — |
|--|---|

Family GEOMETRIDAE

- | | |
|--------------------------------------|---|
| 16. <i>Sterrha sacraria</i> Linnaeus | — |
|--------------------------------------|---|

Family PYRALIDAE

- | | |
|--|---|
| 17. <i>Pachyzancla licarsisalis</i> Walker | — |
|--|---|

Family ARCTIIDAE

- | | |
|---|---|
| 18. <i>Cretonotus gangis</i> (Linnaeus) | — |
|---|---|

Family CTENUCHIDAE

- | | |
|-------------------------------------|---|
| 19. <i>Syntomis cyssea</i> (Cramer) | — |
|-------------------------------------|---|

Family LASIOCAMPIDAE

- | | |
|-----------------------------------|---|
| 20. <i>Chilena similis</i> Walker | — |
|-----------------------------------|---|

Family AGARISTIDAE

- | | |
|--------------------------------------|---|
| 21. <i>Aegocera venulia</i> (Cramer) | — |
|--------------------------------------|---|

Family PAPILIONIDAE

- | | |
|------------------------|---|
| 22. <i>Chilasa</i> sp. | — |
|------------------------|---|

Order ORTHOPTERA

Identified by Dr. M. S. Shishodia

Family ACRIDIDAE

- | Scientific name | Common name |
|---|-------------|
| 1. <i>Oedaleus abruptus</i> (Thumb.) | — |
| 2. <i>Acrida</i> sp. | — |
| 3. <i>Gastrimargus africanus africanus</i> (Sauss.) | — |

Family TETRIGIDAE

- | | |
|--------------------------------------|---|
| 4. <i>Thoradonta nodulosa</i> (Stal) | — |
|--------------------------------------|---|

Family TRIGONIDIIDAE

- | | |
|--|---|
| 5. <i>Trigonidium cicindeloides</i> Rambur | — |
| 6. <i>Trigonidium</i> sp. | — |

Family GRYLLIDAE

- | | |
|--|---|
| 7. <i>Turanogryllus histrio</i> (Sauss.) | — |
| 8. <i>Gymnogryllus</i> sp. | — |
| 9. <i>Greyllodes sigillatus</i> (Walker) | — |

Family TRIDACTYLIDAE

- | | |
|----------------------------|---|
| 10. <i>Tridactylus</i> sp. | — |
|----------------------------|---|

Family PYRGOMORPHIDAE

- | | |
|--|---|
| 11. <i>Chrotogonus trachypterus</i> (Balanchard) | — |
| 12. <i>Simploce biligata</i> (Walker) | — |
| 13. <i>Pycnoscelus surinamensis</i> (Linnaeus) | — |
| 14. <i>Haberdina concina</i> (Haan) | — |
| 15. <i>Blattela germanica</i> (Linnaeus) | — |

Class ARACHNIDA

Order ARANEAE

Identified by Dr. B. Biswas

Family ACRIDIDAE

- | Scientific name | Common name |
|--|-------------|
| 1. <i>Myrmarachne plataleoides</i> (Cambridge) | — |
| 2. <i>Phidippus pateli</i> Tikader | — |
| 3. <i>Plexippus paykulli</i> (Aud.) | — |

Family HETEROPODIDAE

- | | |
|--|---|
| 4. <i>Heteropoda sexpunctata</i> Simon | — |
|--|---|

Family CLUBIONIDAE

- | | |
|---|---|
| 5. <i>Clubiona drassodus</i> Cambridge | — |
| 6. <i>Cheiracanthium insigene</i> Cambridge | — |

7. *Castianeira albopicta* Gravelly —
 Family LYCOSIDAE
8. *Lycosa mackenziei* Gravelly —
 Family ARANEIDAE
9. *Leucauge decorata* (Blackwall) —
 Phylum MOLLUSCA
 Identified by Shri K. V. Surya Rao
 Class GASTROPODA
 Family VIVIPARIDAE
1. *Bellamya bengalensis* (Kobelt) —
 Family CYCLOPHORIDAE
2. *Cyclophorus pyrotrema* Benson —
 Family THIARIDAE
3. *Thiara (T) scabra* (Mueller) —
4. *Thiara (Melanoides) tuberculata* (Mueller) —
5. *Thiara (Tarebia) lineata* (Gray) —
 Family ARIOPHANTIDAE
6. *Cryptaustenia bensoni* (Pfeiffer) —
7. *Cryptozona ligualata* (Ferussac) —
 Family ACATINIDAE
8. *Acatina fulica* Bowdich —
 Class BIVALVIA
 Family AMBLEMIDAE
9. *Parreysia (Parreysial) favidens* (Benson) —
10. *Parreysia (Radiatula) caerulea* (Lea) —
11. *Corbicula striatella* Deshayes —

DISCUSSION

Vilmiki Tiger Reserve being extended over

hills, Bhabar, Terai and plains. Represents a varied physiography, It contains a large number of everflowing streams, nullahs, canals along with some permanent swamps and marshy land. Some part of the reserve is also subject to seasonal inundation. These diverse ecological factors resulted varied macro and micro-habitats which in turn gave rise to a wonderful faunal diversity including the tiger apex of the Pyramed. Subsequently to conserve this great national heritage, the area has been declared as Tiger Reserve in 1990. However, till the period of present surveys, it has been realised that the entire administration of the Reserve is under the control of Forest Development Corporation. All the management programmes for the Tiger Reserve are still lying in papers only. It was really shocking to note that even an inch of the Reserve is not free from human interference. There is no village in the core area, but at least eight villages of the buffer zone are entirely dependent on the natural resources of the Reserve. Tribals (Tharu, Manda, Dhangar, Musser and others) living within three kilometers of the Reserve are still enjoying legal rights over the forest produce as per settlement of 1936. Collection of firewood, timber, cane, sabai and other grassess, sal seed, fish, etc. along with occassional poaching continuing unabated (Plate 4b). Legal permission for the collection of timber, bamboos and cane brakes are also regularly given against revenue (Plate 5a). A population of about 32000 cattle living in and around the Reserve also exert tremendous pressure on the area for grazing. Cattle were found even in the deepest part of the core area (Plate 5b). Huge grazing of the domestic stock not only degrades the habitat but also may lead to the serious out break of contagious disease among the wild herbivores.

Accidental forest fire, particularly during summer, is also a common feature. Due to lack of sufficient antifire measures, a lot of habitat destruction are caused by the fire.

This fragile habitat lies in the border of Nepal and Uttar Pradesh and vulnerable to both smuggling and poaching. Miscreants are very active in the Reserve. Logs are regularly taken by

them and transported through Nepal and Uttar Pradesh. Miscreants are so well organized with modern arms that they do not hesitate to attack the management people. During our surveys, several such incidents occurred and in one of them Forester and Forest Guard of Kotraha beat were severely injured.

A number of developmental projects such as irrigation canals, hydro-electricity, Bagha-Chhitauni railway line (Plate 6a) are coming up in this part of the country. Different parts of the Valmiki Tiger Reserve are being sacrificed for these project (Plate 6b). Movement of heavy vehicles, operation of machinaries are going inside the Reserve even during the night for construction works of these projects.

As a result of above factors habitat quality is being degraded at a very fast rate and flora and fauna are becoming the worst victims. It is reported that many animals including tigers have moved to the adjacent forest of Nepal. This fact is well reflected by the reduction in the number of tigers from 80 (1989 census—Anon. 1993) to 51 (1993 census— J. L. Srivastava pers Comm.) and probably much less at present.

To monitor the changes in the vegetation cover of the Tiger Reserves between the period 1983-89, a study based on visual interpretation of the Land Sat imagery was undertaken by the Forest Survey of India (Forest Survey of India 1993). The finding of the above study in respect of Valmiki Tiger Reserve is given in Table 1. From the table we can find that between 1983 to 1989, (1) dense forest cover has decreased by 68.22 Sq. Km., (2) Open forest cover has increased by 68.22 Sq. Km., (3) scrub area has increased by 10.69 Sq. Km. and (4) non-forest area has decreased by 16.16 Sq. Km. The changes which have occurred in different categories of forest cover between 1983 and 1989 has been summarised in Table 2. It is obvious that, (1) 176.62 Sq. Km. of earlier dense forest has changed into open forests with crown density less than 40% to 10%, (2) 22.10 Sq. Km. of earlier dense open forests has changed into scrub land, (3) 115.53 Sq. Km. which was earlier open forests

with crown density less than 40% to 10% have improved in crown density to be classed as dense forests, (4) 0.95 Sq. Km. open forest has changed into non-forest category, (5) 14.50 Sq. Km. scrub area have improved into open forest with crown density less than 40% to 10%, (6) 14.02 Sq. Km. which was earlier non-forests have improved into open forest with crown density less than 40% to 10% and (7) 3.09 Sq. Km. non-forest has changed into scrub.

From the above discussion it is obvious that, though the forest has been declared as National Park and Tiger Reserve, but in reality it is not even enjoying the status of even a Reserve Forest. Entire zone with its varied ecosystems and great faunal diversity is now most vulnerable and may reach to point of no return within a short time.

RECOMMENDATIONS

To conserve the great national heritage contained in the Valmiki Tiger Reserve, socio-economic condition of the people living in and around should be taken into consideration. Practical aspects as regard to the needs and requirements of the local people can't be ignored by simple notification and framing rules. Following recommendations may be considered for the conservation of the Valmiki tiger Reserve.

1. Administrative control of the entire forest area should immediately be transferred from the Forest Development Corporation to State Forest Department and the Project Tiger Authorities.
2. All the central and state fund for the management and eco-development of the Tiger Reserve should immediately be released.
3. To meet up the rights (as per settlement of 1938) of the tribal people on the forest produce, the buffer zone may be declared as protected forest, from where they may collect fuel wood and other requirement under the total management of the Tiger Reserve Authorities. However, attempt should be made to minimise their

- requirement gradually. Supply of low fuel consuming 'Chula', use of solar energy, social forestry, easy loan for construction of pakka buildings, *etc.*, may come under this programme.
4. Cultivation of fodder in the waste land to be initiated to minimise the grazing in the core area. Free inoculation for the domestic cattle should be arranged.
 5. Official procedures as regard to the transportation and selling of the tree product grown in personal land should be simplified.
 6. Champaran land is very much fertile for the growth of almost all the plant species. There is also much demand for the seedlings among the villagers. Authorities should start Kishan Nursery or Forest Nursery in all the beats to meet up the demand of the seedling. This in turn, will not only minimise the dependence on forest produce, but will also act as economic booster for the area.
 7. To fight against the miscreants and drive them away from the Reserve, number of forest guards should sufficiently be increased along with proper equipment. In this connection communication system among the different blocks should be improved. Active co-operation from the police department should also be asked for.
 8. Unless the local people are taken into confidence, no conservation programme could be successful. Awareness programme should regularly be organised to make the local people understand that 'Tiger Project' is not against them but for them. Assurance should be given to them that they will not be deprived from their right on the forest produce. So that, fullest cooperation may be received from them for the conservation of this national heritage which many serve as sustainable resource for future generation.
 9. Entire West Champaran has the tremendous potentiality of becoming a wonderful tourist belt. Vicinity of the great Himalayan Range, views of the snow-capped peaks, flowing river, green forest, rich wildlife, and simple but cordial lifestyle of tribals are of great attraction for the tourists from India as well as outside. Improved transport and accommodation facilities along with little publicity may change the socio-economic condition of the area through tourism. However, to make the tourism eco-friendly and to avoid the cultural hazards resulting from the tourists, management programme for the tourism should totally be kept under the control of Project authorities.
 10. Well-equipped research wing is to be developed immediately. This wing will carry out researches on the eco-development of the area, status of the endangered species, population fluctuations, animal behaviour, disease and others. Carrying capacity of the forest is also to be studied from time to time in respect of different species.

SUMMARY

Based on the survey works, literature and local reports a detailed account of the faunal composition of the Valmiki Tiger Reserve was prepared. A total of 53 species of mammals, 145 species of birds and 121 species of other groups of animals have been reported. Status of different mammalian species including tiger has been discussed. Two subspecies and one species of mammal have been recorded for the first time from Bihar. Attempts have been made to identify the different factors responsible for the habitat degradation. Necessary recommendations have been appended for the habitat improvement and management of the Valmiki Tiger Reserve.

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Table 1. Category-wise distribution of forest cover in Valmiki Tiger Reserve

Category	Year of imagery		Net difference in the area as compared to 1983 (Sq. Km.)	% change
	1983	1989		
1. Dense forest	488.73	425.98	62.75 (-)	12.84
2. Open forest	233.19	301.41	68.22 (+)	29.25
3. Scrub	19.26	29.95	10.69 (+)	55.50
4. Non forests	138.82	122.66	16.16 (-)	11.64

Table 2. Changes which have occurred in the different categories of forest over in Valmiki Tiger Reserve between 1983 and 1989

Category	Area (Sq. Km.)
1. Dense forest to open forests	176.22
2. Dense forest to scrub	1.66
3. Open forest to dense forests	115.53
4. Open forest to scrub	20.44
5. Open forest to non-forests	0.95
6. Scrub to open forests	14.50
7. Non-forests to open forests	14.02
8. Non-forest to scrub	3.09

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PLATE 1



- a. Shelter and breeding ground of Tiger in Valmiki Tiger Reserve
- b. Young of *Sceloporus heathi heathi*

PLATE 2



- a. Hide of a freshly killed specimen of *Cervus unicolor* seized by the Forest Department
- b. Roseringed Parakeet, *Psittacula krameri mandlensis* on a mango tree of Valmiki Tiger Reserve

PLATE 3



- a. A pair of Indian Myna, *Acridotheres tristis* in Valmiki Tiger Reserve
b. Dwarf Rock Lizard, *Psammophilus blanfordianus* in Valmiki Tiger Reserve

PLATE 4



- a. Few specimens of coleoptera collected from Valmiki Tiger Reserve
- b. Collection of fire wood from Valmiki Tiger Reserve

PLATE 5



- a. Collection of bamboo from Valmiki Tiger Reserve
- b. Grazing of Cattle in the Valmiki Tiger Reserve

PLATE 6



- a. Construction work of Chhitauni-Bagha Railway Project in Mandanpur Range
- b. Destruction of forest for the different development projects in the Valmiki Tiger Reserve

AMPHIBIA

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INTRODUCTION

Now a days special stress is given on the studies of fauna of Sanctuary, National Park and Tiger Reserve of our Country. Basing on this aspect several Field trips have been conducted by our department in Valmiki Tiger Reserve, West Champaran district (Bihar) to assess the faunal account of the area. As a result 152 ex. of amphibians belonging to 10 species, 6 genera and 4 families under order Anura have been collected, determined and reported for the first time from the area. The order Apoda and Caudata are not reported in this collections.

Amphibian fauna of Bihar as a whole is little known. Boulenger (1890 & 1920), Annandale and Rao (1918) and Parker (1934) have recorded amphibians from different parts of India and adjoining countries, but they also mention very little about the amphibians from the State of Bihar. Without mentioning any place of collection in particular Venkateswarlu and Murthy (1972) have published a list of amphibians occurring in Bihar. Sarkar (1991) has published amphibians of Chota Nagpur (South Bihar) in details. From the above account this is found that altogether 13 species of anurans have so far been recorded from Bihar.

SYSTEMATIC ACCOUNT

Class : AMPHIBIA

Order : ANURA

Key to the families

- | | | | |
|--|-----|-----|-----------|
| 1. Jaws toothless | ... | ... | 2 |
| Upper jaw toothed | ... | ... | 3 |
| 2. Skin rough with well-developed warts, parotoids present | ... | ... | BUFONIDAE |

- | | | |
|--|--------|---------------|
| Skin more or less smooth, parotoids absent | | MICROHYLIDAE |
| 3. No intercalary ossification (extra cartilaginous bone) between the distal and penultimate phalanges | | RANIDAE |
| An intercalary ossification between the distal and penultimate phalanges | | RHACOPHORIDAE |

Family 1. BUFONIDAE

Family Bufonidae is represented in Valmiki Tiger Reserve by two species of the genus *Bufo*

Genus 1. *Bufo* Laurenti, 1768.

1768. *Bufo laurenti*, Synops, Rept., : 25

Key to the species of the genus *Bufo*

- | | | | |
|--|-----|-----|----------------------|
| 1. Head with bony ridges, parotoids kidney-shaped | ... | ... | <i>melanostictus</i> |
| Head without bony ridges, parotoids flat (not kidney-shaped) | ... | ... | <i>stomaticus</i> |

1. *Bufo melanostictus* Schneider (Common Indian Toad)

1799. *Bufo melanostictus* Schneider, Hist Amph. 1 :216.

1972. *Bufo melanostictus* Venkateswarlu and Murthy, Indian J. Zool. 13 (3) : 129.

1991. *Bufo melanostictus* Sarkar, Rec. zool. Surv. India 89 (1-4) : 210.

Material examined : 1 ex., Valmiki Nagar, 13. xi. 1995; 1 ex., Manguraha, 5. ix. 1996. All coll. S. Ray.

Total length : 55 mm. 89 mm. from snout to vent.

Diagnostic character : Head broader than long,

with cornified bony ridges ; snout rounded, nearly equal the diameter of the eye ; nostril a little nearer to the tip of snout than to the eye; interorbital width broader than that of upper eyelid ; tympanum very distinct, two third the diameter of the eye. Fingers free, first a little longer than second, tips of finger and toes swollen. Toes nearly half-webbed, more than three phalanges of fourth toe free ; two oval (inner and outer) metatarsal tubercle present. Tarsometatarsal articulation reaches in between tympanum and eye. Dorsum dark brownish, rough with several spiny warts, parotoid large, kidney shaped. Venter dull whitish with numerous small spiny warts.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. Common throughout the plains of India, and Andaman and Nicobar. *Elsewhere* : Pakistan, Bangladesh, Sri Lanka, Nepal, Myanmar, South China, Malaya Peninsula and Archipelago.

