State Fauna Series 11

FAUNA OF
BIHAR
(INCLUDING JHARKHAND)

PART-1

Zoological Survey of India

STATE FAUNA SERIES 11

FAUNA OF BIHAR
(INCLUDING JHARKHAND)
PART-1

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STATE FAUNA SERIES
FAUNA OF BIHAR
(INCLUDING JHARKHAND)

PART-1 **2004** **1-213**

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THE STATE OF BIHAR : AN OVERVIEW

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INTRODUCTION

The state of Bihar was separated from Bengal on the 1st April, 1912 when the province of Bihar and Orissa came into existence. On the 1st April, 1936, Bihar was separated from Orissa. On this date of separation its area was 69,348 sq. miles (= 1,79,541,972 sq. kms.). At the time of States recognization in 1956, some portions of Bihar were transfered to West Bengal. As a result of these transfer, the present area of the Bihar including Jharkhand is 67,196 sq. miles (= app. 1,74,000 sq. kms., Fig. 1). Bihar including Jharkhand forms an important part of the Indian Union and lies in the eastern part of it; bounded on the north by Nepal, on the east by West Bengal, on the south by Orissa, on the north west by Uttar Pradesh and south west by Madhya Pradesh.

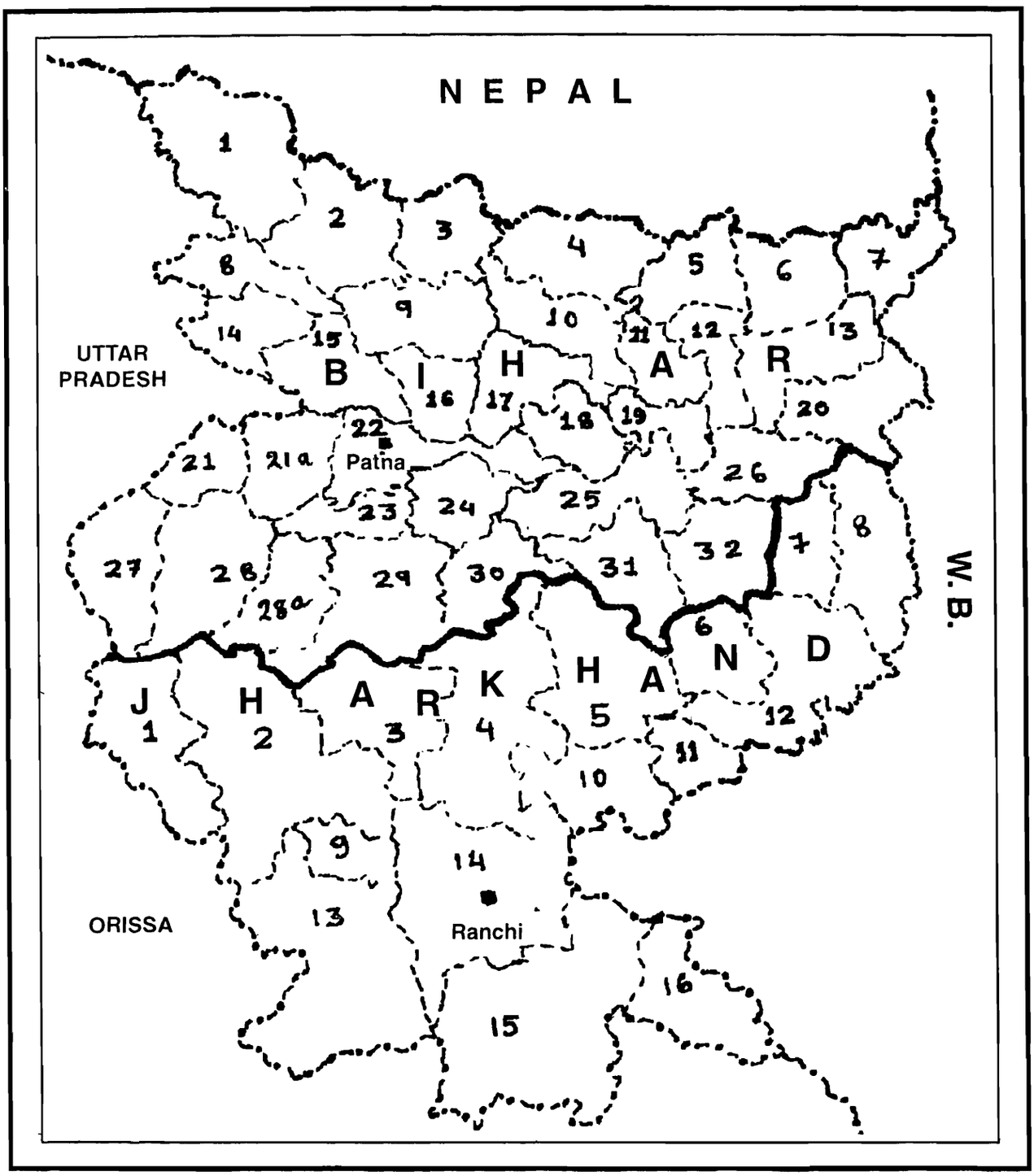
TOPOGRAPHY

The state of Bihar including Jharkhand approximately lying between 21°58'15" and 27°31'15" N latitude and 83°19'50" and 88°17'40" longitude. It extends to 605 kms. from North to South and 483 kms. from West to East. Its shape is somewhat like quadrilateral and embraces some of the fertile lands in India. The river Ganga flows right across it from West to East and divides the State into two unequal parts, the southern portion being almost double the northern portion. The northern portion, further divided into two natural parts; (1) Himalayan foot hills and (2) the plains of the North of the Ganga river. Like wise, the southern portion also divided into two parts : (1) the plains of the South of the Ganga river and (2) the Southern Hilly Regions.

The Himalayan foothills is a small hilly area in the North-western corner of Bihar in west Champaran district. This is a part of the well-known extensive Siwalik Range and covers about 942. 306 sq. kms. This area consists of two different ranges of hills and intervening valleys, all parallel to the Nepal border in a North-West to South-East direction. The southern range of low hills is called the Ramnagar Dun of which the highest point is about 238 metres near Santpur. The valley of the Harra called the Dun valley started from this place which is only about 21 kms. long and below 152 metres above sea level. North of this valley lies the Sumeswar Range. It starts from near the head of the Tribeni canal in the west along the border of Nepal and extends for about 69 kms. upto Bhikhna Thori pass. The international boundary between India and Nepal runs along the crest of this range.

The plains of the North of the Ganga extend from the base of the *terai* in the North to the Gangá river in the south. It covers an area of about 56,980 sq. kms. of alluvial soil of great depth and extreme fineness. It covers the whole Tirhut and Kosi divisions and has a gentle slope towards the South. The main two rivers of the North plains are the Gandak joins the Ganga just above Patna and the Kosi much further east meet with the Ganga.

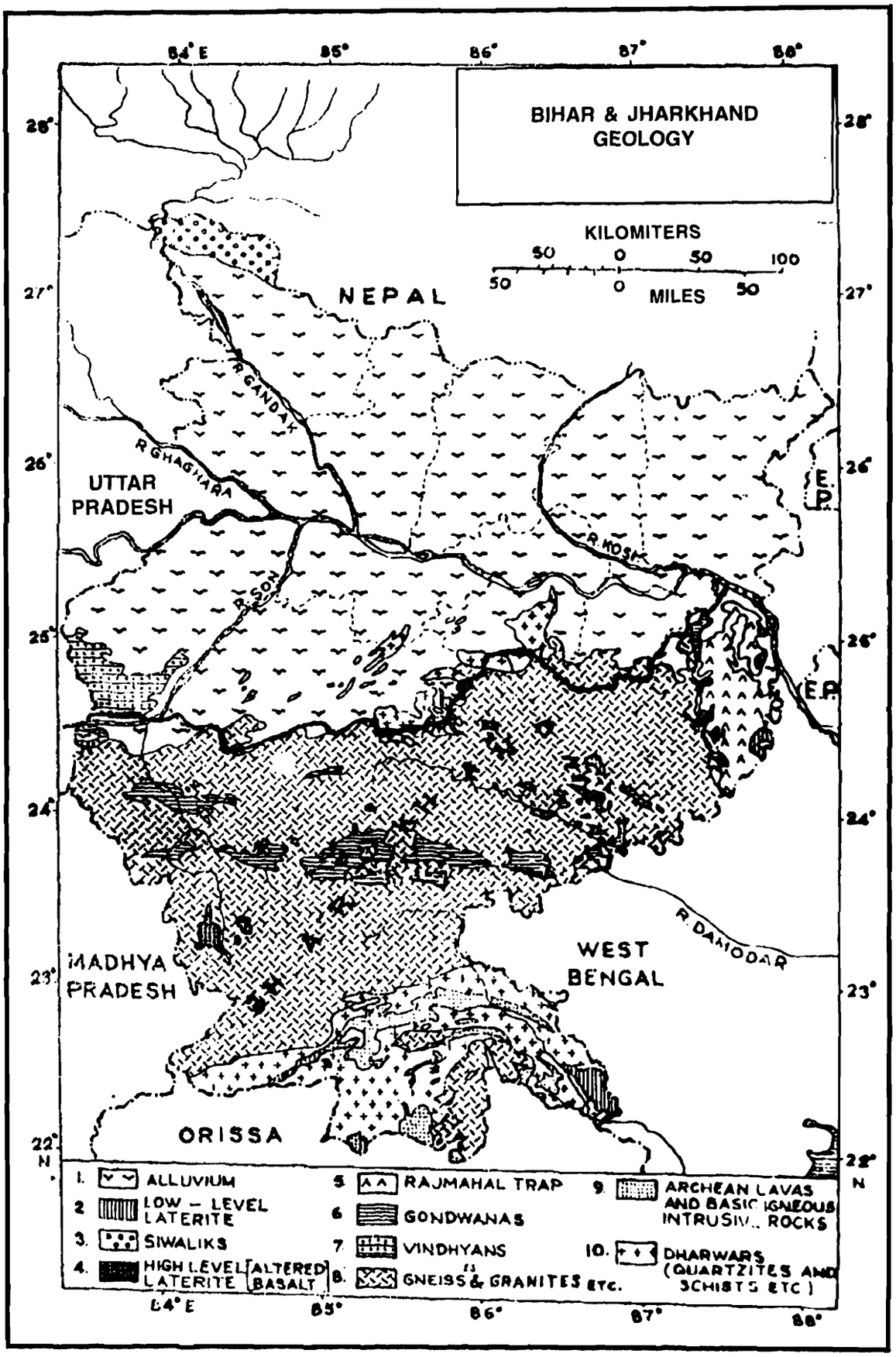
The plains of the South of the Ganga river is shallow and their peninsular edge is very ragged. In the West where the Son makes a great deltaic re-entrance into the older rocks, this alluvial stripes is some 137 kms. wide but in the east where lie the Rajmahal Hills, it goes directly to the Ganga. The country is roughly divisible into a narow belt of highland along the Ganga and the rest of the plain in which behind the Ganga levee is a treeless low lying country called 'Tal' lying in Patna district. As the high Ganga levee disturbes the entry of



Map 1 : District-wise map of Bihar and Jharkhand.

Bihar :- 1. W. Champaran, 2. E. Champaran, 3. Sitamarti, 4. Madhubani, 5. Supaul, 6. Ararid, 7. Kishenganj, 8. Gopalganj, 9. Muzaffarpur, 10. Darbhanga, 11. Saharsa, 12. Madhepura, 13. Purnia, 14. Siwan, 15. Saran, 16. Vaishali, 17. Samastipore, 18. Begusarai, 19. Khagaria, 20. Katihar, 21. Buxar, 21a. Bhojpur, 22. Patna, 23. Jehanabad, 24. Nalanda, 25. Munger, 26. Bhagalpur, 27. Bhabhua, 28. Rohtas, 28a. Aurangabad, 29. Gaya, 30. Nawada, 31. Jamui, 32. Banka.

Jharkhand :- 1. Garhwa, 2. Palamou, 3. Chatra, 4. Hazaribagh, 5. Giridih, 6. Deogarh, 7. Godda, 8. Sahebganj, 9. Lohardagga, 10. Bokaro, 11. Dhanbad, 12. Dumka, 13. Gumla, 14. Ranchi, 15. West Singhbhum, 16. Singhbhum.


BIHAR & JHARKHAND
GEOLOGY
KILOMITERS
50 0 50 100
50 0 MILES 50
NEPAL
UTTAR
PRADESH
MADHYA
PRADESH
WEST
BENGAL
ORISSA
R GANDAK
R GHAGHARA
R SON
R MOSAI
R DAMODAR
E.P.
84° E
85°
86°
87°
88°
28°
27°
26°
25°
24°
23°
22° N
1. ALLUVIUM
2. LOW – LEVEL LATERITE
3. SIWALIKS
4. HIGH LEVEL LATERITE
ALTERED BASALT
5. RAJMAHAL TRAP
6. GONDWANAS
7. VINDHYANS
8. GNEISS & GRANITES ETC.
9. ARCHEAN LAVAS AND BASIC IGNEOUS INTRUSIVE ROCKS
10. DHARWARS (QUARTZITES AND SCHISTS ETC.)

streams coming from the south; these streams (e.g. Punpun, Phelgu and Paimar) flow parallel to the Ganga for several kilometres. As we more towards south, some low hills (e.g. the small hill near Bihar Sharif and higher hills at Rajgir) appear. The Rajgir hill extend towards Gaya. The extensive triangular hill of Khargpur in Munger and Jumui districts rises from 152 to 305 metres and its northern suballuvial portion is responsible for the sharp bend of the Ganga near the town of Munger.

Except the Kaimur plateau in Shahabad and Santal Parganas, all the southern tract is known as the Chotanagpur plateau. In ancient time, it was known as Jharkhand or the forest tract. It is full of hill and ridges, having many winding rivers, valleys and basins etc. It ranges from 300 metres to 900 metres above the sea level. This plateau is the part of the great Gneissic-schistose plateau of Peninsular India. In late Paleozoic, it was partly covered by lower Gondwana rocks, including coal-bearing strata. The main coalfields lies partly in Bihar, partly in West Bengal and notably along the Damodar valley. Interbedded lavas as well as dykes of igneous rock occur in the western portion of Chotanagpur plateau.

GEOLOGY

Most of Chotanagpur plateau consisting of crystalline gneisses and granites is supposed to represent an originally solidified crust. These gneisses and granites are known to belong to the Archaean era. Even the other parts of the state, e.g., the Ganga Plain, the Kaimur plateau and Damodar basin, which do not consist of gneisses and granites on the surface, are supposed to be of similar rock inside concealing under later deposits.

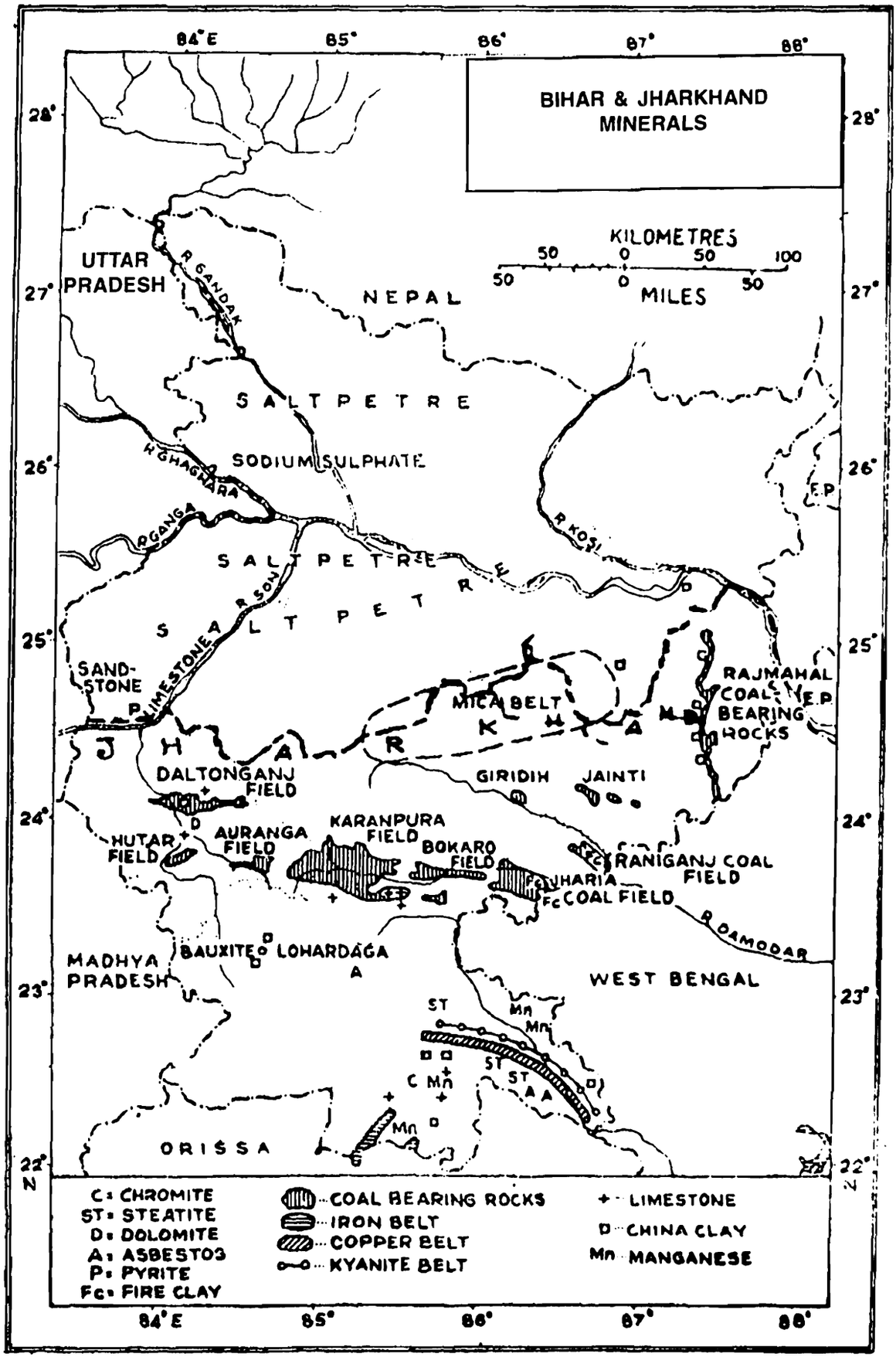
The oldest sedimentary and metamorphic rocks known as Dharwars, occur as schists, quartzites and limestones etc., are found mainly in Gaya, Hazaribagh and Munger and also part of East and West Singhbhum districts and also in south-east fringes of Ranchi district. Since the vindhyan uplift till the entire Jurassic period Bihar was probably as a land area above sea level as a part of Gondwana land. The Gondwana in Bihar contain three important mineral deposits known as coal, the fireclay and the iron ore. At that time, in Bihar, on the northern margin, the Indo-Gangatic depression was deeper and sediments were deposited after the second Himalayan upheaval. These sediments were later folded up during the last Himalayan uplift which are known as the Siwalik Range represented in Bihar by the Dun and Someswar Ranges of West Champaran districts. For detail please see Ahmed (1965).

CLIMATE

Cold weather starts in Bihar generally in the first week of November and ends in the middle of March. Then comes summer season which stays up to mid June. Soon after this, the rainy season commences and continues till the end of September. October is the autumn when leaves falls from the tree and the weather is hot and sluttery. The climate in the cold weather is pleasant. The days are bright and warm, the sun is not too hot and the weather is generally dry. In hot season, the heat in the northern plains is intence during the day but loss so in the highland regions of Chotanagpur. The highest temperature is generally recorded in May which is the hottest month in the state. Like the other states of northern India; Bihar also experience dust-storm, thunder-storm and dust-raising winds during the hot season. The hot winds (loo) of the Bihar plains blow during April and May. The month of June, although hot, records lower temperature on account of the rains associated with the onset the monsoon which is followed by a period of continuous rainfall from June to September. The commencement of the monsoon generally caused by the first cyclonic storm which comes from the Bay of Bengal.

Although the rainy season begins in June, the rainiest months are July and August. During these two months rains increases due to South-west Monsoon which normally withdraws from Bihar in the first week of October.

The mean temperature in November has been observed in Ranchi is about 19°c and in Jamshedpur about 22°c while average temperature throughout Chotanagpur plateaus was found about 20°c. The minimum temperature in Gaya and


BIHAR & JHARKHAND
MINERALS
KILOMETRES
50 0 50 100
50 0 MILES 50
84°E
85°
86°
87°
88°
28°
27°
26°
25°
24°
23°
22° N
UTTAR PRADESH
NEPAL
R GANDAK
SALTPETRE
SODIUM SULPHATE
R GHAGHARA
R GANGA
R SONE
R KOSI
E.P
SAND-STONE
LIMESTONE
MICA BELT
RAJMAHAL COAL BEARING ROCKS
JHARKHAND
DALTONGANJ FIELD
GIRIDIH
JAINTI
KARANPURA FIELD
AURANGA FIELD
HUTAR FIELD
BOKARO FIELD
RANIGANJ COAL FIELD
JHARIA COAL FIELD
R DAMODAR
BAUXITE
LOHARDAGA
MADHYA PRADESH
WEST BENGAL
ST
Mn
C
A
ORISSA
C: CHROMITE
ST: STEATITE
D: DOLOMITE
A: ASBESTOS
P: PYRITE
Fc: FIRE CLAY
COAL BEARING ROCKS
IRON BELT
COPPER BELT
KYANITE BELT
LIMESTONE
CHINA CLAY
MANGANESE

Patna in December has been recorded as 17°c and 18°c respectively and about 17°c in the same month at Ranchi and Hazaribag. January is the coldest month in the Bihar and the mean temperature in this month varies from 7.5°c to 10.5°c though some places like Netarhat recorded much less than 7.5°c.

In March, when the hot season begins, the mean temperature varies between 23.2°c (Motihari) and 27.5°c (Jamshedpur). The highest temperature is often registered in May which is the hottest month in the state. The average temperature in May is more than 32°c throughout the state except in the northern end of the state and the elevated parts of Chotnagpur.

SOIL

The soil of Bihar has been grouped into seven categories as :

(1) *Swamp Soils* : This type of soil is dark gray clay having high moisture contents to waterlogging conditions and good for growing rice crop. It is found in the Tarai (valley) in the north of East and West Champaran districts.

(2) *The Gangetic Alluvium* : This soil is formed on wear and tear of vast areas by means of alluvial and deluvial action by the numerous streams on one hand and deposition of silt and sand on the other. Large tracts of this soil are subjected to excessive moisture and swampy conditions by inundation and rains but in the dry period of desiccation it is characterized by the blazing sun and blasting 'loo' sets up the process of arid climate in the soiland subsoil leading to some accumulation of salt in some area in north-west. The vast plains of North and South Bihar are covered by this soil. This vast tract has been denuded of the natural vegetation and cover by cultivation, which started thousands of years ago.

(3) *Calcarious Soil* : This type of soil has lime accumulation and contains a higher percentage of carbonate of lime. Its subsoil contains beds of Kankar or nodular lime stone. The belt of this soil roughly corresponds with the Bangar area in Saran, the Bangar Doab between the Little Gandak and the Baghmati in Muzaffarpur, Champaran and Darbhanga district in the north and between the river uplands in the south.

(4) *Red Sandy Soil of the Kaimur Plateau* : This type of soil is sandy. Ferruginous contents are also found in it. this soil overlies on the Kaimur plateau in south Shahabad except in the saucer-shaped valley which have a rich deposits of vegetable mould. The soil varies from place to place. As a whole it forms a thin layer overlying the rocky substratum. It yields poor and precarious crops of millets and hardier rabi crops.

(5) *Red and Yellow Soils of the Chotanagpur Plateau and Its Fringe* : This type of soil contain nitrogen, phosphoric acid and humus but porash and lime derived from felspar, hornblende and augite of the crystaline rocks are sufficient. The soil as a whole is light with a relatively high sand proportion. The colour of soil is somewhere red but some where it is blackish. The soil is good for the growth of arhar and custar. The soil of valleys and depression relatively moist and good for growing paddy.

(6) *Black clayey Soil* : It is a black clay which is hard when dry but friable. It is sticky when wet and retains moisture for a long time. It is infertile, thin and of light colour on the uplands, but on the lowlands and in the valleys it is fairly deep enriched by washing from above and is given to paddy cultivation. Rice is also grown on upper terraced fields where the thickness of the soil is maintained.

The soil is clayey because its constituent minerals are felspar and hornblends. This type of soil is found on the basic rocks on the western flanks of the Rajmahal Hills and Santal Parganas.

(7) *Dark Reddish Brown Soil or Laterite Soil* : This type of soil is of red-colour due to high percentage of iron oxide in it. The chief defect of laterite soil is its marked acidic characters. After removal of acidity of this soil, it may be rendered productive. Laterite soils are found in the Rajmahal area in Santal Parganas, in south-eastern Dalbhum on Tertiary sediments and in the 'Pat' region of west Ranchi and south Palamau. The red and yellow soils of Chotanagpur may also be treated as initial stage of laterite formation.

DRAINAGE

There are two types of draniage : One is surface water form and another is underground. As regards surface drainage of Bihar, all drainage ultimately goes to the Ganga or its distributary the Hooghly except 29785 kms. in east & west Singhbhum, Ranchi, Gumla and Lohardanga districts which goes directly to the Bay of Bengal through the Sank, south Koel and the Subarnarekha rivers.

The Ganga enters in Bihar near Chausa in Buxar district on the boundary of Bihar where Karmanasa river joins it. After that among three affluents – the Ghaghara and the Sone join the Ganga near Patna and the Gandak which is formed by the union of seven Himalayan streams, enters the Bihar near Balmikinagar in west Champaran district, joins the Ganga opposite to Patna. The Punpun joins it from the south at Fatwah in Patna district while the Harohar and the kiul at Surajgarh in Munger. In this way the Karmanasa, the Son, the Punpun, and the Kiul are the principal streams that joins the Ganga from south. Further, important river that join the Ganga from the north are the Burhi Gandak, the Kosi, the Mahananda and their tributaries.

The principal rivers of Chotanagpur are the Damodar, the Suvarnarekha, the Barakar and the Koel.

Water falls in various forms are found in Ranchi, Gumla, east and west Singhbhum, Hazaribagh, Palamau, Shahabad, Nawadah, Gaya, and Santal Pargana districts.

The main water falls are Hundru, Dasam and Jonha in Ranchi district; Sadni in Gumla district; Hirni in West Singhbhum district; Gutamghagh and Ghaghri in Palamau dostrict; Durgaoti and other finest water fall on the Karmanasa near Chhanpathar village in Shahabad district and Kokolat in Nawadah district.

Among springs, the hot springs are valuable. The main hot springs in Bihar are found in Bhimbandh sanctuary between Munger and Jamui districts in Kharagpur hills and in Rajgir in Nalanda district. Similar type of three hot springs are found in Dhanbad district. There is also one hot spring named as Tataha found in Palamau district.

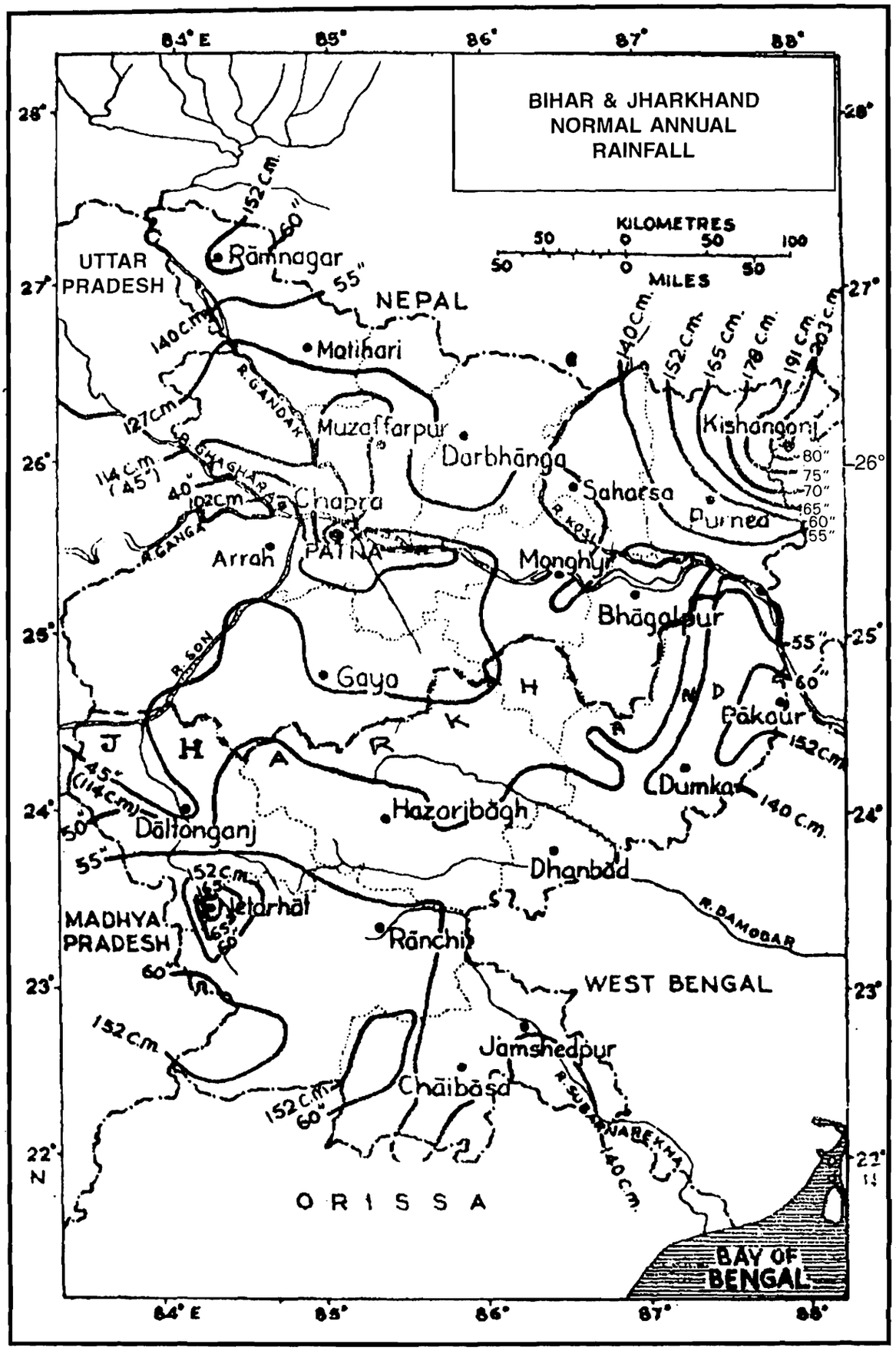
FOREST AND VEGETATION

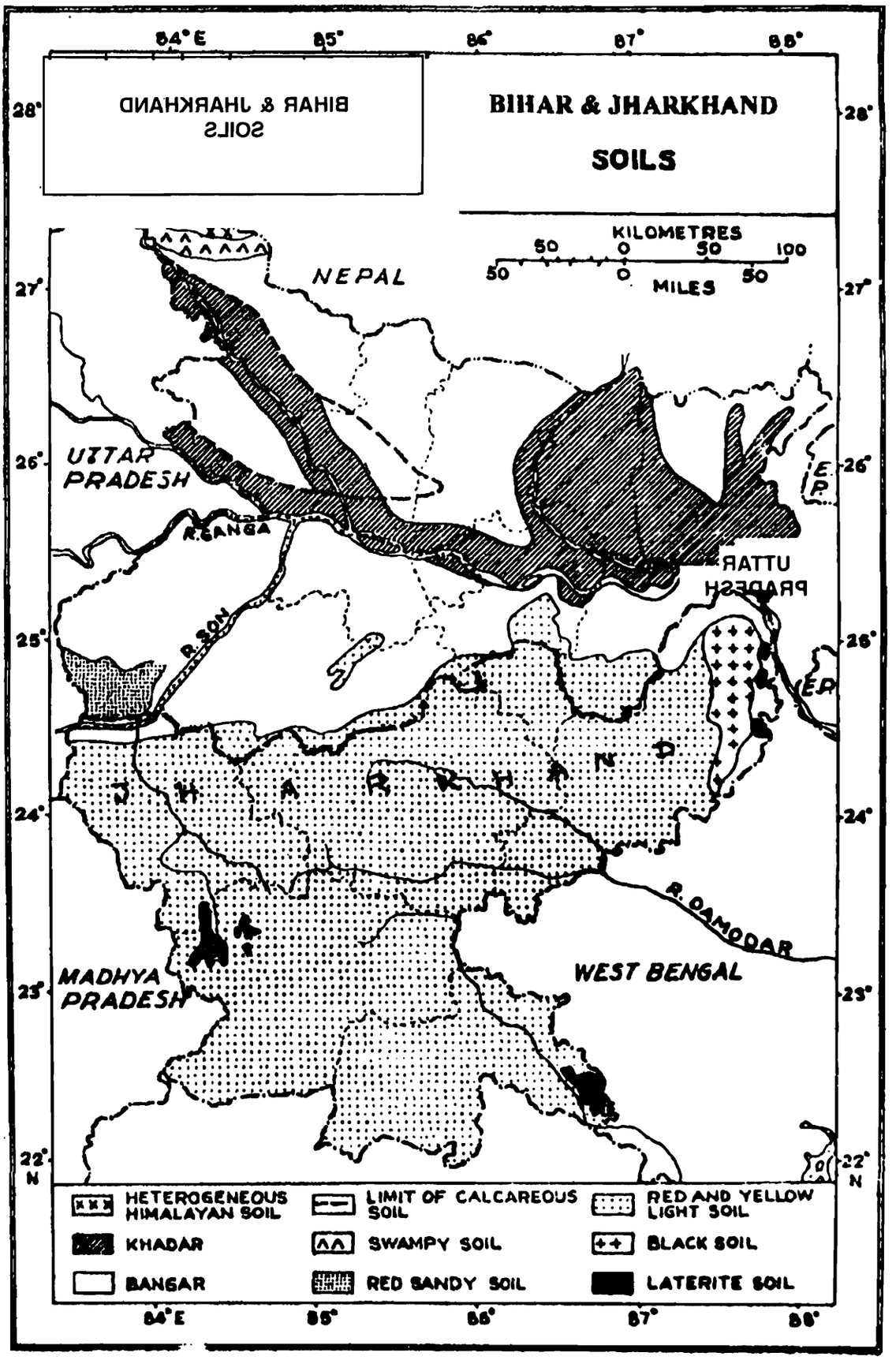
Bihar has 21.8 per cent of its total area clothed with forests and woodland of the total area (30,490 sq. km.) under forest in Bihar in 1968-69, 'reserved' forest occupied 4,390 sq. km. 'protected' forests covered 24,872 sq. km. and 'unclassified' forests 1,228 sq. km.

The vegetation of Bihar including Jharkhand which recently separated from it is divisible into two broad types : tropical moist deciduous covering the hills of south Bihar and Chotanagpur and the submontane vegetation in the North Bihar plains and the tropical dry deciduous vegetation type occurring over the rest of the State.

The tropical moist deciduous vegetation occur in Bihar in the areas with more than 50 inch (1270 mm.) of annual rainfall. Sal is the most important species making 60-90 per cent of the canopy. Bamboos generally avoid the company of sal. The scarlet blossoms of *Butea frondosa* and *Butea superba* give a burning red look to the forest.

The sub-Himalayan Foothill Forest of the Sumeswar and Dun ranges in champaran district consists of moist deciduous type of forest vegetation, scrubs and a number of grasses and reeds. In the moist or swampy region south of the foothills zone in Champaran and further east wherever the Tarai occurs, the typical vegetation consists of bamboos, the long coarse sabai grass, narkat reeds, tamarick locally called then and some forest trees of the Himalayan foothills zone. A large part of the Chotanagpur highlands and Santal Parganas receiving more than 50 inch (1270 mm.) of rainfall is occupied by the tropical moist deciduous types of forest vegetation. Sal is the preference for some rocks of this area. They grow best in the east and west Singhbhum districts. The sal occurs with a number of other species like mahua (*Bassia latifolia*), kusum (*Schleichera trijuga*), gular (*Ficus glomerata*), asan (*Terminalia tomentosa*), pier (*Buchanania latifolis*), khair (*Acacia catachu*), amaltas (*Cassia fistula*), bamboo (*Dendrocalamus strictus*), gambar


BIHAR & JHARKHAND
NORMAL ANNUAL
RAINFALL
KILOMETRES
50 0 50 100
50 0 50
MILES
84° E
85°
86°
87°
88°
28°
27°
26°
25°
24°
23°
22° N
UTTAR PRADESH
NEPAL
MADHYA PRADESH
WEST BENGAL
ORISSA
BAY OF BENGAL
Rāmnagar
Matihari
Muzaffarpur
Darbhānga
Saharsa
Purnea
Kishanganj
Chapra
Arrah
PATNA
Monghyr
Bhāgalpur
Gaya
Pākaur
Dumka
Hazaribāgh
Dālton ganj
Dhanbād
Rānchi
Jamshedpur
Chāibāsa
Netarhāt
R. GANDAK
R. GHAGHARA
R. GANGA
R. SON
R. KOSI
R. DAMODAR
R. SUBARNAREKHA
152 c.m.
60"
55"
140 c.m.
127 c.m.
114 c.m.
(45")
40"
102 c.m.
178 c.m.
191 c.m.
203 c.m.
80"
75"
70"
65"
60"
55"
50"


BIHAR & JHARKHAND
SOILS
KILOMETRES
50 0 50 100
50 0 MILES 50
NEPAL
UTTAR PRADESH
R.GANGA
R.SON
JHARKHAND
R.DAMODAR
WEST BENGAL
MADHYA PRADESH
HETEROGENEOUS HIMALAYAN SOIL
LIMIT OF CALCAREOUS SOIL
RED AND YELLOW LIGHT SOIL
KHADAR
SWAMPY SOIL
BLACK SOIL
BANGAR
RED SANDY SOIL
LATERITE SOIL
84°E
85°
86°
87°
88°
28°
27°
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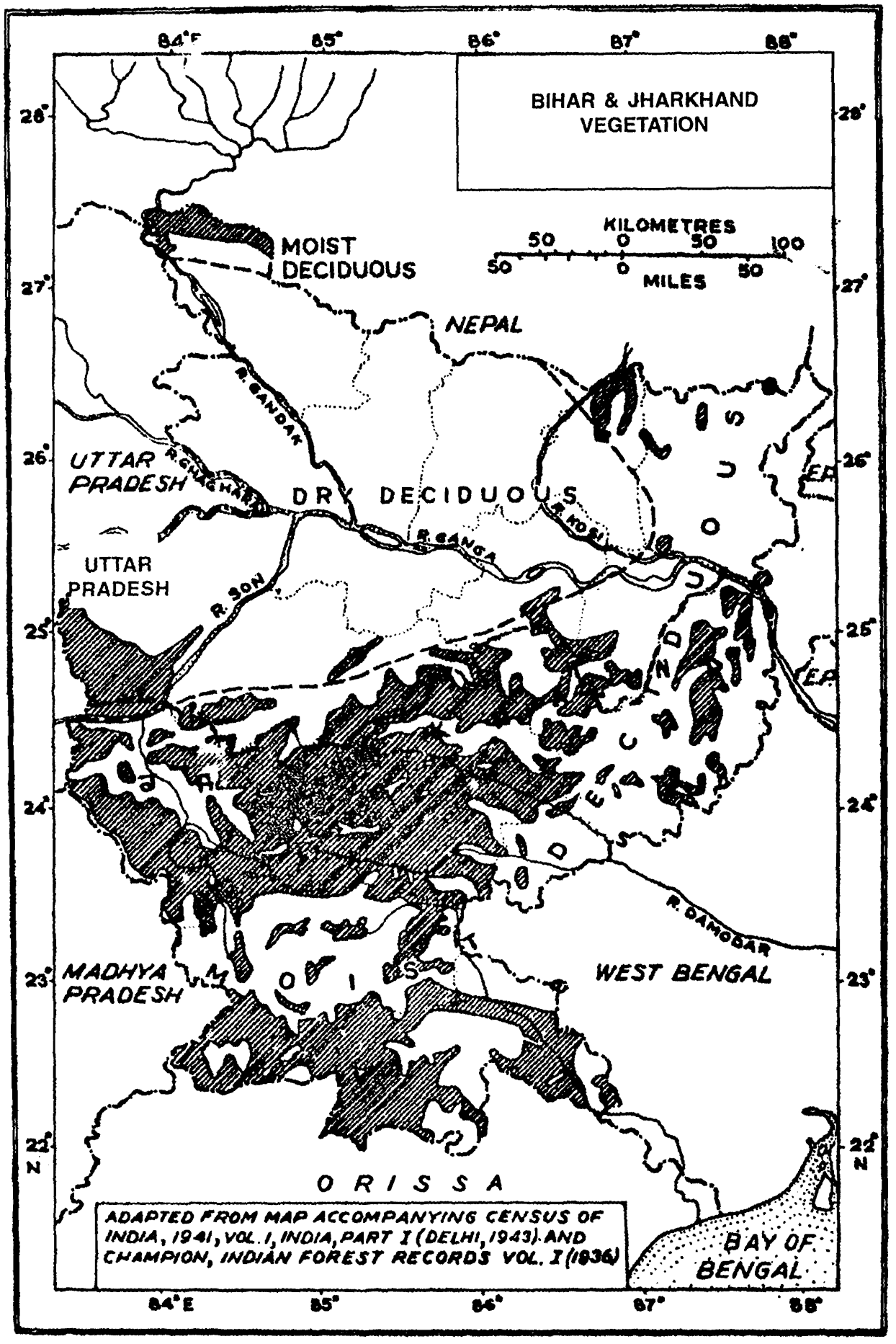
25°
24°
23°
22° N


BIHAR & JHARKHAND
VEGETATION
KILOMETRES
50 0 50 100
50 0 50
MILES
MOIST
DECIDUOUS
NEPAL
R. GANDAK
UTTAR
PRADESH
R. GHAGHARA
DRY DECIDUOUS
R. KOSI
R. GANGA
UTTAR
PRADESH
R. SON
R. DAMODAR
MADHYA
PRADESH
WEST BENGAL
ORISSA
BAY OF
BENGAL
ADAPTED FROM MAP ACCOMPANYING CENSUS OF INDIA, 1941, VOL. I, INDIA, PART I (DELHI, 1943) AND CHAMPION, INDIAN FOREST RECORDS VOL. I (1936)
84°E
85°
86°
87°
88°
28°
27°
26°
25°
24°
23°
22° N

(*Gmelina arborea*), kend (Diospyros melanoxylon). karanj (*Ponamia glabera*), palas (*Butea frondosa*) and khajur (*Phoenix sylvestris*) etc.

The Singhbhum forests are the best in the Kolhan area or the west Singhbhum district, although about half of the district round the cultivated Chaibasa plain is wooded. The district is characterised by the high temperatures in the shade, scorched southern slopes, but deep damp valleys and hence its natural vegetation is a mixture of the plants of hot drier countries as well as those growing on the moist tracts of Assam. In Hazaribagh and Palamau the forests become slightly poorer than in the south with a gradual decrease of rainfall and such trees of drier habitat as shishan begin gradually to appear.

Dry deciduous vegetation cpers the poorer forests of the north-western fringe of Chotanagpur in Palamau and adjoining areas and in Kaimur plateau in Shahabad. Patches of sal are occasional in Shahabad. The common forest is a mixed stunted growth consisting of bamboos, amaltas, semal, harra (*Terminalia chabuls*), abnus or tend (*Diospyros melanexylon*), khair, gapas, asan and mahua. The grasses include sabai and kua (*Poa cynosuroides*) and spear-grass.

In Palamau, the forests are of dry deciduous type of which the most important species is the sal, which covers approximately 53 percent of the area. Salai (*Boswalia serrata*) is very common and bamboo occur throughout the district.

In south Gaya, south Munger and south Bhagalpur the forest is generally replaced by scrub in which sal is relatively small in number.

In the rest of the region of tropical dry deciduous the natural vegetation is largely suppented by cultivated vegetation of field crops and fruit gardens and orchards. These fruit gardens and orchards are called parkland. It interference of man and animals were withdrawn, the parkland would be replaced by woodland and ultimately by dense forests with little chance of grass growth.

In north bihar the predominant reature in the vegetation is the frequency of groves and orchards, largely of deciduous trees but with quite a few evergreen species. Isolated trees growth is very common. Patches of grass land may be noted in low lands or wastes.

The vegetation of the State is one of its principal natural resources. Sal is the most important timber tree in the state. Other timber trees are *Shisham*, *bia* (*Petrocarpus marsupium*), asen, gamhar, mahua and karam etc. the importance of bamboos in paper industry, in house-building, as posts and scaffoldings, etc., is great. It occurs throughout the state. *Sabai*, the most important grass of south of the Ganges is valuable in the making of ropes and paper. Other grasses are used as thatching material, including Khar (*Heteropogon muricatus*), spear grass and munj. The kus (*Pao cynosuroides*) grass is a source of fragrant oil. The best fodder grasses are dub and kans etc. Firewood is supplied by *salai*, *semal*, *acacia* and *harra*. The matchwood trees of the State are *semal*, *salai*, *piar*, *gamhar* and *bia* or *chilbil* (*Holoptelia integrifolia*) and ginjan (*Odina wodier*). Piar and ginjan are excellent for matches splints as well as boxes. The best trees on which lac insects are reared are kusum and palas. Other trees on which lack insects subsits are ber *(Zizyphus jujuba)*, dumar *(Ficus hispida)*, khair, ghont *(Zizyphus xylopyra)* and karam *(Adina latifolia)* etc. Lac is grown over entire Chotanagpur but most important districts are Palamau and Ranchi. Chotanagpur is the home of tasar silkworm. It feeds on the leaves of ber, asan and arjan etc. The presence of these tree in Bhagalpur, Gaya, Shahabad, Ranchi and Singhbhum is responsible for the rearing of tasar silkworms.

AGRICULTURE

About 80 percent population of Bihar are sustained by agriculture. The great majority of this land have no occupation apart from it. Therefore, the success or failure of the crops every year is a matter of vital importance. About 90 percent of total cropped area here is utilized for foodcrops against the national average of only 75 percent. The agriculture year in Bihar is generally divided into three seasons : (i) bhadai or Autumn (crops harvested in September-October), (ii)

aghani (crops harvested in Aghan, November-December) and (iii) rabi (crops harvested in rabi or spring about March). But there is one more summer season in which summer crops likes vegetables and some millets and bore rice grown in moist riparian tracts or irrigated land near houses. The bhadai crops generally consists of early ripening varieties of rice, millets, maize, jute, some pulses and vegetables etc. The *aghani* crops consist mainly of winter rice, sugarcane, some oil seeds and pulses. The *rabi* harvest consists of wheat, barley, raps and mustard, linseeds, tobacco, peas, gram and arhar etc.

While the *bahdai* and *aghani* crops are important throughout Bihar, the *rabi* crop is relatively insignificant in the overdrained, poorly irrigated and rocky districts of Chotanagpur particularly Ranchi, Hazaribagh, Dhanbad and East and west Singhbhum districts. The summer crops are important in North Bihar while they are relatively important in south Bihar plains and Chotanagpur.

Rice is the leading crop in all the districts of Bihar. Normally about 90 per cent of the rice grown in Bihar is winter paddy, the remaining being autumn or broadcast rice.

Maize (*Zea maya*) is the next most important crop of Bihar. It needs well-distributed light showers with short sunny intervals. The chief maize country of Bihar consists of the plains north of the Ganga, eastern districts of South Bihar, viz. Santal Parganas, Bhagalpur and Munger.

Wheat (*Triticum sativum*) is the third crop of the state. It is generally a dry-zone crop occurring mostly in the areas under 40 inch of annual rain. The wheat is grown in the North Bihar plains and the canal-irrigated plain of South Bihar west of Munger. The *diaras* and river-side uplands of North Bihar which form the main wheat areas of North Bihar are generally unirrigated. They are sufficiently moist from the floods. In South Bihar, however, irrigation of wheat is considerable where about one-third of the wheat acreage is irrigated.

Among other important crops of Bihar, barley is harder then wheat growing on light sandy and usually unmanured loams, *marua* sown and transplanted like rice. *Gram* is the most important among pulses and net only to wheat among the rabi crops of the State *Tur* or *arhar* is the next most important among the pulses. It is a deep-rooted crop remaining in the field for about ten months. It needs no irrigation and can flourish on light soil even during years of drought. Although *arhar* is of considerable importance in Chotanagpur, the main *arhar* belt of Bihar is a North Bihar west of the Kosi and south Bihar plains west of Bhagalpur district.

Other less important food grains including pulses are jowar, bajra, sawan, tanjun, china, masur, urid, mung, pear and khesari etc.

Among cash-crops sugarcane growing area covers the plains of west of the Kosi and Munger and north of the Bihar plateau. Maximum sugarcane grows in Saran and Champaran region. Among the spices, chillies are of considerable importance in Bihar, other spices of this areas are turmeric, ginger, coriander (*dhania*), aniseed (sounf) and garlic etc.

The important fruits of this area are mango *(Mangifera indica)*, litchi *(Nephelium litchi)*, jackfruit, plantain, orange, lemon, guava, melone, bel and papaya etc. The common vegetable and root crops are potatoes, tomatoes, radiphes, carrots, sweet potatoes, beans, cucumber, brinjal, gourd, spinach, pumphin and onion etc. Among oilseeds grown in Bihar, rape and mustard are the most important. Linseeds are also equally importants. The other oilseeds grown in Bihar are sesamum, castor and surguja. The surguja is important in Chotanagpur.

Jute is the most important cashcrop in Purnea and Saharsa districts. The other fibres grown in Bihar are mesta and sunn-hemp. The other mentionable cash-crop is tobacco which has been grown north of the Ganga from the Gandak to the eastern limits of the State, In the western parts the deshi variaty *(Nicotiana tabacum)* predominate while in Purnea the vilayati *(Nicotiana rustica)* predominate. In Purnea the vilayati *(Nicotiana rustica)* variety is generally grown.

The economy of the state is also depended on the animal husbandry and fisheries. Bihar has relatively poor livestock throughout the state. In the thickly populated and closely cultivated sections of the plains there is very little pasture and the ill-fed livestock can browse on some poor grasses or vegetation in the village wastes or orchards or on the uncultivated riverine grassland. Generally the cattle are stall-fed on such fodder as stalks of Jowar and maize or straw of rice, wheat, barley, arhar, peas or green grasses collected from the riverine tracts or grasses weeded from cultivated fields.

In the hilly areas large herds are driven into the village wastes or adjoining jungles particularly during rains when there is sufficient grass. There are other ecological reasons, e.g. humidity, terrain, soil and ground moisture.

The distribution of livestock in Bihar is roughly proportionate to the human population. The number of cattle is the largest. The number of bullocks for plough and cart is about one per seven persons, that of cow is about one per ten persons. In Bihar, the number of male buffalow is very less than male buffalow. The number of male buffaloes is the largest in hilly areas of Chotanagpur. It is relatively low in the rest of the state than Chotanagpur. In Bihar the number of cows and female buffaloes taken together is about one per seven persons. In Bihar inferior quality sheep are reared for mutton and coarse hair rather than for wool. They are also used as a source of fertilization to current fallows where they are flocked during night. Their density is relatively low in plains but they are quite numerous in Chotanagpur and other hilly areas. The goats reared primarily for mutton. The local breeds of horses and ponies are poor. This group of animals are used for drawing vehicles or as beast of burden or for riding.

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MAMMALS

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INTRODUCTION

Information about mammalian fauna of Bihar is very much scattered except the Order Chiroptera by Sinha (1986). In this paper, altogether records of 95 species and subspecies of mammals of Bihar, belonging to order Scandentia (1 sp. & subsp.), Insectivera (2 sp. & subsp.), Chiroptera (29 sp. & subsp.), Primates (2 sp. & subsp.), Pholidata (1 sp. & subsp.), Carnivora (20 sp. & subsp.), Proboscidea (1 sp. & subsp.), Perissodactyla (1 sp. & subsp.), Artiodactyla (14 sp. & subsp.), Lagomorpha (1 sp. & subsp.) Rodentia (22 sp. & subsp.) and Cetacea (1 sp. & subsp.), have been procured through specimens present in Zoological Survey of India, extant literature and recent observations. These important literature which deals with the mammalian fauna of India, including Bihar are due to Agrawal *et. al* (1992), Andersen (1912), Anderson (1881), Blanford (1888-91), Blyth (1863), Corbet & Hill (1992), Dobson (1876; 1978), Ellerman (1961), Ellerman and Morrison-Scott (1951), Gupta & Sinha (1980), Hill (1963), Inglis (1916), Jones (1982), Khajuria (1953), Khajuria *et. al* (1977), Kumar (1970), Nath (1951), Pocock (1937 *a*; *b*; 1939; 1941), Prasad (1983), Roy Chaudhary (1958 *a*; *b*; 1960 *a*; *b*; 1961; 1962; 1963; 1964 *a*; *b*; 1965; 1966), Sclater (1891), Shahi (1977), Sinha (1981), Tiakder (1983), Venkateshwarlu (1973), Wilson & Reeder (1993) and Wroughton (1915; 1918 *a*; *b*;).

All measurements mentioned in the text are in millimetres and the figures in parentheses indicate arithmetic means (for more than two specimens).

Keys for the identification of family, genera and species of mammals of Bihar have been given under each order. Common name, material examined, diagnosis, distribution and remarks on distribution etc. have been provided for future workers on this group.

The following abbreviations have been used in the text :

ad.	=	adult;
apf	=	Length of anterior palatal foramina;
b	=	length of bulla;
c^1 c^1	=	distance between outer surfaces of upper canines;
cw	=	cranial width;
d	=	length of diastema;
E	=	length of ear;
Fa	=	length of forearm;
F & cl	=	length of foot and claw;
H & B	=	length of head and body
G. P. R. S, Pat.	=	Gangetic Plains Regional Station, Zoological Survey of India, Patna;
Hf	=	length of hindfoot;
iw	=	least interorbital width;
l	=	greatest length of skull;
m^1 m^1	=	distance between outer surfaces of first upper molars;
m^2 m^2	=	distance between outer surfaces of second upper molars;

m^3 m^3 = distance between outer surfaces of third upper molars;
ml = mandibular length;
mtr = length of maxillary tooth row;
mw = maxillary width;
n = nasal length;
on = occipitonasal length;
orb = length of orbit;
pl = palatal length;
pm^4 = length of fourth upper premolar;
pow = post orbital width;
Tb = length of tibia;
Tl = length of tail
Tr = length of tragus;
y = young;
Z. S. I. Cal. = Zoological Survey of India, Calcutta;
zw = zygomatic width.

SYSTEMATIC LIST

Systematic List of the Mammalian species and subspecies from Bihar alongwith their distribution (districtwise), based on the specimens, extant literature and recent observations.

Only the name of those districts have been numbered here from where mammals are recorded or collected as : 1. Araria, 2. Aurangabad, 3. Banka, 4. Begusarai, 5. Bhabhua, 6. Bhagalpur, 7. Bhojpur, 8. Bokaro, 9. Darbhanga, 10. Deoghar, 11 Dhanbad, 12. East Champaran, 13. East Singhbhum, 14. Gaya, 15. Giridih, 16. Godda, 17. Gopalganj, 18. Hazaribag, 19. Jahanabad, 20. Jammui, 21 Katihar; 22. Kishanganj, 23. Madhubani, 24. Munger, 25. Muzaffarpur, 26. Nawada, 27. Nalanda, 28. Palamau, 29. Patna, 30. Purnea, 31. Ranchi, 32. Rohtas, 33. Saharsa, 34. Sahebganj, 35. Samastipur, 36. Santal Pargana, 37. Saran, 38. Sitamarhi, 39. Siwan, 40. Vaishali, 41. West Champaran, 42. West Singhbhum.

Sl. No.	Systematic List	Districtwise distribution
	Order SCANDENTIA	
	Family TUPAIIDAE	
1.	***Anathana ellioti pallida*** Lyon	6, 24.
	Order INSECTIVORA	
	Family SORICIDAE	
2.	***Suncus murinus caerulescens*** (Shaw)	Almost all districts No. 1-42
3.	***Suncus etruscus nitidofulvus*** (Anderson)	15, 42.
	Order CHIROPTERA	
	Family PTEROPODIDAE	
4.	***Rousettus l. leschenaulti*** (Desmarest)	2, 18, 29, 42.
5.	***Pteropus g. giganteus*** (Brünnich)	Almost all districts No. 1-42
6.	***Cynopterus s. sphinx*** (Vahl)	1, 5, 9, 10, 14, 18, 21, 22, 24, 29, 30, 32, 34, 35, 36, 41, 42.
7.	***Cynopterus brachyotis*** (Müller)	5, 14, 32, 35.
	Family RHINOPOMATIDAE	
8.	***Rhinopoma microphyllum kinneari*** (Wroughton)	18.
9.	***Rhinopoma h. hardwickei*** Gray	7, 14, 15, 24, 32.
	Family EMBALLONURIDAE	
10.	***Taphozous l. longimanus*** Hardwicke	4, 6, 7, 9, 15, 18, 29, 30, 33, 37, 40, 41, 42.

Sl. No.	Systematic List	Districtwise distribution
11.	***Taphozous m. melanopogen*** Temminck	29.
12.	***Taphozous k. kachhensis*** Dobson	14, 32.
13.	***Taphozous saccolaimus crassus*** Blyth	42.
	Family MEGADERMATIDAE	
14.	***Megaderma lyra lyra*** Geoffroy	1, 2, 6, 7, 11, 15, 17, 21, 22, 23, 30, 33, 35, 40, 42.
	Family RHINOLOPHIDAE	
15.	***Rhinolophus l. lepidus*** Blyth	14, 15, 18, 26, 42.
16.	***Rhinolophus mitratus*** Blyth	42.
17.	***Hipposideros fulvus pallidus*** Anderson	9, 14, 15, 18, 24.
18.	***Hipposideros galeritus brachyotus*** (Dobson)	14.
	Family MOLOSSIDAE	
19.	***Tadarida plicata plicata*** (Buchannan)	6.
	Family VESPERTILIONIDAE	
20.	***Myotis f. formosus*** (Hodgson)	37, 42.
21.	***Myotis formosus andersoni*** (Troueseart)	30.
22.	***Pipistrellus c. coromandra*** (Gray)	2, 6, 7, 14, 15, 17, 18, 19, 23, 24, 25, 28, 29, 40, 41, 42.
23.	***Pipistrellus mimus*** Wroughton	4, 7, 9, 12, 14, 15, 18, 19, 23, 25, 26, 29, 32, 33, 36, 38, 41, 42.
24.	***Pipistrellus ceylonicus indicus*** (Dobson)	11, 42.
25.	***Pipistrellus dormeri*** (Dobson)	7, 14, 15, 18, 25, 32, 35, 36, 39, 40, 41, 42.
26.	***Pipistrellus paterculus*** Thomas	9.
27.	***Scotoecus pallidus*** (Dobson)	6, 9, 25, 34.
28.	***Scotomanes ornatus ornatus*** (Blyth)	6.
29.	***Hesperoptenus tickelli*** (Blyth)	42.
30.	***Scotophilus k. kuhli*** Leach	7, 14, 18, 19, 21, 22, 24, 25, 28, 29, 34, 36, 40, 42.
31.	***Scotophilus h. heathi*** (Horsfield)	1, 4, 5, 6, 9, 10, 15, 18, 21, 22, 25, 26, 29, 30, 32, 33, 40, 41.
32.	***Kerivoula p. picta*** (Pallas)	9.
	Order PRIMATES	
	Family CERCOPITHECIDAE	
33.	***Macaca m. mulatta*** (Zimmermann)	4, 6, 12, 27, 28, 29, 42.
34.	***Presbytis entellus entellus*** (Dufresne)	6, 7, 10, 18, 27, 28.
	Order PHOLIDOTA	
	Family MANIDAE	
35.	***Manis crassicaudata*** Gray	6, 27, 42.

Sl. No.	Systematic List	Districtwise distribution
	Order CARNIVORA	
	Family CANIDAE	
36.	***Canis lupus pallipes*** Sykes	6, 14, 18, 24, 28, 29, 30, 33, 37, 41
37.	***Canis aureus indicus*** Hodgson	6, 8, 9, 14, 18, 25, 28, 29, 30, 32, 33, 37.
38.	***Vulpes bengalensis*** (Shaw)	6, 9, 18, 25, 28, 29, 30, 32.
39.	***Cuon alpinus primaevus*** (Hodgson)	6, 11, 14, 28, 32, 37, 41, 42.
	Family URSIDAE	
40.	***Melursus ursinus ursinus*** (Shaw)	6, 8, 12, 14, 18, 27, 28, 29, 32, 41, 42.
	Family MUSTELIDAE	
41.	***Mustela kathiah kathiah*** (Hodgson)	6.
42.	***Mellivora capensis indica*** (Kerr)	6, 18, 28.
43.	***Arctonyx c. collaris*** Cuvier	6.
44.	***Lutra perspicillata perspicillata*** I. Geoffrey	6, 28, 30.
	Family VIVERRIDAE	
45.	***Viverra z. zibetha*** Linnaeus	6.
46.	***Viverricula indica indica*** (Desmarest)	6, 18.
47.	***Paradoxurus hermaphroditus*** (Pallas)	6, 8, 14, 15, 33, 40.
	Family HERPESTIDAE	
48.	***Herpestes a. auropunctatus*** (Hodgson)	8, 18.
49.	***Herpestes edwardsi nyula*** (Hodgson)	4, 6, 7, 8, 9, 12, 18, 20, 28, 29, 30, 40.
	Family HYAENIDAE	
50.	***Hyaena hyaena hyaena*** (Linnaeus)	6, 9, 14, 18, 28, 29, 30, 32, 41.
	Family FELIDAE	
51.	***Felis chaus kuta*** Pearson	6, 8, 9, 14, 18, 28, 29, 41, 42.
52.	***Felis viverrina*** Bennett	6.
53.	***Acinonyx jubatus venaticus*** (Griffith)	42. (New extinct from India)
54.	***Panthera pardus fusca*** (Mayer)	6, 9, 11, 14, 22, 25, 27, 28, 29, 32, 33, 37, 41, 42.
55.	***Panthera tigris tigris*** (Linnaeus)	6, 9, 11, 14, 28, 30, 32, 33, 37, 38, 41, 42.
	Order PROBOSCIDEA	
	Family ELEPHANTIDAE	
56.	***Elephas maximus indicus*** Cuvier	6, 9, 13, 28, 30, 38, 41.
	Order PERISSODACTYLA	
	Family RHINOCEROTIDAE	
57.	***Rhinoceros unicornis*** Linnaeus	30, 33, 41.
	Order ARTIODACTYLA	
	Family SUIDAE	
58.	***Sus scrofa cristatus*** Wagner	6, 9, 11, 13, 14, 18, 24, 25, 27, 28, 29, 30, 32, 33, 37, 42.

Sl. No.	Systematic List	Districtwise distribution
	Family TRAGULIDAE	
59.	***Tragulus meminna*** Erxleben	13, 28.
	Family CERVIDAE	
60.	***Muntiacus muntjak vaginalis*** (Boddaert)	13, 14, 18, 28, 41.
61.	***Axis porcinus porcinus*** (Zimmermann)	6, 30, 32, 33, 41.
62.	***Axis axis axis*** Erxleben	6, 14, 18, 24, 28, 30, 32, 33, 41, 42.
63.	***Cervus unicolor niger*** Blainvile	6, 14, 18, 24, 27, 28, 32, 41, 42.
64.	***Cervus duvauceli duvauceli*** Cuvier	6, 24.
	Family BOVIDAE	
65.	***Bos gaurus*** Smith	28, 31, 41, 42.
66.	***Bubalus bubalis bubalis*** (Linnacus)	6, 9, 30, 33, 41.
67.	***Capra*** sp.	41.
68.	***Antilops cervicapra rupicapra*** Müller	6, 7, 11, 14, 29, 30, 32, 37, 41
69.	***Boselaphus tragocamelus*** Pallas	9, 12, 14, 25, 27, 28, 29, 32, 33, 37, 40, 41.
70.	***Tetracerus quadricornis*** Blainville	6, 14, 18, 28, 41.
71.	***Gazella gazella bennetti*** (Sykes)	14, 18, 28, 32.
	Order LAGOMORPHA	
	Family LEPORIDAE	
72.	***Lepus nigricollis ruficaudatus*** Geoffroy	14, 28, 29, 30, 32, 33.
	Order RODENTIA	
	Family SCIURIDAE	
73.	***Petaurista petaurista philippensis*** (Elliot)	42.
74.	***Funambulus p. palmarum*** (Linnaeus)	14, 15, 18.
75.	***Funambulus pennanti*** Wroughton	9, 14, 15, 18, 19, 28, 29, 35, 40, 42.
76.	***Ratufa indica centralis*** Ryley	42.
	Family HYSTRICIDAE	
77.	***Hystrix indica indica*** Kerr	2, 6, 28, 29, 30.
	Family MURIDAE	
78.	***Vandeleuria oleracea oleracea*** (Bennett)	18.
79.	***Vandeleuria oleracea dumeticola*** (Hodgson)	19, 42.
80.	***Millardia m. meltada*** (Gray)	9, 15, 18, 35.
81.	***Cremnomys blanfordi*** (Thomas)	15, 18.
82.	***Rattus rattus arboreus*** (Horsfield)	2, 13, 14, 15, 18, 28, 29.
83.	***Rattus rattus rufescens*** (Gray)	1, 18, 29, 42.
84.	***Rattus cutchicus medius*** (Thomas)	14, 18.
85.	***Mus musculus castaneus*** Waterhouse	8, 9, 14, 15, 18, 26, 27, 28, 29, 42
86.	***Mus booduga booduga*** (Gray)	8, 15, 18, 42.
87.	***Mus dunni*** (Wroughton)	8, 18, 28, 42.

Sl. No.	Systematic List	Districtwise distribution
88.	***Mus platythrix*** Bennett	14, 15, 18.
89.	***Diomys crumpi*** Thomas	15.
90.	***Golunda ellioti ellioti*** Gray	15.
91.	***Bandicota b. bengalensis*** (Gray)	8, 9, 15, 18, 28, 29, 30, 42.
92.	***Bandicota i. indica*** (Bechstein)	18.
93.	***Nesokia i. indica*** (Gray)	29, 40.
94.	***Tatera i. indica*** (Hardwicke)	18, 28.
	Order : CETACEA	
	Family : PLATANISTIDAE	
95.	***Platanista gangetica*** (Roxburgh)	6, 29.

SYSTEMATIC ACCOUNT

Order SCANDENTIA

Mammals of this order appear like squirrel but have a long snout, devoid of long whiskers.

The order contains only one family the Tupaiidae

Family TUPAIIDAE

There is only one genus, namely *Anathana* Lyen, occurs in Bihar.

Genus ***Anathana*** Lyen, 1919

Genus *Anathana* is represented by one species *Anathana ellioti* (Waterhouse). Out of three subspecies, one occurs in Bihar.

1. ***Anathana ellioti pallida*** Lyen

1913. *Anathana pallida* Lyen, *Proc. U. S. natn. Mus.*, **45** : 124 (Manbhum = Purulia district, West Bengal, India).

Common name : Madras Tree-shrew (English).

Material examination : Nil.

Measurements : Nil.

Diagnosis : Dorsal body colour reddish brown; tail darker than dorsal surface of body; hind legs and feet grizzled buffy.

Distribution : India : Bihar : Bhagalpur district (Roy Choudhury 1962), Munger district (Anderson 1881 : Kharagpur); Madhya Pradesh; Orissa; West Bengal.

Remarks : No recent record is available from Bihar.

Order INSCETIVORA

Small size mammal with pointed snout projecting far beyond the lower jaw; ears and eyes small, limb short, toe five in number. Body covered with short, close-set fur; orbit open posteriorly; zygomatic arches may be present or absent.

The order Insectivora is represented by one family Soricidae in Bihar.

Family SORICIDAE

Only one genus of family Soricidae *viz. Suncus* Ehrenberg occurs in Bihar.

Genus ***Suncus*** Ehrenberg, 1833

Two species of the genus *Suncus* are found in Bihar.

Key to species of genus *Suncus*

Head and body length more than 92 mm.... .....*Suncus murinus*

Head and body length less than 48 mm. .... *Suncus etruscus*

Suncus murinus (Linnaeus)

One subspecies of *Suncus murinus* occurs in Bihar.

2. ***Suncus murinus caerulescens*** (Shaw)

1766. *Sorex caerulescens* Shaw, *Genl. Zool. Mammal*, **1** : 533 (India).

Common name : House shrew (English).

Material examined : Darbhanga district : 1♀, Bahgownie, coll. N. A. Baptista, 25.vii.1922, Z.S.I., Cal.; Gaya district : 1♂, Singar, coll. C. A. Crump, 28.v.1914, Z.S.I., Cal.; Giridih district : 1♂, Parashnath hills, coll. F. Stoliezka, 1874, Z.S.I., Cal.; Hazaribag district : 1♀, Gajhunda, coll. C. A. Crump, 13.v.1914, Z.S.I., Cal.; Kishanganj district : 1♂, Kishanganj, coll. Y.P. Sinha, 16.i.1982, G.P.R.S., Pat.; Palamau district : 1♂, 1♀, Daltonganj, coll. C. A. Crump, 18.iii.1914, Z.S.I., Cal.; Patna district : 1♀, Bakhtiiarpur, coll. Mrs. M. Guha, 5.xii.1972, 2♀♀, Maner, coll. R. K. Varshney, 21.ix.1972; 2♂♂, 1♀, Salimpur Arah, coll. R. N. Verma, 29.vii.1965, Kidwaipuri, Patna, coll. R. N. Verma, 13.viii.1987, 3♂♂, 2♀♀, Chitragupta Nagar, Patna, coll. Y. P. Sinha and Jaimala Sinha, 8,10,20.viii.1987, 6.ix.1981, 8.ix.1987; G.P.R.S., Pat.; Ranchi district : 1♂, Dhurwa, coll. R. K. Varshney, 12.iii.1970, G.P.R.S., Pat.; West Singhbhum district : 1♂, Luia near Chaibasa, coll. C. R. Crump, 29.vii.1914, Z.S.I., Cal.

Measurements : External : 10♂♂ : H & B 90.0-143.0 (109.0); Tl 48.0-96.0 (70.2); Hf. 17.0-24.0 (20.5); E 6.0-14.0 (1.0). 8♀♀ : H & B 92.0-146.0 (118.0); Tl 47.0-86.0 (70.8); Hf. 17.0-24.0 (20.0); E 6.0-17.0 (12.0) Cranial : 3♂♂ : l 34.0, 35.0, 37.3 cb 33.0, 34.0, 34.2, pl 17.0, 17.8, 18.0 cw 14.5, 15.0, 15.0. 2♀♀ : l 35.7, 36.7; cb. 34.5, 35.8; pl. 16.6, 17.2; cw 13.6, 14.5.

Diagnosis : Largest of the Indian house shrews. Fur short, less than 5 mm in length. Tail thick on base and thinly clad with hairs.

Distribution : India : Bihar : Almost all districts; Madhya Pradesh; Orissa.

Elsewhere : Sri Lanka.

Suncus etruscus Savi

One subspecies of *Suncus etruscus* occurs in Bihar.

3. ***Suncus etruscus nitideofulvus*** (Anderson)

1877. *Crocidura (Pachyura) nitidefulva* Anderson, *J. Asiat. Soc. Beng.*, **46** : 272 (Calcutta: West Bengal, India).

Common name : Pygmy Shrew (English).

Material examined : West Singhbhum district : 1♂, Sangapala, Chaibasa, 1♂, 2♀♀, Luia, Chaibasa; coll. C. A. Crump, 9-29.vii.1914, Z.S.I., Cal.

Measurements : External : 2♂♂, H & B 38.0, 44.0; Tl 26.0, 31.0; Hf 7.0, 8.0; E 5.0, 5.0. 2♀♀ : H & B 41.0, 56.0; Tl 31.0, 46.0; Hf 7.0; 11.0; E 6.0, 9.0.

Diagnosis : Limb poorly developed; hind foot short, not more than 8 mm; tail rounded in cross-section; fur very short, silvery brown to dark brown above.

Distribution : India : Bihar : Giridih district (Anderson 1881; Parashnath), West Singhbhum district (present material); West Bengal; Orissa.

Elsewhere : Bangladesh.

Remarks : Very rare in Bihar not collected after C. A. Crump on 1914.

Order CHIROPTERA

Chiroptera is the only true flying mammals.

Suborder MEGACHIROPTERA

Family PTEROPODIDAE

Suborder Megachiroptera consists of single family Pteropodidae. This family characterised by the absence of both nose-leaf and tragus; the tail reduced, rod-like and often absent. Three genera of this family *viz. Rousettus*, *Pteropus* and *Cynopterus* are found in Bihar.

Key to the genera of the family PTEROPODIDAE

1. Hind neck and shoulders paler than back. .. .. ***Pteropus***

   Upper part of one colour throughout. 2

2. Five upper and six lower cheek-teeth. .... ***Rousettus***

   Four upper and five lower cheek-teeth. .... ***Cynopterus***

Genus ***Rousettus*** Gray, 1821

Rousettus is represented by a single species and subspecies in Bihar.

4. ***Rousettus leschenaulti leschenaulti*** (Desmarest)

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

Common name : Indian Fulvous Fruit Bat (English).

Material examined : None, after Sinha (1986).

Measurements : See Sinha (1986).

Diagnosis : A medium sized (forearm around 80 mm) fruit bat, dorsal colour light brown with a rufescent tone; tail short (13-17 mm) and rod-like; upper cheek teeth five and lower six.

Distribution : India : Bihar : Aurangabad district, Hazaribagh district, Patna district, West Singhbhum district; widely distributed throughout the Indian mainland.

Elsewhere : Pakistan (Mirza, 1965), Sri Lanka (Sinha, 1969), Nepal, Bhutan (Chakraborty, 1975), Myanmar (=Burma), Southern China (Weng *et. al.* 1962) including Tibet (Cai & Zhang 1980), Hong Kong, Thailand, Laos (Phillips, 1967), possibly Cambodia (Rock maker & Bergmans 1981) and Vietnam.

Remarks : This bat has not been found north of the Ganga river in Bihar.

Genus ***Pteropus*** Brisson, 1762

The genus *Pteropus* is represented by a single species and subspecies in Bihar.

5. ***Pteropus giganteus giganteus*** (Brünnich)

1782. *Vespertilio gigantea* Brünnich, *Dyrenes Historie*, 1 : 45 (Bengal = West Bengal, India).

Common name : Indian Flying Fox (English).

Material examined : Besides Sinha (1986); Madhubani district : 1 ♂, Awansi Badhangaon, coll. G. M. Yazdani, 20.ii.1987, G.P.R.S., Pat.; Sahebganj district : 1 ♀, Rajmahal, coll. Y. P. Sinha, 9.iv.1995, G.P.R.S., Pat.

