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FAUNA OF SIKKIM

(PART-1)



Zoological Survey of India

State Fauna Series 9

FAUNA OF SIKKIM
(PART-1)
VERTEBRATES

Edited by
The Director, Zoological Survey of India, Kolkata



Zoological Survey of India
Kolkata

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FAUNA OF SIKKIM
STATE FAUNA SERIES

Part-1	2006	1-214
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CONTENTS

1. OVERVIEW	1-32
Ramakrishna and J.R.B Alfred	
2. MAMMALIA	33-76
S. Chattopadhyay, S.S. Saha, M.K. Ghosh and V.C. Agrawal	
3. AVIES	77-156
B.B. Dutta, S. Ghosh, S. Basu-Roy, B.K. Datta, A.K. Sett, R. Sakthivel and T.P. Bhattacharyya	
4. REPTILIA	157-171
D.P. Sanyal, S. Sur and N.C. Gayen	
5. AMPHIBIA	173-183
S.K. Chandra	
6. FISHES	185-214
A.K. Karmakar	

FAUNA OF SIKKIM : AN OVERVIEW

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INTRODUCTION

Sikkim was inhabited in pre-historic times by three tribes namely Naong, Chang and the Mon, now is a multi-ethnic state, with Lepchas, Bhutias, Sherpas as the major tribes besides other ethnic groups, their botanical and zoological affluence is truly impressive. To the Lepchas – this was “*Nye-mae-e langl*” (“the holy land or abode of Gods”) and to the Bhutias it is “*Beymul Denzong*” (The hidden valley of Rice). The word Sikkim is derived from two Limbu words – “*Su*” which means new and “*Heem*” meaning a house. It is believed that the Tensing Namgyal, the second Chogyal is said to have built a new house for his wife, and called it a “*Suheem*” (New House). In the course of time, Suheem became Sukhim and then Sikkim. Sikkim is essentially a mountainous state without flat piece of land, measuring nearly 65 Km by 115 Km and enjoying a temperate climate spread below the world’s third highest

mountain Kangchendzonga (8585m), is the “*Switzerland of the east*” Mt. Kangchendzonga is an indisputable part of the consciousness of the Sikkimese people, the rivers Tista (Teesta) and Rangitt with deep ravines and their valleys nourishes animals like Snow-Leopard, Thar, Yaks, wild Ass, Red Panda and trees such as Rhododendron and giant Magnolia, Conifers, Primulas, Gentians, Blue poppies, Wild Strawberry, Raspberry, considered as “Garden of the Himalayas” Equally impressive about the state representatives, the state animal is Red Panda (*Ailurus fulgens*), state bird – Blood Pheasant (*Ithaginis cruentus*); state flower – Nobile Orchid (*Dendrobium nobile*) and the state tree is Rhododendron (*Rhododendron niveum*).

The state of Sikkim is included under northeastern Himalaya by Ahmed *et al.* (1990), Alfred *et. al.* (2002), Central Himalaya under the Biotic provinces and Himalaya under



Source : National Informatics Centre, Sikkim

Biogeographic zone by Rodgers and Panwar (1988). Sikkim is a state of India, situated in the eastern Himalayan Region and predominantly a land of hills, spread over an area of 7096 Sq. Km. The geographical coordinates of Sikkim state are 27°00'46" and 28°07'48", North latitude and 88°00'58" and 88°55'25" East longitude. The landlocked state is almost rectangular in shape and bounded by Nepal in the west, Bhutan and Chumbi valley of Tibet in the east, Tibetan plateau, in the north and north east, and Darjeeling district of West Bengal along its southern boundary. The topography of Sikkim is quite varied and the elevation ranges from 250 m to 8598 m. The well known peaks are Kumbha Karna (7711 m), Pauhunri (7125 m), Pandim (6691 m), Kabru Dome (6545 m), Talung (6147 m), Tent Peak (7365 m), Jongsang (7459 m), Rathong (6679 m), Koktang (6147 m) and Sinioulchu (6887 m), Narsingh (5825 m) etc., regarded by the mountaineers as the most beautiful peaks in the world.

The mountainous terrain of Sikkim consists of a tangled series of interlacing ridges, rising one above the other, from south to the foot of the high snow covered peaks of in the north, surround the state in all three sides i.e., Greater Himalayas in the north, Singalia in the west and Chola in the east. The entire state is covered with steep hills and deep valleys. The trend of the mountain system viewed as a whole is in a general east west direction. The general run of the main ridges is north-south with subsidiary interlacing spurs from each ridge in a roughly east-west direction. Sikkim is primarily the catchments of Tista (Teesta) and Rangitt drainage system. Tista River, originates form Lake Chalamu, north Sikkim district fed by snow from Kangchendzonga, flows north-south direction divides the state into two parts. The valleys cut by these rivers and their chief feeders are very deep, but usually attain a steep gorge like structure as one approach the bed of the rivers. Its other tributaries join from Lhonak, Zemu, Talung glacier of Kangchendzonga group in the west. The chief tributaries of Tista – the Great Rangit (origin

Rathong glacier) fed from the snow of Narsing and Kabru peaks, south of Kangchendzonga. Many smaller streams flow in east and north Sikkim districts. These streams include (1) Rani Khola, (2) Rangpo Khola, (3) Sethi Khola, (4) Jolly Khola in the east District while Lachen chu and Lachung chu in north District. The state has twenty-eight mountain peaks, twenty-one glaciers, 227 high altitude lakes (important ones are lake Aritar, lake Tsongmo, lake Chhanggu, lake Mamen chu, lake Gurudongmar and lake Khecheopalri), five hot springs (Phur-Cha, Ralang, Sachu, Yumthang, Momay), and over 100 rivers and streams. Eight mountain passes connect the state to Tibet, Bhutan and Nepal ((La is the Tibetan word for pass). On the Eastern Chola range the most important passes are the *Nathu La* and *Jelep La* both at an altitude of about 15,000 ft. and *Bhutah La* at an altitude of about 13,000 ft. The first two lead to Tibet and the third to Bhutan. The other passes located in the state are *Yak La* at a height of 14,400 ft, *Cho La* (14,550 ft),



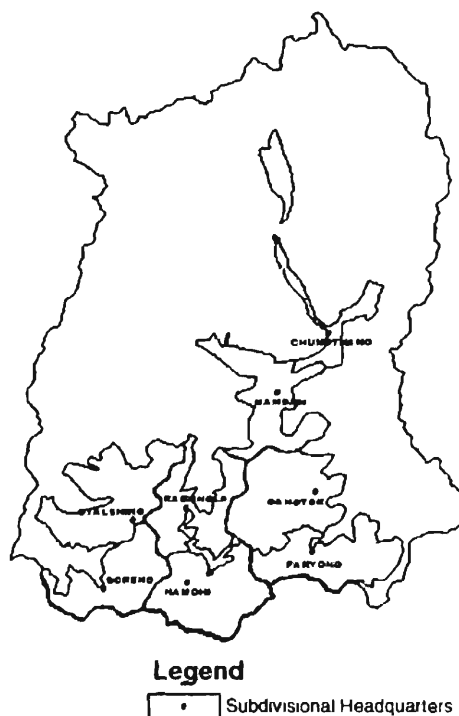
Map of Sikkim showing different Rivers, Streams & Glaciers

Source : National Informatics Centre, Sikkim

Thanka La (16,000 ft.), all situated north of *Nathu La*. On the western border of Sikkim the most important pass is *Chibhanjan*, which is situated at an altitude of 10,300 ft. The other passes on the west is *Kang La* (16,740 ft.). In the north one of the important passes is the *Kangra La* (14,770 ft). Besides passes, the north Sikkim is endowed with glaciers the chief ones are Zemu Glacier, Rathong Glacier and the Lhonak Glacier.

Administrative Division

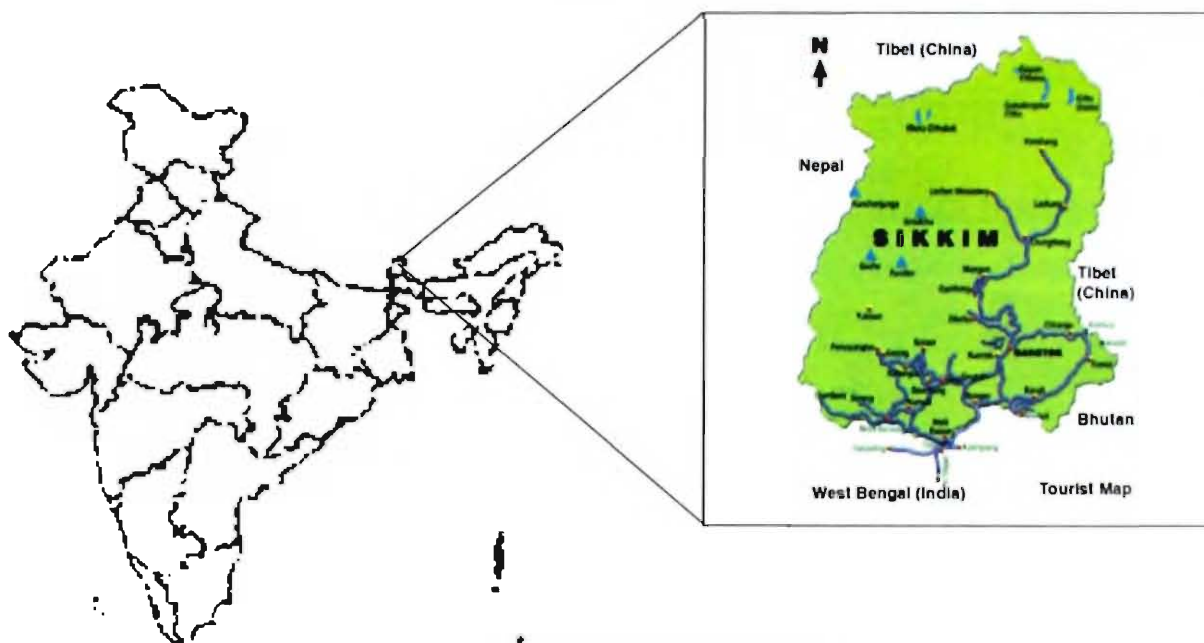
In 1947 when India became independent, Tashi Namgyal was successful in getting a special status of protectorate for Sikkim. Tashi Namgyal died in 1963 and was succeeded by his son Palden Thondup Namgyal. Because of the unrest during this period, Government of India tried to bring about a semblance of order in the state by appointing a Chief administrator. Further events and election led to Sikkim becoming transformed from a protectorate to an associate State. Sikkim became a full-fledged 22nd state of the Indian Union on 16th May 1975. The institution of Chogyal was subsequently abolished. Sikkim has been divided administratively in to four districts namely North Sikkim (4226 sq. km), South Sikkim (750 sq. km), East Sikkim (954 sq. km) and West Sikkim (1166 sq. km). Each District has further been divided into two subdivisions. Gangtok,



Map of Sikkim showing subdivisional Boundaries

Source : National Informatics Centre, Sikkim

Pakyong and Rongli in East Sikkim, Namchi and Ravangla in South Sikkim, Magan and Chungthang in North Sikkim and Gyalshing and Soreng in West Sikkim. There are 12 major towns namely Gangtok, Namchi, Jorethang Soreng, Ravangla, Singtam, Pakyong, Mangan and Chungthang. The Indian army has control of a large territory, as the state is a sensitive border area. Many areas are restricted and permits are



Map showing the location of Sikkim

needed to visit them. There are 447 villages out of which 440 are inhabited. A total of 405,505 populations were recorded in 1991 with an average density of 57 persons per square kilometres. The recent census of 2001 indicates the change in the demography of the state over the last ten years. [State population as per 2001 Census is 540,493 (Male 288,217; Female 252,276) 0.05% of the total population of India; Sex ratio; 875 females/1000 males; Density of population 76 per sq. miles].