Remarks : First report from the area. Annandale and Rao (1918) and Venkateswarlu and Murthy (1972) reported from Bihar and Sarkar (1991) from South Bihar. Big-seized toad. It is nocturnal in habit and used for dissection in college laboratories, and the males are used in pregnancy diagnosis tests of human beings.

Status : Common in Valmiki Tiger Reserve (Bihar).

2. *Bufo Stomaticus* Lutken

(Marbled Toad)

1863. *Bufo melanostictus* Lutken, *Vidensk. Medd. dansk naturh-Foren*, 14 :305.

1972. *Bufo stomaticus* : Venkateswarlu and Murthy, *Indian J. Zool.* 13 (3) : 130.

1991. *Bufo stomaticus* Sarkar, *Rec. zool. Surv. India*, 89 (1-4) : 211.

Material examined : 2. ex., Madanapur, 6. vi. 1993, S. Chakraborty. 2 ex., Kotraha, 4-5. xi. 1995 ; 2 ex., Gonouli, 8-11. xi. 1995, 2 ex., Valmiki Nagar, 12-13. xi. 1995 ; 2 ex., F. R. House Compound, Manguraha, 4-5. ix. 1996 ; 1 ex., Ganuaha, 6. xi. 1996 ; 1 ex., Chanpatia,

8. ix. 1996 ; 1 ex., Bakri, 10. ix. 1996 ; 3 ex., Gohardhana, F. R. House Compound, 11-12. ix. 1996 ; 1 ex., Ramnagar, 11. ix. 1996 ; 1 ex., Bagha, 13. ix. 1996 ; 1 ex., Madanpur, 15. ix. 1996 ; 1 ex., Kotraha, 17. ix. 1996 ; 1 ex., Valmiki Nagar, 18. ix. 1996. All coll. S. Ray.

Total length : 22 mm. 81 mm. from snout to vent.

Diagnostic Character : Head broader than long, without bony ridges ; snout rounded, nearly once the diameter of the eye ; nostril nearer the tip of snout than the eye ; nostril nearer the tip of snout than the eye ; interorbital width broader than that of upper eyelid ; tympanum very distinct, nearly once the diameter of the eye. Fingers free, first a little longer than second, tips of fingers and toes swollen. Toes more than half webbed, two phalanges of four toe free ; two oval (inner and outer) metatarsal tubercles present. Tarsometatarsal articulation reaches in between tympanum and eye. Dorsum brownish, rough with several non-spiny warts, parotoids large, flat, not kidney shaped. Venter dull-whitish with numerous small, non-spiny warts.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. Common throughout the plains of India from Jammu and Kashmir to Karnataka, and Assam in the east. *Elsewhere* : Pakistan, Nepal, Myanmar, Sri Lanka and Arabia.

Remarks : First report from the area. Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Medium-sized toad. It is terrestrial and nocturnal in habit.

Status : Very common in the area.

Family II. MICROHYLIDAE

This family is represented by two genera, each represented by a single species.

Key to the genera of the family MICROHYLIDAE

Two normal metatarsal tubercles present
... .. *Microhyla*

Two large, shovel shaped matatarsal tubercles (inner larger) present *Kaloula*

Genus 2. *Microhyla* Tschudi, 1838.

1838. *Microhyla* Tschudi, *classif. Batr.* : 71.

3. *Microhyla ornata* (Dumeril and Bibron)
(Ornate Microhylid)

1841. *Engystoma ornatum* Dumeril and Bibron, *Erpet. Gen.*, 8 : 745.

1972. *Microhyla ornata* : Venkateswarlu and Murthy, *Indian J. Zool.* 13 (3) : 130.

1991. *Microhyla ornata* : Sarkar, *Rec. zool. Surv. India* 89 (1-4) : 212.

Material examined : 1 ex., Kothraha, 5. xi. 1995 ; 1 ex., Ganouli, 9. xi. 1995 ; 1 ex., Valmiki Nagar, 12. xi. 1995 ; 2 ex., Manguraha, 5. xi. 1996 ; 1 ex., Chanpatia, 8. xi. 1996 ; 1 ex., Bakri, 10. ix. 1996 ; 3 ex., Gobardhana F. R. House Compound, 11. ix. 1996 ; 1 ex., Ramnagar, 11. ix. 1996 ; 2 ex., Ganouli, 14. ix. 1996 ; 1 ex., Madanpur, 15. ix. 1996 ; 3 ex., Kotraha, 17. ix. 1996 ; 2 ex., Valmiki Nagar, 17. ix. 1996 ; All coll. S. Ray.

Total length : 11 mm. 19 mm. from snout to vent.

Diagnostic Character : Head broader than long ; snout obtusely pointed, a little longer than the diameter of the eye ; nostril nearer to the tip of snout than the eye ; interorbital width a little broader than that of upper eyelid ; tympanum not so distinct. Fingers free, first shorter than second, tips flattened. Toes with a rudiment of web, tips blunt, two small but distinct oval (inner and outer) metatarsal tubercles present. Tibiotarsal articulation reaches near to eye. Dorsum smooth, brownish with broad darker markings. Venter smooth, dull whitish, little darker on throat.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. It is widely distributed species in India and found all over the plains of the Country upto an altitude of 1524 metres, and Andaman. *Elsewhere* : Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, South

China, South east Asia and Taiwan.

Remarks : First report from the area. Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Small frog generally found inside bush and under dry leaves spread over moist soil. They are nocturnal in habit, sometimes found in human dwellings during rainy days.

Status : Very common in the area.

Genus 3. *Kaloula* Gray

1831. *Kaloula* Gray, *Zool. Misc.*, 1 : 38.

4. *Kaloula pulchra* Gray
(Painted Frog)

1831. *Kaloula pulchra* Gray, *Zool. Misc.*, 1 : 38.

1972. *Kaloula pulchra* : Venkateswarlu and Murthy, *Indian J. Zool.* 13 (3) : 130.

Material examined : 1 ex., Inside forest, Manguraha, 5. xi. 1996. Collector S. Ray.

Total length : 35 mm. from snout to vent.

Diagnostic Character : Head broader than long ; snout rounded, as long as the diameter of the eye ; nostril nearer to the tip of snout than the eye ; interorbital width much broader than that of upper eyelid ; tympanum hidden. Fingers free, first shorter than second, tips bearing well-developed truncate discs ; subarticular tubercles of fingers and toes distinct. Toes one third webbed, tips obtusely swollen ; inner metatarsal tubercle well developed, large, shovel-shaped, outer metatarsal tubercle small, shovel-shaped. Tibiotarsal articulation reaches the axil. Dorsum rough with scattered warts, and greyish with reddish brown patches margined with black. Venter wrinkled on belly, granular on throat and under surface of thighs, and light brownish.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. West Bengal, Madhya Pradesh ; Karnataka, Tamil Nadu in India. Also Sri Lanka.

Remarks : First report from the area. Venkateswarlu and Murthy (1972) reported it from Bihar. Terrestrial and nocturnal in habit. Collected

from burrow under tree-trunk during day time.

Status : Rare

Family III. RANIDAE

This family is represented in Valmiki Tiger Reserve by four species of genus *Rana*, and one of genus *Tomopterna*.

Key to the genera of family RANIDAE

Outer metatarsal separated by web at least in the distal half *Rana*
Outer metatarsal united or separated only in their distal extremity *Tomopterna*

Genus 4. *Rana* Linnaeus

1758. *Rana* Linnaeus, *Syst. Nat. Ed. 10. 1.* : 210.

Key to the species of genus *Rana*

1. Toes webbed upto the tips, inner metatarsal tubercle digitiform (toe like) *cyanophlyctis*
Toes not webbed upto the tips, inner metatarsal tubercle not digitiform. 2
2. Both inner and outer oval-shaped metatarsal tubercles present *limnocharis*
Inner metatarsal tubercle present, Outer metatarsal tubercle absent 3
3. Inner metatarsal tubercle blunt, not shovel-shaped *tigerina*
Inner metatarsal tubercle sharp and shovel-shaped *crassa*

5. *Rana cyanophlyctis* Schneider (Skipping Frog)

1799. *Rana cyanophlyctis* Schneider, *Hist Amph.* 1 : 137.
1920. *Rana cyanophlyctis* : Boulenger, *Rec. Indian Mus.*, 20 : 12.
1972. *Rana cyanophlyctis* : Venkateswarlu and Murthy, *Indian, J. Zool.* 13 (3) : 129.
1991. *Rana cyanophlyctis* : Sarkar, *Rec. Zool. Surv. India*, 89 (1-4) : 213.

Material examined : 1 es., Kotraha, 7. vi. 1993, S. Chakraborty. 6 ex., Kotraha, 4-6. xi. 1995 ; 6 ex., Ganouli, 9-11. xi. 1995 ; 2 ex.,

Valmiki Nagar, 13-14 xi. 1995 ; 2 ex., Manguraha, 4-5. ix. 1996 ; 1 ex., Ganuaha, 6. ix. 1996 ; 1 ex., Gobardhana, 11. ix. 1996 ; 1 ex., Dhungi river, 12. ix. 1996 ; 1 ex., Ganouli, 14. ix. 1996 ; 3 ex., Madanpur, 14. ix. 1996 ; 1 ex., Valmiki Nagar, 16. ix. 1996. All coll. S. Ray.

Total length : 18 mm. 61 mm. from snout to vent.

Diagnostic Character : Head broader than long ; snout generally rounded, equal or a little longer than the diameter of the eye ; nostril equidistant from the tip of the snout and the eye ; interorbital width much smaller than that of the upper eyelid ; tympanum distinct, nearly once the diameter of the eye. Fingers free, first equals second, tips pointed ; subarticular tubercles of fingers and toes feebly prominent. Toes fully webbed, tips swollen ; a pointed digit-like inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches in between posterior end of tympanum and nostril. Dorsum darker with small warts. Venter whitish and smooth.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. Common throughout the plains of India, and upto 1846 m. in the Himalayas. *Elsewhere* : Pakistan, Bangladesh, Nepal, Afghanistan, Beluchistan, Iran, South Arabia, Thailand and Sri Lanka.

Remarks : First report from the area. Annandale and Rao (1918) and Venkateswarlu and Murthy (1972) reported from Bihar and Sarkar (1991) from South Bihar. Medium-sized frog. The frogs are generally found floating on the surface of water.

Status : Very common.

6. *Rana limnocharis* Boie (Cricket Frog)

1835. *Rana limnocharis* (Boie), Wiegmann, *N. Acta. Ad. Leop. Carol.*, 17 (i) : 255.
1972. *Rana limnocharis* : Venkateswarlu and Murthy, *Indian J. Zool.* 13 (3) : 129.
1991. *Rana limnocharis* : Sarkar, *Rec. zool. Surv. India*, 89 (1-4) : 212.

Material examined : 4 ex., Kothra, 4-6. xi. 1995 ; 4 ex., Ganouli, 9-11. xi. 1995 ; 13 ex., Valmiki Nagar, 12-14. xi. 1995 ; 3 ex., Manguraha, 5. ix. 1996 ; 3 ex., Gaunaha, 6. ix. 1996 ; 1 ex., Thori, 7. ix. 1996 ; 4 ex., Gobardhana, 11. ix. 1996 ; 1 ex., Dhungi river, 12. ix. 1996 ; 5 ex., Madanpur, 13. ix. 1996 ; 3 ex., Ganouli, 15. ix. 1996 ; 2 ex., Kotraha, 17. ix. 1996 ; 1 ex., Valmiki Nagar, 18. ix. 1996. All coll. S. Ray.

Total length : 19 mm. 47 mm. from snout to vent.

Diagnostic Character : Head generally as long as broad ; snout generally pointed, projecting beyond the mouth, as long as or a little longer than the diameter of the eye, nostril nearer to the tip of snout than the eye ; interorbital width much smaller than that of the upper eyelid ; tympanum distinct, nearly two-third the diameter of the eye. Fingers free, first longer than second, tips swollen. Subarticular tubercles of fingers and toes distinct. Toes half-webbed, normally three phalanges of fourth toe free ; a distinct oval inner metatarsal tubercle, and a feebly distinct outer metatarsal tubercle present. Tibiotarsal articulation reaches in between tympanum and nostril. Dorsum geryish and warty. Venter whitish and smooth.

Distribution : Valmili Tiger Reserve (Bihar). As mentioned in the *Material examined*. It is a broadly distributed species in India and found almost all the biotopes of the Country, and Andaman and Nicobar. Also Eastern Asia from Pakistan, Nepal, Bangladesh, Sri Lanka and China to Japan.

Remarks : First report from the area. Annandale and Rao (1980) and Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Small frog generally found inside bush grown on moist soil, and on moist forest bed covered with thick canopy of trees.

Status : Very common.

7. *Rana tigerina* Daudin (Indian Bull Frog)

63. *Rana tigerina* Daudin, *Hist. Rain. Gren. Crap.* : 64.

1972. *Rana tigerina* : Venkateswarlu and Murthy, *Indian J. Zool.* 13 (3) : 129.

1991. *Rana tigerina* : Sarkar, *Rec. zool. Surv. India*, 89 (1-4) : 215.

Material examined : 1 ex., Kotraha, 7. vi. 1993, S. Chakraborty. 1. xi., Valmiki Nagar, 14, xi, 1995 ; 1 ex., Manguraha, 5. ix. 1996 ; 1 ex., Gaunaha, 6. ix. 1996 ; 1 ex., Thori, 7. ix. 1996 ; 1 ex., Chanpatia, 8. ix. 1996 ; 1 ex., Dhungi river, 12. ix. 1996 ; 1 ex., Valmiki Nagar, 18. ix. 1996 ; 1 ex., Bakri, 10. ix. 1996 ; 1 ex., F. R. House, Gobardhana, 11. ix. 1996. All coll. S. Ray.

Total length : 39 mm. 108 mm. from snout to vent.

Diagnostic Character : Head as long as broad or a little broader than long ; snout rounded or pointed, projecting beyond the mouth, longer than the diameter of the eye ; nostril generally equidistant from the tip of the snout and the eye ; interorbital width much smaller than that of the upper eyelid ; tympanum distinct, nearly equal to the diameter of the eye. Fingers free, first longer than second, tips not sharply pointed ; subarticular tubercles of fingers and toes not very distinct. Toes entirely webbed tips not pointed ; a blunt, not shovel shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches in between posterior end of eye and nostril. The heels overlapping when the limbs are folded at right angles to the body. Dorsum olive green with darker spots, distinct warts and long glandular folds. Venter whitish and smooth.

Distribution : Valmili Tiger Reserve (Bihar). As mentioned in the *Material examined*. It is common throughout India from base of Himalaya to Southern part of the Country, and Andaman. *Elsewhere* : Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, South China and Thailand.

Remarks : First report from the area. Annandale and Rao (1980) and Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Commonest and largest species of edible frogs. It frequents inside the bushes grown on the banks of ditches, ponds, canals and lakes.

Status : common.

8. *Rana crassa* Jerdon
(Jerdon's Bull Frog)

1835. *Rana crassa* Jerdon, *J. Asiat. Soc., Beng.*, **22** : 531.
1972. *Rana crassa* : Venkateswarlu and Murthy, *Indian J. Zool.* **13** (3) : 129.
1991. *Rana crassa* : Sarkar, *Rec. zool. Surv. India*, **89** (1-4) : 215.

Material examined : 2 ex., Manguraha, 5. ix. 1996 ; 1 ex., Thori, 15. ix. 1996 ; 3 ex., Chanpatia, 8. ix. 1996 ; 2 ex., Bakri, 10. ix. 1996 ; 1 ex., Ramnagar, 11. ix. 1996 ; 1 ex., F. R. House, Gobardhana, 12. ix. 1996 ; 1 ex., Bhgha, 13. ix. 1996 ; 1 ex., Madanpur, 15. ix. 1996 ; 1 ex., Valmiki Nagar, 17. ix. 1996. All coll. S. Ray.

Total length : 39 mm. 68 mm. from snout to vent.

Diagnostic Character : Head a little broader than long ; snout generally beyond the mouth, longer than the diameter of the eye ; nostril generally equidistant from the tip of snout and the eye ; interorbital width much smaller than that of upper eyelid ; tympanum distinct, nearly equal to the diameter of the eye. Fingers free, first longer than second ; subarticular tubercles of fingers and toes feebly distinct. Toes entirely webbed, penultimate phalange of fourth toe free, tips not pointed ; a highly developed, shovel-shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches the tympanum or the eye. The heels do not overlap when the limbs are folded at right angle to the body. Dorsum light greyish with interrupted long warts. Venter dull whitish with darker spots on throat, and smooth.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. West Bengal ; Andhra Pradesh ; Kerala ; Tamilnadu ; Orissa and Uttar Pradesh in India. Also Sri Lanka.

Remarks : First report from the area. Annandale and Rao (1980) and Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Fairly big-sized frog. Nocturnal in habit. It is an edible burrowing frog that spends

day inside the crevices on elevated walls of ditches, ponds, rivers and canals.

Status : common.

Genus 5. *Tomopterna* Dumeril and Bibron

1841. *Tomopterna* Dumeril and Bibron, *Erp. Gen.*, **8** : 443.