Measurements : Besides Sinha (1986); External : 1 ♂ : Fa 175.0; E 36.0; Tbr 75.0; F & Ct 47.0.

Diagnosis : Largest forearm (160-175 mm) fruit bat of Bihar, hind neck and shoulders paler than back; tail externally absent, numbers of cheek teeth same as in *Reusettus l. leschenaulti.*

Distribution : India : Bihar : Almost all the districts; widely distributed throughout the Indian union, including Andaman Islands (Mason 1908).

Elsewhere : Pakistan (Blanford 1891), Sri Lanka, Nepal, Bangladesh (Anderson 1912) and Myanmar (=Burma).

Remarks : Very common in Bihar. Besides Sinha (1986), colonies of this species observed by the author in Balha village Kalayanpur block (22.x.1986), Samastipur district on Banyan (*ficus bengalensis*) and Kadam (*Anthocephalus sinensis*) trees; in yadu Pipra, Baheni block, Darbhanga district (19.x.1987) on Banyan tree; in Deoghar, Deoghar district (6.iv.1995) on Banyan tree; in Rajmahal, Sahebganj district (9.iv.1995) on Tamarind (*Tamarindus indica*), Peepal (*Ficus religiosa*), Neem (*Azadirachta indica*) and Ashoka (*Saraca asoca*) trees, in Godda, Godda district (16.iv.1995) on four wild *Ficus* trees; in Chakai, Jamui district (17.iv.1995) on *Equiliptus* tree; in Purnea (6.xii.1995) and Dangasua village, Dangarua Block (8.xii.1995), Purnea district on Banyan and Bamboo trees respectively; in Mahadeva village, Jokihat block, Araria district

(12.xii.1995) on Tamarind tree; in Kishanganj, Kishanganj district (18.xii.1995) on Peepal tree; Jaimangla Garh, Kabar lake, Begusarai district (25.v.1988) on banyan tree in the night.

Genus ***Cynopterus*** F. Cuvier, 1824

The genus *Cynopterus* is represented by two species *viz* : *Cynopterus sphinx* and *C brachyotis* in Bihar.

Key to the species of the genus *Cynopterus*

Ear large, 19.0-24.0 mm..... *C. sphinx* (*sphinx*)

Ear small, 16.0-18.0 mm. ..... *C. brachyotis*

6. ***Cynopterus sphinx sphinx*** (Vahl.)

1799. *Vespetilio sphinx* Vahl. *Shr. Nat. Selsk Copenhagen*, 4(1) : 123 (Tranquebar, Tanjavur district, Tamil Nadu, India).

Common name : Short-nosed Fruit Bat (English).

Material examined : Besides Sinha (1986); Deoghar district : 2♂♂, 3♀♀ Haripur, Deoghar block, coll. R. N. Verma, 15.xii.1994, G.P.R.S., Pat. Kishanganj district : 1♂, 3♀♀, Lohadanga, Variadanga block, coll. Y. P. Sinha, 16.xii.1995; Araria district : 3♂♂, Targachia village, coll. Y. P. Sinha, 12.xii.1995; G.P.R.S., Pat.

Measurements : Besides Sinha (1986); External : 3♂♂ : Fa 70.0-76.0 (73.6); E 20.0-23.0 (21.6); Tb 26.0-28.0 (27.0); F & Cl 15.0-17.0 (16.0); Tl 13.0-15.0 (14.0); 6♀♀ : Fa 68.0-76.0 (71.8); E 20.0-21.0 (20.7) Tb 27.0-30.0 (28.5); F & Cl 15.0-18.0 (16.8); Tl 11.0-16.0 (14.5).

Diagnosis : Medium-sized (forearm around 70 mm) fruit bat with white margin to ear, metacarpals and phalanges whitish; dorsal colour grey or greyish-brown; tail rod-like and reduced (13-19 mm); upper cheek teeth four and lower five.

Distribution : India : Bihar : Araria district, Bhabhua district, Darbhanga district, Deoghar district, Gaya district, Hazaribag district, Katihar district, Kishanganj district, Munger district, Patna district, Purnea district, Rohtas district, Sahebganj district, Samastipur district, Santal Pargana district, West Singhbhum district, West Champaran district; widely distributed throughout the mainland of Indian Union.

Elsewhere : Pakistan (Andersson 1881), Sri Lanka, Nepal (Fry 1920), Bangladesh and Myanmar (=Burma).

Remarks : Very common in Bihar. A cluster of 5 individuals first time seen in Bihar under a leaf of a plantain tree on 16th December, 1995 in Lohadanga village, Variadanga block, Kishanganj district and a cluster of six individual in Targachia village, Araria district on 12th December, 1995.

7. ***Cynopterus brachyotis*** (Müller)

1838. *Pachysoma brachyotis* Müller. *Tijdschr. Natuur. Gesch.*, 5(1) : 146 (Borneo).

Common name : Lesser dog-faced Fruit Bat (English).

Material examined : Gaya district : 1♀, Bodh Gaya, coll. Y. P. Sinha, 28.vii.1978; Nawada district : 1♀, Nawada, coll. Y. P. Sinha, 9.xi.1982. Bhabhua district : 1♂, Mohania, coll. Y. P. Sinha, 21.ii.1982; G.P.R.S., Pat. Samastipur district : 1(unsexed), Pusa, T. B. Fletcher, 19.v.1931; Z.S.I., Cal.

Measurements : External : 1♂ : Fa. 73.0; E 17.0; Tb 29.0; F & cl 18.0; Tl 14.0; 2♀♀, 1 (unsexed) : Fa 71.0-73.0 (72.0); E 16.0-18.0 (16.8); Tb. 27.0-30.0 (29.0); F & cl 16.0-18.5 (17.3); Tl 13.0 (1 ex.). Cranial : 1♂, 1♀ : *l* 33.4, 32.5; cr 8.3, 8.2; *mtr* 11.2, 11.0; c^1-c^1 7.0, -; zw 20.5, 20.0; m^1-m^1 12.0, 12.0; *ml* 25.7, 25.0.

Diagnosis : Ear smaller (13-18 mm) than *Cynopterus sphinx* (18-24 mm).

Distribution : India : Bihar : Bhabhua district, Gaya district, Rohtas district, Samastipur district; Assam; Andaman and Nicobar Islands; Goa. (Agrawal 1973); Kerala; Meghalaya; Tamil Nadu; West Bengal.

Elsewhere : Andalas (= Sumatra), Combodia, Java, Kalimantan (= Borneo), Malayasia, Myanmar (= Burma), Nepal, Pakistan, Philippine Islands, South China, Sri Lanka, Sulawes (= Celebes), Thailand (= Siam), Vietnam.

Remarks : Although Agrawal, *et al* (1992) have given measurements of West Bengal specimens as Fa. 61.8, 63.0 and E. 15.1, 15.3 but includes these specimens under *Cyropterus sphinx sphinx* (Vahl.). All the specimens identified by Sinha (1986) as *Cynopterus brachyotis* (Müller)? have been recognised here as *Cynopterus brachyotis* (Müller).

Suborder MICROCHIROPTERA

The suborder MICROCHIROPTERA in Bihar consists of six families.

Key to the families of the suborder MICROCHIROPTERA

1. Both nose-leaf and tragus present. ..... MEGADERMATIDAE

   Either tragus or nose-leaf present, but not both. 2

2. A nose-leaf but no tragus present. ..... RHINOLOPHIDAE

   No nose-leaf but a tragus present. 3

3. Tail entirely enclosed in inter-femoral membrane. ..... VESPERTILIONIDAE

   Distal portion of the tail free from interfomoral membrane. 4

4. Tail emerging from the upper surface of the inter femoral membrane. ..... EMBALLONURIDAE

   Tail emerging from the end of the inter femoral membrane. 5

5. Tail very long and slender. ..... RHINOPOMATIDAE

   Tail comparatively short and stout. ..... MOLOSSIDAE

Family RHINOPOMATIDAE

Rhinpomatidae family consists of a single genus *Rhinopoma*.

Genus ***Rhinopoma*** E. Geoffroy, 1818.

Two species of the genus *Rhinopoma* occur in India. Either of these occurs in Bihar.

Key to the species and subspecies of *Rhinopoma*

Length of forearm more than 64.0 mm; tail usually shorter than forearm; sagittal crest prominent and high. .... *Rhinopoma microphyllum kinneuri*

Length of forearm less than 63.0 mm; tail usually longer than forearm; sagital crest low. ..... *Rhinopoma hardwickei hardwickei*

8. ***Rhinopoma microphyllum kinneari*** Wroughton

1912. *Rhinopoma kinneari* Wroughton, *J. Bombay nat. Hist. Soc.*, **21** : 767 (Bhuj. Cutch = Bhuj. Kachch district, Gujarat, India).

Common name : Larger Rat-tailed Bat (English).

Material examined : None.

Measurement : Nil.

Diagnosis : A medium-sized bat; tail (50.0-65.0 mm), generally smaller than forearm (60.0-75.0 mm).

Distribution : India : Bihar : Hazaribag district (Wroughton, 1916); Delhi (Brosset 1962); Gujarat (Wroughton, 1912; Sinha 1980, 1981); Madhya Pradesh (Wroughton 1912); Maharashtra (Khajuria, 1953; Sinha 1980); Orissa (Khaparde 1980); Rajasthan (Prakash 1958; Sinha 1980); West Bengal (Agrawal *et. al.* 1992); Uttar Pradesh (Brosset 1962*a*; Sinha 1980).

Remarks : Seems rare in Bihar.

9. ***Rhinopoma hardwickei hardwickei*** Gray

1831. *Rhinopoma hardwickei* Gray, *Zool. Misc.*, 37 (India).

Common name : Lesser Rat-tailed Bat (English).

Material examined : Sinha (1986) examined 41♂♂, 66♀♀ (including youngs); from Bhojpur, Gaya, Giridih, Munger and Rohtas districts of Bihar.

Measurements : See Sinha (1986).

Diagnosis : Smaller than *Rhinopoma microphyllum kinneari* (forearm 56-65 mm); tail (62-81 mm) usually longer than forearm.

Distribution : India : Bihar : Bhojpur district (Sinha 1986), Gaya district (Wroughton 1915, Sinha 1988), Giridih district (Sinha 1986), Munger district (Sinha 1986), Rohtas district (Sinha 1986); Delhi (Brosset 1962*a*); Gujarat (Sinha 1981); Jammu & Kashmir (Dobson 1878); Karnataka; Kerala (Wroughton 1921*b*); Madhya Pradesh; Orissa (Das & Agrawal 1973); Rajasthan (Sinha 1980); Tamil Nadu (Jerdon 1867, Dobson 1876), Uttar Pradesh; West Bengal (Agrawal *et. al.* 1992).

Elsewhere : Afghanistan (Gaisler 1970), Pakistan (Hill 1977), Myanmar (= Burma, Blanford 1891) and Thailand.

Remarks : Very common in South Bihar but not seen in the plains of north Bihar, north of the Ganga river.

Family EMBALLONURIDAE

Only one genus of the family Emballonuridae occurs in Bihar.

Genus ***Taphozous*** E. Geoffroy, 1818

Four species and subspecies of the genus *Taphozous* are found in Bihar.

Key to the species and subspecies of the genus *Taphozous*

1. Radio-metacarpal pouch present, lower lip scarcely grooved in front. 2
- Radio-metacarpal pouch absent, lower lip deeply divided in the centre of its upper surface and infront by a deep, narrow groove. .... *Taphozous saccolaimus crassus*
2. Black beard present in male; gular sac absent in both sexes. . *Taphozous m. melanopogon*
- Black beard absent, gular sac prominent in males rudimentary in females. 3
3. Forearm short, length below 64.0 mm; skull short, length below 22.0 mm. .... *Taphozous l. longimanus*
- Forearm long, length above 66.0 mm; skull long, length above 25.0 mm .... *Taphozous k. kachhensis*

10. ***Taphozous longimanus longimanus*** Hardwicke

1825. *Taphozous longimanus* Hardwicke, *Trans. Linn. Soc. Lond.*, **14** : 525 (Calcutta, Calcutta district, West Bengal, India).

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

Material examined : Besides Sinha (1986); Darbhanga district : 1 ♂, Yadu Pipra, Baheri block, Y. P. Sinha, 19.x.1989, G.P.R.S. Pat.

Measurements : See Sinha (1986).

Diagnosis : A dark brown (adult male usually lighter brown), medium-sized (forearm 57-63 mm) bat with broad tragus; gular sac prominent in males and rudimentary in females; radio-metacarpal pouch moderately developed; inner margin of ear smooth (not papillate); lower lip scarcely grooved.

Distribution : India : Bihar : Begusarai district, Bhagalpur district (Roy Choudhuri 1962), Bhojpur district, Darbhanga district, giridih district (Wroughton 1915), Hazaribag district, Patna district, Purnea district, Saharsa district, Saran district, Vaishali district, West Champaran district, West Singhbhum district; widely distributed in the Indian Peninsula; northwards to Gujarat and Rajasthan (Sinha 1976) on the west and West Bengal, Assam (Sinha 1996) and Tripura (Agrawal & Bhattacharyya 1977) on the east.

Elsewhere : Sri Lanka, Nepal (Worth & Shah 1969), Bangladesh (Ahmed & Hussain 1982), Myanmar (= Burma) (Sinha 1970), possibly Thailand (McNeely 1977) and Cambodia (Hill & Thonglongya 1972).

Remarks : Easily available in Bihar, in hollows in the trunk of trees, in crown of palm tree and inside the dome of church.

11. ***Taphozous melanopogon melanopogon*** Temminck

1841. *Taphogous melanopogon* Temminck, *Mon. Mammo.* **2** : 287 (Bantam, Western Java).

Common name : Black-bearded Tomb Bat (English).

Material examined : Sinha (1986) examined 129♂♂, 98♀♀, from Patna City, Patna district, Bihar.

Measurements : See Sinha (1986).

Diagnosis : This species differs from others in the presence of black beard in male, absence of gular sac and pectoral gland in both sexes; upper incisors weak and minute (not found in other Indian species, Sinha 1986).

Distribution : India : Bihar : Patna district (Sinha 1981 1986); Kerala (Sinha 1970); Karnataka; Maharashtra; Tamil Nadu; Andhra Pradesh; Gujarat (1981); Madhya Pradesh (Khajuria 1979); Orissa (Khaparde 1976); Rajasthan (Sinha 1981) and Andaman Islands (Khajuria 1953; Hill 1967).

Elsewhere : Sri Lanka (Philips 1922), Myanmar (= Burma), Malaya, Yunnan, Laos, Java.

Remarks : Very common in Patna city but has not been obtained from other places in Bihar.

12. ***Taphozous kachhensis kachhensis*** Dobson

1872. *Taphozous kachhensis* Dobson, *J. Asiat. Soc. Beng.*, **41** (pt. 2) : 221 (Kachh = kachchh district, Gujarat, India).

Common name : Nacked-bellied Tomb Bat (English).

Material examined : Sinha (1986) examined 1♂, 2♀♀ from Bodh Gaya, Gaya district and Sasaram, Rohtas district.

Measurements : See Sinha (1986).

Diagnosis : larger (forearm 69-79 mm) than *Taphozous longimanus*; blackish grey in colour; the position of gular sac indicated by a semicircular fold of skin; muzzle and throat naked; ear papillate along the margin; radio-metacarpal pouch very small.

Distribution : India : Bihar : Gaya district (Wroughton 1915, Sinha 1986), Rohtas district (Sinha 1986); Delhi (Brosset 1962*a*); Gujarat; Jammu & Kashmir (Sharma & Sharma 1976); Karnataka (Sinha 1980); Madhya Pradesh (Lindsay 1926, Sinha 1980); Maharashtra; Rajasthan (Prakash 1956, Sinha 1976); Sikkim; Uttar Pradesh (Brosset 1962*a*); West Bengal (Khajuria 1953, Wroughton 1916*b*, Sinha 1980).

Elsewhere : Afghanistan (Gaisler 1970); Pakistan (also Sinha 1980).

13. ***Taphozous saccalaimus crassus*** Blyth

1844. *Taphozous crassus* Blyth, *J. Asiat. Soc. Beng.*, **13** : 491 (Mirzapur, Mirzapur district, Uttar Pradesh).

Common name : Pouch-bearing Bat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : It can be easily separated from other species of *Taphozous* by the absence of radio-metacarpal pouch; presence of complete bullae; much broader mesopterygoid fessae and proportionately larger anterior upper premolar.

Distribution : India : Bihar : West Singhbhum district (Wroughton 1915); Andaman & Nicobar Islands (Hill 1967); Gujarat (Brosset 1962*a*); Karnataka (Wroughton 1913); Maharashtra (Brosset 1962*a*); Orissa (Wroughton 1915); Tamil Nadu; Uttar Pradesh; West Bengal.

Elsewhere : Sri Lanka, Bangladesh (Dobson 1876), possibly Myanmar (= Burma), Thailand (Lekagul & McNeely 1977); Malaya Peninsula and Islands and Sumatra.

Remarks : The pouch bearing bat was recorded by Wroughton (1915). After that, it has not been found in Bihar.

Family MEGADERMATIDAE

Family Megadermatidae is represented in Bihar by a single genus Megaderma.

Genus ***Megaderma*** E. Geoffroy, 1810

Only one species and subspecies of the genus *Megaderma* occurs in Bihar.

14. ***Megaderma lyra lyra*** E. Geoffroy

1810. *Megaderma lyra* E. Geoffroy, *Ann. Mag. Hist. nat. Paris*, **15** : 190 (India, possibly Madras, Madras district, Tamil Nadu).

Common name : Indian False Vampire (English).

Material examined : Besides Sinha (1986); Araria district : 4♂♂, 2♀♀, Targachia, Tarabari block, coll. K. C. Kansal, 13.ix.1995; Y. P. Sinha, 12.xii.1995; 2♂♂, 4♀♀, Raniganj, Raniganj block, coll. Y. P. Sinha, 13.xii.1995; G.P.R.S., Pat. Gumla district : 3♂♂, 7♀♀, Nagpheni, Sissauni block, coll. Y. P. Sinha, 10.iii.1997, G.P.R.S., Pat. Katihar district : 2♀♀ Kora, coll. Y. P. Sinha, 22.xii.1995, G.P.R.S., Pat. Purnea district : 2♂♂, 1♀, Garh Banaili, coll. K. C. Kansal, 8.ix.1995, G.P.R.S., Pat. Samastipur district : 1♀, Harpur Aloth village, Sarai Ranjan block, coll. Y. P. Sinha, 27.x.1986, G.P.R.S., Pat. *Other observation localities* : In Begusarai district : Size of colony *ca.* 50 exs. in the Majhaul Kothi on 28.v.1988.

Measurements : Besides Sinha (1986); 8♂♂ : Fa 67.0-70.0 (68.5); E 35.0-39.0 (38.0); Tb 32.0-35.0 (36.0); F & cl 17.0-19.0 (18.0); Tr 15.0-23.0 (19.0). 8♀♀ : Fa 64.0-71.0 (68.0); E 37.0-41.0 (38.0); Tb 32.5-37.0 (35.0); F & cl 17.5-22.0 (18.5); Tr 16.0-22.0(18.5).

Diagnosis : Medium-sized (forearm 60.0-70.0 mm) 4 false vampire bat; posterior termination of nose-leaf truncated; conjoined for nearly half the length of inner margin and large; tragus bifid and large, the posterior portion longs narrow and acutely pointed; tail externally not visible; dorsal colour slaty grey, ventral parts dirty white.

Distribution : India : Bihar : Araria district, Aurangabad district, Begusarai district (Personal observation), Bhagalpur district, Bhojpur district, Dhanbad district, Giridih district, Gopalganj district, Gumla district, Katihar district, Kishanganj district, Madhubani district, Purnea district, Saharsa district, Samastipur district (Dalgliesh 1903 : Dalsing Sarai), Vaishali district, West Singhbhum district (Wroughton 1915); widely distributed throughout the Indian main land from Jammu & Kashmir to Cape comorin (Dobson 1976) and from Gujarat (Recently Sinha 1981) and Rajasthan (Prakash 1963; Sinha 1980) to West Bengal (Recently Agrawal *et. al.* 1992) and Assam (Hinton & Lindsay 1926).

Elsewhere : Afghanistan (Aellen 1959), Pakistan, Sri Lanka, Nepal (Anderson 1881) and Bangladesh (Dobson 1876).

Remarks : Very common in plains of Bihar and helpful in control of harmful rodents and other small vertebrates.

Family RHINOLOPHIDAE

The bats of this family have complicated nose-leaf, large ears, small eyes and tail almost entirely enclosed in the inter-femoral membrane. The nose-leaf consists of anterior, rounded, horizontal portion, the horse shoe, the central portion and the posterior vertical portion.

Ellerman & Morrison-Scott (1951) have divided this family into two subfamilies, *viz.*, Rhinolophinae and Hipposiderinae.

Subfamily RHINOLOPHINAE

This subfamily consists of a single genus *Rhinolophus*.

The anterior portion of nose-leaf or the horse-shoe has a median notch and completely or partially covers the muzzle. The central portion is called the sella. Behind the sella rises the posterior portion or posterior nose-leaf as a long, lancet-shaped point. The posterior nose-leaf is divided into cells by horizontal septa. A posterior-dorsal connecting process connects the sella with the posterior nose-leaf. Basal portion of outer margin of ear deeply notched to form a distinct antitragus.

Genus ***Rhinolophus*** Lacepede

Only two species of *Rhinolophus viz. Rhinolophus lepidus* and *Rhinolophus mitratus* occur in Bihar.

Key to the species and subspecies of the genus *Rhinolophus*

- Forearm long, length above 57.0 mm. .... *Rhinolophus mitratus*
- Forearm short, length below 43.0 mm. .... *Rhinolophus l. lepidus*

15. ***Rhinolophus lepidus lepidus*** Blyth

1844. *Rhinolophus lepidus* Blyth, *J. Asiat. Soc. Beng.*, **13** : 486 (Vicinity of Calcutta, West Bengal, India, according to Das 1986).

Common name : Little Indian Horse-shoe Bat (English).

Material examined : Sinha (1986) examined 13♂♂, 3♀♀ from Gaya, Giridih; Munger and Singhbhum districts. Recently he collected 1♀ from chautha village, Rajauli block, Nawada district on 13.ix.1996, present in G.P.R.S., Pat.

Measurements : See Sinha (1986).

Diagnosis : Smaller horse-shoe Bat (forearm around 40.0 mm, or average) with longer ear (Length 15.0-16.0 mm), tragus absent; antitragus present, nose leaf large.

Distribution : India : Bihar : Gaya district (Wroughton 1915; Sinha 1986); Giridih district (Sinha 1980); Hazaribag district (Wroughton 1915); Nawada district (present material); West Singhbhum district (Wroughton 1915; Sinha 1986); Andhra Pradesh (Das 1986); Delhi (Brosset 1962); Karnataka (Wroughton 1913); Kerala (Blanford 1891); Madhya Pradesh (Khajuria 1980); Maharashtra (Wroughton 1916*a*); Meghalaya (Hinton & Lindsay 1926); Orissa (Das & Agrawal 1973, Sinha 1980); Rajasthan (Prakash 1956, Sinha 1980); Tamil Nadu (Das 1986*b*); Uttar Pradesh (Wroughton 1914); West Bengal (Blyth 1863, Wroughton 1915, 1917; Agrawal *et. al.* 1992).

Elsewhere : Nepal (Mitchel 1980), Afghanistan (Aellen 1959) and Thailand (Lekagul & McNeely 1977).

Remarks : Author always found solitary male hanging from ceiling of old house but on 13.ix.1996, he found solitary female in the well fitted with water pump in Nawada district.

16. ***Rhinolophus mitratus*** Blyth

1844. *Rhinolophus mitratus* Blyth, *J. Asiat Soc. Beng.*, **13** : 482 (Chaibasa, Bihar, India).

Common name : None.

Material examined : None after Sinha (1973).

Measurements : See Sinha (1973).

Diagnosis : The status of *mitratus* is uncertain.

Distribution : It is known only from holotype in the collection of the Zoological Survey of India, Calcutta.

Remarks : Sinha (1973) provided an account of the specimen, with measurements.

Subfamily HIPPOSIDERINAE

Anterior nose-leaf without median notch. Some species have lateral supplementary leaflets ventro-lateral to the anterior nose-leaf. The central portion of the nose-leaf is a cushion-like structure. The posterior nose-leaf is low and rounded and usually divided into cells by vertical septa. No distinct antitragus present.

In Bihar only one genus *viz. Hipposideros* of the subfamily Hipposiderinae is found.

Genus ***Hipposideros*** gray, 1831

Only two species and subspecies of the genus *Hipposideros viz. Hipposideros fulvus pallidus* and *Hipposideros galeritus brachyotus* are found in Bihar.

Key to the species and subspecies of the genus *Hipposideros*

- Absence of supplementary leaflet on each side of anterior nose-leaf. .... *Hipposideros fulvus pallidus*
- Presence of two supplementary leaflets on each side of anterior nose-leaf. .... *Hipposideros galeritus brachyotus*

17. ***Hipposideros fulvus pallidus*** Anderson

1918. *Hipposideros fulvus pallidus* Anderson, Ann. Mag. nat. Hist., (9) **2** : 381 (Junagadh, Gujarat, India).

Common name : Fulvous leaf-nosed Bat (English).

Material examined : Sinha (1986) examined 23♂♂, 13♀♀ from Darbhanga, Gaya, Giridih, Hazaribag and Munger district.

Measurements : See Sinha (1986).

Diagnosis : Smaller in size (forearm 35.0-40.0 mm); skull length 16.4-17.1 mm; anterior lower

premolar much reduced, 1/3 length of the second; dorsum paler, venter creamy with grey tinge; adult specimens have prominent frontal sac.

Distribution : India : Bihar : Both side of the Ganga river recorded from Darbhanga district, Gaya district, Giridih district, Hazaribag district, Munger district; North parts of India.

Elsewhere : Afghanistan, Sri Lanka (Corbet & Hill 1992).

Remarks : The specimens of *H. fulvus* Gray mentioned by Wroughton (1915) from Bihar have been treated here as *H. fulvus pallidus* Anderson.

18. ***Hipposideros galeritus brachyotus*** Dobson

1874. *Phyllorhina brachyota* Dobson, *J. Asiat. Soc. Beng.*, **43** : 237 (Central India).

Common name : Fawn leaf-nosed Bat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : It can be easily separated from *H. f. pallidus* by the presence of two supplementary leaflets on each side of anterior nose-leaf; width of cochleas subequal to their distance apart (wider in *H. f. pallidus*) and longer in size (forearm 44 mm *vs.* 35-40 in *H. f. pallidus*).

Distribution : India : Bihar : Gaya district (Wroughton 1915 : Singar); probably all over western and central India (Brosset 1962 *b*).

Elsewhere : Sri Lanka, possibly Bangladesh.

Remarks : Tate (1941, p. 367) suggests that it is a race of *galeritus*. Corbet and Hill (1992) mention it, similar to nominate species but available material limited.

Family MOLOSSIDAE

Family Molossidae is represented in Bihar by a single genus *Tadarida*.

Genus ***Tadarida*** Rafinesque, 1814

Only one species and subspecies *Tadarida plicata plicata* of this genus is found in Bihar.

19. ***Tadarida plicata plicata*** (Buchannan)

1800. *Vespertilio plicatus* Buchannan, *Trans. Linn. Soc. Lond.*, **5** : 261, pl. 13 (Bengal = West Bengal, India).

Common name : Wrinkle lipped Bat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Muzzle broad and thick; upper lip overhanging the lower, marked by pronounced vertical wrinkles; ear large, thick and rounded, joined infront of orbit by a band of skin; antitragus well defined; lower part of feet free from wings which is connected with ankle by a rafter.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962); Madhya Pradesh (Kashyap 1982); Meghalaya (Blyth 1852); Punjab (Blyth 1863); Rajasthan; Tamil Nadu (Jerdon 1867); Uttar Pradesh (Dobson 1876); West Bengal.

Elsewhere : Tibet (Hill 1961), Southern China (Honacki *et. al.* 1982), including Hainan, Hong Kong (Romer 1960), Myanmar (= Burma), Thailand (Hill & Thonglongya 1972), Vietnam (Honacki *et. al.* 1982), Cambodia (Yoshiyuki 1966), Malay Peninsula, Singapore (Dobson 1878), Sumatra and Borneo.

Remarks : The wrinkled-lipped Bat is mostly an inhabitant of tree in Bhagalpur district (Roy Chaudhury 1962). I could not find this bat in Bihar.

Family VESPERTILIONIDAE

Bats of this family have tragus but no nose-leaf; tail as long as forearm and covered in the interfemoral membrance.

Two subfamilies of this family have been reported from Bihar.

Key to subfamilies of the family VESPERTILIONIDAE

1. Ears funnel-shaped. .....KERIVOULINAE

   Ear not funnel-shaped. .....
   .....VESPERTILIONINAE

Subfamily VESPERTILIONINAE

Key to the genera of the subfamily VESPERTILIONINAE

1 Cheek-teeth six on each side of upper and lower jaw. ..... ***Myotis***

– Cheek-teeth less than six on each side of upper and lower jaw. 2

2. Upper premolars 2-2. ..... ***Pipistrellus***

3. Upper premolars 1-1. 4

4. Upper incisors 2-2. ..... ***Hesperoptenus***

– Upper incisors 1-1. 5

5. First and second upper molars with 'W' pattern distorted or nearly absent. ..... ***Scotophilus***

– First and second molars with 'W' pattern not distorted. 6

6. Larger forearm above 55.0 mm. ..... ***Scotomanes***

– Smaller forearm below 40.0 mm. ..... ***Scotoecus***

Genus ***Myotis*** Kaup, 1820

Only one species of the genus *Myotis viz. Myotis formosus* (Hodgson) occurs in Bihar. Sinha (1986) accepted two subspecies of this species *viz. M. formosus formosus* (Hodgson) and *M. f. andersoni* Trouesart hesitantly due to small sample-size of *andersoni* but the longer size of *andersoni* differs (forearm 50.0, 53.0 and skull length 19.2 *vs.* forearm 44.2-48.0 and skull length 16.0-17.9 in *formosus*) so much from *formosus* so that it has been treated separate from *formosus*, until we have enough specimens of *andersoni* from Purnea for study in detail.

20. ***Myotis formosus formosus*** (Hodgson)

1835. *Vespertilio formosa* Hodgson, *J. Asiat. Soc. Beng.*, **4** : 700 (Nepal).

Common name : Hodgson's Bat (English).

Material examined : Saran district : 1 (unsexed), Serpur (= Siripur) near Chapra, coll. J. M. D. Mackenjie, no date, Z.S.I., Cal.; 3 (unsexed), Chaibasa, coll. S. R. Tickell, 1842, Z.S.I. Cal. Syntypes of korivoala pallida Blyth.

Measurements : See Sinha (1986).

Diagnosis : See Sinha (1986).

Distribution : India : Bihar : Saran district, West Singhbhum district; Assam (Blanford 1891, Sinha 1986), Himachal Pradesh (Sinha 1986); Maharashtra (D'Abreu 1925); Meghalaya (Dobson 1876); Punjab (Sinha 1986); Sikkim (Jerdon 1867); Uttar Pradesh; West Bengal (Calcutta district : Blanford 1891).

Elsewhere : Nepal.

21. ***Myotis formosus andersoni*** (Trouessert)

1881. *Vespertilio dobsoni* Anderson, *Cal. Mamm. Indian Mus.* Calcutta, p. 143 (Purnea, Bihar).

1891. *Vespertilio andersoni* Troussart, *Cal. Mamm.*, **1** : 129. New name for *Vesportilio dobsoni* Anderson, preoccupied.

Common name : None.

Material examined : Bihar : Purnea district : 1 ♀ (ad.), 1 ♀ (y.), Purnea, coll. S. J. Shillingford, 20.v.1875, Z.S.I., Cal. Reg. Nos. 15582, 15583 Syntypes).

Measurements : See Sinha (1986).

Diagnosis : Differs from *M. f. formosus* in having longer forearm, foot (including claw) and skull.

Distribution : India : Bihar : Purnea in Purnea district; West Bengal (Darjeeling district : Jerdon 1867).

Remarks : Recently no collection of this species has been made from Bihar.

Genus ***Pipistrellus*** Kaup, 1829

Five species and subspecies *viz. P. coromandra coromandra*, *P. mimus*, *P. ceylonicus indicus*, *P. dormeri* and *P. paterculus* of the genus *Pipistrellus* have been recognised in Bihar.

Key to the species and subspecies of the genus *Pipistrellus*

1. Size large, forearm 32.0-38.3 mm; skull length 13.0-15.1 mm. 2

– Size small, forearm 26.0-32.0 mm; skull length 10.5-13.0 mm. 3

2. Outer upper incisor is generally absent in adult and if present it is very minute. *P. dormeri*

– Outer upper incisor longer and slightly below the inner one. .....*P. ceylonicus indus*

3. Presence of profile sloping uniformly from brain-case to rostum and absence of pit at the junction of brain-case and rostrun. .... *P. paterculus*

– There is no profile sloping uniformly from brain-case to rostrum; presence of pit at the junction of brain-case and rostrum. 4

4. Skull longer (length 12.0-13.0 mm) and rostrum broader (m^3-m^3 : 5.1-6.1 mm). .... *P. coromandra coromandra*

– Skull smaller (length 10.5-11.8 mm) and rostrum narrower (m^3-m^3 : 4.3-5.4 mm). .... *P. mimus*

22. ***Pipistrellus coromandra coromandra*** (Gray)

1838. *Scotophilus coromandra* Gray, *Mag. Zool. Bot.*, **2** : 498 (Pondicherry, Coromandel coast, India).

Common name : Indian Pipistrelle (English).

Material examined : After Sinha (1986); Jahanabad district : 3♀♀, Tehta village, coll. Y. P. Sinha, 3.ix.1996; Samastipur district : 4♂♂, 1♀, Gaddopur, Pusa block, coll. Y.P. Sinha, 27.x.1986, G.P.R.S., Pat.

Measurements : See Sinha (1986).

Diagnosis : Size small (Forearm around 31.0 mm, on average), with dorsal fur blackish brown, tips of hairs slightly sufescent; belly fur slightly paler brown; tragus forward curving and bluntly rounded; a small calcarial lobe present.

Distribution : India : Bihar : Both sides of the Ganga river in Aurangabad district, Bhagalpur district, Bhojpur district, Gaya district, Giridih district, Gopalganj district, Hazaribag district, Jahanabad district, Madhubani district, Munger district, Muzaffarpur district, Palamau district, Patna district, Vaishali district, West Champaran district, West Singhbhum district; widely distributed in peninsular India; north to Jammu (Sharma & Sharma 1976) & Kashmir (Chakraborty 1983); east to north eastern states, including Tripura (Agrawal & Bhattacharrya 1977).

Elsewhere : Afghanistan (Meyer-Ochme 1965), Pakistan (Walton 1974), Sri Lanka, Nepal (Hinton & Fry 1923).

Remarks : Common in Bihar.

23. ***Pipistrellus mimus*** Wroughton

1899. *Pipistrellus mimus* Wroughton. *J. Bombay nat. Hist. Soc.* **12** : 722 (Maheshkatri, Dangs district, Gujarat, India).

Common name : Indian Pygmy Pipistrelle (English).

Material examined : After Sinha (1986); Jahanabad district : 1♂, Jhunathi village, Kurtha block, coll. Y. P. Sinha, 5.ix.1996; Nawada district : 4♂♂ 4♀♀ : Korma and Nawada, coll. Y. P. Sinha, 7 & 12.ix.1996.

Measurements : See Sinha (1986).

Diagnosis : Smallest pipistrelle (forearm 25.0 to 32.0 mm.); fur dense and short; dorsal coloration bistre brown, base of hairs almost black; ventral parts lighter; face, ears and wing-membrane almost black, ears small and scarcely triangular; tragus short and curved forward; post-caloarial lobe present; wings from base of toes.

Distribution : India : Bihar : Begusarai district, Bhojpur district, Darbhanga district; East Champaran district, Gaya district, Giridih district, Hazaribag district, Jahanabad district, Madhubani district, Muzaffarpur district, Nawada district, Rohtas district, Saharsa district, Santal Pargana district, Sitamarhi district, West Champaran district, West Singhbhum district; widely distributed throughout the mainland of Indian Union.

Elsewhere : Afghanistan (Meyer - Ochme 1965), Pakistan, Sri Lanka, Nepal (Mitchell 1980), Burma, Thailand (Lekagul & McNeely 1977) and Vietnam.

Remarks : Common in Bihar.

24. *Pipistrellus ceylonicus indicus* (Dobson)

1878. *Vesperugo indicus* Dobson, *Cat. Chiroptera Br. Mus.* : 222 (Mangalore, Dakshina Kannada district, Karnataka, India).

Common name : Kelaart's Pipistrelle (English).

Material examined : None, after Sinha (1986).

Measurements : See Sinha (1986).

Diagnosis : Size large (forearm nearly 40.0 mm), ear short (length around 10.0 mm) and triangular, outer margin straight; tragus with straight inner and convex outer margin and a triangular lobe at base; wing from base of toes; post calcarial lobe semicircular; extreme tip of tail free from membrane; dorsal colour brown, reddish brown or greyish brown, ventral part slightly paler; ears and membrane blackish brown.

Distribution : India : Bihar : Dhanbad district (Sinha 1986), West Singhbhum district (Wroughton 1915); Andhra Pradesh (Lal 1984), Gujarat; Karnataka; Kerala (Blanford 1891), Madhya Pradesh (Brosset 1962 *b*); Maharashtra (Wroughton 1912 a); Orissa (Das & Agrawal 1973); Rajasthan (Ryley 1914); Tamil Nadu (Dobson 1878); Uttar Pradesh (Lab 1984); West Bengal (Lal 1984).

Elsewhere : Pakistan and Bangladesh (Siddiqi 1961, Khan 1982).

Remarks : Not obtained from other parts of Bihar except Dhanbad (Sinha 1980). Collection from Singhbhum district is very old.

25. *Pipistrellus dormeri* (Dobson)

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

Common name : Dormer's Bat (English).

Material examined : none, after Sinha (1986).

Measurements : See Sinha (1986).

Diagnosis : Very much similar to *P. ceylonicus indicus* in size (forearm 32.0-38.0 mm) and shape, but second upper incisor very small, not extending beyond cingulum of inner incisor; under parts whitish, often lemon yellow in live and freshly killed specimens.

Distribution : India : Bihar : Bhojpur district, Gaya district, Giridih district, Hazaribag district, Muzaffarpur district, Rohtas district, Samastipur district, Santal Pargana district, Siwan district, Vaishali district, West Champaran district, West Singhbhum district; widely distributed in the Indian mainland from Jammu & Kashmir (Chakraborty 1983), south up to Karnataka, Tamil Nadu and Kerala (specimen seen by me at Madurai Kamraj University), from Gujarat east to Meghalaya (Sinha 1995).

Elsewhere : Pakistan (Roberts 1977) and possibly Taiwan (Formosa).

Remarks : Common in Bihar.

26. *Pipistrellus paterculus* Thomas

1915. *Pipistrellus paterculus* Thomas, *J. Bombay nat. Hist. Soc.*, **24** : 32 (Mt. Popa, Upper Burma).

Common name : Burmese Pipistrelle (English).

Material examined : None, after Sinha (1986).

Measurements : See Sinha (1986).

Diagnosis : External and skull measurement resembles with *P. mimus*. It differs from the latter in presence of profile sloping uniformly from brain-case to rostrum, broader, flatter and smooth rostrum and absence of pit at the junction of brain-case and rostrum.

Distribution : India : Bihar : Darbhanga district (Sinha 1983).

Elsewhere : Myanmar (= Burma), Pakistan (Walton, 1974), Thailand, S. W. China.

Remarks : This bat is rather uncommon in Bihar, India.

Genus *Scotoecus* Thomas, 1901

Only one species *viz. Scotoecus pallodus* of the genus *Scotoecus* is found in Bihar.

27. *Scotoecus pallidus* (Dobson)

1876. *Scotophilus pallidus* Dobson, *Monogr. Asiat. Chiroptera*, Appendix D : 186 (Mian Mir, near Lahore, India = Main Mir, near Lahore, the Punjab, Pakistan).

Common name : Yellow Desert Bat (English).

Material examined : None, after Sinha (1986).

Measurements : See Sinha (1986).

Diagnosis : Cheek teeth less than six on each side of upper and lower jaws; upper premolar one in each side; upper incisor one in each side; first and second upper molars with 'W' pattern not distorted; size small, forearm below 40.0 mm, dorsal surface pale brown, tinged with fawn, ventral surface paler (greyish white); antitragal lobe thick and fleshy.

Distribution : India : Bihar : Bhagalpur district (Sinha 1986), Darbhanga district (Sinha & Chakraborty 1971), Muzaffarpur district (Sinha 1986), Sahebganj district (Khajuria 1953); Uttar Pradesh (Khajuria 1953); West Bengal (Agrawal *et. al.* 1992).

Elsewhere : Pakistan.

Remarks : Not as common as pipistrelles.

Genus ***Scotomanes*** Dobson, 1875

Only one species and subspecies of the genus *Scotomanes* occurs in Bihar.

28. ***Scotomanes ornatus ornatus*** (Blyth)

1851. *Nycticejus ornatus* Blyth, *J. Asiat. Soc. Beng.*, **20** : 517 (Chemapunj, Khasi hills, Assam = Cherrapunji, East Hills district, Meghalaya, India).

Common name : Harlequin Bat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Size large (Forearm around 60.0 mm); ears moderate, subtriangular with rounded tips; tragus bluntly pointed with some white and streaks; hairs dark brown at base, then isabelline, tips brownish yellow; a broad white V-shaped band extend to abdomen; a white collar commencing beneath each ear; rest of lower parts brown; tip of tail free.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962); Meghalaya; Sikkim; West Bengal.

Elsewhere : Possibly Bangladesh (Khan 1982).

Remarks : The Harlequin bat has neither been collected nor seen by me in Bihar but mentioned here on the basis of Roy Chaudhury (1962) statement that it was rarely seen in Bhagalpur district.

Genus ***Hesperopternus*** Peters

Only one species of the genus *Hesperopternus* occurs in Bihar.

29. ***Hesperopternus tickelli*** (Blyth)

1851. *Nycticejus tickelli* Blyth, *J. Asiat. Soc. Beng.*, **20** : 157 (Chaibasa, Bihar, India).

Common name : Tickell's Bat (English).

Material examined : None, after Sinha (1986).

Measurements : See Sinha (1986).

Diagnosis : Size large, forearm 51.0 mm to 58.0 mm; colour golden yellow, head greyish; ear oval; wing membrane blackish; wings from base of the toe; small pad under thumb; second upper incisors small and located at base of first.

Distribution : India : Bihar : West Singhbhum district; Andaman Island (Dobson 1876); Karnataka (Wroughton 1912 *c*); Madhya Pradesh (Dobson 1876); Maharashtra; Orissa; Rajasthan; Tamil Nadu; West Bengal (Wroughton 1917 *a*).

Elsewhere : Sri Lanka, Nepal (Mitchell 1980), Bangladesh (Khan 1982), Myanmar (= Burma; Anderson 1981), Thailand (Hill & Thonglongya 1972) and possibly south western China (Honackei *et. al.* 1982).

Remarks : This bat have not been collected after 1914.

Genus ***Scotophilus*** Leach, 1821

Two species and subspecies of the genus *Scotophilus* are found in Bihar.

Key to the species and subspecies of the genus *Scotophilus*

– Size smaller, forearm on average less than 55.0 mm. ..... *Scotophilus kuhli kuhli*

– Size large, forearm average, more than 55.0 mm. ..... *Scotophilus heathi heathi*

30. ***Scotophilus kuhli kuhli*** Leach

1821. *Scotophilus kuhli* Leach, *Trans. Linn. Soc. Lond.*, **13** : 69. 71 (India).

Common name : Lesser yellow Bat (English).

Material examined : After Sinha (1986); Jahanabad district : 4♂♂, 4♀♀, Tehta village, coll. Y. P. Sinha, 3.ix.1996, G.P.R.S., Pat.

Measurements : See Sinha (1986).

Diagnosis : Size small, forearm 47.0-54.0 mm; ear small, rounded at tip; tragus semilunar, markedly convex on posterior border, concave anteriorly, tip slender; wing from side of foot near base of toe; tip of tail free; fur short, dense and sleek; dorsal colour olive-brown, ventral creamy white with a tinge of red.

Distribution : India : Bihar : Bhojpur district, Gaya district, Hazaribag district, Jahanabad district, Katihar district, Kishanganj district, Munger district, Muzaffarpur district, Palamau district, Patna district, Sahebganj district, Samastipur district, Vaishali district, West Singhbhum district, widely distributed practically throughout the Indian Union including Nicobar Islands (Hill 1967).

Elsewhere : Pakistan (Walton 1974), Sri Lanka, Bangladesh (Blyth 1863) and Myanmar (= Burma).

Remarks : Common.

31. ***Scotophilus heathi heathi*** (Horsfield)

1831. *Nycticejus heathi* Horsfield, *Proc. zool. Soc. Lond.*, 113 (Chennai = Madras, India).

Common name : Greater yellow Bat (English).

Material examined : Besides Sinha (1986); Araria district : 1♂, 1♀, Targachia, Tarabari block, coll. Y. P. Sinha, 12.xii.Sakara 1995; Begusarai district : 1♂ Kabar lake area, coll. Y. P. Sinha, 29.v.1988; Katihar district : 2♀♀, Kora, coll. Y. P. Sinha, 22.xii.1995; Darbhanga district : 1♂, Koela Asthan, Keotirunway block, coll. Y. P. Sinha, 18.x.1987; Lohardaga district : 9♀♀, Nagjua village, coll. Y. P. Sinha, 16.iii.1997; Samastipur district : 1♂, Malinagar, Kalyanpur block, coll. Y. P. Sinha, 22.x.1986; 1♂, 5♀♀, Jatmalpur, Kalyanpur block, coll. Y. P. Sinha, 24.x.1986; Nawada district : 2♂♂, Chautha village, Rajauli block, coll. Y. P. Sinha, 13.ix.1996; G.P.R.S., Pat.

Measurements : See Sinha (1986).

Diagnosis : Very much similar to *Scotophilus k. kuhlii* but larger in size (forearm 56.0-65.0 mm); ventral parts lemon-yellow to orange-yellow.

Distribution : India : Bihar : Araria district, Begusarai district, Bhabhua district, Bhagalpur district (Roy Choudhury, 1962) Darbhanga district, Deoghar district, Giridih district, Hazaribag district, Katihar district, Kishanganj district, Lohardaga district, Muzaffarpur district, Nawada district, Patna district, Purnea district, Rohtas district, Saharsa district, Vaishali district, West Champaran district; widely distributed throughout the Indian subcontinent.

Elsewhere : Afghanistan (Meyer-Oehme 1965), Pakistan, Sri Lanka, Nepal (Agrawal & Chakraborty 1971), Bangladesh (Hutton 1872) and Myanmar (= Burma).

Remarks : Very common.

Subfamily KERIVOULINAE

Subfamily Kerivoulinae is represented in Bihar by a single genus *Kerivoula*.

Genus ***Kerivoula*** Gray, 1842

Only one species and subspecies of the genus *Kerivoula* occurs in Bihar.

32. ***Kerivoula picta picta*** (Pallas)

1767. *Vespertilio picta* pallas, *spicil. Zool.*, **3** : 7 (Ternate Island, Molucca Islands, Indonesia).

Common name : Painted Bat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : A rather medium-sized (forearm around 35.0 mm) kerivouline bat with

characteristic colour pattern; ear large bluntly pointed and of bright orange colour, posterior margin with shallow concavity below tip; tragus long and slender; fur soft and silky; dorsal colour light orange, ventral colour slightly paler; wing membrane orange-coloured with prominent black markings between fingers.

Distribution : India : Bihar : Darbhanga district (Inglis 1916), Samastipur district (Dalgliesh 1903 : Dalsing Sarai); Assam (Chaturvedi 1969); Goa (Agrawal 1973); Karnataka (Jerdon 1867, Wroughton 1912 *b*); Maharashtra (Wroughton 1916); Orissa (Blyth 1863); Rajasthan (Sharma 1987); Sikkim (Blanford 1891); Tamil Nadu (Jerdon 1867); West Bengal (Dobson 1876, Anderson 1881; Inglis *et. al.* 1919).

Elsewhere : Sri Lanka, Bangladesh (Jerdon 1867; Dobson 1876); Myanmar (= Burma, Jerdon 1867), Vietnam (Chasen 1940), Thailand (Chasen 1940), Malaya, Sumatra, Java, Bali, Lombok (Hill 1965), Borneo and Molucca Islands.

Remarks : Not found in Bihar after Inglis (1916).

Order PRIMATES

Mammals of the order Primates retain arboreal habits of their ancestors and characterised by prehensile hands and feet, the thumb and big toe opposable to other digits and each digit usually tipped with a flat nail. Other characters include an increase in the size and complexity of the brain, complete bony rim around the orbit and reduced dentition.

Three families of primates *viz.* Lorisidae, Cercopithecidae and Nylobatidae occur in India. Out of these only one *viz.* Cercopithecidae is found in Bihar.

Family CERCOPITHECIDAE

Key to the Indian genera of family CERCOPITHECIDAE

- Face red; cheek pouches present; tail generally smaller than head and body. ..... *Macaca*
- Face black; cheek pouches absent; tail always longer than head and body. ..... *Presbytis*

Genus *Macaca* Lacépéde, 1799

Only one species and subspecies of the genus *Macaca* occurs in Bihar.

33. *Macaca mulatta mulatta* (Zimmermann)

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

Common name : Rhesus Macaque (English).

Material examined : None.

Measurement : Nil.

Diagnosis : Medium sized (Head & body length around 500.0 mm) with a rather short tail (length about 200.0 mm); crown hairs grow back from brown; face light pink; upper back olive in colour; loin, rump and base of tail orange red.

Distribution : India : Bihar : Begusarai district, Bhagalpur district, Darbhanga district (Dalgliesh 1903), East Champaran district, Nalanda district, Palamau district, Patna district and West Singhbhum district (Wroughton 1915 : recorded from Luia); Andhra Prdesh; Arunachal Pradesh; Assam; Delhi; Gujarat; Himachal Pradesh; Jammu & Kashmir; Madhya Pradesh; Meghalaya; Orissa; Punjab; Rajasthan; Sikkim; Tripura (Agrawal & Bhattacharyya 1977); Uttar Pradesh; West Bengal.

Elsewhere : Bhutan, Bangladesh, Myanmar (= Burma), China, Thailand and Vietnam.

Remarks : Common in Bihar and found in abundant in fruiting seasons. Observations made in Bihar from 22nd November to 7th December 1983 in Betla National Park (Palamau district), from 25th to 29th July 1985 in and around Bhagalpur (Bhagalpur district) from January to December 1985 in Patna city (Patna district) on 5th December 1985 near Tilai Jheel (East Champaran district) from 6th to 10th December 1986 and 24th to 27th April 1987 at Rajgir (Nalanda district) and from 23rd May to 5th June 1988 at Jaimangla garh, Kabar lake (Begusarai district).

Genus *Presbytis* Eschscholtz 1821

Only one species and subspecies of the genus *Presbytis* occurs in Bihar.

34. ***Presbytis entellus entellus*** (Dufresne)

1797. *Simia entellus* Dufresne. *Bull. Soc. Philom. Paris.* 1(7) : 49 (Bengal).

Common name : Hanuman Langur (English)

Material examined : None.

Measurements : Nil.

Diagnosis : A large (Head and body length 550.0-700.0 mm) black faced langur; body grey colour; limbs long; tail longer (length 900.0 to 1000.0 mm.) than head and body; whispers short, only partly covering the ears; crown of head a little paler then the nape and shoulders; crown hairs radiate from a frontal whorl; hands and feet black or brown and strongly contrasted with that of arms and legs.

Distribution : India : Bihar : Bhagalpur district, Bhojpur district, Deoghar district, Nalanda district, Palamau district, Hazaribag district (Wroughton 1915), Samastipur district (Dalgliesh 1903 : Dalsing Sarai); Delhi; Gujarat; Haryana; Madhya Pradesh; Orissa; Punjab; Rajasthan; Uttar pradesh.

Elsewhere : Bangladesh.

Remarks : Observations made by the author in Bihar from 22nd November to 7th December 1983 in Betla National Park (Palamau district), on 14th September 1984 in Chandwa village near Arrah (Bhojpur district) from 25th to 29th July 1985 in Bhagalpur and around (Bhagalpur district) from 6th to 10th December 1986 and 24th to 27th April 1987 in Rajgir (Nalanda district) and on 5th April 1995 in Tapoban near Deoghar (Deoghar district).

Order PHOLIDOTA

Body long and tapering, covered above with large overlapping scales; under surface clothed with coarse, bristle like hairs; head small and pointed; jaws devoid of teeth. This order has only a single family Manidae, with a single genus *Manis*.

Family MANIDAE

Genus ***Manis*** Linnaeus, 1758

35. ***Manis crassicaudata*** Gray

1827. *Manis crassicaudata* Gray, in *Griffith's Cuvier Anim. Kingd.*, **5** : 282 (India).

Common name : Indian Pangolin (English).

Material examined : 1 (unsexed, stuffed specimen) from Calcutta Zoological Garden, present in G.P.R.S., Z.S.I., Patna; exact locality not known.

Measurements : External : H & B 485.0; Tl 340.0; Hf 177.0.

Diagnosis : Body covered with 11-13 longitudinal rows of overlapping horny scales; tip of tail without any naked glandular area.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Nalanda district (Mayank 1995 : Bihar Sharif), West Singhbhum district (Sclater, 1891 : Wroughton 1915 : Chaibasa); Andhra Pradesh; Gujarat; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Orissa; Punjab; Rajasthan; Uttar Pradesh and West Bengal.

Elsewhere : Pakistan, Sri Lanka and China.

Remarks : Rare in Bihar; a forest animal, lives in burrows. Sometimes appears but killed by local people due to lack of knowledge. They think it a ferocious animal. Recently it was killed when it entered in a house of Sohdih Mahalla, Bihar Sharif, Nalanda district (Mayank 1995). According to Forest department Bihar (1981) pangolin is among the chief inhabitant of Rajgir Wild Life Sanctuary (Nalanda district).

Order CARNIVORA

Incisors small, equal in size and six in number; canine conical and one in each side; last upper premolar and first lower molar have sharp-edged lobes for shearing the flesh.

Seven families of the order Carnivora occur in Bihar.

Key to families of the order CARNIVORA

1. Ethmo-turbinal very large, covering the greater part of nasal chamber, extending anteriorly to the anterior orifice; auditory bulla composed of two bones; cowper's gland absent. 2

– Ethmo-turbinals excluded from the anterior orifice of nasal chamber by large maxillo-

turbinals; auditory bulla composed of a single tympanic bone; Cowper's gland present. ... 5

2. Posterior palatal foramine set far back on the maxillo-palatine suture; dental formula 3, 1, 3 or 2, 1/3, 1, 4 or 3, 2 or 1; inter-ramal tuft of vibrisae absent. ..... FELTIDAE

– Posterior palatal foramine located in front of the maxillo-palatine suture; dental formula 3,1,4 or 2,1/3,1,4 or 3,2 or 1; inter-ramal tuft of vibrissae present. 3

3. Four toes in four and hind teeth; dog-like structures, ears lacking any marginal bursa. .....HYAENIDAE

– Four or five toes in fore- and hind feet; not dog-like structures; ears having a marginal bursa 4

4. Ears moderate in size with well-developed bursa and simple supratragus, but devoid of a valvular flap over it; feet compact with short claws; anus not enclosed in a glandular sac. ..... VIVERRIDAE

– Ears small and rounded with vestigeal bursa, valvular supratragus and a valvular flap over it; feet with free digits and fossorial claws; anus enclosed in a glandular pouch..... .....HERPESTIDAE

5. Legs long, slender and digitigrade. ....CANIDAE

– Legs relatively short and thick, plantigrade or semiplantigrade. 6

6. Large-sized animals with a short tail. ....URSIDAE

– Small-sized animals with a moderately long tail. ..... MUSTELIDAE

Family CANIDAE

Family Canidae is represented by three genera in Bihar.

Key to genera of the family CANIDAE

1. A frontal sinus present; tail less than half of head and body length. 2

– No frontal sinus; tail more than half of head and body length..... ***Vulpes*** (*V. bengalensis*)

2. Seven teeth in lower molar series..... ***Canis***

– Six teeth in lower molar series. ....***Cuon*** (*c. alpinus*)

Genus ***Canis*** Linnaeus, 1758

Two species and subspecies of the genus *Canis* occur in Bihar.

Key to species and subspecies of the genus *Canis*

– Size large, males 65-75 cm high at the shoulders. ..... *Canis lupus pallipes*

– Size small, males 38-43 cm high at the shoulders. ..... *Canis aureus indicus*

36. ***Canis lupus pallipes*** Sykes

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

Common name : wolf (English).

Material examined : None.

Measurements : Nil.

Diagnosis : Size large, males 65-75 cm high at the shoulders; greatest length of skull 18-24 cm; first upper molar with indistinct outer cingulum; Dorsum greyish fulvous or reddish with a brownish tinge, sometimes mixed with black; face and limbs reddish; forehead elevated and brows arched.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : Now very rare), Darbhanga district (Dalaliesh 1903 : Hattowie village), Gaya district (Roy Chaudhury 1957), Hazaribag district (Wroughton 1915), Munger district, Palamau district (personal observation), Patna district (Kumar 1970 : Now practically disappeared), Purnea district (Roy Chaudhury, 1963 : Abundant), Saharsa district (Roy Chaudhury 1965 : Common), Saran district (Roy Chaudhury 1960 : Now rarely seen), West Champaran district (Roy Chaudhury 1960); Andhra Pradesh; Assam; Gujarat; Karnataka; Madhya Pradesh;

Maharashtra; Orissa; Rajasthan; Uttar Pradesh; West Bengal.

Elsewhere : Arabian Peninsula, Iran and Pakistan.

Remarks : Found only in deep forests. It was seen by me in the core area of Betla National Park, Palamau district on 25.xi.1983.

37. ***Cania aureus indicus*** Hodgson

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

Common name : Asiatic Jackal (English).

Material examined : None.

Measurements : Nil.

Diagnosis : Smaller than the wolf and lacks the arching brows and elevated forehead. Dorsal colour typically a mixture of black and white; washed with buff about the shoulders, ears, and legs.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : Plentiful), Bokaro district (Wroughton 1915), Darbhanga district (Roy Chaudhury 1964 : Now only remnants), Gaya district (Wroughton 1915), Hazaribag district (Wroughton 1915), Muzaffarpur district (Roy Chaudhury 1958), Palamau district (Wroughton 1915; Roy Chaudhury 1961; Personal observation). Patna district (Kumar 1970), Purnea district (Roy Chaudhury 1963 : Still numerous), Rohtas (= Sahabad) district (Roy Chaudhury 1966 : common), Saharsa district (Roy Chaudhury 1965), Saran district (Roy Chaudhury 1958); Arunachal Pradesh; Assam; Manipur; Meghalaya; Nagaland; Sikkim; Tripura (Agrawal & Bhattacharyya 1977).

Elsewhere : Bhutan, Myanmar (= Burma) and Thailand.

Remarks : The author saw a jackal going towards thick bushes near Kerh Dak Bunglow in Betla National Park, Palamau district on 26.xi.1983.

Genus ***Vulpes*** Oken, 1816

One species of the genus *Vulpes* occurs in Bihar.

38. ***Vulpes bengalensis*** (Shaw)

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

Common name : Bengal Fox (English).

Material examined : (by me). Patna district : 1♂ : office compound Rajendra Nagar, Patna, coll. R. Kumar, 6.x.1976. By Pocock (1937) : Darbhanga district : 2♂♂, 2♀♀ : Bahgownie, Darbhanga, coll. N. A. Baptista, 29.vii. to 21.x.1937.

Measurements : External : 3♂♂ : H & B 51.0-530.0 (516.7); Tl 270.0-290.0 (277.0); E 74.0 (1 ex.); Hf 150.0, 120.0 (2 ex.); 1♀ : H & B 500.0; Tl 260.0 cranial 2♂♂ : *l* 116.0; 117.0; *zw* 68.0, 69.0; *iw* 23.0, 24.0; *mw* 19.0, 20.0; *ml* 91.0, 89.0. 2♀♀ : *l* 110.0, 104.0; *zw* 65.0, 59.0; *iw* 21.0, 20.0; *mw* 17.5, 18.0; *ml* 84.0, 80.0.

Diagnosis : A grey-coloured fox, having slender limbs, back of ears sandy brown and tail-tip black.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : seen everywhere), Darbhanga district (Pocock 1937; Roy Chaudhury 1964 : Now only ramnants). Hazaribag district, Muzaffarpur district (Roy Chaudhary 1958), Palamau district (Roy Chaudhary 1961; personal observation), Patna district (Kumar 1970; above material), Purnea district (Roy Chaudhary 1963), Rohtas (= Sahabad) district (Roy Chaudhary 1966 : common); occurs throughout India.

Elsewhere : Pakistan (Robert 1977), Nepal and Bangladesh.

Remarks : The author saw two Bengal foxes on the left bank of Kusiara Nala near Chipadohor range of Betla National Park, Palamau district on 2.xii.1983.

Genus ***Cuon*** Hodgson, 1838

Only one species and subspecies of this genus occurs in Bihar.

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

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

Common name : Dhole or Indian Wild Dog (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Appearance like domestic dog, with long and thin body, short legs and muzzle. Ears rounded and tip of the tail bushy. Body deep red in colour.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhary 1962 : Existence not beyond doubt), Dhanbad district (Roy Chaudhary 1964 : Available but not common), Gaya district (Roy Chaudhary 1957), Palamau district (Roy Chaudhary 1961; personal observation), Rohtas (=Sahabad) district (Roy Chaudhary 1966 : Rare), Saran district (Roy Chaudhary 1960 : Mr. A. P. Middleton noticed in 1930; extremely rare now), West Champaran district (Roy Chaudhary 1960 : Available), West Singhbhum district (Roy Chaudhary 1958 : Frequently seen); Sikkim; Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Bhutan.

Remarks : A group of wild dog (about 5 in number) were seen by the author in Sedu compartment 1, Betla National Park, Palamau district on 30.xi.1983.

Family URSIDAE

Genus ***Melursus*** Meyer 1793

40. ***Melursus ursinus ursinus*** (Shaw)

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

Common name : Sloth Bear (English).

Material examined : None.

Measurements : Nil.

Diagnosis : Size large, 140-170 cm in head and body length; claw ivory white; coat rough and black, with or without a V-shaped breast patch.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhary 1962), Bokaro district (Wroughton 1915 : Nimiaghat), East Singhbhum district (Dalma), Gaya district (Roy Chaudhary 1957), Hazaribag district (Lawalong), Nalanda district (Kumar 1970 : Rajgir), Palamau district (Roy Chaudhary 1961), Patna district, Rohtas (= Sahabad) district (Roy chaudhary 1966 : Occassionally met), West Champaran district (Roy Chaudhary 1960), West Singhbhum district (Roy Chaudhary 1958 : Large number); Arunachal Pradesh; Assam; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Meghalaya; Orissa; Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh.

Remarks : Endangered.

Family MUSTELIDAE

Four genera of the family Mustelidae occur in Bihar.

Key to the genera of the family MUSTELIDAE

1. Adapted to semiaquatic life, paws relatively larger, digits extensively webbed, with well-developed claws. ..... ***Lutra***

– Adapted to terrestrial life. 2

2. Feet adapted for running and climbing; claws short; muzzle, limbs and tail shorter; body more elongated and cylindrical; ears small. ..... ***Mustela***

– Feet adapted for digging; claws strong. 3

3. Snout hog-like; earpal and meta-tarsal pads small, separated from each other and from the planter pads, ears with well-developed pinna; a sub-equal glandular pouch present. ..... ***Aretonyx***

– Snout not hog-like; carpal and metatarsal pads confluent and in contact with the planter pads; pinna reduced to a thickened rim; no glandular pouch. ..... ***Mellivera***

Genus ***Mustela*** Linnaeus, 1758

One species and subspecies of the genus *Mustela* occurs in Bihar.

41 *Mustela kathiah kathiah* Hodgson

1835. *Mustela (Putorius) kathiah* Hodgson. *J. Asiat. Soc. Beng.*, **4** : 702 (The Kachar, northern region of Nepal).

Common name : Yellow-bellied Weasel (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Coat dark chocolate brown above and rich yellow below. Muzzle, limbs and tail shorter; body more elongated and cylindrical; ear large.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhary 1962), Darbhanga district (Dalgliesh 1903 : Hattowrie village), Samastipur district (Dalgliesh 1903 : Dalsing Sarai); Arunachal Pradesh; Assam; Meghalaya; Nagaland; Sikkim; Uttar Pradesh; West Bengal.

Elsewhere : Bhutan, China and Myanmar (= Burma).

Remarks : This species has not been seen by me in Bihar.

Genus *Mellivora* Storr, 1780

Genus *Mellivora* is represented by only one species and subspecies in Bihar.

42. *Mellivora capensis indica* (Kerr)

1792. *Ursus indicus* Kerr. *Anim. Kingd.* : 188 (India).

Common name : Ratel or Honey Badger (English).

Material examined : None.

Measurements : Nil.

Diagnosis : Bear-like appearance; body short and thick; legs stumpy; tail small; snout not projecting, very similar to hog. Colour of dorsal surface grey and ventral black.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhary 1962), Hazaribag district (Wroughton 1915 : loc. Gajhundi), Palamau district (Roy Chaudhary 1961); Gujarat; Madhya Pradesh; Orissa; Punjab; Uttar Pradesh; West Bengal; also peninsular India except Malahar coast (Blanford 1888-91).

Elsewhere : Iran, Afghanistan and Pakistan.

Remarks : Recently not recorded from Bihar.

Genus *Arctonyx* Cuvier, 1825

Only one species and subspecies of the genus *Arctonyx* is found in Bihar.

43. *Arctonyx collaris* Cuvier

1825. *Arctonyx collaris collaris* Cuvier, *Hist. nat. Mem.*, **3** : 51 (Bhutan Duars, Jalpaiguri district, West Bengal, India).

Common name : Hog-Badger (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Size small, head and body length 55-70 cm; short and thick bear-like body, stumpy legs and long powerful claws. Snout long like that of a hog, mobile and naked towards the end; ears with well developed pinna; a sub-caudal glandular pouch present.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962); Arunachal Pradesh; Assam; Manipur; Nagaland; Sikkim; West Bengal.

Elsewhere : Nepal and Bangladesh.

Remarks : Rare during present situation.

Genus *Lutra* Brisson, 1762

Only one species and subspecies *viz. Lutra p. perspicillata* of the genus *Lutra* occurs in Bihar.

44. *Lutra perspicillata perspicillata* I. Geoffroy

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

Common name : Smooth-coated Indian Otter (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Adapted to semiaquatic life; tail

thick and muscular, hind-foot wider than forefoot; vibrissae thick; paws relatively larger, digits extensively webbed with well-developed claws. Sides of frontal bones behind post-orbital processes more or less parallel up to constriction in front or brain case; fur short and adpressed; hind foot short.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Darbhanga district (Dalaliesh 1903 : Hattowrie village near small pond), Palamau district (Roy Chaudhury 1961), Purnea district (Sclater 1891); Andhra Pradesh; Arunachal Pradesh; Assam; Karnataka; Kerala; Madhya Pradesh; Meghalaya; Nagaland; Orissa; Pondicherry; Tamil Nadu; Uttar Pradesh; West Bengal (Sclater 1891).

Elsewhere : Bangladesh, Myanmar (= Burma), China, Vietnam, Malaysia and Indonesia.

Remarks : Sometimes, it is found in muddy streams.

Family VIVERRIDAE

Three genera of the family Viverridae occur in Bihar. Each genus is represented by single species and subspecies.

Key to the genera of the family VIVERRIDAE

1. Feet terrestrial and digitigrade; carpal pad single; metatarsal pad absent; scent glands opening into highly specialised pouches..... 2

– Feet scansorial and semi-plantigrade; carpal and metatarsal pad double; glandular pouches less specialised. 3

2. Anterior edge of ears widely separated due to broad forehead; a dorsal crest of hairs present extending posteriorly at least from the shoulders. ..... ***Viverra***

– Anterior edge of ears set close together due to narrow forehead; no dorsal crest of long hairs... ..... ***Viverricula***

3. A definite pattern of dorsal stripes and lateral spots present at least in new coat. .... ***Paradoxurus***

Genus *Viverra* Linnaeus, 1758

Only one species and subspecies of this genus occurs in Bihar.

45. *Viverra zibetha zibetha* Linnaeus

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

Common name : Large Indian Civet (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Scent gland present in both sexes, in male perinaesal, between scrotum and prepuce; in female behind or encircling vulva. Feet terrestrial and digitigrade; carpal pad single; metatarsal pads absent; scent glands opening into highly specialized pouches. Anterior edge of ears widely separated due to broad forehead; a dorsal crest of hairs present, extending posteriorly at least from the shoulders. Body markings indistinct and cloudy; tail with complete dark and light rings; crest of long, black, erectile hairs present on the back; anterior upper molars distinctly triangular.

Distribution : India : Bihar : Bhagalpur district (Roy Choudhury 1962), Darbhanga district (Dalgliesh 1963); Arunachal Pradesh; Assam; Madhya Pradesh; Meghalaya; Mizoram; Nagaland and Sikkim.

Elsewhere : Bangladesh, Myanmar (= Burma), Thailand, Vietnam, Malaysia and Singapore.

Genus *Viverricula* Hodgson, 1838

Genus *Viverricula* is represented in Bihar by one species and subspecies.

46. *Viverricula indica indica* (Desmarest)

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

Common name : Small Indian civet (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Anterior edge of the ears set close

together due to narrow forehead; no dorsal crert of long hairs. Body consists of small spots on the fore-quarters, larger spots tending to run into longitudinal lines on the flanks and form six to eight stripes down the back. Muzzle short and weak. Claws unprotected by sheaths of skin.

Distribution : India : Bihar : Bhagalpur district (Roy Choudhury 1962), Hazaribag district (Wroughton 1915 : loc. Jagodih) Madhubani district (Dalgliesh 1903); Andhra Pradesh; Arunachal Pradesh; Assam; Goa; Gujarat; Himachal Pradesh; Jammu & Kashmir; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Manipur; Meghalaya; Orissa; Sikkim; Tamil Nadu; Tripura; Uttar Pradesh and West Bengal.

Elsewhere : Sri Lanka, Bhutan and Bangladesh.

Remarks : Now a days it has become rare on the most parts of Bihar.

Genus ***Paradoxurus*** Cuvier, 1821

One species of the genus *Paradoxurus*, namely *P. hermaphroditus* occurs in Bihar.

47. ***Paradoxurus hermaphroditus*** (Pallas)

1777. *Viverra hermaphrodita* Pallas, In Schreber, *Die saugethiere*, **3** : 426 (India).

Common name : Common Palm civet or Toddy cat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Colour fulvus, ashy or black; the anterior palatine foramina, only extending as far as the canine.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Bokaro district (Wroughton 1915 : Nimiaghat), Darbhanga district (Dalgliesh 1903), Gaya district (Wroughton 1915 : Singar, Gaya), Giridih district (Wroughton 1915 : Parasnath hills), Saharsa district (Roy Chaudhury 1965), Vaishali district (personal observation by the author in Nov. 1987 at Harpur osti); throughout India.

Elsewhere : Sri Lanka, China, Malaysia, Indonesia and Philippines.

Remarks : As seen by the author it is very common in village habitation. It came very near to the author at his village in the courtyard of his house daily at his staying period in November 1986, in the early hour of the night. Sometimes it comes just as domestic cats.

Family HERPESTIDAE

Family Herpestidae is represented in India by one genus *Herpestes*.

Genus ***Herpestes*** Illiger, 1811

The genus *Herpestes* is characerised by longish body, short, rounded ears, mostly concealed by hairs; counter hairs banded with pale and darker annulations giving a speckled appearance.

Two species and subspecies of the genus occur in Bihar.

Key to the species and subspecies of the genus *Herpestes*

Contour hairs, when fully grown, long, many banded and usually coarse; legs darker than body..... *H. edwardsi nyula*

Contour hairs short, soft, with a few bands; legs not darker than body..... ..... *H. auropunctatus auropunctatus*

48. ***Herpestes auropunctatus auropunctatus*** (Hodgson)

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

Common name : Small Indian Mongoose (English).

Material examined : Bokaro district : 1♂, Nimiaghat, coll. B. Nath, 13.iv.1948, Z.S.I., Cal.

Measurements : External : 1♂ : H & B 305.0; Tl 258.0; Hf 58.0. Cranial : 1♂ : *l* 61.6; *cb* 61.3; *mw* 10.3; *iw* 11.7; *pow* 17.2; *pm* 5.9; *zw* 29.2.

Diagnosis : Size small (Head and body length around 250.0 mm; tail length 256.0 mm), Central

hairs soft, with a few bands; legs not darker than body; muzzle dark brown; cranium gradually narrows from the orbit.

Distribution : India : Bihar : Bokaro district (Wroughton 1915; Pocock 1937 : Nimiaghat), Hazaribag district (Wroughton 1915 : Hazaribag); Arunachal Pradesh; Assam; Himachal Pradesh; Jammu & Kashmir; Manipur; Meghalaya; Nagaland; Orissa; Sikkim; Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Bhutan.

Remarks : Recently not seen in Bihar.

49. ***Herpestes edwardsi nyula*** (Hodgson)

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

Common name : Indian Grey Mongoose (English)

Material examined : Patna district 1 ♂, Maner, coll. Y. P. Sinha, 13.iv.1978, G.P.R.S., Pat.; by Pocock (1937) : Darbhanga district : 1 ♂, coll. C. A. Crump; Palamau district : 1 ♂, 1 ♀, Daltonganj, coll. C. A. Crump; Hazaribag district : 1 ♂, Hazaribag, coll. C. A. Crump.

Measurements : External : 4 ♂♂ : H & B 360.0-430.0 (402.5); Tl 300.0-380.0 (350.5); E 30.0 (1 ex); Hf 72.0-80.0 (75.0).Cranial : 3 ♂♂ : *l* 77.0-84.0 (81.0); *zw* 38.0-42.0 (40.0); *iw* 14.0-16.0 (15.3); *pow* 11.0-13.0 (11.7); *mw* 14.0-15.0 (14.7); *ml* 52.0, 56.0 (2 ex.), 1 ♀ : *l* 75.0; *zw* 38.0; *iw* 14.0; *pow* 11.0; *mw* : 13.0; *ml* 49.0.

Diagnosis : Size large, head and body around 350.0 mm in length and tail around 335.0 mm.. contour hairs, when fully grown, long, many banded and usually coarse; legs darker than body.