GEOLOGY AND GEOMORPHOLOGY

Sikkim encompasses the lesser Himalaya, Central Himalaya and the Tethys Himalaya (Raina and Srivastava 1981). It is essentially a mountainous state, the mountains rise in elevation northward; however, the trend of the mountain system is in general is east-west direction and chief ridges run in a more or less north south direction. Because of these ridges, the rivers **Tista** and **Rangit** form the main channels of drainage run nearly north-south. The northern portion of the state is deeply cut into steep escarpments, and except in the Lachen and Lachung valleys. Southern Sikkim is lower, more open, and fairly well cultivated. This configuration of the State is partly due to the direction of the main drainage which is southern. A large portion

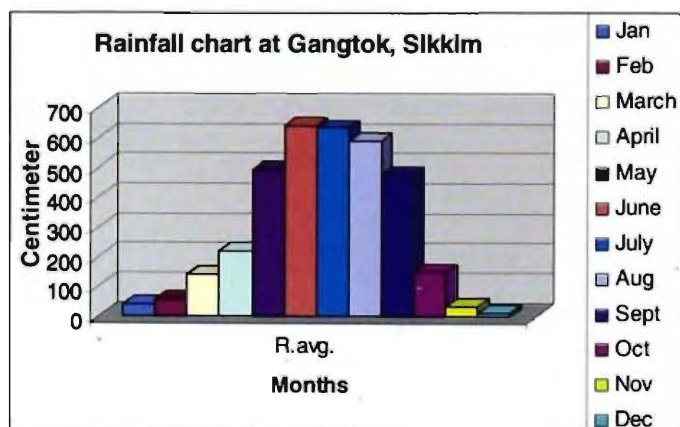
of the Sikkim territory is covered by the Precambrian rock and geologically “younger units of Palaeozoic age”, while the southern area has sedimentary and meta-sedimentary rock. There are two predominant zones *viz.* Gneissic and Daling group and also with some intermediaries. Daling group consists of predominantly phyllites. At the boundary between this and gneissic rocks they pass into silvery mica schist. Dark clay slates with thick quartzite bands prevail in certain areas, silt stones and siliceous limestone is also found in several other areas. Because the hills consist of gneissose and half-schistose rocks, soil is coarse with brown clay, generally poor in organic content and mineral nutrients and contains large amounts of iron oxide ranging from neutral to acidic. This type of soil tends to support evergreen and deciduous forests. The central and southern portion of the state is formed of comparatively soft, thin, slate and half-schistose rocks which denudes very easily. The slopes are highly susceptible to weathering and prone to erosion because of phyllites and schist's. This combined with the intense rain, causes extensive soil erosion and heavy loss of soil nutrients through leaching. As a result, landslides are frequent, isolating the numerous small towns and villages from the major urban centres.

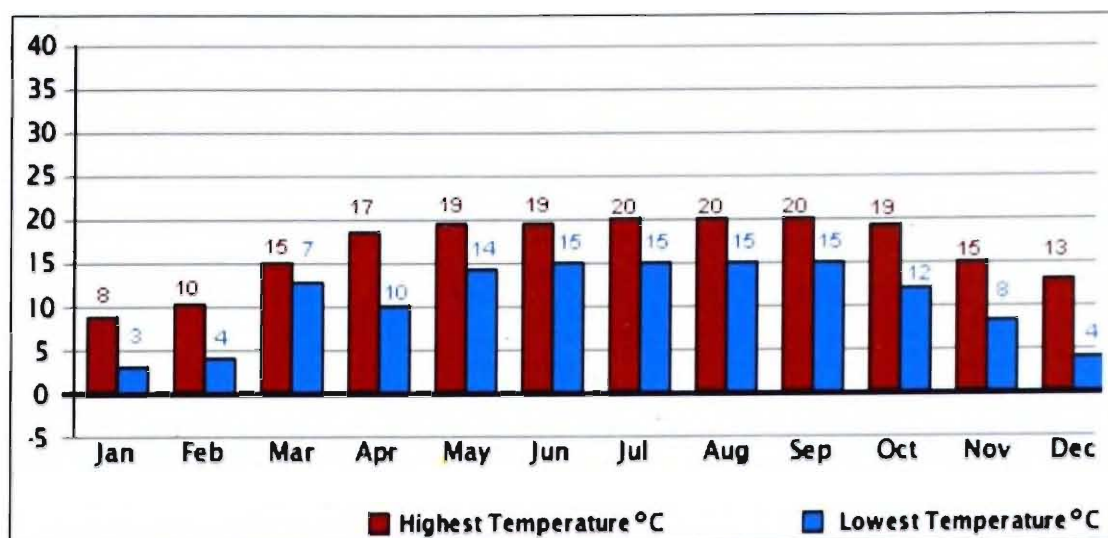
Climate

Sikkim is the wettest part of the north eastern region; the climate varies from the Sub-tropical, temperate to the alpine depending upon the altitude. Most of the inhabited regions of Sikkim, however, enjoy a temperate climate, with the temperatures rarely exceeding 28°C in summer



Satellite image of Sikkim





Map showing temperature range of Sikkim

or dropping below 0°C in winter. Climatic divisions are usually : Sub-tropical up to 1500 meters : Temperate-1500-2000 meters; Alpine up to 4000 meters and snowline at 5000 meters and above. The southwest monsoon lasts from the end of May to September and brings heavy rainfall. There are two maximum rainfall areas viz. (i) in South-East which includes Mangan, Singhik, Dikchu, Gangtok, Kerporang, Rongali, Gnathang etc. and (ii) in South-West corner including Hilley. In between these two regions, there is a low rainfall region e.g. at Namchi, where the rainfall is about half of former areas. This is an area in North-West Sikkim which gets very little rainfall (even less than 4.9 mm) as this area is mainly having snow-covered mountains [the mean annual rainfall is minimum at Thangu (82 mm) and maximum at Gangtok (3494 mm)]. Occasional spells of premonsoon showers during April is quite common. The intensity of rainfall during South-West monsoon season decreases from south to North, while the distribution of winter rainfall is in the opposite order. The relative humidity remains above 70 per cent throughout the year at most places. The temperature varies with altitude and the slope, the mean temperature in the lower altitudinal zone, varies from 1.5 degree centigrade to 9.5 degree centigrade. The maximum temperature is recorded usually during July and August and minimum during December & January. Fog is a common feature in the entire state from May to September.

Forests

All the major four types of recognized forests identified in India by Champion & Seth (1968) viz. tropical forests, sub-tropical forests, temperate forests and alpine forests present covering nearly 3118 Km² (43.94%) of the state. However, six broad vegetation cover has been demarcated in the state based on the indigenously developed Digital Terrain Model software used to highlight change of vegetation type with altitude using satellite remote sensing technology by Sudhakar, S. Sengupta and M.L. Arrawatia (1998), Regional Remote Sensing Unit at IIT Kharagpur. Under the Forest Cover Map, the forests are delineated into (a) Dense (Closed) forest > 40% (b) Open forests 20-40% (c) Degraded forest 10-20% (d) Scrubs < 10% and (e) Forest blanks. Besides the above, based on digital terrain, the forests of Sikkim are classified as :

1. **Tropical Moist deciduous to Evergreen forests** (300-900 m); Sal as a member of the association along with a few deciduous components is the climax type of vegetation in the foot hills of Sikkim.

2. **Sub-tropical Moist to Semi-evergreen forest** (900-1800 m) (Wet Hill Forests); with the change in the altitude from 900-1800 m, the forests also gradually changes from Tropical to Sub-tropical moist to semi-evergreen forests comprising tree species of *Macaranga*, *Scheima*, *Eugenia*, *Sapium*, *Castanopsis* and these are

generally mixed with shrubby species of *Baliospermum*, *Clerodendrum* and *Emblia*.

3. **Sub temperate to Temperate to Sub-alpine forests** (1800-2700 m); at this altitude vegetation changes from sub-tropical to sub-temperate in the altitudinal range of 1800-2400 m and there after the vegetation becomes distinct Temperate forests. Terrace cultivation of *Triticum* (wheat), *Hordem* (barley), *Solanum* (potato) and *Capsicum* (chillies) has found along the tracts in these altitude zones. Species of *Suaga* (hamlock), *Acer*, *Michelia*, *Juglans*, *Rhododendron*, *Ilex* associated with *Rosa*, *Rubus*, *Berberis* and *Viburnum* are distributed at this range. The typical temperate forests comprising tree species of *Quercus* (Oak), *Acer*, *Populus*, *Larix* and *Abies densa* are predominating in the region between 2400 m and 2700 m.

4. **Temperate to Sub-alpine forests** (2700-3000 m); typically a transitional zone where tall trees of *Abies densa* are mostly associated with

shrubby and bushy species of *Rhododendron*, *Juniperous*, *Berberies* and *Salix*.

5. **Sub-alpine forests** (3000-3700 m) the vegetation from typical temperate type gradually changes to subalpine type at higher elevations. The tree species of *Rhododendron* are predominantly mixed with a variety of species like *Gaultheria*, *Euonymus*, *vibrunum*, *Juniperous* and *Rubus*.

6. **Alpine Moorland forests** (3700-4500 m). comprises of typical alpine meadows/moorland type where tree growth is completely arrested. Quite a few stunted bushy growth species of *Rhododendron* are mixed with tough clumps of *Juniperous*, *Salix*, *Berberis*, *Rosa* and *Lonicera* are common.

Forest cover accounts for 45% of the total geographical area of which, 42.46% geographical area are protected under Protected Area Network (PAN) consisting of National Park, Sanctuaries and Biosphere Reserve.