9. *Tomopterna breviceps* (Schneider)
(Burrowing Frog)

1799. *Rana breviceps* Schneider, *Hist Amph.*, **1** : 140
1920. *Rana breviceps* : Boulenger, *Rec. Indian Mus.*, **20** : 103-105.
1986. *Tomopterna breviceps* : Inger and Dutta. *J. Bombay nat. Hist. Soc.*, **83** : 138.
1991. *Tomopterna breviceps* : Sarkar, *Rec. zool. Surv. India*. **89** : (1-4) : 215.

Material examined : 4 ex., Manguraha, 4-5. ix. 1996 ; 1 ex., Bakri, 10. ix. 1996 ; 3 ex., F. R. House Compound, Gobardhana, 11-12. ix. 1996 ; 2 ex., Ramnagar, 11. ix. 1996 ; 1 ex., Babha, 13. ix. 1996 ; 1 ex., Madanpur, 15. ix. 1996 ; 2 ex., Valmiki Nagar, 18. ix. 1996. All coll. S. Ray.

Total length : 16 mm. — 52 mm. from snout to vent.

Diagnostic Character : Head broader than long; snout rounded, not projecting beyond the mouth, shorter than the diameter of the eye ; nostril equidistant from the tip of the snout and the eye ; interorbital width is smaller than that of the upper eyelid ; tympanum distinct, more or less half diameter of the eye. Fingers free, first much longer than second, tips swollen, subarticular tubercles of fingers and toes well-developed. Toes 1/4 to 1/2 webbed ; a highly developed, large, shovel-shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches axil or shoulder. Dorsum greyish and warty. Venter whitish and granular.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. The species is available all over the plains of India. Also Sri Lanka, Nepal and Myanmar.

Remarks : First report from the area. Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Medium sized frog. Burrowing and nocturnal in habit. One example of frog collected from Gobardhana, one example of frog collected from Valmiki Nagar and another from Ramnagar possess broad mid-dorsal yellowish stripe from snout to vent.

Status : Common in Valmiki Tiger Reserve.

Family IV. RHACOPHORIDAE

This family is represented in Valmiki Tiger Reserve by one species of the genus *Polypedates*.

Genus 6. *Polypedates* Tschudi

1838. *Polypedates* Tschudi, *chassif*, *Batr.* : 34.

10. *Polypedates maculatus* (Gray) (Tree Frog)

1832. *Hyla maculata* Gray. *III Indian Zool.* 1 pl. 82 fig. 1

1986. *Polypedates maculatus* : Inger and Dutta, *J. Bombay nat. Hist. Soc.*, 83 : 139.

1991. *Polypedates maculatus* : Sarkar, *Rec. zool. Surv. India.* 89 (1-4) : 216.

Material examined : 1 ex., Kotraha, 7. vi. 1993, S. Chakraborty. 1 ex., Valmiki Nagar, 13 xi. 1995 ; 1 ex., F. R. House, Manguraha, 5. ix. 1996 ; 1 ex., F. R. House, Gobardhana, 12 ix. 1996. All coll. S. Ray.

Total length : 32 mm. — 61 mm. from snout to vent.

Diagnostic Character : Vomerine teeth present. Head broader than long, skin on head free ; snout pointed, projecting a little beyond the mouth, generally longer than the diameter of the eye ; nostril nearer the tip of the snout than the eye ; interorbital width broader than that of the upper

eyelid ; tympanum distinct, about three-fourth diameter of the eye. Fingers with rudimentary web, first equals the second, tips of fingers and toes bear horse-shoe shaped distinct discs ; subarticular tubercles of fingers and toes distinct. Toes nearly three-fourth webbed, two phalanges of fourth toe free ; a distinct oval inner metatarsal tubercle present. Outer metatarsal tubercle absent. Tibiotarsal articulation reaches in between posterior end of eye and tip of snout. Dorsum brownish with light darker spots and smooth. Venter dull whitish and granular.

Distribution : Valmiki Tiger Reserve (Bihar). As mentioned in the *Material examined*. The species is available throughout the plains of India in general. Also Sri Lanka.

Remarks : First report from the area. Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from South Bihar. Medium sized frog. Nocturnal in habit, one example collected from the tree trunk of a Mango tree at Manguraha.

Status : Rare.

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SUMMARY

The paper is consisting of 152 examples of anurans belong to 10 species, 6 genera and 4 families. All the species are recorded for the first time from the area. Keys and short diagnostic characters of the species have been added in the paper for determination of the species.

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REPTILIA

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INTRODUCTION

The present paper is based on a collection made from Valmiki Tiger Reserve covering north-east part of Bihar including West Champaran District. Most of the species listed were collected from Madanpur, Kotraha, Valmikinagar, Gobardhana and Munguraha area of the Reserve Forest. A few specimens from adjacent area will probably be additions to the reptiles fauna of Valmiki Reserve Forest. The diverse fauna of the reserve forest is due to its varied ecological conditions. Valmiki Tiger Reserve forest covers an area of 910 sq. km., of which 335 sq. km., has been declared core area. The Reserve forest extends over hills and plains. Mixed forest includes plantations as well as natural patches of Sisso, Khair, Segun, Sal, Amla and also bamboo cane, bushes and stretches of grassland. Large number of rainfed as well as overflowing streams and nullahs criss cross the forest. These result in various habitats.

The species *Ophiophagus hannah*, *Python molurus* and *varanus bengalensis* were observed in the field and are probably rare, although they are found in the reserve forest area.

The authors anticipate that the fauna will increase with more intensive field surveys.

In the present paper, a dichotomous key to the genera and species for identification in the field has been provided, in addition to the status of every species has been included.

LIST OF SPECIES

Systematic List

Order I : TESTUDINES
Family I : BATAGURIDAE
Genus (1) : MELANOCHELYS

1. *Malanochelys tricarinata* Blyth

Order II : SQUAMATA
Sub Order : SAURIA
Family 2 : GEKKONIDAE
Genus (2) : HEMIDACTYLUS

2. *Hemidactylus brookii* Gray

3. *Hemidactylus leschenaulti* Dum & Bibr.

4. *Hemidactylus flaviviridis* Ruppell

5. *Hemidactylus frenatus* Dum & Bibr.

Family 3 : AGAMIDAE
Genus (3) : CALOTES

6. *Calotes versicolor* (Daudin)

Genus (4) : SITANA

7. *Sitana ponticeriana* Cuvier

Family 4 : SCINCIDAE
Genus (5) : MABUYA

8. *Mabuya carinata* (Schneider)

9. *Mabuya macularia* (Blyth)

Genus (6) : RIOPA

10. *Riopa albopunctata* Gray

11. *Riopa punctata* (Gmelin)

Genus (7) : SCINCELLA

12. *Scincella sikkimensis* (Blyth)

Genus (8) : SPHENOMORPHUS

13. *Sphenomorphus maculatum* (Blyth)

Sub Order (2) : SERPENTES
Family 5 : TYPHLOPIDAE
Genus (9) : RAMPHOTYPHLOPS

14. *Ramphotyphlops braminus* (Daudin)
 Family 6 : BOIDAE
 Genus (10) : PYTHON
15. *Python molurus* (Linnaeus)
 Genus (11) : ERYX
16. *Eryx johnii johnii* (Russell)
 Family 7 : COLUBRIDAE
 Genus (12) : SIBYNOPHIS
17. *Sibynophis sagittarius* (Cantor)
 Genus (13) : PTYAS
18. *Ptyas mucosus* (Linn.)
 Genus (14) : AMPHIESMA
19. *Amphiesma stolata* (Linn.)
 Genus (15) : XENOCHROPHIS
20. *Xenochrophis piscator* (Schneider)
 Genus (16) : LYCODON
21. *Lycodon striatus* (Shaw)
 Genus (17) : BOIGA
22. *Boiga trigonata* (Schneider)
 Genus (18) : DENDRELAPHIS
23. *Dendrelaphis pictus* (Linn.)
 Genus (19) : CHRYSOPELEA
24. *Chrysopelea ornata* (Shaw)
 Family (8) : ELAPIDAE
 Genus (20) : BUNGARUS
25. *Bungarus fasciatus* (Schneider)
 Genus (21) : NAJA
26. *Naja naja* (Linn.)
 Genus (22) : OPHIOPHAGUS
27. *Ophiophagus hannah* (Cantor)
 Family 1. : BATAGURIDAE
 Genus (1) : *Melanochelys* Gray, 1869.

1. *Melanochelys tricarinata* (Blyth)

1856. *Geoemyda tricarinata* Blyth, *J. Asiat. Soc. Bengal*, 24. p. 714.

1869. *Melanochelys tricarinata* Gray, *Proc. Zool London.* : 187.

Material examined : Bihar, West Champaran, Munguraha, 1 ex., 8.9.96 and Gobardhana. 1. ex., 11.9.96, Coll. S. Sur & Party.

Diagnostic character : Carapace elongated tricarinata, shell arched with steep sides; carapace keels low; marginals unserrated; axillary scutes present, inguinal absent; plastron long, notched posteriorly; head moderate; snout short truncate; skin of the posterior of the forehead divided into large shields; fingers half webbed; toes almost free; the outer surface of fore limbs with enlarged scales, Carapace dark olive; grey black or reddish brown, with pale yellow keels, plastron yellow or orange, head and limbs grey black. A red stripe extend from the nostrils, across the eyes, to the neck, another from the angle of the jaws to the neck, in both the side of the head reason.

Distribution : Valmiki Tiger Reserve Forest as stated above under material. Elsewhere : The species is distributed along the Himalayan foot hills from U. P. to Arunachal Pradesh, Assam (Manas Tiger Reserve), Bihar (Chaibassa, Vicinity of Gandak Dam) Arunachal Pradesh (Dafla hills), and West Bengal (Jalpaiguri Dist. of North Bengal).

Remarks : A terrestrial species, the tricarinata hill turtle is found in grassland along the river Ganga and Brahmaputra at the foot of the Himalayas as well as the hilly country in the vicinity, the forest types utilised being moist deciduous as well as wet evergreen.

Status : The species is listed in Schedule I of the Indian Wildlife (Protection) Act of 1972.

Order II : SQUAMATA

Suborder : SAURIA

KEY TO THE FAMILIES

1. Top of head with symmetrical shields2.
Top of head without symmetrical shields ..3.
2. Body covered with osteodermal plates, femoral pores absent *Scincidae*.
3. Eye with movable eyelids, digits free4.
Eye without movable eye lids; digits clawed *Gekkonidae*.
4. Tongue not club-shaped *Agamidae*

Family : GEKKONIDAE

Key to the species of genus *Hemidactylus*

1. Enlarged dorsal tubercles numerous, strongly keeled arranged in regular longitudinal series 2.
Enlarged dorsal tubercles not numerous, feebly keeled, not regular by arranged..4.
2. Free distal phalanx of inner digit half as long as the dilated portion 3.
3. Dorsal tubercles large, back with dark spots brookii.
4. Free distal phalanx of inner digit half as long as the dilated portion, males with femoral pores only 5.
Free distal phalanx of inner digit not half as long as the dilated portion *frenatus*
5. Tail with enlarged tubercles above; 9 to 11 lamellae under the fourth toe *leschenaultii*
Tail with enlarged tubercles above 11 to 14 lamellae under the fourth toe *flaviviridis*

Genus 2 *Hemidactylus*, Oken 1817.2. *Hemidactylus brookii* Gray

(Brook's Gecko)

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

1906. *Hemidactylus brooki* Annandale, *Mem. Asiatic Soc. Beng.* 1 : 183.

Material examined : Valmiki Tiger Reserve Forest Bihar, *Ganouli*, 2 ex., 8.11.95 & 10.11.95, *Valmikinagar* 1 ex., *Manguraha*, 3 ex., 4.9.96, Coll. S. Sur & Party.

Measurement : Snout to vent 21-40 mm. tail 22-45 mm.

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

Distribution : Valmiki Tiger Reserve in Bihar. Elsewhere; Throughout the Indian region. It also occurs in Southeast and Western Asia and the northern half of Africa.

Remarks : Although a domestic gecko but is also found far away from human habitations.

Status : Common.

3. *Hemidactylus leschenaulti* Dumeril & Bibron.

(Bark Gecko)

1836. *Hemidactylus leschenaulti* Dum & Bibr. *Erp. Gen.* 3. : 364.

Material examined : Valmiki Tiger Reserve Forest Bihar *Valmikinagar* 1 ex., 12.11.95. *Kothra* 2 ex., 5.11.95 & 18.9.96, *Manguraha* 1 ex., 8.9.96, Coll. S. Sur & party.

Measurement : Snout to vent 35 to 42; tail 36 to 40 mm.

Diagnostic character : Body stout with a lateral fold upper labials 10 to 12 and lower 8 to 10. Body dorsally covered with fine granules intermixed with small tubercles irregularly scattered scales on the belly small rounded, imbricate. 9 to 11 lamellae under the fourth toe, 6 to 7 under the first. 10 to 17 femoral on each side in the males. Grey above and white below. Back with conspicuous wavy cross bars. A dark line from the eye to ear on each side of the head.

Distribution : Valmiki Tiger Reserve Forest in Bihar as mentioned in the material. Elsewhere : Sri Lanka and peninsular India.

Remarks : It is found mostly on large trees where it conceals under bark several feet above ground.

Status : Common.

4. *Hemidactylus flaviviridis* Ruppell

(Yellow-bellied House Gecko)

1835. *Hemidactylus flaviviridis* Ruppell. *Neue Wirb. Faun. Abyss*, 18 Page Pl. VI. fig. 2.

Material examined : Valmiki Tiger Reserve Forest, Bihar, *Kothra*, 3 ex., 18.9.96, 4.11.95, 6.11.95, *Ganouli*, 1. ex., 8.11.95, *Valmikinagar* 1. ex., 13.11.95, *Manguraha*, 1 ex., 4.9.95, Coll. S. Sur & party.

Measurement : Snout to Vent 45 to 78 mm., tail 50 to 79..

Diagnostic Character : Moderately large house gecko, with 12 to 15 upper and 10 to 12 lower labials, 7 to 10 lamellae under the first and 11 to 14 under the fourth toe. Tail swollen at the base. Body greyish above with five greenish brown indistinct bands edged with white posteriorly. Belly white, scales with minute black dots.

Distribution : Valmiki Tiger Reserve Forest, Bihar, Elsewhere : This species occurs from the shores of the Red Sea and around the Coasts of Arabia and Iran, across northern India to West Bengal and south to the vicinity of Mumbai.

Remarks : It often in houses. It changes its colouration.

Status : Common.

5. *Hemidactylus frenatus* Dumeril & Bibron.

(South Asian Gecko)

1836. *Hemidactylus frenatus* Dumeril & Bibron *Erp. Gen. Paris* 3 : 366.

Material examined : Valmiki Tiger Reserve Forest, Bihar. *Manguraha*, 1 ex., 8.9.96, Coll. S. Sur & party.

Measurement : Snout to vent 30 mm, tail 32 mm.

Diagnostic character : Snout obtusely pointed, head rather large, 1st toeless than half of length of second; male with a continuous series of 23 or more preano-femoral pores; dorsal tubercles scattered or partly in linear arrangement or absent. Dark brownish dorsally and dirty whitish below. A dark stripe through the eye to the sides and groin. Flanks with dark spots.

Distribution : Valmiki Tiger Reserve Forest in Bihar. Elsewhere : Widely distributed in south India, Sri Lanka, Indo Malaya and Indo-China.

Remarks : It is a common house-gecko in south India. The species is recorded for the first time from Valmiki Tiger Reserve Forest.

Status : Common.

Family 3 : AGAMIDAE

Key to the genera of the family AGAMIDAE.

1. Body not depressed2.
2. Dorsal crest present, five toes only ..*Calotes*
* *Dorsal Crest absent, four toes only....Sitana*

Genus (3) : *Calotes Rafinesque*, 1815.

6. *Calotes versicolor* (Daudin)

(Common Garden Lizard)

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

1853. *Calotes Versicolor*, Jerdon, *J. Asiat. Soc. Beng.* 22 : 470.

Material examined : Valmiki Tiger Reserve Forest-Bihar : *Gonouli*, 2 ex., 8.11.95 & 14.9.96 *Gaunaha* 6 ex., 7.9.96, *Chanpatia*, 1 ex., 11.9.96, *Kotra*, 4.11.95, *Valmikinagar*, 1 ex., 12.11.95, *Thori*, 4 ex., 10.9.96. Coll. S. Sur & Party.

Measurement : Snout to vent 38 to 55 mm., tail 45 to 155 mm.,

Diagnostic Character : Body is laterally compressed, head oval, dorsal scales strongly keeled. Two distinct spines on each side of head

behind tympanum. Dorso-nuchal crest well developed extending from nape to above vent in the male. Tail long and rounded. Greyish brown above with dark transverse bars, belly whitish with dark streaks. Tail with dark brown cross bar. Head and shoulders of males turn orange or scarlet red. It exhibits considerable colour variation.

Distribution : Valmiki Tiger Reserve Forest in Bihar. Elsewhere : widely distributed throughout the Indian subcontinent and most of SE Asia.

Remarks : An arboreal diurnal lizard of gardens, hedges, scrubland and forest.

Status : The commonest lizard of India.

Genus (4) : SITANA CUVIER, 1829

7. *Sitana ponticeriana* Cuvier

(Fan-throated lizard)

1844. *Sitana ponticeriana* Cuvier *Reg. Anim Rept.* pl. 10 : fig. 2.

Material examined : Valmiki Tiger Reserve forest, Bihar. *Mangurah* : 1 ex., 5.9.96, *Valmikinagar*, 2 ex., 17.9.96, *Kothra* 1 ex., 18.9.96, *Chanpatia*, 2 ex., 8.9.96, Coll. S. Sur & party.