Distribution : India : Bihar : Begusarai district (personal observation at Jaimangla Garh on 25.v.1988), Bhagalpur district (Roy Chaudhary 1962 : Abundant), Bhojpur district (personal observation in Chandwa village on 14.xi.1984), Bokaro district (Wroughton 1915 : loc. Nimiaghat), Darbhanga district (Pocock 1937; personal observation in Laheria Sarai on 14.x.1987), East Champaran district (personal observation in Jihuli village on 6.xii.1985), Hazaribag district (Pocock 1937 : Hazaribag; Wroughton 1915 : loc. Jagodih. Lohra and Gajhundi), Jamui district (personal observation in Lakhisarai on 4.iv.1995); Palamau district (Wroughton 1915; Pocock 1937 : loc. Daltonganj), Patna district (above material), Purnea district (personal observation in Purnea on 10.xii.1995), Vaishali district (personal observation in Jandhua village on 8.xi.1977); Assam; Gujarat; Madhya Pradesh; Orissa; Sikkim; Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Bangladesh.

Remarks : The author observed this species, near human habitation, especially at the time of crossing road from one paddy field to another, near sugar cane field, wheat field and among bamboos.

Family HYAENIDAE

Family Hyaenidae is representative in India by only one genus, namely *Hyaena*.

Genus ***Hyaena*** Brisson, 1762

Out of two species of this genus, one viz *Hyaena hyaena* occurs in Bihar.

50. ***Hyaena hyaena hyaena*** (Linnaeus)

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

Common name : Striped Hyaena (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Vertical dark stripes on the body and transverse bars on the upper portion of legs; a long crest of mane extending from head to the root of tail.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Darbhanga district (Roy Chaudhury 1964 : Met with but rarely), Gaya district (Roy Chaudhury 1962), Hazaribag district (Wroughton 1915 : loc. Jagodih and Hazaribag), Palamau district (Roy Choudhury 1961), Patna district (Kumar 1970), Purnea district (Roy

Choudhury 1963 : abundant), Rohtas district (Roy Choudhury 1966); West Champaran district (Roy Choudhury 1960), Hyaena found almost throughout India, the eastern limit being West Bengal.

Elsewhere : North Africa, through Arabia, Iraq, Iran, Afghanistan to Pakistan, also Transcaucasia and Turkestan in Russia and Nepal.

Remarks : At present it is rare in plains of Bihar due to deforestation but the author observed it in Betla National Park, Palamau district between 23rd November to 6th December 1983.

Family FELIDAE

Two genera of the family Felidae occur in Bihar.

Key to the genera of the family FELIDAE

1. Size large, hyoidean apparatus modified by the conversion of median part of suspenser into a long elastic tendo. ..... ***Panthera***

- Size small, hyoidean apparatus of normal mammalian type; the suspensor consisting of a chain of bones, jointed end to end. ..... ***Felis***

Genus *Felis* Linnaeus, 1758

Two species and subspecies of the genus *Fellis* occur in Bihar.

Key to the species of the genus *Felis*

1. Outer chamber of auditory bulla small, partition arising close to orifice; facial portion of skull shorter, tip of postorbital process in front of middle of skull. 2

- Outer chamber of auditory bulla relatively large, partition arising from some distance of orifice; tip of postorbital process about the middle of skull; nasal branch of premaxilla broad. *Falis chaus kutas*

2. Medium sized, thick set body, head and body length, on average, 74 cm or more, tail less than one-half of head and body. ..... *Felis viverrina*

51. *Felis chaus kutas* Pearson

1832. *Felis kutas* Pearson, *J. Asiat. Soc. Beng.*, **1** : 75 (Medinipur, West Bengal, India).

Common names : Jungle cat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Size medium (head and body 640.0-720.0 mm; tail around 280.0 mm); tail terminating in a black tip; pelage unspotted except on lower flanks and elbow; black horizontal stripes on the inner side of forelegs; back of ears reddish chestnut with inconspicuous hair tuft.

Distribution : India : Bihar : Bhagalpur district (Roy Choudhury 1962 : most common), Bokaro district (Wroughton 1915 : loc. Nimiaghat), Darbhanga district (Roy Choudhury 1964), Gaya district (Wroughton 1915 : loc. Singar and Gaya), Hazaribag district (Wroughton 1915 : Jagodih and Lohra), Palamau district (Roy Chaudhury 1961), Patna district (Kumar 1970), West Champaran district (Roy Choudhury 1960), West Singhbhum district (Wroughton 1915 : Koira); Gujarat; Madhya Pradesh; Orissa; Rajasthan; Uttar Pradesh and West Bengal.

Remarks : Wroughton (1915) mentions that it does not appear to be very common in Bihar. Now a days it is rare in Bihar due to destruction of habitat. The author saw a jungle cat crossing road in the forest area of Betla National Park, Palamau district on 22.xi.1983.

52. *Felis viverrina* Bennett

1833. *Felis viverrinus* Bennett, *Proc. zool. Soc. Lond.* : 68 (India, probably Malabar coast).

Common name : Fishing cat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Size medium (head and body length 660.0-700.0 mm) and tail length about 300.00 mm); back of ears black withround whitish spot in the centre; body covered with black or

brown spots throughout, spots always longer than broad; six to eight black lines run from the forehead to the naps, breaking up into shorter lines and spots on the shoulders. Several cross bands present on the forehead and throat.

Distribution : India : Bihar : Bhagalpur district (Roy Choudhury 1962 : found in thick jungle); Assam; Andhra Pradesh; Karnataka; Kerala; Maharashtra; Orissa; Tamil Nadu; Uttar Pradesh and West Bengal.

Elsewhere : Pakistan, Sri Lanka, Nepal, Bangladesh, Thailand, Indonesia, Vietnam and Taiwan.

Remarks : Very rare in Bihar; it is found only in thick forest (Roy Choudhury 1962).

Genus ***Acinonyx*** Brookes, 1828

53. ***Acinonyx jubatus venaticus*** (Griffith)

1821. *Felis venatica* Griffith, *Vert. Ani,. Carnivora* : 93 (India).

Common name : Hunting Leopard (English).

Remarks : Shahi (1977) mentioned that although cheetah (*Acinonyx jubatus* has now become extinct from India but A. Marvyn Smith shot a cheetah (*Acinonyx jubatus*) in the Saranda forest of Singhbhum district. In his book, *sport and Adventure in the Indian Jungle* (1904), A. Mervyn Smith writes : It is generally believed that the cheetah is only found in the more open parts of the scrub jungle of Central India, but I have killed them in the dense forest of Saranda in Chota Nagpur. The skin is differently marked to that of the panthar. Both have a yellowish brown ground with black spots. The spots on the panther are rosettes; on the cheetah they are simply black drabs without a central opening of yellow.

Genus ***Panthera*** Oken, 1816

Two species and subspecies of the genus *Panthera* occur in Bihar.

Key to the species of the genus *Panthera*

Ground colour of body yellow, with distinct black spots arranged in rosettes. .... *Panthera pardus*

Ground colour of body orange - Tawny, with vertical black stripes. ..... *Panthera tigris*

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

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

Common name : Common Indian Leopard or Panther (English).

Material examined : Nil.

Measurement : Nil.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : found in south of the Ganga river). Darbhanga district (Roy Chaudhury 1966 : Practically denuded due to advance of cultivation, the growth of human population and extension of means of communication); Dhanbad district (Roy Chaudhury 1964 : available but not commonly seen), Gaya district (Roy Chaudhury 1957), Kishanganj district (Roy Chaudhury 1963 : Leopards are still common in the jungle), Muzaffarpur district (Roy Chaudhury 1958 : *occasionally found but they are only stray visitors* from Nepal). Nalanda district (Forest Ministry Bihar 1982 : Present in Rajgir Wild Life sanctuary), Palamau district (Roy Chaudhury 1961), Patna district (Kumar 1970), Rohtas (= Sahabad) district (Roy Chaudhury 1966 : Leopards are numerous in forest), Saharsa district (Roy Chaudhury 1965 : Decline due to denudation of forest), Saran district (Roy Chaudhury 1960 : Formerly common but now completely disappear), West Champaran district (Roy Chaudhury 1960 : Available in the forest), West Singhbhum district (Roy Chaudhury 1958 : present but very rare appearance); throughout India in suitable habitats.

Elsewhere : Sri Lanka, Bangladesh, Myanmar (= Burma) and China.

Remarks : Endangered due to destruction of habitat. The author saw pug mark of leopard in the morning of 29.xi.1983 in the dry sandy bed of Java river in Sedu compartment 1 of Betla National Park, Palamau district.

55. ***Panthera tigris tigris*** (Linnaeus)

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

Common name : Tiger (English).

Material examined : By Sclater (1891) : Purnea district : 1♂ (Juv, Skin), Purnea, coll. J. F. Barkley, 1875 : 1♂ (Skull) : Purnea, coll. J. Shillingford, Shahabad (= Rohtas) district : 1♂ (Juv, skull), Shahabad, J. F. Barckley.

Measurements : Nil.

Diagnosis : Ground colour of body Orange-Tawny, with vertical black stripes.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : Found in high grass jungle and in the hills of south of the district but commonly not seen), Darbhanga district (Roy Chaudhury 1960 : were common but now completely disappeared), Dhanbad district (Roy Chaudhury 1964 : available but not commonly seen), Gaya district (Roy Chaudhury 1957), Palamau district (Roy Chaudhury 1961), Purnea district (Roy Chaudhury 1963 : tigers were quite common but very rare even at the time of O'Malley 1911), Rohtas (= Sahabad) district (Roy Chaudhury 1966 : not common; occassionally met with), Saharsa district (Roy Chaudhury 1965 : Number decline due to denudation of the forest), Saran district (Roy Chaudhury 1960 : were common but now completely disappeared), Sitamarhi district (Roy Chaudhury 1958 : Stray visitor from Nepal), West Champaran district (Roy Chaudhury 1960), West Singhbhum district (Roy Chaudhury 1958 : Present but make very rare appearance), found throughout India except in desert of Rajasthan; Punjab and Gujarat.

Elsewhere : Nepal, Bangladesh and Myanmar (= Burma).

Remarks : Endangered due to loss of habitat. The author saw the pug marks of tiger in wet sandy bed on the confluence of Budha and Koel rivers near Bage Champa in Barasand range of Betla National Park, Palamau district on 3.xii.1983.

Order PROBOSCIDEA

Massive buid with long, flexible proboscis; generally male possess large tusks which are nothing but enlargement of incisor teeth; molars large and transversely ridged. The genus Proboscidea contains a single family Elephantidae.

Family ELEPHANTIDAE

In India, this family is represented by a single genus *viz. Elephas*.

Genus ***Elephas*** Linnaeus, 1758

Only one species and subspecies of the genus *Elephas* occurs in Bihar.

56. ***Elephas maximus indicus*** Cuvier·

1797. *Elephas indicus* Cuvier, *Tabl. Elem. Hist. Nat.*, **1** : 148 (India).

Common name : Indian Elephant (English).

Material examined : By Sclater (1891) : Santhal Pargana district : 1♂, (Skeleton), Bilkandi, coll. W. M. Smith, 1870.

Measurements : Nil.

Diagnosis : Height at the shoulder up to 335 cm or little more. Body blackish grey throughout; proboscis ends in a single lip; four nails on each hind foot; ears large but not enormous.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : wild elephant now; down to the end of 18th B. C. they were found in large number), Darbhanga district (Roy Chaudhury 1964 : denuded due to destruction of habitat), East Singhbhum district (Roy Chaudhury 1958 : Wild elephants are common in the Dalma range), Palamau district, Purnea district (Roy Chaudhury 1963 : About a century.before herds of wild elephant were quite common), Sitamarhi district (Roy Chaudhury 1958 : Stray visitors from Nepal), West Champaran district (Roy Chaudhury 1960 : Fast disappearing); Arunachal Pradesh; Assam; Karnataka; Kerala; Meghalaya; Mizoram; Nagaland; Orissa; Tamil Nadu; Tripura; Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, Bhutan, Myanmar (= Burma), Thailand, Vietnam, Malaysia, Sumatra and Borneo.

Remarks : The author has seen elephant in Madhsuma and Hathbajhawa area on 28.xi.1983; dung and pug mark on 29.xi.1983 and a group of seven elephants (male, female and young) in Basuria Pahar in Chipadohor range on 2.xii.1983 among bamboo trees of Betla National Park,

Palamau district. In other parts of Bihar it is endangered due to loss of forests.

Order PERISSODACTYLA

It is characterised by the number of toes in each foot, being usually odd, third or middle toes being most prominent.

Family RHINOCEROTIDAE

Three toes on each foot, terminating in a small hoof-like nail.

Genus ***Rhinoceros*** Linnaeus, 1758

Actually now-a-days it is not found in Bihar but sometimes comes from Nepal in border areas. The species which comes from Nepal is *R. unicornis*.

57. ***Rhinoceros unicornis*** Linnaeus

1758. *Rhinoceros unicornis* Linnaeus, *Syst. Nat. 10th. ed.*, 1 : 56 (Assam, India).

Common name : Great Indian One-horned Rhinoceros (English).

Material examined : By Sclater (1891) : Purnea district : 1♂, stuffed and bones of feet, coll. G. W. Shillingford, 1871.

Measurements : Nil.

Diagnosis : Size large, height at the shoulders 170 cm or more; horn only one on the tip of snout; skull with the post-tympanic and post-glenoid processess of the squamosal bone united for a considerable extent below the meatus auditorious; upper lip rounded.

Distribution : India : Bihar : Purnea district (Sclater 1891 : it was formerly plentiful in the Purnea district, but now it seems to be almost confiened to the Doars to the east of the Teesta river; Roy Chaudhury 1963 : Rhino used to be shot in the district half a century before. The biggest one stand stuffed in the Calcutta Museum shot in this district by Shillingford), Saharsa district (Roy Chaudhury 1965 : At one time Rhinoceros used to come from Nepal), West Champaran district (Roy Chaudhury 1960 : makes stray appearance in the forest of Madanpur, Balgangwa and Hathimalkhanta from Nepal); West Bengal; Assam; Uttar Pradesh (recently introduced).

Elsewhere : Nepal.

Remarks : At present it has not been seen in Bihar. Shahi (1977) mentions that the one horned Rhinoceros once common in the Rajmahal hill of Santhal Parganas and in Purnea district, North Bihar is now extinct.

Even-toed ungulate; axis of the foot passes between third and fourth toes.

Order Artiodactyla is represented by four families in Bihar.

Key to the families of the order ARTIODACTYLA

1. Upper incisors absent. 2
- Upper incisors present. ..... SUIDAE
2. Either horns or antlers present; size large. 3
- Horns or antlers absent, size very small. ..... TRAGULIDAE
3. Horns consists of a hollow outer sheath and an inner bony core, unbranched and permanent. ..... BOVIDAE
- Antlers solid, branched, ornamented with knots or ridges, and periordically shed. ..... CERVIDAE

Family SUIDAE

This family is represented in India by a single genus, *Sus* Linnaeus, 1758 of which one species and subspecies *viz. Sus scrofa cristatus* occurs in Bihar.

58. ***Sus scrofa cristatus*** Wagner

1839. *Sus cristatus* Wagner, Munch. *Gelehrt. Anz.*, 9 : 435 (Probably Malabar coast, India).

Common name : Indian Wild Boar (English).

Material examined by Sclatter (1891) : Purnea district : 1♂ (skull) and 1♂ (skeleton), Purnea, J. L. Shillingford, 1881.

Measurements : Nil.

Diagnosis : Size large, height at shoulders 76-102 cm; a crest of black bristles present from nape to the back; tail long, extending nearly to hocks.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962 : Found in all parts of district), Darbhanga district (Roy Chaudhury 1964 : Formerly it was a great sport but no longer found in herds), Dhanbad district (Roy Chaudhury 1964), East Singhbhum district, Gaya district (Roy Chaudhury 1957), Hazaribag district (Hazaribag wild Life Sanctuary), Munger district (Bhimband Wild Life Sanctuary), Muzaffarpur district (Roy Chaudhury 1958 : formerly fairly common in diaras and in the patches of grass and jungle but now the number decreased due to hunting), Nalanda district (Rajgir Wild Life Sanctuary), Palamau district (Roy Chaudhury 1961), Patna district (Kumar 1970), Purnea district (Roy Chaudhury 1963 : One time were abundant), Rohtas (= Sahabad) district (Roy Chaudhury), Saharsa district (Roy Chaudhury 1965 : number decline), Saran district (Middleton 1930 : Present but declined in number due to hunting), West Champaran district (Roy Chaudhury 1960 : Available), West Singhbhum distrtict (Roy Chaudhury 1958 : Present in fairly large number); forested tracts throughout India.

Elsewhere : Pakistan, Sri Lanka, Nepal, Bangladesh, Myanmar (= Burma), Indonesia, Malaysia and Vietnam.

Remarks : The author could not see the wild boar in Betla National Park, Palamau district and Rajgir Wild Life Sanctuary, Nalanda district during tour in November-December 1983 and December 1986 respectively but got evidence of its existance in the forest by Forest Department, Bihar. A boar is formidable and extremely difficult animal to encounter.

Family TRAGULIDAE

Only one genus of the family Tragulidae occurs in Bihar.

Genus ***Tragulus*** Brisson, 1762

Only one species and subspecies *viz. Tragulus meminna* Erxleben is found in Bihar.

59. ***Tragulus meminna*** Erxleben

1777. *Moschus meminna* Erxleben, *Syst. Regn. Anim., Mamm.* 322 (Sri Lanka = Ceylon).

Common name : Indian spotted Chevrotain or Mouse-deer (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Size small (length of head and body about 51.0 cm and the length of tail just a bit more than two centimetres); the height on shoulder about 25.0 cm. An adult mouse-deer is furnished with long upper canines which protrude like tusks. The colour of coat olive brown, sides of body marked with longitudinal white spots to give it the appearance of a miniature spotted deer.

Distribution : India : Bihar : East Singhbhum district (Shahi 1977 : In the forest of Dalma hills), Palamau district (Roy Chaudhury 1961); Peninsular India.

Elsewhere : Sri Lanka, Nepal Terai.

Remarks : A forest animal rarely seen in Dalma Wild Life Sanctuary in East Singhbhum district of Bihar but not very uncommon.

Family CERVIDAE

Three genera of the family Cervidae occur in Bihar.

Key to the genera of family CERVIDAE

1. Upper canines tusk like, in male; antlers short, consisting of a short brow-tine and an unbranched beam. ..... ***Muntiacus***

– Upper canine when present, not tusk like, antlers long and branched. 2

2. Body in adults, distinctly spotted; brow-tine set at right angles to the beam of antlers. ..... ***Axis***

– Body unspotted; brow-tine form an acute angle with the beam of antlers. ..... ***Cervus***

Genus ***Muntiacus*** Rafinesque, 1815

Only one species and subspecies of the genus *Muntiacus* occurs in Bihar.

60. ***Muntiacus muntjak vaginalis*** (Boddaert)

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

Common name : Indian Muntjac or Barking Deer (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Height at shoulders, in males, 50-75 cm, females a little smaller; antlers placed on bony pedicles which extend down on either side of the face as bony ridges. Coat-colour deep chestnut, becoming darker on the back and paler and duller below.

Distribution : India : Bihar : East Singhbhum district (Roy Chaudhury 1958), Gaya district (Roy Chaudhury 1957), Hazaribag district, Palamau district (Roy Chaudhury 1961), Rohtas district, West Champaran district (Roy Chaudhury 1960); Arunachal Pradesh; Assam; Meghalaya; Sikkim; Tripura (Agrawal & Bhattacharyya 1977); Uttar Pradesh and West Bengal.

Elsewhere : Bhutan, Bangladesh, Northern Myanmar (= Burma), Yunan and northern Vietnam.

Remarks : On 3.xii.1983, the author saw two barking deers, one in Teno and other in Dariahi in compartment 9 of Betla National Park, Palamau district.

Genus ***Axis*** Smith, 1827

Two species of this genus occur in Bihar.

Key to the species of the genus *Axis*

- Size small, height at shoulder less than 76 cm; generally not spotted..... *A. porcinus*
- Size large, height at shoulders more than 76 cm; adult always spotted..... *A. axis*

61. ***Axis porcinus porcinus*** (Zimmermann)

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

Common name : Hog Deer (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Ears are large in comparison to its body than the cheetal; prominent white spots absent; inner side of tail and ears white; pig like in movement. Beam of antlers after giving a short brow tine almost straight, till it divides into a longer fore and shorter hind tine.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Purnea district (Roy Chaudhury 1963), Rohtas district (Roy Chaudhury 1966), Saharsa district (Roy Chaudhury 1965), West Champaran district (Roy Chaudhury 1960); Meghalaya; Punjab; Tripura; Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Sri Lanka (introduced).

Remarks : At present, this species almost vanished from Bihar due to reclamation of the grassy riverine tracts for agricultural purposes. It is very rare in Purnea-Saharsa region (Shahi, 1977).

62. ***Axis axis axis*** (Erxleben)

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

Common name : Spotted Deer (English).

Material examined by Sclater (1891) : Purnea district : 1 (unsexed Juv. Skin), Purnea, J. Shillingford 1871.

Measurements : Nil.

Diagnosis : Coat bright rufous-fawn, profusely spotted with white at all ages and seasons. antlers with three tines, a long brow-tine set nearly at right angles to the beam; latter divides into two branches.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Darbhanga district (Dalgliesh 1903), Gaya district (Roy Chaudhury 1957), Hazaribag district (Tikader 1983), Munger district (Tikader 1983), Palamau district (Roy Chaudhury 1963), Purnea district (Roy Chaudhury 1963), Rohtas district (Roy chaudhury 1966), Saharsa district (Roy Chaudhury 1965), West

Champaran district (Roy Chaudhury 1960), West Singhbhum district (Roy Chaudhury 1958); Peninsular India, northwards to Kumaon Uttar Pradesh and Sikkim and eastwards to Assam and Meghalaya.

Elsewhere : Sri Lanka, Nepal and Bangladesh.

Remarks : The author saw it in thriving in the Betla National Park and around in November-December 1983. He also saw this animal in association with monkey and langurs in the core area of Betla National Park without any antagonism.

Genus ***Cervus*** Linnaeus, 1758

Two species of the genus occur in Bihar.

Key to the species of the genus *Cervus*

- Each antler, in adults, normally with more than 3 tines; browantler forming an angle of 90° with the beam. ..... *C. duvauceli*

- Each antler, in adults, normally with 3 tines; brow antler forming an acute angle with the beam. ..... *C. unicolor*

63. ***Cervus unicolor niger*** Blainville

1816. *Cervus niger* Blainville, *Bull. Soc. Philom. Paris* : 76 (Probably somewhere in North India, according to Ellerman & Morrison-Scott 1951).

Common name : Sambar (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Largest of the Indian deer, height at shoulders about 150 cm; coat coarse and shaggy; a mane present in stags about neck and throat; general colour brown with yellowish or greyish tinge, venter paler; females lighter in tone.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Gaya district (Roy Chaudhury 1957), Hazaribag district (Tikader 1983), Munger district (Tikader 1983), Nalanda district (Tikader 1983), Palamau district (Roy Chaudhury 1961), Rohtas district (Roy Chaudhury 1966), West Champaran district (Roy Chaudhury 1960), West Singhbhum district (Roy Chaudhury 1958); Andhra Pradesh; Goa; Gujarat; Himachal Pradesh; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Orissa; Rajasthan; Tamil Nadu; Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Bangladesh.

Remarks : on 3.xii.1983, the author saw Sambars in association with chitals and monkeys in Seobal and Balsain area of Betla national Park, Palamau district. He also saw a wounded sambar sitting on the bank of Barbahi dam in the same park.

64. ***Cervus duvauceli Duvauceli*** Cuvier

1823. *Cervus duvaucelii* Cuvier, Oss. Foss., 2nd ed., 4 505 (North India).

Common name : Swamp Deer (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Size large, height at shoulders 105-130 cm; coat almost woolly in texture, brown to yellowish brown; summer-coat paler. A mane present, in stags, over neck.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962); Munger district (Sclater 1891); Assam; Meghalaya; Madhya Pradesh (Sclater 1891); Uttar Pradesh and West Bengal.

Elsewhere : Nepal.

Remarks : According to Roy Chaudhury (1962) Swamp deer or Barasingha is sometimes met with in Bhagalpur district.

Family BOVIDAE

Records of seven genera of the family Bovidae are available in Bihar but present status of two genera *viz. Bubalus* and *Capra* is doubtful.

Key to the genera of the family BOVIDAE

1. Horns always present in both sexes; occipital and frontal planes form an acute angle; no antorbital pits. 2

- Horns not always present in the females; occipital and frontal planes hardly form an angle

but a rounded surface; antorbital pits always present. 5

2. Horns set apart; body large and massive; four mammae; muffle large. 4

3. Horns triangular in cross-section and transversely ridged, exceeding 92 cm in length. ..... ***Bubalus***

– Horns oval in cross-section and smooth, less than 92 cm in length. ..... ***Bos***

4. Horns set with bases close to one another; body small; two mammae; no muffle. ..... ***Capra***

5. Horn smooth, present in males only, muffle present; mammae four in number. 6

– Horn ringed; no muffle; mammae two in number. 87

6. Size large; horn short and two in number; a short erect mane and a throat tuft in male. ..... ***Boselaphus***

– Size small; horn four in number; no mane and throat tuft absent. ..... ***Tetracerus***

7. Horns longer (length 50-60 cm) with prominent ridges at regular intervals and spiral in shape, present in males only. ..... ***Antilope***

– Horns shorter (25-30 cm), present in both sexes; annulated in females. ..... ***Gazella***

Genus ***Bos*** Linnaeus, 1758

One species of the genus *Bos* occurs in Bihar.

65. ***Bos gaurus*** Smith

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

Common name : Indian Bison or Gaur (English).

Material examined by Sclater (1891) : 1♂ (stuffed), Chota Nagpur, Bihar, A. A. Kinloch, 1883; 1♀ (Skeleton), Chota Nagpur, Bihar, Major Qusley, 1840.

Measurements : Nil.

Diagnosis : Body large and massive; height at shoulders, in males, 175-196 cm, females a little smaller. A muscular ridge present on the shoulders which slopes down to the middle of the back where it ends in an abrupt dip. General colour of body coffee or reddish brown, jet black in old bulls; ashy forehead; yellowish or white stockings.

Distribution : India : Bihar : Madhubani district (Dalgliesh 1903), Palamau district (Roy Chaudhury 1961); Ranchi district (Shahi 1977 : inhabited of the Simdega subdivision is completely vanished from the district), West Champaran district (Roy Chaudhury 1960), West Singhbhum district (Shahi 1977 : Also found in the forest of Saranda); Arunachal Pradesh; Andhra Pradesh; Assam; Goa; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Mizoram; Nagaland; Orissa; Rajasthan; Tamil Nadu; Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Bangladesh.

Remarks : Shahi (1977) mentions that the total number of Gaur in Bihar would not be more than two hundred. The author saw six Indian Bisons or Gaurs in Kashwa and one in Madhchua in the evening on 29.xi.1983 and a herd of eleven numbers in the night on 1.xii.1983 in Betla National Park, Palamau district.

Genus ***Bubalus*** H. Smith, 1827

One species of the genus *Bubalus* was occurred in Bihar but now completely vanished.

66. ***Bubalus bubalis bubalis*** (Linnaeus)

1758. *Bos bubalis* Linnaeus, *Syst. Nat.*, 10th ed. 1 : 72 (Rome, Italy).

Common name : Wild Buffalo (English).

Material examined by Sclater (1891) : 1♂ (Skeleton) : Purnea, Purnea district, coll. J. L. Shillingford, 1881; 1♀ (Skeleton) : Purnea, Purnea district, coll. A. Weekes, 1881.

Measurements : Nil.

Diagnosis : A robust animal, height at the shoulders, in males, 150-280 cm, females a little shorter. Body-colour slaty black, with dirty white feet. Horns triangular in cross section and transversely ridged.

Distribution : India : Bihar; Bhagalpur district (Roy Chaudhury 1962), Darbhanga district (Roy Chaudhury 1964), Purnea district (Roy Chaudhury 1963), Saharsa district (Roy Chaudhury 1964), West Champaran district (Roy Chaudhury 1960); Assam; Madhya Pradesh; Maharashtra; Orissa and West Bengal.

Elsewhere : Sri Lanka (probably feral).

Remarks : Now completely vanished from Bihar.

Genus ***Capra*** Linnaeus, 1758

67. ***Capra*** sp.

Common name : Wild Goat (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Horns smooth and angular; no muffle; no antorbital pits; feet-pits if present, only in the fore feet; basioccipital wider in front and the anterior tubercles larger; two mammae.

Distribution : India : Bihar : West Champaran district (Roy Chaudhury 1960).

Remarks : According to Roy Chaudhury 1960, this animal was available in the forest of Champaran district but fast disappearing.

Genus ***Antilope*** Pallas, 1766

One species of genus *Antilope* occurs in Bihar.

68. ***Antilope cervicapra rupicapra*** Müller

1776. *Antilope cervicapra rupicapra* Müller, *Natursyst. Suppl.* : 56 (Bengal).

Common name : Black buck (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Height at the shoulders about 80 cm in males, a little shorter in females. Body colour blackish in male, yellowish fawn in female on the upper surface and white on the under surface. Male possesses a pair of spiral twisted, closely ringed horns; female hornless.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Bhojpur district (Shahi 1977, Buxar), Dhanbad district (Roy Chaudhury 1964), Gaya district (Roy Chaudhury 1957), Patna district (Kumar 1970), Purnea district (Roy Chaudhury 1963), Rohtas district (Roy Chaudhury 1964), Saran district (Roy Chaudhury 1960), West Champaran district (Roy Chaudhury 1960); Orissa; Uttar Pradesh and West Bengal.

Remarks : The Blackbuck was once common in Bihar in the forest and mainlands of the above mentioned districts, are now either disappearing or completely disappeared and commonly not seen. According to Shahi (1977) it is now confined to an agricultural tract in Bhojpur district.

Genus ***Boselaphus*** Blainville, 1816

Only one species of the genus *Boselaphus* occurs in India.

69. ***Boselaphus tragocamelus*** (Pallas)

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

Common name : The Nilgai or Blue Bull (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Looking like a horse with strong legs, the forepart of body slants towards the hind parts because the hind limbs are shorter than the forelimbs. The females are hornless and the males have short horns (about 15 cm long). A long haired mane runs over the neck in both sexes. The tail is long reaching the knees. Male has tuft of hairs on the chin. Head and body about 200 cm, tail 45 cm, ear 17 cm and height at shoulder of male about 130 cm. Females are slightly smaller in size.

Distribution : India : Bihar : Darbhanga district (Roy Chaudhury 1964), East Champaran district (Roy Chaudhury 1960), Gaya district (Roy Chaudhury 1957), Muzaffarpur district (Roy Chaudhury 1958), Nalanda district, Palamau district (Roy Chaudhury 1961), Patna district

(Kumar 1970), Rohtas (= Sahabad) district, Saharsa district (Roy Chaudhury 1965), Saran district (Roy Chaudhury 1960), Vaishali district (Personal observation), West Champaran district (Roy Chaudhury 1960); throughout India, except in extreme South, Assam and on Malabar Coast.

Remarks : It inhabits open plain and live generally in herds of 3-5 animals. The author saw pug mark of Nilgai near salt lick in Betla National Park on 29.xi.1983 and a male in Rajgir forest, Nalanda district on 7.xii.1986. Very often seen by the author near his village in Vaishali district.

Genus ***Tetracerus*** Leach, 1825

Only one species of the genus *Tetracerus* found in India.

70. ***Tetracerus quadricornis*** Blainville

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

Common name : Four-horned Antelope or Chausingha (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : The four-horned antelope is the only four horned animal of this species in the world. Unlike the black buck, it is not gregarious and prefers to lead a solitary life.

Distribution : India : Bihar : Bhagalpur district (Roy Chaudhury 1962), Gaya district (Roy Chaudhury 1957), Hazaribag district (Shahi 1977), Palamau district (1961), West Champaran district (Roy Chaudhury 1960).

Remarks : As mentioned by Shahi (1977), this animal is occasionally seen in the forests of Palamau and Hazaribag but can no longer be seen in the other forests of the states. It is due to destruction of habitat.

Genus ***Gazella*** Blainville, 1816

71. ***Gazella gazella bennetti*** (Sykes)

1831. *Antilope bennettii* Sykes, *Proc. zool. Soc. Lond.* 1830-31 : 104 (Deccan, India).

Common name : Indian Gazelle or Chinkara (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : It is smaller in size as compared to the black buck. It has shorter (25-30 cm) annulated horns, slightly curved forward. In the female, horns are present as spikes, not usually annulated (7-10 cm). Head and body 100 cm, tail 20 cm, ear 15 cm, height at shoulder 60-65 cm, body weight 20-25 kg.

Distribution : India : Bihar : Gaya district (Roy Chaudhury 1957), Hazaribag district (Wroughton 1915 : Jagodih and Hazaribag), Palamau district (Roy Chaudhury 1961), Rohtas district (Roy Chaudhury 1966); north western and central India, in the peninsular region up to Krishna river.

Remarks : The number of chinkara has sharply declined in Bihar and are at present fighting for survival in Kaimur plateau in Rohtas district (Shahi 1977).

Order LAGOMORPHA

Two pairs of incisors in the upper jaw, placed one behind the other. Tail very short or absent. Ear short or very long.

Only one family Leporidae of the order Legomorphora occurs in Bihar.

Family LEPORIDAE

Only one genus of the family Leporidae occurs in Bihar.

Genus ***Lepus*** Linnaeus, 1758

One species of the genus *Lepus* occurs in Bihar.

72. ***Lepus nigricollis ruficaudatus*** Geoffroy

1826. *Lepus ruficaudatus* Geoffroy, *Dict. Class. Hist. Nat.*, 9 : 381 (Bengal).

Common name : Rufous-tailed Hare (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Head and body 40-50 cm in length; grey patch on the nape; upper surface of tail rufous-brown.

Distributton : India : Bihar : Gaya district (Wroughton 1915 : Gaya and Singar), Palamau district (Wroughton 1915 : Daltonganj), Patna district (Kumar 1970), Purnea district (Roy Chaudhury 1963), Rohtas district (Roy Chaudhury 1966); Saharsa district (Roy Chaudhury 1965); Assam; Madhya Pradesh; Meghalaya; Nagaland; Orissa; Rajasthan; Sikkim; Tripura (Agrawal & Bhattacharyya 1977); Uttar Pradesh and West Bengal.

Elsewhere : Nepal and Bangladesh.

Remarks : Fairly common. Two animals of this species was observed by the author in Kashwa, Betla National Park, Palamau district in the evening of 29.xi.1983 and many hares in the night of 26.iv.1987 in Rajgir forest, Nalanda district.

Order RODENTIA

Rodents are characterized by the presence of a pair of chisel-shaped incisors in each jaw and a distinct diastema between incisors and cheek teeth.

Three families of rodents, namely, Sciuridae, Muridae and Hystricidae occur in Bihar.

Key to the families of the order RODENTIA

1. Fur modified into quills or long stiff hairs; cheek teeth 4/4 in number..... HYSTRICIDAE
– Fur not modified into quills; cheek teeth except in genus Ratufa, never 4/4 in number..... 2
2. Infraorbital foramen not or scarcely open for muscle transmission; cheek teeth, except in genus Ratufa 5/4 in number.... SCIURIDAE

   Infraorbital foramen clearly open for muscle transmission; cheek teeth 3/3 in number..... ..... MURIDAE

Family SCIURIDAE

Three genera of the family SCIURIDAE are found in Bihar.

Key to the genera of the family SCIURIDAE

1. Flying membrane present on both sides of body. ..... ***Petaurista***
– Flying membrane absent..... 2
2. Body size large, over 280 mm in head and body length; maxillary teeth 4 in number.... ..... ***Ratufa***
– Body size less than 280 mm in head and body length; maxillary teeth 5 in number..... ..... ***Funambulus***

Genus ***Petaurista*** Link, 1795

One species of this genus occur in Bihar.

73. ***Petaurista petaurista philippensis*** (Elliot)

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

1842. *Petromys oral* Tickell, *Calcutta J. nat. Hist.* **2** : 401, pl. xi (Singhbhum district, Bihar, India).

Common name : Common Gaint flying Squirrel (English).

Material examined by Ellerman (1961) : West Singhbhum district : 1♂, 1♀, Luia, Chaibasa.

Measurements : External : 1♂ : H & B 375.0; Tl 430.0; Hf 70.0; E 40.0; 1♀ (Subad.) : H & B 350.0; Tl 409.0; Hf 70.0; E 42. Cranial : 1 (Subad.) : *on* 66.1; *n* 18.4; *pl* 32.3; *iw* 13.1; *orb* 23.4; *mtr* 14.6.

Diagnosis : Body dark brown above, with greater part of the tail black; underparts whitish grey.

Distribution : India : Bihar : West Singhbhum

district (Wroughton 1915 : Luia); Andhra Pradesh; Gujarat; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Orissa; Tamil Nadu; West Bengal.

Genus ***Funambulus*** Lesson, 1835

Two species of the genus *Funambulus* occur in Bihar.

Key to the species of the genus *Funambulus*

- Dorsal surface of body having 5 buff stripes. ..... *F. Pennanti*
- Dorsal surface of body having 3 buff stripes. ..... *F. palmarum*

74. ***Funambulus palmarum palmarum*** (Linnaeus)

1766. *Sciurus palmarum* Linnaeus. *Syst. Nat.*, 12th ed., **1** : 86 (Madras, Tamil Nadu, India).

1916. *Funambulus bengalensis* Wroughton, *J. Bombay nat. Hist. Soc.* **24** : 648 (Hazaribag, Bihar. India).

Common name : Indian Palm Squirrel (English).

Material examined by me : Hazaribag district : 2♂♂, Gajhundi (11.v.1914, Z.S.I., Cal.) and Lohra (3.v.1914, Z.S.I., Cal.) by Ellerman (1961) : Hazaribag district : 2♂♂, 1♀, Jagodih; 1♀ : Gajhundi.

Measurements : External : 4♂♂, H & B 136.0-143.0 (142.3); Tl 153.0-160.0 (155.3); Hf 35.0-39.0 (36.5); E 16.0-17.0 (16.5). 2♀♀ : H & B 140.0, 141.0; tl 146.0, 158.0; Hf 36.0, 37.0; E 15.0, 16.0. Cranial : 4♂♂ : *on* 37.0-38.0 (38.3); *n* 10.5-11.5 (11.0); *pl* 18.5-19.4 (19.1); *iw* 10.5-10.7 (10.6); *orb* 10.5-11.7 (11.1); *mtr* 7.4-7.9 (7.7). 2♀♀ : *on* 37.0, 37.5; *n* 10.5, 10.5; *pl* 18.5, 18.6; *iw* 10.7, 11,2; *orb* 11.0, 11.4; *mtr* 7.5, 7.6.

Diagnosis : See key to the species.

Distribution : Gaya district (Wroughton 1915 : Singar and Gaya), Giridih district (Wroughton 1915 : Parashnath), Hazaribag district (Wroughton 1915 : Jagodih, Lohra, Gajhundi); Andhra Pradesh; Karnataka; Kerala; Orissa; Tamil Nadu and West Bengal.

Elsewhere : Sri Lanka.

Remarks : This species has not been seen in North Bihar.

75. ***Funambulus pennanti*** Wroughton

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

Common names : Northern Palm Equirrel, Five-striped Squirrel (English).

Material examined : Darbhanga district : 1♂, Baghowni, coll. N. A. Baptista, 5.x.1922, Z.S.I. Cal.; Gaya district : 2♀♀ Bodh Gaya, coll. Y. P. Sinha, 22-23.vii.1978; Giridih district : 1♂, Nimiaghat, coll. C. A. Crump, 24.vi.1914, Z. S. I. Cal.; Hazaribag district : 1♂, 1♀, Hazaribag P. W. D. Dak Bunglow, coll. Y. P. Sinha, 25.vii.1979; Jahanabad district : 1♂, Jahanabad, coll. Bhola, 17.vi.1966; Patna district : 3♂♂, 4♀♀ Rajendra Nagar, Patna, coll. D. P. Sanyal, 14.xi.1968, Maner, coll. Y. P. Sinha, 13.iv.1978, Vikram, coll. L. Ram, 12.viii.1975; Palamau district : 1♂, Kundri, Daltonganj, Krishna swami, vi.1955, Z. S. I. Cal.; Samastipur district : 1♂, Harpur Aloth village, Sarai Ranjan block, coll. Y. P. Sinha, 27.x.1986; Vaishali district : 2♂♂, Gandak Project Dak Bunglow, Hajipur, coll. Y. P. Sinha, 9.xi.1977; G. P. R. S., Pat.

Measurements : External : 11♂♂ : H & B 135.0-150.0 (144.5); Tl 140.0-170.0 (162.5); Hf 33.0-39.0 (36.5); E 14.5-18.0 (17.0). 7♀♀ : H & B 145.0-155.0 (149.0); Tl 150.0-180.0 (166.4); Hf 38.0-39.0 (38.5); E 16.0-18.0 (17.5). Cranial : 4♂♂ : *on* 37.0-39.0 (38.1); *n* 11.1-12.5 (11.9); *pl* 19.0-20.0 (19.7); *iw* 10.5-12.5 (11.4); *orb* 9.8-10.1 (10.0); *mtr* 7.6-7.8 (7.7). 2♀♀ : *on* 35.6, 38.2; *n* 11.5, 12.2; *pl* 18.6, 19.3; *iw* 10.2, 11.0; *orb* 9.7, 10.0; *mtr* 7.1, 8.1.

Diagnosis : See key to the species.

Distribution : India : Bihar : Darbhanga district, Gaya district (Wroughton 1915 : Singar, Gaya), Giridih district (Wroughton 1915 : Nimiaghat), Hazaribag district, Jahanabad district, Palamau district (Wroughton 1915 : Daltonganj), Patna district, Samastipur district, Vaishali district, West Singhbhum district (Wroughton 1915 : Luia);

Andaman Islands; Gujarat; Jammu & Kashmir; Madhya Pradesh; Maharashtra; Meghalaya; Orissa; Punjab; Rajasthan; Sikkim; Uttar Pradesh and West Bengal.

Elsewhere : Iran, Pakistan, Nepal and Bangladesh (Posamentier 1989).

Remarks : The author and other faunistic survey tour parties observed this species in almost all the districts of Bihar in villages as well as cities on the branches and stem of different trees during fruiting and non-fruiting season and also running on the ground in the gardens. It makes it own nest on the branches of tree.

Genus ***Ratufa*** Gray, 1867

One species of the genus *Ratufa*, namely *R. indica* occurs in Bihar.

76. ***Ratufa indica centralis*** Ryley

1913. *Ratufa indica centralis* Ryley, *J. Bombay nat. Hist. Soc.*, **22** : 436 (Bori, Hoshangabad, Madhya Pradesh, India).

Common name : Indian Giant Squirrel or Malabar Squirrel.

Material examined (by me) : West Singhbhum district : 1♂, Luia near Chaibasa, coll. C. A. Crump, 26.vii.1914, Z. S. I. Cal. by Ellerman (1961); West Singhbhum district : 2♂♂, 2♀♀, Sangajata and Luia near Chaibasa.

Measurements : External : 3♂♂ : H & B 345.0-365.0 (356.7); Tl 425.0-450.0 (433.3); Hf 75.0-81.0 (77.3); E 28.0-30.0 (29.3). 2♀♀ : H & B 323.0; 355.0; *tl* 385.0, 420.0; Hf 74.0, 76.0; E 27.0, 28.0. Cranial : 3♂♂ : *on* 74.0-74.3 (74.1); *n* 22.9-25.6 (24.7); *pl* 31.0-31.4 (31.2); *iw* 28.6-29.5 (28.9); *orb* 23.0-23.2 (23.1); *mtr* 14.1-14.7 (14.4). 1♀ : *on* 72.1; n 22.6; *pl* 31.3; *iw* 28.1; *orb* 23.1; *mtr* 14.3.

Diagnosis : The shoulders and upper part of the forelimbs are usually quite sharply contrasted black; the tail is black and the rump is also greater or lesser degree black.

Distribution : India : Bihar : East and West Singhbhum districts (Wroughton 1915 : Sangajata and Luia); Karnataka; Madhya Pradesh; Orissa; Tamil Nadu.

Remarks : Not common; found in deep forest. Author observed this species in Dalma sanctuary in E. Singhbhum distict.

Family HYSTRICIDAE

Only one genus, namely, *Histrix* is found in Bihar.

Genus ***Hystrix*** Linnaeus, 1755

77. ***Hystrix indica indica*** Kerr

1792. *Hystrix critata* var. *indica* Kerr. *Anim. Kingd.* : 213 (India).

Common name : Indian Crested Porcupine (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : A crest of bristles, 15-30 cm long, present on the crown; quills bears several alternating bands of white and blackish brown. Size very large, head and body length 633-744 mm and tail 88-210 mm.

Distribution : India : Bihar : Aurangabad district (personal observation), Bhagalpur district (Roy Chaudhury 1962 : becoming scarce as it is taken by lower casts), Darbhanga district (Dalgliesh 1903), Palamau district (Roy Chaudhury 1961), Patna district (Kumar 1963), Purnea district (O Malley 1911 : Rarely met; Roy Chaudhury 1963 : not seen now); occurs throughout India except in northeastern portion. Syria, Iraq, S. Arabia, Iran, Russian Turkestan, Pakistan, Sri Lanka and China.

Remarks : During a faunistic survey tour, the author has seen quills and burnt crested portions of porcupine near the forest of Hariharganj, Aurangabad district on 16.xii.1979.

Family MURIDAE

Family MURIDAE is characterised by the presence of three pairs of molars in each jaw. The premolar and canine are absent. The molar teeth may be cuspidate, laminate, prismatic or flat crowned in surface pattern.

Out of six subfamilies occur in India, only two namely, Murinae and Gerbillinae are found in Bihar.

Key to the subfamilies of the family MURIDAE

- Cusps on maxillary teeth arranged in three longitudinal rows. ..... MURINAE
- Cusps on maxillary teeth arranged in two longitudinal rows. .....GERBILLINAE

Subfamily : MURINAE

Nine genera of this subfamily occur in Bihar.

Key to the genera of the subfamily MURINAE

1. Hallux clawless and opposable ..... ***Vandeleuria***
- Hallux clawed and not opposable. 2
2. Upper incisors grooved on front surface. ....***Golunda***
- Upper incisors not grooved on front surface. 3
3. Condylobasal length exceeds or equal to occipitonasal length; upper incisors proodont. 4
- Condylobasal length less than occipitonasal length; upper incisors opisthodont or orthodont. 6
4. Occipitonasal lenght not exceeding 33.2 mm. Lower incisor root forms only a week knob on outer side of lower jaw. Molars not tending to become plain laminate. ..... ***Diomys***
- Occipitonasal length is not less than 34.6 mm. Lower incisors root forms prominent knobe on outer side of lower jaw. Molars tending to become plain straight laminals. 5
5. The palatal foramina are not reduced and normally exceed 7 mm in length; M_2 usually retains some traces of the original front lamina. Tail usually more than three-quarters of head and body length..... ***Bandicota***
- The palatal foramina strongly shortened, not reaching 7 mm in length; M_2 lacks traces of the original front lamina. Tail usually less than three-quarters of head and body length. .... ***Nesokia***
6. First upper molar more than half the length of cheektooth row and its antero-internal cusp distorted inwards to reach the level of second lamina; third molar extremely reduced. .... ***Mus***
- First upper molar less than half the length of cheektooth row and its antero-internal cusp not distorted inwards to reach the second lamina; third molar not so reduced..... 7
7. Palate and anterior palatal foramina long, more than one half and one fifth of occipitonasal length respectively. ..... ***Millardia***
- Never combining the characters of long palate and long anterior foramina. 8
8. Palate short, less than one-half of occipitolnasal length. ..... ***Cremnomys***
- Palate long, more than one-half of occipitonasal length. ..... ***Rattus***

Genus ***Vandeleuria*** Gray

One species and two subspecies of this genus occur in Bihar.

78. ***Vandeleuria oleracea oleracea*** (Bennett)

1832. *Mus oleraceus* Bennett, *Proc. zool. Soc. Lond.*, 121 (Duccan, India).

Common name : Indian Long-tailed Tree Mouse (English).

Material examined by Ellerman (1961) : Hazaribag district : 1 ♂, Lohra, Hazaribag.

Measurements : External : H & B 76.0; Tl 123.0; Hf 18.0; E 16.0. Cranial : *on* 21.9; *pl* 10.4; *apf* 3.9; *mtr* 3.3; *iw* 3.0.

Diagnosis : Usually smaller; tail most often less than 150% of head and body length; back

less dark, under part white; occipito-nasal length reaching up to 22 mm.

Distribution : India : Bihar : Hazaribag district (Wroughton 1915 : Lohra); Gujarat; Karnataka; Madhya Pradesh; Maharashtra; Uttar Pradesh.

79. ***Vendeleuria oleracea dumeticola*** (Hodgson)

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

1915. *Vandeleuria oleracea marica* Thomas, *J. Bombay nat. Hist. Soc.*, **24** : 54 (Koira, Chaibasa, 800 ft. Bihar, India).

Common name : Indian Long-tailed Tree Mouse (English).

Material examined by Ellerman (1961) : West Singhbhum district : 3 ♀♀, Koira, Chaibassa; by me : Jahanabad district : 1 ♀ (ad.) and 1 ♀ (y.), Jhunathi, Kurtha block, coll. Y. P. Sinha, 5.ix.1996, G.P.R.S., Pat.

Measurements : External : 4 ♀♀ : H & B 74.0-82.0 (80.0), Tl 120.0-128.0 (124.2); Hf 18.0 (in all); E 14.0-15.0 (14.3). Cranial : 1 ♀ : *on* 20.6; *pl* 9.5; *apf* 3.7; *b* 3.6; *mtr* 3.0; *iw* 3.0.

Diagnosis : Small race with very long tail on average over 150% of head and body length; bright red in colour, occipitonasal length 19.2-22.7 mm; Head and body length 56-85 mm.

Distribution : India : Bihar : Jahanabad district (present material), West Singhbhum district (Thomas 1915 : Koira; Wroughton 1915 : Luia); Arunachal Pradesh; Assam; Manipur; Meghalaya; Nagaland; Orissa; Sikkim; Uttar Pradesh; West Bengal.

Elsewhere : Myanmar (= Burma) and Nepal.

Genus ***Millardia*** Thomas, 1911

One species of the genus *Millardia* occurs in Bihar.

80. ***Millardia meltada meltada*** (Gray)

1837. *Golunda meltada* Gray, *Maz. nat. Hist.*, **1** : 586. (Dharwar, Karnataka, India).

Common name : The soft-ferred Field-Rat or Metad (English).

Material examined by Ellerman (1961) : Giridih district : 1 ♀, Pareshnath; by me : Darbhanga district : 1 ♂, 1 ♀, Baghowni, coll. N. A. Baptista, 3.vii.1922 and 12.viii.1922, Z. S. I., Cal.; Hazaribagh district : 1 ♂, Balutunda village, coll. B. Nath, 18.iv.1948, Z. S. I., Cal.; Samastipur district : 1 ♂, 1 ♀, Hasanpur, Surat, Patori, coll. Y. Chaturvedi, 13.viii.1987, G. P. R. S., Pat.

Measurements : 3 ♂♂ : H & B 107. 0-154. 0 (126.0); Tl 115.0, 127.0 (2 ex.); Hf 22.0-27.0 (25.0); E 18.0-22.0 (21.0); 3 ♀♀ : H & B 106.0-126.0 (117.3); Tl 100.0-132.0 (119.3); Hf 21.0-28.0 (23.7); E 17.0-22.0 (19.07). Cranial : 1 ♂, 1 ♀ : *on* 32.0, 31.0; *pl* 16.5, 16.0; *apf* 7.4, 7.3; *b* 6.0, 5.7; *d* 8.3, 8.5; *mtr* 5.5, 5.0.

Diagnosis : Fur soft; planter pad five in number; mammae 2+2=8; head & body slightly longer or equal to tail; first and fifth toe slightly shorter than the central three; palatal foramina much longer than the rat species; upper incisors ungrooved and orange colour.

Distribution : India : Bihar : Darbhanga district, Giridih district, Hazaribag district, Samastipur district; Kerala; Mdhya Pradesh; Tamil Nadu.

Elsewhere : Sri Lanka.

Remarks : Female collected from Hasanpur was pregnant, carring four foetuses, size : 22-28 mm.

Genus ***Cremnomys*** Wraughton, 1912

One species of the genus *Cremnomys* occurs in Bihar.

81. ***Cremnomys blanfordi*** (Thomas)

1881. *Mus blanfordi* Thomas, *Ann. Mag. nat. Hist.*, **7** : 24. (Madras, Tamil Nadu, India).

Common name : Blanford's Rat (English).

Material examined by Ellerman 1961 : Hazaribag district 3 ♂♂, Jagodih, Lohra; Giridih district : 3 ♀♀, Pareshnath.

Measurements : External : 3 ♂♂ : H & B 167.0-188.0 (177.3); Tl 182.0-219.0 (205.3); Hf 34.0-37.0 (35.3); E 26.0-29.0 (27.0). 3 ♀♀ : H &

B 159.0-173.0 (166.3); Tl 212.0-225.0 (220.0); Hf 34.0-35.0 (34.5); E 27.0-28.0 (27.7). Cranial : 1♂ : *on* 41.9; pl 20.5; apf 8.7; b 8.2; d 10.1; mtr 6.4. 3♀♀ : on 41.8-44.0 (42.7); *pl* 21.0-21.6 (21.3); apf 8.9-9.3 (9.1); b 8.2-8.4 (8.3); d 10.3-11.2 (10.7); mtr 6.2, 6.3 (2ex.).

Diagnosis : Body gray to reddish brown above, white below; terminal half of tail wholly white; tail tends to be slightly tufted terminally.

Distribution : India : Bihar : Giridih district; Hazaribag district; Andhra Pradesh; Goa; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Orissa; Tamil Nadu; West Bengal (Agrawal & Bhattacharia 1987).

Elsewhere : Sri Lanka.

Genus ***Rattus*** Fischer, 1803

Two species of the genus *Rattus* occur in Bihar.

Key to species of the genus *Rattus*.

- Size large, head and body length 135.0-204.0 mm; occipitonasal length 35.4-46.9 mm. .... *Rattus ratus* (*arboreus* and *rufescens*)
- Size small, head and body length 114.0-130.0 mm.; occipitonasal length 31.0-34.5 mm. .... *Rattus cutchicus* (*medius*)

82. ***Rattus rattus arborius*** (Horsfield)

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

Common name : House Rat (English).

Material examined : Aurangabad district : 3♂♂, 1♀, Biratpur, Aurangabad, coll. Y. P. Sinha, 13.xii.1979, G. P. R. S., Pat. Gaya district : 1♂, Singar, coll. C. A. Crump, 21.v.1914. Z. S. I., Cal. Giridih district : 1♂, 4♀♀, Jagodih, Karmatongi and Nimiaghat coll. B. Nath, 12-14.iv.1948 and C. A. Crump, 2.vi.1914, Z. S. I., Cal. Hazaribag district : 4♂♂, 1♀, Gujundi and Lohra, coll. C. A. Crump, 11-16.v.1914 and 28.iv.1914, Z. S. I., Cal. Palamau district. 1♂, Dak Bunglow, Chattarpur, Coll. B. Nath, 2.ii.1971; 1♂, 3♀♀ : Naua Toli, Daltonganj, coll. Y. P. Sinha, 19.xii.1979; Patna district : 2♂♂, 1♀, Kadam Kaun, Patna, coll. S. N. Ram, 3.xii.1968; Sahibganj district : 1♂, (y.), Borio, coll. Y. P. Sinha, 7.iv.1979; East Singbhum dist. : 1♂, Parsudih, Jamsedpur, coll. R. K. Varshney, 8.ii.1973; G. P. R. S., Pat.

Measurements : External : 14♂♂ : H & B 135.0-160.0 (145.0); Tl. 175.0-220.0 (191.0); Hf 30.0-31.0 (30.6); E 20.0-23.0 (22.2). 10♀♀ : H & B 135.0-175.0 (155.0); Tl 170.0-250.0 (206.3); Hf 29.0-32.0 (30.0); E 21.0-25.0 (22.8). Cranial : 3♂♂ : *on* 39.3-42.0 (40.3); *n* 13.0-15.0 (14.0); *pl* 20.0-23.1 (22.5); *apf* 7.8-8.0 (7.9); *d* 10.1-11.4 (10.5); *b* 7.6-7.8 (7.7); *mtr* 7 (inall) 1♀ : *on* 38.0; *n* 14.0; *pl*. 21.5; *apf* 21.5; *d* 11.0; *b* 7.0; *mtr* 7.0.

Diagnosis : The underpart of the specimens white or dirty white; length of occipitonasal length 38.0-42.0 mm.; bullae exceeded 7.0 mm.; mammae 10.

Distribution : India : Bihar : Aurangabad district, East Singbhum district; Gaya district, Giridih district, Hazaribagh district, Palamau district, Patna district, Orissa; Utter Pradesh; West Benagl.

Elsewhere : Nepal.

Remarks : Very common in South Bihar and generally found from hut near crop field and a serious pest of crop.

83. ***Rattus rattus rufescens*** (Gray)

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

Common name : House Rat (English).

Material examined : Araria district : 1♂, Raniganj, Raniganj block, coll. Y. P. Sinha, 13.xii.1995; Hazaribag district : 1♂, 1♀, Hazaribag National Park, coll. R. K. Varhsney, no date; Patna district : 2♂♂, 1♀(y), Kadam Kuan, Patna, coll. S. N. Ram, 20.i.1969; 1♂, 1♀, Rajendra Nagar, Patna, coll. Y. Chaturvedi, 27.iii.1979; 4♂♂, 1♀, Kidwai Puri, Patna, coll. R. N. Verma, 7-8.ix.1987; G. P. R. S., Pat.

Mesurements : External : 9♂♂ : H & B 120.0-180.0 (140.7); Tl 160.0-210.0 (175.7); Hf 26.0-32.0 (28.1); E 20.0-23.0 (21.7). 4♀♀ : H & B

145.0-160.0 (157.5); T1 190.0-215.0 (206.3); Hf 31.0-32.0 (31.3); E 21.0-26.0 (23.3). Cranial : 2♂♂ : *on* 36.0, 39.0; *n* 13.0, 14.7; *pl* 19.2, 22.2; *apf* 7.2,7.5; *d* 9.0, 9.6; *b* 6.0, 6.5; *mtr* 5.6, 6.4. 4♀♀ : *on* 37.6-41.0 (39.2); *n* 13.5-14.0 (13.8); *pl* 20.5-23.0 (21.8); *apf* 6.0-7.7 (6.8); *d* 9.0-9.8 (9.4); *b* 6.0-6.7 (6.3); *mtr* 6.0-6.5 (6.3).

Diagnosis : Dorsal colour more rufous in this race; underparts dull as opposed white in *arboreus*. Occipitonasal length 36.0-41.0; bullae not exceeded 7.0 mm.; Mammae 10-12.

Distribution : India : Bihar : Araria district, Darbhanga district (Dalgliesh 1903), Hazaribag district, Patna district, Singbhum district (Sclater 1891); now found in all major cities of India.

Elsewhere : Pakistan, Thailand and Malayasia.

Remarks : A common commensal form; found in godowns, shops and residential complexes.

84. ***Rattus cutehicus medius*** (Thomas)

1916. *Cremnomy medius* Thomas, *J. Bombay nat. Hist. Soc.*, **24** : 240 (Kudia, Junagarh, Gujarat, India).

1916. *Cremnomys medius caenosus* Thomas, *J. Bombay nat. Hist. Soc.*, **24** : 241 (Singar, Gaya, Bihar, India).

Common name : The Cutch Rock-Rat (English).

Material examined by Ellerman (1961) : Gaya district : 2♂♂, 2♀♀, Singar, Gaya; Hazaribag district : 2♂♂, Gajhundi.

Measurements : External : 4♂♂ : H & B 118.0-129.0 (123.3); T1 148.0-155.0 (153.0); Hf 25.0-28.0 (26.5); E 19.0-21.0 (20.3). 2♀♀ ; H & B 125.0, 126.0; T1 146.0, 161.0; Hf 25.0, 27.0; E 20 (1 ex.) Cranial : 4♂♂ : on 33.4-34.4 (33.7); pl 16.1-16.7 (16.4); apf 7.4-7.9 (7.7); d 7.7-8.3 (8.0); b 4.9-5.4 (5.0); mtr 4.9-5.6 (5.3), 1♀ : on 33.7; pl 16.0; apf 8.0; d 7.9; b 5.5; mtr 5.3.

Diagnosis : Occipitonasal length over 33 mm.; Head and body not reaching 130 mm.; tail on average more than 120% of head and body and less than 130%; hind foot more than 24 mm.; belly dark and generally with no buffy patch on the nape; Mammae 6; weight 2 to 3 oz.

Distribution : India : Bihar : Gaya district, Hazaribag district; Gujarat.

Remarks : Not found in North Bihar.

Genus ***Mus*** Linnaeus, 1758

Four species of the genus *Mus* are recognised in Bihar

Key to the species of the genus *Mus*

1. Tail unicolor and longer than head and body. ..... *Mus musculus* (*castaneus*)

– Tail bi-color (dark above and pale below) and equal to or shorter than head and body.... 2

2. Body fur spiny. 3

– Body fur soft. 4

3. Larger in size, occipitonasal length 23.9 to 27.4 mm. ..... *Mus platythrix*

4. Smaller in size, occipitonasal length 17.9 to 20.0. 5

5. Ventral surface of body white in colour. ..... *Mus booduga* (*booduga*)

– Ventral surface of body grey in colour. ..... *Mus dunni*

85. ***Mus musculus casteneus*** Waterhouse

1843. *Mus casteneus* Waterhouse, *Ann. Mag. nat. Hist.*, 12 : 134 (philippine).

Common name : House mouse (English).

Material examined by me : Darbhanga district : 1♂, 1♀, Buhnar, coll. N. A. Baptista, 17 & 20.viii.1922, Z. S. I., Cal. Gaya district : 1♂, Gaya, coll. L. Ram, 22.xi.1975, G. P. R. S., Pat.; Singar, coll. C. A, Crump, 22.v.1914, Z. S. I., Cal. Giridih district : 2♂♂, 5♀♀, Madhuban and Belutunda, coll. B. Nath, 14-22.iv.1948, Z. S. I., Cal.; Hazaribag district : 1♀, Gajhundi, coll. C. A. Crump, 22.v.1914, Z. S. I., Cal.; Naland district : 1♂, Rajgir, coll. P. D. Gupta, 29.vii.1977; Nawada district : 2♂♂, 1♀, Maya Bigha, coll. Y. P. Sinha, 7.ix.1996; Palamau district : 2♂♂, 1♀,

Naua Toli, Daltonganj, Coll. Y. P. Sinha, 19xii.1979; G. P. R. S., Pat.; Daltonganj, coll. C. A. Crump, 30.iii.1914, Z. S. I., Cal. Patna district : 1♂(y) , 1♀, Kidwaipur, Patna, coll. R. N. Verma, 20.viii.1987; 1♂, 1♀, Chitragupta Nagar, Patna, coll. Y. P. Sinha, 18.viii.1987; G. P. R. S., Pat., West Singbhum district : 1♂, Luia near Chaibassa coll. C. A. Crump, 27.vii.1914, Z. S. I., Cal. By Ellerman (1961) : Bokaro district : 2♂♂, Nimiaghat; Hazaribag district : 1♂, Gajhundi; Palamau district : 1♂, 1♀, Daltonganj; W. Singhbhum district : 3♀♀, Chaibassa.

Measurements : External : 14♂♂ : H & B 66.0-76.0 (69.9); T1 73.0-92.0 (79.8); Hf 15.0-17.0 (16.2); E 11.0-13.0 (11.8). 16♀♀ : H & B 71.0-79.0 (75.3); T1 80.0-92.0 (84.0); Hf 16.0-17.0 (16.67); E 11.0-14.0 (11.9). Cranial : 5♂♂ : *on* 18.8-21.9 (20.8); *pl* 9.6-11.2 (10.7); *apf* 4.7-5.2 (5.0); *d* 4.7-5.0 (4.9); *mtr* 3.2-3.5 (3.3). 6♀♀ : *on* 20.0-22.5 (21.3); *pl* 10.2-11.5 (10.9); *apf* 4.6-5.5 (5.0); *d* 4.0-5.1 (4.7); *mtr* 3.0-3.3 (3.1).

Diagnosis : Underpart dark brown or dull; tail not bicolored, almost black, slightly paler below, tip all black; feet sepia, drab or cinamon and phalange white. Ear brown or dark brown.

Distribution : India : Bihar : Bokaro district, Darbhanga district, Gaya district, Giridih district, Hazaribag district, Nalanda district, Nawada district (present materials), Palamau district, Patna district, West Singhbhum district; Andhra Pradesh; Assam; Delhi; Gujarat; Jammu & Kashmir (Chakraborty 1983); Karnataka; Kerala; Meghalaya; Orissa (Das *et. al.* in press); West Bengal (Wroughton 1995).

Elsewhere : Africa, Sri Lanka, Myanmar (Burma), China, Thailand, Malayasia, Philippines and New Guinea.

Remarks : Common in houses.

86. *Mus booduga booduga* (Gray)

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

Common name : Little Indian Field Mouse (English).

Material examined : Bokaro district : 1♂, Nimiaghat, coll. C. A. Crump, 3.vi.1914, Z. S. I., Cal. Giridih district : 1♂, Madhuban near Paresh Nath Hill, Coll. B. Nath, 22.iv.1948, Z. S. I., Cal. Hazaribag district : 1♂, Jagodih village, coll. B. Nath, 18.iv.1948, Z. S. I., Cal.; Barkagaon, coll. C. A. Crump, 10.iv1914, Z. S. I., Cal. West Singhbhum district : 2♂♂, 2♀♀, Luia, Chaibassa, coll. C. A. Crump, 23.viii.1914. Z. S. I., Cal.

Measurements : External : 5♂♂ : H & B 55.0-64.0 (59.4); T1 56.0-63.0(58.8); Hf 13.0-14.0 (13.4); E 9.0-11.0 (10.4). Cranial : Nil.

Diagnosis : Belly mainly white; tail generally smaller or equal to the head and body length. Body fur soft.

Distribution : India : Bihar : Bokaro district, Darbhanga district (Dalgliesh 1903), Giridih district, Hazaribag district, West Singhbhum district; Goa (Agrawal 1973); Gujarat; Himachal Pradesh; Jammu & Kashmir (Lal 1976); Karnataka; Kerala; Madhya Pradesh; Maharastra; Meghalya; Orissa; Tripura (Agrawal & Bhattacharyya 1977); Tamil Nadu; West Bengal.

Elsewhere : Bangladesh (Posamentier 1989).

Remarks : Very common in the paddy field during harvesting.

87. *Mus dunni* (Wroughton)

1912. *Leggada dunni* Wrougton, *J. Bombay nat. Hist. Soc.*, **21** : 339 (Ambala, C 274 m, Haryana, India).

Common name : None.

Material examined by Ellerman (1961) : Bokaro district : 1♂, 1♀, Nimiaghat; Palamau district : 1♀, Daltonganj; Hazaribag district : 1♀, Barkagaon; West Singhbhum district : 5♀♀, Kuria near chaibassa.

Measurements : External : 8♀♀ : H & B 55.0-80.0 (63.6); T1 55.0-67.0 (59.8); Hf 13.0-15.0 (13..3); E 10.0-13.0 (10.4). Cranial : 2♂♂ : *on* 17.4, 18.5; *pl* 8.7, 9.9; *apf* 4.0, 4.0; *d* 4.1, 4.6; *mtr* 3.0, 3.1; 1♀: *on* 18.0; *pl* 9.3; *apf* 3.7; *d* 4.6; *mtr* 2.8.

Diagnosis : Belly mainly grey; tail equal or

shorter than head and body. Occupatonasal length 17.4-18.5 mm.

Distribution : Bihar : Bokaro district, Hazaribag district, Palamau district, West Singhbhum district; Gujarat; Karnataka; Maharashtra; Orissa; Uttar Pradesh; West Bengal (Agrawal & Bhattacharia 1987).

Remarks : Recently not collected from Bihar.

88. ***Mus platythrix*** Bennett

1832. *Mus platythrix* Bennett, *Proc. zool. Soc. Lond.* : 121 (Dukhuro = Deccan, India).

Common name : Brown Spiny Mouse (English).

Material examined : Giridih district : 1♂, Paresh Nath, coll. C. A. Crump, 11.vi.1914, Z.S.I., Cal.; 1♀, from Inspection Bunglow at the top of Paresnath Hill, B. Nath, 14.iv.1948. By Ellerman (1961) : Hazaribag district : 1♂, 1♀, Hazaribag; Gaya district : 1♀, Singar; Giridih district : 1♀, Paresnath.

Measurements : External : 2♂♂ : H & B 78.0, 86.0; T1 65.0, 72.0; Hf 16.0, 16.0, E 13.0, 16.0. 2♀♀ : H & B 89.0, 91.0; T1 68.0, 74.0; Hf 16.5, 16.0; E 15.0, 16.0. Cranial : 1♂, 1♀, *on* 24.5, 25.1; *pl* 12.8, 12.7; *apf* 5.5, 5.2; d 6.1, 6.3; *mtr* 4.3, 4.1.

Diagnosis : Medium sized mice : head and body length 78.0-91.0 mm.; tail short 65.0-74.0, bicolor, dark above white below; fur spiny; dorsal colour brown or pale brown, ventral normally white; feet usually whitish; mammae 10 or 12.

Distribution : India : Bihar : Gaya district, Giridih district, Hazaribag district; Andhra Pradesh; Gujarat; Himachal Pradesh; Karnataka; Kerala; Maharashtra; Madhya Pradesh; Punjab; Rajasthan; Tamil Nadu; West Bengal.

Elsewhere : Pakistan, Nepal, Mayanmar (= Burma).

Remarks : Found in forested area.

Genus ***Diomys*** Thomas

89. ***Diomys crumpi*** Thomas

1837. *Diomys crumpi* Thomas, *J. Bombay nat. Hist. Soc.*, 25 : 204 (Paresnath, Giridih district, Bihar, India).

Common name : Crump's Mouse (English).

Material examined : Nil.

Measurements : Nil.

Diagnosis : Fur thick and soft. Tail (110.0-135.0 mm.) usually a little longer than head and body (100.0-135.0 mm.); supra occipital ridge prominent; foot with five toes, all clawed, the hallux and the fifth toe roughly equal in length, much shorter than the central three; number of planter pad 6 in hind foot. Belly dirty white.

Distribution : India : Bihar : Giridih district; Manipur.

Remarks : Not common in Bihar.

Genus ***Golunda*** Gray, 1837

Genus *Golunda* is represented by only one species. *Golunda ellioti*. The nominate subspecies occurs in Bihar.

90. ***Golunda ellioti ellioti*** Gray

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

Common name : Indian Bush rat (English).

Material examined by Ellerman (1961) : Giridih district : 1♂, Parashnath.

Measurements : External : 1♂ : H & B 115.0; T1 108.0; Hf 24.0; E 18.0; Cranial : 1♂ : *on* 31.4; *pl* 15.8; *apf* 5.7; *b* 5.2; *mtr* 6.3.

Diagnosis : Upper incisors broad and prominently grooved; tooth row long, sometime as much as one fifth of the occipitionasal length; tail usually shorter than head and body; colour above yellowish brown speckled with black, underpart usually drab grey.

Distribution : India : Bihar : Giridih district; Andhra Pradesh; Assam; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Orissa; Punjab; Tamil Nadu; Uttar Pradesh; West Bengal.

Elsewhere : Afganistan, Pakistan, Sri Lanka and Nepal.

Remarks : Not very common in Bihar.

Genus ***Bandicota*** Gray, 1873

Two species of the genus *Bandicota* occur in Bihar.

Key to the species of the genus *Bandicota*

- Size large, head and body length more than 220 mm.; nasal more than one third of occipitonasal length. .....*B. indica (indica)*
- Size small, head and body length less than 220 mm.; nasal less than one third of occipitonasal length. .... *B. bengalensis (bengalensis)*

91. ***Bandicota bengalensis bengalensis*** (Gray)

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

Common name : Lesser Bandicoot-Rat (English).

Material examined : Bokaro district : 3♂♂, 1♀, Nimiaghat, coll. C. A. Crump, 2-26.vi.1914, Z.S.I., Cal.; Darbhanga district : 2♂♂, 1♀, Bahgownii, coll. N. A. Baptista, 3-29.viii.1922, Z.S.I., Cal.; Giridih dist. : 3♀♀, Balutunda village, coll. B. Nath, 18.iv.1948 & 17.xi.1948, Z.S.I., Cal. Hazaribag district : 1♂, Hazaribag lake, coll. R. K. Varshney, 28.ii.1970; Palamau district : 1♂, Daltonganj, coll. Y. P. Sinha, 18.xii.1979; Patna district : 1♂, Kadam kuan, Patna, coll. S. N. Ram, 20.i.1969; 1♂, 2♀♀, Chitrogupta Nagar and Rajendra Nagar, Patna, coll. Y. P. Sinha, 6 & 9.ix.1987 and 5.xi.1980; G. P. R. S., Pat. West Singhbhum district : 1♀, Luia, Chaibassa, coll. C. A. Crump, 24.vii.1914, Z. S. I., Cal.

Measurements : External : 9♂♂ : H & B 132.0-195.0 (163.8); Tl 127.0-190.0 (141.9); Hf 31.0-39.0 (37.2); E 21.0-23.0 (21.9). 8♀♀ : H & B 140.0-190.0 (163.2); Tl 110.0-180.0 (144.1); Hf 26.5-37.0 (33.0); E 17.0-23.0 (20.6). Cranial : 3♂♂ : *on* 37.0-45.0 (41.0); *n* 12.0--15.0 (14.0); *pl* 22.0-27.4 (24..9); *apf* 8.0-9.0 (8.4); *b* 8.0-9.6 (8.9); *mtr* 7.2-8.0 (7.7). *on* 33.0-41.0 (37.0); *n* 12.0-14.0 (13.0); *pl* 20.0-24.6 (22.3); *apf* 6.9-8.5 (7.8); *b* 7.0-8.5 (7.8); *mtr* 7.3-7.7 (7.5).

Diagnosis : Smaller than *Bandicota indica*; fur usually short and harsh; tail short; hand with four fingers, all clawed, foot with five toes, all clawed; Mammae vary from 12 to 18. Colour dark brown above, feet usually dark; tail wholly dark normally. Nasal shorter, palate longer and bullae larger.

Distribution : India : Bihar : Bokaro district, Darbhanga district, Giridih district, Hazaribag district, Palmau district, Patna district, Purnea district (Scalater 1891). West Singhbhum district; throughout India.