Forest Cover		Tree Cover	
Very Dense forest	458 Km ²	Cultivable Non-Forest Area (CNFA)	322 Km ²
Moderately Dense Forest	1904 Km ²	No. of trees per ha of CNFA	20.3
Open Forest	900 Km ²	Tree Cover	22 Km ²
Total	3262 Km ²	Of State's Geographic Area	0.31 %
Of State's Geographic Area	45.97 %	Of CNFA	6.83 %
Of Country's Forest Cover	0.48 %		

Forest Cover Change Matrix [SIKKIM]

2001 Assessment	2003 Assessment				Total 2001
	Dense Forest	Open Forest	Scrub	Non-forest	
Dense Forest	1859	437	8	87	2391
Open Forest	289	413	36	64	802
Scrub	27	4	236	74	341
Non-forest	187	46	80	3249	3562
Total 2003	2362	900	360	3474	7096
Net Change	-29	98	19	-88	

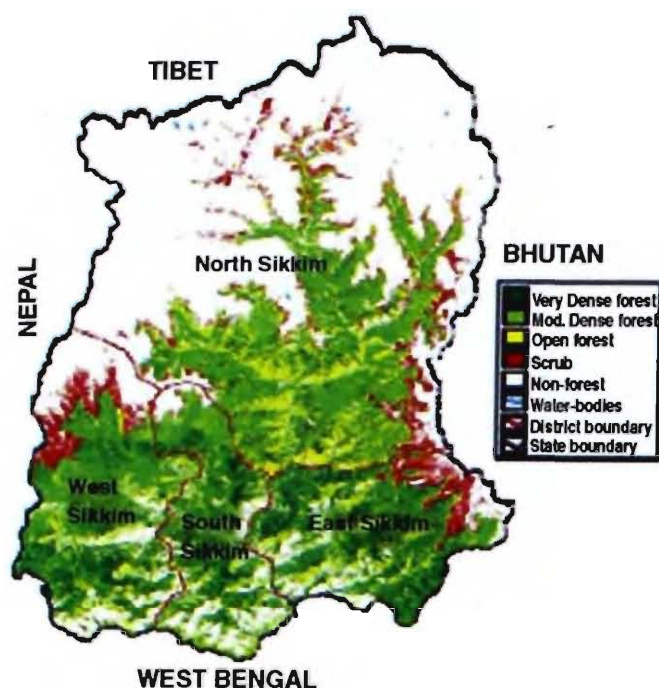
Source : Forest Survey of India, 2004

No.	National Park/ Sanctuaries and Forest Parks	Location/ District	Year of Initiation	Area in hectares	% of total State area
1	Kanchendzonga National Park	NORTH	AUGUST, 77	1,78,400	25.1409
2	FabongLho Wildlife Sanctuary	EAST	APRIL, 84	5,176	0.7000
3	Shingba Rhododendron Sanctuary	NORTH	AUGUST, 84	4,300	0.6060
4	Kyongnosla Alpine Sanctuary	EAST	AUGUST, 84	3,100	0.4369
5	Maenam Wildlife Sanctuary	SOUTH	MARCH, 87	3,534	0.4800
6	Barsey Rhododendron Sanctuary	WEST	—	10,400	1.4656
7	Biosphere Reserve (Kanchendzonga)	S/W/N	APRIL, 91	2,00,000	27.3972

Publication by Botanical Survey of India has broadly classified the state of Sikkim into four forest zones. **Tropical forest** is the area occupying up to 900 m mainly consisting of moist deciduous to semi-evergreen species with Sal (*Shorea robusta*) as the dominant species located adjacent to West Bengal in Teesta and Rangeet valleys. Changes have occurred recently in the Sal forest along the Rangeet, as many of the area has been converted in to agricultural land. Chir pine (*Pinus roxburghi*) can also be seen in dry valleys of south Sikkim along with *Shorea robusta*, *Cycas pectinata*, *Ficus oligodon*, *Grewia sapida*, *Phoenix humilis*, *Rhus parviflora*, *Woodfordia fruticosa* and several others. Species of grasses such as *Saccharum*, *Oroxylum indicum* and *Meizotropis buteiformes* are common along the river banks. The subtropical forest located at an elevation of 800–1500 m along the Teesta and Rangeet rivers and tributaries. The forest includes mixed vegetation with several species of trees reaching up to 30 m; with no dominant species. The characteristic feature of the forest is they have bamboo thickets (*Calamus*), epiphytic species of orchids, ferns and several climbing species. Temperate forest located above 1500 m and below 3500 m in Lachen and Lachung valley which is further classified into Broad leaved forest and Coniferous forest. Oak is the characteristic feature of broad leaved forest while the coniferous forest includes *Abies densa*, *Larix griffithiana*, *Picea spinulosa*, *Psuga demosa* and several others. The Alpine forest ranges 3500 m and above (up to

5000) which support *Rhododendron*, *Brerberies*, *Cotoneasters*, *Diapensia himalaica*, *Euonymus*, *Salix* etc. *Rhododendron* grows up to 5400 m mostly as stunted vegetation. The valleys of Llonakh and Chholmau plains of northwest and northeast part of the state have more affinity with Tibetan flora than Himalayan flora.

Based on the altitudinal zonation and tree composition, forests are further classified in the following manner : Subtropical deciduous monsoon forest (*Shorea robusta*, *Terminalia* spp.) located in river basins below 1000 m. Subtropical evergreen hill forest (*Schima wallichii*, *Castanopsis tribuloides*) abundant at 1000-2000 m. Lower temperate broadleaf forest (*Quercus* spp., *Lithocarpus* spp., *Lauraceae*) and upper temperate conifer (*Tsuga dumosa*) or deciduous (*Acer* spp., *Magnolia* sp.) forest occurs at 2000-3000 m. Rhododendron forest (*R. arboreum*, *Quercus semecarpifolia*, *Lyonia ovalifolia*) occurs at 2000-3000 m on drier slopes, and subalpine forest (*Abies* sp., *Betula utilis*) grows from 3000 m to altitudinal treeline at 4000 m. Extensive moist alpine scrub (*Juniperus* spp., *Rhododendron* spp., *Potentilla* spp.) occurs between tree line and the altitude of permanent rock and ice. Lower hill forest consists of three main types, viz., sal forest, dry mixed forest and wet mixed forest. Sal Forest is confined to Tista and Rangit river valleys. Principal associates of Sal forest are Dabdabe (*Garuga pinnata*), Pakasaj (*Terminalia crenulata*), Chilouni (*Schima wallichii*) and Burra (*Terminalia*



Vegetation types in Sikkim

(Source : Sikkim Govt. publication)

chebula). In Rangit valley Chirpine (*Pinus longifolia*) also occur along with *Shorea robusta*. Dry Mixed forests are mainly deciduous and occur on ridges and drier slopes. Sal occurs as isolated species. Common species are Chilouni, Dabdbe and Comari (*Gmelina arborea*). Wet Mixed Forest are evergreen valley forests on damper soils and prevail on the north and north eastern parts of the state with Jamun (*Eugenia operculata*) as common species.

A recent analysis on the Biodiversity Value calculated in the forests of Sikkim (Economically important species) by Indian Institute of Remote Sensing (Dept. of Space), Forest Department, Sikkim & Tamil Nadu and Zoological Survey of

India, Dehra Dun based on ethnobotanical importance, weightage assigned to useful species distributed in the forests revealed that the Rhododendron Forests has the highest value and the Degraded Forest has the Lowest. (Arun Kumar *per. comn.*).

Natural resources

Several minerals are found in the state, among them, coal, copper, limestone and graphite are the most important. Dolomite, garnet, talc and magnetite are others of less importance. A coal field bounded on the south by the Rammian and Rangit rivers near Naya Bazar occur in South Western Sikkim. The coal is reportedly non-cooking variety, low in moisture and volatile matter and high in fixed carbon. The ores of copper are widespread in Sikkim and are in the Daling beds. Some are situated in the transition rocks between the Daling and the gneiss, but none in the geuine itself, Copper deposits are found in East and West Sikkim. Crystalline limestone has been reported from Chhangu in eastern Sikkim and Chungthang in north Sikkim. Sedimentary deposits of limestone are reported in west Sikkim in Naya Bazar-Reshi-Namchi area and in the north Sikkim. Amorphous to lumpy varieties of Graphite occurs in North Sikkim and West Sikkim. Iron occurs chiefly as pyrites in association with chalcopryite. It is most plentiful at Bhotang, where magnetite also occurs. Garnet is abundant in the gneiss and mica schist's at places, but both iron and garnet is of less commercial importance

Faunal explorations in Eastern Himalaya including Sikkim

Name of the explorers / faunal Expeditions	Period	Areas
T. Hardwicke	1778-1823	Himalayas
E. Blyth	1832	Eastern Himalayas
Mrs. Oakes	1842	Eastern Himalayas
B Hodgson	1845 - 58	Eastern Himalayas
W. Theobald	1861	Eastern Himalayas
Gunther	1868	Eastern Himalayas

Table Contd.

Name of the explorers / faunal Expeditions	Period	Areas
W.T. Blanford	1870	Eastern Himalayas
Mr. Milman	1870	Central Himalayas
Dr. F. Stoliczka	1871	Eastern Himalayas
G. King	1872	Eastern Himalayas
Lt. Col. Godwin- Austin	1874-75	Eastern Himalayas
J.A. Grammie	1877	Eastern Himalayas
F. Day	1878	Eastern Himalayas
L. Mandelli	1879	Eastern Himalayas
E.W. Brooks	1880	Eastern Himalayas
Col. C.T. Bingham	1894	Eastern Himalayas
Col. F.M. Baily, H. Stevans	1923-27	Eastern Himalayas
J. McClelland	1944	Eastern Himalayas
S.L Hora	1951	Eastern Himalayas
S. Ali	1962	Eastern Himalayas
Scientists of ZSI	1991 – 1998	Eastern Himalayas

(Note : The list is still exhaustive only a selected ones are shown above)

Biological Resource

The Himalayas feature as a fragile ecosystem. For centuries, this ecosystem has remained delicately balanced, and has been responsible for the tremendous biodiversity of the Himalayas. Sikkim has been a dream of naturalists. Dr. J. Hooker during the middle of the last century surveyed in the detail the botanical wealth in Sikkim and his findings were embodied in the publication '*Himalayan Journal*' that is still considered as an authoritative document. According to Mehra and Bir (1964), Singh *et al.* (1995), Singh & Chauhan (1999), besides the forest based trees; the flora of Sikkim is rich and diverse with nearly 4500 species of flowering plants, 362 species of ferns and fern allies. Members of the family Orchidiaceae dominates with 494 species followed by Asteraceae (280 species), Poaceae (271 species), Leguminosae (201 species), Cyperaceae (143 species), Rosaceae (138 species), Scrophulariaceae (112 species),

Rubiaceae (110 species) and others. The distribution of vegetation has a particular significance, as can be seen from the distribution of Phytophagous orthopterans affecting sal vegetation or the Aphids with maximum association with the members of Asteraceae (30 species) followed by Poaceae (29 species), Rosaceae (20 species) and Polygonaceae (12 species) and several others,

Agriculture and Horticulture

More than 90% of the population depends on agriculture in the state, besides cattle rearing and cottage industries in the higher elevations. A unique feature of the state is the rice cultivation in the hills (terrace system), along the mountain slopes. Fruit gardens are common in the southern warmer climate, the major ones being mangoes, bananas and guavas in the foothills, and citrus fruits in the northern part. Besides above, orchards of peaches and plums are common in high altitude

areas. Tea gardens at Temi and Kewzing area produce quality tea. Most important cash crop of the state is the cardamom. Recently, attempts are also being made to establish coffee plantations in the state. For most part, the land is unfit for agriculture because of the precipitous and rocky slopes. However, certain hill slopes have been converted into farm lands using terrace farming techniques and is used for cultivation. The table given below is not only indicative of the crop pattern but equally important for the distribution of several groups of insects especially isopteran species such as *Pericapritermes assamensis*, *Orontotermes horai* which are soil inhabiting eastern Himalayan species, 115 species of Aphids infecting economically important plants with a maximum concentration of species is in the

elevation range of 1000–2300 m. The degree of infestation is 5 species in cereals, 1 species on sugarcane, 19 species on vegetable plants, 6 species on spices, 14 species on fruit plants, 25 on ornamental plants, 35 on forest trees and 9 species on bamboo plants. The distribution of coleopterans viz. *Platypus solidus*, *P. indicus*, *P. secretus*, *P. cupulatus* on a wide variety of host plants while *Diacavus furtivus* found restricted to *Shorea robusta* (Sal) plant is important. Members of the family curculionidae, coleopteran insects are entirely vegetable feeders; some of them are pests of food grains, agricultural crops and forest trees. In contrast, the coccinellids are of profound economic importance as they predate on aphids, mealy bugs and others. Some of the endomychids and erotolids are useful coleopterans feeding on