Measurement : Snout to Vent 25 to 35 mm., tail 55 to 60 mm.

Diagnostic character : A small lizard easily distinguished among the other agamid lizards by its four toes. Body compressed, dorsal scales pointing backwards and upwards, strongly keeled, no dorsal crest. Male with a gular pouch. Tail very long. Dorsally light or dark brown with a series of dark-brown, black edged rhomboidal spots on the back; belly whitish.

Distribution : Valmiki Tiger Reserve Forest, Bihar. Elsewhere : Whole of India up to the limit of the Ganges in the east. Out side India-Sri Lanka.

Remarks : Swift runner, inhabits all biotops except the heavy rainfall forest and deserts.

Status : Common.

Family 4 : SCINCIDAE

Key to the genera of the family Scincidae

1. Pterygoid bones separated from one another, the palated notch reaching towards to the level of the centres of the eyes*Mabuya*
Pterygoid bones not separated from one another, the palated notch not reaching towards to the level of the centres of the eyes2.

2. Limbs present, usually well developed, no supra nasal. Tympanum not exposed3.
Supra nasal present, limbs short or vestigial, body stout or elongated. Tympanum exposed ...*Riopa*.

3. Lower eyelid scaly*Sphenomorphus*
Lower eyelid with a more or less transparent disc..... *Scincella*

Genus (5) : MABUYA Rafinesque, 1826.

Key to the species of the genus *Mabuya*

Fronto-nasal broader than long*carinata*

Fronto-nasal not broader than long*macularia*

8. *Mabuya carinata* (Schneider)

(Common or Brahminy Skink)

1801. *Scincus carinatus* Schneider, *Hist. Amph.* 2 : 182.

1887. *Mabuya carinata* Boulenger, *Cat. Liz. Brit. Mus.* 3 : 181.

Material examined : Valmiki Tiger Reserve Forest, Bihar : *Valmikinagar*, 1 ex., 12.11.95, *Kothra*, 1 ex., 6.11.95, *Ganouli*, 1 ex., 10.11.95, Coll. S. Sur & Party.

Measurement : Snout to Vent 76 to 130 mm., tail 97 to 160 mm.

Diagnostic Character : Head shields arranged symmetrically, one pair of nuchals, Fronto-nasal broader than long. Dorsal and lateral scales subequal with 3 or 5 distinct keels; 30-34 scales round the body. Digits moderately long, with smooth or obtuse keeled lamellae, from 14-18 under the 4th toe. Adult light bronze above with 4-6 rows of black dots on the back. A light band from behind the eye to the base of the tail. Belly white or yellow.

Distribution : Valmiki Tiger Reserve Forest, Bihar. Elsewhere : widely distributed in the Indian peninsula, outside India-Sri Lanka, Nepal and Bangladesh.

Remarks : A terrestrial diurnal lizard.

Status : Very Common.

9. *Mabuya macularia* (Blyth)

(Bronze Grass Skink)

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

1887. *Mabuya macularia* Boulenger, *Cat. Liz. Brit. Mus.* 3 : 182.

Material examined : Valmiki Tiger Reserve Forest-Bihar *Valmikinagar*, 1 ex., 12.11.95, *Ganouli* 2 ex., 11.11.95 & 9.11.95, *Kothra*, 4 ex., 4.11.95, *Gobardhana*, 2 ex., 9.9.96, Coll. S. Sur. & party.

Measurement : Snout to vent 27-32 mm., tail 30-35 mm.,

Diagnostic character : Small size, supranasal absent, lower eyelid with large transparent disc. ear opening absent; 20 scales round the body; dorsal scales largest. Limbs short, pentadactyle. Tail with enlarged plater. Body olive-greenish above with shining metallic lustre. A light stripe from supraciliary edge to tail base. Tail pinkish.

Distribution : Valmiki Tiger Reserve Forest-Bihar. Elsewhere : Indian peninsula. Outside India : Pakistan, Sri Lanka, Bangladesh, South East and East Asia.

Remarks : It is terrestrial, diurnal, insectivorous in habit.

Status : Common.

Genus : *Riopa* Gray. 1839.

Key to the species of the genus *Riopa*

Lower eye lid scaly, ear opening with 1 or 2 minute lobules on anterior margin ...*albopunctata*
Lower eye lid with an undivided transparent disc..... *punctata*.

10. *Riopa albopunctata* Gray

(Brown Dwarf Skink)

1846. *Riopa albopunctata* Gray, *Ann. Nat. Hist.* 18 : 430.

Material examined : Valmiki Tiger Reserve Forest-Bihar. *Kothra*, 1 ex., 7.6.93. Coll. S. Chakraborty.

Measurement : Snout to vent 43mm., tail 51 mm.

Diagnostic Character : Limbs reduced, body elongated, lower eyelid scaly; nuchal indistinct. Ear opening distinct with 1 or 2 minute lobules on anterior margin. Tympanum deeply sunk. Body scales subequal or dorsal scales a little larger than the laterals, 12-15 lamellae under 4th toe. Tail thicker at base. Brown or reddish brown above, each scale with a distinct dark spot, forming longitudinal series. Yellowish white below.

Distribution : Valmiki Tiger Reserve Forest in Bihar. Elsewhere : Widely distributed in India from Kerala, Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, Bihar, Orissa, Bengal and Assam, Outside-Nepal.

Remarks : Lives under loose soil.

Status : Common.

11. *Riopa punctata* (Gmelin)

(Dotted Garden Skink)

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

1845. *Riopa punctata* Gray, *Cat. Liz. Brit. Mus.* : 96.

Material examined : Valmiki Tiger Reserve Forest, Bihar; *Valmikinagar*, 1 ex., date 12.11.95, *Kothra*, 5 ex., 4-7, 11-95 *Ganouli*, 3 ex., 8.11.95., Coll. S. Sur & party.

Measurement : Snout to vent 22 to 54 mm., tail 27 to 65 mm.,

Diagnostic character : Elongated snake like body with 5 fingers and 5 toes limbs. Lower eyelid with an undivided transparent disc. Body scales smooth, 24-22 scales round middle of body

and 62-76 scales down middle of back. Limbs not developed, 4th toe quite longer than 3rd, 11-14 lamellae under 4th toe. Tail thick at base. Colour brown above, each scale with a dark spot forming a longitudinal series; belly yellowish white.

Distribution : Valmiki Tiger Reserve Forest-Bihar, Elsewhere : Whole of India, except the north-east. Outside India-Sri Lanka, Tonking Man-soan Myanmar.

Remarks : Lives under loose soil, diurnal, insectivorous

States : Common.

Genus (7) : *Scincella* Mittleman, 1950.

12. *Scincella sikkimensis* (Blyth)

1854. *Mococa sikkimensis* Blyth *J. Asiat. Soc. Beng.* 22 : 652.

1952. *Scincella sikkimensis* Mittleman, *Smithsonian Misc. Coll. Washington*, 117 (17) : 30.

Material examined : Valmiki Tiger Reserve Forest-Bihar : Kothra, 1 ex., 7.11.95, Coll. S. Sur & party.

Measurement : Snout to vent 23 mm., tail 20 mm.

Diagnostic character : Dorsal scales distinctly large than laterals, 22 to 24 scales round the body, ear without projecting lobules ear-opening smaller than palpebral disc. the adpressed limbs do not meet or the leg may reach to the wrist; digits more compressed, 15 to 17 lamellae beneath the 4th toe. Bronze-brown above with black, sometimes with small gold spots or short streaks arranged in longitudinal series, a dark brown stripe along the upper part of the side of the head, neck and body, pale bluish or whitish below.

Distribution : Valmiki Tiger Reserve Forest-Bihar as mentioned in the material. Elsewhere : The Eastern Himalayas, North Bengal, Bihar. Outside India : Nepal, South Tibet.

Remarks : Oviparous laying 4 to 6 eggs. It is found 3,000 and 10,000 feet altitude.

Status : Common in the Eastern Himalayan area.

Genus (8) : *Sphenomorphus* Pope, 1935

13. *Sphenomorphus maculatum* (Blyth)

1853. *Lissonota maculata* Blyth *J. Asiat. Soc. Beng.* 22 : 653.

1935. *Sphenomorphus maculatus* C. H. Pope, *Rept. China* New York, 483.

Material examined : Valmiki Tiger Reserve Forest-Bihar, Kothra 1 ex./, 7.11.95. Coll. S. Sur & party.

Measurement : Snout to vent 46 mm., tail 34 mm.

Diagnostic character : Body not elongated, limbs well developed, rostral flat or concave prefrontals rather small, separated from one another, no nuchals; supra-orbital region prominent, 5 supra oculars, first longest, 5 the smallest, 10 to 12 supraciliaries; 2 loreals, tympanum not deeply sunk; 7 supralabials, the 5th and 6th below the eye, separated from it by small scales, 38 to 42 scales round the body. Tail tapering gradually to a point. The leg reaches to the elbow. Bronzy or brown above, whitish below.

Distribution : Valmiki Tiger Reserve Forest-Bihar, as mentioned in the material. Elsewhere : The Eastern Himalayas North Bengal, Assam & Andaman and Nicobar Island. Outside India. S.W. Yunnan, Myanmar and Siam.

Remarks : It is a common oviparous lizard of the Eastern Himalayas. The species is recorded for the 1st time from Valmiki Tiger Reserve Forest of Bihar.

Status : Common in the Eastern Himalayan range.

Suborder : SERPENTES

Family 5 : TYPHLOPIDAE

Genus (9) : *Ramphotyphlops* Fitzinger, 1843.

14. *Ramphotyphlops braminus* (Daudin)

(Common Blind Snake)

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

1966. *Ramphotyphlops braminus* Robb, *Ann. & Mag. nat. Hist.* 9 : 657-679.

Material examined : Valmiki Tiger Reserve Forest Bihar. *Valmikinagar*, 1 ex., 5.11.95 and *Gobardhana*, 1 ex., 9.9.96. Coll. S. Sur & party.

Measurement : Total length 115 mm. (Maximum).

Diagnostic character : Head bluntly rounded. Eyes indistinct. Rostral large, snout rounded; 4 upper labials, last two in contact with ocular. Nasal suture terminating at the edge of preocular. Body uniformly cylindrical. Tail very short ending in a small short stiff point 20 scales round the body. Colour brown or blackish brown above lighter below, snout, anal region and end of tail pale.

Distribution : Valmiki Tiger Reserve Forest, Bihar. Elsewhere : Throughout the Oriental region, Africa, Mexico and New Guinea. Introduced by human agency in several island of the Pacific.

Remarks : Lives beneath the soil or stones and debris. They have also been found in floodplain forest under logs and stones. Often seen inside houses. It is a blind non-poisonous snake and recorded 1st time from this locality.

Status : The most widespread species in the genus.

Family 6 : BOIDAE

Key to the genera of the Family BOIDAE

A supraorbital bone; teeth to the premaxilla; head covered with large shields; labials pitted*Python*. No supraorbital bone; No teeth on the premaxilla; head covered with small shields; labials not pitted.....*Eryx*.

Genus (10) *Python* Daudin, 1803

15. *Python molurus* (Linnaeus)

(Indian Rock Python)

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

1943. *Python molurus* Gray, *Zool. Misc.* London : 44.

Material examined : Seen in the field but not collected. Description based on literature.

Diagnostic Character : Head flattened with a long snout; neck distinct. Head covered with large shields; labials pitted. Nostril large, directed upwards and situated high on the snout. Rostral and first two labials with sensory pits. Eyes small, pupil vertical, iris flecked with gold. Chin with mental groove. Tail short and prehensile tapering abruptly. Colour greyish, whitish, or yellowish in adults and in the young often a very pretty shade of pink. A dark streak from eye to nostril in young may or may not be present in adult. A conspicuous dark, oblique band from eye to nape. On the back of head and nape is a large lance shaped mark with a pale centre, Often fading anteriorly in adult. The body with series of large, roughly quadrate patches from neck to tail dorsally.

Distribution : Valmiki Tiger Reserve Forest, Bihar. Elsewhere : The range of the nominate is confined to peninsular India to the extreme limit of Sind and Punjab in the north-west and to Bengal in the north-east. Also Sri Lanka, Bangladesh and Nepal.

Remarks : These large non-poisonous snakes inhabit dense as well as open forest with rocky outcrops near marshes and streams.

Status : Protected under Schedule I of the India Wild life Act. 1972.

Genus (11) *Eryx* Daudin, 1803

16. *Eryx Johnii johnii* (Russell)

(John's Sand Boa)

1801. *Boa Johnii* Russell, *Ind. Serp.* 2 : 18 & 20 Pls 16 & 17.

1943. *Eryx johnii* Smith, *Fauna Brit. ind.* 3 : 113-114.

Material examined : Valmiki Tiger Reserve Forest-Bihar : *Valmikinagar*, 1 ex., 13.11.95, Coll. S. Sur & party.

Measurement : Snout to vent 235 mm, tail 15mm.

Diagnostic Character : Head not distinct from neck, snout broad edge shaped, rostral shield wide and heavy, nostril slit like between enlarged nasals, upper labials 9 to 12, lower labials 13-18, mental groove present, no chin shields ; eye completely surrounded by 9 to 12 small scales, body robust, cylindrical with very little taper ; tail completely blunt. Body scale small, smooth. Head scales a little larger than back scales. Eye small ; pupil vertically elliptical ; iris spotted with ruddy gold. Tail short, stumpy, rounded at its end and in general form very similar to the head. Colour sandy grey or yellowish above, the scales edged with dark brown or entirely brown above, the scales edged with dark brown or entirely brown above ; uniform or with more or less distinct dark transverse bands ; these bands usually distinct on the tail ; lower parts whitish, spotted with dark brown or almost entirely brown.

Distribution : Bihar : Valmiki Tiger Reserve Forest, W. Champaran District, as stated in the material. Elsewhere : Widely distributed in the plains of the Indian subcontinent In hills, up to about 600m elevation.

Remarks : That the snake has two heads is belief held all over the country due to its stumpy rounded tail and in general form is similar to the head. It is a non poisonous snake and 1st time recorded from this locality.

Status : Recorded as common in some areas.

Family 7 : COLUBIDAE

Sub-family: COLUBRINAE

Key to the genera of sub family COLUBRINAE

1. All the teeth solid 2.
All the teeth not solid, last 2 or 3 maxillary teeth grooved 10.
2. Hypapophyses present throughout the vertebral column 3.
3. Dentary bone freely moveble on the articular ; 30 to 50 maxillary teeth present
Sibynophis

Dentary bone not freely movable on the articular ; usually less than 30 maxillary teeth 4.

4. Scales in 15 to 19 rows 5.
5. Internasal distinctly narrowed anteriorly
Xenochrophis.
Internasal broadly truncate anteriorly
Amphiesma.
6. Head elongate, distinct from neck 7.
7. Maxillary teeth 20-28 *Pryas*.
8. Maxillary teeth 18-20, subequal ; Scales in 17 rows..... *Chrysopelea*
9. Pupil vertical *Boiga*
10. Pupil horizontal *Dendrelaphis*

Genus (14) **Amphiesma** Dumeril & Bibron, 1854

19. *Amphiesma stolate* (Linnaeus)

(Striped keelback)

1758. *Coluber stolate* Linnaeus, *Syst. Nat.* 10th Ed : 219 and 12th Ed. 1966 : 379

1854. *Amphiesma stolatam*, Dumeril & Bibron. *Erp. Gen.* Paris, 7 (1) : 727.

Material examined : Valmiki Tiger Reserve Forest, Bihar : *Munguraha*. 2 ex., 8. 9.9.1996. Coll. S. Sur & party.

Measurement : Snout to vent 152 to 288 mm, tail 47 to 82 mm.,

Diagnostic Character : Internasal broadly truncate anteriorly ; nostrils slightly directed upwards. 8 upper labials. 3rd, 4th and 5th touching the eye. Nasals not touching the 2nd upper labials, rostral touching 6 shields, a single anterior temporal. Scales in 19 rows, strongly keeled, except the outer rows, which in smooth. Colour olivaceous brown. A pair of conspicuous bulf stripes covering one whole or two half rows of scales front neck or forebody to tip of tail. Head olivaceous-brown, whitish, yellowish, orange on tips. Belly white with some small scattered black spots.

Distribution : Valmiki Tiger Reserve Forest, West Champaran Dist. of Bihar : as mentioned in the material. Elsewhere : The whole of India.

Remarks : A remarkably inoffensive and gentle snake, common in fields, grassy and cultivated areas of open country during the rainy season. It is a non-poisonous snake and first time recorded from this locality.

Status : A common snake in the plains.

Genus (15) *Xenochrophis* Gunther, 1864.

20. *Xenochrophis piscator* (Schneider)

(Cheekered keelback)

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

1965. *Xenochrophis piscator*, Malnate and Minton, *Proc. Acad. Nat. Sci. Philadelphia* 117 : 19.

Material examined : Valmiki Tiger Reserve Forest, Bihar. Valmikinagar, 13.11.95. Coll. S. Sur & party.

Measurement : Snout to vent 430 mm. tail 215 mm.,

Diagnostic Character : Head slightly flattened, distinct from neck ; snout bluntly pointed, rostral wider than high. Internasal distinctly narrowed anteriorly ; nostril between nasals ; single large loreal ; eye moderate size, with round pupil, 9 supralabials, 4th & 5th touching the eye, the 6th excluded by the lowest postocular, Body stout ; scales in 19 rows, more or less distinctly keeled, except the outer one or two rows which are smooth. Colour yellowish or olivaceous above with black spots quincuncially arranged; belly uniform whitish or yellowish, head olive-brown above, with two oblique black streaks, one below, the other behind the eye. The dorsal spots are arranged in five series, namely, a vertebral 2 dorso-lateral and 2 lateral. Together they form a chess-board pattern.