Elsewhere : Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh and Myanmar (= Burma).

Remarks : Common in Godowns, shops and near residential houses.

92. ***Bandicota indica indica*** (Bechstein)

1836. *Mus indicus* Bechestein, *Ueber Vierf. Thiere*, 2.497 (Pondicharry., India).

Common name : Large Bandicoot-Rat (English).

Material examined by Ellerman (1961) : Hazaribag district : 2♂♂, 1♀, (Skull only), Bahri, Gajhundi and Hazaribag.

Measurements : External : 2♂♂ : H & B 272.0, 288.0; Tl 266.0, 275.0; Hf 57.5, 58.0; E 33.0, 32.0. Cranial : 1♂ : *on* 62.9; *pl* 37.2; *apf* 10.6; *n* 24.8; *b* 10.3; *mtr* 10.5. 1♀ : *on* 59.9; *pl* 35.5; *apf* 10.7; *n* 23.5; *b* 9.8; *mtr* 9.8.

Diagnosis : Larger than *B. bengalensis*; nasal longer (length 20.9-27.7 mm.) than *B. i. nemorivaga* (length 17.1-20.5 mm.).

Distributional remarks : Agrawal *et al* (1992) mention, Bihar as a distribution range of *Bandicota nemorivaga* but the measurements mentioned by Ellerman (1961), show nasal length of above specimens from Hazaribag district (23.5 and 24.8 mm.), much more than *B. i. nemorivaga* and treated them as nominate subspecies (*Bandicota indica indica Bachstein*) with which I agree. Distribution other than Bihar : India : Delhi, Gujarat, Karnataka, Kerala, Madhya

Pradesh, Maharashtra, Tamil Nadu, Orissa, Rajasthan, Uttar Pradesh.

Elsewhere : Sri Lanka.

Genus ***Nesokia*** Gray, 1872

Genus *Nesokia* is represented by one species, namely, *Nesokia indica.*

93. ***Nesokia indica indica*** (Gray)

1832. *Arvicola indica* Gray, *Illus. Indian Zool.* **1** : pl. 11 (India).

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

Material examined : Vaishali district : 1♂, 1♀ Brahabatta, *ca.* 12 km. S. W. of Mahuwa, coll. Y. P. Sinha, 28.v.1979; Patna district : 1♀, Chitragupta Nagar, Patna, coll. Y. P. Sinha, 10.i.1984.

Measurments : External : 1♂ : H & B 161.0; Tl 98.0; Hf. 30.0; E. 20.0. 2♀♀ : H & B 140.0, 145.0; Tl. 85.0, 108.0; Hf 29.0, 30.2; E. 18.0, 20.0. Cranial : 1♂ : *on* 37.2; *pl* 22.2; *apf* 5.0; *n* 13.0; *d* 12.2; *b* 8.2; *mtr* 7.8. 2♀♀ : *on* 35.0, 38.0; *pl* 21.5, 21.8; *apf* 4.5, 5.1; *n* 10.5, 11.8; *d* 11.0, 12.0; *b* 8.2, 8.7; *mtr* 6.8, 8.0.

Diagnosis : Dorsal surface dull brown, under surface lighter brown; tail 70% of head and body or less; palatal foramina short, less than 14% of occipitonasal length; planter pad six in number; Mammae 6 pairs.

Distribution : India : Bihar : Vaishali district (Sinha 1881), Patna district (present material); Delhi; Haryana; Punjab; Rajasthan; Uttar Pradesh; West Bengal.

Elsewhere : Iran, Afganistan, Pakistan and Bangladesh (Posamentier 1989).

Remarks : Obtained from crop field. It is a serious pests of crops in Bihar.

Subfamily GERBILLINAE

Out of three genera found in India, only one *Tatera* Lataste, 1882 occurs in Bihar. It is represented by only one species *Tatera indica.*

94. ***Tatera indica indica*** (Hardwicke)

1807. *Dipus indicus* Hardwicke, *Trans. Linn. Soc. Lond.*, **2** : 144, pl. 26 (between Varanasi and Hardwar, Utter Pradesh, India).

Common name : Indian Antelope-Rat (English).

Material examined by Ellerman (1961) : Palamau district : 1♂, 1♀, Daltonganj.

Mesurements : External : 1♂, 1♀ : H & B 162.0, 168.0; Tl 189.0, 198.0; Hf 39.0, 38.0; E 25.0, 25.0. Cranial : 1♂, 1♀ : *on* 43.6, 46.4; *pl* 22.5, 24.2; *apf* 8.5, 9.1; *n* 19.0, 19.9; *b* 10.5, 11.4; *mtr* 6.1, 6.6.

Diagnosis : Colour of body above ranges from brown to sandy brown, under surface white; tail dark above and below, paler on the sides and tufted.

Distribution : India : Bihar : Hazaribag district (Wroughton 1915), Palamau district (Wroughton 1915); Gujarat; Jammu & Kashmir; Karnataka; Madhya Pradesh; Maharashtra; Orissa; Punjab; Rajasthan; Uttar Pradesh; West Bengal.

Elsewhere : Iran, Afganistan, Pakistan and Nepal.

Remarks : Rare in Bihar.

Order CETACEA

Only one genus of the family Platanistidae *viz.* PLATANISTIDAE Wagler, 1830 is represented of which one species *platanista gangetica* (Roxburgh) occurs in the Ganga river, within Bihar.

95. ***Platanista gangetica*** (Roxburgh)

1801. *Delphinus gangeticus* Roxburgh, *Asiat. Res. Trans. Soc.*, 7 : 171 (Hugli river, near Calcutta, West Bengal, India).

Common name: Gangetic Dolphin (English).

Material examined : Patna district : 1 (subad.) and 1♂, (Complete skeleton), Ganga river, Kurji Ghat and Gandhi Ghat, Patna, donated by Fisherman, 3.vi.1971 and 30vi.1971 respectively, present in GPRS. ZSI., Patna.

Measurements : (Some of measurements taken from Nath 1974) : 1♂ : Body size 8 ft (= 244 cm.); length of pectoral fin 31.75 cm.; expanse of tail 48.06 cm.; length of snout 79.0 cm. (taken by me from photograph). The length of snout given by Nath 1974 has been wrongly printed as 17.78 cm.

Diagnosis : The body is fusiform measuring 240 to 244 cm. but sometimes a little longer; females larger than males. The head being prolonged into a compressed beak or rostrum. The numbers of teeth varies from 27 to 32 each side of each jaw, there being slightly higher count in the lower than the upper jaw (Ali 1992). Eyes are very small. The pectoral flippers are more or less triangular in shape with a rudimentary dorsal fin and horizontally placed tail fluke.

Distribution : India : Bihar : In Ganga river from Buxar district to Rajmahal Sahibganj district; Dalgliesh 1903 reported it from Keray river in Darbhanga district. Occurs in Ganga-Brahmaputra -Meghna river Systems in India, Bangladesh and Nepal, from tidal zone to the foot of the Himalayas. In recent years it has been reported from the river Narayani, a tributary of Gandak in Nepal (Uprety *et al.* 1982), Brahmaputra and Meghna in Bangladesh (Kasuya *et al.* 1972) and the river Ganga from Varanasi to Calcutta (Gupta 1986).

Remarks : It is belived that the dolphin is much less numerous now than in former days (Ali 1992).

SUMMARY

1. A list of 95 species and subspecies based on collection as well as from literature is given from Bihar with districtwise distribution.
2. The Order Chiroptera with 29 species and subspecies from the biggest group in the mammalian fauna of Bihar. The next is Rodentia containing 22 species and subspecies.
3. Distribution of 13 species and subspecies of bats extended in Bihar after Sinha (1986). Personal observations in the field were made by the author on two species and subspecies of Primates, seven species and subspecies of carnivora, one species and subspecies of proboscidea, seven species and subspecies of Artiodactyla, one species and subspecies of Lagomorpha, seven species and subspecies of Rodentia and one species of cetacea.

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INTRODUCTION

Biogeographically the states of Bihar and Jharkhand fall under the Indian Sub-region of the Oriental Region under the Megagean Realm. The states embrace two Bio-geographical provinces namely, the Gangetic Plains and the Deccan Plateau. But there are three distinct sections when avifaunal sections are concerned. They are : 1 Sub-Himalayan Section, 2. Gangetic Plain Section and 3. Chhotanagpur Plateau Section. The Sub-Himalayan Section merges with the Gangetic plains in its southern boundary while merging with the Himalayan Province along its northern boundary. The Chhotanagpur Plateau Section lies in the southeastern part of the Gangetic Plains. In winters the migratory species add to the manyfold to the resident birds specially in the plain section when birds from the Himalayas as well as from Eurasian countries arrive in huge variety and numbers who leave during on-set of summer. The plateau section also enjoys the arrival of some hillbirds during cold months. During monsoon when the plains are flooded and large and extensive water bodies appear, the breeding birds congregate in large numbers in suitable nesting and foraging grounds and in dry seasons when fields are full of crops the crop raiding species congregate in large flocks. A total of 465 species and sub-species are known to occur in Bihar and Jharkhand, of which, 317 are resident and 148 are migratory. A total of 5 species and sub-species of them are included in the Schedule I of the Indian Wild Life (Protection) Act, 1972 and one species, namely, the Pinkheaded Duck is believed to be extinct.

HISTORY OF ORNITHOLOGICAL ACCOUNT OF BIHAR AND JHARKHAND

The history of ornithological account of both Bihar and Jharkhand is a very old one. All sorts of ornithological activities were actually stated by a good number British personnel who were posted in this region in different times. The pioneer was Colonel Tickell, Assistant to the Governor-General's agent on the South-Western Frontier of Bengal, popularly called as Chotanagpur. Colonel Tickels was in Singhbhum for seven years and made a huge collection from Chaibassa and Borabhum and Dholbhum area. Colonel Tickell described as many as 14 new forms of birds making type locality as. 66 in the jungle of Borabhum and Dholbhum (J. A. S. B., Vol. II, 1832, P. 569)"

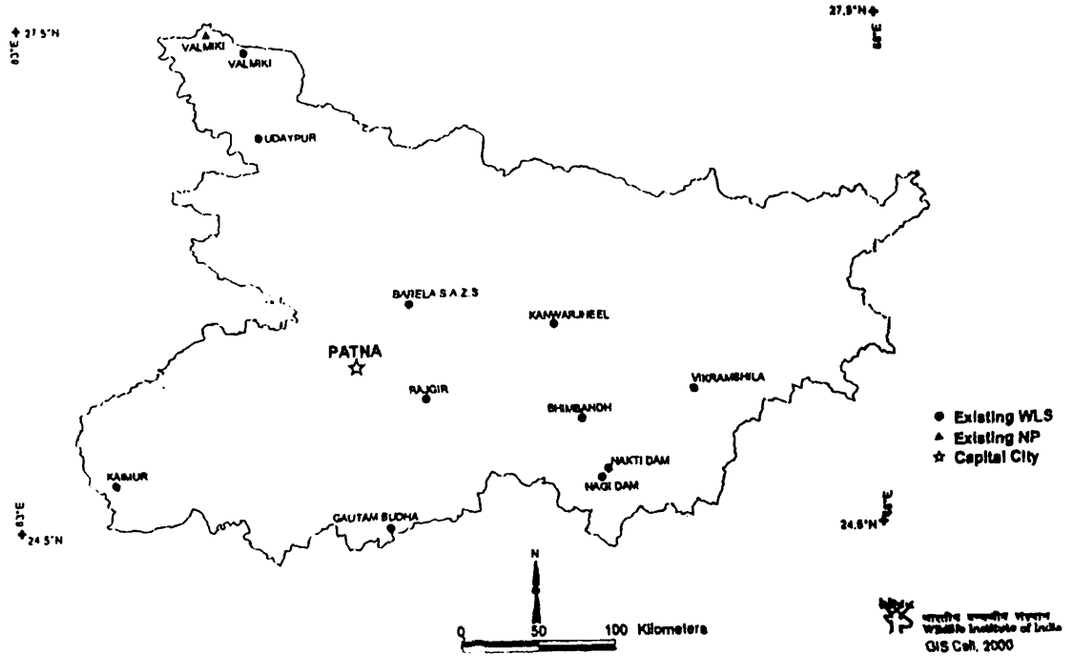
Mr. E. Blyth (1842) worked on a collection of birds made by Tickell from Chaibassa (J. A. S. B., 1842 P. 456).

Capt. Beavan (1865) in-charge of the Revenue Survey of Manbhum for two years, collected birds from this area and subsequently published an account of them in Ibis. Capt. Beavan who was professionally engaged with the second Bengal Division of the Revenue Survey, collected bird specimens in Manbhum dist. during cold weather in 1864-65.

Beavan described the area as a tract of country of some 5,000 to 6,000 square miles in extent, forming a portion of the province of Chotanagpore, a elevated plateau gradually rising from Midnapore and Bankura of West Bengal, uptill it reaches its greatest culmination in the offshoots of the great Vindhyan range near Hazaribagh. A large portion of it, according to Beavan, was covered with heavy jungle.

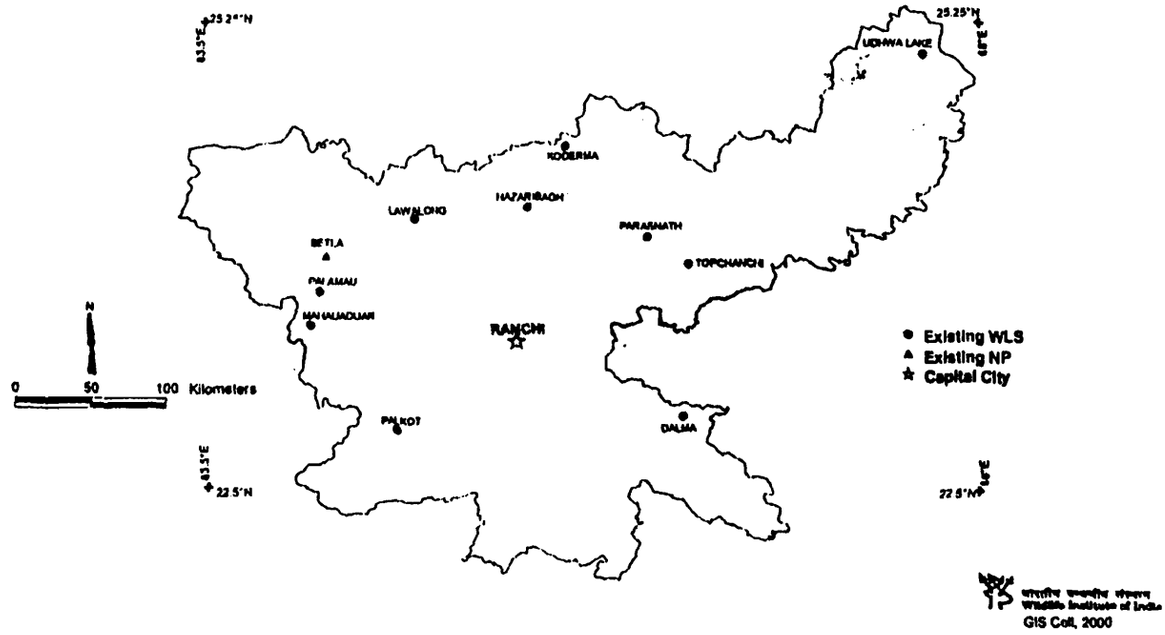
Capt. Beavan collected as many as 121 species of birds from Manbhum dist. Apart from common birds which are still easily found in this area, following are a few examples of birds which are, in turn, pointer of the quality of avifauna in association with good flora of this region as well.

WILDLIFE PROTECTED AREAS LOCATION IN BIHAR STATE



State boundaries have been Taken from Digital
Administrative Boundary database of Survey of India (SOI).
However, they require further revalidation and authentication from SOI

WILDLIFE PROTECTED AREAS LOCATION IN JHARKHAND STATE



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The systematic list of birds from the states of Bihar and Jharkhand, India. The said list is prepared on the collection made by Ball (1874) and Inglish (1901-4; 1909) from both Bihar and Jharkhand. The list further shows the abundance of birds found in those days in undivided state of Bihar. Altogether 456 species and sub-species are known to occur in Bihar and Jharkhand of which 341 species and sub-species are listed below and rest 124 species and sub-species are incorporated in the "Ornithological Account" and are enclosed in the square bracket [ ]

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
1.	*Pelecanus onocrotalus* Linnaeus White or Rosy Pelecan	20	–	–	–	+	–	–	–	–
2.	*Pelecanus philippensis philippensis* Gmelin Spottedbilled or Grey Pelecan	21	–	–	+	+	+	–	+	–
3.	*Phalacrocorax carbo sinensis* (Shaw) Large Cormorant	26	+	–	–	+	+	–	–	–
4.	*Phalacrocorax fuscicollis* Stephens Indian Shag	27	+	–	–	+	–	–	–	–
5.	*Phalacrocorax pygmaeus* (Pallas) Pygmy Cormorant	28a	–	–	+	+	–	–	–	–
6.	*Anhinga rufa melanogaster* Pennant Darter or Snake-bird	29	–	+	+	+	+	–	+	–
7.	*Ardea cinerea rectirostris* Gould Eastern Grey Heron	36	+	–	–	–	+	–	–	–
8.	*Ardea purpurea manilensis* Meyen Eastern Purple Heron	37	+	+	–	+	–	–	+	–
9.	*Ardeola grayii grayii* (Sykes) Paddybird on Indian Pond Heron	42	–	+		+	–	–	–	–
10.	*Bubulcus ibis coromandus* (Boddaert) Cattle Egret	44	+	+	+	+	–	–		–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
11.	*Egretta intermedia intermedia* (Wagler) Mediar Egret	47. 48	–	+	+	+		–	–	–
12.	*Egretta garzetta garzetta* (Linnaeus) Little Egret	49	–	+	–	+	–	–	–	
13.	*Ixobrychus cinnamomeus* (Gmelin) Chestnut Bittern	56	–	–	–	–	–	–	–	–
14.	*Mycteria leucocephala* (Pennant) Painted Stork	60	–	–	–	+	–	–	–	–
15.	*Anastomus oscitans* (Boddaert) Openbil Stork	61	+	+	+	+	+	–	–	–
16.	*Ciconia ciconia ciconia* (Linnaeus) White Stork	63	–	+	–	+	+	–	–	–
17.	*Ciconia nigra* (Linnaeus) Black Stork	65	–	–	–	+	+	–	–	–
18.	*Leptoptilos javanicus* (Horsfield) Lesser or Haircrested Adjutant	68	–	–	–	+	+	–	–	–
19.	*Threskiornis aethiopica melanocephala* (Latham) White Ibis	69	–	+	–	–	+	–	–	–
20.	*Pseudibis papillosa papillosa* (Temminck) Indian Black Ibis	70	+	+	+	+	–	–	–	–
21.	*Plegadis falcinellus falcinellus* (Linnaeus) Glossy Ibis	71	+	+	–	–	–	–	–	–
22.	*Platalea leucorodia major* Temminck & Schlegel Spoonbill	72	–	–	–	–	–	–	–	–
23.	*Anser anser rubrirostris* Swinhoe Eastern Greylag Goose	81	–	+	–	–	–	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
24.	*Anser indicus* (Lathem) Barheaded Goose	82	–	+	–	–	–	–	–	–
25.	*Dendrocygna javanica* (Horsfield) Lesser Whistling Teal	88	+	+	–	+	+	–	–	–
26.	*Tadorna ferruginea* (Pallas) Ruddy Shelduck or Brahminy Duck	90	+	+	+	+	+	–	–	–
27.	*Anas acuta* Linnaeus Pintail	93	–	+	–	+	–	–	–	–
28.	*Anas crecca crecca* Linnaeus Common Teal	94	+	+	–	+	+	–	–	–
29.	*Anas poecilorhyncha poecilorhyncha* J. R. Forster Spotbil Duck	97	–	+	–	–	+	–	–	–
30.	*Anas strepera strepera* Linnaeus Gadwall	101	–	–	–	–	–	–	–	
31.	*Anas clypeata* Linnaeus Shoveller	105	+	+	+	+	+	–	–	–
32.	*Rhodonessa caryophllacea* (Latham) Pinkheaded Duck	106	+	–	–	–	–	–	+	–
33.	*Netta rufina* (Pallas) Redcreasted Pochard	107	+	+	+	+	–	–	–	–
34.	*Aythya ferina* (Linnaeus) Common pochard	108	–	+	–	–	–	–	–	–
35.	*Aythya nyroca* (Guldenstadt) White-eye Pochard	109	+	+	–	–	–	–	–	–
36.	*Nettapus coromandelianus coromandelianus* (Gmelin) Cotton Teal or Quacky-Duck	114	+	+	–	+	+	–	–	–
37.	*Sarkidiornis melanatos melanotos* (Pennant) Nakta or Comb Duck	115	–	–	–	+	+	–	–	–
38.	*Mergus albellus* Linnaeus Smew	119	–	–	–	–	–	–	–	

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			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
39.	*Elanus caeruleus Vociferus* (Latham) Blackwinged Kite	124	–	+	–	+	–	–	–	–
40.	*Pernis ptilorhynchus ruficollis* Lesson Creasted Honey Buzzard	130	+	–	+	+	–	–	–	–
41.	*Milvus migrans govinda* Sykes pariah Kite	133	+	–	–	+	+	–	–	–
42.	*Haliastur indus indus* (Boddaert) Brahminy Kite	135	+	+	–	+	+	–	–	–
43.	*Accipiter badius dussumieri* (Temminck) Indian Shikra	138	+	+	+	+	+	–	–	–
44.	*Accipiter trivirgatus indicus* (Hodgson) North Indian Creasted Goshawk	144	–	+	+	–	–	–	–	–
45.	*Accipiter nisus nisosimilis* (Tickell) Asiatic Sparrow-Hawk	147	–	+	+	–	–	+	–	–
46.	*Accipiter virgatus affinis* Hodgson East Himalayan Besra Sparrow-Hawk	150	–	–	–	+	–	–	+	–
47.	*Butastur teesa* (Franklin) White-eyed Buzzard-Eagle	157	–	–	–	+	–	–	+	–
48.	*Spizaetus nipalensis nipalensis* (Hodgson) Feathertoed Hawk-Eagle	158	–	–	–	–	–	+	–	–
49.	*Spizaetus cirrhatus cirrhatus* (Gmelin) Indian Creasted Hawk-Eagle	161	–	–	–	+	–	–	–	–
50.	*Hieraaetus fasciatus fasciatus* (Vieillot) Bonelli's or Slender Hawk-Eagle	163	–	–	–	+	–	–	–	–
51.	*Hieraaetus pennatus* (Gmelin) Booted Hawk-Eagle	164	–	–	–	–	+	–	–	–
52.	*Hieraaetus kienerii kienerii* (E. Geoffroy) Rufousbellied Hawk-Eagle	165	–	–	–	–	+	–	–	–
53.	*Aquila rapax vindhiana* Franklin Tawny Eagle	168	–	–	+	–	–	–	–	–

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54.	*Aquila clanga* Pallas Greater Spotted Eagle	170	–	–	–	–	–	+	–	–
55.	*Aquila pomarina hastata* (Lesson) Lesser Spotted Eagle	171	–	–	–	–	+	–	–	–
56.	*Haliaeetus leucogaster* (Gmelin) Whitebellied Sea Eagle	173	–	–	–	+	–	–	+	–
57.	*Haliaeetus leucoryphus* (Pallas) Pallas's Fishing Eagle	174	–	+	+	+	–	–	–	–
58.	*Icthyophaga ichthyaetus ichthyaetus* (Horsfield) Greyheaded Fishing Eagle	175	+	+	–	–	–	–	–	–
59.	*Sarcogyps calvs* (Scopoli) Black or King Vulture	178	–	+	–	+	–	–	–	–
60.	*Gyps fulvus fulvescens* Hume Indian Griffon Vulture	180, 183	–	+	–	–	–	–	–	–
61.	*Gyps indicus indicus* (Scopoli) Indian Longbilled Vulture	182	–	–	–	–	–	–	–	–
62.	*Gyps bengalensis* (Gmelin) Indian Whitebacked Vulture	185	–	–	–	–	–	–	–	–
63.	*Neophron percnopterus ginginianus* (Latham) Indian Scavenger Vuthure	187	–	–	–	+	–	–	–	–
64.	*Circus macrourus* (S. G. Gmelin) Pale Harrier	190	+	+	+	–	–	–	+	–
65.	*Circus melanoleucos* (Pennant) Pied Harrier	192	–	–	+	+	–	–	+	–
66.	*Circus aeruginosus aeruginosus* (Linnaeus) Marsh Harrier	193	+	+	–	+	+	–	–	–
67.	*Circaetus gallicus gallicus* (Gmelin) Short-toed Eagle	195	–		+	–	–	–	–	–

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68.	*Spilornis cheela melnotis* (Jerdon) Lesser or Peninsular Crested Serpent Eagle	197	–	–	+	+	+	–	–	–
69.	*Pandion haliaetus haliaetus* (Linnaeus) Osprey	203	–	–	–	+	–	–	–	–
70.	*Falco biarmicus jugger* J. E. Gray Laggar Falcon	208	–	+	+	–	+	–	–	–
71.	*Falco peregrinus babylonicus* P. L. Sclater Redcapped or Barbary Falcon	210	–	–	–	–	–	–	–	–
72.	*Falco peregrinus peregrinator* Sundevall Shaheen Falcon	211	–	–	–	–	–	–	–	–
73.	*Falco subbuteo subbuteo* Linnaeus Hobby	212	–	–	–	–	–	–	–	–
74.	*Falco chicquera chiequera* Daudin Redheaded Merlin	219	–	–	–	+	+	–	–	–
75.	*Faclo tinnunculus tinnunculus* Linnaeus European-Kestrel	222	+	+	+	+	+	–	–	–
76.	*Francolinus pictus pictus* (Jardine & Selby) Southern Painted Partridge	241	–	–	–	–	–	–	–	–
77.	*Francolinus pondicerianus interpositur* Hartert North Indian Grey Partridge	245	+	+	–	+	–	–	+	–
78.	*Coturnix coromandelica* (Gmelin) Blackbreasted or Rain Quail	252	–	+	–	+	–	–	–	–
79.	*Perdicula erythrorhyncha blewitti* (Hume) Northern Painted Bush Quail	263	–	–	–	–	+	–	–	–
80.	*Galloperdix spadicea spadicea* (Gmelin) Red Spurfowl	275	–	–	–	–	–	–	–	–

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81.	*Galloperdix lunulata* (Valenciennes) Painted Spurfowl	278	+	+	–	–	+	+	–	–
82.	*Gallus gallus murghi* Robinson & Kloss Indian Red Junglefowl	299	+	+	+	+	+	+	–	+
83.	*Pavo cristatus* Linnaeus Indian Peafowl	311	+	+	–	+	–	–	–	–
84.	*Turnix sylvatica dussumier* (Temminck) Little Bustard Quail	313	–	–	–	–	–	–	–	–
85.	*Turnix suscitator taigoor* (Sykes) Indian Bustard Quail	318	–	+	–	+	–	–	–	–
86.	*Geus antigone antigone* (Linnaeus) Indian Sarus Crane	323	–	+	–	+	+	–	–	–
87.	*Amaurornis akool akool* (Sykes) Brown Crake	342	–	–	+	–	–	–	–	–
88.	*Amaurornis phoenicurus chinensis* (Boddaert) Chinese Whitebreasted Waterhen	343	–	–	–	+	+	–	–	–
89.	*Gallicrex cinerea cinerea* (Gmelin) Rora or Watercock	346	+	+	–	–	–	–	–	–
90.	*Gallinula chloropus indica* Blyth Indian Moorhen	347	+	–	–	–	–	–	–	–
91.	*Porphyrio porphyrio poliocephalus* (Latham) Indian Purple Moorhen	349	+	+	+	–	–	–	–	–
92.	*Fulica atra atra* Linnaeus Coot	350	–	+	+	+	+	–	–	–
93.	*Eupodotis bengalensis bengalensis* (Gmelin) Bengal Florican	356	–	–	–	–	–	–	–	–
94.	*Sypheotides indica* (J. F. Muller) Likh or Lesser Florican	357	–	–	–	–	+	–	–	–

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95.	*Hydrophasianus chirurgus* (Scopoli) Pheasant-tailed Jaeana	358	+	+	–	+	–	–	–	–
96.	*Metopidius indicus* (Latham) Bronzewinged Jacana	359	+	+	+	+	–	–	–	–
97.	*Vanellus indicus indicus* (Boddaert) Redwattled Lapwing	366	–	+	+	+	+	–	–	–
98.	*Vanellus spinosus duvaucelii* (Lesson) Spurwinged Lapwing	369	–	–	–	+	–	–	–	–
99.	*Vanellus malabaricus* (Boddaert) Yellow-wattled Lapwing	370	+	+	–	+	–	–	–	–
100.	*Pluvialis dominica fulva* (Gmelin) Eastern Golden Plover	373	–	–	–	–	–	–	–	–
101.	*Charadrius alexandrinus alexandrinus* Linnaeus	381	–	–	–	–	–	–	–	–
102.	*Charadrius alexandrinus seebohmi* Hartert & Jackson Ceylon Kentish Plover	382	+	–	–	–	–	–	–	–
103.	*Charadrius mongolus atrifrons* Wagler Pamirs Lesser Sand Plover	384	–	–	+	–	–	–	–	–
104.	*Gallinago stenura* (Bonaparte) Pintail Snipe	406	–	+	–	–	–	–	–	–
105.	*Scolopax rusticola rusticola* Linnaeus Woodcock	411	–	–	–	–	–	–	–	–
106.	*Calidris ruficollis* (Pallas) Eastern Little Stint	415	–	–	–	+	–	–	–	–
107.	*Calidris minutus* (Leisler) Little Stint	416	–	–	–	–	–	–	–	–
108.	*Calidris temminckii* (Leisler) Temminck's Stint	417	–	–	–	+	–	–	–	–

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109.	*Calidris alpinus alpinus* (Linnaeus) Dunlin	420. 421	–	–	–	–	–	–	–	–
110.	*Rostratula bengalensis benghalensis* (Linnaeus) Painted Snipe	429	–	+	+	+	+	–	–	–
111.	*Burhinus oedicnemus undicus* (Salvadori) Indian Stone Curlew	436	–	–	–	+	–	–	–	–
112.	*Esacus magnirostris recurvirostris* (Cuvier) Great Stone Plover	437	–	–	–	+	–	–	–	–
113.	*Cursorius coromandelicus* (Gmelin) Indian Courser	440	–	–	–	+	+	–	+	–
114.	*Glareola lactea* Temminck Small Indian Pratincole	444	–	+	–	+	–	–	–	–
115.	*Larus ichthyaetus* Pallas Great Blackheaded Gull	453	–	–	+	–	–	–	–	–
116.	*Chlidonias hybrida indica* (Stephens) Indian Whiskered Tern	458	–	+	–	–	–	–	–	–
117.	*Sterna acuticauda* J. E. Gray Blackbellied Tern	470	–	+	–	+	+	–	–	–
118.	*Rynchops albicollis* Swainson Indian Skimmer or Scissorbill	484	+	–	–	–	–	–	–	–
119.	*Pterocles exustus erlangeri* (Neumaun) Indian Sandgrouse	487	–	–	–	+	–	–	–	–
120.	*Treron bicincta bicincta* (Jerdon) Indian Orangebreasted Green Pigeon	501	–	+	–	–	–	–	–	–
121.	*Treron phoenicoptera chlorigaster* (Blyth) Southern Green Pigeon	504	+	+	+	+	+	–	–	–
122.	*Ducula aenea sylvatica* (Tickell) Northern Green Imperial Pigeon	506	+	+	+	–	–	–	–	–
123.	*Columba livia intermedia* Strickland Indian Blue Rock Pigeon	517	+	+	+	+	+	–	–	–

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124.	*Columba punicea* Blyth Purple Wood Pigeon	524	–	+	+	–	+	–	–	–
125.	*Streplopelia orientalis meena* (Sykes) Western Turtle Dove	531	+	+	+	+	–	–	–	–
126.	*Streptopelia decaocto decaocto* (Frivaldszky) Indian Ring Dove	534	+	+	+	+	–	–	–	–
127.	*Streptopelia tranquebarica tranquebarica* (Hermann) Indian Red Turtle-Dove	535	–	+	–	+	–	–	–	–
128.	*Streptopelia chinensis suratensis* (Gmelin)	537	+	+	–	+	–	–	–	–
129.	*Streptopelia senegalensis cambayensis* (Gmelin) Indian Little Brown or Senegal Dove	541	+	+	+	+	–	–	–	–
130.	*Chalcophaps indica indica* (Linnaeus) Indian Emerald Dove	542	+	–	+	–	–	–	–	–
131.	*Clamator jacobinus jacobinus* (Boddaert) Ceylon Pied Creasted Cuckoo	571	–	–	–	+	–	–	–	–
132.	*Cuculus sparverioides sparverioides* Vigors Large Hawk-Cuckoo	572	–	–	–	–	–	–	–	–
133.	*Cuculus varius varius* Vahl Common Hawk-Cuckoo or Brainfever Bird	573	+	+	+	+	+	–	–	–
134.	*Cuculus micropterus micropterus* Gould Indian Cuckoo	576	–	–	–	+	–	–	–	–
135.	*Cuculus canorus canorus* Linnaeus Cuckoo	578	–	–	–	+	+	–	–	–
136.	*Cacomantis sonneratii sonneratii* (Latham) Indian Baybanded Cuckoo	582	–	–	–	+	–	–	–	–
137.	*Cacomantis merulinus passerinus* (Vahl) Rufousbellied Plaintive Cuckoo	584	–	+	+	–	–	+	–	–

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			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
138.	*Surniculus lugubris dicruroides* (Hodgson) Indian Drongo-Cuckoo	588	–	–	–	–	–	–	–	–
139.	*Rhopodytes tristis tristis* (Lesson) Large Greenbilled Malkoha	593	–	–	–	–	–	–	–	–
140.	*Rhopodytes viridirostris* (Jerdon) Small Greenbilled Malkoha	595	–	–	–	–	–	–	–	–
141.	*Taceocua leschenaultii infuscata* Blyth Eastern Sirkeer Cuckoo	597	+	+	–	+	+	–	–	–
142.	*Centropus toulou bengalensis* (Gmelin) Lesser Coucal	605	–	–	–	+	–	–	–	–
143.	*Otus scops sunia* (Hodgson) North Indian Scops Owl	616	–	+	–	–	–	–	–	–
144.	*Bubo bubo bengalensis* (Franklin) Indian Great Horned or Eagle-Owl	627	–	+	–	+	+	–	–	–
145.	*Bubo coromandus coromandus* (Latham) Dusky Horned Owl	630	–	+	–	–	–	–	–	–
146.	*Glaucidium radiatum radiatum* (Tickell) Barred Jungle Owlet	636	+	+	+	+	+	–	+	–
147.	*Glacidium cuculoides cuculoides* (Vigors) West Himalayan Barred Owlet	639	+	–	–	+	–	–	–	–
148.	*Ninox scutulata lugubris* (Tickell) Indian Brown Hawk-Owl	642	+	+	+	+	–	–	–	–
149.	*Athene brama indica* (Franklin) Northern Spotted Owlet	650	+	+	+	+	+	–	–	–
150.	*Athene blewitti* (Hume) Forest Spotted Owlet	653	–	–	–	–	–	–	–	–
151.	*Strix ocellata ocellata* (Lesson) Southern Mottled Wood Owl	657	–	+	–	+	+	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
152.	*Caprimulgus indicus indicus* Latham Indian Jungle Nightjar	671	–	–	–	+	+	–	–	–
153.	*Caprimulgus indicus kelaarti* Blyth Ceylon Jungle Nightjar	672	–	–	–	–	–	–	–	–
154.	*Caprimulgus macrurus albonotatus* Tickell Indian Longtailed Nightjar	675	–	+	+	+	–	–	–	–
155.	*Caprimulgus macrurus atripennis* Jerdon Jerdon's or Southern Longtailed Nightjar	676	–	–	–	+	–	–	–	–
156.	*Caprimugus asiaticus asiaticus* Latham Indian Little Nightjar	680	+	+	–	+	–	–	–	–
157.	*Caprimulgus affinis monticola* Franklin Franklin's or Allied Nightjar	682	+	+	+	+	+	–	–	–
158.	*Collocalia esculenta affinis* Beavan Beavan's or Whitebellied Swiftlet	687	–	+	–	+	–	–	–	–
159.	*Chaetura sylvatica* (Tickell) Whiterumped Spinetail Swift	692	–	–	+	–	–	–	–	–
160.	*Apus melba melba* (Linnaeus) Alpine Swift	693	–	–	+	–	–	–	–	–
161.	*Cypsiurus parvus batasiensis* (J. E. Gray) Indian Palm Swift	707	+	+	+	+	–	–	–	–
162.	*Hemiprocne longipennis coronata* (Tickell) Crested Tree Swift	709	–	–	–	–	+	–	–	–
163.	*Harpactes fasciatus malabaricus* (Gould) Malabar Trogon	711	–	–	+	–	–	–	–	–
164.	*Ceryle rudis leucomelanura* Reichenbach Indian Pied Kingfisher	719	+	+	–	+	+	–	–	–
165.	*Alcedo atthis bengalensis* Gmelin Indian Small Blue Kingfisher	723	+	+	–	+	+	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
166.	*Pelargopsis capensis capensis* (Linnaeus) Brownheaded Storkbilled Kingfisher	730	+	–	–	+	–	–	–	–
167.	*Halcyon smyrnensis fusca* (Boddaert) Indian Whitebreasted Kingfisher	736	+	+	+	+	+	–	–	–
168.	*Merops philippinus philippinus* Linnaeus Bluetailed Bee-eater	748	–	–	–	+	+	–	–	–
169.	*Merops orientalis orientalis* Latham Indian Small Green Bee-eater	750	+	+	+	+	+	–	–	–
170.	*Nictyornis athertoni athertoni* (Jardine & Selby) Bluebearded Bee-eater	753	–	–	–	–	–	–	–	–
171.	*Coracias benghalensis indica* Linnaeus Southern Roller	756	+	+	+	+	–	–	–	–
172.	*Upupa epops epops* Linnaeus European Hoopoe	763	+	+	–	+	+	–	–	–
173.	*Tockus birostris* (Scopoli) Common Grey Hornbill	767	+	+	+	+	–	+	–	–
174.	*Anthracoceros cronatus coronatus* (Boddaert) Malabar Pied Hornbill	775	–	+	+	+	+	–	–	–
175.	*Megalaima zeylonica caniceps* (Franklin) Northern Green Barbet	780	+	+	+	+	–	–	–	–
176.	*Megalaima haemacephala indica* (Latham) Crimsonbreasted Barbeton Coppersmith	792	+	+	–	+	–	–	–	–
177.	*Jynx torquilla torquilla* Linnaeus European Wryneck	796	–	+	–	+	+	–	–	–
178.	*Micropternus brachyurus phaioceps* Blyth Eastern Rufous Woodpecker	803	+	+	–	+	–	–	–	–
179.	*Picus myrmecophoneus Stresemann* Little Scalybellied Green Woodpecker	808		–		+	+	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
180.	*Picus chlorolophus chlorolophus* Vieillot East Himalayan Small Yellownaped Woodpecker	815	–	–	–	+	–	–	–	–
181.	*Dinopium benghalense puncticolle* (Malherbe) Southern Goldenbacked Woodpecker	820	–	+	–	+	+	–	–	–
182.	*Dinopium javanense malabaricum* Whistler & Kinnear Malabar Goldenbacked Threetoed Woodpecker	825	–	–	–	–	–	–	–	–
183.	*Picodes mahrattensis mahrattensis* (Latham) Yellowfronted or Mahratta Pied Woodecker	847	+	+	+	+	–	–	+	–
184.	*Picoides nanus nanus* (Vigors) Northern Pygmy Woodpecker	851	–	–	+	+	–	–	+	–
185.	*Chrysocolaptes festivus festivus* (Boddaert) Indian Blackbacked Woodpecker	858	–	–	–	+	+	–	–	–
186.	*Chrysocolaptes lucidus guttacristatus* (Tickell) Eastern Larger Goldenbacked Woodpecker	861	–	–	+	–	–	–	–	–
187.	*Pitta brachyura brachyura* (Linnaeus) Indian Pitta	867	–	–	–	+	+	–	–	–
188.	*Mirafra javanica cantillans* Blyth Singing Bush Lark	872	–	–	+	–	–	–	–	–
189.	*Mirafra assamica assamica* Horsfield Bengal Bush Lark	873	+	+	+	–	–	–	–	–
190.	*Mirafra erythroptera erythrotera* Blyth Redwinged Bush Lark	877	–	+	+	+	–	–	–	–
191.	*Eremopterix grisea* (Scopoli) Ashycrowned Finch-Lark	878	+	+	–	+	–	–	–	–
192.	*Eremopterix nigriceps affinis* (Blyth) Blackrowned Finch-Lark	879	–	+	+	–	–	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
193.	*Galerida cristata chendoola* (Franklin) Indian Crested Lark	899	–	–	–	–	–	–	–	–
194.	*Alauda gulgula gulgula* Franklin Indian Small Skylark	907	–	–	–	–	+	–	–	–
195.	*Riparia riparia diluta* (Sharpe & Wyatt) Siberian Collared Sand Martin	910	–	–	–	–	–	–	–	–
196.	*Hirundo rustica rustica* Linnaeus Western Swallow	916	–	+	–	+	+	–	–	–
197.	*Hirundo smithii filifera* Stephens Indian Wiretailed Swallow	921	+	–	+	+	+	–	–	–
198.	*Hirundo fluvicola* Blyth Indian Cliff Swallow	922	–	–	–	–	–	–	–	–
199.	*Hirundo daurica erythropygia* Sykes Indian Striated or Redrumbed Swallow	927	+	+	+	+	+	–	–	–
200.	*Deliehon urbica urbica* (Linnaeus) European House Martin	930	–	–	–	–	–	–	–	–
201.	*Lanius excubitor lahtora* (Sykes) Indian Grey Shrike	933	+	+	–	+	–	–	–	–
202.	*Lanius vittatus vittatus* Valenciennes Indian Baybacked Shrike	940	+	–	–	–	–	–	–	–
203.	*Lanius collurio isabellinus* Hemprich & Ehrenberg Pale Brown Shrike	943	–	–	–	+	+	–	–	–
204.	*Lanius tephronotus tephronotus* (Vigors) Eastern Tibet Greypacked Shrike	945	+	–	–	+	+	–	–	–
205.	*Lanius schach erythronotus* (Vigors) Rufousbacked Shrike	946	–		–	+	–	–	–	–
206.	*Lanius schach caniceps* Blyth South Indian Greybacked Shrike	947	+				–		–	
207.	*Lanius cristatus cristatus* Linnaeus Brown Shrike	949	+	+	+	+	–		–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
208.	*Oriolus oriolus kundoo* Sykes Indian Golden Oriole	953	–	+	–	+	+	–	–	–
209.	*Dicrurus adsimilis macrocercus* Vieillota King Crow	963	+	+	+	+	–	–	–	–
210.	*Dicrurus leucophaeus longicaudatus* Hay Indian Grey Drongo	965	+	–	–	–	–	–	–	–
211.	*Dicrurus caerulescens caerulescens* (Linnaeus) Indian Whitebellied Drongo	967	+	+	+	+	+	–	+	–
212.	*Dicrurus aeneus aeneus* Vieillot Bronzed Drongo	971	–	–	–	+	–	–	–	–
213.	*Dicrurus hottentottus hottentottus* (Linnaeus) Haircrested or Spangled Drongo	973	–	+	+	–	–	–	–	–
214.	*Dicrurus paradiseus grandis* (Gould) Northern Large Racket-failed Trongo	976	+	+	–	–	–	–	–	–
215.	*Artamus fuscus Vieillot* Ashy Swallow-Shrike	982	+	+	+	+	+	–	–	–
216.	*Sturnus pagodarum* (Gmelin) Blackheaded or Brahminy Myna	994	+	+	–	+	+	–	–	–
217.	*Sturnus roseus* (Linnaeus) Rosy Starling or Rosy Pastor	996	–	+	–	+	+	–	–	–
218.	*Sturnus vulgaris porphyronotus* Sharpe Central Asian Starling	999	–	–	–	+	–	–	–	–
219.	*Sturnus contra contra* Linnaeus Indian Pied Myna	1002	+	+	+	+	+	–	–	–
220.	*Acridotheres tristis tristis* (Linnaeus) Indian Myna	1006	–	–	+	+	–	–	–	–
221.	*Acridotheres ginginianus* (Latham) Bank Myna	1008	–	–	–	+	–	–	–	–
222.	*Acridotheres fuscus fuscus* (Wagler) Northern Jungle Myna	1009	–	–	–	+	+	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
223.	*Gracula religiosa intermedia* A. Hay Northern Hill Myna	1015	–	–	–	–	–	–	–	–
224.	*Dendrocitta vagabunda vagadunda* (Latham) Northeastern Tree Pie	1032	+	+	+	+	–	–	–	–
225.	*Pyrrhocoraxgraculus digitatus* Hemprich & Ehrenberg Alpine Chough	1045	+	+	+	+	–	–	–	–
226.	*Corvus macrorhynchos levaillantii* Lesson Eastern Jungle Crow	1055	–	+	+	+	–	–	+	–
227.	*Hemipus picatus picatus* (Sykes) Blackbacked Pied Flyeatcher-Shrike	1065	–	–	+	–	–	–	–	–
228.	*Tephrodornis pondicerianus pondicerianus* (Gmelin) Indian Wood Shrike	1070	–	+	+	+	+	–	+	–
229.	*Coracina novaehollandiae macei* (Lesson) Indian Large Cackoo-Shrike	1072	+	+	+	+	+	–	+	–
230.	*Coracina melaschistos melaschistos* (Hodgson) Dark Grey Cuckoo-Shrike	1077	–	+	–	+	–	–	–	–
231.	*Coracina melanoptera sykesi* (Strickland) Peninsular Blackheaded Cuckoo-Shrike	1079	+	–	–	+	–	–	–	–
232.	*Pericrocotus lammeus speciosus* (Latham) North Indian Searlet Minivet	1080	+	+	+	+	+	–	–	–
233.	*Pericrocotus brevirostris brevirostris* (Vigors) Shortbilled Minivet	1084	–	–	–	–	–	–	–	–
234.	*Pericrocotus roseus roseus* (Vieillot) Rosy Minivet	1089	–	–	–	–	–	–	–	–
235.	*Pericrocotus cinnamomeus peregrinus* (Linnaeus) Northern Small Minivet	1091	+	+	–	+	+	–	–	–
236.	*Perecrocotus erythropygius erythropygius* (Jerdon) Whitebellied Minivet	1096	–		–	–		–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
237.	*Aegithina tiphia tiphia* (Linnaeus) Common Iora	1098	+	–	+	+	–	–	+	–
238.	*Aegithina nigrolutea* (Marshall) Marshall's Iora	1102	–	–	–	+	–	–	+	–
239.	*Chloropsis aurifrons aurifrons* (Temminck) Northern Goldfronted Chloropsis	1103	+	+	–	+	+	–	–	–
240.	*Chloropsis cochinchinensis jerdoni* (Blyth) Jerdon's Goldmantled Chloropsis	1107	+	+	+	+	–	–	+	–
241.	*Pyenonotus melanicterus laviventris* (Tickell) Blackheaded Yellow Bulbul	1115	–	–	+	–	–	–	–	–
242.	*Pycnonotus jocosus emeria* (Linnaeus) Bengal Redwhiskered Bulbul	1121	+	+	–	–	–	–	–	–
243.	*Pycnonotus cafer cafer* (Linnaeus) Redvented Bulbul	1128	–	+	+	+	+	–	–	–
244.	*Pycnontus cafer bengalensis* Blyth Bengal Redvented Bulbul	1131	+	–	+	–	–	–	–	–
245.	*Pycnonotus luteolus luteolus* (Lesson) Whitebrowed Bulbul	1138	–	–	+	–	–	–	–	–
246.	*Hysipetes indicus indicus* (Jerdon) Yellowbrowed Bulbul	1144	+	–	–	–	–	–	–	–
247.	*Pellorneum ruficeps ruficeps* Swainson Peninsular Spotted Babbler	1154	+	+	–	–	–	–	–	–
248.	*Pomatorhinus schisticeps horsfieldii* Sykes Deccan Scimitar Babbler	1173	–	–	–	–	–	–	–	–
249.	*Dumetia hyperythra hyperythra* (Franklin) Rufousbellied Babbler	1222	–	+	–	+	+	–	–	–
250.	*Macronous gularis rubricapilla* (Tickell) Yellowbreasted Babbler	1228	–	+	+	–	–	–	–	–
251.	*Chrysomma sinense sinense* (Gmelin) Yellow-eyed Babbler	1231	–	+	+	+	–	–	+	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
252.	*Turdoides caudatus caudatus* (Dumont) Common Babbler	1254	–	–	–	+	–	–	+	–
253.	*Turdoides striatus malabaricus* (Jerdon) Malabar Jungle Babbler	1264	–	–	–	–	–	–	–	–
254.	*Turdoides striatus striatus* (Dumont) Bengal Jungle Babbler	1265	+	+	–	+	+	–	+	–
255.	*Muscicapa latirostris* Raffles Brown Flycatcher	1407	–	+	+	–	–	–	–	–
256.	*Muscicapa ruficuda* Swainson Rufoustailed Flycatcher	1409	–	–	–	–	–	–	–	–
257.	*Muscicapa parva parva* Bechstein Western Redbreast Flycatcher	1411	–	–	+	–	–	–	–	–
258.	*Muscicapa parva albicilla* Pallas Eastern Redbreasted Flycatcher	1412	+	–	–	–	+	–	–	–
259.	*Muscicapa superciliaris superciliaris* Jerdon Whitebrowed Blue Flycatcher	1421	–	+	+	–	+	–	–	–
260.	*Muscicapa superciliaris aestigma* Gray Little Blue-and-White Flycatcher	1422	–	–	–	–	–	–	–	–
261.	*Muscicapa rubeculoides rubeculoides* (Vigors) Bluethroated Flycatcher	1440	+	–	–	–	–	–	–	–
262.	*Muscicapa tickelliae tickelliae* (Blyth) Tickell's Redbreasted Blue Flycatcher	1442	–	–	+	+	–	–	–	–
263.	*Muscicapa thalassina thalassina* Swainson Verditer Flycatcher	1445	–	+	+	+	+	–	–	–
264.	*Culicicapa ceylonensis calochrysea* Oberholser Northern Greyheaded Flycatcher	1448	+	+	+	+	+	–	–	–
265.	*Rhipidura albicollis albicollis* (Vicillot) Eastern Whitethroaled Fantail Flycatcher	1455	–	+	–	+		–	–	

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
266.	*Terpsiphone paradisi leucogaster* (Swainson) West Himalayan Paradise Flyeatcher	1460	–	–	–	–	–	–	–	–
267.	*Terpsiphone paradisi paradisi* (Linnaeus) Peninsular Indian Paradise Flyeatcher	1461	+	+	–	+	–	–	+	–
268.	*Monarcha azurea styani* (Hartlaub) Indian Blacknaped Monarch Flyeatcher	1465	+	+	+	+	+	–	–	–
269.	*Prinia rufescens rufescens* Blyth Rufous Wren-Warbler	1501	–	–	–	–	–	–	–	–
270.	*Prinia hodgsonii hodgsonii* Blyth Franklin's Ashy-grey Wren-Warbler	1503	–	–	–	+	–	–	+	–
271.	*Prinia buchanani* Blyth Rufousfronted Wren-Warbler	1506	–	–	–	+	–	–	–	–
272.	*Prinia gracilis stevensi* Hartert Eastern Streaked Wren-Warbler	1509	–	–	+	+	–	–	+	–
273.	*Prinia socialis socialis* Sykes Southern Ashy Wren-Warbler	1517	–	–	–	+	–	–	–	–
274.	*Prinia sylvatica insignis* (Hume) Northwestern Jungle Wren-Warbler	1520	–	–	–	–	–	–	–	–
275.	*Orthotomus sutorius patia* Hodgson Bengal Tailor Bird	1536	–	+	–	+	–	–	–	–
276.	*Megalurus palustris toklao* (Blyth) Striated Marsh Warbler	1548	–	–	–	–	–	–	–	–
277.	*Acrocephalus dumetorum* Blyth Blyth's Reed Warbler	1556	–	+	+	+	–	–	–	–
278.	*Acrocephalus agricola agricola* (Jerdon) Indian Paddyfield Warbler	1557	–	–	–	–	–	–	–	–
279.	*Acrocephalus (stentoreus) orinus* Oberholser Largebilled Reed Warbler	1561	–	–	–	–	–	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
280.	*Hippolais caligata caligata* (Lichtenstein) Siberian Booted Tree Warbler	1562	–	–	–	–	–	–	–	–
281.	*Hippolais caligata rama* (Sykes) Indian Booted Tree Warbler	1563	–	+	–	+	–	–	–	–
282.	*Sylvia hortensis jerdoni* (Blyth) Eastern Orphean Warbler	1565	–	+	–	–	–	–	–	–
283.	*Phylloscopus collybita tristis* Blyth Brown Chiffchaff	1575	–	–	+	+	–	–	–	–
284.	*Phylloscopus neglectus* Hume Plain Leaf Warbler	1577	+	–	+	+	–	–	–	–
285.	*Phylloscopus affinis affinis* (Tickell) Tickell's Leaf Warbler	1579	–	–	+	–	–	–	–	–
286.	*Phylloscopus inornatus humei* (Brooks) Hume's Yellowbrowed Leaf Warbler	1590	–	–	–	+	–	–	–	–
287.	*Phylloscopus maculipennis centralis* Ripley Central Greyfaced Leaf Warbler	1598	–	–	–	+	–	–	–	–
288.	*Phylloscopus trochiloides viridanus* Blyth Western Greenish Leaf Warbler	1602	–	–	–	+	–	–	–	–
289.	*Phylloscopus occipitalis occipitalis* (Blyth) Large Crowned Leaf Warbler	1606	–	–	–	–	–	–	–	–
290.	*Phylloscopus cantator cantator* (Tickell) Blackbrowed or Yellowfaced Leaf Warbler	1612	–	–	–	–	–	–	–	–
291.	*Abroscopus superciliaris flaviventris* (Jerdon) Sikkim Yellowbellied Flycatcher-Warbler	1622	–	+	–	–	–	–	–	–
292.	*Copsychus saularis saularis* (Linnaeus) Indian Magpie-Robin	1661	+	+	–	+	–	–	–	–
293.	*Copsychus malabaricus indicus* (Baker) Indian Shama	1667	+	+	–	–	–	–	–	–
294.	*Phoenicurus ochruros rufiventris* (Vieillot) Eastern Black Redstart	1672	+	+	–	+	+	–	+	

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
295.	*Saxicola torquata indica* (Blyth) Indian Collared Bush Chat	1697	+	+	–	+	–	–	+	–
296.	*Saxicola caprata bicolor* Sykes Northern Pied Bush Chat	1700	–	–	+	+	–	–	–	–
297.	*Saxicoloides fulicata cambaiensis* (Latham) Brownbacked Indian Robin	1717	+	+	+	+	–	–	+	–
298.	*Myiophonus forsficldii horsfieldii* (Vigors) Malabar Whistling Thrush	1728	+	+	+	–	+	–	–	–
299.	*Zoothera citrina citrina* (Latham) Orangeheaded Ground Thrush	1733	+	+	+	+	–	–	–	–
300.	*Zoothera citrina cyanotus* (Jardine & Selby) Whitethroated Ground Thrush	1734	–	–	–	–	+	–	–	–
301.	*Zoothera dauma dauma* (Latham) Smallbilled Mountain Thrush	1741	+	+	–	–	+	–	–	–
302.	*Turdus unicolor* Tickell Tickell's Thrush	1748	+	–	+	–	+	–	–	–
303.	*Turdus merula nigropileus* Blackcapped Blackbird	1753	–	–	–	–	–	–	–	–
304.	*Turdus ruficollis atrogularis* Jarocki Blackthroated Thrush	1763	+	–	–	–	–	–	–	–
305.	*Cephalopyrus flammiceps flammiceps* (Burton) West Firecapped Tit	1815	–	–	–	–	–	–	–	–
306.	*Sitta castanea almorae* Kinnear & Whistler Western Chestnutbellied Nuthatch	1827	+	–	+	+	+	–	–	–
307.	*Sitta leucopsis leucopsis* Gould Western Whitecheeked Nuthatch	1833	–	+	–	–	–	–	–	–
308.	*Sitta frontalis frontalis* Swainson Velvetfronted Nuthatch	1838	–	–	+	–	–	–	–	–
309.	*Salpornis spilonotus spilonotus* (Franklin) Indian Spotted Grey Creeper	1841	–	–	–	+	–	–	–	–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
310.	*Anthus hodgsoni hodgsoni* Richmond Indian Tree Pipit	1852	+	+	+	+	–	–	–	–
311.	*Anthus trivialis trivialis* (Linnaeus) European Tree Pipit	1854	–	+	+	–	–	–	–	–
312.	*Anthus novaeseelandiae richardi* Vieillot Richard's Pipit	1857	–	–	–	–	–	–	–	–
313.	*Anthus novaeseelandiae rufulus* Vieillot Indian Paddyfield Pipit	1859	–	–	+	+	–	–	–	–
314.	*Anthus campestris campestris* (Linnaeus) Tawny Pipit	1861	–	–	–	–	–	–	–	–
315.	*Anthus godlewskii* (Taczanowski) Blyth's Pipit	1863	+	–	+	–	–	–	–	–
316.	*Motacilla indica* Gmelin Forest Wagtail	1874	–	–	–	–	–	–	–	–
317.	*Motacilla flava beema* (Sykes) Blueheaded Yellow Wagtail	1876	–	+	–	–	–	–	–	–
318.	*Motacilla citreola citreola* Pallas Northern Yellowheaded Wagtail	1881	–	–	+	–	–	–	–	–
319.	*Motacilla alba dukhunensis* Sykes Indian White Wagtail	1885	+	–	+	–	–	–	–	–
320.	*Motacilla alba personata* Gould Masked Wagtail	1886	–	–	–	–	–	–	–	–
321.	*Motacilla maderaspatensis* Gmelin Large Pied Wagtail	1891	+	+	+	+	–	–	–	–
322.	*Dicaeum agile agile* (Tickell) Indian Thickbilled Flowerpecker	1892. 1894	–	–	–	+	–	–	–	–
323.	*Dicaeum concolor concolor* Jerdon Nilgiri Flowerpecker	1902	–		–			–	–	–
324.	*Nectarinia zeylonica sola* (Vieillot) Indian Purplerumped Sunbird	1907		+		+		–		–

Sl. No.	Name	H.B. No.	LOCALITIES IN BIHAR AND JHARKHAND							
			Rajmahal Hills	Manbhum	Singbhum	Lohardugga	Sirguja	Sonepur	Hazaribagh	Madhubani
325.	*Nectarinia asiatica asiatica* (Litham) Indian Purple Sunbird	1917	+	+	+	+	+	–	–	–
326.	*Aethopyga siparaja seheriae* (Tickell) Indian Yellowbacked Sunbird	1927	–	–	+	–	–	–	–	–
327.	*Passer domesticus indicus* Jardine & Selby Indian House Sparrow	1938	+	+	–	–	–	–	–	–
328.	*Petronia xanthocollis xanthocollis* (Burton) Indian Yellowthroated Sparrow	1949	–	+	–	+	+	–	+	–
329.	*Ploceus philippinus philippinus* (Linnaeus) Indian Baya	1957	–	+	+	+	–	–	–	–
330.	*Ploceus benghalenis* (Linnaeus) Blackthroated Weaver Bird	1961	–	–	–	–	–	–	–	–
331.	*Ploceus manyar flaviceps* Lesson Indian Streaked Weaver Bird	1962	–	–	–	–	–	–	–	–
332.	*Estrilda amandava amandava* (Linnaeus) Red Munia or Avadavat	1964	–	+	–	+	+	–	–	–
333.	*Estrilda formosa* (Latham) Green Munia	1965	–	–	–	+	+	–	–	–
334.	*Lonchura malabarica malabarica* (Linnaeus) Whitethroated Munia	1966	–	+	+	+	+	–	+	–
335.	*Lonchura striata striata* (Linnaeus) Southern Whitebacked Munia	1968	–	+	+	–	–	–	–	–
336.	*Lonchura punctulata punctulata* (Linnaeus) Indian Spotted Munia	1974	+	+	+	+	–	–	–	–
337.	*Lonchura malacca rubroniger* (Hodgson) Nepal Blackheaded Munia	1976	–	+	–	+	–	–	–	–
338.	*Lonchura malacca malacca* (Linnaeus) Southernav Blackheaded Munia	1978	–	–	–	–	–	–	–	–
339.	*Carpodacus erythrinus roseus* (Blyth) Indian Rosefinch	2011	–	–	+	+	+	–	–	–
340.	*Emberiza melanocephala* Scopoli Blackheaded Bunting	2043	–	–	–	+	–	–	–	–
341.	*Melophus lathami* (Gray) Crested Bunting	2060	–	–	–	+	–	–	–	–

1. ***Ibis leucocephalus*** (Pennant)
Painted stork

Common in Manbhum.

2. ***Ciconia nigra*** (Linnaeus)
Black Stork

Common in Manbhum.

3. ***Dendrocygna javanica*** (Horsfield)
Lesser Whistling Teal

Abundantly found in Manbhum.

4. ***Anas crecca crecca*** Linnaeus
Common Teal

Common in Manbhum.

5. ***Anas poecilorhyncha zonorhyncha*** Swinhoe
Eastern Grey Duck

Once procured in Bihar (Darbhanga-Inglish).

6. ***Anas falcata*** Georgi
Falacated Teal

Noted as vagrant (Trihut, Patna, Darbhanga).

7. ***Rhodonessa caryophyllacea*** (Lattam)
Pinkheaded Duck

Last procured in Bihar, in 1935 (Darbhanga-Inglish)

8. ***Aythya marila marila*** (Linnaeus)
Scaup Duck

Recorded in Mongyar (Bihar).

9. ***Falco naumanni*** Swinhoe
Lesser Kestrel

Sight record in Dinapur (Bihar).

10. ***Francolinus pondicerianus interpositus*** Hartert
North Indian Grey Partridge

Very common in Manbhum

11 ***Perdicula asiatica asiatica*** (Latham)
Jungle Bush Quail

Abundantly found in Manbhum.

12. ***Turnix suscitator taigoor*** (Sykes)
Indian Bustard-Quail

Very common in Manbhum.

13. ***Grus antigone antigone*** (Linnaeus)
Indian Sarus Crane

Common in Manbhum.

14. ***Fulica atra atra*** Linnaeus
Coot

Common in Manbhum.

15. ***Treron bicincta bicincta*** (Jerdon)
Indian Orangebreaste

Green Pigeon. Abundant in Manbhum area.

16. ***Treron phoenicoptera chlorigaster*** (Blyth)
Southern Green pigeon

Abundant in Manbhum area.

17. ***Columba punicea*** Blyth
Purple Wood Pigeon

Common in Manbhum.

18. ***Harpactes fasciatus legerli*** Koelz
Central Indian Trogon

Tickell's collection, common in Manbhum.

19. ***Tockus birostris*** (Scopoli)
Common Grey Hornbill

Not common in Manbhum, occasionlly seen solitary bird.

20. ***Anthracoceros coronatus coronatus*** (Boddaert)
Malabar Pied Hornbill

Common in Manbhum, seen in flocks of 7-8 birds in high trees.

21. ***Dicrurus hottentottus hottentottus*** (Linnaeus)
Haircrested Drongo

Common in Manbhum.

22. ***Dicrurus paradiseus grandis*** (Gould)
Northern Large Racket-tailed Drongo

Common in Manbhum.

23. ***Sturnus roseus*** (Linnaeus)
Rosy Pastor

Abundantly found in enormous flocks in Manbhum.

24. ***Gracula religiosa peninsularis*** Whistler & Kinnear
Eastern Hill Myna

Very common in Manbhum.

Mr. V. Ball (1874) of Geological Survey of India was posted in Chotanagpur in 1864 and since then he spent seven working seasons in this area. Mr. Ball Geologist by profession took interest on birds and made a large collection during his stay in this area, catalogued his whole collection and ultimately published in *Stray Feathers* (1874), (vol. II No. 4 : 355-440).

He also made a fascinating description of Chotanagpur. It would be worthwhile to quote some of the lines of his text.

Total area of Chotanagpur, according to Ball, is be 44 and 35,000 sqr. miles. Hills occur in cluster, untill at Parasnath, the summit of which is said to be 4,624 feet and these plateous have a general average elevation of about 2,000 feet.

"Politically Chotanagpur consists of four British districts, namely, Hazaribag, Lohardanga, Manbhum and Singhbhum, and of seven semi-independent Gujart states, otherwise called Tributory Mehals; these are Sirguja, Jushipur, Udipur, Gangpur, Kores, Chang Bokar and Bonai."

"The Chotanagpur Division or province is bounded on the north by Rewa, Mirzapur, Shahabad, Gaya and Monghyr; on the east by Burdwan, Bankura and Midnapur; on the South by the Orissa and Central provinces, Native Tributary states of Mohurbung, Keonjhar, Bamra, and Raigarh and the British district of Sambalpur; and lastly on the west by Bilashpur and Rewa."

During his tennure of seven years in Chotanagpur, Mr. Ball made an illaborate record of both mammals and birds of this area. Ball altogether lists 294 forms of birds from Chotanagpur. The list itself had richness of qualitative examples. Following are the few examples of birds which not only indicates the richness of flora of this region, but also potentrality of avifauna as well. We don't know whether these birds are still available in Chotanagpur as it was found during the time of Mr. V. Ball unless mentioned otherwise all ebservations were made by Balls.

1. ***Podiceps ruficollis capensis*** Salvadori
Little Grebe

Noted common in this area.

2. ***Plalacrocorax carbo sinensis*** (Shaw)
Cormorant

Noted occasionally in this area.

3. ***Phalacrocorax niger*** (Vieillot)
Little Cormorant

Very common in this area.

4. ***Anhinga rufa melanogaster*** Pennant.
Darter

Occurs singly or in pairs in this area.

5. ***Egretta alba modesta*** (J. E. Gray)
Large Egret

Occurs in several parts, collected specimen in Manbhum.

6. ***Ibis leucocephalus*** (Pennant)
Painted Stork

Noted and collected one example in the koel river in Palamou.

7. ***Anastomus oscitans*** (Boddart)
Openbill Stork

Noted in parties from 3-12 birds throughout Chotanagpur.

8. ***Ciconia c. ciconia*** (Linnaeus)
White Stork

Occurs abundantly in most parts of the Division.

9. ***Ciconia nigra*** (Linnaeus)
Black Stork

Several pairs noted in Sirguja.

10. ***Xenorhynchus a. asiaticus*** (Latham)
Blacknecked Stork

Noted single in a river in Sirguja.

11. ***Leptoptilos dubius*** (Gmelin)
Adjutant

Single individuals are occasionally seen in Manbhum Singhbhum and Sirguja.

12. ***Leptoptilos javanicus*** (Horsfield)
Lesser Adjutant

Seen in Sirguja and shot one in Manbhum.

13. ***Threskiornis melanocephala*** (Latham)
White Ibis

Found in all parts, but in no great abundance anywhere.

14. ***Pseudibis p. papillosa*** (Temminck)
Black Ibis

Common, occurs in flocks from 4 to 20 birds.

15. ***Plegadis f. falcinellus*** (Linnaeus)
Glossy Ibis

Rare, noted a small flock near Rajmahal hill.

16. ***Anser anser rubrirostris*** Swinhoe
Greyleg Goose

Rare, noted only on a few occasion.

17. ***Anser indicus*** (Latham)
Barheaded Goose

Noted once in the Damodar river, in Dec. 1872.

18. ***Dendrocygna javanica*** (Horsfield)
Lesser Whistling Teal

Common in all parts of Chotanagpur.

19. ***Tadorna ferruginea*** (Pallas)
Brahniny Duck

Commonly found in the sandy reaches of the Damodar, Kosi, Subarnarekha, Rer and Mahan rivers.

20. ***Anas acuta*** Linnaeus
Pintail

Commonly found with Gadwall, noted some very large flocks in Manbhum.

21. ***Anas c. crecca*** Linnaeus
Common Teal

Common in this area.

22. ***Anas platyrhynchos*** Linnaeus
Makard

Rare, noted a pair in a sheltered pool in the bed of the Gobri river in Sirguja and shot both.

23. ***Anas s. strepera*** Linnaeus.
Gae wall

Commonly found wherever there plenty of tanks and jheels.

24. ***Anas querquedula*** Linnaeus
Gargany

25. ***Anas clypeata*** Linnaeus
Shoveller

Rare in this area.

26. ***Rhodonessa caryophyllacea*** (Latham)
Pinkheaded Duck

Not seen and inserted in the list on the authority of others who tell him it occurs in Manbhum. Shot it near Sahebgunj on the Ganges, where it appears to be not uncommon in the proper season.

27. *Netta rufina* (Pallas)
Redcrested Pochard

Noted it as not rare in Manbhum area.

28. *Aythya ferina* (Linnaeus)
Common Pochard

Not seen, but included in the light on the authority of Mr. Wilcox, Sp, Manbhum who shot one bird there.

29. *Aythya nyroca* (Guldenstadt)
White-eyes Pochard

Met with it frequently in the well-watered parts of Chotanagpur.

30. *Aythya fuligula* (Linnaeus)
Tufted Duck

Occurs in large flocks in this area.

31 *Nettapus c. coromandelianus* (Gmelin)
Cotton Teal

Common in this area.

32. *Sarkidiornis m. melanotos* (Pennant)
Comb Duck

Very common in the western parts of Chotanagpur, more particularly in the neighbourhood of the Red river and its tributaries in Sirguja. Occasionally seen in the Manbhum area.

33. *Mergus merganser orientalis* Gould
Common Merganser

Col. Tickell, as recorded by Dr. Jerdon, obtained it as Chaibassa. Noted in flocks of 12-30 birds on seferal occasions in the Subarnrekha and Damador rivers and once in the Red river in Sirguja.

34. *Torgos calvus* (Scopoli)
Black Vulture

More or less common in this area.

35. *Gyps bengalensis* (Gmelin)
Indian Whitebacked Vulture

More or less common in this area.

36. *Neophron percnopterus ginginianus* (Latham)
Scavenger Vulture.

Noted as common around villages of untidy aborgines.

37. *Francolinus francolinus asiae* Bonaparte
Black Partridge

Most abundant in the West, rare in Manbhum.

38. *Francolinus pondicerianus interpositus* Haetert
Grey Partridge

Occurs in most parts of Chotanagpur, but rare in the extreme west. very abundant in palamou.

39. *Coturnix c. chinensis* (Linnaeus)
Bluebreasted Quail

Occurs, but not very common.

40. *Perdicula a. asiatica* (Latham)
Jungle Bush Quail

Capt. Beavan noted it as tolerably abundant in Manbhum and obtained serveral specimens.

41. *Perdicula erythrorhyncha blewitti* (Hume)
Painted Bush Quail

Blankford obtained it from Chanda and the Udaipur country of Sironcha. Ball obtained it from Sirguja.

42. *Galloperdix s. spadicea* (Gmelin)
Red Spurfowl

Not uncommon in the Soodpuras.

PROTECTED AREA IN BIHAR

Sl. No.	N A M E	AREA (IN SQ. KM.)	District
1.	Valmiki National Park	335.65	Pashchim Champarn
2.	Barela S. A. Z. S. WLS	1.96	Vaishali
3.	Bhimbandh WLS	681.99	Munger
4.	Gautam Budha WLS	259.50	Gaya
5.	Kanwarjheel WLS	63.11	Begusarai
6.	Kaimur WLS	1342.00	Rohtas
7.	Nagi Dam WLS	7.91	Jamui
8.	Nakti Dam WLS	3.32	Jamui
9.	Rajgir WLS	33.84	Nalanda
10.	Udaypur WLS	8.74	Paschim Champaran
11.	Valmiki WLS	544.67	Paschim Champaran
12.	Vikramshila Gangetic Dolphin WLS	0.5	Bhagalpur.

PROTECTED AREA IN JHARKHAND

Sl. No.	N A M E	AREA (IN SQ. KM.)	District
1.	Betla National Park	231.67	Palamau
2.	Dalma WLS	193.22	Ainghbhum East
3.	Hazaribag WLS	186.22	Hazaribag
4.	Koderma WLS	177.95	Hazaribag
5.	Lawalong WLS	207.00	Chatra
6.	Mahaneduar WLS	63.25	Palamau
7.	Palamau WLS	794.33	Palamau
8.	Palkot WLS	183.00	Gumla
9.	Parasnath WLS	49.33	Giridih
10.	Popchanchi WLS	8.75	Dhanbad
11.	Udhwa Lake WLS	05.65	Sahebganj

Source : ENVIS Bulletin. Vol. 3, No1, June, 2000. Wildlife Institute of India. Dehra Dun.

PROTECTED AREA STATISTICS IN BIHAR AND JHARKHAND

Area Km²	Existing Protected Area Status						Proposed Protected Area Status					
B. J.	No. of NPs	Area Km²	% of State Area	No of WLS.	Area Km²	% of State Area	No. of NPs	Area Km²	% of State Area	No. of WLS	Area Km²	% of Sate Area
173877	2	567.32	0.33	19	3882.64	2.23	3	238.10	0.14	6	466.10	0.27

43. ***Galloperdix lunulata*** (Valenciennes)
Painted spurfowl

More common species in this area. Beavan noted it tolerably aboundant in Manbhum.

44. ***Turnix t. tanki*** Blyth
Button Quail

Tolerably common in Chotanagpur. Capt. Beavan noted it as aboundant in the vicinity of Parasnath hills.

45. ***Grus grus linfordi*** Sharpe
Common Crane

Large flocks most frequently seen in the vicinity of the Damodar and Mohan rivers.

46. ***Grus a. antigone*** (Linnaeus)
Sarus Crane

Most common in the open valleys of Sirguja.

47. ***Sypheotides indica*** (J. F. Miller)
Lesser Florican

Shot one specimen in Sirguja.

48. ***Pterocles exustus erlangeri*** (Neumann)
Indian Sandgrouse

Not uncommon in the Satpuras.

49. ***Pterocles i. indicus*** (Gmelin)
Painted Sandgrouse

Not uncommon in the Satpuras.

50. ***Treron b. bicincta*** (Jerdon)
Orangebreasted Green Pigeon

Capt. Beavan found it in abundance near Ambikanagar, Manbhum in December, 1864.

51. ***Ducula aenea sylvatica*** (Tickell)
Green Imperial Pigeon

Occurs very locally in Chotanagpur and met with a few pair in the Ambikanagar, Manbhum.