Area	Climate	Altitude (meters)	Ecological Adaptation	Crops	
Lower Hills	Tropical	300-500	Wet and dry agriculture, sedentary farming, livestock, horticulture	Agricultural	Horticulture
	Sub-Tropical	500-1500		Rice, Maize, Millet, Wheat and Mustard, Pulses, Soyabean vegetables, Potato	Guava, Lime, Lemon, Ginger, Oranges
Mid Hills	Temperate	1500-2000	Wet and dry agriculture, Slash and Burn agriculture or rotational dry cultivation, hunting and collection of minor forest produce, horticulture	Paddy, Maize, Millet, Wheat, Soyabean, Ginger, Potato, Vegetables,	Mandarin, (Oranges) large Cardamom, Plum, Peach, Peas
High Hills	Temperate	2000-2700	Dry agriculture, Bhutias Transhumance	Maize, Barley, Vegetable seed, Potato	Apple, Plum, Peach, Peas
	Sub-Alpine	2700-4000	Yak herding, horticulture, pastoral economy, wool, cheese, butter, hides, apple and potato are commercial commodities	—	—
	Alpine	4000-5000			
Very High Hills	Alpine	Above 5000	Lechenpa and Lachungpa Transhumant Groups visit the area, Lechenpa grows vegetable and potato at higher elevation	Mainly used for seed Potato, Vegetables	Pasturage

fungus and living on dead and decaying organic matter present inside the bark of plants. Larvae of langurids are stem borers and adults feed on pollen or foliage of host plants. Rhizophagids are root eating beetles. Besides above, an All India Coordinated Project on Nematode Pests under the grant from ICAR was undertaken during 1981 by Zoological Survey of India to estimate the crop infection by nematodes on Mandarins (Sikkim Oranges) which has the highest export value to the state. The survey revealed 61 species of soil and plant nematodes affecting the citrus trees (*Citrus reticulata*), of which 10 species are discovered new to science.

There are extensive grassy meadows at a height varying from 14,000 to 20,000 ft. suitable for cattle and sheep grazing. The native cattle of Sikkim are Siri and Siri type but artificial insemination has resulted in influencing the native type into the crossbreed. The majority of sheep belong to heavy bodied with short tail Banpala breed. The local breeds of goat are of Bengal type and crossbreed of Jamuna pari, Betal and Barabari. The pigs found in Sikkim are largely crossbreeds with varying proportions of large white, Yorkshire and Saddle Back blood. Recently, the department introduced "Durac" breed of Pig from Royal Govt. of Bhutan. The details of the animal breeds are given in the table. Fisheries are yet another occupation of the people of Sikkim. Nearly 64 species under 43 genera and 15 families are recorded from the state, of which 23 species are having food value and are of commercial importance. 25 species are of taxonomic importance, while 6 species have value in terms of aquarium fishes which are not exploited completely. The state is also known for Mahaseer and Trout fishery. The game fishes include *Neolisscheilus licagonioleptus*, *Schizothoracichthyes prograstrus*, *Schizothorax richardsoni*, and *Salmo trutta*. Two species of exotic fishes which are introduced to contain the breeding of mosquitoes throughout India are also represented in the state (*Poecilia reticulata* and *Hypothalanichthyes molitrex*). *Puntius* yet another

common species is represented by five species in the state. Recently the Government of Sikkim has taken the following initiatives viz., Carp culture, Trout Seed Production, Mahseer Programme, Conservation Programme, Research and Survey, Education and Training. The Sikkim Fisheries Act, 1980 has come in force in the state. It has brought streamlining in the activities of the department. This Act has been modified in Sikkim Fisheries Rule, 1990

Faunistic affinities with Darjeeling Himalaya

The Darjeeling Himalaya region lies on the extreme northern fringe of West Bengal state and includes Darjeeling, Kurseong and Kalimpong subdivisions of Darjeeling district and northern fringe of Jalpaiguri district. Here also the Singalila range stands on the western border and the Sinchula range forms the common boundary between Bhutan and Jalpaiguri district. This range is the most floristically and faunistically rich area of the state and represented by the elements which share many common features with the state of Sikkim. A cursory glance of the faunistic distribution is given below, and the commonality is seen in many groups. It is also found that the faunal number increases from Jalpaiguri and maximum is seen in Darjeeling district, as the number of micro niches are more than Sikkim.

Groups	Jalpaiguri	Darjeeling	Sikkim
Mollusca	32	101	89
Spiders	110	46	91
Insects	1244	5458	3656
Amphibia	22	29	21
Reptilia	39	49	31
Aves	356	424	364
Mammals	84	128	92

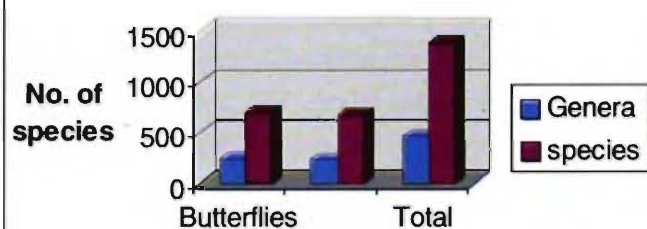
Endemic fauna in Sikkim

Endemic fauna in Sikkim is not completely worked out, however, a cursory glance of several groups reveal that a large number of endemics are distributed in Sikkim and needs further study. In the present scenario, of the 185 species of

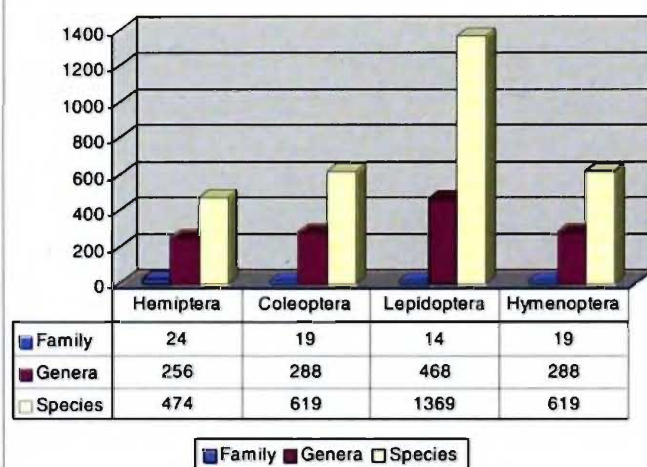
aphids recorded from the state, nearly 86 species are considered as endemic. Lepidopterans exhibit maximum endemicity viz., 27 species of the members of Papilionidae, 8 species of Ctenuchidae and Limacodidae, 2 species of Pieridae, 6 species of Zygaenidae, 42 species of Archidae, and 92 species of Trichoptera exhibits endemism. Among

other invertebrates, one species of earthworm (*Papirionix variegates*) and 3 species of mollusca exhibits endemism. The higher groups, several endemic fauna distributed in the eastern Himalayan states are found in Sikkim. However, the Himalayan Tahr and Kiang are endemic to entire Himalayan region including Sikkim.

Distribution of butterflies & moths in Sikkim



Distribution of selected orders of insects in Sikkim



Faunal Resources recorded at a glance

Order/ Groups	Species	Genera	Families
Apterygota	25	16	6
Odonata	65	34	10
Orthoptera	18	15	1
Dermaptera	50	30	7
Blattaria	17	13	5
Isoptera	16	8	2
Hemiptera	474	256	24
Thysanoptera	17	10	2
Coleoptera	619	288	19
Diptera	188	107	12
Lepidoptera	1369	468	14
Trichoptera	179	45	21
Hymenoptera	619	288	19
Other			
Invertebrates	566	329	191
Chordata	630	437	117
Total	4862	2344	450

Faunal Analysis

No.	Fauna	No. of Species/ Sub-species	Remarks
1.	Mammalia	92	Preponderance of (40%) Palearctic species at high altitude, Oriental (50%) and Indo-Chinese elements at lower and medium altitudes. No endemic mammals in Sikkim except Himalayan Tahr, Red Panda, Kiang which are endemic to entire stretch of Himalayas.

No.	Fauna	No. of Species/ Sub-species	Remarks
2.	Domestic mammals	Cattle Goat Sheep Mules Pigs	Jersey, Jersey crossbred, Brown Swiss crossbred, Mixed-cross, Siri, Holstein. Yak Nepalese breed, Tibetan breed. Crosses of Jamuna pari, Bengal, Betal, Barabari with local. Banpala, Gharpala, Cross-breed, Merind, Cross breed Corrodale, Tibetan Sheep, Rambouillet Cross breed. Local Durac, Saddleback, Large white Yorkshire and their crosses and local (Punri) landrace.
3.	Aves (Birds)	Over 422 species and subspecies with authentic records and 612 species and subspecies in total likely to occur in the state	Survey includes collections and observations made by Hodgson (1845-58), Blanford (1870), Grammie (1877), Brooks (1880), Baily, Stevans, Ludlow, Meinertzhagen (1923-37), Salim Ali (1962), ZSI State Survey (1991-1994). The details of the significant diversity and distribution given separately.
4.	Amphibia & Reptilia	Amphibia – 21 species Reptilia – 31 species	Authentic records. Several sightings of others known but not included due to non availability of representative collection at ZSI, especially the turtles.
5.	Pisces	64 species	Food fish–24, Fishes of systematic interest–25, Aquarium fishes–6, Sports fish–2, Game fish–4, Introduced fishes–2, Others – 3
6.	Butterflies & Moth	Butterflies Moths Genera 243 225 species 697 672	15 species are protected under Schedule-I of WLPA 39 species in Schedule – II 1 species in Schedule – IV 85 species of Lepidoptera are endemic 92 species of Trichoptera

No.	Fauna	No. of Species/ Sub-species	Remarks
			are endemic <i>Anthera assamensis</i> (Muga Silkmoth), <i>Anthera paphia</i> (Tassar Silkmoth) and <i>Samia Cynthia</i> (Eri Silkmoth) all distributed in the state
7.	Major Insect Orders	Order Family Genera Species Hemiptera 24 256 474 Coleoptera 19 288 619 Lepidoptera 14 468 1369 Hymenoptera 19 288 619	Total no of species/genera/families of insects are as follows 3656 1578 142

Diversity, Distribution and Significant features of Aves of Sikkim

No.	Family in India	Species / subspecies	Sikkim	Percentage representation	Remarks
1.	Podicipididae	4	1	25	Little Grebe, distributed at lower elevations only
2.	Phalacrocoracidae	3	2	66	Indian Shag & Cormorant, distributed at lower elevations of 2000' – 3500'
3.	Anhingidae	1	1	100	Darter, distribution as above
4.	Ardeidae	23	10	23	Grassland & Marshland species, 50% common remaining rare
5.	Ciconiidae	–	4	–	Some resident & Some migratory Storks found at low altitudes adjacent to Bengal & Nepal
6.	Anatidae	–	7	–	Rare winter visitor, Ducks and Geese normally not found in Sikkim. Lachen valley is the traditional bird flyway for ducks and geese
7.	Accipetridae	74	33	44	Bearded vulture is largest and occurs at higher altitudes of Himalaya. Record 13,000' by Blanford & 16,000' by Schafer (1938), Many of them are winter visitors
8.	Pandionidae	1	1	100	Osprey, rare and not much known on their distribution except stray occurrence