Distribution : Valmiki Tiger Reserve Forest, Bihar : as mentioned in the material. Elsewhere : It is found throughout the Indian subcontinent

from Baluchistan to Assam and into upper Myanmar.

Remarks : Frequent water and is very common in tanks paddy fields pools and rivers. Non-poisonous snake and 1st recorded from this locality.

Status : The commonest freshwater snake.

Genus (13) *Ptyas* Fitzinger, 1843.

18. *Ptyas mucosus* (Linnaeus)

(Cheekered keelback)

1758. *Coluber mucosus* Linnaeus, *Mus. Ad. Frid. 1* : 37 and *Syst. Nat. Ed. 10.* 1758 : 226

1861. *Ptyas mucosus*, E.D. Cope *Proc. Acad. Nat. Sci. Philadelphia* 12 : 563.

Material examined : Valmiki Tiger Reserve Forest Bihar. Munguraha 1 ex., .9.1996. Coll. S. Sur & party.

Measurement : Standard length 1290 1335 mm.,

Diagnostic character : Maxillary teeth 20 to 28. Head long, distinctly wider than neck; snout bluntly pointed; rostral higher than wide; nostril between nasals and first upper labial; 3 loreals, 2 preocular, 2 postocular, 8 upper labials, 4th and 5th touching eye, 9 or 10 lower labials. Eyes large and lustrous. Scale rows at midbody 17 and 14 to 12 two head-lengths before vent. Body robust, compressed, tapering towards both ends. Tail cylindrical about one-fourth total. Colour olivaceous brown or dull tan to dark olive brown scales on the posterior part irregularly marginal with black forming a reticulate pattern to form crossbars. Lips and ventral scales marginal with black. Belly greyish white.

Distribution : Valmiki Tiger Reserve Forest, Bihar : as mentioned in the material. Elsewhere : Throughout the Indian sub-continent, Sri Lanka and Myanmar. In the west, extends to Afghanistan and Turkestan. In the east, to south China.

Remarks : Diurnal in habits but in populated areas may not be commonly seen during the day. It is a non-poisonous snake and 1st time recorded from this locality.

Status : A common snake in all parts of the country.

Genus (17) *Boiga* Fitzinger, 1826.

22. *Boiga trigonata* (Schneider)
(Indian Gamma or Cat Snake)

1802. *Coluber trigonatus* Schneider, in *Bechst. Transl Lacep.* 4 : 256.

1943. *Boiga trigonata*, Smith, *Fauna Brit. Ind.* 3 : 349-350.

Material examined : Valmiki Tiger Reserve Forest, Bihar. *Munguraha* 1 ex., 9.9.1996, and *Gounaha*, 2 ex., 6.9.96., Coll. S. Sur & party.

Measurement : Snout to vent 305 to x 610 mm. tail 73 to 137 mm, Standard length 450-470 mm.

Diagnostic Character : Head triangular, much wider than thin neck, rather flat, rostral strongly concave below, slightly wider than high; nostril large between nasals; loreal present; eye large, with vertically elliptical pupil, 1 preocular and 2 postoculars; 8 supra labials, 3rd 4th and 5th touching eye. 10-11 lower labials. Scales in 21 : 21 : 15 rows. Ground colour yellowish brown, sandy or fawn, uniform or mottled with darker shades. Dorsally a series of dark 'Y' shaped mark which meet at the centre and resemble arrowheads. The marking fade before or at the vent. Belly white. Head with a pair of lung-shaded brown patches often bordered with black. A narrow dark streak from behind eye to gape.

Distribution : Valmiki Tiger Reserve Forest Bihar : as mentioned in the material. Elsewhere : The whole of the peninsular India to Baluchistan (Pakistan) in the west to Assam in the east. Sri Lanka, Nepal and Bangladesh.

Remarks : Essentially arboreal, frequenting bushes, scrub or trees, usually close to ground. It is a non poisonous snake and 1st time recorded from this locality.

Status : A fairly common snake in India ascending up to about 150 m.

Genus (12) *Sibynophis* Fitzinger, 1843.

17. *Sibynophis sagittarius* (Cantor)
(Cantor's Black Headed Snake)

1839. *Calamaria sagittaris* Cantor, *Proc. Zool. Soc. London* : 49.

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

Material examined : Valmiki Tiger Reserve Forest, Bihar : *Valmikinagar*, 1 ex., 7.11.1995. Coll. S. Sur & party.

Measurement : Snout to vent 180 mm., tail 51 mm.

Diagnostic Character : Snout broad and more rounded, 7 supralabials. 3rd and 4th touching eye; parietal touches both postoculars. Colour light brown above, with a vertebral series of black dots; greyish brown on the sides, the colour occupying four scale rows, and bordered above with black; head nape dark brown or black, with a larger elongate oval patch of yellow on each side of the back of the head. Lower parts yellow, with a black dot on the outer edge of each ventral scale.

Distribution : Valmiki Tiger Reserve Forest, Bihar, as mentioned in the material. Elsewhere : North-eastern India from the Central and Northern India to Bangladesh.

Remarks : It is a non poisonous snake and 1st time recorded from this locality.

Status : Indeterminate.

Genus (19) *Chrysopelea* Boie, 1826.

24. *Cyrysopelea ornate* (Shaw)
(Golden Tree Snake)

1802. *Coluber ornatus* Shaw, *Gen. Zool. London* 3 (2) : 477.

1807. *Chrysopelea ornata*, Boie, *Isis, Oken Jena* 20 : Col. 546.

Material examined : Valmiki Tiger Reserve Forest, Bihar : *Valmikinagar* : 1 ex., 18.9.1996. Coll. S. Sur & party.

Measurement : Snout to vent 431 mm., tail 142 mm.,

Diagnostic Character : Head distinct from neck; eye large with round pupil; internasals shorter than the prefrontals; loreal elongate; 1 large preocular; 2 postoculars; temporals 2+2; 9 supralabials, 4th just touching, 5th and 6th below the eye; last ventral shield divided, colour green above, each scale with a black median line; a series of large reddish or orange vertebral spots present.

Distribution : Valmiki Tiger Reserve Forest, Bihar as stated in the material : Orissa Western Ghats. Elsewhere : The whole of the Indo-chinese region.

Remarks : It is a common snake with diurnal habits and found in human habitations.

Status : Common.

Genus (18) **Dendrelaphis** Boulenger, 1890.

23. **Dendrelaphis pictus** (Gmelin)

(Painted Bronze-back)

1758. *Coluber aheatulla* Linnaeus, *Syst. Nat.* Ed. 10 : 225.

1934. *Dendrelapis pictus*, Mertens, *Arch. Hydrobiol.*, Stuttgart 12(4) : 693.

Material examined : Valmiki Tiger Reserve Forest Bihar : *Munguraha* 1 ex., 10.9.1996, Coll. S. Sur & party

Measurement : Snout to vent 305 mm., tail 98mm.,

Diagnostic Character : Snout broadly rounded; internasals usually a little shorter than the prefrontals; temporals 1+2; 9 supralabials 4th touching, 5th and 6th below the eye; vertebral scales enlarged not broader at mid-body than the scales of the outer row. Scales in the 15 rows; a black temporal stripe present.

Distribution : Valmiki Tiger Reserve Forest, Bihar, as mentioned in the material. Elsewhere : The whole of the Indo-chinese region from Bengal

and the Eastern Himalayas to Southern China. Common in many places, both in the hills and in the plains.

Remarks : It is a non poisonous snake and 1st time recorded from this locality.

Status : Common.

Genus (16) **Lycodon** Boie, 1836.

21. **Lycodon striatus** (Shaw)

(Shaw's Wolf Snake)

1802. *Coluber striatus* Shaw, *Gen. Zool.* 3 : 527.

1870. *Lycodon striatus*, Stoliczka, *J. Asiat. Soc. Beng.* 29 : 200.

Material examined : Valmiki Tiger Reserve Forest, Bihar : *Munguraha* 1 ex., 20.9.96, Coll. S. Sur & party.

Measurement : Snout to vent 250 mm., tail 50 mm.,

Diagnostic Character : Snout projecting beyond the lower jaw; anterior nasal larger than the posterior; loreal in contact with the internasal, not touching the eye; a preocular. 8 supralabials. 17 scales round the mid body. Colour dark brown with 13 white crossbars on body which divide on the sides to enclose triangular spots of the body colour. Belly and upper lip white.

Distribution : Valmiki Tiger Reserve Forest, Bihar. as stated in the material. Elsewhere : Peninsular India, Westwards to Iran and to the East up to Bihar. Also Sri Lanka.

Remarks : A timid snake which hides its head beneath its coil if disturbed. It is a non poisonous snake and 1st time recorded from this locality.

Status : Indeterminate.

Family 8 : ELAPIDAE

Key to the genera of the family ELAPIDAE

1. Maxillary bone extending forwards beyond the palatine 2
- Maxillary bone not extending forwards beyond the palatine *Bungarus*.

2. Vertebral series of scales enlarged
Ophiophagus. Vertebral series of scales not
 enlarged 3.

3. Scales in 15-25 rows on the body; scales
 oblique *Naja*.

Genus (20) *Bungarus* Daudin, 1803.

25. *Bungarus fasciatus* (Schneider)

(Banded Krait)

1801. *Pseudoboa fasciatus* Schneider, *Hist. Amph.*
 2 : 283.

1803. *Bungarus fasciatus*, Daudin, *Hist. Nat. Rept.*
 5 : 263.

Material examined : Valmiki Tiger Reserve
 Forest, Bihar. *Munguraha*, 1 ex., 10.9.1996, Coll.
 S. Sur & party.

Measurement : Snout to vent 470 mm, tail
 48 mm.,

Diagnostic Character : Head broad and
 depressed, snout short, eye black, pupil very faintly
 outlined in yellow. Neck distinct. Body smooth
 and glossy. A prominent ridge down the back and
 tail ending bluntly, usually more or less swollen
 at the tip. Alternately banded with black and
 yellow bands, completely encircling the body. Nape
 has large, elongate, black patch, rounded behind.
 Top of the head with a yellow 'V' mark.

Distribution : Valmiki Tiger Reserve Forest,
 Bihar, as mentioned in the material. Elsewhere :
 North-east Peninsular India, the southern most
 record being Hyderabad. Also found in Assam
 and Bangladesh. Occurs throughout the Indo-
 chinese subregion.

Remarks : It is a poisonous snake in nocturnal
 habit. Frequents moist places and the vicinity
 water. First time recorded from this locality.

Status : Common in some parts of its
 distributional range.

Genus (2): NAJA LAURENTI, 1768

26. *Naja naja* (Linnaeus)

(Indian Cobra)

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

1907. *Naja naja* Stejneger, *Bull. U. S. Natl. Mus.*,
 Washington, 58 : 394.

Material examined : Valmiki Reserve Forest,
 Bihar. *Munguraha*, 2 ex., 6.9.1996, Coll. S. Sur
 & party.

Measurement : Snout to vent 327 to 770 mm.,
 tail 46 to 147 mm.,

Diagnostic Character : Head depressed with
 short, rounded snout. Nostrils large, pupil round.
 Head shields glossy, body with a more or less
 distinct groove down the spine; 1 preoculars and
 3 postoculars. 7 upper labials, 3rd largest, touching
 both nasal and eye. 8 lower labials, small triangular
 shield (cuncate) between 4th and 5th lower labial
 at oral margin. Scale rows across widest part of
 hood usually 25 and 13-15 rows just anterior to
 vent. Extremely variable in coloration and
 markings. Three races are recognised on the basis
 of hood pattern. Indian cobras generally buff,
 brown or black in colour. The dorsal pattern
 usually consists of light or dark bands, cross-bars,
 variegations or reticulations which disappear as
 age advances.

Distribution : Valmiki Tiger Reserve Forest,
 Bihar. as mentioned in the material. Elsewhere :
 occurs from Indian subcontinent to Southern
 China in the East to the Phillipines; South
 Andaman, Sri Lanka.

Remarks : This species is found in all types
 of vegetation Plains, Jungles, open fields and even
 in the areas heavily populated by man. Frequently
 found near or in water. A strong swimmer.

Status : Common.

Genus (22) : *Ophiophagus* Gunther, 1842.

22. *Ophiophagus hannah* (Cantor)

(Hamadryad; King Cobra)

1836. *Hamadryas hannah* Cantor, *Asiat. Research.*
 19 (1) : 87.

1945. *Ophiophagus hannah* Bogert, *Copeia*, Ann. Arbor : 47.

Material examined : Material not collected but seen in the Valmiki Forest Range. Description based on literature.

Description : Head flat; snout rounded and eyes with moderately round pupil, Scales smooth, oblique, those of the vertebral series and the outer 2 rows larger than the others, 17 or 19 rows upon the neck, 15 at mid-body and in front of the vent. In the anterior part of the body only the vertebral rows of scales is enlarged; in the hinder part of the body the median three rows may be enlarged. The overall colouration is olive green or yellowish but the tail is almost entirely jet black. The lower surfaces are whitish. Head olivaceous brown.

Distribution : Valmiki Tiger Reserve Forest area, Bihar.

Elsewhere : In the Peninsular India it occurs in the dense forests of Western Ghats and in the forest of the hills, plains, estuaries of Orissa, Bengal Assam and Andamans.

Remarks : It is a deadly poisonous snake and diurnal in habits. Its main diet snakes. All species including poisonous snakes being taken.

Status : Not a common snake in India. The species is listed in Schedule I of the Indian Wildlife (Protection) Act of 1972.

SUMMARY

This paper deals with 27 species of reptiles, including 14 species of snakes (11 non-poisonous and three poisonous) in 14 genera; 12 species of lizards in seven genera; and one species of turtle, collected during 1995-96 from Valmiki Tiger Reserve, Bihar. Most of the species are being reported for the first time from the area. A dichotomous identification key to the 27 species is also provided.

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INSECTA : HEMIPTERA

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Valmiki Tiger Reserve in the District of West Champaran of Bihar, was not surveyed previously for its faunal wealth until recently it was done by the survey parties from Zoological Survey of India, Calcutta, under the Fauna of conservation area project.

The present paper is dealt with Hemipteran insects of the Valmiki Tiger Reserve, Bihar which comprises 35 species belonging to 32 genera distributed over 10 families of the order Hemiptera.

Diagnostic characters and distribution of each species have been provided in the present study. It also has included the keys for suborders and families of Hemiptera found in the said reserve. All the species constitute new locality records from the District of West Champaran including the Valmiki Tiger Reserve, Bihar.

The present study will increase our knowledge of the fauna of Hemiptera from Bihar. Proper survey and study in the area may reveal more faunal diversity of Hemiptera which are yet to be known.

Classified list of Hemiptera from Valmiki Tiger Reserve, Bihar

Suborder 1. HOMOPTERA

Family 1. CICADIDAE

Genus 1. *Balinta* Distant

1. *Balinta octonotata* (Westwood)

Genus 2. *Huechys* Amy. & Serv.

2. *Huechys sanguinea* (De Geer)

Genus 3. *Haphsa* Distant

3. *Haphsa velitaris* (Distant)

Genus 4. *Platypleura* Amy. & Serv.

4. *Platypleura polita* (Walker)

Family 2. CERCOPIDAE

Genus 5. *Abidama* Distant

5. *Abidama producta* (Walker)

Genus 6. *Clovia* Stal

6. *Clovia puncta* (Walker)

Family 3. FULGORIDAE

Genus 7. *Alcathous* Stal

7. *Alcathous fecialis* Stal

Genus 8. *Pyrilla* Stal

8. *Pyrilla purpusilla* Walker

Suborder 2. HETEROPTERA

Series 1. GEOCORISAE

Family 4. COREIDAE

Genus 9. *Clavigralla* Spin.

9. *Clavigralla gibbosa* Spin.

Genus 10. *Cletus* Stal

10. *Cletus bipunctatus* (Westwood)

Genus 11. *Leptocorisa* Latr.

11. *Leptocorisa acuta* (Thunberg)

- Genus 12. *Riptortus* Stal
12. *Riptortus fuscus* (Fabricius)
13. *Riptortus linearis* (Fabricius)
- Family 5. LYGAEIDAE
- Genus 13. *Horridipamera* Malipatil
14. *Horridipamera nietneri* (Dohrn)
- Genus 14. *Metochus* Scott
15. *Metochus uniguttatus* (Thunb.)
- Genus 15. *Paromius* Fieber
16. *Paromius exiguus* (Dist.)
- Genus 16. *Rhyparotheres* Scudder
17. *Rhyparotheres sparsus* (Dist.)
- Family 6. PENTATOMIDAE
- Genus 17. *Agonoscelis* Spin.
18. *Agonoscelis nubila* (Fabr.)
- Genus 18. *Amauropepla* Stal
19. *Amauropepla denticulata* Hagl.
- Genus 19. *Eusarcocoris* Distant
20. *Eusarcocoris guttiger* (Thumb.)
21. *Eusarcocoris ventralis* (Westwood)
- Genus 20. *Macroscytus* Fieber
22. *Macroscytus subaenus* (Dallas)
- Family 7. PYRRHOCORIDAE
- Genus 21. *Antilochus* Stal
23. *Antilochus coqueberti* (Fabr.)
- Genus 22. *Dysdercus* Amy. & Serv.
24. *Dysdercus koenigii* (Fabricius)
- Genus 23. *Physopelta* Amy. & Serv.
25. *Physopelta gutta* (Burmeister)

26. *Physopelta schlanbuschi* (Fabricius)

Family 8. REDUVIIDAE

Genus 24. *Ectomocoris* Mayr

27. *Ectomocoris atorx* (Stal)

Genus 25. *Ectrychotes* Burm.