52. ***Columba punicea*** Blyth
Purple Wood Pigeon

Noted by Col. Tickell in a small parties of 4-5 birds along the banks of river shaded by large forests trees in Singbbhum.

53. ***Harpactes fasciatus legerli*** Koelz
Malabar Trogon

Col. Tickell obtained a solitary specimen near Dampura in Dholbhum.

54. ***Tockus birostris*** (Scopoli)
Common Grey Hornbill

Met with occasionally on the borders of heavy jungle and in open park of the country where mohung trees abound. Collected specimens from Manbhum, Singbhum and Hazaribag and commented that it was more aboundant in the Rajinahal and satpura hills and collected altogether 202 ♀ from there.

55. ***Anthracoceros c. coronatus*** (Boddaert)
Malabar Pied Hornbill

Noted in a flock of 6-10 individuals and shot it in Manbhum, Singhbhum and Sirguja and also seen it in fine jungle which border the ghat on the road from Ranchi plateau to Purulia of West Bengal.

Jamal Ara (1953) reported an account of some bird nests from a small town of Doranda, Ranchi, Jharkand State. George (1964) reported on migratry birds from north Bihar. However, Fauna of British India by E. C. S. Baker (1922-30) adequately included references from undivided Bihar (now = Bihar and Jharkhand), so also the Handbook of birds of India by Ali & Ripley (1968-74). Zoological Survey of India, in course of its faunistic surveys in undivided Bihar gathered substantial informations and materials over the years. The present ornithological account in the foregoing pages is a synthesis of those available data.

ORNITHOLOGICAL ACCOUNTS

The numbers preceeding the names of the birds in this chapter used in Ali & Ripley's. **Handbook of the Birds of India and Pakistan,** Vols 1-10 (1968-1974)

Birds said to occur in Bihar and Jharkand based on reliable sight records, on actual collection records by earlier ornithologist/ naturalist and also collection records from National Zoological Collection of Zoological Survey of India, are enlisted here.

Birds said to occur in Bihar and Jharkand from logical inference such as from distributional point of view, and not based on, as mention in para two above, have their accounts given in square brackets.

Family PODICIPEDIDAE

3. ***Podiceps cristatus cristatus*** (Linnaeus)
Great Crested Grebe

Winter visitor.

5. ***Podiceps ruficollis capensis*** Salvadori
Little Grebe

Resident.

Zoological Survey of India's Survey party collected bird (1948) from Manbhum District Jharkhand; 1 ♀ (16 Sept. 1973) from patna, Bihar.

Family PELECANIDAE

22. ***Pelecanus philippensis crispus*** Bruch
Dalmatian Pelican

Winter visitor.

Family PHALACROCORACIDAE

26. ***Phalacrocorax carbo sinensis*** (Shaw)
Large Cormorant

Resident. Inglish (1901-4) noted as scarce in Madhubani, Bihar.

27. ***Phalacrocorax fuscicollis*** Stephens
Indian Shag

Resident.

Inglish (1901-4) noted as scarce in Mdhubani, Bihar.

28. ***Phalacrocorax niger*** (Vieillot)
Little Cormorant

Resident.

Zoological Survey of India's Survey party collected 2♂ (1948) from Manbhum District Jharkhand and 1♀ (10 September, 1973) from Rajgir, Gaya District, Bihar.

29. ***Anhinga rufa melanogaster*** Pennant
Snake-bird

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Zoological Survey of India's Survey party collected the specimen from Hazaribagh, Jharkhand on 20th December, 1954.

Family ARDEIDAE

33. ***Ardea insignis*** Hume
Great Whitebellied Heron

Resident.

36. ***Ardea cinerea rectirostris*** Gould
Eastern Grey Heron

Resident.

Common in Madhubani Sub-division, Bihar (Inglish, 1901-4).

37. ***Ardea purpurea manilensis*** Meyen
Eastern Purple Heron

Resident.

Scarce, Inglish (1901-4) obtained one example from Madhubani, Bihar.

42. ***Ardeola grayii grayii*** (Sykes)
Indian Pond Heron

Resident.

Inglish (1901-4) noted it abundant in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 1♂ and 1♀ from Hazaribag (18th December, 1954) and 15th December, (1954); 2♂ from Ranchi (24th Feb. 1962 and 27th Feb. 1962) and 1♀ from Mandhum (13th November, 1948); 1♀ (1951) from Hazaribugh; 1 unsexed (1958) from Chaibassa, Jharkhand and 1♂, 1♀ (10 September, 1973) from Rajgir, Gaya District, Bihar.

44. ***Bubulcus ibis coromandus*** (Boddaert)
Cattle Egret

Resident.

Very common in Madhubani, Bihar (Inglish, 1901-4).

Zoological Survey of India's Survey party collected 1♂ bird from Bachhai, Hazaribagh, Jharkhand on 20th December, 1954 and 2♀ (1955) from Chaibassa District, Jharkhand.

46. ***Ardea alba modesta*** J. E. Gray
Eastern Large Egret

Resident.

Common in Madhubani, Dharbhanga, Trihut, Bihar (Inglish 1901-4).

47. ***Egretta intermedia intermedia*** (Wagler)
Median Egret

Resident.

Common in Madhubani, Darbhanga, Bihar. (Inglish, 1901-4).

49. ***Egretta garzetta garzetta*** (Linnaeus)
Little Egret

Resident.

Beavan (1865) noted it as abundant in Manbhoom District, Jharkhand.

Common in Madhubani and Trihut, Bihar, (Inglish, 1901-4).

Zoological Survey of India's Survey party collected one bird from Barakar, Dhanbad,

Jharkhand on 8th November, 1948, another bird from Manbhum, Jharkhand on 13th November, 1948 and 1 ♀ (1931) from Ranchi, Jharkhand.

52. ***Nycticorax nycticorax nycticorax*** (Linnaeus)
Night Heron

Resident.

Beavan (1865) noted it as common in Manbhum District, Jharkhand.

Common in Madhubani, Bihar (Inglish, 1901- 4).

56. ***Ixobrychus cinnamomeus*** (Gmelin)
Chestnut Bittern

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

57. ***Ixobrychus sinensis*** (Gmelin)
Yellow Bittern

Resident.

Scarce. Inglish (1901-4) obtained one example near Jainagar, Madhubani, Bihar.

58. ***Ixobrychus flavicollis flavicollis*** (Latham)
Black Bittern

Resident.

Scarce. Inglish (1901-4) obtained a pair near Baghownie, Madhubani, Bihar.

59. ***Botaurus stellaris stellaris*** (Linnaeus)
Bittern

Winter visitor.

Scarce. Inglish (1901-4) obtained two examples from Madhubani, Bihar.

Family CICONIIDAE

60. ***Mycteria leucocephala*** (Pennant)
Painted Stork

Resident.

Beavan collected a bird (1865) from Manbhum District, Jharkhand.

Scarce. Inglish (1901-4) obtained one example from Madhubani, Bihar.

61. ***Anastomus oscitans*** (Boddaert)
Openbill Stork

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

62. ***Ciconia episcopus episcopus*** (Boddaert)
Whitenecked Stork

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

63. ***Ciconia ciconia ciconia*** (Linnaeus)
White Stork

Winter visitor.

65. ***Ciconia nigra*** (Linnaeus)
Black Stork

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

66. ***Ephippiorhynchus asiaticus asiaticus*** (Latham)
Blacknecked Stork

Resident.

67. ***Leptoptilos dubius*** (Gmelin)
Adjutant Stork

Resident.

68. ***Leptoptilos javanicus*** (Horsfield)
Lesser Adjutant

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Family THRESKIORNITHIDAE

69. ***Threskiornis aethiopica melanocephala*** (Latham)
White Ibis

Resident.

Beavan collected (1865) one example from Manbhoom District, Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

70. ***Pseudibis papillosa papillosa*** (Temminck)
Indian Black Ibis

Resident.

Very common in Madhubani, Bihar (Inglish, 1901-4). Beavan collected one example (1865) from Manbhoom District Jharkhand.

72. ***Platalea leucorodia major*** Temminck & Schlegel
Spoonbill

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

73. ***Phoenicopterus roseus*** Pallas
Flamingo

Resident.

Family ANATIDAE

80. ***Anser erythropus*** (Linnaeus)
Lesser Whitefronted Goose

Winter visitor.

81 ***Anser anser rubrirostris*** Swinhoe
Eastern Greyleg Goose

Winter visitor.

82. ***Anser indicus*** (Latham)
Barheaded Goose

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

88. ***Dendrocygna javanica*** (Horsfield)
Lesser Whistling Teal

Resident.

Beavan (1865) noted it as abundant in Manbhoom District, Jharkhand.

Abundantly found in Madhubani and Trihut, Bihar (Inglish, 1901-4).

91 ***Tadorna tadorna*** (Linnaeus)
Brahminy Duck

Winter visitor.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

93. ***Anas acuta*** Linnaeus
Pintail

Winter visitor.

Very common in Madhubani and Trihut. Bihar (Inglish, 1901-4).

94. ***Anas crecca crecca*** Linnaeus
Common Teal

Winter visitor.

Beavan (1865) noted it as scarce in Manbhoom District, Jharkhand, very common in Madhuani and Trihut, Bihar (Inglish, 1901-4).

95. ***Anas formosa*** Georgi
Baikal Teal

Winter visitor.

97. ***Anas poecilorhyncha poecilorhyncha*** J. R. Forster
Spottbill Duck

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

100. ***Anas platyrhynchos*** Linnaeus
Mallard

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

101. ***Anas strepera strepera*** Linnaeus
Gadwall

Winter visitor.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

102. ***Anas falcata*** Georgi
Falcated Teal

Winter visitor.

Recorded from Tirhut, Darbhanga District, Bihar.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

103. ***Anas penelope*** Linnaeus
Wigeon

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

104. ***Anas querquedula*** Linnaeus
Garganey

Winter visitor.

Adundantly found in Madhubani and Trihut, Bihar (Inglish, 1901-4).

105. ***Anas clypeata*** Linnaeus
Shoveller

Winter visitor.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

Inglish collected one example (June, 1930) from Darbhanga District, Bihar.

107. ***Netta rufina*** (Pallas)
Redcrested Pochard

Winter visitor.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

108. ***Aythya ferina*** (Linnaeus)
Common Pochard

Winter visitor.

109. ***Aythya nyroca*** (Guldenstadt)
White-eyed Pochard

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

110. ***Aythya baeri*** (Radde)
Baer's Pochard

Winter visitor.

111 ***Aythya fuligula*** (Linnaeus)
Tufted Duck

Winter visitor.

Inglish (1901-4) obtained a pair from Madhubani, Bihar.

114. ***Nettapus coromandelianus coromandelianus*** (Gmelin)

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

115. ***Sarkidiornis melanotos melanotos*** (Pennant)
Comb Duck

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

118. ***Bucephala clangula clangula*** (Linnaeus)

Winter visitor.

119. ***Mergus albellus*** Linnaeus
Smew

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Family ACCIPITRIDAE

124. ***Elanus caeruleus vociferus*** (Latham)
Blackwinged Kite

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

130. ***Pernis ptilorhynchus ruficollis*** Lesson
Crested Honey Buzzard

Resident.

133. ***Milvus migrans govinda*** Sykes
Pariah Kite

Resident.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

135. ***Haliastur indus indus*** (Boddaert)
Brahminy Kite

Resident.

Very common in Madhubani and Trihut, Bihar.

138. ***Accipiter badius dussumieri*** (Temminck)
Indian Shikra

Resident.

Inglish (1901-4) noted as abundant in Madhubani, and Trihut, Bihar.

144. ***Accipiter trivirgatus indicus*** (Hodgson)
North Indian Crested Goshawk

Resident.

147. ***Accipiter nisus nisosimilis*** (Tickell)
Asiatic Sparoow-Hawk

Winter visitor.

148. ***Accipiter nisus melaschistos*** Hume
Indian Sparrow-Hawk

Resident.

Inglish (1901-4) obtained one example from Madhubani, Bihar.

150. ***Accipiter virgatus affinis*** Hodgson
East Himalayan Besra Sparrow-Hawk

Resident.

Very common in Madhubani and Trihun Bihar (Inglish, 1901-4).

Zoological Survey of India Survey party collected 1 ♀ (1931) from Ranchi, Jharkhand.

153. ***Buteo rufinus rufinus*** (Cretzschmar)
Longlegged Buzzard

Winter visitor.

157. ***Butastur teesa*** (Franklin)
White-eyed Buzzard Eagle

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

158. ***Spizaetus nipalensis nipalensis*** (Hodgson)
Hodgson's Hawk-Eagle

Resident.

Inglish (1901-4) noted a pair in Madhubani, Bihar.

161. ***Spizaetus cirrhatus cirrhatus*** (Gmelin)
Indian Crested Hawk-Eagle

Resident.

163. ***Hieraaetus fasciatus fasciatus*** (Vieillot)
Slender Hawk-Eagle

Resident.

164. ***Hieraaetus pennatus*** (Gmelin)
Booted Hawk-Eagle

Winter visitor.

Inglish (1901-4) noted one example from Madhubani, Bihar.

168. ***Aquila rapax vindhiana*** Franklin
Tawny Eagle

Resident.

Inglish (1901-4) obtained one example from Madhubani, Bihar.

170. ***Aquila clanga*** Pallas
Greater Spotted Eagle

Resident.

171 ***Aquila pomarina hastata*** (Lesson)
Lesser Spotted Eagle

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

172. ***Ictinaetus malayensis perniger*** (Hodgson)
Black Eagle

Resident.

174. ***Haliaeetus leucoryphus*** (Pallas)
Ringtailed Fishing Eagle

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

175. ***Ichthyophaga ichthyaetus ichthyaetus*** (Horsfield)
Greyheaded Fishing Eagle

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

177. ***Ichthyophaga nana plumbea*** (Jerdon)
Himalayan Greyheaded Fishing Eagle

Winter visitor.

178. ***Sarcogyps calvus*** (Scopoli)
Black Vulture

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

182. ***Gyps indicus indicus*** (Scopoli)
Indian Longbilled Vulture

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

185. ***Gyps bengalensis*** (Gmelin)
Indian Whitebacked vulture

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

187. ***Neophron percnopterus ginginianus*** (Latham)
Indian Scavenger Vulture

Resident.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

192. ***Circus melanoleucos*** (Pennant)
Pied Harrier

Winter visitor.

Inglish (1901-4) noted as common in Madhubani, Bihar.

193. ***Circus aeruginosus aeruginosus*** (Linnaeus)
Marsh Harrier

Winter visitor.

Very common in Madhubani and Trihut, Bihar (Inglish, 1901-4).

195. ***Circaetus gallicus gallicus*** (Gmelin)
Short-toed Eagle

Resident.

Inglish (1901-4) noted one in Madhubani, Bihar.

196. ***Spilornis cheela cheela*** (Latham)
Crested Serpent Eagle

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

203. ***Pandion haliaetus haliaetus*** (Linnaeus)
Osprey

Winter visitor.

Inglish (1901-4) found it common in Madhubani, Bihar.

Family FALCONIDAE

208. ***Falco biarmicus jugger*** J. E. Gray.
Laggar Falcon

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

211. ***Falco peregrinus peregrinator*** Sundewall
Shaheen Falcon

Resident.

Inglish (1901-4) procured one example from Madhubani, Bihar (Mr. Scroope's collection).

219. ***Falco chicquera chicquera*** Dandin
Redheaded Merlin

Resident.

Inglish (1901-4) procured 5 examples from Madhubani, Bihar.

National Zoological Collection have 1 ♀ (1891) from Gaya Dist., Bihar (Mus. Coll.)

221 ***Falco naumanni*** Fleischer
Lesser Kestrel

Winter visitor.

Sight record from Danapur District, Bihar.

222. ***Falco tinnunculus tinnunculus*** Linnaeus
European Kestrel

Winter visitor.

Zoological Survey of India's Party collected a specimen (1927) and 1 ♀ (27th Feb. 1962) from Ranchi, Jharkhand.

Family PHASIANIDAE

238. ***Francolinus francolinus asiae*** Bonaparte
Indian Black Partridge

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

245. ***Francolinus pondicerianus interpositus*** Hartert
North Indian Grey Partridge

Resident.

Beavan (1865) noted it as very common in Manbhoom District, Jharkhand.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 2 ♂ (1931) from Ranchi and 3 ♂, 1 ♀ (1951) from Hazaribagh, Jharkhand.

247. ***Francolinus gularis*** (Temminck)
Swamp Partridge

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar and obtained a pair.

250. ***Coturnix coturnix coturnix*** Linnaeus
Common Quail

Winter visitor.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

299. ***Gallus gallus murghi*** Robinson & Kloss
Red Jungle-fowl

Resident.

National Zoological Collection have 1 ♂ (1891) from Gaya District, Bihar (Mus. Coll.)

Family RALLIDAE

319. ***Turnix sylvatica dussumier*** (Temminck)
Little Bustard Quail

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

314. ***Turnix tanki tanki*** Blyth
Button Quail

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

329. ***Rallus striatus albiventor*** Swainson
Indian Bluebreasted Banded Rail

Resident.

337. ***Porzana pusilla pusilla*** (Pallas)
Eastern Baillon's Crake

Resident.

342. ***Amaurornis akool akool*** (Sykes)
Brown Crake

Resident.

Zoological Survey of India's Survey Party collected a specimen (28th November, 1972) from Madhubani, Jharkhand.

343. ***Amaurornis phoenicurus chinensis*** (Boddaert)
Chinese Whitebreasted Waterhen

Resident.

Inglish (1901-4) found it as abundant in Madhubani and Trihut, Bihar.

Zoological Survey of India's Survey party collected 1 ♀ (2nd September, 1973) from Rajgir, Gaya Dist., Bihar.

346. ***Gallicrex cinerea cinerea*** (Gmelin)
Watercock

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

347. ***Gallinula chloropus indica*** Blyth
Indian Moorhen

Resident.

Commonly found in Madhubani and Trihut, Bihar (Inglish, 1901-4).

349. ***Porphyrio porphyrio poliocephalus*** (Latham)
Indian Purple Moorhen

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

350. ***Fulica atra atra*** Linnaeus
Coot

Resident.

Beavan collected one example (1863) from Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani and Trihut, Bihar.

Family OTIDIDAE

357. ***Sypheotides indica*** (J. F. Miller)
Lesser Florican

Resident.

Inglish (1901-4) noted it in grassland near Baghownie and in some indigo field at Hatauri, Madhubani, Bihar.

Family JACANIDAE

358. ***Hydrophasianus chirurgus*** (Scopoli)
Pheasant-tailed Jacana

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

359. ***Metopidius indicus*** (Latham)
Bronzewinged Jacana

Resident.

Beavan collected one example (1864) from Manbhoom Dist., Jharkhand.

Abundantly found in Madhubani and Trihut, Bihar (Inglish, 1901-4).

Zoological Survey of India's Survey party collected 1♂ (loth september, 1973) from Rajgir, Gaya Dist, Bihar.

Family CHARADRIIDAE

362. ***Vanellus leucurus*** (Lichtenstein)
Whitetailed Lapwing

Winter visitor.

Inglish (1901-4) noted as common in Madhubani, Bihar.

363. ***Vanellus gregarius*** (Pallas)
Sociable Lapwing

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

364. ***Vanellus vanellus*** (Linnaeus)
Green Plover

Winter visitor.

365. ***Vanellus cinereus*** (Blyth)
Greyheaded Lapwing

Winter visitor.

366. ***Vanellus indicus indicus*** (Boddaert)
Redwattled Lapwing

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani and Trihut, Bihar.

Zoological Survey of India's Survey party collected a bird (1927) from Ranchi and 1♀ (27th Feb. 1962) from Dhanbad, Jharkhand.

369. ***Vanellus spinosus duvauceli*** (Lesson)
Spurwinged Lapwing

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

370. ***Vanellus malabaricus*** (Boddaert)
Yellow-wattled Lapwing

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

373. ***Pluvialis dominica fulva*** (Gmelin)
Eastern Golden Plover

Winter visitor.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

381. ***Charadrius alexandrinus alexandrinus*** Linnaeus
Kentish Plover

Winter visitor.

Inglish (1901-4) noted as common in Madhubani, Bihar.

383. ***Charadrius placidus*** J. E. Gray
Longbilled Ringed Plover

Winter visitor.

386. ***Numenius phaeopus phaeopus*** (Linnaeus)
Whimbrel

Winter visitor.

Inglish (1901-4) noted as scarce and obtained one example in the Maiser Chaur near Baghownie, Madhubani, Bihar.

388. ***Numenius arquata orientalis*** C. L. Brehm
Eastern Curlew

Winter visitor.

Scroope noted 5 examples near Madhubani, Bihar in 1899.

389. ***Limosa limosa limosa*** (Linnaeus)
Blacktailed Godwit

Winter visitor.

390. ***Limosa limosa melanuroides*** Gould
Eastern Blacktailed Godwit

Winter visitor.

392. ***Tringa eythropus*** (Pallas)
Spotted Redshank

394. ***Tringa totanus eurhinus*** (Oberholser)
Eastern Redshank

395. ***Tringa stagnatilis*** (Bechsyein)
Marsh Sandpiper

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

396. ***Tringa nebularia*** (Gunnerus)
Green Shank

Winter visitor.

397. ***Tringa ochropus*** (Linnaeus)
Green Sandpiper

Winter visitor.

Inglish (1901-4) noted as abundant in Madhubani, Bihar.

Zoological Survey of India's Survey party collected a bird (1931) from Ranchi, Jharkhand and 1 ♂ (4th Sept. 1973) from Patna, Bihar.

398. ***Tringa glareola*** Linnaeus
Spotted Sandpiper

Winter visitor.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

401. ***Tringa hypoleucos*** Linnaeus
Common Sandpiper

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 1 ♂ (6th December, 1948) from Manbhum Dist., Jharkhand.

404. ***Gallinago solitaria solitaria*** Hodgson
Eastern Solitary Snipe

Winter visitor.

Zoological Survey of India's Survey party collected 1 ♂ bird from Manbhum, Jharkhand on 6.12.1948.

405. ***Gallinago stenura*** (Bonaparte)
Pintail Snipe

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

409. ***Gallinago gallinago gallinago*** (Linnaeus)
Fantail Snipe

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

410. ***Gallinago minima*** (Brunnich)
Jack Snipe

Winter visitor.

Beavan (1865) noted it as abundant in Manbhum District, Jharkhand.

411. ***Scolopax rusticola rusticola*** (Linnaeus)
Woodcock

Winter visitor.

Inglish (1901-4) obtained one example at Tewarrah, Madhubani, Bihar.

416. ***Calidris minutus*** (Leisler)
Little Stint

Winter visitor.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

417. ***Calidris temminckii*** (Leisler)
Temminck's Stint

Winter visitor.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

418. ***Calidris subminuta*** (Middendorff)
Longtoed Stint

424. ***Limicola falcinellus falcinellus*** (Pontoppidan)
Broadbilled Sandpiper

426. ***Philomachus pugnax*** (Linnaeus)
Ruff and Reeve

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

428. ***Phalaropus lobatus*** (Linnaeus)
Rednecked Phalarope

Winter visitor.

Family ROSTRATULIDAE

429. ***Rostratula benghalensis benghalensis*** (Linnaeus)
Painted Snipe

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted it as rare in Madhubani, Bihar.

Family RECURVIROSTRIDAE

430. ***Himantopus himantopus himantopus*** (Linnaeus)
Indian Blackwinged Stilt

Resident.

National Zoological Collection have a specimen (1891) from Gaya Dist., Bihar (Mus. Coll.)

432. ***Recurvirostra avosetta*** Linnaeus
Avocet

Winter visitor.

Inglish (1901-4) reported a small flock near Benipati, Madhubani, Bihar (Scroope's report).

Family IBIDORHYNCHIDAE

433. ***Ibidorhyncha struthersii*** Vigors
Ibisbill

Resident.

Family BURHINIDAE

436. ***Burhinus oedicnemus indicus*** (Salvadori)
Indian Stone Curlew

Resident.

Beavan (1865) noted it as common in Manbhum Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani and Trihut, Bihar.

Zoological Survey of India's Survey party collected 1♂ (19th September, 1973) from Patna, Bihar.

437. ***Esacus magnirostris recurvirostris*** (Cuvier)
Great Stone Plover

Resident.

Family GLAREOLIDAE

440. ***Cursorius coromandelicus*** (Gmelin).
Indian Courser

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

National Zoological Collection have 1♀ (1891) from Gaya District, Bihar (Mus. Coll.).

443. ***Glareola pratincola maldivarum*** J.R. Froster
Large Indian Prantincole

Resident.

444. ***Glareola lactea*** Temminck
Small Indian Prantincole

Resident.

Beavan collected a single specimen (16th Feb. 1864) from the bank of Damodar River, Manbhoom District, Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Family LARIDAE

458. ***Chlidonias hybrida indica*** (Stephens)
Indian Whiskered Tern

Winter visitor.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

460. ***Gelochelidon nilotica nilotica*** (Gmelin)
Gullbilled Tern

Winter visitor.

461. ***Gelochelidon nilotica affinis*** (Horsfield)
Javan Gullbilled Tern

Winter visitor.

463. ***Sterna aurantia*** J. E. Gray
Indian River Tern

Resident.

465. ***Sterna hirundo tibetana*** Saunders
Tibetan Common Tern

Winter visitor.

470. ***Sterna acuticauda*** J. E. Gray
Blackbellied Tern

Resident.

475. ***Sterna albifrons*** Pallas
Little Tern

Winter visitor.

Family PTEROCLIDIDAE

492. ***Pterocles indicus indicus*** (Gmelin)
Painted Sandgrouse

Resident.

Family COLUMBIDAE

495. ***Treron curvirostra nipalensis*** (Hodgson)
Thickbilled Green Pigeon.

501. ***Treron bicincta bicincta*** (Jerdon)
Indian Orangebreasted Green Pigeon

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

503. ***Treron phoenicoptera phoenicoptera*** (Latham)
Bengal Green Pigeon

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's Survey party collecteed 1♂ (1955) from Chaibassa Dist., Jharkhand.

506. ***Ducula aenea sylvatica*** (Tickell)
Northern Green Imperial pigeon

Resident.

517. ***Columba livia intermedia*** (Strickland)
Indian Blue Rock Pigeon

Resident.

Inglish (1901-4) noted as very common in Madhubani and Trihut, Bihar.

518. ***Columba eversmanni*** Bonaparte
Eastern Rock pigeon

Winter visitor.

Inglish (1901-4) noted as common in Madhubani, Bihar.

524. ***Columba punicea*** Blyth
Purple Wood Pigeon

Resident.

Beavan (1864) noted a party of 4-5 birds in Manbhoom District, Jharkhand.

532. ***Streptopelia orientalis agricola*** (Tickell)
Eastern Turtle Dove

Winter visitor.

Zoological Survey of India's Survey party collected 1♂ (7th November 1955) from Chaibassa Dist., Jharkhand.

534. ***Streptopelia decaocto decaocto*** (Frivaldszky)
Indian Ring Dove

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Zoological Survey of India's Survey Party collected 2♂ (1927) from Ranchi and 1 unsexed (1951) from Hazaribagh, Jharkhand.

535. ***Streptopelia tranquebarica tranquebarica*** (Hermann)
Indian Red Turtle Dove

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist. Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

537. ***Streptopelia chinensis suratensis*** (Gmelin)
Indian Spotted Dove

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted it as abundant in Madhubani and Trihut, Bihar.

Zoological Survey of India's Survey party collected 1♂ (30.11 1948) from Manbhum and 1 (02.02.1955) from singbhum, Jharkhand.

541. ***Streptopelia senegalensis cambayensis*** (Gmelin)
Indian Little Brown Dove

Resident.

Beaven (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Zoological Survey of India's Survey party collected a bird (1931) from Ranchi, Jharkhand.

542. ***Chalcophaps indica indica*** (Linnaeus)
Indian Emerald Dove

Resident.

Zoological Survey of India's Survey Party collected 1♀ (Jan. 1991) from Valmiki Tiger Reserve, West Champaran Dist., Bihar.

Family PSITTACIDAE

545. ***Psittacula eupatria nipalensis*** (Hodgson)
Large Indian Parakeet

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar. Zoological Survey of India's Survey Party collected 1♂ (23 October, 1927) from Ranchi, Jharkhand.

549. ***Psittacula krameri borealis*** (Neumann)
Northern Roseringed Parakeet

Resident.

Beavan noted (1865) it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) collected five examples from Madhubani, Bihar.

Zoological Survey of India's Survey Party collected 1♀ bird (6th December, 1948) from Manbhum, Jharkhand.

551. ***Psittacula alexandri fasciata*** (P.L.S. Muller)
Indian Redbreasted Parakeet

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

557. ***Psittacula cyanocephala bengalensis*** (Forster)
Northern Blossomheaded Parakeet

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 1♂ (27th February, 1962) from Ranchi, Jharkhand and 1♀ (January,1991) From Valmiki Tiger Reserve, West Champaran Dist., Bihar.

Family CUCULIDAE

570. ***Clamator jacobinus serratus*** (Sparrman)
Pied Crested Cuckoo

Both Resident and Migratory.

V. Ball (1875) noted it as very common in Palamou (Levin), Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's Survey party collected a bird (28th April 1927) from Hazaribagh, Jharkhand and 1♂ (18th September, 1973) from Rajgir, Gaya Dist., Bihar.

573. ***Cuculus varius varius*** Vahl
Brainfever Bird

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

576. ***Cuculusmi cropterus micropterus*** (Gould)
Indian Cuckoo

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

578. ***Cuculus canorus canorus*** Linnaeus
Cuckoo

Both resident and migratory.

Inglish (1901-4) noted as abundant in Madhubani, Bihar.

580. ***Cuculus saturatus saturatus*** Blyth
Himalayan Cuckoo

Both resident and migratory.

582. ***Cacomantis soanneratii sonneratii*** (Latham)
Indian Beybanded Cuckoo

Resident.

584. ***Cacomantis passerinus*** (Vahl.)
Indian Plaintive Cuckoo

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

590. ***Eudynamys scolopacea scolopacea*** (Linnaeus)
Indian Koel

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as abundant in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 3♂ (10th September 1973) from Rajgir, Gaya Dist., Bihar.

593. ***Rhopodytes tristis tristis*** (Lesson)
Large Greenbilled Malkoha

Resident.

597. ***Taccocua leschenaultii infuscata*** Blyth
Eastern Sirkeer Cuckoo

Resident.

Beavan collected one example (1865) from Manbhoom Dist., Jharkhand.

V. Ball (1875) obtained single specimen from Palamou (Levin), Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

National Zoological Collection have 1 ♀ (1891) from Gaya Dist., Bihar (Mus. Coll.).

600. ***Centropus sinensis sinensis*** (Stephens)
Common Crow Pheasant

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

605. ***Centropus toulou bengalensis*** (Gmelin)
Lesser Coucal

Resident.

Inglish (1901-4) noted two examples from Madhubani, Bihar.

Family STRIGIDAE

606. ***Tyto alba stertens*** Hartert
Indian Barn Owl

Resident.

608. ***Tyto cpensis longimembris*** (Jerdon)
Grass Owl

Resdent.

616. ***Otus scops sunia*** (Hodgson)
North Indian Scops Owl

Resident.

621. ***Otus bakkamoena gangeticus*** Ticehurst
Gangetic Collared Scops Owl

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 1 ♀ (Jan. 1991) from Valmiki Tiger Reserve, West Champaran Dist, 1 ♂, 1 ♀ and 1 unsexed (October, 1994) from West Champaran Dist., Bihar.

627. ***Bubo bubo bengalensis*** (Franklin)
Indian Great Horned Owl

Resident.

Inglish (1901-4) collected one female from Madhubani, Bihar.

628. ***Bubo nipalensis nipalensis*** Hodgson
Forest Eagle Owl

Resident.

630. ***Bubo coromandus coromandus*** (Latham)
Dusky Horned Owl

Resident.

631. ***Bubo zeylonensis leschenault*** (Temminck)
Brown Fish Owl

Resident.

636. ***Glaucidium radiatum radiatum*** (Tickell)
Barred Jungle Owlet

Resident.

Zoological Survey of India's Survey Party collected 1 ♀ (23rd October, 1927) from Ranchi Jharkhand; 2 ♂, 1 ♀ (January, 1991) and 2 ♂ from West Champaran Dist., Bihar.

639. ***Glaucidium cuculoides cuculoides*** (Vigors)
West Himalayan Barred Owlet

Resident.

642. ***Ninox scutulata lugubris*** (Tickell)
Indian Brown Hawk - Owl

Resident.

Inglish (1901-4) noted as scarce and obtained 3 examples from Madhubani, Bihar.

650. ***Athene brama indica*** (Franklin)
Northern Spotted Owlet

Resident.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

Zoological Survey of India's Survey party collected a specimen (23rd October 1927) from Ranchi, 1 ♂ (1951) from Hazaribagh, Jharkhand and 1 ♂, 1 ♀ (18th September, 1973) from Rajgir, Gaya Dist., Bihar.

656. ***Strix ocellata grisescens*** Koelz
Northern Mottled Wood Owl

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

654-60. ***Strix leptogrammica indranee*** Sykes
Brown Wood Owl

Resident.

663. ***Asio otus otus*** (Linnaeus)
Long-eared Owl

Winter visitor.

Family CAPRIMULGIDAE

671. ***Caprimulgus indicus indicus*** (Latham)
Indian Jungle Nightjar

Resident.

Zoological Survey of India's Survey party collected 1 ♂ bird from Tholkabad, Singhbhum, Jharkhand on 2nd February, 1955.

675. ***Caprimulgus macrurus albonotatus*** (Tickell)
Indian Longtailed Nightjar

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Zoological Survey of India's Survey party collected 1 ♂ (May. 1993) from Bethiah. West Champaran Dist., Bihar.

680. ***Caprimulgus asiaticus asiaticus*** Latham
Indian Little Nightjar

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted one example of Madhubani, Bihar.

Zoological Survey of India's Survey party collected 4 ♂ (19 October, 1927) from Ranchi. Jharkhand.

Family APODIDAE

*692. ***Chaetura sylvatica*** (Tickell)
White-rumped Spinetail Swift

Resident.

V. Ball (1875) noted it as abundant on the Southern part of Chhotanagpur, Jharkhand.

703. ***Apus affinis affinis*** (J. E. Gray)
Indian House swift

Resident.

V. Ball (1875) noted it as common in Chhotanagpur, Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

707. ***Cypsiurus parvus batasiensis*** (J. E. Gray)
Indian Palm Swift

Resident.

Beavan collected one example (1864) from Manbhoom Dist., Bihar.

Inglish (1901-4) noted very common in Madhubani, Bihar.

709. ***Hemiprocne longipennis coronata*** (Tickell)
Crested Tree Swift

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Family TROGONIDAE

710. ***Harpactes fasciatus legerli*** (Koelz)
Central Indian Trogon

Resident.

Beavan collected one example (1865) from Manbhum Dist., Jharkhand.

Family ALCEDINIDAE

719. ***Ceryle rudis leucomelanura*** Reichenbach
Indian Pied Kingfisher

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

724. ***Alcedo atthis taprobana*** Kleinschmidt
Indian Smell Blue Kingfisher

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

730. ***Pelargopsis capensis capensis*** (Linnaeus)
Brwnheaded Storkbilled Kinghfisher

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

736. ***Halcyon smyrnensis fusca*** (Boddaert)
Indian whitebreasted Kingfisher

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

739. ***Halcyon pileata*** (Boddaert)
Blackcapped Kingfisher

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Family MEROPIDAE

748. ***Merops philippinus philippinus*** Linnaeus
Blue-tailed Bee-eater

Both resident and migratory.

V. Ball (1875) noted it in small parties on the banks of the Koel river in palamou (Levin), Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Zoological Survey of India's Survey party collected 1♂ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

750. ***Merops orientalis orientalis*** (Latham)
Indian Small Green Bee-eater

Resident.

Beavan collected (1865) one example (breeding) from Manbhoom District, Jharkhand.

Zoological Survey of India's survey party collected I unsexed bird (10th November, 1948) from Dhanbad; 1♂ (13.2.1952) from Singbhum and 1♂ (23 october, 1927) from Ranchi, Jharkhand.

753. ***Nyctyornis athertoni athertoni*** (Jardine & Selby)
Blue–bearded Bee-eater

Resident.

Family CORACIIDAE

755. ***Coracias benghalensis benghalensis*** (Linnaeus)
Northern Roller

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's Survey party collected a Specimen (1927) from Ranchi, Jharkhand.

Family UPUPIDAE

763. ***Upupa epops epops*** Linnaeus
European Hoopoe

Winter visitor.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

National Zoological Collection have a specimen (1891) from Gaya Dist., Bihar (Mus. Coll.).

Family BUCEROTIDAE

767. ***Tockus birostris*** (Scopoli)
Grey Hornbill

Resident.

Beavan (1865) noted it as not common in Manbhoom Dist., occassionally seen solitary, Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected a specimen (1927) from Ranchi and another (1955) from Chaibasa Dist., Jharkhand.

775. ***Anthracoceros coronatus coronatus*** (Boddaert)
Malabar Pied Hornbill

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Family CAPITONIDAE

780. ***Megalaima zeylonica caniceps*** (Franklin)
Northern Green Barbet

Resident.

Beavan (1865) noted it as common in Madhubani Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected a specimen (1931) from Ranchi 1♂ (22nd Feb. 1962) from Ranchi and 1♂ from Singbhum, Jharkhand.

784. ***Megalaima lineata hodgsoni*** (Bonaparte)
Assam Lineated Barbet

Resident.

Zoological Survey of India's survey party collected 1♀ (January, 1991) from Valmiki Tiger Reserve, West Champaran Dist, Bihar.

787. ***Megalaima franklinii franklinii*** (Blyth)
Golden-throated Barbet

Resident.

788. ***Megalaima asiatica asiatica*** (Latham)
Blue-throated Barbet

Resident.

788. ***Megalaima haemacephala indica*** (Latham)
Coppersmith

Resident.

Inglish (1901-4) noted as abundant in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1♂ (22 Fed. 1962) from Ranchi, Jharkhand.

Family PICIDAE

796. ***Jynx torquilla torquilla*** Linnaeus
European Wryneck

Winter visitor.

Beavan collected one example (1864) from Manbhoom Dist., Jharkhand.

V. Ball (1875) noted it as very rare and obtained one example from palamou (Levin), Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

798. ***Picumnus innominatus innominatus*** Burton
Northern Speckled Piculet

Resident.

803. ***Micropternus brachyurus phaioceps*** Blyth
Eastern Rufous Woodpecker

Resident.

Beavan collected 1♀ (1864) from Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

807. ***Picus squamatus squamatus*** (Vigors)
Himalayan Scaly-bellied Green Woodpecker

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

808. ***Picus myrmecophoneus*** Streseman
Little Scalybellied Green Woodpecker

Resident.

813. ***Picus flavinucha flavinucha*** Gould
Eastern Large Yellow-naped Woodpecker

Resident.

815. ***Picus chlorolophus chlorolophus*** Vicillot
East Himalayan Small Yellownaped Woodpecker

Resident.

819. ***Dinopium benghalensis benghalensis*** (Linnaeus)
Northern Goldenbacked Woodpecker

Resident.

Zoological Survey of India's survey party collected 1 ♂ (8th Feb. 1948) from Manbhum Dist., Jharkhand and 1 ♂ (4th Seotember, 1975) from Patna, Bihar.

842. ***Picoides auriceps incognitus*** (Scully)
Nepal Brownfronted Pied Woodpecker

Resident.

845. ***Picoides macei macei*** (Vieillot)
Indian Fulvousbreasted Pied Woodpecker

Resident.

Zoological Survey of India's survey party collected 1 ♀ (19th October, 1927) from Ranchi, Jharkhand; 1 ♀ (October, 1994) from Manguraha, West Champaran Dist., Bihar.

*847. ***Picoides mahrattensis mahrattensis*** (Latham)
Yellow fronted Pied Woodpecker

Resident.

Beavan (1865) noted it as common in Manbhoom Dist, Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Zoological Survey of India's survey party collected a specimen (19th October, 1927) from Ranchi, Jharkhand; 1 ♀ (October, 1994) from Manguraha, West Champaran Dist., Bihar.

851 ***Picoides nanus nanus*** (Vigors)
Northern Browncrowned Pigmy Woodpecker

Resident.

*861. ***Chrysocolaptes lucidus guttacristatus*** (Tickell)
Eastern Larger Goldenbacked Woodpecker

Resident.

Zoological Survey of India's survey party collected 1 ♂ (6th February, 1955) from Singbhum Dist., Jharkhand.

Order PASSERIFORMES

Family PITTIDAE

867. ***Pitta brachyura brachyura*** (Linnaeus)
Indian Pitta

Breeding.

869. ***Pitta sordida cucullata*** Hartlaub.
Hooded Pitta

Resident.

Family ALAUDIDAE

872. ***Mirafra javanica cantillans*** Blyth
Singing Bush Lark

Resident.

873. ***Mirafra assamica assamica*** Horsfield
Bengal Bush Lark

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

877. ***Mirafra erythroptera erythroptera*** Blyth
Red-winged Bush Lark

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

National Zoological Collection have a specimen (1891) from Gaya Dist., Bihar (Mus. Coll.).

Zoological Survey of India's survey party collected 1 ♂ (23rd October, 1927) from Ranchi, Jharkhand.

878. ***Eremopterix grisea*** (Scopoli)
Ashycrowned Finch-Lark

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♂, 1 ♀ (1927) and 1 ♂, 1 ♀ (1931) from Ranchi, Jharkhand.

882. ***Ammomanes phoenicurus phoenicurus*** (Franklin)
Indian Rufoustailed Finch Lark

Resident.

National Zoological Collection have 1 ♂ (1891) from Gaya Dist., Bihar (Mus. Coll.)

885. ***Calandrella cinerea longipennis*** (Eversmann)
Yarkand Short-toed Lark

Winter visitor.

Inglish (1901-4) reported small flock in winter in Madhubani, Bihar.

886. ***Calandrella cinerea dukhunensis*** (Sykes)
Rufous Short-toed Lark

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

887. ***Calandrella acutirostris acutirostris*** Hume
Hume's Short-toed Lark

Winter visitor.

891 ***Calandrella raytal raytal*** (Blyth)
Ganges Sand Lark

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

899. ***Galerida cristata chendoola*** (Franklin)
Indian Crested Lark

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

902. ***Galerida deva*** (Sykes)
Sykes's Crestedlark

Resident.

Not seen by Inglish (1901-4) but Blanford. gave it distribution in Bihar.

903. ***Alauda arvenis dulcivox*** Brooks
West Siberian Skylark

Winter visitor.

904. ***Alauda gulgula inconspicus*** Severtzov
Turkesten Small Skylark

Resident.

Inglish (1901-4) noted as common.

907. ***Alauda gulgula gulgula*** Franklin
Indian Small Skylark

Resident.

Family HIRUNDINIDAE

910. ***Riparia riparia diluta*** (Sharpe & Wyatt)
Siberian Collared Sand Martin

Winter visitor.

Not seen by Inglish (1901-4).

914. ***Hirundo concolor concolor*** Sykes
Dusky Crag Martin

Resident.

925. ***Hirundo daurica nipalensis*** Hodgson
Red-rumped Swallow

Resident.

Beavan collected one example (1864) from Rognathpore and another (1865) from Ambekanaggur, Manbhoom Dist., Jharkhand.

931 ***Delichon urbica cashmeriensis*** (Gould)
Kashmir House Martin

Resident.

Family LANIIDAE

940. ***Lanius vittatus vittatus*** Valenciennes
Indian Bay-backed Shrike

Resident.

National Zoological Collection have 1♂ (1891) from Gaya Dist., Bihar (Mus. Coll.).

Zoological Survey of India's survey party collected 3♂, 2♀ (1927) from Ranchi, Jharkhand.

945. ***Lanius tephronotus tephronotus*** (Vigors)
Eastern Tibet Grey-backed Shrike

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

948. ***Lanius schach tricolor*** (Hodgson)
Blackheaded Shrike

Resident.

Zoological Survey of India's survey party collected 1♂ (1951) from Hazaribagh, Jharkhand.

949. ***Lanius cristatus cristatus*** Linnaeus
Brown Shrike

Winter visitor.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as abundant in Madhubani, Bihar.

Zoological Survey of India's survey party collected 2♂ (1927) from Ranchi and 1♂ from Manbhum Dist., Jharkhand

Family ORIOLIDAE

953. ***Oriolus oriolus kundoo*** Sykes
Indian Golden Oriole

Resident

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's survey party collected a bird (1927) from Ranchi, Jharkhand.

958. 959. ***Oriolus xanthornus xanthornus*** (Linnaeus)
North Indian Black-headed Oriole

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1♂ (1931) from Ranchi, 1♂ (1947) from Mongyar, Jharkhand and 1♂ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

Family DICRURIDAE

962. ***Dicrurus adsimilis albirictus*** (Hodgson)
North Indian Black Drongo

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Zoological Survey of India's survey party collected 1 ♀ (January 1991) from Valmiki Tiger Reserve, West Champaran District, Bihar.

967. ***Dicrurus caerulescens caerulescens*** (Linnaeus)
Indian White-bellied Drongo

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♀ (23 October, 1927) from Ranchi, Jharkhand; 1 ♀ (May, 1993) and 2 ♂ (October, 1994) from West Champaran Dist., Bihar.

970. ***Dicrurus annectans*** (Hodgson)
Crow-billed Drongo

Resident.

971. ***Dicrurus aeneus aeneus*** (Vieillot)
Bronzed Drongo

Resident.

973. ***Dicrurus hottentottus hottentottus*** (Linnaeus)
Haircrested Drongo

Resident.

Beavan, (1865) noted it as common in Manbhoom Dist., Jharkhand. B. Vall (1875) noted a pair and collected 1 ♂ from southern Chhotanagpur, Jharkhand.

Zoological Survey of India's survey party collected 1 ♀ 1 unsexed (October, 1994) from Manguraha, West Champaran District, Bihar and 1 ♀ (1st February, 1955) from Singbhum, Jharkhand.

976. ***Dicrurus paradiseus grandis*** (Gould)
Northern Large Racket-tailed Drongo

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand. Inglish (1901-4) found only 2 (Two) examples.

Zoological survey of India's Survey party collected 1 ♂ (January, 1991) from Valmiki Tiger Reserve, West Champaran Dist., Bihar.

Family ARTAMIDAE

982. ***Artamus fuscus*** Vieillot
Ashy Swallow-Shrike

Resident.

V. Ball (1875) noted it as common and noted a large flock in Singhbhum Dist., and shot some specimens and also noted it in Palamou, Jharkhand.

Family STURNIDAE

987. ***Sturnus malabaricus malabaricus*** (Gmelin)
Greyheaded Myna

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♂ (19th October, 1927), 1 unsexed (23rd October, 1927) from Ranchi, Jharkhand; 1 ♂ (May, 1993) from Bethiah, West Champaran Dist.-Bihar.

994. ***Sturnus pagodarum*** (Gmelin)
Brahminy Myna

Resident.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

996. ***Sturnus roseus*** (Linnaeus)
Rosy Pastor

Winter visitor.

Beavan noted an enomous flocks in (1864) in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1002. ***Sturnus contra contra*** Linnaeus
Indian Pied Myna

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand. Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

Zoological Survey of India's survey party collected 1 ♂ (24th May, 1949) from Manbhum, 1 ♀ (28th Jan, 1955) from Ranchi and one specimen (1955) from Chaibassa Dist., Jharkhand.

1006. ***Acridotheres tristis tristis*** (Linnaeus)
Indian Myna

Resident.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

Zoological Survey of India's survey party collected a specimen (23rd October, 1927) from Ranchi and 1 ♂ (1927) from Manghyr, Jharkhand.

1008. ***Acridotheres ginginianus*** (Latham)
Bank Myna

Resident.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

1009. ***Acridotheres fuscus fuscus*** (Wagler)
Northern Jungle Myna

Resident.

Inglish (1901-4) noted as abundant in Madhubani and Tribut, Bihar.

1015, 1017. ***Gracula religiosa intermedia*** A. Hay
Northern Hill Myna

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Family CORVIDAE

1022. ***Garrulus lanceolatus*** Vigors
Blackthroated Jay

Resident.

1032. ***Dendrocitta vagabunda vagabunda*** (Latham)
North eastern Tree pie

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dost., Jharkhand. Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♂ (1955) from Chaibassa Dist., Jharkhand and 1 ♀ (16th September, 1973) from Rajgir, Gaya Dist., Bihar.

1047. ***Pyrrhocorax pyrrhocorax himalayanus*** (Gould)
East Himalayan Redbilled Chough

Resident.

1049. ***Corvus splendens splendens*** Vieillot
Indian House Crow

Resident.

Inglish (1901-4) noted as abundant in Madhubani, Bihar.

1055. ***Corvus macrorhynchos levaillantii*** Lesson
Eastern Jungle Crow

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Family CAMPEPHAGIDAE

1064. ***Hemipus picatus capitalis*** (Horsfield)
Brownbacked Pied Flycatcher-Shrike

Resident.

1067. ***Tephrodornis virgatus pelvica*** (Hodgson)
Nepal Wood-Shrike

Resident.

1070. ***Tephrodornis pondicerianus pondicerianus*** (Gmelin)
Indian Wood Shrike

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

National Zoological Collection have 1♂ (1891) from Gaya Dist., Bihar (Mus. coll.).

Zoological Survey of India's survey party collected 1♂ (1931) from Ranchi and 1♂ (1951) from Hazaribag, Jharkhand.

1072. ***Coracina novaehollandiae macei*** (Lesson)
Indian Large Cuckoo-Shrike

Resident.

Zoological Survey of India's survey of party collected 1♂ (1948) from Manbhum Dist., Jharkhand.

1078. ***Coracina melanoptera melanoptera*** (Ruppell)
Himalayan Blackheaded Cuckoo-Shrike

Breeding.

1083. ***Pericrocotus flammeus semiruber*** (Whistler & Kinnear)
East Indian Scarlet Minivet

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1089. ***Pericrocotus roseus roseus*** (Vieillot)
Rosy Minivet

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1091. ***Pericrocotus cinnamomeus peregrinus*** (Linnaeus)
Northern Small Minivet

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1♂ (23rd October, 1927), 2♂ (1931) from Ranchi, Jharkhand.

1096. ***Pericrocotus erythropygius erythropygius*** (Jerdon)
Whitebellied Minivet

Resident.

During Beavan's survey (1865), Hume collected a bird from Trihut., North Bihar.

V. Ball (1875) noted a small party and collected one example from Chhotanagpur, Jharkhand.

Inglish (1901-4) noted Oate's record.

Family IRENIDAE

1098. ***Aegithina tiphia humei*** Baker
Central Indian Iora

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected a bird (1931) from Ranchi and 2♂ (1951) from Hazaribag, Jharkhand.

1102. ***Aegithina nigrolutea*** (Marshall)
Marshall's Iora

Resident.

1103. ***Chloropsis aurifrons arifrons*** (Temminck)
Northern Goldfronted Chloropsis

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Zoological Survey of India's survey party collected 2♂ (1927) from Ranchi, Jharkhand.

1107. ***Chloropsis cochinchinensis jerdoni*** (Blyth)
Jerdon's Chloropsis

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Zoological Survey of India's survey party collected 2♂ (1927) from Ranchi, Jharkhand.

Family PYCNONOTIDAE

1118. ***Pycnonotus jocosus pyrrhotis*** (Bonaparte)
Kumaon Red-whiskered Bulbul

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's survey party collected a bird (1955) from Chaibassa dist., Jharkhand and 3♂, 4♀ (January, 1991) from Valmiki Tiger Reserve, West Champaran Dist., Bihar.

1131 ***Pycnonotus cafer bengalensis*** Blyth
Bengal Redvented Bulbul

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected a bird (1955) from Chaibassa dist., Jharkhand and 3♂, 2♀ (Jan, 1991); 1♀ (October, 1994) from Manguraha, West Champaran Dist., Bihar.

1140. ***Criniger flaveolus flaveolus*** (Gould)
White-throated Bulbul

Resident.

Family MUSCICAPIDAE

1154. ***Pellorneum ruficeps ruficeps*** Swainson
Peninsular Spotted Babbler

Resident.

Zoological Survey of India's survey party collected 1♂ and 1♂ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

1178. ***Pomatorhinus ruficollis ruficollis*** (Hodgson)
Nepal Rufous-necked Scimiter Babbler

Resident.

1222. ***Dumetia hyperythra hyperythra*** (Franklin).
Rufous-bellied Babbler

Resident.

Beavan collected one example (1864) from Manbhoom Dist., Jharkhand.

1228. ***Macronous gularis rubricapilla*** (Tickell)
Yellowbresated Babbler

Resident.

Beavan collected one example (1865) from Manbhoom Dist., Jharkhand.

1231 ***Chrysomma sinense sinense*** (Gmelin)
Redcapped Babbler

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Zoological Survey of India's survey party collected 1♂ (1951) from Hazaribagh, Jharkhand and 3♂, 1♀ (Jan., 1991) from Valmiki Tiger Reserve; 1♂, 1♀ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

1254. ***Turdoides caudatus caudatus*** (Dumont)
Common Babbler

Resident.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1256. ***Turdoides earlei earlei*** (Blyth)
Striated Babbler

Resident.

1265. ***Turdoides striatus striatus*** (Dumont)
Bengal Jungle Babbler

Resident.

Zoological Survey of India's survey party collected one bird (2nd February, 1962) from Singhbhum another (18th February, 1962) from Ranchi, Jharkhand and 1♂ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

1277. ***Garrulax pectoralis pectoralis*** (Gould)
Nepal Blackgorgeted Laughingthrush

Resident.

1283. ***Garrulax leucolophus leucolophus*** (Hardwicke)
Himalayan White-crested Laughingthrush

Resident.

1290. ***Garrulax variegatus variegatus*** (Vigors)
Eastern Variegated Laughingthrush

Resident.

1994. ***Garrulax rufogularis rufogularis*** (Gould)
Rufous-chinned Laughingthrush

Resident.

1299. ***Garrulax ocellatus ocellatus*** (Vigovs)
White Spotted Laughingthrush

Resident.

1315. ***Garrulax lineatus setafer*** (Hodgson)
Nepal Streaked Laughingthrush

Resident.

1319. ***Garrulax squamatus*** (Gould)
Blue-winged Laughingthrush

Resident.

1322. ***Garrulax affinis affinis*** Blyth
Western Blackfaced Laughingthrush

Resident.

1325. ***Garrulax erythrocephalus kali*** Vaurie
Nepal Redheaded Laughingthrush

Resident.

1333, 1334. ***Leiothrix argentauris argentauris*** (Hodgson)
Himalayan Silver-eared Mesia

Resident.

1338. ***Myzornis pyrrhoura*** Blyth
Firetaitled Myzornis

Resident.

1339. ***Cutia nipalensis nipalensis*** (Hodgson)
Nepal Cutia

Resident.

1343. ***Pteruthius xanthochlorus xanthochlorus*** Gray
Eastern Green Shrike-Babbler

Resident.

1345. ***Pteruthius melanotis melonotis*** Hodgson
Chestnut-throated Shrike-Babbler

Resident.

1352. ***Actinodura nipalensis nipalensis*** (Hodgson)
Nepal Hoary Barwing

Resident.

1357. ***Minla ignotincta ignotincta*** (Hodgson)
Red-tailed Minla

Resident.

1362. ***Minla cyanouroptera cyanouroptera*** (Hodgson)
Blue-winged Siva

Resident.

1366. ***Yuhina bakeri*** Rothschild
White-naped Yuhina

Resident.

1368,1369. ***Yuhina flavicollis flavicollis*** Hodgson
Eastern Yellow-naped Yuhina

Resident.

1374. ***Yuhina nigrimenta nigrimenta*** Hodgson
Blackchinned Yuhina

Resident.

1378. ***Alcippe cinerea*** (Blyth)
Yellow-throated Tit-Babbler

Resident.

1379. ***Alcippe castaneceps castaneceps*** (Hodgson)
Chestunt-headed Tit-Babbler

Resident.

1381. ***Alcippe vinipectus vinipectus*** (Hodgson)
Nepal Whitebrowed Tit-Babbler

Resident.

1392, 1393. ***Alcippe nipalensis nipalensis*** (Hodgson).
Nepal Quaker Babbler

Resident.

1398. ***Heterophasia capistrata bayleyi*** (Kinnear)
Eastern Blackcapped Sibia

Resident.

1409. ***Muscipapa ruficauda*** Swainson
Rufoustailed Flycatcher

Breeding.

Beavan (1865) collected one example from Madhupur, E. Bihar.

1410. ***Muscicapa ferruginea*** (Hodgson)
Ferruginous Flycatcher

Breeding.

1412. ***Muscicapa parva albicilla*** Pallas
Eastern Redbreasted Flycatcher

Winter visitor.

Beavan (1865) collected one example from Darbhanga Dist., Bihar.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Zoological Survey of India's survey party collected 2♂ (1927, 1931) from Ranchi, Jharkhand and 1♂ (January, 1991) 2♂, 2♀ and 2 unsexed (October, 1994) from West Champaran Dist., Bihar.

1417. ***Muscicapa hyperythra hyperythra*** Blyth
Rufousbreasted Blue flycatcher

Resident.

1419. ***Muscicapa westermanni collini*** Rothschild
Western Little Pied Flycatcher

Winter visitor.

Beavan (1865) collected one example from Manbhoom District, Jharkhand.

1421. ***Muscicapa superciliaris superciliaris*** Jerdon
Whitebrowed Blue Flycatcher

Winter visitor.

V. Ball (1875) noted it as common in Chhotanagpur and obtained it from Daltonganj (Levir's coll)., Jharkhand.

Inglish (1901-4) obtained one example only.

1428. ***Muscicapa grandis grandis*** (Blyth)
Large Niltava

Resident.

1429. ***Muscicapa macgrigoriae macgrigoriae*** Burton
Western Small Niltava

Resident.

Zoological Survey of India's Survey party collected 1♀ (1948) from Manbhum Dist., Jharkhand.

1432. ***Muscicapa sundara sundara*** (Hodgson)
Eastern Rufousbellied Niltava

Resident.

1436. ***Muscicapa poliogenys poliogenys*** (Brooks)
Western Brooks Flycatcher

Resident.

Zoological Survey of India's survey party collected 1♂ (January, 1991) from Valmiki Tiger Reserve, West Champaran Dist, and 1♀ (October, 1994) from Manguraha, West Champaran Dist., Bihar.

1440. ***Muscicapa rubeculoides rubeculoides*** (Vigors)
Blue-throated Flycatcher

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1442. ***Muscicapa tickelliae tickelliae*** (Blyth)
Tickell's Redbreasted Blue Flycatcher

Resident.

Type locality.

Zoological Survey of India's Survey party collected 1♀ (1931) from Ranchi, Jharkhand.

1445. ***Muscipapa thalassina thalassina*** Swainson
Verditer Flycatcher

Winter visitor.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as common in winter in Madhubani, Bihar.

1448. ***Culicipapa ceylonensis calochrysea*** Oberolser
Northern Greyheaded Flycatcher

Breeding.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1♂ (January, 1991) from Valmimi Tiger Reserve and 1♂ (October, 1994) from Manguraha, West Champaran District, Bihar.

1451. ***Rhipidura aureola aureola*** Lesson
Northern Whitebrowed Fantail Flycatoher

Resident.

1455. ***Rhipidura albicollis albicollis*** (Vieillot)
Eastern Whitethroated Fantail Flycatcher

Resident.

Zoological Survey of India's survey party collected 2♂ (January, 1991) from Valmiki Tiger Reserve, West Champaran Dist., Bihar.

1460. ***Terpsiphone paradisi leucogaster*** (Swainson)
West Himalayan Paradise Flycatcher

Winter visitor.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

V. Ball (1875) noted it as seasonal migrant and also noted in April in Palamou (Levin) Jharkhand.

Inglish (1901-4) noted as common in breeding in Madhubani, Bihar.

1465. ***Monarcha azurea styani*** (Hartlaub)
Indian Blacknaped Monarch Flycatcher

Resident.

Inglish (1901-4) noted as scare in Madhubani, Bihar.

Zoological Survey of India's survey party collected a specimen (1931) from Ranchi, Jharkhand.

1471 *Tesia cyaniventer* Hodgson
Yellowbrowed Ground Warbler

Resident.

1474. *Cettia pallidipes pallidipes* (Blanford)
Indian Palefooted Bush Warbler

Resident.

1486. *Cettia brunnifrons brunnifrons* (Hodgson)
Eastern Rufouscapped Bush warbler

Winter visitor.

1497. *Cisticoea exilis tytleri* Jerdon
Yellowheaded Fantail Warbler

Resident.

1498. *Cisticola juncidis cursitans* (Franklin)
Streaked Fantail Warbler

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1503. *Prinia hodgsoni hodgsoni* Blyth
Franklini's Ashy-grey Wren-warbler

Resident.

Type locality.

1506. *Prinia buchanani* Blyth
Rufousfronted Wren-warbler

Resident.

1507. *Prinia cinereocapilla* Hodgson
Hodgson's Wren-warbler

Resident.

1508. *Prinia gracilis lepida* Blyth
Indian Streaked Wren-warbler

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

1511 *Prinia subflava inornata* Sykes
Central Indian Plain Wren-warbler

Resident.

V. Ball (1975) obtained it from Palamou (Levin), Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1512. *Prinia subflava fusca* (Hodgson)
Eastern Plain Wren-warbler

Resident.

1515. *Prinia socialis stewarti* Blyth
Northern Ashy Wren-warbler

Resident.

1519. *Prinia sylvatica gangetica* (Blyth)
Gangetic Jungle Wren-warbler

Resident.

1525. *Prinia flaviventris flaviventris* (Delessert)
Assam Yellowbellied Wren-warbler

Resident.

1529. *Prinia atrogularis atrogularis* (Moore)
Himalayan Blackthroated Hill Warbler

Resident.

1532. *Prinia burnesii cinerascens* (Walden)
Eastern Longtailed Grass warbler

Resident.

1536. *Orthotomus sutorius patia* Hodgson
Bengal Tailor Bird

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 2♂ (May, 1993) from Bethiah, West Champaran Dist., and 1♀ (October, 1994) from Manguraha, West Champaran Dist., Bihar.

1548. ***Megalurus palustris toklao*** (Blyth)
Striated Marsh Warbler

Resident.

1549. ***Phragamaticola aedon aedon*** (Pallas)
Thickbilled Warbler

Winter visitor.

1556. ***Acrocephalus dumetorum*** Blyth
Blyth's Reed warbler

Winter visitor.

Inglish (1901-4) noted as very common in winter in Madhubani, Bihar.

National Zoological Collection have 1♂ (1891) from Gaya Dist., Bihar (Mus. Coll.).

1558. ***Acrocephalus agricola capistrata*** (Severtzov)
Northern Paddyfield Warbler

Winter visitor.

1565. ***Sylvia hortensis jerdoni*** (Blyth)
Eastern Orphean Warbler

Winter visitor.

Beavan collected one example (1864) and noted (1865) it as scarce in Manbhoom Dist., Jharkhand.

Inglish's Taxidermist shot one specimen on 27.2.1898.

1575. ***Phylloscopus collybita tristis*** Blyth
Brown Chiffchaff

Winter visitor.

Inglish (1901-4) collected two examples.

1579. ***Phylloscopus affinis affinis*** (Tickell)
Tickell's Leaf warbler

Winter visitor.

Inglish (1901-4) noted as common in Madhubani, Bihar.

National Zoological Collection have 2♂ (1891) from Gaya Dist., Bihar (Mus., coll.).

1581. ***Phylloscopus griseodus*** Blyth
Olivaceous Leaf warbler

Winter visitor.

1586. ***Phylloscopus fuscatus fuscatus*** (Blyth)
Siberian Dusky Leaf-warbler

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1590. ***Phylloscopus inornatus humei*** (Brooks)
Hume's Yellowbrowed Leaf-warbler

Winter visitor.

1599. ***Phylloscopus maculipennis maculipennis*** (Blyth)
Eastern Greyfaced Leaf-warbler

Winter vistor.

1602. ***Phylloscopus trochiloides viridanus*** Blyth
Western Greenish Leaf-warbler

Winter visitor.

Inglish (1901-4) noted as common in Madhubani, Bihar.

National Zoological Collection have 1♀ (1891) from Gaya Dist., Bihar (Mus. coll.).

1604. ***Phylloscopus trochiloides trochiloides*** (Sundevall)
Eastern Greenish Leaf-warbler

Winter visitor.

1605. ***Phylloscopus trochiloides nitidus*** Blyth
Bright Green Leaf-warbler

Winter visitor.

1606. ***Phylloscopus occipitalis occipitalis*** (Blyth
Large Crowned Leaf-warbler

Winter visitor.

1608. ***Phylloscopus reguloides kashmiriensis*** Ticehurst
Small Crowned Leaf-warbler

Resident.

1612. ***Phylloscopus cantator cantator*** (Tickell)
Yellowfaced Leaf-warbler

Winter visitor.

Type locality.

1615. ***Seicercus burkii burkii*** (Burton)
Eastern Blackbrowed Flycatcher-warbler

Winter visitor.

1617. ***Seicercus xanthoschistos xanthoschistos*** (Gray)
Nepal Greycheeked Flycatcher-warbler

Resident.

1620. ***Seicercus poliogenys*** (Blyth)
Greyheaded Flycatcher-warbler

Winter visitor.

1621. ***Seicercus castaniceps castaniceps*** (Hodgson)
Chestnut-headed Flycatcher-warbler

Resident.

1622. ***Abroscopus superciliaris flaviventris*** (Jerdon)
Sikkim Yellowbellied Flycatcher-warbler

Resident.

1624. ***Abroscopus schisticeps schisticeps*** (Gray)
Nepal Blackfaced Flycatcher-warbler

Resident.

1626. ***Abroscopus albogularis albogularis***
(Horsfield & Moore)
White-throated Flycatcher-warbler

Resident.

1629. ***Regulus regulus himalayensis*** Bonaparte
Himalayan Goldcrest

Resident.

1639. ***Brachypteryx leucophrys nipalensis*** Hodgson
Lesser Shortwing

Resident.

1640. ***Brachypteryx montana cruralis*** (Blyth)
Whitebrowed Shortwing

Resident.

1643. ***Erithacus calliope*** (Pallas)
Rubythroat

Winter visitor.

1655. ***Erithacus cyanurus rufilatus*** (Hodgson)
Eastern Redflanked Bush Robin

Winter visitor.

1658. ***Erithacus chrysaeus chrysaeus*** (Hodgson)
Eastern Golden Bush Robin

Winter visitor.

1661, 1663. ***Copsychus saularis saularis*** (Linnaeus)
Indian Magpie-Robin

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1♂ (May, 1993) from Ranchi, Jharkhand; 1♀ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

1667 ***Copsychus malabaricus indicus*** (Baker)
Indian Shama

Resident.

Beavan (1865) noted it as common in Manbhoom Dist., Jharkhand.

Only one specimen was obtained by Inglish.

Zoological Survey of India's survey party collected 1♂ (January, 1991) from Valmiki Tiger Reserve and 2♀ (October, 1994) from Manguraha, West Champaran Dist., Bihar.

1672. ***Phoenicurus ochruros rufiventris*** (Vieillot)
Eastern Black Redstart

Winter visitor.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in winter in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♀ (23rd October, 1927) from Ranchi, Jharkhand.

1692. ***Cercomela fusca*** (Blyth)
Brown Rock Chat

Resident.

Type locality.

National Zoological Collection have 1 ♂ (1891) from Gaya Dist, Bihar (Mus. Coll.).

1694. ***Saxicola insignis*** Gray
Hodgson's Bush Chat

Winter visitor.

It was not obtained by Inglish, but Hodgson obtained.

1695. ***Saxicola torquata maura*** (Pallas)
Stone Chat

Winter visitor.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1699. ***Saxicola leucura*** (Blyth)
Whitetailed Bush Chat

Resident.

One example was obtained by Inglish.

1700. ***Saxicola caprata bicolor*** Sykes
Northern Pied Bush Chat

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♀ (23rd October, 1927) from Ranchi, 1 ♂ (1931) from Ranchi-Jharkhand; 1 ♂ (January, 1991) from Valmiki Tiger Reserver, West Champaran Dist., Bihar.

1701. ***Saxicola caprata burmanica*** Baker
Burmesa Pied Bush Chat

Resident.

1704. ***Saxicola jerdoni*** (Blyth)
Jerdon's Bush Chat

Resident.

Type locality.

1706. ***Oenanthe isabellina*** (Temminck)
Isabelline Chat

Winter visitor.

1710. ***Oenanthe deserti deserti*** (Temminck)
Central Asian Desert Wheatear

Winter visitor.

1717. ***Saxicoloides fulicata cambaiensis*** (Latham)
Brownbacked Indian Robin

Resident.

Beavan (1865) noted it as common in Manbhoom Dost., Jharkhand.

National Zoological Collection have 1 ♂ (1891) from Gaya Dist., Bihar (Mus. Coll.)

Zoological Survey of India's survey party collected 1 ♂ (28th November, 1927) from Chakradharpur, Singhbhum Dist., Jharkhand.

1718. ***Saxicoloides fulicata erythrura*** (Lesson)
Bengal Black Robin

Resident.

Type locality.

1728. ***Zoothera citrina citrina*** (Latham)
Orangeheaded Ground Thrush

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1734. ***Zoothera citrina cyanotus*** (Jardine & Selby)
White-throated Ground Thrush

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkand.

1741. ***Zoothera dauma dauma*** (Latham)
Smallbilled Mountain Thrush

Winter visitor.

Beavan (1864) collected one example (rare) from Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1748. ***Turdus unicolor*** Tickell
Tickell's Thrush

Winter visitor.

Not seen by Inglish, Mr. Scroope saw it.

1763. ***Turdus ruficollis atrogularis*** Jarocki
Redthroated Thrush

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Family PARIDAE

1793. ***Parus major nipalensis*** (Hodgson)
Nepal Grey Tit

Resident.

Zoological Survey of India's Survey party collected 1 ♀ (May, 1993) from Bethiah, West Champaran Dist., Bihar.

Family SITTIDAE

1827. ***Sitta castanea almorae*** Kinnear & Whistler
Western Chestnutbellied Nuthatch

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1830. ***Sitta castanea castanea*** Lesson
Peninsular Chestnut-bellied Nuthatch

Resident.

1841. ***Salpornis spilonotus spilonotus*** (Franklin)
Indian Spotted Grey Creeper

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

During Inglish's Survey, Oates noted.

1852. ***Anthus hodgsoni hodgsoni*** Richmond
Indian Tree Pipit

Winter visitor.

Beavan (1865) noted it as abundant in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as common in Madhubani, Bihar.

National Zoological Collection have 1 ♂ (1891) from Gaya Dist., Bihar (Mus. Coll.).

Zoological Survey of India's survey party collected a bird (1931) from Ranchi, Jharkhand.

1859. ***Anthus novaeseelandiae rufulus*** Vieillot
Indian Paddyfield Pipit

Resident.

Inglish (1901-4) noted as very common in winter in Madhubani, Bihar.

Zoological Survey of India's survey party collected a specimen (1931) from Ranchi, Jharkhand.

1862. ***Anthus campestris kastschenkoi*** Johansen
Siberian Tawny Pipit

Winter visitor.

1867. ***Anthus similis jerdoni*** Finsch
Brown Rock Pipit

Resident.

1875. ***Motacilla flava thunbergi*** Billberg
Greyheaded yellow wagtail

Winter visitor.

Inglish (1901-4) noted as scarce in winter in Madhubani, Bihar.

Zoological Survey of India's survey party collected 1 ♂ (1931) from Ranchi, Jharkhand.

1881. ***Motacilla citreola citreola*** Pallas
Yellowheaded Wagtail

Winter visitor.

V. Ball (1875) noted it as common on the banks of the Lobjii and Koel rivers in Palamou (Levin)-Jharkhand. Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1887. ***Motacilla alba alboides*** Hodgson
Hodgson's Pied Wagtail

Inglish (1901-4) noted as very common in winter in Madhubani, Bihar.

1888. ***Motacilla alba leucopsis*** Gould
Whitefaced Pied Wagtail

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

1891. ***Motacilla maderaspatensis*** Gmelin
Large Pied Wagtail

Resident.

Beavan (1865) noted it on the Cossye River as very common in Manbhoom Dist., Jharkhand.

Not seen by Inglish during survey, Scroope saw it. National Zoological Collection have 1 ♀ (1891) from Gaya Dist., Bihar (Mus. Coll.).

Family DICAEIDAE

1892, 1894. ***Dicaeum agile agile*** (Tickell)
Indian Thickbilled Flowerpecker

Resident.

Type locality.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

1899. ***Dicaeum erythrorhynchos erythrorhynchos*** (Latham)
Tickell's Flowerpecker

Resident.

Inglish (1901-4) noted as common in Madhubani, Bihar.

National Zoological Collection have a bird (1891) from Gaya Dist., Bihar (Mus. Coll.).

1901. ***Dicaeum concolor olivaceum*** Walden
Plain Coloured Flower Pecker

Resident.

1904. ***Dicaeum cruentatum cruentatum*** (Linnaeus)
Scarletbacked Flowerpecker

Resident.

Family NECTARINIIDAE

1907. ***Nectarinia zeylonica sola*** (Vieillot)
Purplerumped Sunbird

Resident.

1917. ***Nectarinia asiatica asiatica*** (Latham)
Indian Purple Sunbird

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

National Zoological Collection have a specimen (1891) from Gaya Dist., Bihar (Mus. Coll.).

Zoological Survey of India's survey party collection 1 ♂ (1947) from Manbhum, Jarkhand; 1 ♀ (May 1993) from Bethiah, West Champaran Dist., Bihar.

1923. ***Aethopyga nipalensis nipalensis*** (Hodgson)
Nepal Yellowbacked Sunbird

Resident.

1925. ***Aethopyga siparaja seheriae*** (Tickell)
Indian Yellowbacked Sunbird

Resident.

Type locality.

1931. ***Arachnothora longirestris longirostris*** (Latham)
Little Spiderhunter.

Family ZOSTEROPIDAE

1933. ***Zosterops palpebrosa palpebrosa*** (Temminck)
Indian White-eye

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1938. ***Passer domesticus indicus*** Jordine & Selby
Indian House Sparrow

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as abundant in Madhubani and Trihut, Bihar.

1949. ***Petronia xanthocollis xanthocollis*** (Burton)
Indian Yellowthroated Sparrow

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

National Zoological Collection have 1♂ (1891) from Gaya Dist., Bihar (Mus. Coll.).

Zoological Survey of India's survey party collected 1♂ (1931) from Ranchi, Jharkhand.

1957. ***Ploceus philippinus philippinus*** (Linnaeus)
Indian Baya

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1961 ***Ploceus benghalensis*** (Linnaeus)
Blackthroated Weaver Bird

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1962. ***Ploceus manyar flaviceps*** Lesson
Indian Streaked Weaver Bird

Resident.

Not seen by Inglish.