No.	Family in India	Species / subspecies	Sikkim	Percentage representation	Remarks
9.	Falconidae	20	9	45	Rare and resident in outskirts of forest and cultivation with tall trees from the foot hills to 2000'
10.	Phasianidae	71	13	19	Commonly known as Game birds, Many of them are rare and resident occurring in the open hillside, alpine pastures intermixed with lichen, ferns, grass from 1000 – 15000'
11.	Turnicidae	6	3	50	Grassland species,
12.	Gruidae	7	1	12.5	Single Palearctic migratory species of Crane
13.	Rallidae	21	8	39	Wetlands along the foothills
14.	Otididae		1		Presumed to be present
15.	Jacaniidae	2	2	100	Marsh lands
16.	Rostratulidae	1	1	100	Painted snipe resident species
17.	Charadriidae	21	5	24	Uncommon summer visitors, distributed in marsh lands, river beds up to 1000'
18.	Scolopacidae	41	15	38	Most of them are winter visitors, some of them are uncommon summer visitors. Some exhibit altitudinal migration from 9,000' – 15,000'
19.	Recurvirostridae	3	2	66	Distributed in a wide spectrum of ecological habitat and exhibits different status
20.	Glareolidae	6	1	17	Not much known of the species
21.	Pteroclididae	8	1	13	Terrestrial pigeon like bird
22.	Collumbidae	45	13	37	Few like Hill pigeon is rare resident (N Sikkim), snow and Speckle wood pigeon rare, distributed from 5,000' – 13,000'
23.	Psittacidae	21	7	33	Plum headed parakeet expected to be present, Blossom headed parakeet only sightings, Intermediate parakeets completely unknown

No.	Family in India	Species / subspecies	Sikkim	Percentage representation	Remarks
24.	Cuculidae	32	19	60	Many of them are rare and uncommon
25.	Tytonidae	4	2	50	Moderately common except <i>Phodilus badius</i> which is extremely rare
26.	Strigidae	48	17	36	Many of them are common some are rare recorded from 13,000' for ex. <i>Glaucidium castanonotum</i>
27.	Podargidae	2	1	50	Extremely rare and resident
28.	Caprimulgidae	10	4	40	Stevens recorded at 8,000' Ali(1962) at 9,000, at Lachen
29.	Apodidae	21	7	33	Many of them rare, recorded at 13,000', from foothills to higher elevation
30.	Trogonidae	6	1	17	Evergreen forest
31.	Alcedinidae	28	9	30	Recorded up to 4750' by Stevens
32.	Coraciidae	7	2	29	Rare, resident and secondary tropical forest up to 2,000'
33.	Upupidae	4	1	25	Uncommon summer visitor
34.	Bucerotidae	9	4	45	Sparingly distributed in lower elevations up to 4,500' (Stevens)
35.	Capitonidae	14	6	43	Arboreal, uncommon resident in tall evergreen & mixed forests
36.	Indicatoridae	3	1	33	Very little known not recorded but skin presumably present in British Museum
37.	Picidae	55	19	35	Mostly uncommon, resident in mixed forests. Usually up to 6,000' record of 13,000' by Meinertzhagen (1927)
38.	Eurylaimidae	2	2	100	Rare, resident in dense forest
39.	Pittidae	5	3	60	Rare, resident in secondary dense forest
40.	Alaudidae	34	4	12	Some are rare and uncertain, Blanford (1870) noted several hundreds at Yamthang (Great short toed Lark)

No.	Family in India	Species / subspecies	Sikkim	Percentage representation	Remarks
41.	Hirundinidae	22	7	36	Rare, uncommon, resident in 1000' – 6,500'
42.	Motacillidae	41	10	22	Usually rare and uncommon, some are sporadic winter visitor, recorded up to 16,500'. 2 subspecies of Oriental Pipit present in different seasons and altitudes
43.	Campephagidae	34	9	34	Resident, some are winter visitors recorded from open hill side to 10,000'
44.	Pycnonotidae	34	9	27	Common resident, scrub and mixed forests, up to 5,000'
45.	Irenidae	13	4	33	Uncommon, resident open hill side
46.	Laniidae	14	4	29	Uncommon, resident as well as winter visitor, recorded up to 15,000'
47.	Cinclidae		2		Uncommon, resident in high elevation swift mountain torrents
48.	Troglodytidae		1		2/3 geographical races present
49.	Prunellidae	12	6	50	Rare, resident, recorded at Conifer and Rhododendron forest
50.	Turdinae	120	56	48	Wide spectrum in their distribution and status
51.	Timalinae	203	64	32	As above
52.	Panurinae	16	8	50	Distributed in dense bamboo forests
53.	Sylvinae	143	45	33	Many of the are fairly common, resident, occurring at varying altitudes,
54.	Muscicapinae	45	23	50	Uncommon, rare, some are winter visitors/summer migrants/altitudinal migrants
55.	Monarchinae	8	2	25	
56.	Rhipidurinae	10	3	30	Uncommon, rare, resident, alpine pastures, Rhododendron forests between 9,000–12,000'

No.	Family in India	Species / subspecies	Sikkim	Percentage representation	Remarks
57.	Remizidae	3	1	33	Uncommon, recorded up to 4,500'
58.	Sittidae	13	5	40	Common, resident climbing , dense evergreen forest up to 12,000'
59.	Certhiidae	12	3	25	Uncommon, resident, conifer forests up to 13,500'
60.	Dicaeidae	10	6	60	Some are common, some are rare, living at the edge of the forest streams
61.	Nectariniidae	26	9	33	Common resident however, Fair-tailed Sunbird is rare, foothills and usually with banana plants
62.	Zosteropidae		2		2 geographical races present of a species at the forest edge
63.	Emberizinae	19	6	34	Uncommon, some are accident straglers
64.	Fringilidae	50	27	54	Wide spectrum in their distribution and status
65.	Passarinae	15	9	60	Records at 16,500' during Mt. Everest Expedition
66.	Ploceinae	4	1	25	Common, resident open, grassland
67.	Sturnidae	31	6	20	Usually common, however Hill Myna is uncommon
68.	Oriolidae	6	4	66	Common, resident, evergreen forest,
69.	Dicruridae	9	8	89	Mostly common resident, some altitudinal migrant, open forest and cultivation foot hills up to 3,000'f
70.	Artamidae	2	1	50	Rare summer visitor, open forest
71.	Corvidae	24	12	50	Wide spectrum of occurrence and status, Yellow billed Chow recorded at 18,000'

Diversity of Insects of Sikkim

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
1.	Thysanura	2	3	5	Nil	4 species	
2.	Collembola	4	13	20	Nil		
3.	Odonata	10	34	65	Nil	8 species	
4.	Orthoptera (Acridoidea & Eumastacoidea)	3	39	46	Nil	24 species	Several species distributed in the state are phytophagous in nature devouring and causing damage to crops such as wheat, rice, gram, vegetables besides damaging the commercial timber such as sal and teak. One species (<i>Hygracrus palustris</i>) recorded after a gap of 66 years, one species is rare and recorded from Sikkim, 1 species endemic to Eastern India and is a defoliator of Teak plantation, Occurrence and distribution of <i>Schistocerca gregaria</i> is interesting as they are normally found in arid areas <i>Cercaris nigricornis</i> a south Chinese form has recently invaded northeast India including Sikkim.
5.	Orthoptera Tettigonidae	1	15	18	Nil	6 species	9 species share with eastern Himalaya (north eastern states)
6.	Dermaptera	7	30	50	Nil	Nil	Distribution of Palaearctic forms at elevations of 2500-4000 m., besides many members are of Indo-Malayan and Chinese origin. Srivastava (2003) confirms the phenomenon of congregations of insect fauna at high altitude

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
							5 species which are of doubtful records are not included in the fauna North Sikkim is represented by 22 species, South Sikkim 2 species; East Sikkim has 22 species while the 14 species at West Sikkim. 9 species distributed at an elevation of 400 m, 5 species between 400–1550 m, 1 species between 800–1500 m, 7 species between 1100–1800 m, 6 species between 2300–4900 m. and rest at different elevations or elevations not recorded.
7.	Blattaria	5	13	17	Nil	3 species	
8.	Isoptera	2	8	16	Nil	14 species	Abundance of <i>Reticulotermes assamensis</i> is unusual as they are temperate species <i>Pericapritermes assamensis</i>, <i>Orontotermes horai</i> are soil inhabiting eastern Himalayan species <i>Microtermes obesi</i> is a fungus infecting common species <i>Nausititermes emersoni</i> is known only from Bangladesh and recorded for the first time from Sikkim
9.	Hemiptera : Homoptera : Aphididae	1 8 subfamilies	91	185			All 8 subfamilies described from India are distributed in the state Of the 185 species, 7 genera and 86 species are endemic 115 species infect economically important plants

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
							Maximum concentration of species is in the elevation range of 1000–2300 m Most favoured host plant is members of Asteraceae The degree of infestation is 5 species in cereals, 1 species on sugarcane, 19 species on vegetable plants, 6 species on spices, 14 species on fruit plants, 25 on ornamental plants, 35 on forest trees and 9 species on bamboo plants. Aphids exhibits Palaearctic, Chinese and Malaysian affinity besides Oriental 104 species distributed in East Sikkim 16 species in the West Sikkim 54 species in the North Sikkim 22 species in the South Sikkim Host plant analysis reveals the association with 63 families, 153 genera and 235 plant species of which maximum association with the members of Asteraceae (30 species) followed by Poaceae (29 species), Rosaceae (20 species) and Polygonaceae (12 species)
10.	Hemiptera : Homoptera : Cicadelloidea	8 subfamilies	22	34	Nil	4 species	<i>Petaloccephala insignis</i> is originally described from Sikkim. 13 species distributed in East Sikkim 3 species in West Sikkim 7 species in North Sikkim
11.	Hemiptera : Homoptera : Cicadoidea	2 subfamilies	12	20	Nil	2 species	6 species distributed in North Sikkim 2 species in South Sikkim 11 species in East Sikkim 1 species in West Sikkim

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
12.	Hemiptera : Homoptera : Ercopoidea	1	10	28	Nil	7 species	
13.	Hemiptera : Heteroptera : Coreides	2	20	38	Nil	2 genera and 9 species	14 species distributed in North Sikkim 7 species in South Sikkim 9 species in East Sikkim 8 species in West Sikkim
14.	Hemiptera : Heteroptera : Pentatomidae	9	62	107	Nil	5 species	85 species described earlier by Distant (1902, 1918) 22 species present addition 1 species a new record of subcontinent
15.	Hemiptera : Heteroptera : Reduviidae	1	26	38	Nil	10 species	31 species described earlier by Distant (1902, 1910) Present description is on 13 species
16.	Hemiptera :	7	13	24	Nil	12 species	11 species distributed in east Sikkim 9 species in west Sikkim 1 species in north Sikkim 11 species in South Sikkim
17.	Thysanoptera	2	10	17	Nil	Nil	
18.	Coleoptera : Adephaga : Cicindelidae	1	4	24	Nil	3 species	
19.	Coleoptera : Gyrinidae & Dytiscidae	2	14	40	Nil	1 species to India 20 species	
20.	Coleoptera : Hydrophilidae	1	13	22	Nil	1 species to India 19 species	Only 2 species were known earlier to this study
21.	Coleoptera : Histeridae	1	14	22	1 species	21 species	<i>Hister paraincognitus</i> sp.nov. new to science