28. *Ectrychotes pilicornis* (Fabricius)

Genus 26. *Leptocephala* Lap.

29. *Leptocephala guerini* Lap.

Genus 27. *Pirates* Serv.

30. *Pirates affinis* Serv.

Genus 28. *Polididus* Stal

31. *Polididus armatissimus* Stal

Genus 29. *Sirthena* Spin.

32. *Sirthena flavipes* (Stal)

Genus 30. *Sycanus* Amy. & Serv.

33. *Sycanus varsicolor* Dohrn

Series 2. HYDROCORISAE

Family 9. BELOSTOMATIDAE

Genus 31. *Diplonychus* Laporte

34. *Diplonychus molestus* (Dufour)

Family 10. NEPIDAE

Genus 32. *Laccotrephes* Stal

35. *Laccotrephes ruber* (Linn.)

Key to the suborders and families of the order Hemiptera found in Valmiki Tiger Reserve, Bihar.

1. Head deflexed, gular region small and membranous, or wanting ; the fore pairs of wings usually of uniform consistency throughout ; pronotum small ; trochantines large ; base of rostrum extending between anterior coxae ; tarsi 1-3 segmented.
Suborder Homoptera 2

- Head porrect, gular region sclerotized ; forewings usually sclerotized basally and membranous ; apically pronotum large ; trochantines small ; base of rostrum not touching anterior coxae ; tarsi commonly 3 segmented..... Suborder Heteroptera 4
2. Head with three ocelli and distinct frons Cicadiadae
-head with two ocelli and frons not distinct, 3
3. Tegulae usually present, 1A and 2A of fore wings joined apically to form a "Y" vein ; hind coxae immobile ; antennal pedicel with numerous sensilla and a large sense organ on basal segment of flagellum. Fulgoridae
Tegulae absent, 1A and 2A of fore wings not forming a "Y" vein ; hind coxae mobile ; hind legs with tibiae elongate and bearing one or two large lateral spines and double apical group of small spines Cercopidae
4. Generally terrestrial Heteroptera ; antennae longer than head, gula with rostral groove ; legs not modified for swimming Series Geocorisae — 5
Aquatic Heteroptera ; antennae shorter than head and usually concealed beneath it, gula flat without rostral groove ; hind legs modified for swimming. Series Hydrocorisae — 9
5. Scutellum reaching at least to the base of the membrane or at least half as long as the abdomen sometimes covering the whole of the abdomen and anal appendages
Pentatomidae
Scutellum neither reaching to the base of the membrane nor to the middle of the abdomen 6
6. Rostrum not bent at the base lying in repose against the under surface of head 7
Rostrum stout, bent at base as in repose, it does not lie against the under surface of head ; hemelytra complete, membrane distinct
Reduviidae

7. Antennae elongate, usually four jointed, inserted on the upper portion of the sides of the head ; legs moderate, apices of the femora not nodulose Coreidae
Antennae inserted below a line from the centre of the eye to the apex of the face — 8
8. Ocelli present Lygaeidae
Ocelli absent Pyrrhocoridae
9. Head somewhat elongated, oval but not triangular in shape ; abdomen with a pair of long, slender, non retractile posterior appendages ; hind coxae short, free and rotatory Nepidae
Head nearly triangular anteriorly, abdomen with a pair of short, flat, retractile posterior appendages; hind coxae broadly jointed to the thoracic pleura Belostomatidae

Family 1. CICADIDAE

Genus 1. *Balinta* Distant

1905. *Balinta* Distant, *A. M. N. H.*, (7) 15 : 383.

1. *Balinta octonotata* (Westwood)

1842. *Cicada octonotata* Westwood, *Arc. Ent.*, 2 : 34.

1906. *Balinta octonotata* : Distant, *Fauna Brit. India Rhynohota*, 3 : 148.

Material examined : 1 ex., Madanpur, 88 km., N. W. of Bettiah ; West Champaran, 12. vi. 1993, coll. S. Chakraborty.

Diagnostic character : Head black with the basal margin of front and vertex dark ochraceous, two central angulated fasciae to mesonotum connected with the cruciform elevation, abdomen reddish ochraceous ; tegmina dark shining fuscous with four pale creamy spots, situate one near base, two at the centre, and one near costal apex; wings sanguineous with the apical and posterior margin fuscous.

Length : ♂ : Expansion tegmina 60 to 64 mm. Excluding tegmina 25 to 27 mm.

Distribution : Bihar (West Champaran) ;

Assam; Sikkim. Elsewhere : Myanmar.

Genus 2. *Huechys* Amy. and Serv.

1843. *Huechys* Amy & Serv., *Hem.*, : 464.

2. *Huechys sanguinea* (Da Geer)

1773. *Cicada sanguinea* De Geer, *Mem.*, 3 : 221.

1906. *Huechys sanguinea* : Distant, *Fauna Brit. India. Rhynchota* 3 : 157.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 5. vi. 1993, coll. S. Chakraborty.

Diagnostic characters : Body black, two large spots to mesonotum and abdomen sanguineous, base of the abdomen black ; tegmina black, wings fuscous interior and anal area paler, rostrum passing the intermediate coxae.

Length : Expansion tegmina : 43 to 65 mm. Excluding tegmina 17 to 25 mm.

Distribution : Bihar (West Champaran) ; Assam ; West Bengal. Elsewhere : Borneo, Malay Peninsula, Sumatra.

Genus 3. *Haphsa* Distant

1905. *Haphsa* Distant, *A. M. N. H.*, (7) 15 : 64.

3. *Haphsa valitaris* (Distant)

1897. *Cosmopsaltria valitaris* Distant, *A. M. N. H.*, (6) 20 : 18.

1906. *Hapsa valitaris* : Distant, *Fauna Brit. India, Rhynchota* 3 : 100.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 5. vi. 1993, coll. S. Chakraborty.

Diagnostic characters : It differs from its closely allied species *H. nicomache* by the greater length of rostrum which passes the posterior coxae; the dorsal surface of the abdomen is more black and less castaneous than *H. nicomache*.

Length : Expansion tegmina : 80 mm. Excluding tegmina 27 mm.

Distribution : Bihar (West Champaran).

Genus 4. *Platypleura* Amy. & Serv.

1843. *Platypleura* Amy. & Serv., *Hem.*, : 465.

4. *Platypleura polita* (Walker)

1850. *Oxypleura polita* Walker, *List. Hom.*, 1 : 29.

1906. *Platypleura polita* : Distant, *Fauna Brit. India, Rhynchota*, 3 : 61.

Material examined : 1 ex., Madanpur, 88 km. N. W. of Bettiah ; West Champaran, 12. vi. 1993, coll. S. Chakraborty.

Diagnostic characters : Tegmina and wings pale hyaline, and with transverse veins at bases of apical areas ; head, pro and mesonotum brownish ochraceous ; pronotum with one or two central spots and incisures black, mesonotum with four subconical spots, a central lanceolate spot, and two small black spots in front of cruciform elevation a fascia between eyes and interior area of the opercula black, abdomen black with the tympanal coverings, a spot on each side of anal segment ochraceous.

Length : Expansion tegmina 70 mm. Excluding tegmina 23 mm. Width between pronotal angles : 12 to 12.5 mm.

Distribution : Bihar (West Champaran) ; Kerala.

Family 2. CERCOPIDAE

Genus 5. *Abidama* Distant

1908. *Abidama* Distant, *Fauna Brit. India, Rhynchota*, 4 : 114.

5. *Abidama producta* (Walker)

1851. *Sphenorhina producta* Walker, *List. Hom.*, 3 : 696.

1908. *Abidama producta* : Distant, *Fauna Brit. India. Rhynchota*, 4 : 114.

Material Examined : 1 ex., Govardhana, West Champaran, 31.x.1994, coll. T. P. Bhattacharyya and party.

Diagnostic characters : Head, pronotum, body beneath black, apex of scutellum and tegmina

rufotestaceous, the apical margin of later broadly black, metasternum and legs dark sanguineous ; face laterally and longitudinally striate.

Length : Including tegmina 7 to 9 mm.

Distribution : Bihar (West Champaran) ; Assam ; Bengal ; Maghalaya. Elsewhere ; Myanmar.

Genus 6. *Clovia* Stal

1866. *Clovia* Stal, *Hem. Afr.*, 4 : 75.

6. *Clovia puncta* (Walker)

1851. *Ptyelus puncta* Walker, *List. Hom.*, 3 : 718.

1908. *Clovia puncta* : Distant, *Fauna Brit. India. Rhynchota*, 4 : 94.

Material examined : 4 exs., Manguraha, West Champaran, 24.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Pale tawny brown ; tegmina with a small black spot at posterior angle of inner margin ; head a little shorter than the medial length of pronotum, anterior central area with three pale longitudinal lines, a piceous spot behind each anterior coxae.

Length : 6 mm.

Distribution : Bihar (West Champaran) ; Gujarat ; Maharashtra ; Sikkim ; West Bengal.

Family 3. FULGORIDAE

Genus 7. *Alcathous* Stal

1863. *Alcathous* Stal. *Jr. E. S.*, (3) 1 : 577.

7. *Alcathous feicalis* Stal

1863. *Alcathous feicalis* Stal, *Jr. E. S.*, (3) 1 : 577.

1906. *Alcathous feicalis* : Distant, *Fauna Brit. India. Rhynchota*, 3 : 197.

Material examined : 1 ex., Tribeni, 11 km. of Ganauli, West Champaran, 10.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Cephalic process a little recurved, tegmina ochraceous, venation purplish red, apical third of tegmina reticulate,

basal area spotted with fuscous, costal area spotted with dark fuscous, wings orange yellow with a few discal fuscous spots near anal area, abdomen above bright reddish ochraceous with six black spots, beneath pale luteous ; legs ochraceous annulated with piecous.

Length : Tip of cephalic process to apex of abdomen 15 mm. Expansion Tegmina 3 mm.

Distribution : Bihar (West Champaran) ; South India.

Genus 8. *Pyrilla* Stal

1859. *Pyrilla* Stal, *Berliner. Ent. Zeit.*, 3 : 326.

8. *Pyrilla perpusilla* (Walker)

1851. *Pyrops perpusilla* Walker, *List. Hom.*, 2 : 296.

1950. *Pyrilla perpusilla* : Qadri and Aziz, *Publ. Aligarh Muslim Univ. (Zool. Ser.)* 2 : 1-33.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 5.vi.1993, coll. S. Chakraborty, and party.

Diagnostic characters : Dorsal ridge of the cephalic process is less prominent in front of central ridge than behind ; body and legs ochraceous ; tegmina yellowish white with apical area and outer claval margin spotted with black spots.

Length : Expansion tegmina 18 mm. Excluding tegmina 19 mm.

Distribution : Bihar (West Champaran) ; Madhya Pradesh ; Maharashtra ; Orissa ; Tamil Nadu ; West Bengal.

Family 4. COREIDAE

Genus 9. *Clavigralla* Spin.

1837. *Clavigralla* Spin., *Ess.*, : 200

9. *Clavigralla gibbosa* Spin.

1837. *Clavigralla gibbosa* Spin., *Ess.*, : 202

1904. *Clavigralla gibbosa* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 401.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Belliah, West Champaran ; 8.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Ochraceous, punctate ; pronotum conically tuberculate on disk, the lateral angle produced into active black spines directed a little forward and upward, membrane pale hyaline, legs luteous posterior femora spined beneath near apices, a faint central, castaneous annulation to tibiae, posterior area of pronotum, apical area of corium and spots on connexivum castaneous.

Length : 8-10 mm. Width between pronotal angles 4-5 mm.

Distribution : Bihar (West Champaran) ; Karnataka ; Maharashtra.

Genus 10. *Cletus* Stål

1859. *Cletus* Stal, *Freg. Eug. Resa. Ins. Hem.*, : 236.

10. *Cletus bipunctatus* (Westwood)

1842. *Coseus bipunctatus* Westwood, *Hope Cat.*, 2 : 23.

1904. *Cletus bipunctatus* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 393.

Material examined : 7 exs., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 8.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Ochraceous to pale ochraceous, corium roseate with its lateral margin and a small spot on inner apical margin connexivum pale luteous ; pronotum with posterior area roseate and lateral angles shortly and acutely produced ; abdomen above ochraceous with black transverse markings on basal area, antennae reddish ochraceous with apical joint fuscous.

Length : 9-10 mm. Width between pronotal angles 3.5 to 4 mm.

Distribution : Bihar (West Champaran) ; Karnataka ; Maharashtra ; West Bengal. Elsewhere ; Myanmar, Sri Lanka.

Genus 11. *Leptocoris* Latr.

1825. *Leptocoris* Latr., *Fam. Nat.*, : 421.

11. *Leptocoris acuta* (Thumb.)

1783. *Cimex acuta* Thumberg, *Nov. ins. Sp.*, 2 : 34.

1904. *Leptocoris acuta* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 410.

Material examined : 8 exs., Govardhana, West Champaran, 24.x.1994, coll. T. P. Bhattacharyya and party ; 1 ex., Manguraha, West Champaran, 23-24.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Body beneath pale greenish above brownish olivaceous ; antennae fuscous, base of the 2nd, 3rd and 4th joints luteous ; a small tubercle near each lateral pronotal angle and a central carinate line to pronotum.

Length : 13-15 mm.

Distribution : Bihar (West Champaran) ; West Bengal. Elsewhere. China, Malayan archipelago.

Genus 12. *Riptortus* Stål

1950. *Riptortus* Stal, *Ofv. Vet. AK. Forh.*, : 460.

12. *Riptortus fuscus* (Fabricius)

1798. *Lygaeus fuscus* Fabricius, *Ent. Syst. Suppl.*, : 539.

1904. *Riptortus fuscus* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 414.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 6.vi.1993, coll. S. Chakraborty.

Diagnostic characters : This species differs from *R. pedestoris* by the partial or total absence of the pale laevigate sternal spots ; posterior margin of pronotum and a lateral fascia on each side of the head not extending beyond base of antennae, lateral pronotal spines black.

Length : 13-17 mm. width between pronotal angles 3-4 mm.

Distribution : Bihar (West Champaran), Karnataka, Maharashtra, West Bengal. Elsewhere ; Myanmar, Sri Lanka, Malay Peninsula.

13. *Riptortus linearis* (Fabricius)1775. *Lygaeus linearis* Fabr., *Syst. Ent.*, : 710.1904. *Riptortus linearis* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 415.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 5.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Dark yellowish brown ; the apex of the scutellum and a spot at the middle of the posterior pronotal angle pale luteous ; lateral pronotal spine small, less acute and disk with no distinct rugosity ; posterior femora with a ventro-lateral row of spines.

Length : 14-16 mm. width between pronotal angles 3 to 3.5 mm.

Distribution : Bihar (West Champaran) ; Karnataka ; West Bengal. Elsewhere ; Myanmar, Sri Lanka.

Family 5. LYGAEIDAE

Genus 13. *Horridipamera* Malipatil1978. *Horridipamera* Malipatil, *Aust. J. Zool.*, Suppl. Series No. 56 : 89.14. *Horridipamera nietneri* (Dohrn)1860. *Plociomerus nietneri* Dohrn, *Ent. Zeit.*, 21 : 404-405.1988. *Horridipamera nietneri* : Mukhopadhyay, *Rec. zool. Surv. India. Occ. Paper No.* 107.

Material examined : 4 exs., Govardhana, West Champaran, 29-31.x.1994, coll. T. P. Bhattacharyya and party.

Diagnostic characters : Head, scutellum and anterior lobe of pronotum black ; two small greyish white spot a little before apical angle of corium lateral margin of which luteous, bases of intermediate and posterior femora, tibiae, apices of anterior femora and base of tarsi and apex of scutellum, luteous.

Length : 6.5-7 mm.

Distribution : Bihar (West Champaran) ; West Bengal.

Remarks : This species is known to occur in tiller of *Ficus bengalensis* and on grass. Colour varies from deep castaneous to fuscous.

Genus 14. *Metochus* Scott1847. *Metochus* Scott, *Ann. Mag. Nat. Hist.*, (4) 14 : 433-434.15. *Metochus uniguttatus* (Thumb.)1822. *Pendulinus uniguttatus* Thumb., *Hem. rostr. Cap.*, 4 : 6.1988. *Metochus uniguttatus* : Mukhopadhyaya, *Rec. zool. Surv. India, Occ. paper No.* 107 : 56.

Material examined : 2 exs., 11 km. N. E. of Ganauli, West Champaran, 10.i.1993, coll. S. Chakraborty.

Diagnostic characters : Piceous ; antennae, tibiae and tarsi, brownish ochraceous, corium ochraceous, a transverse fasciae near inner angle and apical margin black ; a central spot on posterior lobe of pronotum and strongly constricted near middle, membrane fuliginous, speckled with ochraceous and a same spot at the apical angle of corium.

Distribution : Bihar (West Champaran) ; Assam ; Andaman ; Karnataka ; Meghalaya. Elsewhere : Myanmar, China, Malay.

Genus 15. *Paromius* Fieber1860. *Paromius* Fieber, *Eur. Hem.* : 45, 170-171.16. *Paromius exiguus* (Distant)1883. *Pamera exigua* Distant, *Trans. Ent. Soc. Lond.*, : 434.1988. *Paromius exiguus* : Mukhopadhyay, *Rec. zool. Surv. India, Occ. paper No.* 107 : 63.