1964. ***Estrilda amandava amandava*** (Linnaeus)
Red Munia

Resident.

Beavan (1865) noted it once in Manbhoom Dist., Jharkhand.

Few seen by Inglish.

1966. ***Lonchura malabarica malabarica*** (Linnaeus)
White-throated Munia

Resident.

Beavan (1865) noted it as scarce in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

1967. ***Lonchura striata acuticauda*** (Hodgson)
Whitebacked Munia

Resident.

1968. ***Lonchura striata striata*** (Linnaeus)
Southern White-backed Munia

Resident.

1974. ***Lonchura punctulata punctulata*** (Linnaeus)
Indian Spotted Munia

Resident.

Beavan (1865) noted it as very common in Manbhoom Dist., Jharkhand.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

National Zoological Collection have 1 ♀ (1891) from Gaya Dist., Bihar (Mus. Coll.).

Zoological Survey of India's survey party collected 1 ♀ (23rd October, 1927) from Ranchi, Jharkhand.

1976. ***Lonchura malacca rubroniger*** (Hodgson)
Nepal Blackheaded Munia

Resident.

1977. ***Lonchura malacca atricapilla*** (Vieillot)
Eastern Blackheaded Munia

Resident.

Inglish (1901-4) noted as very common in Madhubani, Bihar.

Family FRINGILLIDAE

1997. ***Callacanthis burtoni*** (Gould)
Redbrowed Finch

Resident.

2011. ***Carpodacus erythrinus roseatus*** (Blyth)
Indian Rosefinch

Winter visitor.

Inglish (1901-4) noted as scarce in Madhubani, Bihar.

Family EMBERIZIDAE

2043. ***Emberiza melanocephala*** Scopoli
Blackheaded Bunting

Winter visitor.

2046. ***Emberiza aureola aureola*** Pallas
Yellowbreasted Bunting

Winter visitor.

2048. ***Emberiza pusilla*** Pallas
Little Bunting

Winter visitor.

2060. ***Melophus lathami*** (Gray)
Crested Bunting

Winter visitor.

RARE AND ENDANGERED BIRDS UNDER SCHEDULE I OF WILD LIFE (PROTECTION) ACT.

Order FALCONIFROMES

Family FALCONIDAE

208. ***Falco biarmicus jugger*** J. E. Gray
Lagger Falcon

Resident.

211. ***Falco peregrinus peregrinator*** Sundevall
Shaheen Falcon

Resident.

219. ***Falco chicquera chicquera*** Daudin
Redheaded Merlin

Resident.

Family ACCIPITRIDAE

203. ***Pandion haliaetus*** (Linnaeus)
Osprey

Winter visitor.

Order GALLIFORMES

Family PHASIANIDAE

311. ***Pavo cristatus*** Linnaeus
Indian peafowl

Resident.

Extinct bird :

Order ANSERIFORMES

Family ANTIDAE

106. ***Rhodonessa caryophy llacea*** (Latham)
Pinlkheaded Duck

Resident.

Not seen by Inglish (1901-4), but others said about its presence.

Once widespread but last sight record was made in June, 1935 at Darbhanga by C. M. Inglish.

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SUMMARY

A total of 465 species and sub-species belonging to 234 genera, 53 families and 18 orders have been accounted with their state of residence and migration, along with list of endangered species, Brief introduction accopanied by available important references have also been furnished.

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REPTILIA

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INTRODUCTION

The name Bihar is a corrupt form of 'Vihara', which means Buddhist monastery. Bihar has total geographical area of 173,877 Sq. Km. The state squeezed in between West Bengal, Orissa, Madhya Pradesh and Uttar Pradesh. Bihar is bounded on the north by Nepal, on the south by Orissa, on the east by U. P. and the west by M. P.

Bihar experiences all the diversities of changing seasons. It gets worst of heat & worst of cold & plenty of food in bargain. Geographical feature of North Bihar & South Bihar is most striking. North Bihar is almost entirely level tract with an extremely fertile strip of land being watered by the rivers Sarayu, Gandak & Ganga. While South Bihar in & around the districts of Chotanagpur & Santal Pargana is thickly wooded & consists of succession of hills. The elevation varies from 300 m. to 1300 m. The highest peak being 1372 m.

The present work on the Reptile Fauna of Bihar is based on the materials present in the Zoological Survey of India collected by various survey parties from 1938-1996, as well as from the published evidences. This paper deals with 350 examples belonging to 77 species, 50 genera & 18 families of which 67 species collected from different regions of Bihar by various survey parties of the Zoological Survey of India while the rest 10 species taken from the published evidences.

When the faunal work was taken up in the year 1999, the Jharkhand state was not established. So we have also included Jharkhand - the southern part of Bihar, which have come into existence as a separate state from November 2001.

COLLECTION PRESERVATION AND IDENTIFICATION

Many characters are essential for identifying a species so care should be taken not to damage the specimen at the time of collection. After collecting the specimens from different habitats they are killed by anasthising with chloroform and are kept in 5% solution of formaldehyde for fixation. A small incision (for bigger material) is necessary before putting them in formaldehyde solution, to ensure penetration of the solution. Suitable labels containing locality data, name of collector, date of collection, are attached to the specimens and are taken out from the solution, washed in water & then kept in 90% alcohol for permanent preservation.

Pattern of head, shell & characters of limbs are necessary to identify Testudines. Scale characters, measurements, shape colour of the body, presence or absence of spines and tubercles are essential in case of lizard identification. In case of snakes scale characters especially that of head count serves a great deal for identification of snakes. The structure of hemipenis also helps as a specific character in some cases.

Order TESTUDINES

Origin of Testudines is from Triassic. Only 12 families survive today. In India species of 5 families are found. Turtles are amphibious. The turtle has a shell divided into two halves, dorsal carapace & ventral plastron, which are covered by horny shields. The carapace contains shields like vertebrals, costals & marginals & that for the plastrons there are paired gulars, humerals,

pectorals & abdominals, femorals & anals. Among 220 species 31 distributed in India 14 species so far recorded from Bihar.

Order CROCODYLIA

The order crocodylia is divided into three families. 1. **Alligatordiae** (Alligators) in which the fourth teeth of the lower jaw fits into laterally closed pit into the upper jaw. 2. **Crocodilidae** (Crocodiles) in which the fourth teeth of lower jaw is laid into a notch in the upper jaw, open at the side which is visible when it is closed. 3. **Gavialidae** represented by single species in which snout is very much protruded and the teeth are all of same size and shape. So far in this order two genera and two species recorded from Bihar.

Order SQUAMATA

The order Squamata represents two suborders Sauria comprising the lizards and Serpentis comprising the snakes. Lizards are characterized by a short body with four limbs, short flat tongue and an external ear opening. There are exceptions also like limbless lizards, which represent all the characters of lizards except limbs.

Most lizards are insectivorous and oviparous. Lizards are mostly non-poisonous. Only two species are poisonous (Heloderma horridum), Gila monster (Heloderma suspectum). About 3000 species of lizards occur in world. India has about 188 species, so far 24 species of lizards are recorded from Bihar.

Snakes are very popular for their venom though most snakes are harmless for this poison human being frightened wants to fight shy of this creature. The body of snake is elongate & covered with scales. The external limbs are absent although vestiges of pelvis & hind limbs are found in Boas & Pythons. Snakes are distinguished from lizards by their immovable eyelids, forked tongue, absence of external ear. Due to absence of external ear they are unable to hear in normal way. This function is adopted through vibrations of their sensitive body by picking up the earth borne sound. Snakes are carnivorous, they feed mostly on birds, rats, mice, squirrels, fishes, frogs, toads and many kinds of worms. They engulf larger prey also, due to their enormous powers of distension and the lower jaw consisting of two bones connected by elastic ligament enables to do this device. In India there are 262 species of snakes of which 37 species of snakes are reported from Bihar.

SYSTEMATIC LIST

(* Marked species are taken from published references)

Class REPTILIA
Order I CROCODYLIA
Family 1 CROCODYLIDAE
1. *Crocodylus palustris* Lesson
Family 2 GAVIALIDAE
2. *Gavialis gangeticus* (Gmelin)
Order II TESTUDINES
Sub Order 1 CRYPTODIRA
Family 3 BATAGURIDAE
*3. *Geoclemys hamiltoni* Gray
4. *Hardella thurjii* (Gray)
5. *Kachuga dhongoka* (Gray)
6. *Kachuga kachuga* (Gray)
7. *Kachuga smithi* (Gray)
8. *Kachuga tecta* (Gray)
9. *Melanochelys tricarinata* (Blyth)
10. *Melanochelys trijuga indopeninsularis* (Annandale)
*11. *Morenia petersi* (Anderson)
Family 4 TESTUDINIDAE
12. *Indotestudo elongata* (Blyth)
Family 5 TRIONYCHIDAE
13. *Aspideretes gangeticus* (Cuvier)
14. *Aspideretes hurum* (Gray)
*15. *Chitra indica* (Gray)
16a. *Lissemys punctata andersoni* Webb.
16b. *Lissemys punctata punctata* (Bonnaterre)
Order III SQUAMATA
Sub order II SAURIA
Family 6 EUBLIPHARIDAE
17. *Eublepharis hardwickii* (Gray)
Family 7 GEKKONIDAE
*18. *Gekko gecko* (Linnaeus)

19. *Hemidactylus bowringii* (Gray)
20. *Hemidactylus brooki* (Gray)
21. *Hemidactylus flaviviridis* Ruppell
22. *Hemidactylus frenatus* Schlegel.
23. *Hemidactylus leschenaulti* Dum. & Bib.

Family 8 AGAMIDAE

24. *Calotes versicolar* (Daudin)
25. *Psammophilus blanfordanus* (Stoliczka)
26. *Sitana ponticeriana* Cuvier

Family 9 CHAMAELEONIDAE

27. *Chamaeleo zeylanicus* Laurenti

Family 10 SCINCIDAE

28. *Lygosoma albopunctata* (Gray)
29. *Lygosoma punctatus* (Gmelin)
30. *Mabuya carinata* (Schneider)
31. *Mabuya dissimilis* (Hallowell)
32. *Mabuya macularius* (Blyth)
33. *Mabuya trivittata* (Hard & Gray)
34. *Scincella sikkimensis* (Blyth)
35. *Sphenomorphus maculatus* (Blyth)

Family 11 LACERTIDAE

36. *Ophisops leschenaulti* (Milne-Edwards)
37. *Ophisops microlepis* (Blanford)
38. *Ophisops minor* - nictans Arnold

Family 12 VARANIDAE

39. *Varanus bengalensis* (Daudin)
*40. *Varanus flavescens* (Hard. & Gray)

Sub Order III SERPENTES

Family 13 TYPHLOPIDAE

41. *Ramphotyphlops braminus* (Daudin)
42. *Rhinotyphlops acutus* (Dum. & Bib.)

Family 14 BOIDAE

43. *Eryx conica* (Schneider)
44. *Eryx johnii johnii* (Russell)
*45. *Python molurus* (Linn.)

Family 15 COLUBRIDAE

Subfamily (A) COLUBRINAE

46. *Ahaetulla nasutus* (Anderson)
47. *Ahaetulla pulverulenta* (Dum. & Bib.)
48. *Amphiesma stolata* (Linn.)
49. *Argyrogena fasciolatus* (Shaw)
50. *Atretium schistosum* (Daudin)
51. *Boiga forsteni* (Dum. & Bib.)
52. *Boiga gokool* (Gray)
53. *Boiga trigonata* (Schneider)
54. *Chrysopelea ornata* Shaw.
55. *Dendrelaphis pictus* (Gmelin)
56. *Dendrelaphis tristis* (Daudin)
57. *Elaphe helena* (Daudin)
58. *Lycodon aulicus* (Linn.)
59. *Lycodon striatus* (Shaw.)
60. *Oligodon arnensis* (Shaw.)
61. *Oligodon cyclurus* (Cantor)
62. *Oligodon taeniolatus* (Jerdon)
63. *Ptyas mucosus* (Linn.)
64. *Psammophis condanarus* (Merrem)
65. *Sibynophis sagittarius* (Cantor)
66. *Spalerosophis didema* (Schlegel)
67. *Xenochrophis piscator* (Schneider)

Subfamily BHOMALOPSINAE

68. *Enhydris enhydris* (Schneider)
69. *Enhydris sieboldi* Schlegel

Family 16 DASYPELTIDAE

70. *Elachistodon westermanni* Reinhardt

Family 17 ELAPIDAE

71. *Bungarus caeruleus* (Linn.)
72. *Bungarus fasciatus* (Schneider)
*73. *Bungarus sindanus* Walli Wall.
74. *Naja naja* (Linn.)
*75. *Ophiophagus hannah* (Cantor)

Family 18 VIPERIDAE

76. *Daboia russelli* (Shaw)
77. *Echis carinatus* (Schneider)

SYSTEMATIC ACCOUNT

Class REPTILIA

Order 1. CROCODYLIA

Key to the families of the order CROCODYLIA

1. Long & slender snout, at least three times as long as broad at the base, upper jaw consists of 27-29 teeth on each side .. GAVIALIDAE

   Snout slender, not more than twice as long as broad at the base, upper jaw consists of 17-19 teeth on each side ..... CROCODYLIDAE

Family 1. CROCODYLIDAE

Genus 1. ***Crocodylus*** Gronovius, 1763

1. ***Crocodylus palustris*** Lesson

Mugger or Marsh Crocodile

1834. *Crocodylus palustris* Lesson in *Belang, Voy. Ind., Zool.* : 305.

1890. *Crocodylus palustris* Boulenger, *Fauna Brit. India*, 5.

Material not available, only eggs are present, description based on literature.

Diagnostic character : Snout broad without lachrymal ridges 1 1/3 to 1 1/2 times as long as broad at the base. A row of four distinct sharply raised scales just behind the head called post occipitals, dorsal scutes in 16 or 17 transverse & 4 sometimes 6, longitudinal series of bony plates embedded in the skin. Ventral side of the skin is without armour. Fingers webbed.

Distribution : Throughout India.

Remarks : Formerly this species was available in large scale in most States.

Family 2. GAVIALIDAE

Genus 2. *Gavialis* Oppel, 1811

2. ***Gavialis gangeticus*** (Gmelin)

Gharial

1789. *Lacerta gangeticus* Gmelin, *Syst. Nat.* 1 : 1057.

1831. *Gavialis gangeticus* Gray, *Syn. Rept.* : 55.

Material examined : 1 ex. Bankipore, Patna (mounted in the Gallery of Indian Museum), Dr. B. Prashad, (Reg. No. 19981); 1 ex. collected from Badarghat, Patna, 21.10.1970. D. P. Sanyal; 3 eggs, Purnea, date ? J. Anderson (Reg. No. 12552).

Measurement : (Based on D. P. Sanyal's collection from Patna). The specimen measured 247 cm. Maximum Girth : 99 cm. Tail Length : 144 cm. Distance from snout to eye : 38 cm. Lower teeth on each side : 26 Nos. Upper teeth on each side : 27 Nos.

Diagnostic characters : Snout from $3^1/_2$ to $5^1/_2$ times as long as broad at the base. 21 or 22 transverse rows are formed by continuous series of nuchal & dorsal scutes, two small post occipital scutes. Median fingers one-third & outer toes two-thirds webbed. Outer sides of limbs contain a long serrated fringe. Adult male has a large hollow cartilaginous protuberance on the end of snout, which resembles ghara-earthenware pot hence the name *gharial*.

Distribution : The Ganges & its tributaries in the north & as far as south as Mahanadi.

Remarks : They endeavor mostly to collect fish as their food, sometimes birds & also they have been known to seize goats, dogs. Rarely they attack man.

Order II. TESTUDINES

Suborder I. CRYPTODIRA

Key to the families of the order TESTUDINES

1. Forelimbs semi paddle shaped, with 3 claws, carapace covered with smooth skin; edge of carapace flexible ..... TRIONYCHIDAE

   Forelimbs paddle shaped, with more than three claws, carapace covered with bony shields 2

2. Digits webbed, hind limbs paddle shaped .... BATAGURIDAE

   Digits not webbed, hind limbs club shaped ... . TESTUDINIDAE

Family 3. BATAGURIDAE

Key to the genera of the family BATAGURIDAE

1. Vertebral shields short sided anteriorly 2

Vertebral shields short sided posteriorly .... ***Melanochelys***

2. Axillary & inguinal buttresses short not extending half way along the costal plates.. 3

   Axillary & inguinal buttresses well developed & extending almost upto the vertebral shields 4

3. Alveolar surfaces of jaws without median ridge ..... ***Geoclemys***

   Alveolar surfaces of jaws with median ridge ..... ***Morenia***

4. Fourth vertebral shield not longer than broad not longer than third ..... ***Hardella***

- Fourth vertebral shield elongate, much longer than broad, much longer than third..... ..... ***Kachuga***

Genus 3. ***Geoclemys*** Gray, 1855

*3. ***Geoclemys hamiltoni*** Gray

Spotted pond turtle

1831. *Emys hamiltoni* Gray, *Illus. Ind. Zool.* **6** : pl. 9.

1931. *Geoclemys hamiltoni* Smith, *Fauna Brit. India*, **1** : 111-112.

Material not available, known to occur in Bihar (Das I, 1997). Description based on literature.

Diagnostic character : Carapace elongated, distinctly convex & strongly arched with sloping sides & three interrupted keels; posterior marginals serrated, especially in juveniles; nuchal moderate broadest behind, vertebral I longer than broad, vertebral II & III broader than long in juveniles or as long as broad in adults; plastron deeply notched posteriorly truncate anteriorly; axillary & inguinal scutes large; head massive; snout short skin posterior to the forehead divided into symmetrical shields; digits fully webbed; tail short; outer surface of forelimbs with band-like scales.

Distribution : India : Assam; Bihar (vicinity of Gandak, Sahibgung); Jammu; Punjab; Meghalaya; Rajasthan; Uttar Pradesh; West Bengal.

Elsewhere : Pakistan; Bangladesh.

Remarks : It is a carnivorous turtle & feeds mainly on snails.

Genus 4. ***Hardella*** Gray, 1870

4. ***Hardella thurji*** (Gray)

Crowned river turtle

1831. *Emys thurji* Gray, *Syn. Rept.* : 22.

1931. *Hardella thurji* Smith. *Fauna Brit. India* **1** : 122.

1997. *Hardella thurji* Das. *Hamadryad* **22** : 33.

Material examined : 6 ex. Purnea, Anderson (Reg. Nos. 1428, 1430, 1431, 1433) 4 exs. Rajmahal, Chotonagpur, 23.1.54 to 25.1.54, M. N. Acharji (Reg. Nos. 20644-47); 1 ex. Oodhna near Rajmahal (Reg. Nos. 16776); Head & limbs of single specimen Siripur, Saran 19.12.1914, M. Mackenzee (Reg. no. 17436).

Measurement : Height : 157 mm. 175 mm. Length of carapace : 260 mm. - 419 mm. Breadth of carapace : 190 mm. 280 mm.

Diagnostic characters : Head moderately large with a pointed & extremely projecting snout; posterior portion with transverse rows of scales; vertebrals elongate posteriorly with a knob like suture, broader than costals in adults. Nuchal short-sided anteriorly; plastron with paired gular, humeral, axillary, pectoral, abdominal, inguinal, femoral & anal shields, the median suture between the gular the shortest limbs with fully & broadly webbed digits & with narrow transversely enlarged scales; fore limbs with 5 claws.

Distribution : Available in Ganga, Brahmaputra & Sind river system.

Remarks : The most interesting tortoise showing extra ordinary sexual dimorphism, its female reaches upto a length of 650 mm. & male attains maximum length upto 200 mm.

Genus 5. ***Kachuga*** Gray 1869

Key to the species of the genus *Kachuga*

1. The fourth vertebral shield overlaps 4 neural bones 2

Fourth vertebral shield overlaps 5 neural bones 3

2. Humero pectoral suture of plastron is straight ..... *dhongoka*

Humero pectoral suture is curved ..*kachuga*

3. The carapace is elevated; the keel of the third vertebral shield terminates in a backwardly projecting spine .....*tecta*

The carapace is depressed; the keel of the third vertebral shield terminates in a rounded projection ..... *smithi*

5. ***Kachuga dhongoka*** (Gray)
Three striped roofed turtle

1834. *Emys dhongoka* Gray, *Illus. Ind. Zool.* ii. pl. 60.

1912. *Kachuga dhongaka* Chaudhuri, *Rec. Ind. Mus.* 7 : 212.

Material examined : 3 ex. Godhuna near Rajmahal, 1912, B. L. Chaudhuri (Reg. Nos. 17433, 17099, 16789) 10 exs. river Ganges near Rajmahal 1954, M. N. Acharji (Reg nos. 20450, 20636, 20637, 20638, 20639, 20640, 20641, 20642, 20643); Head only, Rajmahal, B. L. Chowdhury (Reg. No. 16779).

Measurement : Height : 98 mm. to 143 mm. Length of carapace : 238 mm. to 392 mm. Breadth of carapace : 172 mm. to 230 mm.

Diagnostic character : Head moderately long with a pointed snout which projects beyond the lower jaw, posterior portion of the head with shields; carapace smooth depressed, the keel most prominent up on second & third vertebral shields, nuchal shield short sided in front, first vertebral longer than broad more or less constricted in the middle, neural plates much longer than broad, limbs with fully & broadly webbed digits & transversely enlarged scales; forelimbs with 5 claws. Olive brown above with a black vertebral stripe; young with 2 black stripes; yellowish beneath; juvenile with a large reddish brown patch on the shields of plastron; a yellow stripe runs along the side of the heads starting from nostrils & passing above the eye & tymphanum.

Distribution : Bihar ; Assam; Arunachal Pradesh; Manipur; Mizoram; Nagaland; Sikkim; Tripura; Uttar Pradesh; West Bengal.

Elsewhere : Nepal.

Remarks : These species are entirely aquatic in nature.

6. ***Kachuga kachuga*** (Gray)
Red crown roofed turtle

1831. *Emys kachuga* Gray, *Ills. Indian Zool.* pl. 5.

1931. *Kachuga kachuga*, Smith, *Fauna Brit. India* 1 : pl. 131.

Material examined : 3 ex. from river Ganges, Rajmahal, 23.1.1954, M. N. Acharji (Reg. Nos. 20632, 20633, 20634); 1 ex. Ganges at Bhagalpur 25.11.1975, K. C. Misra (Reg. No. 23005); Head only, Rajmahal, B. L. Chowdhury 1912 (Reg. No. 16778).

Measurement : Length of carapace : 248 mm. Breadth of carapace : 200 mm.

Diagnostic character : Carapace moderately elevated, oval & slightly flaring posteriorly; vertebral keel with a knob which is most prominent on vertebral II, vertebrals wider than long or as wide as long, except vertebrals II & IV which are longer than wide; plastron narrow truncated & notched posteriorly; snout slightly upturned; upper jaw weakly bicuspid, strongly serrated. Carapace brownish or olive in males; dark brown or black in females; plastron yellow.

Distribution : India : Bihar; Uttar Pradesh; Punjab; West Bengal.

Elsewhere : Bangladesh & Nepal.

7. ***Kachuga smithi*** (Gray)
Brown roofed turtle

1863. *Batagur smithi* Gray, *Proc. Zool. Soc.* p. 653.

1931. *Kachuga smithi* Smith, *Fauna Brit. India* 1 : 125.

Material examined : 3 ex. Godhuna, Rajmahal, Santhal Pargana, B. L. Chowdhury (Reg. No. 16773-75).

Measurement : Height : 42 mm. to 58 mm. Length of carapace : 105 mm. to 155 mm. Breadth of the carapace : 84 mm. to 102 mm.

Diagnostic character : Head moderate, snout

shorter than orbit, pointed and strongly projecting beyond the lower jaw, digits fully webbed, limbs with transversely enlarged scales, carapace depressed, plastron nearly or quite as long as carapace strongly angulate laterally in the young truncate anteriorly; hind lobe narrower than shell opening, notched posteriorly shorter than the width of the bridge. The longest median suture is usually between the abdominal shields, the shortest between the gular; inguinal shields large, axillary smaller. General dorsal coloration is pale olive, vertebral keel is blackish. Ventrum is yellow and each plastral shield tinted with dark brown. Top of the head is black; brown longitudinal stripes present on the neck.

Distribution : The species is available in Ganga and Sindh river system.

Remarks : The species is completely aquatic and is a fast swimmer. It is omnivorous but prefers flesh.

*8. ***Kachuga tecta*** (Gray)

Indian roofed turtle

1831. *Emys tectum* Gray *Illus. Ind. Zool.* 1 pt. 72.

1997. *Kachuga tecta* (Gray) Das. *J. Hamadryad* **22** : 33.

Specimen not available, description based on literature.

Diagnostic character : Carapace elevated oval with a prominent vertebral keel i.e. spiked especially on third shield, hinder margin of carapace not or feebly serrated. Nuchal usually broadest behind. Head moderate pattern with a broad red crescentic band, snout shorter than orbit, pointed and slightly projecting beyond lower jaw; upper jaw unnotched. Digits fully webbed; limbs with transversely enlarged scales. Colour olive brown above with a red keel, below pinkish yellow; each scute with two to three black blotches. Head black on top; temporal regions often with a yellow 'V' shaped mark; limbs dark olive with yellow spots.

Distribution : India : Bihar; West Bengal; Assam; Meghalaya; Arunachal Pradesh; Punjab; Madhya Pradesh; Uttar Pradesh.

Elsewhere : Pakistan, Nepal and Bangladesh.

Remark : These turtles are very active in movement.

Genus 6. ***Melanochelys*** Gray 1869

Key to the species of the genus *Melanochelys*

1. Plastron dark brown or black usually with a yellow border .....*trijuga indopeninsularis*

   Plastron yellow .....*tricarinata*

9. ***Melanochelys tricarinata*** (Blyth)

Tricarinate hill turtle

1865. *Geomyda tricarinata* Blyth. *J. Asiat. Soc. Bengal* **24** : 714.

1869. *Melanochelys tricarinata* Gray *Proc. Zool. London* : 187.

Material examined : 2 ex. Munguraha. West Champaran, 8.9.1996, S. Sur & party, (Reg. no. 25299); 1 ex. type, Chaibasa (Reg. No. Z. S. I. 816).

Measurement : Length of carapace : 88 mm. to 140 mm. Breadth of carapace : 40 mm. to 90 mm. Height : 36 mm. to 55 mm.

Diagnostic character : Carapace elongated, tricarinate, shell arched, carapace keels low, marginals unserrated, axillary scutes typically present, inguinals absent, plastron long, notched posteriorly, adult female with a ligamentous connection between the hyoplastron & carapace; head moderate, snout short, truncate; upper jaw feebly notched; skin of the posterior part of the forehead divided into large shields; fingers half webbed; toes almost free; the outer surface of forelimbs with enlarged scales. Carapace dark olive, grey, black or reddish brown with pale yellow keels; plastron yellow; head & limbs grey black. A yellow or red stripe may extend from the nostril across the eyes to the neck, another from the angle of the jaws to the neck.

Distribution : India : Bihar; West Bengal; Uttar Pradesh: Arunachal Pradesh.

Elsewhere : Nepal; Bangladesh.

Remark : The type specimen Z. S. I. 816 is Holotype, described by Blyth, 1856.

10. ***Melanochelys trijuga indopenonsularis*** (Annandale)

Eastern black turtle

1913. *Geoemyda indopeninsularis* Annandale, *Rec. Ind. Mus.* **9** : 71.

1997. *Melanochelys trijuga indopeninsularis* (Annandale) Das, *Hamadryad* **22** : 33.

Material examined : Type specimen as described by Annandale 1913, Syntypes from Singhbhum district of Chotonagpur (Reg. Nos. 17098, 17100).

Measurement : Stated by Annandale in Record Indian Museum, vol. 9, page 71, 1913 :-

	Type M	Type F
Length of carapace	336 mm.	342 mm.
Breadth of carapace	231 mm.	236 mm.
Height of carapace	350 mm.	350 mm.

Diagnostic character : Carapace elongated, fairly elevated in adults, depressed juveniles, tricarinate, the posterior marginals feebly serrated, nuchal in small, triangular, vertebral typically as long as wide or longer than wide, except vertebral v which is broader than long, plastron truncated anteriorly and notched posteriorly, head moderate with short snout, upper jaw notched, toes fully webbed. Dorsum dark brown in the juveniles but deep black in the adults. Vertebral keels & plastral margins are yellow.

Distribution : Bihar; Assam; Meghalaya; Uttar Pradesh & West Bengal.

Remarks : It is omnivorous and turtle of still water bodies with aquatic vegetation.

Genus 7. ***Morenia*** Anderson

*11. ***Morenia petersi*** Anderson

Indian eyed turtle

1879. *Batagur (Morenia) petersi* Anderson, *Anat. Zool. Res.* P. 761, pl. 59.

1931. *Morenia petersi* Smith, *Fauna Brit. India* 1 : 121.

Material not available, known to occur in Bihar (Das, I, 1995).

Diagnostic character : Carapace domed with low keel especially in juveniles, marginals unserrated; nuchal broader than long; vertebrals (except vertebral I which is longer than broad) are broader than long; axillary scutes large, plastron narrow, notched posteriorly, endoplastron lies anterior to humero-pectoral suture. Head small, snout pointed. Dorsally and laterally, the head is covered with enlarged scales, but the posterior surface of head has numerous small scales. Digits well webbed, tail short. The carapace is green olive or grey black, the vertebrals and costals with a green or yellow border, vertebrals I to IV with green stripes and a U-shaped mark and costals typically having pale green circles and looped lines. The plastron is yellow or orange with black blotches on the axillary scutes and some adjacent marginals. The head is olive with three yellow stripes on each sides, one above the eyes, one over the jaws and one behind the eyes. The limbs have yellow margins.

Distribution : Bihar (Das, 1995); Assam; West Bengal.

Elsewhere : Bangladesh.

Remarks : It is a sluggish species, does not attempt to bite when picked up. It occurs in standing bodies of water.

Family 4. TESTUDINIDAE

Genus 8. ***Indotestudo*** Lindholm (1929)

12. ***Indotestudo elongata*** (Blyth)

Elongated tortoise

1853. *Testudo elongata* Blyth, *J. Asiat. Soc. Bengal* **22** : 639.

1980. *Indotestudo elongata* Bour, *Bull. Mus. Natl. Hist.* Nat. Paris, Ser. 4, **2** : 545.

Material examined : 1ex. [Type] Chaibasa, Chotanagpur, Singhbhum dist., J. sykes Gamble (Reg. no. 11379).

Diagnostic character : Shell elongated, arched flat-topped broader posteriorly, edges serrated becoming less marked with growth, nuchal long & narrow, vertebral I as long as broad, vertebrals II, III & IV broader than long. The highest point of shell is in the region vertebral III. Marginals

XII fused. Plastron long, deeply notched posteriorly interpectoral seam as long as or longer than the inter humeral seam, humero pectoral seam crosses entoplastron; rectangular pectoral scutes. Forelimbs with large pointed scales, hindlimbs with large flat scales. A pair of prefrontal scales & single frontal scale on head, upper jaw tricuspid. Tail ends in a claw-shaped spur. Small conical scales present on the posterior of thigh. Carapace yellow, each scute of both plastron & carapace frequently with black blotches. Head pale yellow.

Distribution : India : Bihar; Uttar Pradesh; Meghalaya; Orissa; West Bengal.

Elsewhere : Nepal; Bangladesh.

Remarks : Its survival to extreme hot condition is remarkable. It is a herbivorous tortoise.

Family 5. TRIONYCHIDAE

Key to the genera of the family TRIONYCHIDAE

1. Marginal bones are present. Snout short .... ***Lissemys***

   Marginal bones are absent 2

2. Orbit nearer the temporal than the nasal fossa; postorbital arch narrower than the diameter of the orbit ..... ***Aspideretes***

   Orbit nearer the nasal than the temporal fossa; post orbital arch twice as broad as the diameter of the orbit ..... ***Chitra***

Genus 9. *Aspideretes* Gray, 1872

Key to the species of the genus *Aspideretes*

1. Maxillary groove well defined; head with black streaks; disc of young without ocelli .... *gangeticus*

- Maxillary groove ill defined; head marbled with black & yellow; disc of young with 4 or more ocelli ..... *hurum*

13. *Aspideretes gangeticus* (Cuvier)

Indian soft shell turtle

1824. *Trionyx gangeticus* Cuvier, *Oss. Foss.* 5. pp. 186, 203, 206.

1997. *Aspideretes gangeticus* (Cuvier) Das, *Hamadryad* **22** : 33.

Material examined : 1 ex. Rajmahal, Santalpargana, 29.3.1912, B. L. Chowdhury (Reg. no. 16791 dry skull only), 1 ex. Ganges at Bhagalpur, 25.11.1975, K. C. Misra (Reg. no. 23004).

Measurement : Length of the carapace : 185 mm. Breadth of the carapace : 166 mm. Height : 29 mm.

Diagnostic character : This is a large soft-shelled turtle, carapace low & oval; a preneural & a neural separating the first pair of pleurals; 8 pair of pleurals, the eighth pair meeting at midline, five callosities in plastron; snout slightly down turned. The head is comparatively large & broad with dorsolaterally situated eyes & quite thick & elongated proboscis. Limbs are with 3 claws. Tail is short. Dorsal colouration is olive green; carapace is dull olive with irregular dark reticulations; plastron is ivory white; head is greenish with black longtidunal streak starting from behind the eye.

Distribution : The species inhabits the Ganga, Sind & Mahanadi river system.

Elsewher : It is common in N. W. Pakistan, Bangladesh & Nepal.

Remark : Its nature is very aggressive, it should be handled very cautiously otherwise it would shoot out its head very rapidly to deliver a painful bite, leaving a V-shaped wound (Das, I. 1995).

14. *Aspederetes hurum* (Gray)

Indian peacock soft shelled turtle

1831. *Trionyx hurum* Gray, *Syn. Rept.* : 47.

1997. *Aspideretes hurum* (Gray) Das, *Hamadryad* **22** 33

Material examined : 1 ex. Little Gandak river near Pusa, 27.101914, F. H. Howlet (Reg. no. 17714); 1 ex. Khierpur, Purnea dist. 15.10.1914, C. Paiva (Reg. no. 18018).

Measurement : Length of carapace : 80 mm. to 95 mm. Breadth of carapace : 73 mm. to 87 mm. Height : 10 mm. to 12 mm.

Diagnostic character : It is a gigantic soft-shelled species. The head is comparatively large & its snout is prominently projecting down turned & is longer than the diameter of the orbit. Carapace low & oval; a prenural & neural between the first pair of pleurals; eighth pair of pleurals meet at carapace midline, ocelli is present in juvenile carapace; plastral callosities large, five in number, triturating surface of maxilla ridgeless & bearing median groove, anterior rim of the carapace with blunt tubercles. Carapace olive with yellow rim; plastron light grey. Head with black reticulations.

Distribution : India : Bihar; West Bengal; Assam; Orissa; Maharashtra; Uttar Pradesh.

Elsewhere : Bangladesh.

Remarks : The species is primarily nocturnal, inhabits river, lakes & ponds.

Genus 10. ***Chitra*** Gray 1844

*15. ***Chitra indica*** (Gray)

Narrow-headed softshelled turtle

1831. *Trionyx indicus Gray, Syn. Rept.* : 47.

1844. *Chitra indica Gray, Cat. Tort. Etc., Brit. Mus.* : 49.

Material not available. Description based on literature.

Diagnostic character : Shell depressed & oval; shell bone prominently pitted, orbit nearer the nasal than the temporal fossa; four plastral callosities & eight pair of pleurals, a single neural between the first pair of pleurals; carapace of juveniles with numerous tubercles & a vertebral keel; head extremely narrow, long with eyes situated close to the nostrils; the alveolar surfaces of jaws are slightly expanded, the edges of the jaws are slightly expanded. carapace is remarkably pitted & vermiculated; dorsal colouration is olivaceous yellow with dark vermiculations or black dots in juveniles. A V-shaped mark commences from the nape & extends to the carapace, which becomes fade in the aged species. Sometimes 4 eye-like markings on the carapace is found. The plastron is cream or light pink.

Distribution : India : Bihar; Uttar Pradesh; West Bengal.

Elsewhere : Nepal; Malayasia & Thailand (Tikader & Sharma, 1985).

Remarks : The turtle does not bite but disables its victims with blows from the head & is known to damage fishing boat. (Das I. 1995).

Genus 11. ***Lissemys*** Smith, 1931

Key to the sub-species of species *Lissemys*

1. Ectoplastral callosity moderate in the adult, carapace is uniform brown or black, young ones being black spotted and cream, light yellow or pink below; the head has three parallel black streaks which may not present in the adult.. ..... *punctata punctata*

   Ectoplastral callosity is usually small in the adult. The head & carapace with yellow blotches ..... *andersoni*

16a. ***Lissemys punctata punctata*** (Bonnaterre) South Indian flap shelled turtle

1789. *Testudo punctata* Bonnaterre in *Daubenton s Tab. Encyl. Meth. Erpet.* p. 30. pl. 6.

1792. *Testudo granosa* Schoepff, *Hist. Test.* p. 127, pls. xxx A & B.

1931. *Lissemys punctata granosa* Smith *Fauna Brit. India*, 1 : 158-159.

1982. *Lissemys punctata punctata* (Bonnaterre, 1789) Webb. *Amphibia Reptilia* 3 : 179-181.

Material examined : 2 ex. Chero Bandh, 5 km. West of Chandwa, Chotanagpur, 7.10.1966, Dr. Rajtilak (Reg. no. 23486).

Measurement : Length of carapace : 123 mm. to 125 mm. Breadth of carapace : 104 mm. to 115 mm. Height : 30 mm. to 40 mm.

Diagnostic character : Small flat turtle, the head is moderately large, snout short & broad; the carapace & plastron covered by soft skin. Neural bones are two in number & rest between the first costal plates, first marginal bone is smaller than the second and entroplastral callosity is very large in the adult individuals. Carapace is uniformly olive-brown, juveniles sometimes with light longitudinal markings on the greenish head.

Distribution : India : Bihar (Hazaribag, Ranchi, Chaibasa, Betla, Patna); West Bengal; Orissa; Madhya Pradesh; Uttar Pradesh; Gujrat; Goa; Rajasthan; Punjab; Karnataka; Kerala; Tamil Nadu; Maharashtra; Andaman.

Elsewhere : Sri Lanka; Pakistan; Bangladesh.

Remarks : It is a very pugnacious creature & bites immediately even on a gentle handling (Tikadar & Sharma, 1985).

16b. ***Lissemys punctata andersoni*** Webb.

North Indian flap shelled turtle

1982. *Lissemys punctata andersoni* Webb, *Amphibia-Reptilia*. **3** : 179-181.

Material examined : 1 ex. Chottipahiri, Patna, 18.8.1966, K. K. Mahajan (Reg. no. 21981); 1 ex. Ganges at Bhagalpur, 25.11.1975, K. C. Misra (Reg. no. 23003).

Diagnostic character : All the taxonomic characters are same as Lissemys punctata punctata except that the first marginal bone is larger than the second, ectoplastral callosity is small in adult. The head & carapace with yellow blotches.

Distribution : India : Bihar; West Bengal; Rajasthan; Uttar Pradesh; Madhya Pradesh; Assam; Meghalaya; Haryana; Sikkim; Jammu.

Elsewhere : Pakistan; Bangladesh & Nepal.

Remarks : The subspecies prefers to live in shallow muddy ditches, lakes & marshes. These turtles are fond of frogs, fishes, shrimps & snails as their food.

Order III SQUAMATA

Suborder II SAURIA

Key to the families of the suborder SAURIA

1. Tongue slender, forked ..... VARANIDAE

   Tongue not slender nor forked 2

2. Top of the head with symmetrical shield 3

   Top of the head without symmetrical shield 4

3. Body not covered with osteodermal plates, femoral pores absent ..... SCINCIDAE

   Body covered with osteodermal plates, femoral pores present ..... LACERTIDAE

4. Tail prehensile ..... CHAMAELEONIDAE

   Tail not prehensile 5

5. Pupil rounded, dorsal scales imbricate..... ..... AGAMIDAE

   Pupil a narrow slit, dorsal scales not imbricate 6

6. Eyes with immovable eyelids, digits dilated .. .. GEKKONIDAE

   Eyes with movable eyelids, digits not dilated EUBLEPHARIDAE

Family 6. EUBLIPHARIDAE

Genus 12. ***Eublepharis*** Gray, 1827

17. ***Eublepharis hardwickii*** Gray

East Indian leopard gecko

1827. *Eublepharis hardwicki* Gray, *Phil. Mag.* (2) ii. p. 56

Material examined : 1 ex. Ranchi, Hazaribag, 1924, D. T. Erizone (Reg. no. 19533); 1 ex. Type, Chaibasa, Capt. Haughton (Reg. no. 6222).

Measurement : Snout to vent : 86 mm.; Tail broken.

Diagnostic character : Head large, neck distinct, snout obtusely pointed, eyelid movable, body stout; limbs short, digits short; rostral broader than high; three or four internasals; 9 or 10 upper & as many as lower labials; head covered above with irregular polygonal scales; tail shorter than the head & body, cylindrical much swollen at the base, tapering to a point. Reddish brown above with broad cream coloured dorsal markings the first is U-shaped & across the nape extending forwards along the upper lip to the tip of the snout, the second twice as broad as the first, is across the middle of the body. The tail has 4 or 5 complete bands.

Distribution : Bihar; Orissa; West Bengal; Madhya Pradesh; Uttar Pradesh; South India.

Remarks : The type specimen *Gymnodactylus lunatus* synonym of *Eublepharis hardwickii* Reg. No. Z.S.I. 6222 (Formerly 65 ASB) Holotype from Chaibassa (South Bihar) first description is found in Blyth in 1854.

Family 7. GEKKONIDAE

Key to the genera of the family GEKKONIDAE

1. Terminal phalenges of outer four digits attached to the dilated portion; inner digit clawless; subdigital lamellae undivided ..... ***Gekko***

   Terminal phalenges of outer-four digits free rising angularly from the expansion; subdigital lamellae divided ..... ***Hemidactylus***

Genus 13. *Gekko* Laurenti 1768

*18. *Gekko gecko* (Linnaeus)
Tokay gecko

1758. *Lacerta gecko* Linnaeus, *Syst. Nat. Ed.* 10 : 205.

1935. *Gekko gecko* Smith, *Fauna Brit. India*, 2 : 111.

Material not available, description based on literature.

Diagnostic character : Head rather large; 12-14 upper labials, the first touching the nostril, 5 pairs of post mentals. Rostral not touches the nostril, 2 large internasals. Head covered above with small polygonal scales. Dorsal with small juxtaposed flat scales intermixed with longer subconical tubercles arranged in about 12 longitudinal series, 3 to 5 small scales between the dorsal scales, belly with large rounded imbricate scales. Digits free above. Tail slightly depressed, annulate covered with subquadrangular smooth scales & regular rows of large conical tubercles, banded black & white, below whitish.

Distribution : Known to occur in Bihar; West Bengal; Assam; Tripura; Andaman & Great Nicobor.

Remarks : This is the largest gecko. The common name is derived from its loud call.

Genus 14. *Hemidactylus* Oken, 1817

Key to the species of the genus *Hemidactylus*

1. Dorsal surface with granules mixed with round larger tubercles or not 2

   Dorsal surface with trihedral tubercles .... *brooki*

2. Males with continuous series of preanal & femoral pores ..... *frenatus*

   Male with femoral pores only 3

3. Tail swollen at the base 4

   Tail not swollen at the base but slightly depressed ..... *bowringi*

4. Males with 5-7 femoral pores on each side. ..... *flaviviridis*

   Males with 10-20 femoral pores on each side separated by a few scales ..... *leschenaulti*

19. *Hemidactylus bowringii* (Gray)
Bowring's gecko

1845. *Doryura bowringi* Gray, *Cat. Liz. Brit. Mus.* : 156.

1885. *Hemidactylus bowringii* Boulenger, *Cat. Liz. Brit. London* 1 : 139.

Material examined : 2 ex. Kolassy, Purnea, 28.5.1872, Anderson (Reg. no. 5642, 5644).

Measurement : Snout to vent : 42 mm. 51 mm.; Tail missing.

Diagnostic character : This is the small gecko, head is quite large in comparison to the body; snout obtusely pointed; upper labials 7-9, mental shield is quite large, subtriangular, roastral broader than high; light brown dorsum which consist of subimbricate scales; digits are free; moderately dialated with oblique lamelle under the toes. Tail slightly depressed. Body pale brown above with longitudinal streak along the side of the head, tail with chevron shaped spots.

Distribution : India : Bihar, Godavari Valley, Sikkim, Darjeeling.

Elsewhere : Myanmar.

20. ***Hemidactylus brookii*** Gray
Brook's gecko

1853. *Hemidactylus brooki* Gray *Cat. Liz. Brit. Mus.* 153.

Material examined : 1 ex. West Champaran, 11.10.1977, N. C. Gayen (Reg. no. 23498); 6 exs. West Champaran, 1995-96, S. Sur & party (Reg. no. 25067, 25075, 25111, 25164, 25172); 5 exs. Ranchi, 1996-97. Rajtilok & party (Reg. no. 21957, 21956, 23607); 4 exs. Singhbhum, 1967-68, Rajtilok & party (Reg. no. 23604, 23605, 23606); 1 ex. Pusa 1925, H. S. Pruthi (Reg. no. 20584); 12 exs. Lodh falls, Betla, Saran, Palamau 18.6.83, 19.6.83 & 24.4.93, S. M. Ali & Dr. S. Chatterjee (Reg. no. 24021, 24022, 24243, 24244, 24966, 24967, 24968).

Mesurement : Snout to vent : 29 mm. to 42 mm.; vent to tail : 35 mm. to 43 mm.

Diagnostic character : Head somewhat large, snout obtusely pointed; 8-10 upper & 7-9 lower labials, femoral pores & preanal pores in males vary from 15-27; back with conical tubercles arranged in regular rows; colour brown or varying shades of grey with brown spots, whitish below.

Distribution : Widely distributed in whole of India.

Elsewhere : Sri Lanka; Pakistan; Myanmar; S. China.

Remarks : It is found in variety of habitats; on trees, rocks, understones & on building it is actually a domestic gecko but sometimes found far away from human habitation.

21. ***Hemidactylus flaviviridis*** Ruppell
Yellow-green house gecko

1835. *Hemidactylus flaviviridis* Ruppell, *Neue, Wirb. Faun. Abyss.* : 18.

Material examined : 9 exs. West Champaran-Kothra, Ganouli, Valmiki Nagar, Mugraha, 1995-96, S. Sur & party; 11.10.1977, N. C. Gayen (Reg. no. 25078, 25150, 25165, 25063, 25066, 25112); 2+1 exs. Dhanbad dist. Top Chanchi, Gidi, 17.6.69. Rajtilok & party, 13.1.94. Dr. A. K. Sanyal (Reg. no. 24999, 23620); 1 ex. Bhagalpur dist. Mandar Hill, 26.9.77, N. C. Gayen (Reg. no. 23496); 1 ex. Sahabad dist., Inspection Bunglow Mohania, 2.10.77, N. C. Gayen (Reg. no. 23495); 1 ex. Palamau dist. Betla, 12.6.1983, S. M. Ali (Reg. no. 24245); 1 ex. Ranchi, 2.1.1989, Dr. T. K. Sadhu, (Reg. no. 24720); 1 ex. Timli, 23.7.1956. Dr. K. K. Tiwari (Reg. no. 24557).

Measurement : Snout to vent : 34 mm. 69 mm.; Tail : 84 mm. 90 mm.

Diagnostic character : Body large & robust, head large with broad snout, ear opening sub-circular; 12-15 upper labials, 10-12 lower labials; 7-10 lamellae under the first toe, 11-14 under the fourth toe, back with fewer enlarged tubercles, tail more or less swollen at the base; males with 5-7 femoral pores on each side. Colour greyish above with indistinct darker transverse bands.

Distribution : India : Whole of India.

Elsewhere : Pakistan; Iran.

Remark : Its voice is remarkable like a chirp of small bird, which can be heard from a long distance. It maintains territorial integrity & shows an acute homing behaviour.

22. ***Hemidactylus frenatus*** Schlegel
Asian house gecko

1836. *Hemidactylus frenatus* Schlegel *Erp. Gen.* 3 : 366.

Material examined : 2 exs. West Champaran dist. Mungraha, 8.9.1996, S. Sur & party; 12.10.1977, N. C. Gayen (Reg. no. 25160, 23499); 5 exs. Madhepura dist., Budhma, 20.4.1986, S. Ahmed (Reg. no. 24357, 24399); 8 exs. Purnea dist. 9.4.1986 & 12.4.1986, S. Ahmed (Reg. no. 24358, 24359); 2 exs. Maranga village, Purnea, 1986, S. Ahmed, (Reg. no. 24372); 2 exs. Kasba, Purnea, 15.4.1986, S. Ahmed, (Reg. no. 24404); 3 exs. Purnea dist. near Inspection Bunglow & near Kuskhi Bag, 10.4.1986, 2.4.1986 (Reg. no. 24443, 24445); 4+3 ex. Farbesgaung & Basantipur, 8.4.86 & 14.4.86 (Reg. no. 24448, 24449).

Measurement : Snout to vent : 32 mm. 55 mm.; Tail : 23 mm. 43 mm.

Diagnostic characters : A smaller gecko, mental sub-triangular; two well-developed pair of post-mentals; gular region with small granular scales, nostril between the rostral, first labial & three or four smaller scales. Dark brownish dorsally & dirty whitish below, a dark stripe through the eye to the sides of the groin; flanks with dark spots.

Distribution : India : Peninsular India, West Bengal; Bihar; Andaman & Nicobar Islands.

Elsewhere : Bangladesh; Indo Chinese & Indo Malayan subregions.

Remarks : In this lizard there are variation in number of tubercles, sometimes found in the posterior part of the body or at the sides or totally absent.

23. ***Hemidactylus leschenaulti*** Dumeril & Bibron
Leschenault's lacerta

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

Material examined : 1 ex., Lohardagga, Ranchi, 19.12.1986, Dr. Rajtilok (Reg. no. 21962), 1 ex., Valmiki Nagar, 12.11.1965, 2 ex. Kothra, 5.11.1995, 18.9.1996, 1 ex. Manguraha, 8.9.1996, dist. West Champaran, S. Sur & party (Reg. no. 25091, 25092, 25161), 1 ex. Ganauli, West Champaran, 14.9.1996, S. Sur & party (Reg. no. 25154).

Measurement : Snout to vent 22 mm. to 52 mm. Tail 42 mm. to 45 mm.

Diagnostic characters : Head is large with broad snout and is covered by small granular scales which become quite large near the snout. Upper labials 10 to 12 and lower labials 8 to 10, 9 to 11 lamellae under the fourth toe, 6 to 7 under the first. Males with 10 to 17 femoral pore on each side. Grey above with undulating crossbars; a black stripe emerge from behind the eye and extend upto the flanks, belly is whitish.

Distribution : India : Peninsular India, Rajasthan, Bihar (Ranchi, Valmiki Nagar).

Elsewhere : Sri Lanka; Pakistan.

Remarks : This lizard is never found in the human dwelling. It is arboreal, found on large trees like mango, tamarind & banyan trees, during daytime lying hidden under the bark of these trees.

Family 8. AGAMIDAE

Key to the genera of the family AGAMIDAE

1. Body depressed ..... ***Psammophilus***

   Body not depressed 2

2. Dorsal crest present; 5 toes only ..... ***Calotes***

   Dorsal crest absent; 4 toes only ..... ***Sitana***

Genus 15. ***Calotes*** Rafinesque, 1815

24. ***Calotes versicolor*** (Daudin)
Indian garden lizard

1802. *Agama versicolor* Daudin *Hist. Nat. Rept.* **3** : 395.

1853. *Calotes versicolar* Jerdon, *J. Asiat. Soc. Beng.* **22** : 470.

Material examined : 1 ex. Palamau dist., 13.6.1983, S. M. Ali (Reg. no. 24019); Patna, 1 ex. Rajendra Nagar, 21.10.1988, Prof. S. P. Roy Chowdhury (Reg. no. 21971); 3 exs, Bahadurpur, 7.8.1965, Y. Paswan (Reg. no. 21977); 7 exs. Rampur, 1.12.1966, B. Nandy (Reg. no. 21980, 21982, 21984, 21985); 1 ex. Angul P. W. D. Bunglow, 18.5.1965, K. K. Mahajan (Reg. no. 21988); 1 ex. Begampur, 12.7.1967, T Venketwesrlu (Reg. no. 21981); 1 ex. Belgaon, Patna, 13.4.1946, B. S. Chauhan (Reg. no. 23576); 1 ex. Bagha, Motihari, 11.2.1971, S. Biswas (Reg. no. 24555); 1 ex. Motihari Irrigation Bunglow, Champaran dist. 7.10.1977, N. C. Gayen; 1 ex. Harap, 4.2.1954, A. P. Kapur (Reg. no. 24292); 11 ex. Manbhum, 1948, Nov. A. P. Kapur, Vazirani (Reg. no. 24293, 24297); 1 ex. Patrabassa, Rajtilok & party (Reg. no. 23306); 6 ex. Chiria Iron ore rewl, 18.2.1955, A. P. Kapur (Reg. no. 24473); 2 exs. Kundunala, Schdri, Dhanbad dist. (Reg. no. 23621).

Measurement : Snout to vent : 38 mm. 86 mm.; Tail : 45 mm. to 230 mm.

Diagnostic characters : Head is oval & body is laterally compressed. Dorsal scales strongly

keeled & more or less larger than the ventrals. Two distinct spines on each side of the head behind tymphanum. Dorsonuchal crest well developed extending from nape to above vent in the male. Tail long & rounded. Juveniles with light dorsolateral stripes, which enclose transverse black spots. Adult greyish brown above with dark transverse bars. Belly whitish with dark streaks. Tail with dark brown cross bars.

Distribution : India : Whole of India.

Elsewhere : Sumatra to South China; Sri Lanka; Pakistan; Afganistan.

Remarks : It exhibits considerable colour variation, lives in variety of habitats, trees, rocks, understones & on buildings.

Genus 16. ***Psammophilus*** Fitizinger, 1843

25. ***Psammophilus blanfordanus*** (Stoliczka)
Blanford's rock agama

1871. *Cherasia blanfordana* Stoliczka, *P. Asiat. Soc. Beng.* : 194.

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

Material examined : 1 ex. Udaypore, West of Chotonagpur, Dr. W. T. Blanford (Reg. no. 6604); 2 ex. Ranchi, 17.1.1870, W. T. Blanford (Reg. no. 6612-6613); 1 ex. Gandharbanala, Paresnath Hill, Hazaribag, 20.4.1948, Nath & Sinha (Reg. no. 23633); 1 ex. Tillaya Dam side, Hazaribah, 21.3.1952, Dr. A. G. K. Menon (Reg. no. 23645); 9 ex. collected by Dr. A. P. Kapur from different regions of Singbhum district during Chotonagpur survey 1955 these are from Lyallas view, 3 miles south west of Jholkabad, 10.2.1955 (Reg. no. 23304); 1 ex. Patrabassa, Monohorpur, 25.1.1955 (Reg. no. 23305); 1 ex. Old Angua, 16.2.1955 (Reg. no. 23438); 6 ex. Chiria Iron ore rewl alt. 1700 ft. 18.2.1955 (Reg. no. 24473).

Measurement : Snout to vent 23 to 79 mm. Tail 45 to 74 mm.

Diagnostic character : Dorsal scales slightly large, keeled & imbricate arranged in 80 to 100 rows round the mid body, flank with a few scattered and little large series of scales. Young and females olive brown with a series of large lozenge-shaped dark brown spots on the back and tail which fade out with age.

Distribution : India : Bihar, Orissa, Madhya Pradesh, Eastern ghats, Kerala, Andhra Pradesh.

Remarks : It is found on rocks.

Genus 17. ***Sitana*** Cuvier, 1829

26. ***Sitana ponticeriana*** Cuvier
Indian fan-throated lizard

1844. *Sitana ponticerriana* Cuvier, *Guerin Icon. Reg. Anima Rept.* pl. x. fig. 2.

Material examined : 3 ex. Manbhum, collected by Nath, Sinha & Baugh; these are from Chawrasi 2 miles west of Inanpur, 26.11.1948 (Reg. no. 24298), from a nullah in village Cholki, 7 miles north of Barakar, 15.11.1948 (Reg. no. 24299) from the bush, Maithan Dam site 6 miles N. W. of Barakar, 15.11.1948 (Reg. no. 24549), 2 exs. Santal Pargana, 18.3.1938, A. S. R. & H. A. H. (Reg. no. 23634); 1 ex. Dhanbad dist., 12.9.1969, Rajtilok & party (Reg. no. 23652); 1 ex. West Champaran dist., Mungraha, 11.10.1977, N. C. Gayen, 1 ex. Tillya Dam side, Hazaribag, 22.3.1952, Dr. Menon (Reg. no. 23646); 8 exs. from different regions of West Champaran dist. viz. Kotra, Ganouli, Champatia, Valmiki Nagar, 18.4.1996, 14.9.1996, 17.9.1996, 8.9.1996 & 5.9.1996, S. Sur & party (Reg. nos. 25151, 25152, 25156, 25158, 25175).

Measurement : Snout to vent : 23 mm. to 39 mm.; Tail : 35 mm. to 74 mm.

Diagnostic character : A small lizard which is easily distinguished by 4 toes instead of 5. No dorsal crest. Tail very long. Male with a gular pouch. Dark brown dorsally with vertebral series of dark brown black edged rhomboidal spots on the back. Ventral side is whitish.

Distribution : India : Whole of India.

Elsewhere : Sri Lanka.

Remarks : It can run with considerable speed & on approach of danger dashes away with tail tip erect until it finds refuge in some hole or crack in the ground or bush.

Family 9 CHAMAELEONIDAE

Genus 18. ***Chamaeleon*** Laurenti, 1768

27. ***Chamaeleo zeylanicus***

Indian Chamaeleon

1768. *Chamaeleo zeylanicus* Laurenti. *Syn. Rept.* : 46.

Material examined : 1 ex. Deogharia hills, Baidyanath Dham, 26.12.1972, A.P. K. & G. M. (Reg. no. 23648).

Measurement : Snout to vent : 105 mm.; Tail : 115 mm.

Diagnostic character : Body laterally compressed, a conical casque on the top of the head. Body covered with granular scales. A prominent canthal & supra orbital crest, the later continued backwards as a ridge of enlarged tubercles along the side of the head & then curved upwards to meet the parietal crest, no rostral appendage, eyes large & except for a small aperture for the pupil, covered by the granular scaled lid. Tympanum absent. Tongue club shaped at the tip & very extensile. The digits of the hand in two opposed set, two directed away from & three towards the body. The number is reversed in case of foot. Tail prehensile. The colour is blackish.

Distribution : India : Bihar (first record); West Bengal; Orissa; Andhra Pradesh

Elsewhere : Peshwar, Pakistan; Sri Lanka.

Remarks : Insectivorous, strictly arboreal & diurnal. Usually 13-31 oval eggs are laid in a hole, about 20-30 cm. deep which is dug out by female only. (Tikadar & Sharma, 1992).

Family 10. SCINCIDAE

Key to the genera of the family SCINCIDAE

1. Pterygoid bones are not touching one another, the palatal notch extending forwards to the level of the centers of the eye ..... *Mabuya*

- Pterygoid bones are usually in contact with one another, the palatal notch not extending to the level of the centers of the eyes 2

2. Limbs well developed 3

  Limbs short ..... *Lygosoma*

3. Lower eyelid with undivided more or less transparent disc ..... *Scincella*

- Lower eyelid scaly ..... *Sphenomorphus*

Genus 19. ***Lygosoma*** Hardwicke & Gray, 1829

Key to the species of the genus *Lygosoma*

1. Lower eyelid scaly; digits shorter .... *albopunctata*

  Lower eyelid with an undivided transparent disc; digits longer ..... *punctatus*

28. ***Lygosoma albopunctata*** (Gray)

White spotted supple skink

1846. *Riopa albopunctata* Gray, *Ann. Mag. Nat. Hist.* **18** : 430.

1977. *Lygosoma albopunctata* Greer, *J. Nat. Hist.* **11** : 516.

Material examined : 1 ex. Gerabari, Katihar dist. 5.4.1986, S. Ahmed (Reg. no. 24400); 1 ex. towards east of Inanpur, Manbhum dist. 1948, S. C. Baugh (Reg. no. 24477); 1 ex. from the bed of Sundarpahari, Guddu, Santal Pargana, 6.3.1968, A. S. R. & H. A. H. (Reg. no. 23636); 1 ex. Kotra, West Champaran dist. 7.6.1993, S. Chakraborty (Reg. no. 24998).

Measurement : 37 mm. to 46 mm. Tail : 43 mm to 60 mm.

Diagnostic character : Limbs reduced; body-elongated snake like, lower eyelid scaly; nuchal indistinct. Ear opening distinct with 1-2 minute lobules on anterior margin. Tympanum deeply sunk. Body scales sub equal or dorsal scales little larger than lateral, 12-15 lamellae under the fourth toe. Tail thick at the base. Brownish red above, each scales with a distinct dark spot forms a longitudinal series. Yellowish white below.

Distribution : India : Bihar; Andhra Pradesh; Madhya Pradesh; Orissa; Uttar Pradesh; West Bengal.

29. ***Lygosoma punctatus*** (Gmelin)
Spotted supple skink

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

1977. *Lygosoma punctatus* Greer, *J. nat. Hist.* **11** : 516.

Material examined : 2 exs. In & around Valmiki Nagar, West Champaran dist., 12.11.95, S. Sur & party (Reg. no. 25090).

Measurement : Snout to vent : 22 mm. - 54 mm.; Tail : 27 mm. - 65 mm.

Diagnostic character : Elongated snake like body with 5 fingers & 5 toes, lower eyelid with undivided transparent disc. Body scales smooth, 24-26 scales round middle of the body and 62-76 scales down middle of back. Limbs reduced fourth toe quite longer than third, 11-14 lamellae under fourth toe. Tail thick at base. Colour brown above, each side with a dark spot forming longitudinal series, belly yellowish white.

Distribution : Throughout India.

Genus 20. ***Mabuya*** Rafinesque, 1815

Key to the species of the genus *Mabuya*

1. Lower eyelid scaly 2

- Lower eyelid with an undivided semi-transparent disc. ..... *dissimilis*

2. 5 broad black edged yellowish stripes ..... *trivittata*

- No such stripes 3

3. Fronto-nasal broader than long ..... *carinata*

- Fronto-nasal as long as broad ..... *macularia*

30. ***Mabuya carinata*** (Schneider)
Keeled grass snake

1801. *Scinus carinatus* Schneider, *Hist. Amph.* **2** : 182.

1935. *Mabuya carinata* Smith, *Fauna, Brit. India* **2** : 266-268.

Material examined : 1 ex. Rajmahal, Dr. N. Annandale (Reg. no. 16406); 1 ex. Pareshnath Hills, Dr. N. Annandale (Reg. no. 16311); 2 exs. 4.2.1954, Ranchi, A. P. Kapur & T. G. Vazirani (Reg. no. 24291); 1 ex. near the confluence of Arun & Kosi river, 14.11.1947, Dr. Tiwari & K. K. Nair (Reg. no. 24550); 1 ex. Monihari village, ca 26 km. South of Katihar, 31.1.1986, S. Ahmed & party (Reg. no. 24447); 1 ex. South of Koel river, 1 km. North of Monohorpur, Singhbhum dist. 29.12.1967, Dr. Rajtilok, (Reg. no. 21958); 1 ex. Ranchi, 10.12.1967, Dr. Rajtilok (Reg. no. 21951); 1 ex. Manbhum dist., 25.11.1948, S. C. Baugh (Reg. no. 24482); 1 ex. Kothra, 6.11.1995, S. Sur & party, (Reg. no. 25080), 1 ex. Valmiki Nagar, 12.11.1995, S. Sur & party (Reg. no. 25087).

Measurement : Snout to vent : 67 mm. - 101 mm.; Tail : 110 mm. - 162 mm.

Diagnostic character : Head shields arranged symmetrically. A single pair of nuchalis. Fronto nasal broader than long. Dorsal & lateral scales sub-equal 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 fourth toe. Young dark bronze above with yellow lateral bands from snout to base of tail, adult light bronze above with 4-6 black dots on back, a light band from behind the eye to the base of the tail; belly white or yellow.

Distribution : India : Bihar; Assam; West Bengal; Orissa.

Elsewhere : Sri Lanka; Bangladesh; Nepal.

Remarks : Common.

31. ***Mabuya dissimilis*** (Hallowell)
Striped grass skink

1857. *Euprepes dissimilis* Hallowell, *Trans. Amer. Phil. Soc.* (2) **11** : 78.

1935. *Mabuya dissimilis* Smith, *Fauna Brit. India*, **2** : 261.

Material examined : 1 ex. Hazaribag, Tinpahar, S. W. of Rajmahal, 1876, J. Woodmason (Reg. no. 2349); 1 ex. from the neighbourhood about a mile away towards the east of Innapur, Manbhum dist., 9.12.1948, S. C. Baugh (Reg. no. 24476).

Measurement : Snout to vent : 58 mm. 77 mm.; Tail broken.

Diagnostic character : No proper nuchalis, fronto nasal broader than long. Dorsal & lateral scales subequal, the former with 2 or sometimes 3 strong keels, 34-36 scales round the middle of the body. Digits short, with smooth lamellae beneath, from 12-16 lamellae beneath the fourth toe. Light brown above generally with three prominent greenish white stripes, flanks with white spots edged with black; lower parts yellowish white, a conspicuous white streak edged with brown along the posterior half of the upper lip.

Distribution : India : Bihar & Rajashtan.

Elsewhere : Pakistan.

Remarks : Prefers open & dry country with plenty of bushes & rock.

32. ***Mabuya macularius*** (Blyth)
Bronze grass skink

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

1997. *Mabuya macularius* (Blyth), Das, *Hamadryad*, **22** : 37.

Material examined : 1 ex. Khursila village, Purnea dist., 11.4.1986, S. Ahmed, (Reg. no. 24373); 1 ex. Pusa, 5.10.1915, F. H. Gravely (Reg. no. 19747); 1 ex. Katihar dist. 5.4.1986, S. Ahmed (Reg. no. 24401); 1 ex. Palamau dist. 11.6.1983, S. M. Ali (Reg. no. 24017); 9 exs. from different regions of Valmiki Tiger Reserve, West Champaran dist. collected by S. Sur & party; Ganouli, Kothra, Gobardhana, 9.11.1995, 12.11.1995, 11.11.1995, 9.9.1996 (Reg. no. 25091, 25088, 25084, 25113, 25176).

Measurement : Snout to vent : 35 mm. 62 mm.; Tail : 55 mm. 85 mm.

Diagnostic character : Head small, snout short, not depressed, eye small, fronto nasal not broader than long, ear opening oval, slightly smaller than eye. A pair of nuchalis present. 6 or 7 upper & 7 lower labials, 28 to 30 scales round the body. Dorsal scales with 5-7 low keels. 12-17 lamellae under the fourth toe. Tail round. Colour pattern is variable. The general body colour is brown with or without spots.

Distribution : India : Whole of India.

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

Remarks : Common.

33. ***Mabuya trivittata*** (Hard & Gray)
Three-lined grass skink

1827. *Tiliqua trivittata* Hardwickie & Gray, *Zool. Journ.* **3** : 227.

1935. *Mabuya trivittata* Smith, *Fauna. Brit. India* **2** : 275-276.

Material examined : 1 ex. Rajmahal, 8.7.1984, Dr. N. Annandale (Reg. no. 16405).

Measurement : Snout to vent : 53 mm; Tail broken.

Diagnostic character : It is a more or less large skink. Supra nasal in contact with one another; frontonasal broader than long, lower eyelid scaly, ear opening sub-circular. Dorsal and lateral scales sub-equal with 5 or 7 strong keels, 34 or 36 scales round the mid body. Digits moderately long 13 or 14 lamellae under the fourth toe. Palms of hands and soles of feet with enlarged sub-conical tubercles intermixed with much smaller ones. Grayish brown with 5 broad, black edged longitudinal stripes extended whole length of body. Lower parts whitish.

Distribution : India : Andhra Pradesh; West Bengal; Bihar; Maharashtra; Tamil Nadu.

Remarks : Uncommon.

Genus 21. ***Scincella*** Mittleman, 1950

34. ***Scincella sikkimensis*** (Blyth)
Sikkimese ground skink

1854. *Mocoa sikkimensis* Blyth. *J. Asiat. Sc. Beng.* **22** : 652.

1952. *Scincella sikkimense* M. B. Mittleman. *Smithsonian Misc. Coll.* Washington, **117**(17) : 30.

Material examined : 1ex. Valmiki Tiger Reserve Forest, Kothra, 7.11.1995, S. Sur & party, (Reg. no. 25086).

Measurement : Snout to vent 23 mm, tail 20mm.

Diagnostic character : Dorsal scales distinctly larger than laterals, 22 to 24 scales round the body, ear without projections lobules, ear opening smaller than palpebral disc. 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 the body, pale bluish or whitish below.

Distribution : India : The eastern Himalayas, North Bengal, Bihar (Paresnath hill, Valmikii tiger Reserve).

Elsewhere : Nepal, South Tibet.

Remarks : Oviparous, lays 4 to 6 eggs.

Genus 22. ***Sphenomorphus*** Fitizinger, 1843

35. ***Sphenomorphus maculatus*** (Blyth)

Spotted litter skink

1853. *Lissonata maculata* Blyth, *J. Asiat. Soc. Beng.* **22** : 653.

1935. *Sphenomorphus maculatus* Pope, *Rept. China, New York* : 483.

Material examined : 1 ex. Singhbhum, 24.4.1990, S. S. Saha (Reg. no. 24823); 1 ex. Kothra, Valmiki Tiger Reserve Forest, 7.11.1995, S. Sur & party, (Reg. no. 25114).

Measurement : Snout to vent : 35 mm. 46 mm.; Tail : 34 mm. - 51 mm.

Diagnostic character : Body not elongated, limbs well developed, rostral flat or concave, pre frontal rather small, separated from one another, no nuchals, supra orbital region prominent, 5 supra oculars, first longest, 5th-the smallest, supraciliaries 10-12 both the loreals higher than long, 2 large superposed scales, tympanum is deeply sunk, upper labial 7; a pair of large preanal scale present, tail gradually tapering to a point, almost two times longer than the head & body, the median rows of scale are transversely enlarged. Limbs are moderately long & compressed, with 16-22 keeled lamellae under the fourth toe. The dorsal colouration bronzy or deep brown, generally with faint small green spots & two median series small black stripes, flank with enormous spots, belly whitish.

Distribution : India : Assam; Bihar; West Bengal; Darjeeling, Andaman & Nicobar Islands.

Elsewhere : Myanmar, South China, Thailand, South Vietnam, North Vietnam.

Remarks : It is low-mountain dwelling species, lays 4 to 5 eggs in a single clutch.

Family 11. LACERTIDAE

Genus 23. ***Ophisops*** Menetries, 1832

Key to the species of the genus *Ophisops*

1. Anterior labials ridged forming a projecting margin, occipital present ..... *leschenaulti*

   Labials not keeled; normally no occipital 2

2. Upper head shields coarsely striated ..... *minor-nictans*

- Upper head shields smooth ..... *microlepis*

36. ***Ophisops leschenaulti*** (Milne-Edwards)

Leschenault's lacerta

1829. *Cabrita leschenaulti* Milne Edwards, *Ann. Sa. Paris*, **16** : 80 & 86.

1989. *Ophisops leschenaulti* Arnold, *Bull. Brit. Mus. Nat. Hist.* (*Zool.*) **55**(2) : 245.

Material examined : 1 ex. West Champaran, 17.7.1870, W. T. Blanford (Reg. no. 2209).

Measurement : Snout to vent 46 mm, tail broken.

Diagnostic character : Head covered with symmetrical shields; dorsal scales keeled and imbricate while the ventrals are smooth and imbricate. Anterior labial ridged; occipital scale present; 42-50 scales round the middle of the body; lower eyelid large and distinct from the upper eyelid. Tail cylindrical, 12 to 16 femoral pores on each side. Dorsally brownish yellow and whitish ventrally. The dorsum with two white lateral bands, two black or green bands present in between the two bands.

Distribution : India : Bihar, Andhra Pradesh, Orissa, Madhya Pradesh, Tamil Nadu.

Elsewhere : Sri Lanka.

Remarks : Insectivorous, burrowing and diurnal.

*37. ***Ophisops microlepis*** Blanford
Small-scaled lacerta

1870. *Ophisops (Gymnops) microlepis* Blanford. *J. Asiat. Soc. Beng.* **39** : 351.

1935. *Ophisops microlepis* Smith, *Fauna Brit. India*, **2** : 380.

Known to occur in Bihar, material not available, description based on literature.

Diagnostic character : Snout elongate, pointed, upper head shield smooth; nostril between upper & lower nasal, one frontal; inter parietal long & narrow, temporal scales keeled, tympanic shield large smooth; dorsal scales rhomboidal, almost equal, except outermost rows in oblique longitudinal series converging towards vertebral line, much smaller than sub-caudals, 56 scales round mid body, ventral in 6 longitudinal rows; 12-16 femoral pores on each side. Colour olive green or brown above, a light dorso lateral stripe starts from supracilliary edge & ends at the base of tail bordered above with black spots, a second stripe less distinct passes along upper lip to base of hind limb, belly greenish white.

Distribution : India : Bihar; Rajasthan; Gujarat; Madhya Pradesh.

38. **Ophisops minor - nictans** Arnold
Indian dwarf lacerta

1870. *Cabrita jerdoni* Beddome, *Madras month. J. Med. Sci.* : 34.

1989. *Ophisops minor nictans* Arnold, *Bull. Brit. Mus. nat. Hist.* (Zool.) **55**(2) : 245.

Material examined : 2 ex. West of Chotonagpur, W. T. Blanford (Reg. no. 2207, 2208).

Measurement : Snout to vent : 39 mm. 43 mm.

Diagnostic character : Upper head shields coarsely striated. Nostril between large anterior & two small posterior nasals. Anterior labials not ridged, occipital scale absent. 26-30 scales round the mid body; 11-15 femoral pores. Colour brownish, with two lateral stripes, the upper much more conspicuous than the lower & is bordered with longitudinal series of black spots. Lips & throat speckled with black.

Distribution : Bihar; Andhra Pradesh; Madhya Pradesh; Uttar Pradesh; Maharashtra.

Remarks : E. N. Arnold proposed the name Ophisops nictans for this lizard, the name nictans meaning blinking in reference to the ability of this species to open & close the eyes unlike most of its congeners. [Bull. Brit. Mus. nat. Hist. (Zool.) 55(2) : 245].