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
22.	Coleoptera : Scarabaeidae	1	13	25	Nil	25 species	
23.	Coleoptera : Rhizophagidae	1	4	4	Nil	2 species	
24.	Coleoptera : Silvanidae	1	7	15	Nil	6 species	
25.	Coleoptera : Languriidae	1	8	18	Nil	3 species	
26.	Coleoptera : Erotylidae	1	6	10	Nil	3 species	
27.	Coleoptera : Endomychidae	1	8	9	1 species	Nil	<i>Ancylopus nigrothoracica</i> sp.nov. new to science
28.	Coleoptera : Coccinellidae	1	32	87	1 species	33 species	<i>Pullus bhaumuki</i> sp.nov. new to science
29.	Coleoptera : Discolomidae	1	1	3	Nil	Nil	All three species are new to science from Sikkim described earlier during 1997
30.	Coleoptera : Colydidae	1	12	12	1 species	1 species	<i>Neotrichus afoveicollis</i> sp.nov new to science
31.	Coleoptera : Inopeplidae	1	1	3	Nil	Nil	Two species having affinity with the eastern Himalaya
32.	Coleoptera : Cerambycidae	1	49	75	Nil	31 species	4 species are first records to the country
33.	Coleoptera : Curculionidae	1	19	28	Nil	8 species	3 species under 3 genera are first records to the country
34.	Coleoptera : Platypodidae	1	2	5	Nil	5 species	<i>Platypus solidus</i> , <i>P. indicus</i> , <i>P. secretus</i> , <i>P. cupulatus</i> is found distributed in wide variety of host plants while <i>Diacavus furtivus</i> found restricted to <i>Shorea robusta</i> (Sal) plant.

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
35.	Coleoptera : Elateridae	1	23	77	2 species	28 species	<i>Meristhus crenulatus</i> sp.nov & <i>Cardiophorus serratus</i> sp.nov. are new to science. 10 species are new for India
36.	Coleoptera : Staphylinidae	1	59	143	11 species	85 species	9 species are first records for India <i>Eleusis sikkimensis</i> , <i>Eleusis biswasi</i> , <i>Phloeonomus (Phloeostiba) gangtokensis</i> , <i>P (P) basui</i> , <i>P (P) bhaumiki</i> , <i>Stenus (Hypostenus) sikkimensis</i> , <i>Astenus sikkimensis</i> , <i>Medon rangpoensis</i> , <i>Scopaeus gangtokensis</i> , <i>Philonthus sikkimensis</i> sp.nov. are new to science
37.	Diptera	8	35	62	Nil	10 species	Family Bibionidae includes 4 species of which one is a new record. Of this one species is exclusive to India and the other three Oriental species extends up to Japan. Family Stratiomyidae represented by 7 species, one species endemic to Sikkim, and one species is a new record. 2 species restricted to northeast India Family Tabanidae includes 19 species, the genus <i>Tabanus</i> includes 13 species. Family Bombylidae includes 6 species, some of the Oriental species extend upto Japan, China and New Guinea. Family Sciomyzidae includes the lone Oriental species Family Sepsidae includes 6 species of which <i>Sepsis neocynipsea</i> a Holarctic species Family Calliphoridae includes 9 species many of them having Himalayan affinity.

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
							Family Sarcophagidae represented by 10 species, all of them represented in the adjacent district of West Bengal. 14 species are confined to India, 3 species are exclusive to the state of Sikkim and 23 species distributed in many parts of the Orient Region.
38.	Diptera : Asilidae	1	15	28	2 species	11 species	<i>Astochia gopae</i> sp.nov & <i>Astochia ranipoolensis</i> sp.nov. are new to science. 2 species are endemic to Sikkim 12 species distributed in parts of north and northeast India while the remaining cosmopolitan
39.	Diptera : Syrphidae	1	34	60	Nil	12 species	<i>Eristalis</i> is the dominant genera includes 5 species 5 species are endemic to Sikkim. 5 species are distributed in rest of the country. Rest of the 50 species spread over to other parts of Orient, Palaearctic, Australian and Ethiopian.
40.	Diptera : Tachinidae	1	12	16	2 species	9 species	<i>Estheria (Paestheria) intermedia</i> and <i>Eurihia indica</i> sp.nov are new to science.
41.	Diptera : Muscidae	1	11	22	Nil	2 species	All species are predominantly Oriental in distribution; of this, 6 species are restricted to Oriental while the others extend beyond this region. In respect of the affinity of the fauna 17 species are Indo-Malayan, 14 have Palaearctic affinity, 4 species Australian and 5 species Ethiopian affinity.

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
42.	Lepidoptera (Papilionidae)	5	24	69	Nil	1 species to India	2 species are endemic to Eastern Himalaya 27 species share with Eastern Himalayan states 4 species restricted to Sikkim 140 additional species are recorded from the state however, donot have representative collections in the survey Of the 69 species 8 species distributed in the north Sikkim, 11 species in east, 4 species in west and 9 species in south Sikkim
43.	Lepidoptera (Nymphalidae)	1	66	155	Nil	Nil	7 species are endemic to Sikkim 15 species are protected under Schedule-I of WLPA 39 species in Schedule – II 1 species in Schedule – IV 39 species are distributed in north Sikkim, 31 species in south, 18 species in west and 49 species in south Sikkim.
44.	Lepidoptera (Ctenuchidae & Limacodidae)	2	22	64	Nil	12 species to state 3 species to India	8 species are endemic to Sikkim 51 species are representatives of the earlier collection, 11 species are from literature
45.	Lepidoptera (Pieridae & Hesperidae)	2	86	227	Nil	6 species to state 2 species to India	2 species are endemic to Sikkim Family Hesperidae includes 176 species under 68 genera Family Pieridae includes 51 species under 18 genera
46.	Lepidoptera : (Saaturidae)	1	14	26	Nil	Nil	Includes <i>Anthera assamensis</i> popularly called "Muga Silk moth" <i>Anthera paphia</i> (The Tassar Silkmoth) <i>Samia Cynthia</i> (Eri Silkmoth)

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
47.	Lepidoptera : (Zygaenidae)	1	29	66	Nil	3 species	6 species are endemic to Sikkim One species is a topotype representative <i>Artona flaviciliata</i> , <i>Artona postalba</i> , <i>Artona posthyalina</i> and <i>Artona sikkimensis</i> recorded at an altitude of 12000 feet; while <i>Artona zebra</i> recorded at 11000 feet
48.	Lepidoptera : (Arctiidae)	1		182	Nil	9 species	42 species are endemic to Sikkim 182 species included under 8 subfamilies
49.	Lepidoptera : (Geometridae)	1	525	182	Nil	3 species for India (3 species from Sikkim)	43 species are endemic to Sikkim 70 species are distributed in Eastern Himalaya 83 are distributed in rest of the country 3 species are recorded from India
50.	Insecta : Trichoptera	21	45	179	Nil	1 species	98 species are endemic to Sikkim 45 species are available in the collections of ZSI and the rest are from literature
51.	Hymenoptera : Vespidae	1	9	32	Nil	Nil	Exhibits social organization and nest architecture. Predators of insect larvae
52.	Hymenoptera : (Scoliidae)	1	9	27	Nil	Nil	Ectoparasitoides of coleopteran larvae mainly Scarabidae which are pests of forest and agriculture
53.	Hymenoptera : (Sphaecidae)	1	25	60	Nil	13 species	Mud daubers are predators on insects and exhibits cleptoparasitic habits
54.	Hymenoptera : (Ichneumonidae)	1	103	204	Nil	Nil	46 species are exclusive to Sikkim, 58 species share with eastern Himalaya
55.	Hymenoptera : (Formicidae)	1	39	114	Nil	17 species	Originally Bingham(1903) reported 69 species Chapman & Capco (1951) added 15 species
56.	Hymenoptera : (Aculeata)	5	8	9	Nil	5 species	Members of Xylocopidae (<i>Xylocopa</i> (C.) <i>fenestrata</i> damages trees by making holes

Diversity of Invertebrates in Sikkim

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
1.	Protozoa	29	43	80	Nil	56 species	Includes 55 free living species; 2 parasitic species; 23 symbiotic species; 8 free living species new to India; 56 species new to Sikkim
2.	Nematodes (plant & Soil)	25	37	42	Nil	42 species	Collected from 43 host species; 2 genera and 2 species are new records to India Study revealed 11 dominant species, 10 common species and 21 rare species. Maximum number of species (10) found in Tomato and Napier grass as hosts followed by Semal (9), Barley, Teak and Garlic (8 species each), 7 species from wide variety of agricultural, horticultural plant.
	Plant and Soil nematodes of Sikkim	23	39	61	10	10 species	The inventorisation was carried out as a part of the All India Coordinated Project on Nematode Pests of Citrus Plants of Sikkim allocated to the scientists of Zoological Survey of India by ICAR during 1991.
3.	Acanthocephala	4	4	8	1 species	Nil	<i>Centrorhynchus sikkimensis</i> sp.nov collected from the intestine of eagle is new to science
4.	Hirudinea	1	2	5	Nil	1 species	1 species share with the eastern Himalaya
5.	Oligochaeta (Freshwater)	2	3	3	Nil	3 species	
6.	Oligochaeta (Earthworms)	6	12	18	Nil	4 species	Includes one genera <i>Plutellus</i> is endemic to India, a rare species originally recorded from Chengu in East Sikkim.

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
							<i>Eisenia foetida</i> is used by Anglers, also produces good fertilizer <i>Parionyx variegates</i> is an endemic species occurring in the districts of Darjeeling (WB) and Sikkim 11 species distributed in east Sikkim, 9 species in West, 9 species in north and 5 species in south Sikkim
7.	Crustacea : Decapoda	2	5	6	Nil	2 species	<i>Macrobrachium hendersonii</i> is an high altitude species distributed in Darjeeling and Sikkim <i>Potamiscus sikkimensis</i> is originally described from Sikkim
8.	Bryozoa (Freshwater)	1	2	4	Nil	2 species	All four species described from Sikkim has distribution in high altitude area of Darjeeling, West Bengal
9.	Mollusca (Land and Freshwater)	18	36	89	Nil	20 species	3 species are endemic to Sikkim Freshwater molluscs includes 9 species Land forms includes 80 species under 31 genera.
10.	Acarina (Animal mites)	1	7	19	Nil	2 genera & 2 species	<i>Haemaphysalis</i> sp. is common attacking cattle & goat
11.	Acarina (Plant mites)	14	29	65	Nil		Phytoseiidae is the largest family includes 28 species followed by Tetranychidae with 14 species and Tydeidae with 5 species. 44 species are predatory in nature 31 species are distributed in East Sikkim 8 species in West Sikkim

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
							19 species in North Sikkim 22 species in South Sikkim
12.	Acarina (Oribatid or moss mites)	45	63	85	Nil	2 genera & 3 species new to India 64 species	Nearly 20% of the total Indian fauna is found in the state 58 species are distributed in east Sikkim 40 species in west Sikkim 22 species in north Sikkim 19 species in south Sikkim
13.	Araneae	19	48	91	Nil	17 species	32 species are exclusive to Sikkim 32 species are Oriental in origin, 6 species are from Oriental and Palearctic and 2 species from Oriental and Ehtiopean. 7 species are known to occur in Australian region and 7 species are cosmopolitan 9 species distributed in north Sikkim 16 species in south Sikkim

Diversity of Vertebrates of Sikkim

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
1.	Pisces	15	43	64	Nil	23	Mc Clelland (1845) described 3 species from Sikkim; Gunther (1868) gave the distribution of <i>Tor mosal</i> , <i>Danio aequipinnatus</i> and <i>Neomacheilus rupecula</i> . Day (1878) showed the distribution of <i>Labeo dyocheilus</i> ; Hora (1951) recorded <i>Glyptothorax gracilis</i> and <i>G. maculates</i> from the river Rangit. The largest number species are found in <i>Puntius</i> (5 species).