Material examined : 7 exs., Govardhana, West Champaran, 27-31.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Anterior lobe of pronotum is shorter and elongate than the allied species *P. scychellesus*, femora, body beneath piceous ; membrane pale fuscous, veins greyish, antennae infuscated.

Length : 7 mm.

Distribution : Bihar (West Champaran).

Genus 16. *Rhyparothesus* Scudder

1962. *Rhyparothesus* Scudder, *Can. Ent.*, **95** : 983.

17. *Rhyparothesus sparsus* (Distant)

1904. *Aphanus sparsus* Distant, *Fauna Brit. India, Rhynchota*, **2** : 81.

1988. *Rhyparothesus sparsus* : Mukhopadhyay, *Rec. zool. Surv. India, Occ. Paper* No. 107 : 54.

Material examined : 4 exs, Govardhana, West Champaran, 28-29.x.1994, coll. T. P. Bhattacharyya and party.

Diagnostic characters : Piceous, speckled with ochraceous ; pronotum broad, lateral margin amplified, a little recurved, lateral margin of corium speckled with ochraceous ; apex of scutellum ochraceous ; membrane fuliginous, basal area piceous apical area mottled with fuscous.

Length : 7 mm.

Distribution : Bihar (West Champaran) ; Maharashtra.

Family 6. PENTATOMIDAE

Genus 17. *Agonoscelis* Spin.

1837. *Agonoscelis* Spin., *Ess.*, : 327.

18. *Agonoscelis nubila* (Fabricius)

1775. *Cimex nubila* Fabricius, *Syst. Ent.*, : 712.

1904. *Agonoscelis nubila* : Distant, *Fauna Brit. India, Rhynchota*, **1** : 189.

Material examined : 3 exs., Govardhana, West Champaran, 28.x.1994, coll. T. P. Bhattacharyya and party ; 1 ex., Kutraha, 70 km. N. W. of Bettiah, West Champaran, 28.v.1993, coll. S. Chakraborty.

Diagnostic characters : Body ochraceous, beneath and legs luteous, abdomen and lateral margin of sternum, connexivum orange yellow, body covered with black punctures, membrane fuliginous, veins piceous ; a double lateral black

spots to sternum and abdomen ; anterior lateral areas of the scutellum with scattered luteous rugosities.

Length : 10-11 mm.

Distribution : Bihar (West Champaran) ; Karnataka ; Kashmir ; Maharashtra ; Meghalaya ; Nagaland ; West Bengal. Elsewhere : Myanmar, China, Japan, Malay Peninsula, Sri Lanka.

Genus 18. *Amauropepla* Stal

1867. *Amauropepla* Stal, *Ofv. vet. AK. Forh.*, : 502.

19. *Amauropepla denticulata* Hagl.

1868. *Amauropepla denticulata* Hagl., *Sfett. Ent. Zelt.* **29** : 151.

1904. *Amauropepla denticulata* : Distant, *Fauna Brit. India, Rhynchota*, **1** : 29.

Material examined : 1 ex., Govardhana, West Champaran, 29.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Lateral lobes of the head a little longer than the central lobe, but widely divergent at their apices ; antenniferous tubercles spinous ; brownish ochraceous body thickly punctate ; basal angle of scutellum, anterior area of pronotum and a central longitudinal line on it, head and piceous.

Length : 8-9 mm.

Distribution : Bihar (West Champaran) ; Assam. Elsewhere : Myanmar.

Genus 19. *Eusarcocoris* Distant

1904. *Eusarcocoris* Distant, *Fauna Brit. India, Rhynchota*, **1** : 165.

20. *Eusarcocoris guttiger* (Thunberg)

1783. *Cimex guttiger* Thunb., *Nov. Ins. Sp.*, **2** : 32.

1904. *Eusarcocoris guttiger* : Distant, *Fauna Brit. India, Rhynchota*, **1** : 165.

Material examined : 3 exs., Madanpur, 88 km. N. W. of Bettiah, West Champaran, 14.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Pale luteous, anterior

area and lateral margin of the pronotum, apical margin of scutellum and a large spot near each basal angle of scutellum luteous ; bronzy black punctures nearly confluent on head, body beneath, legs and antennae ochraceous with the apical joint piceous ; abdomen, central area of sternum black.

Length : 5.2 to 5.5 mm. width between pronotal angles 4.5 mm.

Distribution : Bihar (West Champaran) ; Maharashtra ; Nagaland ; Sikkim ; West Bengal. Elsewhere : Myanmar, China, Japan.

21. *Eusarcocoris ventralis* (Westwood)

1837. *Pentatoma ventralis* Westwood, *Hope Cat.*, 1 : 36.

1904. *Eusarcocoris ventralis* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 167.

Material examined : 2 exs., Govardhana, West Champaran, 30.x.1994, coll. T. P. Bhattacharyya ; 2 exs., Govardhana, West Champara, 27.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Ochraceous brown, anterior area of pronotum luteous with two transverse black spots ; central disk of abdomen and head brassy black ; apex of scutellum often margined with black punctures and a large rounded spot near each basal angle of scutellum, luteous ; antennae and legs ochraceous.

Length : 5.5-6.5 mm. Width between pronotal angles 4 to 4.5 mm.

Distribution : Bihar (West Champaran) ; Karnataka ; Maharashtra ; West Bengal. Elsewhere : Mynamar, Malay Peninsula.

Genus 20. *Macroscytus* Fieber

1851. *Macroscytus* Fieber, *Eur. Hem.*, : 83, 362.

22. *Macroscytus subaeneus* (Dallas)

1851. *Aethus subaeneus* Dallas, *List. Hem.*, 1 : 116.

1904. *Macroscytus subaeneus* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 96.

Material examined : 1 ex., Ganauli, 94 km.

N. W. of Bettiah, W. Champaran, 8.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Head black, ocelli red ; pronotum brassy black with posterior margin dull chestnut, the lateral margin, the centre and anterior margin posterior portion of disk, thickly punctured.

Length : 8-9.5 mm.

Distribution : Bihar (West Champaran) ; Maharashtra.

Family 7. PYRRHOCORIDAE

Genus 21. *Antilochus* Stal

1863. *Antilochus* Stal, *Berl. Ent. Zeitschr.*, 7 : 393.

23. *Antilochus coqueberti* (Fabricius)

1803. *Lygaeus coqueberti* Fabricius, *Syst. Rhyng.*, : 222.

1902. *Antilochus coqueberti* : Distant, *Fauna Brit. India. Rhynchota*, 2 : 101.

Material examined : 2 exs., Ganauli, 94 km. N. W. of Bettiah, W. Champaran, 6.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Antennae, eyes, membrane black, interior angle and apical margin of membrane brownish ochraceous ; body and base of first joint of antennae sanguineous ; pronotum with the anterior discal area margined with black punctures, posterior margin twice as broad as anterior margin ; anterior femora spined beneath near apex.

Length : 17 to 19 mm.

Distribution : Bihar (West Champaran) ; Assam ; Meghalaya ; Sikkim. Elsewhere : Bhutan.

Genus 22. *Dysdercus* Amy. & Serv.

1843. *Dysdercus* Amy. & Serv., *Hem.*, : 272.

24. *Dysdercus koenigii* (Fabricius)

1775. *Cimex koenigii* Fabricius, *Syst. Ent.*, : 719.

1929. *Dysdercus koenigii* : Hussy, *Gen. Cat. Hem.*, 3 : 92.

Material examined : 1 ex., Kutraha, 104 km. N. W. of Bettiah, West Champaran, 29.v.1993, coll. S. Chakraborty.

Diagnostic characters : Body ochraceous with head, rostrum, lateral margins of pronotum, body beneath, sanguineous scutellum, a discal spot to corium, membrane, antennae, apex of rostrum and legs black, posterior margins of the sternal and abdominal segments, anterior collar to pronotum and anterior margin to prosternum creamy white.

Length : 9-16 mm.

Distribution : Bihar (West Champaran) ; Assam ; Karnataka ; Meghalaya ; Nicobar Islands ; Sikkim ; West Bengal. Elsewhere : Myanmar, Sri Lanka.

Remarks : This bug commonly known as 'cotton stainers' is considered as serious pest of cotton (*Gossypium herbaceum*) and also known to attack musk mellow and cabbages.

Genus 23. *Physopelta* Amy. & Serv.

1843. *Physopelta* Amy. & Serv., *Hem.* : 271.

25. *Physopelta gutta* (Burm.)

1834. *Pyrrhocoris gutta* Burm., *Nov. Act. Acad. Leop.*, **16** : 300.

1902. *Physopelta gutta* : Distant, *Fauna Brit. India. Rhynchota*, **2** : 97.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 15.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Reddish ochraceous, basal spot to head, pronotum, antennae, scutellum, basal area of corium, rostrum, sternum, legs, three sublateral spots to abdomen and abdominal insures fuscous ; a discal rounded spot and apical angles of corium, and the membrane black.

Length : 15-17 mm.

Distribution : Bihar (West Champaran) ; Assam ; Meghalaya ; Elsewhere : Myanmar, Japan, Sri Lanka.

26. *Physopelta schlanbuschi* (Fabr.)

1787. *Cinex schlanbuschi* Fabr., *Mant. Ins.*, **2** : 299.

1902. *Physopelta schlanbuschi* : Distant, *Fauna Brit. India. Rhynchota*, **2** : 99.

Material examined : 1 ex., Madanpur, 88 km. N. W. of Bettiah, West Champaran, 14.vi. 1993, coll. S. Chakraborty.

Diagnostic characters : Body sanguineous, two black spots on anterior lobe of pronotum, two large transverse spots near anterior margin of posterior lobe, a rounded discal spot to corium membrane, antennae, apex of rostrum, tibiae and tarsi black ; apex of scutellum and base of first joint of antennae sanguineous.

Length : 13-16 mm.

Distribution : Bihar (West Champaran) ; Assam. Elsewhere : Myanmar, China.

Family 8. REDUVIIDAE

Genus 24. *Ectomocoris* Mayr

1865. *Ectomocoris* Mayr, *Verh. Zool. Ges. Wien.* **15** : 438.

27. *Ectomocoris atrox* (Stål)

1855. *Pirates atrox* Stal, *Ofv. Vet. AK. Forh.* : 187.

1902. *Ectomocoris atrox* : Distant, *Fauna Brit. India. Rhynchota*, **2** : 296.

Material examined : 1 ex., Tribeni, 11 km. N. W. of Ganauli, West Champaran, 10.vi.1993, coll. S. Chakraborty and party.

Diagnostic characters : Hemelytra purplish black, spots to the connexivum, a spot at the base of membrane ochraceous ; anterior femora and apical halves of intermediate and posterior femora black ; antennae pilose, ochraceous ; first joint black its base ochraceous.

Length : 12 to 18 mm.

Distribution : Bihar (West Champaran) ; West Bengal ; Elsewhere : Myanmar, China, Malay peninsula.

Genus 25. *Ectrychotes* Burm1835. *Ectrychotes* Burm., *Handb.*, 2 : 237.28. *Ectrychotes pilicornis* (Fabricius)1787. *Reduvius pilicornis* Fabricius, *Mant.*, 2 : 311.1902. *Ectrychotes pilicornis* : Distant, *Fauna Brit. India. Rhynchota*, 2 : 314.

Material examined : 1 ex., Ganauli, 94 km. N. W. of Bettiah, West Champaran, 8.vi.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Body coral red, with red anterior lobe of pronotum, legs, sternum, the transverse fasciae to 4th and 5th ventral segments and the 6th and anal segments bluish black ; antennae, membrane, interior area of corium, apical half of clavus and a spot on last dorsal abdominal segment black ; trochanters, coxae, bases of intermediate and anterior femora and tarsi coral red, apices of the tarsi black.

Length : 12-13 mm.

Distribution : Bihar (West Champaran) ; Uttar Pradesh.

Genus 26. *Lopocephala* Lap.1832. *Lopocephala* Lap., *Ess. Hem.*, : 12.29. *Lopocephala guerini* Lap.1832. *Lopocephala guerini* Lap., *Ess. Hem.*, : 12.1902. *Lopocephala guerini* : Distant, *Fauna Brit. India. Rhynchota*, 2 : 331.

Material examined : 3 exs., Govardhana, West Champaran, 29.v.1994, coll. T. P. Bhattacharyya and party.

Diagnostic characters : Antennae violaceous black excluding base, basal joint is little longer than the second, sanguineous, scutellum, inner area of corium, membrane, intermediate and posterior femora apices of the tibiae and tarsi violaceous black, head transversely impressed behind eyes and pilose ; posterior pronotal angle rounded or subnodulose.

Length : 16 to 17 mm.

Distribution : Bihar (West Champaran) ; West Bengal. Elsewhere : Sri Lanka.

27. *Pirates* Serv.1831. *Pirates* Serv., *Amm. Sc. Nat.*, 23 : 215.30. *Pirates affinis* (Serv.)1831. *Peirates affinis* Serv., *Am. Sc. Nat.*, 23 : 216.1902. *Pirates affinis* : Distant, *Fauna Brit. India. Rhynchota*, 2 : 299.

Material examined : 1 ex., Tribeni, 11 km. N. E. of Ganauli, West Champaran, 10.vi.1993, coll. S. Chakraborty.

Diagnostic characters : Reddish black ; pronotum and scutellum olivaceous ; anterior pronotal lobe with longitudinal striae at disk and oblique on lateral areas, and posterior lobe transversely rugulose ; antennae pilose, second joint about as long as pronotum ; anterior and intermediate femora spined beneath.

Length : 17 to 21 mm.

Distribution : Bihar (West Champaran) ; Assam ; Maharashtra ; Meghalaya ; Elsewhere : Myanmar, Java, Malay peninsula.

Genus 28. *Polididus* Stål1858. *Polididus* Stal, *Ofv. Vet. A.K. Forh.*, : 448.31. *Polididus armatissimus* (Stal)1859. *Polididus armatissimus* Stål, *Ofv. Vet. A.K. Forh.* : 376.1902. *Polididus armatissimus* : Distant, *Fauna Brit. India. Rhynchota*, 2 : 386.

Material examined : 1 ex., Govardhana, West Champaran, 29.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Head, pronotum, scutellum abdominal margins, femora spinous ; scutellum with three spines ; head with the postocular a little longer than the anteocular area ; first joint of rostrum distinctly longer than the second, and the anteocular portion of head.

Length : 10 mm.

Distribution : Bihar (West Champaran) ; Maharashtra ; West Bengal. Elsewhere : Myanmar, China, Japan, Philippines.

Genus 29. *Sirthenea* Spin.

1840. *Sirthenea* Spin., *Ess. Hem.*, : 100.

32. *Sirthenea flavipes* (Stål)

1855. *Rasahus flavipes* Stål, *Ofv. Vet. A.K. Forh.* : 187.

1902. *Sirthenea flavipes* : Distant, *Fauna Brit. India. Rhynchota*, 2 : 303.

Material examined : 2 exs., Govardhana, West Champaran, 28.x.1994, coll. T. P. Bhattacharyya and party.

Diagnostic characters : Antennae pilose, first joint not reaching apex of head, second about as long as antecular portion of head, body black ; head, anterior lobe of pronotum pale castaneous ; first joint of antennae, base of second and third excluding base, base and apex of clavus, base and a subclaval apical spot to corium, luteous.

Length : 19-21 mm.

Distribution : Bihar (West Champaran) ; Assam ; Nagaland. Elsewhere : Borneo, China, Hong Kong, Japan, Java, Philippines.

Genus 30. *Sycanus* Amy. & Serv.

1843. *Sycanus* Amy. & Serv., *Hem.*, : 360.

33. *Sycanus varicolor* (Dohrn)

1859. *Sycanus varicolor* Dohrn, *Stett., ent. Zeit.*, 20 : 96.

1902. *Sycanus varicolor* : Distant, *Fauna Brit. India. Rhynchota*, 1 : 355.

Material examined : 1 ex., Manguraha, West Champaran, 22.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Head about as long as pronotum and scutellum together ; basal joint of antennae a little shorter than anterior femora ; scutellar spine sanguineous, short, erect, apex acute not bifid ; body black with anterior lobe of

pronotum, basal margin and lateral angles of posterior lobe, apex of scutellum, about apical third of corium, basal margin of membrane, connexivum, apex of rostrum, prosternum, coxae and costal spots sanguineous.

Length : 18-21 mm.

Distribution : Bihar (West Champaran) ; West Bengal. Elsewhere : Myanmar.

Family 9. BELOSTOMATIDAE

Genus 31. *Diplonychus* Laporte

1833. *Diplonychus* Laporte, *Guerin's Mag. Zool.*, 2 : 18.

34. *Diplonychus molestus* (Dufour)

1863. *Appasus molestus* Dufour, *Ann. Soc. Ent. Fr.*, : 395.

1906. *Sphaerodema molestus* : Distant, *Fauna Brit. India. Rhynchota*, 3 : 36.

1980. *Diplonychus molestus* : Venkata Rao, *J. Bombay nat. Hist. Soc.*, 77 : 299.

Material examined : 1 ex., Manguraha, West Champaran, 24.x.1994, coll. T. P. Bhattacharyya.

Diagnostic characters : Body length varying from 13.5 - 17.5 mm., a little broader in width than the related species *rusticum*. Posterior angle of pronotum a little more obtuse and less acute than those of *rusticum*, anterior tarsal claws moderately well developed and longer ; ventrolateral stripe of fine hairs on the abdomen is broader.

Distribution : Bihar (West Champaran) ; Delhi ; Jammu and Kashmir ; Orissa ; West Bengal. Elsewhere : Malacca, Sumatra.