Family 12. VARANIDAE
Genus 24. ***Varanus*** Merrem, 1820

Key to the species of the genus *Varanus*

1. Nostril is nearer to the orbit than to the end of the snout; nuchal scales not larger than those on the crown of the head, supra oculars small ..... *bengalensis*

- Nostril is nearer to the end of the snout than to the orbit, nuchal scales larger than those on the crown of the head; median oculars slightly enlarged transversely ..... *flavescens*

39. ***Varanus bengalensis*** (Daudin)
Indian monitor

1802. *Tupinambis bengalensis* Daudin, *Hist. Nat. Rept.* **3** : 67.

1885. *Varanus bengalensis* Boulenger, *Cat. Liz. Brit. Mus.* **2** : 310.

Material not available. Recorded from Bihar (Sanyal, D. P. 1976, News letter, vol. 2(6) 204.

Diagnostic character : Head long & narrow, snout pointed. Head covered with small scales, body scales granular; limbs strong, neck long & narrow; tail laterally compressed; mid body scale rows 132-176; no femoral pores. Young, adult differs in colouration. Young dark olive above with numerous light spot or ocelli alternating with dark bars & whitish below with narrow dark transverse bars sometimes broken up into spots. Adults brownish or olive above with dots on the back; lower parts yellowish molted with blacks.

Distribution : India : Found throughout India.

Elsewhere : Nepal; Pakistan; Myanmar.

*40. *Varanus flavescens* (Gray)
Indian yellow monitor

1827. *Monitor flavescens* Gray, *Zool. Journ.* 3 : 226.

1935. *Varanus flavescens* Smith, *Fauna Brit. India*, 2 : 404.

Material not available. Description based on literature.

Diagnostic character : Snout short, convex, canthus rostrallis distinct. Nostril an oblique slit, a little nearer to the tip of the snout than to the orbit. Scales on the crown of the head smaller than the nuchal scales; median supra oculars slightly enlarged transversely, abdominal scales smooth, in 65 to 75 transverse rows. Digits short. Tail strongly compressed with low double toothed crest above. Colour dark brown with a reddish tint on the body.

Distribution : Bihar; West Bengal; Orissa.

Remarks : They are very good swimmers.

Suborder III SERPENTS

Key to the families of suborder SERPENTES

1. Eyes vestigial, covered by scales : body worm, like ..... TYPHLOPIDAE

- Eyes developed, exposed, body not worm like 2

2. Vestiges of hind limb-absent ..... BOIDAE

   Vestiges of hind limb present 3

3. Maxillary bone not edentulous, no specialized array of bones in the gullet 4

   Maxillary bone edentulous, specialised array of bones in the gullet ..... DASYPELTIDAE

4. Poison fangs absent in front of the mouth ... . COLUBRIDAE

   Poison fangs present in front of the mouth 5

5. Head shields symmetrical ..... ELAPIDAE

   Head shields asymmetrical ..... VIPERIDAE

Family 13. TYPHLOPIDAE

Key to the genera of the family TYPHLOPIDAE

1. Snout rounded; nostrils lateral; nasal suture terminating at the edge of preocular ..... ***Ramphotyphlops***

   Snout pointed; with sharp horizontal edge and inferior nostrils; nasal suture not terminating at the edge of preocular ..... ***Rhinotyphlops***

Genus 25. ***Ramphotyphlops*** Fitzinger, 1943

41. ***Ramphotyphlops braminus*** (Daudin)
Common blind snake

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

1890. *Typhlops braminus* Boulenger, *Fauna Brit. India* : 236.

1943. *Ramphotyphlops braminus*, Fitizinger, *Bull. Zool. Nomencl* (3/4) : 204-207.

Material examined : 1 ex. Rajmahal, Bihar, 1.12.1880 (Reg. no. 10979); 1 ex. Ranchi, 15.6.1951, Bhattacharji and Chatterjee (Reg. no. 24483); 1 ex. Pusa, July 1917 (Reg. no. 18723); 1 ex. Seripur dist. Saran, M. Macken zee (Reg. no. 17544); 2 ex. Khierpur, Purnea dist. 20.9.1915, C. Paiva (Reg. no. 18713-14); 1 ex. Darbhanga, C. Marries (Reg. no. 11936); 2 ex: Munger, E. Lock Wood (Reg. nos. 6929, 6930); 2 ex. Valmikinagar, Gobardhan, dist. West Champaran, 5.11.1995 & 9.9.1996, S. Sur & party (Reg. nos. 25110 & 25171).

Measurement : Total length : 84 mm. to 151 mm.

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 the preocular. Body uniformly cylindrical. Tail very short, ending in a small short stiff point. Scales lightly polished 20 rows of scales round the body. Colour brown or blackish above, lighter below; snout anal region and end of tail whitish.

Distribution : Found throughout the oriental region.

Remark : Common blind snake of the orinetal region.

Genus 26. ***Rhinotyphlops Fitzinger*** 1832

42. ***Rhinotyphlops acutus*** (Dum. & Bibr.)

Beaked worm snake

1844. *Onychocephalus acutus* Dum. & Bibr. *Erp. Gen.* **6** : 333.

1890. *Typhlops acutus* Boulenger. *Fauna Brit. Ind.* : 241.

1997. *Rhinotyphlops acutus* (Dum. & Bibr.) Das, *Hamadryad* **22** : 38.

Material examined : 1 ex. Chaibasa, H. L. Haughton (Reg. no. 6939); 1 ex. Singhbhum dist. A. J. Maik (Reg. no. 15969).

Measurement : Total length 408 mm to 469 mm.

Diagnostic characters : Snout pointed & hooked, projecting with sharp horizontal edge, nostril inferior. Rostral very large covering most of the head above 23 to 36 scales round the body. Colour brownish above, paler below.

Distribution : India : Bihar as stated above, peninsular India.

Remarks : Largest snake in the Typhlopidae, remarkable character is the presence of hook on the snout, which is meant for making progression above the ground.

Family 14. BOIDAE

Key to the genera of the family BOIDAE

1. A supraorbital bone; teeth on premaxilla, head covered with large shield labials pitted ..... ***Python***

   No supraorbital bone; no teeth on premaxilla; head covered with small shields; labials not pitted ..... ***Eryx***

Genus 27. ***Eryx*** Daudin, 1803

Key to the species of genus *Eryx*

1. Mental groove present; tail blunt .... *johnii johnii*

   Mental groove absent; tail pointed ..... *conica*

43. ***Eryx conica*** (Schneider)

Common sand-boa

1801. *Boa conica* Schneider. *Hist. Amph.* **2** : 268.

1893. *Eryx conicus* Boulenger. *Cat. Sn. Brit. Mus.* **1** : 124.

1997. *Eryx conica* (Schneider) Das, *Hamadryad*. **22** : 39.

Material examined : 1 ex. Chotanagpur V. Ball (Reg. no. 8077); 1 ex. Nimaighat on Paresnath Hill, 15.4.1948, T. B. Sinha, S. C. Baugh (Reg. no. 24288); 1 ex. Sijna, Dist.. Manbhum, N. Warde Jones (Reg. no. 19230); 1 ex. Chaibasa, F. H. Gravely (Reg. no. 16655).

Measurement : Snout to vent 180 mm. to 265 mm.; Vent to tail 14 mm. to 20 mm.

Diagnostic character : Head slightly distinct from neck rostral about two times broader than high, mental groove absent. Nostril slit-like, between two nasals and internasal. Head covered with small keeled scales, 8 to 10 scales across the forehead between eyes; 10 to 15 scale round eye, upper labials 11-13 and lower labials 14-17. Body robust, dorsal scales keled 40-55 rows. Tail very short, bluntly pointed. Colour yellowish, brownish or greyish above with a dorsal series of large dark brown, black-edged spots, usually confluent with one another to form zigzag stripe, lower parts yellowish or whitish outer scale rows with small brown spots.

Remarks : It is persistent burrower and sluggish, hiding in the dry and loose sand during most of the day exposing only the portion of the body.

44. ***Eryx johnii johnii*** (Russell)

Red sand boa

1801. *Boa johnii* Russell. *Ind. Serp* **2** : 18 & 20 pts. 16 & 17.

1943. *Eryx johnii johnii*. Smith. *Fauna Brit. Ind.* **3** : 113-114.

Material examined : Valmiki Tiger Reserve Forest - Bihar : Valmikinagar, West Champaran, 1 ex. 13.11.1995, S. Sur & party (Reg. no. 25126).

Measurement : Snout to vent : 235 mm; Tail 15 mm.

Diagnostic character : Head not distinct from neck, snout broad wedge shaped. Rostral large broader than high, well visible from above with an angular horizontal edge. Nostril slit like between two enlarged nasals. Upper labials 11 to 13, lower labials 14 to 17, mental groove present; no chin shield. Body robust, cylindrical. Eye small, pupil vertically elliptical, iris spotted with ruddy gold, tail short rounded at its end which appears like another head of the snake. Colour sandy grey or yellowish above, the scales edged with dark brown, sometimes distinct transverse bands on the body, lower part whitish mottled with brown.

Distribution : Bihar : Valmiki Tiger Reserve; drier zones of India.

Remarks : The snake can be recognised by colour, bluntly rounded stump like tail which could be mistaken as its head and due to this resemblance there is a belief held all over the country that this non poisonous snake has two heads.

Genus 28. ***Python*** (Daudin), 1803

*44. ***Python molurus*** (Linnaeus)

Indian rock python

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

1890. *Python molurus* Boulenger. *Fauna Brit. Ind.* 246.

Material not available, description based on literature.

Diagnostic character : Head flattened with long snout, neck distinct, head covered with large shield, labials pitted. Nostril large, directed upward & situated high on snout. rostral & first two labials with sensory pits. Eyes small, pupil vertical, iris flaked with gold. Chin with mental groove. Tail short and prehensile tapering abruptly. Colour greyish or yellowish cream in adults and in juveniles often a pretty shade of pink. A dark streak from eye to nostril in juveniles, marking sometimes persists in adults. A conspicuous dark oblique band from eye to neck. On back of head and nape a large lens - shaped mark with a pale centre, often fading anteriorly in adult. Body with series of large roughly quadrate patches from neck to tail dorsally.

Distribution : Throughout India.

Family 15. COLUBRIDAE

Key to subfamilies of family COLUBRIDAE

1. Nostril not valvular ..... COLUBRINAE

   Nostril valvular ..... HOMALOPSINAE

Subfamily COLUBRINAE

Key to the genera of subfamily COLUBRINAE

1. All the teeth solid 2

- All the teeth not solid. Last 2 or 3 maxillary teeth grooved 11

2. Hypapophysis present throughout the vertebral column 3

- Hypapophysis absent (on the posterior dorsal vertebrae) 6

3. Dentary bone freely movable on the articular, 30 to 50 maxillary teeth present ..... ***Sibynophis***

- Dentary bone not or but slightly movable on the articular, less than 30 maxillary teeth 4

4. Posterior maxillary teeth largest 5

   Maxillary teeth equal ..... ***Xenochrophis***

5. Two internasals ..... ***Amphiesma***

   One internasal ..... ***Atretium***

6. Posterior maxillary teeth longest 7

   Maxillary teeth subequal 10

   Some anterior maxillary teeth enlarged and fang like ..... ***Lycodon***

7. Head distinct from neck 8

   Head short, not distinct from neck ..... ***Oligodon***

8. Maxillary teeth less than 20 9

   Maxillary teeth 20 or more ..... ***Ptyas***

9. Prefrontal broken up into several shields ..... ***Sphalerosophis***

   Prefrontal not broken up into several shields ..... ***Argyrogena***

10. Scales above 18 rows ..... ***Elaphe***

    Scales below 18 rows ..... ***Dendrelaphis***

11. Pupil round 12

    Pupil vertical ..... ***Boiga***

    Pupil horizontal ..... ***Ahaetulla***

12. Anterior mandibular teeth strongly enlarged ..... ***Psammophis***

    Anterior mandibular teeth not enlarged ..... ***Chrysopelia***

Genus 29. ***Ahaetulla***, Link 1807

Key to the species of genus *Ahaetulla*

1. Snout acuminate, terminating in a pointed dermal appendage. It has a median groove above ... *nasutus*

   Dermal appendage longer, covered above by small scales, no median groove above ..... *pulverulenta*

45. ***Ahaetulla nasutus*** (Anderson)
Common vine snake

1898. *Dryophis nasutus* Anderson, *Bih. Sven. Vet. Akad.* Stockholm **24, 4, 6,** : 15.

1933. *Ahaetulla nasuta* Stejnagar, *Copeia* : 203.

Material examined : 1 ex. Purnia dist. 11, 1880, F. Fedden (Reg. no. 10977); 3 example from Manbhum : 1 example V. Ball (Reg. no. 8862) and 2 examples W. Swinhoe (Reg. no. 8867-8868).

Measurement : Snout to vent : 405 mm. to 900 mm.; Vent to tail : 207 mm. to 559 mm.

Diagnostic character : Snout acuminate terminating in pointed dermal appandages, variable in length, shorter than eye; it has median groove and is formed by rostral. Eye large; iris powdered with gold, pupil horizontal no loreal, the inter nasals pre frontals in contact with labials, 1 preocular in contact with frontal; 2 post oculars, 8 supra labials, 3rd or 4th or one divided to form 1 or 2 pre suboculars, 5th touching the eye. Colour above verdent green. Belly with lighter shade of green adorned on each side by prominent white stripe situated on the ventral shields. Chin and throat with light blue and yellow markings.

Distribution : India : Rajasthan, Bihar, West Bengal and Assam.

Remarks : The common vine snakes which are described here had been represented as *Ahaetulla mycterizans* but these should be *Ahaetulla nasutus* (Anderson). (Cox; Jackson, Nabhitabhata and Kumthorn Thirakhupt. 1998).

46. ***Ahaetulla pulverulenta*** (Dum. and Bib.)
Brown whip snake

1854. *Dryinus pulverulentus* Dum. and Bib. *Erp. Gen.* **7** : 812.

1997. *Ahaetulla pulverulenta* (Dum. and Bib.) Das *Hamadryad*, **22** : 40.

Material examined : 6 exs., Manbhum, V. Ball (Reg. no. 7811, 7812, 7813, 7814, 7815, 7816); 1 ex., Malpahari, Santal Pargana (Reg. no. 19905).

Measurement : Snout to vent : 315 mm. to 690 mm.; vent to tail : 120 mm. to 447 mm.

Diagnostic characters : Dermal appendage longer, sometimes longer than eye, formed below by the rostral, covered above by small scales. No median groove above, nasals often in contact with one another in front of the internasal. Colour grey or brown, remarkable blackish spot present on the back.

Distribution : India : Bihar (First record); South Western Ghats; Allgari hills; Madurai, Tamil Nadu.

Remarks : It is found in bushes and scrub jungle but not on trees. It has been reported first time from Bihar.

Genus 30. ***Amphiesma*** Dumeril & Bibron, 1854

47. ***Amphiesma stolata*** (Linnaeus)
Striped black snake

1758. *Coluber stolatus* Linnaeus, *Syt. Nat.* 10th ed. : 219 & 12th ed. **1766** : 379.

1854. *Amphiesema stolatum* Dumeril & Bibron. *Erp. Gen.* **7** : 724.

Material examined : 3 ex. Patna : Mithapur, Begumpur, Haldichapra, 15.9.1966, 28.6.1967, K. K. Mahajan, T. Venkateshwarlu (Reg. no. 21986, 21987, 21990); 1 ex. Purnea, 11.4.1986, Sri S. Ahmed & party (Reg. no 24375); 1 ex. Amarpara Dak Bunglow, Santal Pargana, 14.11.1938, Dr. H. Hafiz (Reg. no. 24285); 1 ex. 6 miles from Barakar, Manbhum, B. Nath, T. B. Sinha, S. C. Baugh (Reg. no. 24286); 1 ex. Kumardhubi, Barakar, 14.11.1948 (Reg. no. 24287); 1 ex. Manguraha, dist. West Champaran, Bihar, 8.9.1997, S. Sur & party (Reg. no. 25289); 2 ex. field by the side of Sankh, Ranchi, 14.9.1966, Dr. Raj Tilok (Reg. no. 23451); 1 ex. Sankh & North Koel river between Ranchi & Palamau, 1.10.1966, Chotonagpur Survey, Dr. Raj Tilok (Reg. no. 23405), 1 ex. Katihar, 31.3.1986, North Bihar Survey, 1986, S. Ahmed & party (Reg. no. 24446), 1 ex. in the deep forest Ca 5 km. north of Forest Rest House, Champaran, 11.10.1977, N. C. Gayen (Reg. no. 23535).

Measurement : Snout to vent : 120 mm. to 523 mm.; vent to tail 32 mm. to 136 mm.

Diagnostic character : Nostril placed dorso-laterally, internasal much narrowed anteriorly; frontal constricted in the middle, 8 upper labials, 3rd, 4th and 5th touching the eye. Scales in 19 rows, strong keeled except the outer row, which is smooth. The snake is elongate; olive green to dark-brown in colour with a distinct pattern of two buff coloured strips along the sides of the body. The back is marked with reticulated blackish spots or cross bars. The neck is marked with reticulated blackish spots or cross bars. The belly is whitish with black spots. The head is light brown or oilve and the lips are yellowish.

Distribution : The whole of India.

Elsewhere : Sri Lanka; Pakistan; Southern China; Hainan; Vietnam; Laos; Kampuchea.

Remarks : It is one of the gentlest snake and remarkably inoffensive.

Genus 31. ***Argyrogena*** Werner, 1924

48. ***Argyrogena fasciolatus*** (Shaw, 1802)
Banded racer

1802. *Coluber fasciolatus* Shaw. *Gent. Zool.* **3** : 528.

1924. *Argyrogena rostrata* Werner *Sitz. Ber. Akad. Wiss. Wien.* **133** : 51.

1997. *Argyrogena fasciolatus* Das. *Hamadryad* **22** : 40.

Material examined : 1 ex. Tinpahar, Rajmahal (Reg. no. 17563); 2 ex. Panchet hill 2.5 mile from Inanpur, Manbhum, 10.12.1948, S. C. Baugh (Reg. no. 23508).

Measurement : Snout to vent : 462 mm. to 507 mm.; vent to tail 127 mm. to 140 mm.

Diagnostic character : Head distinct from neck. Maxillary teeth 12-14; snout strongly projecting; rostrum large than high; nostril between two nasal; Loral squarish, one large preocular, usually touching frontal, 2 post oculars; posterior genials longer and narrower than anterior; temporals 2+3 or 3+3; 8 supralabials 4th and 5th touching eye, 5th highest and touching lower anterior temporal. Scales smooth, 21 or 23 round mid body; ventral 197-225 Subcaudals 77-92, anals 2. Body colour light or dark brown in juveniles, ornamented with narrow cross bars of spots which gradually fades towards tail; head above light and dark olive two white spots, one on each side or interparietal suture, lower parts whitish or yellowish.

Distribution : India : Bihar; Maharashtra; Karnataka; Madhya Pradesh; Gujarat and West Bengal.

Remarks : The snake is sometimes mistaken as cobra as it erects itself and flattens the body behind the neck like cobra, if distributed.

Genus 32. ***Atretium***, Cope 1861

49. ***Atretium schistosum*** (Daudin)
Olive keelback water snake

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

1943. *Atretium schistosum* Smith. *Fauna. Brit. India* **3** : 319.

Material examined : 1 ex. Rajendranagar, Patna, 26.8.1966; S. K. Baksi (Reg. no. 21975).

Measurement : Snout to vent : 532 mm.; vent to tail : 155 mm.

Diagnostic character : Rostral visible from above which is broader than high; internasal longer than the suture between prefrontals, loreal about as long as high. Preocular 8 or 9 supralabials. Scale in 19; 19; 17 rows, distinctly keeled. It has a stout body with thin head. It is oilve-green above with a red streak on each side of the body. The belly is bright yellowish.

Distribution : India : Bihar; West Bengal; Orissa; Tamil Nadu; Karnataka; Uttar Pradesh.

Elsewhere : Sri Lanka.

Remarks : It inhabits both plains and hills and is usually found in still waters. Like marine and true fresh water snakes the nostrils are placed on the top of the head.

Genus 33. ***Boiga*** Fitzinger, 1826

Key to the species of genus *Boiga*

1. Preocular not reaching the upper surface of the head 2

   Preocular reaching the upper surface of the head ..... *forsteni*

2. Maxillary teeth 8 to 10+2; posterior genials as long as, or longer than, the anterior separated from one another by small scales .... *trigonota*

   Maxillary teeth 9 to 12+2; posterior genial in contact with one other ..... *gokool*

50. ***Boiga forsteni*** (Dum. & Bib.)
Forstein's cat snake

1854. Triglyphodon forsteni Dum. & Bib. Erp. Gen. **7** : 1077.

1943. Boiga forsteni Smith, Fauna. Brit. India. **3** : 358.

Material examined : 2 ex. Purnea, (Reg. nos. 14275 and 14276); 1 ex. Manbhum (Reg. no. 7852).

Measurement : Snout to vent : 407 mm. to 1177 mm.; vent to tail : 101 mm. to 295 mm.

Diagnostic character : Scales in 25-29 rows, 8-11 supralabials, diameter of the eye not more than twice its distance from the mouth. It is brown or reddish in above with black spots or bars on the back. A black stripe on the head from the frontal shield to the nape and two more on the nape parallel with it. A broad black stripe from the eye to the angle of the mouth.

Distribution : India : Eastern Himalayas; Uttar Pradesh; Bihar; Orissa; Western Ghats (from Mathern to Kerala).

Elsewhere : Sri Lanka.

Remarks : It is the largest Cat Snake.

51. ***Boiga gokool*** (Gray)
Eastern cat snake

1834. *Dipsas gokool* Gray *Ill Ind. Zool.* 2, fig. 1.

1943. *Boiga gokool* Smith, *Fauna. Brit. India* **3** : 351.

Material examined : 1 ex., Chotonagpur, V. Ball (Reg. no. 7842).

Measurement : Snout to vent : 208 mm.; vent to tail : 53 mm.

Diagnostic character : Head triangular, preocular 1 to 2 not reaching the upper surface of head; the posterior genials in contact with one another. Eye large. Scales in 21(19) rows. Colour yellow above with a series of vertical Y or T shaped markings on each side of the back edge with a large arrow shaped brown black edge mark, bisected longitudinally, a black stripe from the eye to the angle of the mouth; lower parts whitish, continuous black spots on each side of the ventrals.

Distribution : Bihar as stated above, Darjeeling district, North Bengal, Assam, Eastern Himalayas.

Remark : The snake is juvenile one and has been recorded first time from Bihar.

52. ***Boiga trigonata*** (Schneider)
Indian gamma or cat snake

1802. *Coluber trigonata* Schneider, *Bechst. Transl. Lacp.* **4** : 256. pl. 2, fig. 1.

1943. *Boiga trigonata*. Smith. *Fauna. Brit. India* **3** : 350.

Material examined : 1 ex. Manbhum, 1866, V. Ball (Reg. no. 7840); 1 ex. Moulpahari, Santal Pargana, Dr. P. Bolding (Reg. no. 19906); 1 ex. Hazaribagh town, 14.1.1938, coll ? (Reg. no. 24345); 1 ex. Betla, dist. Palamau; 29.4.1993, Dr. S. Chatterjee (Reg. no. 24971); 2 ex. West Champaran, Gaunaha & Monguraha; 6.4.1996, S. Sur & party (Reg. nos. 25148, 25190).

Measurement : Snout to vent : 305 mm. to 610 mm.; vent to tail 73 mm. to 137 mm.

Diagnostic character : This is a slender snake with long tail. Upper labial 8 lower labial 9; eye large with vertically elliptical pupil. Scale in 21:21:15 rows. Vertebral feebly enlarged. The snake is brownish above with a series of "y" shaped black and white blotches, which tend to form a zigzag pattern on the back. The belly is whitish.

Distribution : Throughout India.

Remark : This snake is often mistaken with 'saw scaled viper' but these group of snakes lack minute scales on the head which is an essential feature of viper.

Genus 34. ***Chrysopelea*** Boie, 1826

53. ***Chrysopelea ornata*** (Shaw)

Ornate flying snake

1802. *Coluber ornatus*. Shaw. *Gen. Zool.* **3** : 477.

1807. *Chrysopelea ornata*. Boie *Isis. Oken. Jena* **20** : 546.

Material examined : 1 ex. Valmiki Tiger Reserve Forest, dist. West Champaran; 18.9.1996; coll. S. Sur & party (Reg. no. 25185).

Measurement : Snout to vent : 431 mm.; vent to tail : 142 mm.

Diagnostic characters : Head distinct from neck, eye large with a round pupil; internasal shorter than the prefrontals, loreals elongated, 1 large preocular, 2 postocular; temporals 2+2; 9 supralabials, 4th 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 : Bihar as stated above; West Bengal, Orissa, Assam, Tripura, Madhya Pradesh. Western ghats, south of Goa.

Remarks : The snake is well known for its remarkable climbing power and 'flight' and its diurnal habits as well as fondness for human habitation.

Genus 35. ***Dendrelaphis*** Boulenger, 1890

Key to the species of the genus *Dendrelaphis*

1. Maxillary teeth 23 to 28, posterior largest .... *pictus*

   Maxillary teeth 17 to 22, posterior usually smallest ..... *tristis*

54. ***Dendrelaphis pictus*** (Gmelin)

Painted bronze back

1789. *Coluber pictus* Gmelin *Syst. Nat. Ed.* **1** : 1116.

1934. *Dendrelaphis pictus* R. Mertens. *Arch. Hydrobiol. Stuttgart* **12**(4) : 693.

Material examined : 1 ex. Munguraha. West Champaran, 10.9.1996, S. Sur & party.

Measurements : Snout to vent : 305 mm.; vent to tail : 98 mm.

Diagnostic characters : Snout broadly rounded, internasals usually little shorter than the prefrontals. Temporals 1+2; 9 supralabials 4 touching, 5th and 6th below the eye; vertebral scales enlarged not broader at mid-body than the scales of the outer row. Scales in 15 rows, a black temporal stripe present.

Distribution : 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 the plains.

Remark : This is an abnormal snake with larger vertebral scales.

55. ***Dendrelaphis tristis*** (Daudin)

Common bronze back

1803. *Coluber tristis* Daudin *Hist. Nat. Rept.* **6** : 430.

1894. *Dendrelaphis tristis*, Boulenger *Cat. Sn. Brit. Mus.* **2** : 288.

Material examined : 1 ex. Chotanagpur, 2.8.1870, W. T. Blanford. (Reg. No. 7716)

Measurement : Head to tail : 650 mm.; vent to tail 387 mm.

Diagnostic character : Snout broadly rounded, 2 labials touching the eye. (5th and 6th); eye as long as its distance from the nostril, internasals a little shorter than prefrontals, the posterior margin rounded. Scales in 15:15:11 rows. Bronze brown or purplish brown above, yellowish below, a more or less distinct buff flank stripe along the outer two scales.

Distribution : Throughout India.

Remark : It is recorded first time in the locality.

Genus 36. ***Elaphe*** Fitzinger, 1833

56. ***Elaphe helena*** (Daudin)

Trinket snake

1802. *Coluber helena*, Daudin *Hist. Nat. Rept.* **6** : 277.

1943. *Elaphe helena* Smith, *Fauna Brit. Ind.* **3** : 149-150.

Material examined : 1 ex. Cargola, Purnea dist., T. S. Hill (Reg. no. 12554).

Measurement : Damaged specimen, description based on literature.

Diagnostic character : Snout twice as long as the eye; prefrontals nearly twice as long as the internasals; loreal little longer than high. Scale in 25 to 29 rows. Brown above with dark cross bars containing ocelli. A black vertical streak below the eye and an oblique one behind it, lower part lighter.

Distribution : Bihar, Assam, West Bengal, Uttar Pradesh.

Remark : This snake is particularly fond of rodents although birds and their eggs occasionally taken.

Genus 37. ***Lycodon*** Boie 1826

Key to the species of genus *Lycodon*

1. Loreal extensively in contact with internasal 2

2. Ventrals angulate laterally; 9 supralabials .... *aulicus*

- Ventrals not angulate laterally; 8 supralabials ..... *striatus*

57. ***Lycodon aulicus*** (Linnaeus)

Common wolf snake

1754. *Coluber aulicus*, Linnaeus. *Adolph. Frider* **1** : 29.

1864. *Lycodon aulicus*, Gunther, *Report, Brit. Ind.* **3** : 6.

1943. *Lycodon aulicus aulicus*, Smith, *Fauna Brit. Ind.* **3** : 265.

Material examined : 1 ex. Monghyr, Coll. E. Lockwood (Reg. no. 8578); 1 ex. Singhbhum, V. Ball (Reg. no. 8003); 1 ex. Pusa, 21.8.1917, D. N. Sen (Reg. no. 19068); 1 ex. Muzaffarpur Major Challerton (Reg. no. 16265); 1 ex. Purnea dist. C. R. M. Green (Reg. no. 13750).

Measurement : Snout to vent : 378 mm. to 442 mm.; vent to tail 90 mm. to 102 mm.

Diagnostic character : Snout more or less spatulate and projecting beyond the lower jaw; anterior and posterior nasal subequal loreal in contact with the internasal not touching the eye; 17 scales at the midbody; angulate laterally supralabials. Head depressed and pear shaped. Neck slightly constricted. Two races are recognised. In race *Lycodon aulicus aulicus* the colour is brown or greyish brown above, with 12-19 white cross bars which expand laterally or bifurcate enclosing triangular patches. A triangular whitish blotch on each side of the occiput. Upper lip white or spotted with brown. Specimen without any markings and uniform brown in colour occur.

Distribution : The whole Indian subcontinent.

Elsewhere : Sri Lanka, Maldive Islands, Myanmar to Indo China, Malaya, Indonesia, Philipines.

Remark : It is commonest and widespread of the wolf snakes. Its habit of occasionally entering

and living in human dwelling it has earned the Latin name *aulicus* (Murthy, 1984).

58. ***Lycodon striatus*** (Shaw)
Barred wolf snake

1802. *Coluber striatus* Shaw, *Gen. Zool.* **3** : 527.

1870. *Lycodon striatus* Stoliczka, *J. Asiat. Soc. Beng.* **29** : 200.

Material examined : 1 ex. Munguraha, Valmiki Tiger Reserve Forest, S. Sur & party, 20.9.1996, S. Sur & party (Reg. no. 25186); 1 ex. Shirpur, Saran, M. Mackenzie (Reg. no. 17557).

Measurement : Snout to vent : 250 mm. to 300 mm.; vent to tail : 50 mm. to 56 mm.

Diagnostic character : Snout projecting beyond the lower jaw; anterior nasal larger than the posterior, loreal in contact with the internasal, touching the eye, not a preocular, 8 supralabials. 17 scales round the body, colour dark brown 13 white cross bars on the body which are divided on the sides to enclose triangular spots of the body colour. Belly & upper lip white.

Distribution : Himachal Pradesh, Uttar Pradesh, Bihar.

Elsewhere : Sri Lanka, Pakistan, Transcaspia.

Remarks : Like the common wolf snake it is not a climber nor it is found in the human vicinity, it is usually met within hills throughout India. It is timid in disposition or seldom attempting to bite. When disturbed it hides its head beneath the coils of the body.

Genus 38. ***Oligodon*** Boie, 1827

Key to the species of the genus *Oligodon*

1. Hemipenis forked 2
- Hemipenis not forked ..... *arnensis*
2. Maxillary teeth 9 to 10; a small subocular below the preocular ..... *cyclurus*
- Maxillary teeth 6 to 7; no subocular .... *taeniolatus*

59. ***Oligodon arnensis*** (Shaw)
Banded kukri snake

1802. *Coluber arnensis* Shaw, *Gen. Zool.* **3** : 526.

1921. *Oligododn arnensis* Wall, *Sn. Ceylon* : 231.

Material examined : 2 ex. Patna 1 ex. Kongal, 1984, Suresh Gupta (Reg. no. 24094); 1 ex. Mithapur, 29.04.1967, Coll. R. N. Verma (Reg. no. 21976).

Measurement : Snout to vent : 183 mm. to 400 mm. Vent to tail : 22 mm. to 92 mm.

Diagnostic character : 8-11 maxillary teeth 7 supra labials, 3rd and 4th touching the eye; loreal frequently united with pre frontal; scales in 17 rows. Body cylindrical short, smooth and even sized. Hemipens not forked head depressed snout short and blunt; tail short. Colour light brown above with black crossbars, whitish below; head with three chevron shaped marks.

Distribution : India : Bihar; Andhra Pradesh; Gujarat; other states of India may occur.

Elsewhere : Sri Lanka; Pakistan; Nepal.

Remarks : This snake doesn't bite unless severely disturbed, when annoyed it inflates the neck and stiffens the body.

60. ***Oligodon cyclurus*** Cantor
Cantor's kukri snake

1839. *Coronella cyclura* Cantor. *Proc. zool. Soc. Lond.* : 50.

1943. *Oligodon cyclurus* Smith, *Fauna Brit. India.* **3** : 202

Material examined : 1 ex. juvenile, Cargola, Purnea, T. S. Hill (Regd. no. 12356).

Measurement : Snout to vent : 160 mm.; Vent to tail : 18 mm.

Diagnostic character : Supralabials 8, 4th and 5th touching the eye. Scales in 21 rows; a small sub ocular below the preocular. Hemipenis forked. Head portion with variable markings, one in front of the eyes, two laterally below the eyes and another marking starting from frontal enlarges in a triangular form to a few distance.

Distribution : India : Assam; West Bengal; Bihar.

Elsewhere : Bangladesh.

Remarks : Smith (1943) described five colour patterns. the snake described here bears one of such five colour patterns i.e. light brown above with dark brown reticulations which are confined to the edges of the scales and whitish below.

61. ***Oligodon taeniolatus*** (Jerdon)
Streaked kukri snake

1853. *Coronella taeniolata* Jerdon, *J. A. S. Bengal*, **22** : 528.

1943. *Oligodon taeniolatus* Smith. *Fauna Brit. India*, **3** : 223.

Material examined : 1 ex., Harap, Ranchi, 6.2.1954, A. P. Kapur, (Regd. no. 24289).

Measurement : Snout to vent : 310 mm; Vent to tail : 42 mm.

Diagnostic characters : Head short not distinct from neck, snout blunt, rostral large higher than wide and extending posteriorly, almost separating inter nasals; nostril between nasals; loreal present; one preocular; two postoculars sometimes three. Seven supra labials, 3rd and 4th touching the eyes. Seven or eight lower labials. Body slender or almost of uniform diameter from neck to vent. Dorsal scales in 15 rows at mid body. Colour pattern variable according to locality. Light brown to buff above with narrow black transverse crossbars or large black spots. There are two black streaks on nape. Ventral whitish with lateral spots.

Distribution : Throughout India.

Remarks : It is a hill species often found in the human vicinity.

Genus 39. ***Psammophis*** Fitzinger, 1826

62. ***Psammophis condanarus*** (Merr.)
Oriental sand snake

1820. *Coluber condanarus* Merrem, *Tent Syst. Amph.* : 107.

1943. *Psammophis condanarus* Smith, *Fauna Brit. India* **3** : 364.

Material examined : 2 ex. (1 damaged) Purnea, F. A. Shillingford, (Regd. No. 13756, 13755-damaged).

Measurement : Snout to vent : 817 mm; vent to tail : 125 mm.

Diagnostic character : Upper head shields not bulging; nasal incompletely divided; a short suture only from the nostril to the labial; preocular not in contact with nostril; frontal long and narrow; temporal 1+2; 8 supra labials 4th and 5th touching the eye; anal divided. Pale olive or buff above with 4 or 5 dark brown longitudinal stripes, more or less conspicuously edged with black; head brown with more or less distinct longitudinal markings lower part yellowish white with a black line along each side of the outer margin of the ventral shields.

Distribution : India : Bihar; Orissa; West Bengal; Uttar Pradesh; Punjab; Gujrat; Maharashtra; Andhra Pradesh.

Elsewhere : Pakistan.

Remarks : It is very shy and extremely active snake.

Genus 40. ***Ptyas*** Fitizinger, 1843

63. ***Ptyas mucosus*** (Linn.)
Dhaman or rat snake

1758. *Coluber mucosus* Linnaeus. *Mus. Ad. Frid* **1** : 37 and Syst. Nat. Ed. **10** : 226.

1861. *Ptyas mucosus* Cope *Proc. Acad. Nat. Sci.* Philladelphia **12** : 563.

Material examined : 1 ex. Valmiki Tiger Reserve Forest, Gaunaha, West Champaran dist. 6.9.1996, S. Sur and party.

Measurement : Standard length : 1290 mm. to 1335 mm.

Diagnostic character : Maxillary teeth 20 to 28. Head long distinctly wider than neck; snout bluntly pointed, rostral higher thanwide; nostrils between nasals and first upper labials; 3 loreals, 2 preocular, 8 upper labials, 4th and 5th touching eye. 9 or 10 lower labials, eyes large luminous. Scale rows at mid body : 17. Body robust

compressed and 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 margined with black forming a reticulate pattern to form cross bars. Lips and ventral scales margined with black. Belly grey white.

Distribution : Throughout India.

Remarks : Ths snake is very good swimmer and climber, when disturbed runs rapidly hiding in bushes, holes or water.

Genus 41. ***Sibynophis*** Fitizinger, 1843

64. ***Sibynophis sagittaria*** (Cantor)
Cantor's black headed snake

1839. *Calamaria sagittaria* Cantor, *Proc. Zool. Soc.* London : 49.

1943. *Sibynophis sagittaria* Smith *Fauna Brit. India* 3 : 280.

Material examined : 1 ex. Manbhum, 1866, V. Ball (Reg. no. 7068); 1 ex. Purnea, Dr. S. N. Karan (Reg. no. 20826); 1 ex. In and around Kothra, dist. West Champaran, Valmiki Tiger Reserve Survey, S. Sur & party (Reg. no. 25129). 1 ex. between Chaebassa & Chakradharpur, F. H. Gravely. (Reg. No. 17349)

Measurement : Snout to vent : 180mm. to 243mm; veht to tail : 43 to 54mm.

Diagnostic character : Snout broad and rounded; 7 supra labials, 3rd and 4th touching the eye; parietal touches both post oculars, 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 and nape dark brown or black, with a large elongate oval patch of yellow on each side at the back of the head. Lower parts yellow with a black dot on the outer edge of each vertebral scale.

Distribution : Bihar as stated above, Western Himalayas; Central & Northeastern India.

Remarks : These snakes are hill species and contain numerous closely set teeth.

Genus 42. ***Spalerosophis*** Schmidt 1930

65. ***Spalerosophis diadema*** (Schlegel)
Royal snake

1837. *Coluber diadema* Schlegel. *Serp.* 2 : 148.

1930. *Spalerosophis diadema* Schmidt. *Field Mus. Nat. Hist. Zool.* 17 : 226 and 24, 1939 : 77.

Material examined : 1 ex. Purnea, (Reg. no. 10978).

Measurement : Snout to vent : 587 mm.; vent to tail : 136 mm.

Diagnostic character : Head very distinct from neck, crown like pattern on nape, rostral not higher than broad, prefrontals broken up into several shields. The median ones forming an angle with the hinder margins of the inter nasals, 2 loreals one behind the other; 2 preoculers and a series of sub oculars separating the labials; temporals small scale like; 10 to 13 supra labials; scales more or less obtusely keeled usually in 29 or 31 rows in midbody, 21 or 19 posteriorly. Colour yellowish brown above with rhombic black blotches on the back. The belly is whitish, sometimes with dark spots.

Distribution : India : Kashmir; Rajasthan; U. P.; Bihar.

Elsewhere : Afghanistan; Beluchistan; Turkisthan; North Africa.

Remark : Presence of crown like pattern on nape - hence the common name Royal snake. If disturbed the snake coils up and emits a loud hiss but harmless.

Genus 43. Xenochrophis Gunther 1864

66. ***Xenochrophis piscator*** (Schneidor)
Checkered keelback

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

1935. *Xenocrophis piscator* Malnate. *Proc. Acad. Nat. Sci.* Philadelphia, 112 : 41-71.

Material examined : 1 ex. Gobindapur, 1867, E. V. Westmecott (Reg. no. 7391); 1 ex. Innapur, Manbhum, 7.12.1948, B. Nath; 1 ex. Rajgir, 11.9.1973, Dr. T. D. Soota (Reg. no. 23441); 1 ex. Belta, Palamau, 29.4.1993, S. Chattopadhyaya (Reg. no. 24970); 1 ex. Valmiki Nagar, West

Champaran 13.11.1995, S. Sur and party (Reg. no. 25128); 1 ex. Ranchi, July 1975, P. N. Mehrotra (Reg. no. 23749); 1 ex. Patna, Dr. V. S. Verma (Reg. no. 23568).

Measurement : Snout to vent : 430 mm. to 689 mm; tail 215 mm. to 281 mm.

Diagnostic character : Head flattened, distinct from neck. Snout bluntly pointed wider than high; internasal distinctly narrowed anteriorly; Single large loreal, eye moderate size with round pupil; 9 supralabials 4th, 5th touches the eye, the 6th excluded by the post ocular. Scales in 9 rows, more or less distinctly keeled. Colour yellowish or olivaceous above with numerous black and white spots arranged in a chessboard like fashion. The belly is plain white. It has two black streaks running from the eye.

Distribution : Throughout India.

Remarks : It is frequent in water, when excited it rears up and assumes cobra like pose for which it is mistaken for a cobra and its bite is considered as fatal (Murthy).

Subfamily (B) HOMALOPSINAE

Genus 44. ***Enhydris*** Sonnini and Latreillie, 1802

Key to the species of the genus *Enhydris*

1. Loreal in contact with the internasal, scales in 21(23) rows, snout, rounded, internasal 1 .... *enhydris*

   Loreal not reaching the internasal, scales in 29-31 rows, snout blunt, squarish internasal 2 ..... *sieboldi*

67. ***Enhydris enhydris*** (Schneider)

Common smooth water snake

1799. *Hydrus enhydris* Schneider *Hist. Amph.* **1** : 245.

1935. *Enhydris enhydris* Pope, *Rept. China* : 314.

Material examined : 1 ex. Govindapur, Manbhum dist. Oct. 1867, F. V. West Macolt (Reg. no. 8149); 1 ex. Manbhum, 22.2.1954, Dr. A. P. Kapur, Chotonagpur Survey (Reg. no. 24211); 1 ex. Samshergaunge, Katihar dist. 4.4.1986, S. Ahmed and party (Reg. no. 24442); 1 ex. Patna, V. S. Verma (Reg. no. 23567).

Measurement : Snout to vent 397 mm. to 507 mm; tail 114 mm.

Diagnostic character : Snout rounded, internasal single, twice as broad as long in contact with the loreal; frontal broader than the supra ocular, eight supra labials, fourth touching the eye. 21 or 23 scales at mid body. Scales smooth. Eye small, placed high on the face, pupil vertically elliptic. The body colour is dark olive or olive brown above and lemon yellow below. Ventral demarcated laterally by a dark line. A continuous or interrupted dark line in the middle of the belly may be present or absent.

Distribution : Bihar; Uttar Pradesh; Orrisa; West Bengal; Assam; Andhra Pradesh.

Remarks : It is common in the pond, sluggish water and in the irrigated fields.

68. ***Enhydris sieboldi*** (Schlegel)

Siebold's smooth water snake

1837. *Homalopsis sieboldi* Schlegel, *Phys. Serp* **2** : 349. pl. 12. figs. 4 & 5.

1943. *Enhydris sieboldi* Smith *Fauna Brit. India* **3** : 389.

Material examined : 2 ex. Monghyr, B. Lockwood (Reg. no. 8576, 8577); 1 ex. Segowlie Champaran, Editor Asian (Reg. no. 13864); 1 ex. Purnahia, M. Mackenzee (Reg. no. 16614 damaged).

Measurement : Snout to vent : 172 mm. to 213 mm; vent to tail : 39 mm. to 41 mm.

Diagnostic character : Snout blunt, squarish, internasal longitudinally divided touching or just separated from the loreal; 2 preoculars, the lower of the two and the postoculer often extending below the eye 7 or 8 supra labials, 4th touching the eye, last 1 or 2 horizontally divided. Scales in 29 (rarely 31) rows. The snake is buff greenish above with rhomboidal dark transverse spots on the back and a series of roundish spots along the sides. The lower surfaces are usually white, checkered with black.

Distribution : .Maharashtra; Uttar Pradesh; Bihar; Kerala; Assam.

Elsewhere : Bangladesh; Myanmar.

Family 16. DASYPELTIDAE

Genus 45. ***Elachistodon*** Reinhardt

69. ***Elachistodon westermanni*** Reinhardt

Indian egg eater

1875. *Elachistodon westermanni* Reinhardt l.c. s. p. 206. pl.

Material examined : 1 ex. (juvenile SP.), Purnea 1876, G. W. Shillongford (Reg. no. 7212).

Measurement : Snout to vent : 190 mm.; vent to tail : 48 mm.

Diagnostic character : Bones of the platomaxillary arch greatly thinned, absence of teeth in the maxilla except for two minute teeth followed by two small grooved fangs at the posterior extremety. Palateine with two minute teeth, anterior portion of mandible without teeth, 8 to 12 teeth in the posterior portion. Body is elongated laterally compressed; head is not clearly distinct from neck, a large pit in the posterior part of nasal shield. Scales in 15 rows, 19 on the neck. The vertebral series much enlarged, hexagonal, tail short. The snake is blackish above and whitish below. There is a light vertebral stripe besides yellowish spots. The nape bears an angular bar or spots; the lips are yellow.

Distribution : Bihar (Purnia); North Bengal (Jalpaiguri); U. P. (Corbett National Park, Dehradun).

Elsewhere : Nepal; Bangladesh (Rangpur, Mymensingh).

Remarks : This snake is the only species of the family, feeds mainly on eggs of birds and reptiles.

Family 17. ELAPIDAE

Key to the genera of family ELAPIDAE

1. Maxillary bone extending forwards beyond the palatine 2

   Maxillary bone not extending forwards beyond the paletine ..... ***Bungarus***

2. Vertebral series of scale enlarged, no cuneate scale on the lower jaw ..... ***Ophiophagus***

   Vertebral series of scale not enlarged, presence of cuneate scale on the lower jaw ..... *Naja*

Genus 46. ***Bungarus*** Daudin, 1803

Key to the species of genus *Bungarus*

1. Tail ending obtusely; dorsal vertebrae forming a ridge down the back 2

- Tail ending in a point, dorsal vertebrae nor forming ridge down the back ..... *caeruleus*

2. Scales in 15 rows. Back alternately marked with black and yellow annuli ..... *fasciatus*

- Scales in 21 or 19; 19 or 17; 17 rows. Back with narrow white cross bars or transverse series of small spots not arranged in pairs ... . *sindanus walli*

70. ***Bungarus caeruleus*** (Schneider)

Common Indian krait

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

1890. *Bungarus caeruleus* Boulenger, *Fauna. Brit. India* : 388.

Material examined : 1 ex. District Champaran, Major A. H. McMahon (Reg. no. 14676), 1 ex. Rajgir, Patna Survey 1973, 9.9.1973, T. D. Soota (Reg. no. 23443).

Measurement : Snout to vent : 1080 mm.; tail 154 mm.

Diagnostic character : Head flat, distinct from neck; snout blunt, rostral slightly wider than high; nostril between nasals, eye small with round pupil; loreal absent; one preocular; two post oculars; one anterior and two posterior temporals; seven upper labial; 3rd and 4th touching the eye; eight lower labials. Body cylindrical. Tail ending in a point. Scale rows on mid body 15. It is steel blue or dark above with about 40 thin white bars from neck to tails.

Remarks : It is common in the vicinity of human habitation and also found in fields and low scrub jungles.

71. ***Bungarus fasciatus*** (Schneider)
Banded krait

1801. *Pseudoboa fasciatus* Schneider, *Hist. Amph.* **2** : 283.

1803. *Bungarus fasciatus* Daudin, *Hist. Nat. Rept.* **5** : 263.

Material examined : 1 ex. Munguraha Valmiki Tiger Reserve Forest, 10.9.1996, S. Sur and 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, tail ending bluntly. The body is marked with conspicuous bands. Top of the head with a yellow 'V' with its arms passing backward over the temples to the throat.

Distribution : Assam; West Bengal; Bihar; Orissa; Andhra Pradesh.

Remarks : It is a rather large sized krait.

*72. ***Bungarus sindanus walli*** Wall
Wall's krait

1907. *Bungarus walli* Wall, *J. Bombay Nat. Hist. Soc.* **17** : 608 pl.

1997. *Bungarus sindanus walli* (Wall) Das, *Hamadryad*, **22** : 44.

Known to occur in Bihar, material not available description based on literature.

Diagnostic character : Scales in 21 or 19 : 19 or 17 : 17 rows. Ventral 196-208; caudal 50-55. Tail is not pointed. Bluish black above with narrow white cross transverse bars 60 to 80 in number formed by small spots.

Distribution : India; Bihar; Uttar Pradesh; West Bengal; Orissa.

Genus 47. ***Naja*** Laurenti, 1768

73. ***Naja naja*** (Linnaeus)
Indian spectacled cobra

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

1998. *Naja naja* Wuster, *Hamadryad* **23**(1) : 15-32.

Material examined : 1 ex. Chotonagpur Survey, 26.8.1969, Dr. Raj Tilok & party (Reg. no. 22002); 1 ex. Munguraha, dist. West Champaran, 9.9.1996, S. Sur & party (Reg. no. 25191); 1 ex. Gaunaha, dist. West Champaran, S. Sur & party (Reg. no. 25188).

Measurement : Snout to vent : 327 mm. 770 mm. Tail : 46 mm. - 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 preocular & 3 postoculars 7 upper labials 3rd largest; 8 lower labials 4th & 5th largest & with a small triangular scale (CUNEATE) scale between them on the oral margin. Scale rows across the widest part of hood usually 25 & 13 to 15 rows just anterior to vent. Colour is variable. The dorsal side usually with light or dark cross bars or reticulation which disappears with the age.

Distribution : Throughout India.

Remarks : Wolfgang Wuster (1998, Hamadryad) reviewed all the species of Asiatic Cobra. Formerly Naja was a single species and all the Asiatic Cobras were considered to be a part of it. According to him four species are found alone. Naja naja-the species that is described here, is one of them. this species is the longest in relation to head & body size of any of the Asiatic Naja (Wuster, 1998).

Genus 48. ***Ophiophagus*** Gunther, 1864

74. ***Ophiophagus hannah*** (Cantor)
King cobra or Hamadryad

1836. *Hamadryas hannah* Cantor, *Asiat. Research*, **19** : 18.

1945. *Ophiophagus hannah* Bogert, *Copeia, Ann. Arbor* : 47.

Material not found. Description based on literature.

Diagnostic character : Head flat; snout rounded and eyes moderately round with round pupil. Head scales glossy. Scales in 17 or 19 rows upon the neck, 15 at the mid body in front of the

vent. Vertebral rows of scales enlarged in the anterior part of the body only. The overall colouration is olive green or yellowish but the tail is almost entirely jet-black. The young are black above with chevron-shaped transverse bands, which disappear with the age. The lower surface is whitish. Head olivaceous brown.

Distribution : West Bengal, Bihar, Orissa, Northern Andhra, Andaman Islands, Western Ghats, South of Goa.

Remarks : It is the largest venomous dangerous snake in existence. It feeds entirely on snakes and also known to feed on monitor lizards (Varanus species Smith 1943). Remarkable parental care is observed in this species.

Family 18. VIPERIDAE

Key to the genera of the family VIPERIDAE

1. Nostril in a large nasal shield; scales in straight rows ..... *Daboia*

   Nostril in a divided nasal shield; lateral scales in oblique series ..... *Echis*

Genus 49. ***Daboia*** Gray 1842

76. ***Daboia russelli*** (Shaw & Nodder)

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

1998. *Daboia russelli* Wuster, *Hamadryad* **23**(1) : 33-40.

Material examined : 1 ex.Purnea (damaged), F. A. Shillingford (Reg. no. 13761).

Diagnostic character : Head much long, wider than neck, snout bluntly pointed and rostral about twice as high as wide; nostril large crescent shaped in a large nasal shield supraocular entire; 11 upper labials separated from eye by three rows scales; 14 lower labials, head covered with small scales, without any shield, scales strongly keeled and 27 to 33 at mid body. Body stout & dorso ventrally flattened, dorsal scales in straight rows. Three longitudinal rows of reddish brown or dark brown rings with black or black & white edges forming chain like pattern on the back & sides. Head with dark patch behind. A dark streak margined with white, pink or buff behind eye, a dark stripe from eye to labials.

Distribution : India : Bihar as mentioned in the paper.

Elsewhere : occur throughout India.

Remarks : It is a sluggish snake with least disturbance it hisses loudly & continuously attempts to bite. It can strike even from behind.

Genus 50. ***Echis*** Merrem

77. ***Echis carinatus*** (Schneider)

Saw-scaled viper

1801. *Pseudoboa carinata* Schneider *Hist. Amph.* **2** : 285.

1896. *Echis carinata* Boulenger. *Cat. Sn. Brit. Ind.* **3** : 505.

Material examined : 2 exs. (dissected specimens) from the foot of Panchet hill 2/1/2 miles from Inanpur, district Manbhum, B. Nath & S. C. Baugh (Reg. no. 23507).

Measurement : Snout to vent 223 mm. to 312 mm. Tail : 25 mm. to 41 mm.

Diagnostic character : Head short, distinctly wider than neck, Snout blunt; rostral about twice as wide as high; nostril in divided nasal shield; eye surrounded by 10 to 15 small scales exclusive of the supraocular; 3 to 4 scales between eye & nasal, temporal scales small keeled except the lowermost row. 10-12 upper labials the 4th largest. Scales in 25-29; 27-37; 21-27 rows the outermost row the largest, the oblique series in 4-5 rows. Colour brownish with dark brown V-shaped flank mark enclosing a dark area connected to each other forming a wavy flank line, ventral whitish.

Distribution : India : found usually in the arid zones of India.

Remarks : Smaller in size in comparison to Russell viper. Due to its smaller size & colour which is akin to the surroundings where it lives i.e. soil & under stones, the people get bitten before they are aware of the presence of these snakes.

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AMPHIBIA

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INTRODUCTION

Amphibian fauna of Bihar have been found practically unknown till the publication on this group by Venkateswarlu and Murthy (1972) and Sarkar (1991). Venkateswarlu and Murthy (1972) have published a mere list of amphibians of Bihar covering 12 species with some notes on their habit and habitat only. Detailed faunal account of amphibians of Chota Nagpur (South Bihar) covering the then eight administrative districts namely Ranchi, Gumla, Lohardaga, Singhbhum, Hazaribagh, Giridih, Palamau and Dhanbad have been published by Sarkar in 1991. Prior to these, some other stray publications by Annandale and Rao (1918), Bhaduri (1974) and Inger and Dutta (1986) are also available.

This will be the first detailed account on the amphibian fauna of Bihar which is mainly based on the studies of the collections made by different survey parties of Zoological Survey of India. Apart from these studies, the species recorded by earlier authors have also been included in the paper for giving a complete faunal account of amphibians of the state. As a result 14 species belonging to 8 genera and 4 families are reported. Where the collections are large, only localities of collections are given under 'Material examined' Data on field observation are included in the 'Remarks'of the species.

The Order Apoda and Caudata are not represented in the Collection.

MATERIAL AND METHOD

Amphibians are either aquatic, terrestrial or arboreal. Aquatic form has been collected by the help of water-net, a net fitted with a metal ring fixed at the end of a long bamboo-pole. cast-net and fishing hook. Both terrestrial and arboreal forms have been collected by hand or long forceps. The amphibians reported in this paper have mainly been collected by the survey parties of Zoological Survey of India from several ecological niches of Bihar. As amphibians hibernate during winter, collections have mainly been made during pre-monsoon and monsoon months, the breeding season of amphibians. In the field, notes have been taken regarding the habits and habitats of the frogs and toads. For collection, aquatic vegetations, bushes grown on moist soil, heap of rotten leaves or straw, burrows made on elevated banks of ponds and canals, dark corners of village huts, undersurface of barks of trees, soil under stones etc. are explored. Nocturnal fauna has been explored by the help of lamps. The collected material are first chloroformed and then put into 5% formalin solution at least for 24 hours for fixation. Before putting in the formalin, an incision on the abdomen for the smaller specimens and injection of 10% formalin solution inside the abdomen for larger specimens are given for the fixation of vicera. The fixed material along with labels containing the data of locality, altitude, habitat, date of collections and name of collector, are packed properly and kept in 5% formalin. After returning from the tour the material unpacked, washed properly in fresh water, and preserved in 90% alcohol for study. The material have been studied and identified then with the help of literature in the laboratory.

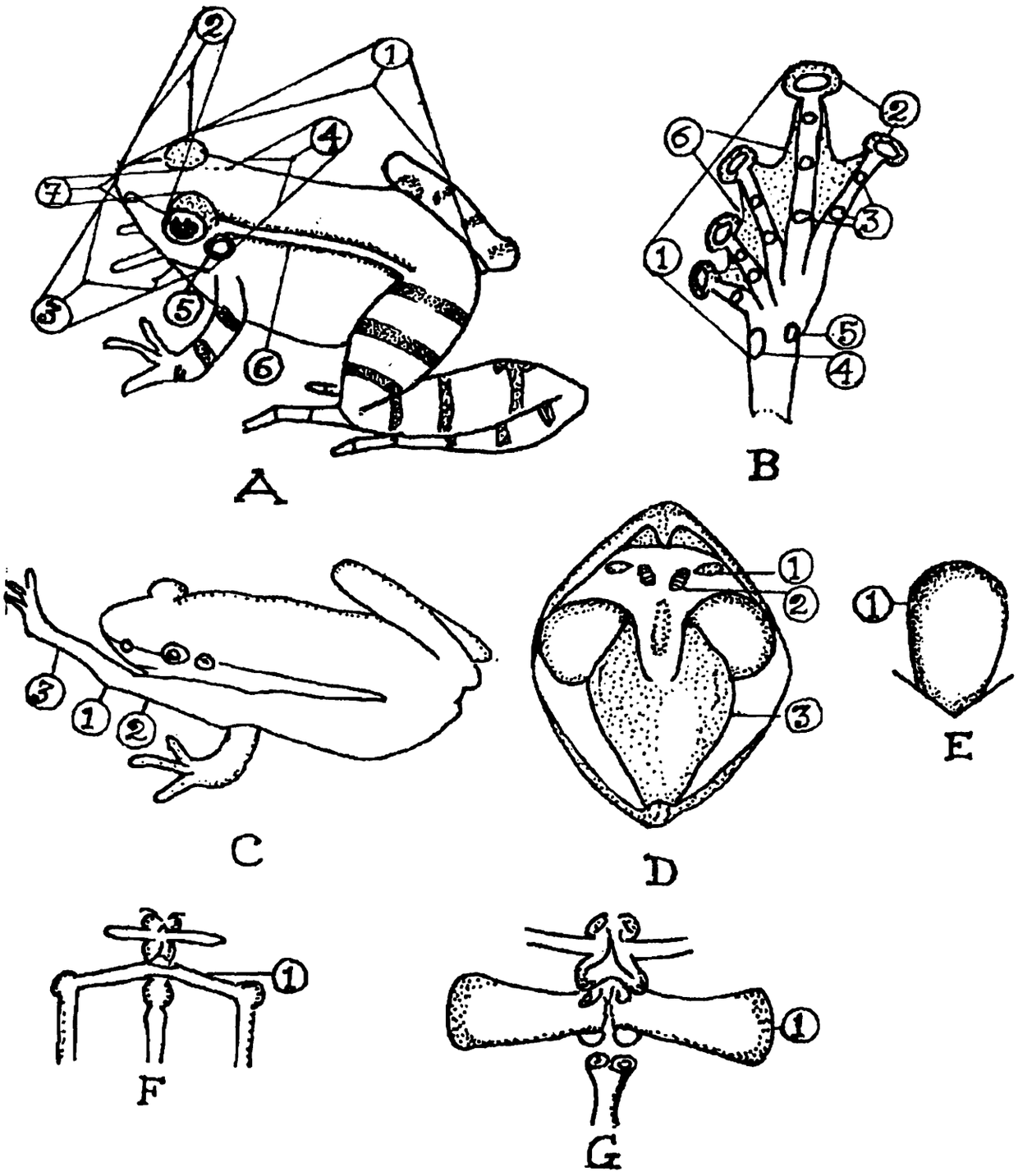

Fig. 1. Illustrations of measurments and essential morphological characters used in the paper.

A 1 : Snout to vent length, A 2 : Snout length, A 3 : Head length, A 4 : Head width, A 5 : Tympanum, A 6 : Glandular dorso-lateral fold, A 7 : Width of interorbital space. B 1 : Foot length, B 2 : Suctorial disc, B 3 : Subarticular tubercle, B 4 : Inner metatarsal tubercle, B 5 : Outer matatarsal tubercle, B 6 : Webs of toes. C 1 : Position of tibiotarsal articulation when hind limb is kept parallel to body, C 2 : Tibia, C 3 : Tarsus. D 1 : Position of Choanae, D 2 : Position of vomerine teeth, D 3 : Tongue (bifid). E 1 : Tongue (entire). F 1 : Cylindrical sacral vertebra. G 1 : Dialated sacral vertebra.

SYSTEMETIC 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 Bihar by two species of the genus *Bufo*.

Genus 1. ***Bufo*** Laurenti

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

Key to the species of the genus *Bufo*

1. Head with bony ridges, Parotoids kidney-shaped ..... *melanostictus*
– Head without bony ridges, Parotoids flat (not kidney-shaped) ..... *stomaticus*

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 : Purbi Champaran dist. : 1 ex., Motihari, 4.xii.1987, M. L. Biswas, S. Das and S. Ray. Darbhanga dist. : 1 ex., Supand, 15.x.1987, Y. P. Sinha. Patna dist. : 3 ex., Bahadurpur, 18.xi. 1981; 2 ex., Patna, 21.xii.1981. All coll. B. K. S. Rohtas dist. : 3 ex., Tumba, Rohtas, 20.ix.1993, K. C. Kansal. Aurangabad dist. : 1 ex., Pawaipur vill., Aurangabad, 27.xi.1975, L. Ram. Ranchi dist. : 1 ex., Mandar Forest House, 24 km. west of Ranchi, 27.ii.1962, B. Rat.; 1 ex., Tagore hill, Ranchi, 7.viii.1962; 1 ex., Lodhana, Ranchi, 8.viii.1992; 2 ex., Ranchi, 8.viii.1962; 1 ex., Raishka, Ranchi, 10.viii.1992. All coll. K. C. Kansal. Hazaribag dist. : 1 ex., Jorakat vill., 12 km. west of Charhi, 12.vi.1994, A. K. Sanyal. Santhal Pargana dist. : 1 ex., Digal Pahar, Santhal Pargana, 19.ix.1989, H. K. Bhowmik. Gumla dist. : 1 ex., Karaiya, Simdega, 19.viii.1992; 2 ex., Karnaguri, Simdega, 20.viii.1992. All coll. K. C. Kansal. West Singhbhum dist. : 1 ex., Chaibasa, 16.viii.1992, K. C. Kansal. East Singhbhum dist. : 2 ex., Singbhum, 20.viii.1992; 1 ex., Brahmooia, on Garhwa D. Ganj Rd., 26.viii.1992. All coll. K. C. Kansal.

Total length : 12 mm to 116 mm from snout to vent.

Diagonstic character : Head broader than long, with cornified bony ridges; snout rounded, nearly equal the diameter of the eye; nostril a little nearer to tip of snout than to the eye; interorbital width broader than that of upper eyelid; tympanum very distinct, two third diameter of the eye. Fingers free, first a little longer than second, tips of fingers 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 : India : Bihar : As mentioned in the material examined. Common throught the plains of India and Andaman and Nicober.

Elsewhere : Pakistan, Bangladesh, Sri Lanka, Nepal, Myanmar, South China, Malaya, Peninsula and Archipelago.

Remarks : Annadale and Rao (1918) and Venkateswarlu and Murthy (1972) reported from Bihar and Sarkar (1991) from South Bihar. Big-sized toad, nocturnal in habit and used for dissection In College laboratories, and the males are used in pregnency diagnosis tests of human beings.

Status : Common in Bihar.

2. ***Bufo stomaticus*** Lutken (Marbled Toad)

1863. *Bufo stomaticus* Lutken, *Vidensk. Meddr. 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 : Purbi Champaran dist. : 1 ex., Motihari, 3.xii.1987, M. L. Biswas, S. Das and S. Ray. Saran dist. : 1 ex., Ekma, 13.vii.1984, L. P. Gupta. 1 ex., Saran, 14.iii.1985, G. M. Yazdani. 3 ex., Chhapra, 7-9-.xii.1987, M. L. Biswas, S. Das and S. Ray. Vaishali dist. : 2 ex., Hazipur, 28.viii.1972, T. Venkateswarlu. Samistipur dist. : 3 ex., Hasanpur, 13.viii.1987, Y. Chaturvedi. Bhojpur dist. : 3 ex., Sakaridi , Arrah, 12-18.ix.1984; 1 ex., Gunki, Arrah, 18.ix.1984. All Coll. Y. P. Sinha. Patna dist. : 1 ex., Bhadurpur, 24.ix.1977, S. Sinha. Rohtas dist. : 1 ex., Rohtas, 20.ix.1993, K. C. Kansal. Nalanda dist. : 3 ex., Bihar Sarif, 11-13.xii.1987, M. L. Biswas, S. Das and S. Ray. Gaya dist. : 1 ex., Gaya, 16.xii.1987, M. L. Biswas, S. Das and S. Ray. Sahibganj dist. : 11 ex., Sahibganj, 1.iv.1995, Y. P. Sinha. Aurangabad dist. : 1 ex., Goh, Aurangabad, 26.ix.1993, K. C. Kansal. Garwa dist. : 7 ex., Daltanganj, 30.ix.1975, L. Ram Palamau dist. : 1 ex., Dehariosen, 26.ix.1975, L. Ram. Ranchi dist. : 3 ex., Horhap, S. E. Ranchi, 22.ii.1962, P. B. Sinha. East Singhbhum dist. : 2 ex., Garha D. Ganj, 26.viii.1992; 4 ex., Sanka Garwa, 26.viii.1992. All coll. K. C. Kansal.

Total Length : 12 mm to 75 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; interorbital width broder 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 fourth 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 : India : Bihar : As mentioned in the material examined. Plains of India from Jammu and Kashmir to Karnataka, and Assam in the east.

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

Remarks : 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 : Common in Bihar.

Family II. MICROHYLIDAE

This family is represented by four genera.

Key to the genera of the family MICROHYLIDAE

1. Tips of fingers with triangular dialatations. 2
– Tips of fingers without triangular dialatations. 3
2. A bony ridge immediatly below internal nares. ..... ***Kaloula***
– A fleshy ridge some way below internal nares. ..... ***Ramanella***

3. Two strong and shovel-shaped metatarsal tubercles (inner larger) present. .... ***Uperodon***

– Two small but distinct and normal (not shovel-shaped) metatarsal tubercles present. .... ***Microhyla***

Genus 2. ***Kaloua*** Gray

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

3. ***Kaloula pulchera*** Gray
(Painted Frog)

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

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

Material examined : Vaishali dist. : 1 ex., Bhabwatpur, Bihar, 17.i.1985, Y. Chaturvedi.

Total Length : 27 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 upper surface of thighs, and light brownish.

Distribution : India : Bihar : As mentioned in the material examined. It has so far been recorded from Assam, West Bengal, Madhya Pradesh, Karnataka, Tamil Nadu States in India.

Elsewhere : Nepal, Sri Lanka, South China, Myanmar, Malaya and Sumatra.

Remarks : Medium sized frog. Terrestrial and nocturnal in habit. The frog is mostly found underground and surface during breeding season (monsoon months). Venkateswarlu and Murthy (1972) repoeted it from Bihar and Ray (In press) from Paschim Champaran district of the State.

Status : Rare.

Genus 3. ***Ramanella*** Rao & Ramanna

1925. *Ramanella* Rao and Ramanna, *Proc. Zool. Soc.* London : 1445.

4. ***Ramanella variegata*** (Stoliczka)
(Variable Ramanella)

1872. *Callula variegata* Stoliczka, *J. Asiat. Soc. Bengal* 111.

1934. *Ramanella variegata* : Parkar, *Mongr. Microhylidae* : 93-94.

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

Material Examined : Recorded from published literature.

Diagnostic character : Head broader than long, snout rouned, as long as the diameter of the eye; nostril nearer to the tip of snout than the eye; interorbital width much broader than the upper eyelid; tympanum hidden; dermal ridge a little way behind the internal nares. Fingers free, First shorter than second, tips bearing well-devoloped truncate discs; subarticular tubercles of fingers and toes distinct. Toes feebly webbed, tips a little dialated; inner metatarsal tubercle prominent, outer metatarsal tubercle not prominent. Tibiotarsal articulation reaching the shoulder. Dorsum more or less smooth and brownish. Venter smooth and white with reddish brown at gular region; anal region poorly granular.

Distribution : Bihar (1991) reports from Chakradharpur, Singbhum district. Assam, West Bengal, Orissa, Andhara Pradesh, Madhya Pradesh, Maharastra, Gujarat and Karnataka in India.

Elsewhere : Sri Lanka.

Remarks : It is Small size frog. Nocturnal in habit.

Status : Rare.

Genus 4. ***Uperodon*** Dumeril & Biborn

1841. *Uperodon Dumeril* and Bibron, *Erp. Gen.*, **8** : 746

Key to the species of the genus *Uperodon*

1. Interorbital space about twice as broad as width of upper eyelid; dorsum marbled. .... *systoma*

2. Interorbital space about thrice as broad as width of upper eyelid; dorsum not marbled. .... *globulosus*

5. *Uperodon systoma* (Schneider) (Marbled Baloon Frog)

1799. *Rana systoma* Schneider, *Hist. Amph.*, **1** : 144.

1934. *Uperodon systoma* : Parkar, *Mongr. Microhylidae* : 75-76.

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

Material examined : Bokaro dist. : 2 ex., 3 km. north of Kargali towards Nawda, 10.vi.1994, A. K. Sanyal.

Total Length : 56 mm to 61 mm from snout to vent.

Diagnostic character : Head broader than long; snout rounded as long as the diameter of the eye; nostril equidistant from the tip of snout and the eye; interorbital width about twice the width of upper eyelid; tympanum hidden. Fingers free, first shorter than second, tips not bearing discs; subarticular tubercles of fingers and toes not very distinct; two shovel-shaped metatarsal tubercles present, the inner very large. Tibiotarsal articulation not reaching the shoulder. Dorsum smooth or slightly tuberculated, olive, marbeld and spotted darker. Venter smooth, white and spotless.

Distribution : India : Bihar : As mentioned in the material examined. First record from Bokaro district. Venkateswarlu and Murthy (1972) recorded it from Bihar. Himachal Pradesh, Karnataka, Kerala, Orissa, Tamil Nadu, Andhra Pradesh and Utter Pradesh in India.

Elsewhere : Sri Lanka.

Remarks : Medium-sized frog. Nocturnal in habit, mostly found underground and surface during monsoon, the breeding season.

Status : Rare.

6. *Uperodon globulosus* (Gunther) (Ballon Frog)

1864. *Cacopus globulosus* Gunther, *Rept. Br. India*, : 416.

1934. *Uperodon globulosum* : Parker, *Monogr. Microhylidae* : 76.

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

1986. *Uperodon globulosus* : Inger and Dutta, *J. Bombay nat. Hist. Soc.* **83** (Supplement) : 137.

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

Material examined : Hazaribagh dist. : 1 ex., Charhi forest, 3 km. south of Charhi C. C. L. Hospital, 12.vi.1994, A. K. Sanyal. Bokaro dist. : 1 ex., 3 km. north of Kargali towards Nawda, 10.vi.1994, A. K. Sanyal.

Total Length : 56 mm to 61 mm from snout to vent.

Diagnostic character : Head broader than long; snout rouned about twice as long as the diameter of eye; nostril equidistant from the tip of snout and the eye; interorbital width about thrice the width of upper eyelid; tympanum hidden. Fingers free, first shorter than second, tips not bearing discs; subarticular tubercles of fingers and toes not very distinct. Toes width a rudiment of web; both inner and outer shovel-shaped metatarasal tubercles present, inner very large. Tibiotarsal articulation not reaching shoulder. Dorsum smooth or sligthly tuberculated and reddish brown. Venter wrinkled and dull whitish.

Distribution : India : Bihar : As mentioned in the material examined. First record from Hazaribagh and Bokaro district. Venkateswarlu and Murthy (1972) recorded it from Bihar. Sarkar (1991) recorded it from Chota Nagpur (Dhanbad district), Assam, Orissa, Madhya Pradesh, Maharastra, Gujarat, West Bengal and Karnataka in India.

Elsewhere : Sri Lanka.

Remarks : Medium-sized frog. Nocturnal in habit, mostly found under-ground and surface during monsoon, the breeding season.

Status : Rare.

Genus 5. ***Microhyla*** Tschudi

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

7. ***Microhyla ornata*** (Dumeril and Bidron) (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 : Purbi Champaran dist. : 1 ex., Motihari, 5.xii.1987, M. L. Biswas, S. Das and S. Ray. Samistipur dist. : 2 ex., Samistipur, 13.viii.1987, Y Chaturvedi. Bhabua dist. : 2 ex., Bhabua, 19.xi.1993, K. C. Kansal. Nalanda dist. : 2 ex., Rajgir, 15.ix.1975, L. Ram. Munger dist. : 2ex., Monghyr, 7.xii.1984, Y. Chaturvedi, Sahibganj dist. : 1 ex., Sahibganj, 9.xii.1995, R.N. Verma. Aurangabad dist. : 5 ex., Obra, Aurangabad, 27.ix.1993; 1 ex., Ramgan, Aurangabad, 28.ix.1993. All coll. K. C. Kansal. Garha dist. : 3 ex., Daltangunj, 30.xi.1975, L. Ram. Palamau dist. : 1 ex., Shahpur vill., Daltangunj, 2.xii.1975, L. Ram; Daltongunj, 12.xi.1991, Y. Chaturvedi. Hazaribag dist. : 1 ex., Parasnath Bandh, Hazaribagh, 21.ii1972, L. Ram. Deoghar dist. : 1 ex., Deoghar, 15.xii.1994, R. N. Verma. Ranchi dist. : 5 ex., Mandar, Ranchi, 6.vii.1992, 1 ex., Ranchi, 8.viii.1992. All coll. K. C. Kansal. Gulma dist. : Simdega, 21.viii.1992, K. C. Kansal. West Singbhum dist. : 9 ex., Chaibasa, 13-16.viii.1992, K. C. Kansal. East Singbhum dist., : 1 ex., Bathua, Sarairanjan, 13.viii.1987; Singbhum, 23.viii.1992. All coll. K. C. Kansal.