No.	Group/Class/Order	Number of			New to Science	New Records	Remarks
		Family	Genera	Species			
2.	Amphibia	7	12	21	Nil	2 species	4 species are rare and 2 species are new records
3.	Reptilia	7	23	31	Nil	1 species	Pattern of distribution is east Sikkim– 6 species, west Sikkim–3 species, north Sikkim–5 species, south Sikkim–5 species and Sikkim (Without locality details)–11 species
4.	Aves	15	296	422	Nil	4 species	Details are given seperately
5.	Mammals	23	63	92	Nil	2 species	Preponderance of (40%) Palaearctic species at high altitude Oriental (50%) and Indo-Chinese elements at lower and medium altitudes. No endemic mammals in Sikkim.

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MAMMALIA

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INTRODUCTION

Our knowledge about the mammalian fauna of Sikkim owes largely to the Mammal Survey of India conducted practically all over the present Indian Union, Pakistan, Myanmar and Sri Lanka under the auspices of the Bombay Natural History Society during the period from 1911 to 1930. Sikkim State (now a part of the Indian Union) was surveyed by C. A. Crump, during the years 1914 and 1915, who made pretty good collection of mammals. Subsequently, stray collections were also brought from this territory by B. Biswas (1953), A.G.K. Menon (1959), T.D. Soota (1977), S.M. Ali (1978), H.C. Ghosh (1979), R.K. Ghose (1979-1982), etc., all scientists belonging to the Zoological Survey of India.

Under the programme of faunistic survey of the Indian States, the Zoological Survey of India sent out a series of parties to different parts of Sikkim from 1988 to 1994 for the collection of different groups of animals, including mammals. Parties for the survey of mammals were led by V.C. Agrawal, S.S. Saha, S. Chattopadhyay, and S. Chakraborty, (1988, 1989, 1990, 1994).

Based on the collections made by C. A. Crump, Wroughton (1916a) described five new species of rodents from Sikkim and further (1916b), reported 41 species and subspecies of mammals from that state. Some informations on the occurrence and distribution are also available from Blanford (1888-1891), Pocock (1939, 1941), Ellerman & Morrison-Scott (1951) and Ellerman (1961). During the status survey of Lesser Cats in Eastern India, Biswas and Ghosh (1982) and

Biswas, Ghose and Ghosal (1985) reported the sightings of many species of mammals in North and West Sikkim. Mistry (1991) reported the occurrence of bats, namely, *Eonycteris spelaea* and *Cynopterus sphinx* from Sikkim but without mentioning the name of the localities.

PHYSIOGRAPHY

Sikkim lies in the Eastern Himalayas between 27° and 28°N latitude. To its north lies the Tibetan Plateau, with Nepal on the west, Bhutan and the Chumbi Valley of Tibet on the east, and Darjeeling district of West Bengal in the south. The State has an area of 7299 sq. km; measures about 113 km from north to south, and 64 km from east to west. It is entirely hilly state, with elevations ranging from 270 to 8580 m above mean sea level. There is very little plain area in the state. The land available for cultivation is only 10.83%, and substantial areas are barren, mountainous or under deep forests (Anon 1982).

Drainage : The steep mountain slopes covered with green forests and vegetation and deep gorges with gurgling music of the flow of river Teesta produce a marvellous effect. The main ridges run from north to south. The two rivers, Rangit and Rane, tributaries of River Teesta, form the southern limit of the State. There are 180 perennial lakes of different dimensions in this state.

Climate : Sikkim is the most humid region in the Himalayas because of its proximity to the Bay of Bengal and direct exposure to south-west monsoon. The mean annual humidity being around 82%. The greater part of the rainfall is received

between April and September, with peak around July (Anon 1982).

Soil : The soil is loamy-sand to silty-clay-loam in texture, varying in depth from a few centimetres to a few metres. The soil is mostly acidic, with pH ranging from 5.0 to 6.0. The organic matter content of soil varies from 2 to 5%, sometimes up to 10%.

Vegetation : Sikkim is known as the land of flowers. It fosters more than 4000 species of flowering plants and 300 species of ferns. Because of the humid climatic conditions, the region abounds in both epiphytic and terrestrial orchids and ferns. More than 450 species of orchids have been reported from the area.

Sikkim is rich in forest wealth. Out of a total area of 7300 sq. km, 2646 sq. km. are covered with forests amounting to 36% of the land area.

Five forest zones have been identified on the basis of the rainfall and topography.

- i) Lower Hill Forest (90-800 m. altitude) consisting of Sal and other dry and wet mixed forests.
- ii) Middle Hill Forest (800-1800 m. altitude) consisting of *Betula* sp., and *Castanopsis* sp.
- iii) Upper Hill Forest (1800-2900 m. altitude) consisting of *Michelia* sp.
- iv) Coniferous forest (1150-300 m. altitude) consisting of Hemlock, fir, bamboo-brakes, etc.
- v) Rhododendron Forest (2900-3600 m. altitude) consisting of rhododendron trees.

Administrative : Sikkim is administratively divided into four districts viz North, South, East and West, and the capital of the state is Gangtok.

FAUNAL ANALYSIS

The mammalian fauna of Sikkim, dealt with here, consists of 63 genera and 89 species belonging to 9 orders and 21 families. It is so varied largely because Sikkim acts as a transitional zone between the Palaearctic and the Oriental

fauna. The high altitude forms generally have the affinity with the Palaearctic fauna and the medium and low altitude forms with the Indian, Indo-Chinese and Malayan elements. There are none which may be treated as strictly endemic to Sikkim but some species of Giant Flying squirrels like *Petaurista caniceps*, *Petaurista magnificus* and *Petaurista nobilis* are localised to Nepal, Sikkim, Bhutan and northern West Bengal.

Palaearctic elements : About 40% of the mammalian fauna of Sikkim are Palaearctic and have come through south China (Tibet), for example, *Rhinolophus ferrumequinum*, *Plectus auritus*, *Nyctalus noctula*, *Taphozous nudiventris*, *Barbastella leucomelas*, *Cuon alpinus*, *Vulpes vulpes montana*, *Martes fonia*, *Mustella sibirica*, *Lutra lutra*, *Selenarctos thibetanus*, *Panthera unica*, *Moschus chrysogaster*, *Ovis ammon*, *Equus kiang*, *Pseudois nayaur*, *Procapra picticaudata*, *Lepus oiostolus*, *Lepus hypsibius*, *Ochotona nubrica*, *Ochotona roylei*, *Ochotona thibetana*, *Ochotona forresti*, *Ochotona macrotis*, *Marmota himalayica*, *Eupetaurus cinereus*, *Rattus turkestanicus*, *Pitymys sikkimensis*, etc.

Oriental elements : About 50% of the fauna are Oriental, mostly from the Malayan and Indo-Chinese subregion. They are *Chimmarogle himalayica* *Talpa micrura*, *Soriculus nigrescens*, *Soriculus caudatus*, *Soriculus leucops*, *Tupaia glis*, *Rousettus leschenaulti*, *Sphaerias blanfordi*, *Cynopterus sphinx*, *Eonycteris spelaea*, *Rhinolophus rouxi*, *R. pearsoni*, *Hipposideros pomona*, *Hipposideros armiger*, *Myotis muricola*, *Myotis siligorensis*, *Macaca assamensis*, *Presbytis entellus*, *Prionodon pardicolor*, *Viverra zibetha*, *Arctictis binturong*, *Arctonyx collaris*, *Paguma larvata*, *Ailurus fulgens*, *Felis temmincki*, *Felis bengalensis*, *Felis marmorata*, *Neofelis nebulosa*, *Muntiacus muntjac*, *Belomys pearsoni*, *Hylopetes alboniger*, *Petaurista caniceps*, *Callosciurus pygerythrus*, *Tamiops macclellandi*, *Dremomys lokriah*, *Ratufa bicolor*, *Hystrix brachyura*, *Niviventer niviventer*, *N. fulvescens*, *N. eha*, *Rattus nitidus*, *Bandicota indica*, etc.

Some species, especially of rats, mice and shrews, for example, *Rattus rattus*, *Mus musculus*

and *Suncus murinus* are cosmopolitan in distribution and reached Sikkim through human agencies. Some others like *Presbytis entellus*, *Pteropus giganteus*, *Pipistrellus coromandra*, *Lepus nigricollis*, etc., are purely Indian.

All measurements are in millimetre and have been taken after Pocock (1939-41) for Primates and Carnivora, Khajuria (1953) for Chiroptera, and Ellerman (1961) for Rodentia and Lagomorpha. The figures in parentheses indicate arithmetic means (for more than two specimens). Carbet and Hill (1986) has been followed for classification up to species,

Following is a list of abbreviations used for various measurements.

apf	=	length of anterior palatal foramina
b	=	length of bulla
c ¹ – c ¹	=	distance between outer surface of upper canines
cb	=	condylobasal length
cr	=	cranial rostrum
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
Hf	=	length of hindfoot
i ¹ – m ³	=	length of upper tooth row
iw	=	least interorbital width
l	=	Greatest length of skull
m ₁	=	length of first lower molar
m ¹ – m ¹	=	distance between outer surface of first upper molars
m ² – m ²	=	distance between outer surface of Second upper molars
m ³ – m ³	=	distance between outer surface of third upper molars
ml	=	mandibular length
ms	=	width of mesopterygoid space
mtr	=	length of maxillary tooth row
mw	=	maxillary width
n	=	length of nasal
on	=	occipitonasal length
orb	=	length of orbit
pl	=	length of palate
pm ⁴	=	length of fourth upper premolar
pow	=	postorbital width
Tb	=	length of tibia
Tl	=	length of tail
Tr	=	length of tragus
zw	=	zygomatic width

List of species of mammals collected / reported districtwise from Sikkim

Order / Species	West	South	East	North
SCANDENTIA				
1. <i>Tupaia glis lepcha</i>	–	+	–	–
INSECTIVORA				
2. <i>Talpa micrura</i>	–	+	–	–
3. <i>Soriculus n. nigrescens</i>	–	–	–	+
4. <i>Soriculus caudatus</i>	–	–	–	+
5. <i>Soriculus macrurus</i>	–	–	–	+
6. <i>Suncus murinus soccatus</i>	–	+	–	–
7. <i>Chimmarogale himalayica</i>	–	+	–	–
8. <i>Nectogale elegans sikhimensis</i>	–	–	–	+