Family 10. NEPIDAE

Genus 32. *Laccotrephes* Stal

1865. *Laccotrephes* Stal, *Hem. Afr.*, 3 : 186.

35. *Laccotrephes ruber* (Linnaeus)

1764. *Laccotrephes ruber*, Linnaeus, *Mus. Lud. Utr.*, : 165.

1906. *Laccotrephes ruber* : Distant, *Fauna Brit. India. Rhynchota*, 3 : 18.

1989. *Laccotrephes ruber* : Thirumalai, *Rec. zool. Surv. India, Occ. paper*, 118 : 29.

Material examined : 1 ex., Manguraha, West Champaran, 24.x.1994, coll. T. P. Bhattacharyya and party.

Diagnostic characters : Adult insects 30-35 mm in length excluding abdominal appendages, breadth between posterior pronotal angles 7-9 mm. ; abdome above reddish yellow in colour ; prosternum convex at the middle provided with a small tuber at the anterior region ; abdominal appendages distinctly longer than the body.

Distribution : Bihar (West Champaran) ; Jammu & Kashmir ; Kerala ; Maharashtra ; Meghalaya ; Orissa ; Tamil Nadu ; Uttar Pradesh ; West Bengal. Elsewhere : China, Formosa, Japan, Nepal, Pakistan.

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PARASITIC NEMATODES

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INTRODUCTION

The author undertook faunistic Surveys of some areas of the Valmiki Tiger Reserve, West Champaran district, Bihar during October November, 1994 and January, 1996, in the course of which some nematodes were collected from some vertebrate hosts. The present paper deals with this material which comprises 14 species of 19 genera of 17 families and 5 orders. Most of these are fairly well known but forming new host or locality records. The classification followed for higher taxa is more or less based on CIH Keys.

Order : ENOPLIDA

Superfamily : TRICHINELLOIDEA

Family : TRICHURIDAE

Subfamily : CAPILLARIINAE

Genus. *Capillaria* Zeder, 1800

Capillaria Sp.

Material : Two ♀♀ ; 2.5.1. : 2.5.1. Reg. No. WN 717; host-Greater yellow Bat (*Scotophilus h. heathi*); location-intestine; locality — Naurangia, West Champaran district, Bihar; 2–XI–1994; Coll – S. R. Dey Sarkar.

Remarks : In the absence of males specific identification is not possible. Its occurrence in *Scotophilus h. heathi* from West Champaran, Bihar forms the first host and locality records. It may be noted that the incidence of infection by this genus appears totally insignificant.

Order : STRONGYLIDA

Superfamily : STRONGYLOIDEA

Family : CHABERTIIDAE

(Popova, 1952 Subfam.)

Lichtenfels, 1980

Subfamily : OESOPHAGOSTOMINAE

Railliet, 1916

Genus. *Kuntzistrongylus* Lichtenfels, 1880

Kuntzistrongylus Sp.

Material : Two ♂♂ (Subad.), four ♀♀ ; Z.S.1. Reg. No. WN 718; host - Indian Bush Rat (*Golunda* sp.); location-intestine; locality – Ganuli, West Champaran district, Bihar; 14–1–1996; Coll – S. R. Dey Sarkar.

Remarks : In the absence of adult males specific identification is not possible. However, the genus is recorded for the first time from India.

Superfamily : TRICHOSTRONGYLOIDEA

Family : TRICHOSTRONGYLIDAE

Leiper, 1912

Subfamily : TRICHOSTRONGYLINAE

Leiper, 1912

Genus. *Trichostrongylus* Looss, 1905

Trichostrongylus pigmentus (V. Linstow, 1904) Hall; 1916

Material : Several ♂♂ and ♀♀ ; Z.S.1. Reg. No. WN 719; host - Indian Gerbil (*Tatera indica*); location – intestine, and liver ; locality —

Govardhana, West Champaran district, Bihar; 31-X-1994; Coll- S. R. Dey Sarkar.

Remarks : The species was originally reported from the Black-naped hare (*Lepus nigricollis*) at Rainna, Southern Province, Srilanka (then Ceylon). It is also reported from Orissa, Meghalaya, Rajasthan and West Bengal, India, from the same host. It is now recorded for the first time from a host and from a new locality. The incidence of infection in the host is high is shown by the fact that all the three hosts examined, found infected by these parasites.

Family : MOLINEIDAE Durette – Desset and Chabaud, 1977

Subfamily : MOLINEINAE Skrjabin and Schulz, 1937

Genus. *Oswaldocruzia* Travassos, 1917

Oswaldocruzia goezei Skrjabin and Schulz, 1952

Material : Three ♂♂, four ♀♀; Z.S.1. Reg. No. WN 720; host - *Bufo melanostictus*; location - intestine; locality - Govardhana, West Champaran district, Bihar; 31-X-1994; Coll - S. R. Dey Sarkar.

Remarks : This species is a synonyms of *Oswaldocruzia filiformis* (Goeze, 1782) Travassos, 1917, and has a world-wide distribution.

Order : OXYURIDA

Superfamily : OXYUROIDEA

Family : OXYURIDAE Cobbold, 1864

Genus. *Syphacia* Scurat, 1916

Syphacia muris (Yamaguti, 1935) Yamaguti, 1941

Material : One ♀; 2.S.1. Reg. No. WN 721; host *Rattus rattus*; location - rectum; locality - Kotraha, West Champaran district, Bihar; 09-01-1996; Coll — S. R. Dey Sarkar.

Remarks : The species in recorded for the first time from Bihar. It may be noted that the incidence of infection by this species appears totally insignificant.

Order : ASCARIDIDA

Superfamily : COSMOCERCOIDEA

Family : COSMOCERCIDAE

(Railliet, 1916 Subfam.) Travassos, 1925

Subfamily : COSMOCERCINAE Railliet, 1916

Genus. *Oxysomatium* Railliet and Henry, 1916

Oxysomatium macintoshi (Stewart, 1914)
Karve, 1927

Material : Two ♀♀; 2.S.1. Reg. No. WN 722; host - *Bufo melanostictus*; location — rectum; locality — Govardhana, West Champaran district, Bihar, 31-X-1994; Coll - S. R. Dey Sarkar.

Remarks : This species is quite widely distributed in India.

Superfamily : HETERAKOIDEA

Family : HETERAKIDAE

Railliet and Henry, 1912

Subfamily : HETERAKINAE Inglis, 1967

Genus. *Heterakis* Dujardin, 1845

Heterakis spumosa Schneider, 1866

Material : Three ♂♂, five ♀♀; 2.S.1. Reg. No. WN 723; host *Rattus rattus*; location - intestine; locality - Kotraha, West Champaran district, Bihar; 9-i-1996; Coll - S. R. Dey Sarkar.

Remarks : This species has world-wide occurrence and has been reported from rats and bandicoots.

Family : ASCARIDIIDAE Travassos, 1919

Genus. *Ascaridia* Dujardin, 1845

Ascaridia galli (Schrank, 1788) Freeborn, 1923

Material : One ♂, two ♀♀; 2.S.1. Reg. No. WN 724; host - domestic fowl; location - intestine; locality - Manguraha, West Champaran district, Bihar; 24-X-1994; Coll - S. R. Dey Sarkar.

Remarks : This species has world-wide occurrence and has been reported from ducks, hens and rarely from cat.

Superfamily : SUBULUROIDEA

Family : SUBULURIDAE (Travassos, 1914)
York and Maplestone, 1926.

Subfamily : SUBULURINAE Travassos, 1914

Genus. *Subulura* (*Subulura*) Molin, 1860

Subulura (*Subulura*) Sp.

Material : One ♀ ; Z.S.1. Reg. No. WN 725 ;
host collared Scops owl (*otus bakkamoena*) ;
location – caeca; locality – Govardhana,
West Champaran district, Bihar; 28-X-1994;
Coll – S. R. Dey Sarkar

Remarks : In the absence of a male specific
identification is not possible. The incidence of
infection in the host appears to, be low.

Subulura (*Subulura*) Sp.

Material : Two ♀♀ ; Z.S.1. Reg. No. WN
726 ; host *Rattus rattus*; location – rectum;
locality – Kotraha, West Champaram district,
Bihar; 9-i-1996; Coll – S. R. Dey Sarkar

Remarks : In the absence of a male specific
identification is not possible. The incidence of
infection by this genus is very low.

Superfamily : SEURATOIDEA

Family : SEURATIDAE (Hall, 1916)
Railliet, 1906

Subfamily : SEURATINAE, Hall, 1916

Genus. *Seuratum* Hall, 1916

Seuratum Sp.

Material : Four ♀♀ ; Z.S.1. Reg. No. WN
727 ; host Indian False Vampire (*Meghderma
lyra*); location – intestine; locality – Manguraha,
West Champaram district, Bihar; 22-xi-1996;
Coll – S. R. Dey Sarkar

Remarks : In the absence of a male specific
identification is not possible. The genus is parasites
of Chiraptera and rodents. Its occurrence in
Megaderma lyra from West Champaran, Bihar
forms the first host and locality records.

Order : SPIRURIDA

Superfamily : PHYSALOPTEROIDEA

Family : PHYSALOPTERIDAE
(Railliet, 1893 Subfam.) Leiper, 1908

Subfamily : PHYSALOPTERINAE Railliet, 1893

Genus. *Physaloptera* Rudolphi, 1819

1 : *Physaloptera temminki* Soota and
Chaturvedi, 1971

Material : Four ♂♂, 3 ♀♀ ; Z.S.1. Reg. No.
WN 728; host Greater yellow bat (*Scotophilus
heathi heathi*); location – Stomach; locality –
Manguraha, West Champaran dist, Bihar;
22-X-1994; Coll – S. R. Dey Sarkar ; Four ♂♂,
Six ♀♀ ; 2.5.1. Reg. No. WN-729; locality –
Naurangia, West Champaran, Bihar; 02-xi-1994;
host, location and collector same as above.

Remarks : Soota and Chaturvedi (1971)
described *Physaloptera temminaki* from
Scotophilus temminki from Nagpur. It is now
recorded for the first time from a new locality.

2. Genus. *Pseudophysaloptera* Baylis, 1934

Pseudophysaloptera soricina Baylis, 1934

Material : Fourteen ♂♂, seventeen ♀♀ ;
Z.S.1. Reg. No. WN 730; host – house shrew
(*Suncus murinus caeruleus*); location –
Stomach; locality – Manguraha, West Champaran
district Bihar; 23-X-1994; Coll – S. R. Dey
Sarkar.

Fourteen ♂♂, Fourteen ♀♀ ; Z.S.1. Reg. No.
WN-731; 24-x-1994; host, location and collector
same as above.

3 ♂♂, 4 ♀♀ ; 2.5.1. Reg. No. WN-732 ;
locality – Kotraha, West Champaran district,
Bihar; 6-i-1996; host, location and collector same
as above.

Remarks : The species was originally reported
from *Crociodura* sp. from Africa and subsequently
from *Suncus caeruleus* from SriLanka (then

Ceylon), South China and *Sorex p. personatus* from North America. Now, it is recorded from another shrew, *Suncus murinus caerulescens* and from a new locality. It may be noted that the incidence of infection by this species in the host is very high.

Superfamily : SPIRUROIDEA

Family : SPIROCERCIDAE
(Chitwood and Wehr, 1932 Subfam.)
Chabaud, 1975

Subfamily : SPIROCERCINAE Chitwood and Wehr, 1932

Genus. *Cylicospirura* (*Gastronodus*)
(S. N. Singh, 1934 gen.)

Cylicospirura (*Gastronodus*) *stresseni*
(Singh 1934)

Material : Three ♂♂, four ♀♀; Z.S.1. Reg. No. WN 733; host - house shrew (*Suncus murinus caerulescens*); location - Stomach nodules; locality - Manguraha, West Champaran district, Bihar; 22-X-1994; Coll - S. R. Dey Sarkar.

Remarks : This species was reported from Hyderabad, India. It is now recorded for the first time from Bihar.

Superfamily : HABRONEMATOIDEA

Family : HABRONEMATIDAE
(Chitwood and Wehr, 1932 Ivaschkin, 1961)

Subfamily : HABRONEMATINAE
Chitwood and Wehr, 1932

Genus. *Habronema* Diesing, 1861

Habronema imbricatum Maplstone, 1930

Material : One ♂, two ♀♀; Z.S.1. Reg. No. WN 734; host collared scops owl (*otus bakkamaena*); location - under honny layer of gizzard; locality - Manguraha, West Champaran district, Bihar; 23-X-1994; Coll - S. R. Dey Sarkar. 4 ♂♂, 5 ♀♀ and 2 fragments of females ;

Z.S.1. Reg. No. WN 735; host - spotted owlet (*Athene brama*); locality - Govardhana, West Champaran district, Bihar; 28-X-1994; location and collector same as above.

Remarks : This species is widely distributed in India. It is now recorded for the first time from Bihar.

Subfamily : HISTOCEPHALIANE Gendre 1922

Genus. *Viguiera* Seurat, 1913

Viguiera majumdari Dey, 1979

Material : Two ♂♂, four ♀♀; Z.S.1. Reg. No. WN 736; host - Haircrested Drongo (*Dicrurus hottentotus*); location - under horny layer of gizzard; locality - Manguraha, West Champaran district, Bihar; 24-X-1994; Coll - S. R. Dey Sarkar.

Remarks : The species was described by De (1969) from *Dicrurus m. macrocerus* from Burdwan, West Bengal. It is now recorded from another species of drongo, *Dicrurus hottentotus* and from a new locality.

Viguiera Sp.

Material : One ♀; Z.S.1. Reg. No. WN 737; host wood pecker (*Dinopium* sp); location - under horny layer of gizzard; locality - Govardhana, West Champaran district, Bihar; 28-X-1994; Coll - S. R. Dey Sarkar. 3 ♀♀; 2.5.1. Reg. No. WN 738; host Greater Racket tailed drongo (*Dicrurus paradiseus*); location - under horny layer of gizzard; locality - Madanpur, West Champaran district, Bihar; 17-i-1996; Coll - S. R. Dey Sarkar.

Remarks : In the absence of a male specific identification is not possible.

Superfamily : ACUARIOIDEA

Family : ACUARIIDAE (Railliet, Henry and Sisoff 1912 subfam.) Chitwood and wehr, 1934.

Subfamily : ACUARIINAE Railliet,
Henry and Sisoff, 1912

Genus. *Acuaria* Bremsler, 1811

Acuaria anthuris (Rudolphi, 1819) Railliet,
Henry and Sisoff, 1912

Material : Two ♂♂, Z.S.1. Reg. No. WN 739; host - white bellied drongo (*Dierurus caerulescens*); location - under horny layer of gizzard; locality - Naurangla, West Champaran district, Bihar; 3-xi-1994; Coll - S. R. Dey Sarkar.

Remarks : This species is widely distributed in India. It is now recorded for the first time from a new host and from a new locality.

Superfamily : THELAZIOIDEA

Family : THELAZIIDAE Skrjabin, 1915

Subfamily : THELAZIINAE (Skrjabin 1915
fam.) Baylis and Daubney, 1926.

Genus. *Thelazia* (*Thelaziella*) Travassos, 1918

Thelazia (*Thelaziella*) Sp.

Material : One ♀; Z.S.1. Reg. No. WN 740; host - Black drongo (*Dicrurus adsimilis*); location - eye; locality - Naurangia, West Champaran district, Bihar; 3-xi-1994; Coll - S. R. Dey Sarkar.

Remarks : In the absence of a male specific identification is not possible. It is to be noted that the incidence of infection by this genus appears totally insignificant.

Superfamily : DIPLOTRIAENOIDEA

Family : DIPLOTRIAENIDAE (Skrjabin,
1916 Subfam) Anderson, 1958.

Subfamily : DICHEILONEMATINAE Wehr,
1935.

Genus. *Hamatospiculum* Skrjabin, 1916.

Hamatospiculum nepalensis Soota and
Chaluruvedi, 1971.

Material : One ♂; Z.S.1. Reg. No. WN 741; host - Black drongo (*Dicrurus adsimilis*); location - neck muscles; locality - Naurangia, West Champaran district, Bihar; 3-xi-1994; Coll - S. R. Dey Sarkar.

Remarks : Soota and Chaturvide (1971) described the species from drongo (*Dicrurus hottentatus*) from Hitaru (Nepal). Soota (1981) reported this species from Racket-tailed drongo (*Dicrurus* sp.) from Aandaman. It is now recorded from another species of drongo from a new locality.

Superfamily : FILARIOIDEA

Family : ONCHOCERCIDAE (Leiper, 1911)

Subfamily : SPLENDIDOFILARIINAE
Chabaud and Choquet, 1953.

Genus. *Chandlerella* York and Maplestone, 1926.

Chandlerella bosei (Chandler 1924) York
and Maplestone 1926.

Material : One ♂, two ♀♀; Z.S.1. Reg. No. WN 742; host - Shama (*Copsychus malabaricus*); location - body cavity; locality - Manguraha, West Champaran district, Bihar; 23-x-1994; Coll - S. R. Dey Sarkar.

Remarks : The species is originally reported by Chandler (1924) from Racket-tailed drongo (*Dicrurus paradiseus* = *Dissemurus paradiseus*) is the Zoological garden, Calcutta and from a 'crow' from Madras. It is now recorded for the first time from a new host and from a new locality.

SUMMARY

The paper deals with parasitic nematodes collected from vertebrate hosts from the Valmiki Tiger Reserve. West Champaran district, Bihar. It includes 14 species contained in 19 genera belonging to 17 families and 5 orders. Most of them forming new host or locality records.

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