Total length : 9 mm to 21 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 flattend. Toes with a rudiment of web, tips blunt, two small but distinct oval (inner and outer) metatarsal tubercles present. Tibiotarsal articulation reaches nearer to eye. Dorsum smooth, brownish with broad darker markings. Venter smooth, dull whitish, little darker on throat.

Distribution : India : 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 meters, and Andaman.

Elsewhere : Pakistan, Nepal, Bangladesh, Sri Lanka, Mayanmar, South China, South east Asia and Taiwan.

Remarks : 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 nocturnul in habit, sometimes found in human dwellings during rainy days.

Status : Common.

Family III. RANIDAE

This family represented in Bihar by five species of the genus *Rana* and one species of genus *Tomopterna*.

Key to the genera of the family RANIDAE

- Outer metatarsal separated by web, at least in the distal half. ..... ***Rana*** Linnaeus
- Outer metatarsal united or separated in thier distal extremity. .... ***Tomopterna*** Dumeril and Bibron

Geneus 6. ***Rana*** Linnaeus

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

Key to the species of the genus *Rana*

1. Toes webbed upto tips. 2
- Toes webbed not upto disc. 3
2. Inner metatarsal tubercle digitiform (toe-like) ..... *cyanophlyctis*
- Inner metatarsal tubercle not digitiform. 4

3. Tips of toes and fingers with distinct discs. ..... *erythraea*

– Tips of toes and fingers swollen but not with discs. ..... *limnocharis*

4. Inner metatarsal tubercle sharp and shovel-shaped. ..... *crassa*

– Inner metatarsal tubercle blunt and not shovel-shaped. ..... *tigerina*

8. ***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 : 592 examples of frogs and 1 tadpole collected from Paschim Champaran dist. : Champaran. Purbi Champaran dist. : Motihari. Sitamari dist. : Dhankal, Sitamari, Soharsa. Saran dist. : Chhapra, Saran, Burwa. Muzaffarpur dist. : Muzaffarpur. Saharsa dist. : Sonarga. Madhepura Dist. : Madhepura. Vaishali dist : Khargolia, Vaishali, Hatpuraghat, Bhagwatpur, Kurniji, Ghoghatlal, Malang, Hazipur, Pantepur, Domgra, Dovachh. Khagaria dist. : Khagaria. Bhojpur dist. : Ara, Sahar, Binuratoli. Patna dist. : Bahadurpur, Patna Yatra. Bhabua dist. : Bhabua, Bhagwanpur. Rohtas dist. : Rohtas. Jahanabad dist. : Jahanabad. Nalanda dist. : Bihar Sarif, Candi, Islampur. Munger dist. : Munger. Bhagalpur dist. : Bhagalpur. Gaya dist. : Gaya. Godda dist. : Godda, Sundarpahar. Sahibgunj dist. : Sahibgunj. Aurangabad dist. : Aurangabad, Harihargunj, Goh, Barun. Garwa dist. : Daltongunj. Palamau dist. : Palamau. Chhatra dist. : Chhatra, Mandar. Hazaribag dist. : Hazaribag, Charhi. Deoghar dist. : Deoghar. Santhal Pargana dist. : Dumka, Sutharia, Pakur. Bokaro dist. : Kargali, Temghal Dam. Ranchi dist. : Hakia dam, Ranchi, Malguda, Dasham falls, Hoondroo falls, Horhap. Gumla dist. : Simdega, Guma, Gumla. West Singbhum dist. : Chaibasa. East Singbhum dist. : Singbhum, Chatrapur. All coll. staff of Z. S. I. Collections are available throughtout the year.

Total length : 17 mm to 73 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; nostrill 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 nostrill. Dorsum darker with small warts. Venter whitish and smooth.

Distribution : India : Bihar : As mentioned in the material examined. Common throughout the plains of India, and upto 1846 m in the Himalayas.

Elsewhere : Pakistan, Bangladesh, Nepal, Afganistan, Beluchistan, Iran, South Arabia, Thailand and Sri Lanka.

Remarks : Annandale and Rao (1918) and Venkateswarlu and Murthy (1972) reported it 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.

9. ***Rana erythraea*** (Schlegel) (Leaping Frog)

1837. *Hyla erythraea* Schlegel, *Abbild.* : 27.

1920. *Rana erythraea* : Boulenger, *Rec. Indian Mus.*, **20** : 152-155.

Material examined : Begusarai dist. : 1 ex., Kabar Lake, 6.vi.1989, E. V. Muley.

Total length : 27 mm from snout to vent.

Diagnostic character : Head longer than broad, snout more or less pointed, projecting

beyond the mouth, longer than the diameter of eye; nostril nearer the tip of the snout than the eye; interorbital width equal / little broader than that of upper eyelid; tympanum very distinct, nearly once the diameter of eye. Fingers slender with rudimentary web, first a little longer than second, tips with distinct disc; subarticular tubercles of fingers and toes well developed. Toes three-fourth webbed, two phalanges of fourth toe free, tips with distinct discs; an oval inner metatarsal tubercle present, outer metatarsal tubercle mostly absent. Tibiotarsal articulation reaching in between posterior end of eye to tip of snout. Dorsum smooth with distinct dorso-lateral glandular folds running from above the tympanum to the hip on both the sides of the back. Venter smooth.

Distribution : India : Bihar : As mentioned in the material examined. Sarkar and Ray (in press) reported it from Begusarai district, Bihar.

Elsewhere : Assam, West Bengal, Orissa in India and South-east Asia.

Remarks : This is an elongated, medium-sized frog. In general, these frogs are found inside the floating aquatic vegetation and in the bushes grown at the edge of water.

Status : Uncommon.

10. ***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.* **13** (3) : 129.

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

Material examined : 119 Frogs and 2 tadpoles collected from Purbi Champaran dist. : Motihari. Saran dist. : Saran, Chhapra, Saraipokra. Muzaffarpur dist. : Dadhol, Muzaffarpur. Saharsa dist. : Nauhalla. Madhepura dist. : Madhepura. Vaishali dist. : Hazipur, Jalalpur. Khagaria dist. : Khagaria. Bhojpur dist. : Sakadi, Arrah, Maurahin. Bhabua dist. : River Durgabati, Bhabua. Rohtas dist. : Rohtas. Nalanda dist. : Rajgir, Islampur, Bihar Sarif. Munger dist. : Kharagpur Lake, Munger. Bhagalpur dist. : Bhagalpur. Gaya dist. : Gaya. Godda dist. : Godda. Sahibgunj dist. : Sahibgunj. Aurangabad dist. : Aurangabad, Hariharganj, Shivganj. Chhatra dist. : Chhatra. Hazaribag dist. : Charhi. Deoghar dist. : Deoghar. Santhal Pargana dist. : Dholdoli Bokaro Dist. : Kongali. Ranchi dist. : Ranchi. Gumla dist. : Gumla, Simdega. West Singbhum dist. : Chaibasa. All coll. staff of Z.S.I. Collections are available throughout the year.

Total length : 13 mm to 57 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, nostrill 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 nostrill. Dorsum greyish and warty. Venter whitish and smooth.

Distribution : India : 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.

Elsewhere : Eastern Asia from Pakistan, Nepal, Bangladesh, Sri Lanka and China to Japan.

Remarks : Annandale and Rao (1918), 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 banks of ditches, pools and canals and on moist forest bed covered with thick canopy of trees.

Status : Very common.

11. ***Rana crassa*** Jerdon
(Jerdon's Bull Frog)

1853. *Rana crassa* Jerdon, *J. Asiat. Soc., Beng.*, **22** : 531.

1947. *Rana crassa* : Bhaduri, *J. Bombay nat. Hist. Soc.*, **44**(3 & 4) : 484-486.

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 : Vaishali dist. : 1 ex., Manpur, Belsai, 9.viii.1984, Y. Chaturvedi. Bhabua dist. : 1 ex., Kurda, 16.ix.1993, K. C. Kansal. Rohtas dist. : 1 ex., Rohtas, 20.ix. 1993, K. C. Kansal. Bhagalpur dist. : 1 ex., Bhagalpur, 11.ix.1989, H. K. Bhowmik. Bokaro dist. : 2 ex., 3 km. north of Korgali towards Nawda, A. K. Sanyal. Ranchi dist. : 1 ex., Ranchi, 10.viii.1992, K. C. Kansal.

Total length : 36 mm to 72 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; nostrill 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 devoloped, 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 : India : Bihar : As mentioned in the material examined. West Bengal, Andhra Pradesh, Kerala, Tamil Nadu, Orissa and Utter Pradesh in India. Also Sri Lanka.

Remarks : Annandale and Rao (1918), Venkateswarlu and Murthy (1972) reported it from Bihar. Bhaduri (1947) reported the same from Gaya district, Bihar and Sarkar (1991) from south Bihar. It is nocturnal in habit and spend day inside the crevices on the elivated walls of ditches, ponds and canals. Fairly big-sized edible frog.

Status : Not very common.

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

1803. *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 : Purbi Champaran dist. : 1 ex., Motihari, 4.xii.1987, M. L. Biswas, S. Das and S. Ray. Saran dist. : 2 ex., Chhapra, 7.xii.1987, M. L. Biswas, S. Das and S. Ray. Bhojpur dist. : 1 ex., Bhojpur, 20.xii.1984, Y. P. Sinha. Patna dist. : 1 ex., River Ganga, Patna, 15.v.1970, R. K. Vershney. 3 ex., Bhadurpur, Patna, 24.ix.1977, S. N. Sinha. 1 ex., R. Nagar, Patna, 7.x.1977, B. Prashad. Nalanda dist. : 1 ex., Candi, 13.vii.1987, L. P. Gupta. 1 ex., Bihar Sarif, 11.xii.1987, M. L. Biswas, S. Das and S. Ray. Aurangabad dist. : 2 ex., Aurangabad, 24.xi.1993, K. C. Kansal. Hazaribag dist. : 1 ex., Charhi forest, 3 km. south of Charhi CCL Hospital, Hazaribag, 12.vi.1994, A. K. Sanyal. Santhal Pargana dist. : 1 ex., Dumka, 28.ii.1972, B. Nath. Bokaro dist. : 2 ex., 3 km. north of Kargali, towards Nawda, 10.vi.1994, A. K. Sanyal. Ranchi dist. : 1 ex., Ranchi, 8.vii.1992, K. C. Kansal. Gumla dist. : 1 ex., Simdega, 20.viii.1992, K. C. Kansal. West Singbhum dist. : 1 ex., Chaibasa, 17.ix.1992, K. C. Kansal. East Singbhum dist. : 1 ex., Singbhum, 20.viii.1992, K. C. Kansal.

Total length : 20 mm to 159 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; nostrill 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 nostrill. The heels overlaping 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 : India : Bihar : As mentioned in the material examined. It is common throughout India from the base of the Himalaya to Southern part of the Country and Andaman.

Elsewhere : Pakistan, Nepal, Bangladesh, Sri Lanka, Mayanmar, South China and Thailand.

Status : Common.

Remarks : Ananandale and Rao (1918) and Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from south Bihar. Commonest and largest species of edible frog. It Frequents inside the bushes grown on the banks of ditches, ponds, canals and lakes.

Genus 7. ***Tomopterna*** Dumeril and Bibron

1841. *Tomopterna* Dumeril and Bibron, *Erp. Gen.*, **8** : 443.

13. ***Tomopterna breviceps*** (Schneider) (Burrowing Frog)

1799. *Rana breviceps* Scheider, *Hist. Amph.*, **1.** : 140.

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 : Bhojpur dist. nawwnagar, 11 km. w. of Arrah, Bhojpur, 15.ix.1984; 1 ex., Sakadi, 15 km. s. of Arrah, Bhojpur, 20.xi.1994. All coll. Y. P. Sinha. Aurangabad dist : 1 ex., Goh, Aurangabad, 26.ix.1993, K. C. Kansal. Hazaribag dist. : 1 ex., Charhi forest, 3 km. south of Charhi CCL Hospital, 12.vi.1994; 1 ex., (Juv.), Bokaro river near Bokaro Coal Field (TISCO), 14.vi.1994; 1 ex., Rajruppa forest, 3 km. east of CCL Guest House, Rajruppa, 12.vi.1994. All coll. A. K. Sanyal. Ranchi dist. : 1 ex., Lodhana, Ranchi, 8.viii.1992; 2 ex., Ranchi, 8.viii.1992. All coll. K. C. Kansal. West Singbhum dist. : 3 ex., Chaibasa, 17-21.viii.1992, K. C. Kansal. East Singbhum dist. : 1 ex., Khonri, Chatarpur Rd. D. Gunj., 25.viii.1992, K. C. Kansal.

Total length : 13 mm to 42 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; nostrill 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 : India : Bihar : As mentioned in the material examined. The species is available all over the plains of India.

Elsewhere : Also Sri Lanka, Nepal and Mayanmar.

Remarks : Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from south Bihar. Medium sized frog. Burrowing and nocturnal in habit.

Status : Not very common.

Family IV. RHACOPHORIDAE

This family represented in Bihar by one species of the genus *Polypedates*.

Genus 8. ***Polypedates*** Tschudi

1838. *Polypedates* Tschudi, *Classif. Batr.* : 34.

14. ***Polypedates maculatus*** (Gray) (Tree Frog)

1832. *Hyla maculata* Gray, *Ill Indian Zool.* **1** pl. 82 fig. 1.

1986. *Polypedates maculatus* : Inger and Datta, *J. Bombay nat. Hist. Soc.*, **83** : 139.

1991. *Polypedates maculatus* : Sarkar, *Rec. zool. Surv. India*, **89**(1-4) : 216.

Material examined : Rohtas dist. : 2 ex., Rohtas, 17-20.ix.1993, K. C. Kansal. Munger dist. : 1 ex., Kharagpur, Munger, 7.xii.1989, Y. Chaturvedi. Bhagalpur dist. : 1 ex., Bhagalpur, 12.ix.1989, H. K. Bhowmik. Aurangabad dist. : 3 ex., Aurangabad, 27.xi.1975, L. Ram; 1 ex., Devhara, Aurangabad, 27.ix.1993, K. C. Kansal. Singbhum dist. : 1 ex., Singbhum, 20.viii.1992, K. C. Kansal.

Total length : 15 mm. to 73 mm. form 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; nostrill 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 : India : Bihar : As mentioned in the material examined. The species is available throughout the plains of India in general. Also Sri Lanka.

Remarks : Venkateswarlu and Murthy (1972) reported it from Bihar and Sarkar (1991) from south Bihar. Medium sized frog. Nocturnal in habit.

Status : Rare.

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SUMMARY

The paper deals with the Amphibian fauna of Bihar based on the collections mainly made by the surveys undertaken by the Scientists of Zoological Survey of India. The paper consists of 889 ex. of anurans belonging to 14 species, 8 genera and 4 famillies, of which several species are recorded for the first time from different districts. Keys, illustrations of essential morphological characters to follow the key and diagnostic characters of the species in short have been added in the paper for determination of the species.

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AQUATIC INSECTS

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INTRODUCTION

The state of Bihar is situated in the eastern part of India. It is situated between 22°00'-27°30' N latitude and 83°20'-88°17' E longitude. From northern side it is bounded by Nepal, eastern side, by West Bengal and southern side by Orissa, northwestern side by Uttar Pradesh and from southwestern side by Madhya Pradesh. The state has got varied topography, the Himalayan foot hills in the north, riverine belt in the middle and Chhota Nagpur plateau in the south. The ecological niches provide suitable habitats for aquatic insects especially for Coleopterans and Hemipterans. The hill streams as well as permanent and temporary water bodies are suitable habitats for aquatic insects.

No comprehensive work on aquatic insects of Bihar has been done. The present work is based on the collections of the Gangetic Plains Regional Station, Zoological Survey of India, Panta as well as from the literature.

The author has studied the materials present in the station. Among the aquatic insects, two major groups order Coleoptera and Hemiptera (Heteroptera) have been dealt in separately in this paper. The study reveals that in order Coleoptera 52 species under 20 genera belonging to 4 families have been reported from Bihar.

In the Order Hemiptera 18 species under 12 genera belonging to 8 families have been dealt in this paper. Pioneer workers like Distant (1902, 1906, 1910), Paiva (1918, 1919), Hafiz & Ribeiro (1939), Hafiz & Pradhan (1947), Hutchinson (1935, 1940), Brooks (1951), Julka (1965), Cheng & Fernando (1969), and Thirumalai (1986, 1989 & 1994) have rendered valuable informations on Indian bugs along with other exotic forms of water bugs.

GEOGRAPHIC AND CLIMATIC FEATURES

The state of Bihar has got ecological niches best suited for the collections of aquatic insects. The hilly streams, water bodies, the gangetic plains, Chhota Nagpur plateau having rocky and hilly areas are the diverse habitats.

Climatically northern Bihar is temperate while southern Bihar is hotter. Annual rainfall ranges between 100 to 150 cm.

From geological point of view Bihar is one of the richest state in India. It produces about 40% of the total mineral products of the country. It also produces animal products like lac and tassar silk. In agricultural crops it is nearest to Uttar Pradesh for sugar, and to West Bengal for the rice. Due to its situation in the centre of Gangetic Plains, many other agri and horticultural crops are grown here and their prospect is very good one.

The river Ganges divides the plains horizontally into two parts, i. e., plains of north Bihar and South Bihar. The northern plains are transversed by a number of rivers including Ghaghra, Gandak, Burhi Gandak, Bagmati and Kosi etc. Rivers Karmanasha, Sone, Punpun, Falgu, Morhar, Pemar, Sakari, Kiul, Chir etc. are in the southern plains. The whole area is part of the Indo-Gangetic Plains, which is most fertile due to its alluvial soil deposits. The northern boundary of the state has a small tract of terai.

The Chhota Nagpur plateau is one of the richest area due to minerals, mines and forested parts of the Indian sub continents. The plateau is enriched with hills, forest tracts and waterfalls. To enhance the glory of the Chhota Nagpur belt, the tribals mainly the munda, oraon, ho, santhal etc., who predominate the region, are very hard working, cheerful meek, submissive and wonderfully clean and simple people. They excel in sports, hunting and trekking etc. The life and customs of the aboriginal or tribals of this plateau provide great attraction to the students of anthropology. The wild life of Chhota Nagpur is also extremely praiseworthy. The Hazaribagh National Park in District Hazaribagh and the Betla National Park in Palamau District are worth visiting.

INSECTA : COLEOPTERA : ADEPHAGA

1. Family DYTISCIDAE

The members of the family are commonly known as predaceous diving beetles and they are most perfectly adapted to the aquatic life. They form the main constituents of insect fauna of aquatic biota. They are very active swimmers preying upon other small aquatic animals. The larvae, popularly knowns as 'water-tigers' of larger species may at times destroy the finger lings of commercial fishes. The group has a characteristic appearance with convex form, streamlined body and paddle like legs. Dytiscid beetles are found both in stagnant and running water bodies. They also inhabit in fresh as well as brackish water bodies more or less salt water. A few of the members of the family have also been found in hot springs. Though both larval and adults are found in water, adults are perfectly capable of living on land.

Both larvae and adult are carnivorous and prey on various aquatic animals including molluscs, worms, insects, tadpoles and small fishes. This is why this group has importance in pisciculture. In fishery culture beetles serve multiple roles. They serve food for carnivores or omnivorous fishes and they are also highly predators on fish fry up to 5 cm. and compete with the small fish or food.

The beetles of the family Dytiscidae occur throughout the world. It contains about 4000 species of which 223 species have been recorded from India.

Zimmerman (1920) published in Coleopterorum catalogues part 71, vol. 4 of his world catalogue of this family. Vazirani took up the work of Indian Fauna. From 1953 to 1980 he published a series of papers and thus he brought the information of India Fauna together with the description of several new taxa.

Other workers who contributed a lot to our knowledge of this group are mainly Balfour-Browne (1946 a & b), Guignot (1954, 1956 and 1958), Gesthwendtner (1936), Wewalka (1975) and Brancucci (1983 a & b). These authors have contributed a lot in describing or recording new Indian taxa. They have also contributed more and have added to our knowledge of the geographical distribution of our species and genera.

No any comprehensive work on the Fauna of Bihar in this group has been done so far. Distributional data of the species has been given from the published records as well as study of the specimens. Important synonymies only have been included.

SYSTEMATIC ACCOUNT

Order	CEOLEOPTERA
Sub order	ADEPHAGA
Family	DYTISCIDAE
Sub family 1.	NOTERINAE

Genus 1. ***Canthydrus*** Sharp

1. ***Canthydrus laetabilis*** (Walker)

1858. *Hydroporus laetabilis* Walker, *Ann. Mag. nat. Hist.*, **3** (2) : 205.

1876. *Hydrocanthus orientalis* Wehncke, *Berlin. Ent. Zeitsch*, **20** : 222.

1948. *Canthydrus amiculus* Guignot, *Bull. Soc. Ent. France*, **52** : 9.

1977. *Canthydrus laetabilis*, Vazirani, *Cat. Orient; Dytiscidae, pp.* 6.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Orissa, Andhra Pradesh, Maharashtra, Gujrat, Kerala, Rajasthan and Uttar Pradesh.

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

2. ***Canthydrus luctuosus*** (Aube)

1838. *Hydrocanthas luctuosus* Aube, in Dejean's Coleopteres, **6** : 408.

1882. *Canthydrus ornatus* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 275.

1882. *Canthydrus frontalis* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 276.

1882. *Canthydrus sexpunctatus* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 276.

1977. *Canthydrus luctuosus*, Vazirani, *Cat. Orient; Dytiscidae, p.* 6.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Maharashtra, Karnataka and Kerala.

Elsewhere : Iran and Sri Lanka.

3. ***Canthydrus ritsemai*** Regimbart

1880. *Canthydrus ritsemai* Regimbart, *Notes Leyden Mus.* **2** : 213.

1883. *Canthydrus javanus* Wehncke, *Deutsch. ent. Z.*, **27** : 145.

1977. *Canthydrus ritsemai*, Vazirani, *Cat. Orient; Dytiscidae, p.* 8.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Orissa, Andhra Pradesh.

Elsewhere : Myanmar, Vietnam, Indonesia, Malaysia and Singapore.

Sub family II LACCOPHILINAE

Genus 2 ***Laccophilus*** Leach

4. ***Laccophilus anticatus*** Sharp

1890. *Laccophilus anticatus* Sharp, *Trans. Ent. Soc. London* : 341.

1977. *Laccophilus anticatus*, Vazirani, *Cat. Orient: Dytiscidae, p.* 9.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Orissa, and Manipur.

5. ***Laccophilus elegans*** Sharp

1882. *Laccophilus elegans* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 302-303.

1977. *Laccophilus elegans*, Vazirani, *Cat. Orient: Dytiscidae, p.* 11.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Nagaland., Orissa, Andhra Pradesh and Andaman Island.

6. ***Laccophilus ellipticus*** Regimbart

1899. *Laccophilus ellipticus* Regimbart, *Ann. Soc. Ent. Fr.*, (6) **9** : 152.

1977. *Laccophilus ellipticus*, Vazirani, *Cat. Orient: Dytiscidae, p.* 11.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Andhra Pradesh, Madhya Pradesh, Goa and Kerala.

Elsewhere : Myanmar, Sri Lanka, China and Vietnam.

7. ***Laccophilus flexuosus*** Aube

1838. *Laccophilus flexuosus* Aube, in Dejean's Species Coleopteres, **6** : 430.

1882. *Laccophilus cognatus* Sharp, *Sci Trans. R. Dublin. Soc.*, **2** : 316.

1936. *Laccophilus solutus* indicus *Gschwendtner, Rec. Ind. Mus.*, **37** : 367.

1977. *Laccophilus flexuosus*, Vazirani, *Cat Orient, Dytiscidae, p.* 11-12.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Andhra Pradesh, Madhya Pradesh, Maharashtra, Uttar Pradesh, Himachal Pradesh, Karnataka, Tamil Nadu, Gujrat and Rajasthan.

Elsewhere : Myanmar, Sri Lanka, Nepal, Pakistan, Iraq, Iran, Japan and Indonesia.

8. ***Laccophilus chinensis inefficiens*** Walker

1858. *Laccophilus chinensis* Boheman in Konglia Svenska Fregatten. Eugenies resa Zoologi, 1. *Insecta* : 21.

1859. *Laccophilus inefficiens* Walker, *Ann. Mag. Nat. Hist.*, **3** (3) : 51.

1954. *Laccophilus chinensis inefficiens*, Guignot, *Ark. Zool. (N. S.)*, **6** : 565.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Orissa, Madhya Pradesh, Uttar Pradesh, Himachal Pradesh, Punjab and Rajasthan.

9. ***Laccophilus parvulus*** Aube

1838. *Laccophilus parvulus* Aube, in Dejean's *Species Coleopteres*, 6.

1977. *Laccophilus parvulus*, Vazirani, *Cat. Orient; Dytiscidae*, 13-14.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Madhya Pradesh, Andhra Pradesh, Maharashtra, Tamil Nadu, Goa, Gujrat and Rajasthan.

Elsewhere : Myanmar, Sri Lanka, Pakistan, Malaysia, Indonesia and Philippines.

10. ***Laccophilus rufulus*** Regimbart

1888. *Laccophilus rufulus* Regimbart, *Ann. Mus. Stor. Nat. Geneva.* (2) **6** : 61.

1977. *Laccophilus rufulus*, Vazirani, *Cat. Orient; Dytiscidae, pp.* 14-15.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Manipur, Orissa and Madhya Pradesh.

11. ***Laccophilus sharpi*** Regimbart

1989. *Laccophilus sharpi* Regimbart, *Ann. Soc. Ent. Fr.* **6** (9) : 151

1977. *Laccophilus sharpi*, Vazirani, *Cat. Orient; Dytiscidae, p.*15.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Madhya Pradesh, Maharashtra, Tamil Nadu, Gujrat. Rajasthan and Andaman Island.

Elsewhere : Myanmar, Sri Lanka, Nepal, Pakistan, Iran Japan and Formosa.

Sub family III. HYDROPORINAE

Genus 3. ***Metheles*** Sharp

12. ***Metheles indicus*** Regimbart

1899. *Metheles indicus* Regimbart, *Ann. Soc. Ent. Fr.* **68** p. 241.

1977. *Metheles indicus*, Vazirani, *Cat. Orient; Dytiscidae*, 20.

Material examined : From literature.

Distribution : India : Bihar; West Bengal.

Genus 4. ***Hyphydrus*** Illinger

13. ***Hyphydrus (Apriophorus) renardi*** Severin

1890. *Hyphydrus renardi* Severin, *Ann. Soc. Ent. Belg.* 34.

1977.*Hyphydrus (Apriophorus) renardi*, Vazirani, *Cat. Orient; Dytiscidae*, : 23.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Uttar Pradesh, Madhya Pradesh, Tamil Nadu and Rajasthan.

Elsewhere : Myanmar.

Genus 5. ***Hydrovatus*** Motschulsky

14. ***Hydrovatus acuminatus*** Motschulsky

1859. *Hydrovatus acuminatus* Motschulsky, *Etude Entomologques*, **8** : 42.

1863. *Hydrovatus babius* Clark, *Trans. ent. Soc. Lond.* (3) **1** : 424.

1880. *Hydrovatus consanguineus* Regimbart, *Notes Leyden Mus.*, **2** : 212.

1977. *Hydrovatus acuminatus*, Vazirani, *Cat. Orient; Dytiscidae*, : 25.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa and Kerala.

Elsewhere : Myanmar, China, Indonesia, Malaysia, Celebes and Madagascar.

15. ***Hydrovatus bonvouloiri*** Sharp

1882. *Hydrovatus bonvouloiri* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 335.

1977. *Hydrovatus bonvouloiri*, Vazirani, *Cat. Orient; Dytiscidae*, : 26.

Material examined : From literature.

Distribution : India : Bihar; West Bengal and Karnataka.

Elsewhere : Sri Lanka, Myanmar, China, Malaysia, Vietnam, Formosa, Indonesia and Philippines.

16. ***Hydrovatus cardoni*** Severin

1890. *Hydrovatus cardoni* Severin, *Ann. Soc. Ent. Belg.*, 34, *Bull.* (4) **12** : 189.

1970. *Hydrovatus cardoni*, Vazirani, *Orient; Ins.*, **4** : 96.

Material examined : From literature.

Distribution : India : Bihar; West Bengal and Orissa.

17. ***Hydrovatus castaneus*** Motschulsky

1855. *Hydrovatus castaneus* Motschulsky, *Etudes Entomologiques*, **5** : 82.

1977. *Hydrovatus castaneus*, Vazirani, *Cat. Orient; Dytiscidae*, : 26.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Punjab and Kerala.

Elsewhere : Myanmar, Celebes and Indonesia.

18. ***Hydrovatus confertus*** Sharp

1882. *Hydrovatus confertus* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 329.

1977. *Hydrovatus confertus*, Vazirani, *Cat. Orient; Dytiscidae*, : 27.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Uttar Pradesh, Punjab, Tamil Nadu, Kerala and Rajasthan.

Elsewhere : Sri Lanka, Myanmar, Thailand, Vietnam, China and Indonesia.

19. ***Hydrovatus pinguis*** Regimbart

1892. *Hydrovatus pinguis* Regimbart, *Ann. Soc. Ent. Belg.*, **36** : 114.

1977. *Hydrovatus pinguis*, Vazirani, *Cat. Orient; Dytiscidae*, : 29.

Material examined : From literature.

Distribution : India : Bihar; West Bengal and Orissa.

Elsewhere : Myanmar and Indonesia.

Genus 6. ***Guignotus*** Houlbert

20. ***Guignotus flammulatus*** (Sharp)

1882. *Bidessus flammulatus* Sharp, *Sci. Trans. R. Dublin Soc.* **2** : 359.

1892. *Bidessus antennatus* Regimbert, *Ann. Soc. Ent. Belg.*, **36** : 116.

1977. *Guignotus flammulatus*, Vazirani, *Proc. Zool. Soc. Calcutta.* **25** : 121.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Uttar Pradesh, Madhya Pradesh, Tamil Nadu, Maharashtra, Gujrat and Rajasthan.

Elsewhere : Indonesia, Vietnam, Thailand, Japan, China, Pakistan, Sri Lanka and Bangladesh.

Genus 7. ***Clypeodytes*** Regimbart

21. ***Clypeodytes bufo*** (Sharp)

1890. *Bidessus bufo* Sharp, *Trans. ent. Soc. Lond.*, : 344.

1971. *Clypeodytes bufo*, Vazirani, *Orient Ins.* **4** : 444.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Maharashtra and Goa.

22. ***Clypeodytes indicus*** (Regimbart)

1892. *Bidessus indicus* Regimbart, *Mem. Soc. Ent. Belg.*, **36** : 117.

1899. *Clypeodytes indicus*, Regimbart, *Ann. Soc. Ent. Fr.*, **68** : 219.

1977. *Clypeodytes indicus*, Vazirani, *Cat. Orient; Dytiscidae*, : 39.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Assam, Uttar Pradesh, Madhya Pradesh and Maharashtra.

Genus 8. ***Uvarus*** Guignot

23. ***Uvarus quadrilineatus*** (Zimmermann)

1923. *Bidessus quadrilineatus* Zimmermann, *ent. Blatter*, **19** : 34.

1956. *Uvarus bilineatus* Guignot, *Ark. Zool.* (N. S.) **9** : 45.

1977. *Uvarus quadrilineatus*, Vazirani, *Cat. Orient; Dytiscidae*, : 42.

Material examined : From literature.

Distribution : India : Bihar; West Bengal.

Genus 9. ***Hyphoporus*** Sharp

24. ***Hyphoporus aper*** Sharp

1882. *Hyphoporus aper* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 390.

1977. *Hyphoporus aper*, Vazirani, *Cat. Orient; Dytiscidae*, : 44.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Uttar Pradesh, Punjab, Madhya Pradesh and Maharashtra.

25. ***Hyphoporus bengalensis*** Severin

1890. *Hyphoporus bengalensis* Severin, *Ann. Soc. Ent. Belg.* 34. *Bull.* (4) **12** : 191.

1977. *Hyphoporus bengalensis*, Vazirani, *Cat. Orient; Dytiscidae*, : 44.

Material examined : From literature.

Distribution : India : Bihar; West Bengal and Punjab.

Genus 10. ***Peschetius*** Guignot

26. ***Peschetius quadricostatus*** (Aube)

1838. *Deronectes quadricostatus* Aube, in Dejean's Species Coleopteres, **6** : 487.

1977. *Peschetius quadricostatus*, Vazirani, *Cat. Orient; Dytiscidae*, : 48.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Orissa, Uttar Pradesh, Tamil Nadu, Kerala, Goa and Maharashtra.

Sub family IV COLYMBETINAE

Genus 11. ***Rhantus*** Stephens

27. ***Rhantus (S. str.) taprobanicus*** Sharp

1890. *Rhantus taprobanicus* Sharp, *Trans. ent. Soc. London* : 346.

1977. *Rhantus (S. str.) taprobanicus*, Vazirani, *Cat. Orient; Dytiscidae*, : 73.

Material examined : From literature.

Distribution : India : Bihar; West Bengal, Meghalaya, Uttar Pradesh, Tamil Nadu, Pondicherry, Maharashtra, Karnataka and Rajasthan.

Elsewhere : Pakistan and Sri Lanka.

Sub family V DYTISCINAE

Genus 12. ***Eretes*** Castelnau

28. ***Eretes sticticus*** (Linnaeus)

1767. *Dytiscus sticticus* (Linnaeus), *Syst. Nat., ed.* **12** : 666.

1833. *Eretes sticticus*, Castelnau, *Ann. Soc. Ent. Fr.*, (5) **8** : 450.

1977. *Eretes sticticus*, Vazirani, *Cat. Orient; Dytiscidae*, : 73-74.

Material examined : 21 exs., Hasanpura, Patna Distt., 19-iv-1966, coll. T. Venkateswarlu., 2 exs., Hazaribagh lake, Hazaribagh distt., 6-iii-1970., coll. R. K. Varshney., 8 exs., Tonto talab, Chaibasa Distt., 21-ii-1973, coll. R. K. Varshney.

Distribution : India : Bihar (Patna, Hazaribagh & Chaibasa), West Bengal, Manipur, Assam, Uttar Pradesh, Panjab, Kashmir, Orissa, Tamil Nadu, Maharashtra, Karnataka and Rajasthan.

Elsewhere : Reported from all tropical and sub tropical regions of the world.

Genus 13. ***Hydaticus*** Leach

29. ***Hydaticus (Guignotites) fabricii*** Macleay

1883. *Hydaticus fabricii* Macleay, *Annulosa Javanica* : 134.

1838. *Hydaticus rufulus* Aube, in Dejean's *Species Coleop.* **6** : 199.

1958. *Hydaticus confuscus* Baheman, *Eugen. Ressiesa. Col.*, : 21.

1977. *Hydaticus (Guignotites) fabricii*, Vazirani, *Cat. Orient; Dytiscidae*, : 76-77.

Material examined : From literature.

Distribution : India : Bihar West Bengal, Assam, Manipur, Panjab, Himachal Pradesh, Orissa, Tamil Nadu, Maharashtra and Rajasthan.

Elsewhere : Philippines, Indonesia, Vietnam, Myanmar, Pakistan and Nepal.

30. ***Hydaticus (Guignotites) luczonicus*** Aube

1838. *Hydaticus luczonicus* Aube, in Dejean's *Species Coleop.* **6** : 179.

1977. *Hydaticus (Guignotites) luczonicus*, Vazirani, *Cat. Orient; Dytiscidae*, : 79.

Material examined : From literature.

Distribution : India : Bihar W. Bengal, Uttar Pradesh, Orissa, Madhya Pradesh, Maharashtra, Gujrat and Rajasthan.

Elsewhere : Thailand.

31. ***Hydaticus vittatus*** (Fabr.)

Material examined : 1, ex., Hazaribagh, 1-iii-1970, coll. R. K. Varshney. (Identified and retained by Vazirani).

Distribution : India : Bihar.

Genus 14. ***Cybister*** Curtis

32. ***Cybister (Mega) tripunctatus asiaticus*** Sharp

1882. *Cynister asiaticus* Sharp, *Sci. Trans. R. Dublin Soc* **2** : 731.

1889. *Cybister tripunctatus asiaticus* Regimbert, *Ann. Soc. Ent. Fr.*, **68** : 352.

1977. *Cybister (Mega) tripunctatus asiaticus*, Vazirani, *Cat Orient; Dytiscidae*, : 92.

Material examined : 1 ex., Samaspur, River Ganga, Patna Dist., 19-iv-1966, coll. T Vemateswarlu., 8 exs., Areraj, Champaran Dist., 2-1-1969., coll. R. K. Varshney., 2 exs., Chonar River bank, Kanke, Ranchi Dist., 12-iii-1970, coll. R. K. Varshney., 4 exs., Hizala, Dumka (S. P.), 5-iii-1972, coll. Bhola Nath., 2 exs., Sundar Nagar, Jamshedpur, 9-ii-1973., coll. R. K. Varshney., lex., Panchkura Talab., Jamshedpur, 11-ii-1973., coll. R. K. Varshney, 5 exs., Tonto Talab, Chaibasa, 21-ii-1973, coll. R. K. Varshney., 2 exs., Jubilee Talab, Jamshedpur, 22-ii-1973, coll. R. K. Varshney., 1 ex Maner, Patna Dist., 7-ii-1975, coll. K. P. Singh.

Distribution : India : Bihar (Patna Dist, Champaran Dist. Ranchi Dist. Dumka (S. P.), Jamshedpur and Chaibasa), W. Bengal.

Elsewhere : Pakistan, Afghanistan, Nepal, Sri Lanka and Bangla Desh.

33. ***Cybister confuscus*** Sharp

1882. *Cynister confuscus*, Sharp, *Sci. Trans. R. Dublin Soc.* **68** : 739.

1977. *Cybister (Meganectes) confuscus*, Vazirani, *Cat. Orient. Dytiscidae*, : 90.

Material examined : 1 ex., Hasanpura pond, Patna Dist. 19-iv-1966, coll. T. Vemateswarlu., 1 ex., Kumhrar, Patna Dist., 25-viii-1966., coll.

S. Banerjee, Dam near Dumri, Hazaribagh National Park, 5-iii-1970, coll. R. K. Varshney., 1 ex., Hizala, Dumka (S. P.), 5-iii-1972, Bhola Nath, 2 exs., Tonto Talab, Chaibasa, 21-ii-1973., coll. R. K. Varshney.

Distribution : India : Bihar (Patna Dist, Hazaribagh Dist. Dumka (S. P.), Chaibasa Dist.), W. Bengal, Manipur, Karanataka, Maharashtra and Orissa.

Elsewhere : Pakistan, and Sri Lanka.

34. ***Cybister (Meganectes) limbatus*** Fabr

1775. *Dytiscus limbatus* Fabricius, *Systema Ent.*, 230.

1838. *Cybister limbatus*, Aube, in Dejean's Species Coleopteres, **6** : 55.

1977. *Cybister (Meganectes) limbatus*, Vazirani, *Cat. Orient; Dytiscidae*, : 91.

Material examined : 1 ex., Subarnrekha river, Ranchi, 10-iii-1970, coll. R. K. Varshney, 3 exs., Sunder Nagar, Jamshedpur, 9-ii-1973., coll. R. K. Varshney, 1 ex., Panchkura Talab, Jamshedpur, 11-ii-1973, coll. R. K. Varshney.

Distribution : India : Bihar (Ranchi, Jamshedpur), West Bengal, Arunachal Pradesh, Orissa, Madhya Pradesh, Maharashtra, Goa and Kerala.

Elsewhere : Japan, China, Vietnam, Formosa and Philippines.

35. ***Cybister (Meganectes) cognatus*** Sharp

1882. *Cybister congatus* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 744.

1977. *Cybister (Meganectes) congatus*, Vazirani, *Cat. Orient; Dytiscidae*, : 89.

Material examined : From literature.

Distribution : India : Bihar, West Bengal, Maharashtra and Goa.

Elsewhere : Indonesia.

36. ***Cybister (Meganectes) javanus*** Aube

1883. *Cybister javanus* Aube, in Dejean's Species Coleopteres, **6** : 59.

1977. *Cybister (Meganectes) javanus*, Vazirani, *Cat. Orient; Dytiscidae*, : 91.

Material examined : From literature.

Distribution : India : Bihar, West Bengal, Orissa, Tamil Nadu and Kerala.

Elsewhere : Sri Lanka and Indonesia.

37. ***Cybister (Meganectes) ventralis*** Sharp

1882. *Cybister ventralis* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 742.

1882. *Cybister crassus* Sharp, *Sci. Trans. R. Dublin Soc.*, **2** : 743.

1977. *Cybister (Meganectes) ventralis*, Vazirani, *Cat. Orient; Dytiscidae*, : 92-93.

Material examined : From literature.

Distribution : India : Bihar, West Bengal, Madhya Pradesh, Maharashtra and Karnataka.

Elsewhere : Bangladesh.

Family GYRINIDAE

The members of the family Gyrinidae are commonly known as whirling beetles because of their habit of swimming in groups on the surface of ponds and quiet streams. They are predominantly scavengers feeding on live or dead insects, which are trapped floating on the surface of water. 700 species are known from the world of which 56 species are known from India.

The adults normally swim and feed upon the surface but can swim equally beneath water. Usually they are whirling around and around and the congregations of these beetles are usually seen in the later summer and autumn. When disturbed they dive beneath the surface of water with an air bubble on their under surface.

The larvae are predacious feeding on other aquatic insect larvae and nymphs. One most striking feature of their eyes are that they are divided, due to which they can see both above and below the water at the same time. This divided vision and habit of quick swimming help them to escape from the predators both above and below the water.

Key to the genera of the Family Gyrinidae

1. Episternum of mesothorax not extending up to elytral epipleurae., pronotum and elytra without any pubescence., scutellum concealed or invisible, elytral striae indistinct, protarsi of male slightly dilated, clothed beneath with dense papillae forming an elongate, narrow brush .... *Dineutus* Macleay

– Pisternum of mesothorax reaching the base of elytral epipleurae., pronotum and elytra with pubescence., scutellum visible, at least in one sexes., apical segment of protarsi less than $1\text{-}^1/_2$ times longer than preceeding one ..... *Orectochilus* Eschscholtz.

Genus 1. ***Dineutus*** Macleay

1825. *Dineutus* Macleay, *Annulosa javanica, ed.* **1** : 30.

1833. *Cyclous* Eschscholtz, in Dejean's cat. Coleopteres, ed **II** : 58 (Type species, australis Fabricius).

1837. *Cyclinus* Kirby, in *Richards, Fauna Bor. Amer.*, **4** : 78 (type species, *assimilis* Kirby).

Key to the Species

1. Elytra with a spine at parasultural angle *(Spinosodineutus* Hatch) ..... 2.

   Elytra without any apipleural or parasutural spine ..... *(Protodineutus* Ochs).

- Elytra black, feebly striated, punturation double, external apical angle obtuse and rounded, femora in male with a tooth on the internal border, a little before apex... ..... *indicus* Aube.

2. Apex of elytra with one spine at epipleural angle ..... *unidentatus* (Aube).

   Apex of elytra two spines, one in contineuation of epipleural angle and other with parasutural angle which may be reduced in some cases .... *spinosus* (Fabricius).

1. ***Dineutus (Spinosodineutus) spinosus*** (Fabr.)

1781. *Gyrinus spinosus* Fabricius, *Species Insectorum*, p. 298.

1984. *Dineutus (Spinosodineutus) spinosus* (Fabricius). *Fauna India, pp.* 16-20.

Material examined : From literature.

Distribution : India : Bihar, West Bengal, Assam, Meghalaya, Orissa and Uttar Pradesh.

Elsewhere : Myanmar, Thailand, Malaysia, Laos and Vietnam.

2. ***Dineutus unidentatus*** (Aube)

1838. *Dineutus unidentatus* Aube. *Species Coleopteres*, **6** : 788.

1930. *Dineutus (spinosodineutus)* unidentatus : *Ochs. Cat Ins.* : 12.

1958. *Dineutus unidentatus* : Vazirani, *Rec. Indian Mus.*, **53** : 161.

Material examined : From literature.

Distribution : India : Bihar, Uttar Pradesh, Delhi, West Bengal, Assam, Meghalaya, Orissa and Tamil Nadu.

Elsewhere : Bangladesh, Myanmar, Thailand, Malaysia, Laos and Vietnam.

3. ***Dineutus indicus*** Aube

1838. *Dineutus indicus* Aube, *Species Coleopteres*. **6** : 772.

1926. *Dineutus (Prodineutus)* indicus : *Ochs. Ent. Z. Frankf.*, **40** : 137.

Material examined : 8 exs., Areraj, Champaran Dist, 2-i-1969, coll. R. K. Varshney, 17 exs., Gandharva nala, Paresnath hill, 20-ii-1972, coll. Bhola Nath, 14 exs., Sita nala, Paresnath hill 25-ii-1972, coll. Bhola Nath, 17 exs., Gandharva nala, Paresnath hill, 25-ii-1972.

Distribution : India : Bihar, West Bengal, Gujarat, Himachal Pradesh, Karnataka, Kashmir, Kerala, Madhya Pradesh, Maharashtra, Andhra Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh.

Elsewhere : Pakistan.

Genus 2. ***Orectochilus*** Eschscholtz

1833. *Orectochilus* Eschscholtz, in *Dejean's Catalogue coleopteres, ed.* **II** : 59.

4. *Orectochilus (Patrus) desgodinsi desgodinsi* Regimbart

1886. *Orectochilus desgodinsi* Regimbart, *Ann. Soc. ent. Fr.*, (6) : 260 pl. 4. F. 10.

1984. *Orectochilus (Partus) desgodinsi desgodinsi* : Vazirani, *Fauna India, pp.* 43-44.

Material examined : From literature

Distribution : India : Bihar, West Bengal and Sikkim.

Elsewhere : Bhutan.

5. *Orectochilus (Patrus) productus* Regimbart

1883. *Orectochilus productus* Regimbart, *Ann. Soc. ent. Fr.*, (6) **5** : 422.

1984. *Orectochilus (Partus) productus* : Vazirani, *Fauna India, pp.* 51-52.

Material examined : From literature

Distribution : India : Bihar, West Bengal Assam, Kerala, Madhya Pradesh and Tamil Nadu.

6. *Orectochilus (Patrus) discifer* Walker

1859. *Gyrinus discifer* Walker, *Ann. Mag. nat. Hist.* (3) **3** : 51.

1984. *Orectochilus (Partus) discifer* : Vazirani, *Fauna India, pp.* 60-62.

Material examined : From literature

Distribution : India : Bihar, West Bengal, Madhya Pradesh, Kerala, Maharashtra and Tamil Nadu.

Elsewhere : Sri Lanka.

7. *Orectochilus (Patrus) haemorrhous* Regimbart

1891. *Orectochilus haemorrhous* Regimbart, *Ann. Soc. ent. Fr.*, **60** : 706.

1984. *Orectochilus (Partus) haemorrhous* : Vazirani, *Fauna India, pp.* 85-87.

Material examined : From literature

Distribution : India : Bihar, West Bengal, Madhya Pradesh, Maharashtra and Kerala.

8. *Orectochilus (Patrus) ribeiroi* Vazirani

1958. *Orectochilus ribeiroi* Vazirani, *Rec. Indian Mus.*, **53** : 14.

1984. *Orectochilus (Partus) ribeiroi* : Vazirani, *Fauna India, pp.* 90-91.

Material examined : From literature

Distribution : India : Bihar, West Bengal and Uttar Pradesh.

9. *Orectochilus (Patrus) gangeticus* (Wiedemann)

1821. *Gyrinus gangeticus* Wiedemann, in *German, Magazin d' Ent.*, **4** : 119.

1984. *Orectochilus (Partus) gangeticus* : Vazirani, *Fauna India, pp.* 92-94.

Material examined : From literature

Distribution : India : Bihar, West Bengal, Sikkim and Uttar Pradesh.

Elsewhere : Bangladesh and Indonesia.

Family HALIPLIDAE

The members of the family Haliplidae are commonly known as "crawling water beetles" They usually live in at the edge of small ponds, lakes, quiet streams and both the adults and larvae are omni-vorous feeding upon both plant and animal materials, They usually prefer algae and also preyed upon by fishes, though it was not recorded in India. Beier (1929) observed that animal food as Oligochaetes.

These beetles in addition to plant food easily accept nematodes, and larvae of Anopheles, Culex and Chironomous. However, like other aquatic beetles they rather crawl, instead of swimming along the pond bottom or upon submerged vegetations or they may be called poor swimmers and the swimming is effected by alternate movement of the legs and is

therefore feeble. Due to which their legs are not flattened or fringed with hairs like other aquatic beetles.

Genus 1. ***Haliplus*** Latreille

1802. *Haliplus* Latreille, *Hist. Nat. Crust. Ins.*, 3-77.

1806. *Haliplus* Clairville, *Ent. Helv.* **2** : 218.

1808. *Haliplus* Gyllenhal, *Faun. Suce.*, **1** : 545.

Key to the species of the Genus *Haliplus*.

1. Prosternal process canaliculate and without any distinct pit at apex., elytra with two dilations on either side .... *pulchellus indicus* Regimbart.

- Prosternal process not canaliculate.....2.

2. Pronotum with a notch on lateral side before posterior angle .... *augustifrons* Regimbart.

   Pronotum without notch before posterior angles .....3.

3. Prosternal process with large pit at apex; prosternum with ferrugineous spot on disc; metacoxal plate more or less regularly and finely punctate, addeagus with penis moderately curved .....*pruthi* Vazirani.

   Prosternal process with small pit at apex; pronotum without any ferrugineous spot on disc; metacoxal plate moderately punctate, puncturation on anterior side small or more or less regularly arranged; aedeagus with penis moderately stongly curved .... *arrowi* Guignot.

1. ***Haliplus (Liaphlus) pulchellus indicus*** Regimbart

1899. *Haliplus pulchellus var* Regimbart, *Ann. Soc. ent. Fr.* **68** : 188-189.

1984. *Haliplus (Liaphlus) pulchellus indicus*, Vazirani, *Fauna India, pp.* 119-120.

Material examined : From literature

Distribution : India : Bihar, West Bengal, Orissa and Rajasthan.

2. ***Haliplus (Liaphlus) augustifrons*** Regimbart

1892. *Haliplus augustifrons* Regimbart, *Ann. Soc. ent. Belg.*, 36-112.

1984. *Haliplus (Liaphlus) augustifrons*, Vazirani, *Fauna India. and pp.* 112-124.

Material examined : From literature

Distribution : India : Bihar, West Bengal, Himachal Pradesh, Madhya Pradesh, Qrissa and Punjab.

Elsewhere : Also known from Myanmar.

3. ***Haliplus (Liaphlus) arrowi*** Guignot

1936. *Haliplus arrowi* Guignot, *Bull. Soc. ent. Fr.*, **41** : 115-118.

1984. *Haliplus (Liaphlus) arrowi*, Vazirani, *Fauna India. pp.* 127-128.

Material examined : From literature

Distribution : India : Bihar, West Bengal and Tamil Nadu.

Elsewhere : Also known from Myanmar.

Family : HYDROPHILIDAE

The Superfamily Hydrophiloidea of the sub order Polyphaga : Coleoptera includes a dominant family Hydrophilidae. Members of the family Hydrophilidae are commonly known as water scavenger beetles. Majority of this group of insects are truly aquatic in habit and form an important constituent of fresh water ecosystem. Some are terrestrial or found in moist places such as dung, decaying vegetable heaps, under cervices in oozing tree trunk, rotten banana stem and such other places.

These insects may vary from very small to large in size. They can be easily distinguished by its antennae and size of maxillary palp which is conspicuously large and bigger than antennae in length. Due to its extended palpi the group is also called Palpicorina.

No comprehensive work on the Superfamily Hydrophiloidea has been done in India. Informations on Hydrophiloidea are all scattered

in different journals. d' Orchymont (1928), Balfour Browne, (1948), Sharp (1890) are the major contemporary workers who have dealt with the Indian Fauna. In India this group of insects have been neglected.

The group is widely distributed and 2000 species are known from the world of which about 150 species are known from India. The species reported from Bihar is based on the reports from the literature only.

Genus 1. ***Spercheus*** Kugel

1798. *Spercheus* Kugel in Ill, *verz. Kaf. Preuss*, p. 241.

1924. *Spercheus* Kugel in Ill, *col. Cat.* **14** (79) : 62-65.

1. ***Spercheus gibbus*** Champion

1919. *Spercheus gibbus* Champion, *Ent. Mon. Mag.*, **55** : 238.

Material examined : From literature

Distribution : India : Bihar, West Bengal.

Genus 2. ***Paracymus*** Thomson

1867. *Paracymus* Thomson, *Skand. Col.*, **9** : 119-120.

1924. *Paracymus* Thomson, *Col. Cat.*, **14** (79) : 164-168.

2. ***Paracymus evanescens*** (Sharp)

1890. *Hydrobius evanescens* Sharp, *Trans. Ent. Soc. London* : 349.

1924. *Paracymus evanescens*, Knisch, *Col. Cat. Pars* **79** : 166.

Material examined : From literature

Distribution : India : Bihar, West Bengal.

Elsewhere : Sri Lanka, Tonkin, Sumatra, Philippines.

Genus 3. ***Laccobius*** Erichson, 1837

1837. *Laccobius* Erichson, *Kaf. Mark Brand.*, **1** : 202.

1924. *Laccobius Erichson, Col. Cat.*, **14** (79) : 181-192.

3. ***Laccobius simulans*** d'Orchymont

1923. *Laccobius simulans* d'Orchymont *Mem. Dep. Agr. India*, **8** : 7.

Material examined : From literature

Distribution : India : Bihar, West Bengal, Meghalaya & Uttar Pradesh.

HEMIPTERA : WATER BUGS

SYSTEMATIC ACCOUNT

Class INSECTA
Order HEMIPTERA
Sub order HETEROPTERA
Family CORIXIDAE

1. Genus ***Micronecta*** Kirkaldy

1. ***Micronecta (Basileonecta) Scutellaris scutellaris*** (Stal)

2. Genus ***Corixa*** Geoffroy

2. ***Corixa (Tropocorixa) distora*** Distant

Family II NEPIDAE

3. Genus ***Ranatra*** Fabricius

3. ***Ranatra elongata*** Fabricius
4. ***Ranatra filiformis*** Fabricius

4. Genus ***Laccotrephes*** Stal

5. ***Laccotrephes ruber*** (Linnaeus)
6. ***Laccotrephes grieseus*** (Guerin)

Family III BELOSTOMATIDAE

5. Genus ***Lethocerus*** Mayr

7. ***Lethocerus indicus*** (Lepeletier & Serville)

6. Genus ***Sphaerodema***

8. ***Sphaerodema annulatum*** (Fabricius)

Family IV NOTONECTIDAE

7. Genus ***Anisops*** Spinola

9. ***Anisops barbata*** Brooks
10. ***Anisops bouvieri*** Kirkaldy
11. ***Anisops cavifroms*** Brooks

8.Genus ***Enithares***

12. ***Enithares abbreviata*** (Kirby)

Family V PLEIDAE

9. Genus ***Plea*** Leach

13. ***Plea indistinguenda*** Matsumura
14. ***Plea liturata*** (Fieber)

Family VI VELIIDAE

10. Genus ***Microvelia*** Distant

15. ***Microvelia diluta*** Distant

Family VII GERRIDAE

11. Genus ***Limnogonus*** Stal

16. ***Limnogonus (Limnogonus) fossarum*** (Fabr.)
17. ***Limnogonus (Limnogonus) nitidus*** Mayr.

Family VIII HYDROMETRIDAE

12. Genus ***Gerris***

18. ***Gerris*** sp.

Aquatic & semi aquatic familes of Hemiptera

INSECTA : HEMIPTERA : HETEROPTERA, CORIXIDAE, NE[ODAE, BEIOSTOMATIDAE, NOTOTNECTIDAE, PLEIDAE, VELIIDAE, GERRIDAE & HYDROMETRIDAE.

Family 1 CORIZIDAE

1. Genus ***Micronecta*** Kirkaldly

1. ***Micronecta (Basileonecta) Scutellaris scutellaris*** (Stal)

1858. *Sigara scutellaris* Stal. *Ofvers. Akad. Forh.*, **15** : 339.

1910. *Micronecta dione* : Distant, *Fauna British India, Rhynchota*, **5** : 348.

1989. *Micronecta (Basileonecta) Scutellaris scutelleris* : Thirumalai, *Rec. zool. Surv. India, OCC. Paper*, **118** : 15.

Materials examined : From Literature.

Diagnostic Characters : Adult insect about 4 mm in body length. It is the largest known Micronecta from India, in males, the pronotum is grayish brown, paler marginals and with obscurely marked elytra.

Distribution : India : Bihar, Andhra Pradesh, Delhi, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh, West Bengal.

2. Genus ***Corixa*** Geoffroy

2. ***Corixa (Tropocorixa) distorta*** Distant

1910. *Corixa distorta* Distant, *Fauna Brit. India. Rhynchota*, **5** : 343.

1910. *Corixa affinis* : Distant, *Fauna Brit. India. Rhynchota*, **5** : 341.

1910. *Corixa verecunda* : Distant, *Fauna Brit. India. Rhynchota*, **5** : 344.

1933. *Sigara (sigara) distorta* : Hutchinson, *Rec. India. Mus.*, **35** : 403.

Materials examined : From Literature.

Diagnostic Characters : Adult upto 5.05 mm in body length, head yellowish and rather elongate, anterior margin of vertex evenly rounded, posterior margin with a blunt median carina between two rows of 5 punctures between this row and internal margin 7 each eye, pronotum black with six regular transverse yellowish lines, pale in males with 38 pegs, the peg row is almost parallel with the flexor margin distal 5 pegs rather elongate and more pointed.

Family II NEPIDAE

3. Genus ***Laccotrephes*** Stal

3. ***Laccotrephes ruber*** (Linaeus)

1764. *Nepa ruber* Linnaeus, *Mus. Lud. Ulr.*, : 165.

1864. *Laccotrephes ruber* : Stal, *Hemi. Fabr.* **1** : 135.

1906. *Laccotrephes ruber* : Distant, *Fauna Brit. India. Rhynchota*, **3** : 18.

Materials examined : From Literature.

Diagnostic Characters : Adult insects ranging to 30-35 mm in length excluding abdominal appendages, breadth between posterior pronotal angles 7-9 mm, abdomen reddish yellow above, prostermum convex at the middle provided with a small tuber at the anterior region, abdominal appendages distinctly longer than the body.

Distribution : India : Bihar, Delhi, Gujrat, Jammu & Kashmir, Kerala, Maharashtra, Meghalaya, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : China, Taiwan, Japan, Nepal, Pakistan.

4. ***Laccotrephes griseus*** (Guerin)

1829. *Nepa griseus* Guerin, *Icnogr. Regne. Anim. Ins.* 352.

1910. *Laccotrephes griseus* : Montandon, *Annali Mus. Zool. Napoli*, **3** (10) : 3.

1910. *Laccotrephes griseus* : Distant, *Fauna Brit. India, Rhynchota*, **5** : 314.

Materials examined : 5 exs., Karhara Gola Road, Katihar Dist, 22-xii-1995, coll. Y. P. Sinha.

Diagnostic Characters : Adult 15-20 mm in body length excluding abdominal appendages which are distictly shorter than the body, anterior area of prosternum provided with a strongly acute tubercle, base of the anterior femora characterized by a tooth which is obtusely rounded.

Distribution : India : Bihar, Andhra Pradesh, Delhi, Kerala, Maharashtra, Orissa, Pondicherry, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Myanmar, Malacca, Seychelles, Thailand, Sri Lanka.

4. Genus ***Ranatra*** Fabricius

5. ***Ranatra elongata*** Fabricius

1790. *Ranatra elongata* Fabricius, *Skr. nat. selsk. 1.*, **1** : 228.

1906. *Ranatra elongata* : Distant, *Fauna Brit. India, Rhynchota*, **3** : 20.

1947. *Ranatra elongata* : Hafiz & Paradhan, *Rec. Indian Mus.*, **45** : 368.

1994. *Rantra elongata* Fabricus : *State Fauna Series* **3** : Fauna of West Bengal : 542.

Materials examined : 2 exs., Bara Hasanpur, Patna Dist. 19-iv1996, coll. T. Venkateswaralu & Party, 1 ex., Thathae tand, Simdega, Singhbhum Dist. 19-vii-1992, coll. K. C. Kansal & Party; 1 ex; Deoghar Madhupur Road, Karankole, Deoghar Dist. 13-xii-1994, coll. R. N. Verma & Party; 2 exs; Pathergama, Godda Dist. 23-xii 1994, coll. R. N. Verma & Party; 2 exs; Pagawara, Pathergama, Godda Dist. 23-xii-1994, coll. R. N. Verma & Party; 2 exs; Rautara, Katihar Dist. 23-xii-1995, coll. Y. P. Sinha & Party; 3 exs, Ghosi, Jehanabad Dist. 4-ix-1996, coll. Y. P. Sinha & Party; 1 ex; Maya Bigha, Nawadah Dist. 7-ix-1996, coll. Y. P. Sinha & Party.

Diagnostic Characters : Adult attain a length about 40-45 mm and abdominal appendages may be about 10 mm. More longer than the body; anterior area of pronotum with an obscure dark brown linear fascia.

Distribution : India : Bihar, Jammu & Kashmir, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh & West Bengal.

6. ***Ranatra filiformis*** Fabricius

1790. *Ranatra filiformis* Fabricius, *Skr. Nat. selsk. 1.*, **1** : 228.

1906. *Ranatra filiformis* : Distant, *Fauna Brit. India, Rhynchota*, **3** : 21.

1947. *Ranatra filiformis* : Fernando & cheng, *Fdn. Mus. J.* **19** : 33.

1994. *Ranatra filiformis* Fabricius *State Fauna Series* **3** : Fauna of West Bengal : 542-543.

Materials examined : 1 ex; Peeyaljori; Chaibasa, Singhbhum Dist.; 14-viii-1992, Coll. K. C. Kansal & Party, 5 exs. Sonua, Chaibasa, Singhbhum Distt.; 15-viii-1992, Coll. K. C. Kansal & Party; 3 exs.; Rautara, Katihar Dist.; 23-xii-1995, Coll. Y. P. Sinha & Party.

Diagnostic Characters : Adult attain a length about 27-28mm and abdominal appendages about 23mm; both the teeth on anterior femur spinulose; head may be provided with a distinct tubercle on the vertex.

Distribution : Assam, Bihar, Maharashtra, Orissa, Uttar Pradesh; West Bengal.

Elsewhere : Malay, Peninsula, Philippines, Sri Lanka, Thailand.

Family III BELOSTOMATIDAE

5. Genus ***Lethocerus*** Mayr

7. ***Lethocerus indicus*** (Lep. & Serv.)

1825. *Belostoma indica* Lep & Serv. *encycl. Meth,* : 272.

1909. *Lethocerus indicus* : Montandon, *Bull Soc. Sci. Buc:* **17** : 138.

Materials examined : 5 exs; Chuttupola, Ranchi Dist. 9-viii-1992, coll. K. C. Kansal & Party, 1 ex., Kudara, Chaibasa, Singhbhum Dist. 16-viii-1992, coll. K. C. Kansal & Party; 4 exs; Paharpur, Madhupur Road; Deoghar Dist. 13-xii-1994, coll. R. N. Verma & Party; 5 exs; Trikut Parwat on Haripur Road, Deoghar Dist. 4-xii-1994, coll. R. N. Verma & Party; 4 exs; Tin Pahar, Sahekganj Dist. 18-xii-1994, coll. R. N. Verma & Party; 4 exs; Sunder Pahar, Godda Dist. 22-xii-1994, coll. R. N. Verma & Party; 3 exs; Ghaghra bandh, Godda Dist. 24-xii-1994, coll. R. N. Verma & Party; 3 exs; Kakolat, Akbarpur Dist. 8-ix-1996, coll. Y. P. Sinha & Party.

Diagnostic Characters : This giant Indian water bug may vary in length from 62mm-85mm, head between eyes with parallel sides; pronotum with a transverse faciae at the basal end and a fine mid longitudinal carinastion; intermediate and posterior legs provided with thick sets of swimming hairs on the ventral side.

Distribution : India : West Bengal, Assam, Bihar, Kerala, Maharashtra, Mizoram, Orissa, Uttar Pradesh.

Elsewhere : Myanmar, Java, Malay Peninsula, Pakistan, Phillippines, Sumatra.

6. Genus ***Sphaerodema***

8. ***Sphaerodema annulatum*** (Fabricius)

1803. *Nepa annulatum* Fabricius, *Syst. Rhyngo* : 106.

1863. *Sphaerodema annulatum* : Dufour, *annu. Soc. ent. Fr.* **3**: 397.

1940. *sphaerodema annulatum* : Hafiz & Ribeiro, *Rec. Indian Mus.* **41** : 431.

1994. *Sphaerodema annulatum* (Fabricius) : Bal and Basu, Insecta : Hemiptra : Belostomatidae Nepidae, Notonectidae and Pleidae. State Fauna series 3 : Fauna of West Bengal : 537-538.

Materials examined : 4 exs; Nagri; Ranchi Dist. 7-viii-1992, coll. K. C. Kansal & Party, 1 ex., Kudara, Chaibasa, Singhbhum Dist. 16-viii-1992, coll. K. C. Kansal & Party; 6 exs; Jamune Panki, Daltonganj, Singhbhum, Dist. 23-viii-1992, coll. K. C. Kansal & Party; 2 exs; Chatarpur, Daltonganj, Singhbhum, Dist. 25-viii-1992, coll. K. C. Kansal & Party; 4 exs; Sarumilal Chowk, Godda, Dist. 22-xii-1994, coll. R. N. Verma & Party.

Diagnostic Characters : Adult may attain the body length of 21-22 mm and breadth is remarkably more than other two species of Sphaerodema, *Viz.* rusticum and molestum.

Distribution : India : West Bengal, Assam, Bihar and Orissa.

Elsewhere : Bangladesh and Pakistan.

Family IV NOTONECTIDAE

7. Genus ***Anisops*** Spinola

9. ***Anisops barabata*** Brooks

1951. *Anisops barbata* Brooks, *Kans. Univ. Sci. Bul* **34** (8) : 387.

1974. *Anisops barbata* : Fernando & *Cheng. Fdn. Mus J.* **19** : 36.

1994. *Anisops barbata* Brooks : *State Fauna Series* **3** : Fauna of West Bengal : 546-547.

Materials examined : From literature.

Diagnostic Characters : Body length for males 8.6-9.3 mm for females 8.0-9.1mm greatest body width at the middle of the body length; general body colour may be greyish or pale yellowish.

Distribution : India : West Bengal, Andhra Pradesh, Bihar, Himachal Pradesh and Haryana.

Elsewhere : Myanmar, Formosa, Java, Malay Peninsula and Sri Lanka.

10. ***Anisops bouvieri*** Kirkaldy

1904. *Anisops bouvieri* Kirkaldy, *Wien ent. Zig.* **23** : 116.

1951. *Anisops bouvieri*, Brooks, *Kans Univ. Sci. Bull.* **34** (8) : 430.

1974. *Anisops bouvieri* : Fernando & *Cheng. Fdn, Mus. J.* **19** : 35.

1994. *Anisops bouvieri* Kirkaldy : *State Fauna Series* **3** : Fauna of West Bengal : 548.

Materials examined : From literature.

Diagnostic Characters : Body length for males 6.0-6.3 mm for females 5.7-6.0 mm, greatest body width at about two fifth of the body length; general body colour pearlaceous.

Distribution : India : West Bengal, Assam, Andhra Pradesh, Bihar, Madhya Pradesh and Orissa.

Elsewhere : Bangladesh, Myanmar, New Guinea and Thailand.

11. ***Anisops cavifrons*** Brooks

1951. *Anisops cavifrons*, Brooks, *Kans Univ. Sci. Bull.* **34** (8) : 418.

1994. *Anisops cavifrons*, Brooks : *State Fauna Series* **3** : Fauna of West Bengal : 548.

Materials examined : From literature.

Diagnostic Characters : Body length for males 5.1-5.7 mm for females 5.4-6.0 mm, greatest width at mid way of body length, general body colour perlaceous; Synthlipsis of the head narrow, frons traingularly excavate with rounded apex, bordered on each side by two carinae, inner two carinae meet apically to form a median commissure in males, rostal prong as long as 3rd rostral segments, stridulatory comb with about 14 teeth which decreases in length from base to apex.

Distribution : India : West Bengal, Bihar, Himachal Predesh, Kerala, Maharashtra, Punjab, Tamil Nadu and Uttar Pradesh.

8 Genus ***Enithares*** Spinola

12. ***Enithares abbereviata*** (Kirby)

1894. *Notonecta abbereviata* Kirby, *J. Linn. Soc.* **24** : 126.

1906. *Enithares indica* : Distant, *Fauna Brit. India, Rhynchota*, **3** : 42.

1910. *Enithares paivana* : Distant, *Fauna Birt. India, Rhynchota*, **5** : 329.

1919. *Enithares lactaea* : Pariva, *Rec. Indian Mus.* **16** : 155.

1933. *Enithares abbereviata* : Hutchinson, *Rec. Indian Mus.* **35** : 395.

1994. *Enithares abbereviata* Kirby : *State Fauna Series* **3** : Fauna of West Bengal : 549 550.

Materials examined : From literature.

Diagnostic Characters : General body length varies from 8.5-10.0 mm. For both the sexes, males are a little smaller than females in length, head rounded with large eyes, posterior margin of eyes truncated with the anterior margin of pronotum, pronotum more than twice as broad between the humeral angels than the median length, with prominently foveately excavation at the anterior angles, a prominent anteapical tooth on the intermediate femur, male provided with a moderately distinct protuberance at the posterior three fourth possition on the ventro-lateral margin of the posterior femur.

Distribution : India : Bihar, Andaman Islands, Kerala, Maharashtra, Uttar Pradesh and West Bengal.

Elsewhere : Java, Sri Lanka and Sumatra.

Family V PLEIDAE

9 Genus ***Plea*** Leach

13. ***Plea indistinguenda*** Matsumura

1905. *Plea indistinguenda* Matsumura, *J. Sapporo agric. coll.*, **2** : 59.

1906. *Plea palescens* : Distant, *Fauna Brit. India, Rhynchota*, **3** : 48.

1934. *Plea indistinguenda* : Lundblad, *Arch. Hydrobiol. Suppl.* **12** : 127.

1947. *Plea indistinguenda* : Hafiz & Pradhan, *Rec. Indian Mus.* **45** : 347.

1994. *Plea indistinguenda* Matsumura : *State Fauna Series* **3** : Fauna of West Bengal : 551.

Materials examined : From literature.

Diagnostic Characters : General body

length upto 1.5 mm, pale yellowish above, elytra less punctate.

Distribution : India : Bihar, Kerala, Uttar Pradesh and Kerala.

Elsewhere : Bangla Desh and Japan.

14. ***Plea liturata*** (Fieber)

1854. *Plea liturata* Fieber, *Ent. Mongr. Leipzig*, (5) **3** : 296.

1910. *Plea metiadus a* : Distant, *Fauna Brit. India, Rhynchota*, **5** : 337.

1934. *Plea indistinguenda* : Lundblad, *Arch. Hydrobiol. Suppl.* **12** : 127.

1992. *Plea liturata* : Bal & Basu *Proc. Zool. Soc. Calcutta*, **45** (Suppl. A) : 326.

Materials examined : From literature.

Diagnostic Characters : Body length upto 2 mm dull yellowish grey in Colour, elytra coarsely but prominently punctate, pronotum with fine punctures spread all over, abdominal keel prominent and not compact, moderately prominent spine like process on 4th, 5th and 6th abdominal sternite.

Distribution : India : Bihar, Delhi, Tripura and West Bengal.

Elsewhere : Bali, Java, Sumatra, Malay Peninsula and Indonesia.

Family VELLIDAE

10 Genus ***Microvelia*** Distant

15. ***Microvelia diluta*** Distant

1909. *Microvelia diluta* Distant, *Ann. mag. Nat. Hist.* (8) **3** : 500.

1910. *Microvelia diluta* Distant, *Fauna Brit. India, Rhynchota*, **5** : 139.

Materials examined : From literature.

Diagnostic Characters : Body length about 2.5 mm. lateral angles of pronotum sub-equally prominent, pronotum with reddish-yellow anterior margin reaching the anterior angles, antennal 2nd segment distinctly shorter than the 3rd segment, hemielytra scarcely reaching the abdominal apex, presence of tibial comb both in the anterior and middle tibiae in males.

Distribution : India : Bihar, Delhi, Tamil Nadu, Tripura and West Bengal.

Elsewhere : Bangladesh, Myanmar. Singapore, Sri Lanka and Sumatra.

Family VII GERRIDAE

11 Genus ***Limnogonus*** Stal

16. ***Limnogonus (Limnogonus) fossarum*** (Fabr.)

1775. *Cimex fossarum* Fabridus, *Systema Entomologiae* : 727.

1868. *Limnogonus fossarum* : Stal, *K. Svenska Vet Akad Handl.*, **7**: 133.

1902. *Gerris fossarum* : Distant, *Fauna Brit. India, Rhynchota*, **2** : 178.

Materials examined : From literature.

Diagnostic Characters : Length of adult insect body varies from 9.0 mm to 10.0 mm 1st antennal joint longest while 2nd 3rd and 4th joints shortest and sub-equal in length.

Distribution : India : Bihar and West Bengal.

Elsewhere : Australia, Myanmar, China, Formosa, Java, Malacca, Philippines and Sumatra.

17. ***Limnogonus (Limnogonus) nitidus*** Mayr

1865. *Hydrometra nitida* Mayr, *Verh. Zool. bot Ges Wien*, **15** : 443.

1902. *Gerris nitida* : Distant, *Fauna Brit India, Rhynchota*, **2** : 178.

1989. *Limnogonus (Limnogonus) nitidus*. Thirumalai, *Rec Zool. Sur. India, Misc Occ Pap.*, **118** : 41.

Materials examined : From literature.

Diagnostic Characters : Adult may be 6.0-8.0 mm in body length, posterior margin of dorsal vesick plate is remarkably angular, 1st and 4th antenal segments longer and nearly subequal in length while 2nd and 3rd segments shortest and sub-equal in length, fairly prominent connexival spines present in both sexes (on 7th abdominal segments).

Distribution : India : Bihar, Assam, Delhi, Kerala, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, Indonesia, Myanmar, Maldive Islands, Malaya, Nepal, Sri Lanka, Thailand and Vietnam.

Family VIII HYDROMETRIDAE

12. Genus ***Gerris***

18. ***Gerris*** Sp.

Materials examined : 2 exs; Gandhi Maidhan, Patna Dist. 29-x-1969, coll. R. K. Varshney & Party.

Diagnostic Characters : Thin, slender with thread like legs and very elongate heads and heads as long as thorax, are found near the margins of ponds, streams, ditches on floating vegetation, few are terrestrial, found on surface above water level.

Distribution : India : Bihar and Cosmopolitan.

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