Order / Species	West	South	East	North
CHIROPTERA				
9. <i>Rousettus leschenaulti</i>	-	-	-	+
10. <i>Sphaerias blanfordi</i>	-	-	+	-
11. <i>Eonycteris spelaea</i>	-	-	+	-
12. <i>Cynopterus sphinx</i>	-	-	+	-
13. <i>Taphozous nudiventris kuchhensis</i>	-	-	+	-
14. <i>Rhinolophus rouxi rouxi</i>	-	-	+	-
15. <i>Rhinolophus pearsoni</i>	-	-	+	-
16. <i>Rhinolophus ferrumeguinum tragatus</i>	-	-	-	+
17. <i>Hipposideros pomona gentilis</i>	-	-	-	+
18. <i>Hipposideros armiger armiger</i>	-	-	-	+
19. <i>Harpiocephalus harpia lasyurus</i>	-	+	-	-
20. <i>Murina cyclotis cyclotis</i>	-	-	-	+
21. <i>Murina aurata aurata</i>	-	-	-	+
22. <i>Myotis siligorensis</i>	+	-	-	+
23. <i>Myotis muricola caliginosus</i>	-	-	-	+
24. <i>Plecotus auritus homochrous</i>	-	-	-	+
25. <i>Nyctalus noctula labiatus</i>	-	-	+	-
26. <i>Pipistrellus c. coromandra</i>	-	-	+	-
27. <i>Barbestella leucomelas darjelingensis</i>	-	-	-	+
PRIMATES				
28. <i>Macaca assamensis pelops</i>	+	-	-	+
29. <i>Presbytis entellus schistaceus</i>	-	-	-	+
CARNIVORA				
30. <i>Canis aureus</i>	+	-	+	-
31. <i>Cuon alpinus primaevus</i>	-	+	+	-
32. <i>Vulpes vulpes montana</i>	-	-	-	+
33. <i>Arctictis binturong</i>	-	-	-	+
34. <i>Paguma larvata grayii</i>	-	+	-	-
35. <i>Prionodon pardicolor</i>	+	-	-	+
36. <i>Viverra zibetha</i>	+	+	-	-
37. <i>Martes f. flavigula</i>	-	-	-	+
38. <i>Martes foina intermedia</i>	-	-	-	+
39. <i>Mustella sibirica subhimachalana</i>	+	-	-	+
40. <i>Arctonyx collaris collaris</i>	-	-	+	-
41. <i>Lutra lutra</i>	-	+	-	-
42. <i>Selenarctos thibetanus</i>	+	-	-	-
43. <i>Ailurus f. fulgens</i>	+	-	-	+
44. <i>Felis chaus affinis</i>	-	+	+	-

Order / Species	West	South	East	North
45. <i>Felis bengalensis horsfieldi</i>	+	+	-	-
46. <i>Felis marmorata charltoni</i>	+	-	-	+
47. <i>Felis t. temminckii</i>	+	+	-	+
48. <i>Neofelis nebulosa macrosceloides</i>	-	-	+	-
49. <i>Panthera uncia</i>	-	-	-	+
50. <i>Panthera pardus pernigra</i>	-	-	-	+
PERISSODACTYLA				
51. <i>Equus kiang</i>	-	-	-	+
ARTIODACTYLA				
52. <i>Moschus chrysogaster</i>	-	-	-	+
53. <i>Muntiacus muntjac vaginalis</i>	+	+	-	-
54. <i>Nemorhaedus goral hodgsoni</i>	+	-	-	+
55. <i>Hemitragus jemlahicus schaeferi</i>	-	-	-	+
56. <i>Ovis ammon hodgsoni</i>	-	-	-	+
57. <i>Pseudois nayaur nayaur</i>	-	-	-	+
58. <i>Procapra p. picticaudata</i>	-	-	-	+
LAGOMORPHA				
59. <i>Lepus nigricollis ruficaudatus</i>	-	-	+	-
60. <i>Lepus hipsibius</i>	-	+	-	-
61. <i>Lepus oiostolus</i>	-	-	-	+
62. <i>Ochotona curzoniae</i>	-	-	-	+
63. <i>Ochotona nubrica</i>	-	-	-	+
64. <i>Ochotona roylei</i>	+	-	-	+
65. <i>Ochotona thibetana sikimaria</i>	+	+	-	+
66. <i>Ochotona forresti</i>	-	-	-	+
67. <i>Ochotona macrotis</i>	-	-	-	+
RODENTIA				
68. <i>Belomys pearsoni</i>	-	-	+	-
69. <i>Hylopetes a. alboniger</i>	-	+	-	-
70. <i>Eupetaurus cinereus</i>	-	-	-	+
71. <i>Petaurista caniceps</i>	+			+
72. <i>Petaurista nobilis nobilis</i>	-	+	+	-
73. <i>Petaurista magnificus</i>	+	-	-	-
74. <i>Calloscirus pygerythrus lokroides</i>	-	-	+	-
75. <i>Tamiops macclellandi</i>	-	+	-	-
76. <i>Dremomys lokriah</i>	+	+	-	-
77. <i>Ratufa bicolor gigantea</i>	-	+	-	-
78. <i>Marmota himalayana</i>	+	-	-	+
79. <i>Hystrix brachyura</i>	+	-	-	+

Order / Species	West	South	East	North
80. <i>Pitymys sikimensis</i>	—	—	—	+
81. <i>Niviventer niviventer lepcha</i>	+	—	—	—
82. <i>Niviventer f. fulvescens</i>	—	+	—	+
83. <i>Niviventer eha eha</i>	—	—	—	+
84. <i>Rattus nitidus nitidus</i>	—	+	—	+
85. <i>Rattus turkestanicus</i>	—	—	—	+
86. <i>Rattus rattus brunneusculus</i>	—	—	+	—
87. <i>Rattus rattus tistae</i>	+	+	—	—
88. <i>Mus pahari</i>	—	—	—	+
89. <i>Mus musculus urbanus</i>	—	+	—	—
90. <i>Mus musculus homourus</i>	—	—	—	+
91. <i>Bandicota indica nemorivaga</i>	—	+	—	—

TAXONOMIC ACCOUNT

Order SCANDENTIA

Squirrel-like in appearance but with a long snout, devoid of whiskers. Orbits in skull complete.

Family TUPAIIDAE

One genus of family Tupaiidae namely, *Tupaia* occurs in Sikkim.

Genus *Tupaia* Raffles, 1821

The genus *Tupaia* is represented in Sikkim by one species and subspecies. It is characterised by the lower lobe of ears smaller than the upper, and inner side of ears scantily haired.

1. *Tupaia glis lepcha* (Thomas)

1922. *Tupaia belangeri lepcha* Thomas, *J. Bombay nat. Hist. Soc.*, 28 : 428 (Narbong c 629 m, Darjeeling district, West Bengal).

Common name : Common Tree-Shrew (Eng.).

Material examined : 1M, Rongli, coll. C. A. Crump, 26. XI. 1914.

Measurement : External : 1M : H & E 156; Tl 167; Hf 42; E 16. Cranial : 1M : l 46.4; pl 24.4; cw 19.2; TR 24.0.

Diagnostic characters : Head and body less

than 160 mm. in length and the tail generally longer than that (Agrawal 1975) ; dorsal colour of body a fine grizzle of deep brown and ochraceous buff ; shoulder streak diffuse.

Distribution : India : Sikkim (Wroughton 1916) and northern West Bengal.

Remarks : A black patch is present on the postero-dorsal portion of the body.

Order INSECTIVORA

Usually small in size, with protruded snout devoid of whiskers, small eyes and ears, five-toed limbs and close-set fur on the body. Orbits, in skull, incomplete.

Two families of the order Insectivora occur in Sikkim.

Key to the families of the order INSECTIVORA

Zygomatic arch in skull present ; bulla ossified
..... TALPIDAE

Zygomatic arch in skull absent ; bulla imperfect..... SORICIDAE

Family TALPIDAE

Only one genus of the family Talpidae occurs in Sikkim.

Genus *Talpa* Linnaeus, 1758

Body covered with short, velvety fur; no external ear, tail very small and scantily haired.

One species of the genus *Talpa* occurs in Sikkim.

2. *Talpa micrura* Hodgson

1841. *Talpa micrurus* Hodgson, *Calcutta J. nat. Hist.*, 2 : 221 (Nepal).

Common name : Eastern Mole (Eng.).

Material examined : 4M, 1F, Sureil, colls. G. King and J. L. Lister, 4. I. 1878, 10. II. 1879.

Measurements : *External* : 4M, 1F : H & B —; TI 4.0-6.5 (5.3); Hf 15.0-16.0 (15.5); E 4.0 (in all). *Cranial* : 2M : l 33.8, 34.6; pl 13.4, 14.0; cw 16.0 (in both); TR 13.1, 13.5.

Diagnostic characters : Premolars 4/4 in number, tail less than 10 mm in length.

Distribution : India : Sikkim, West Bengal and Northeastern India.

Remarks : Wroughton (1916) reported a specimen from Dikchu Valley, North Sikkim.

Family SORICIDAE

Four genera of the family Soricidae are represented in Sikkim.

Key to the genera of the family SORICIDAE

1. Teeth tipped brown *Soriculus*
Teeth entirely white 2
2. Tail without a fringe of white hairs; 18 teeth in upper jaw *Suncus*
Tail with a fringe of white hairs; 16 teeth in upper jaw 3
3. Ear-conch present *Chimmarogale*
Ear conch absent *Nectogale*

Genus *Soriculus* Blyth, 1854

Three species of the genus *Soriculus* occur in Sikkim.

Key to the species of the genus *Soriculus*

- Tail small, less than 50 mm in length or less than 3/4 of head and body length
..... *S. Nigrescens*
- Tail medium, 50-80 mm in length or between 75% and 120% of head and body length
..... *S. Caudatus*
- Tail long, more than 80 mm in length or more than 140% of head and body length
..... *S. Macrurus*

3. *Soriculus nigrescens nigrescens* (Gray)

1842. *Corsira nigrescens* Gray, *Ann. Mag. nat. Hist.*, 10 : 261 (Darjeeling district, West Bengal, India).

Common name : Sikkim Large-clawed Shrew (Eng.).

Material examined : North Sikkim : 1M, 2F, Gnatong (c 182m), 31. X. 1914; 8M, 9F, Chunthang (c 1630m), 10-19. XII. 1914, 13. I. 1915; 2M, 4F, Sodonchen (c 1981m), 11-17. XI. 1914; 8F, 4M, Lachen (c 2682m), 23-31. XII. 1914, 1-2.I. 1915; coll. C. A. Crump.

Measurements : *External* : 19M, H & B 74-93 (84); TI 36-46 (42.5); Hf 14-16 (14.8). 1SF : H&B 77-99 (83); TI 35-45 (41); Hf 14-17 (14.8).

Cranial : 2M : l 22.0-24.0 (23.0); on 19.1-20.7 (19.9); pl 10.0-11.0 (10.5); cw 11.2-12.0 (11.6); TR 9.6-10.4 (10.0). 1F : l 22.7; on 20.2; pl 10.1; cw 11.4; TR 9.7.

Diagnostic characters : As mentioned in the key to the species above.

Distribution : India : Northern Uttar Pradesh, Sikkim and northern West Bengal. Besides the above mentioned localities, Wroughton (1916) also recorded this subspecies from Gangtok in East Sikkim.

Elsewhere : Nepal.

Remarks : On the basis of the studies on 245 specimens of *Soriculus nigrescens* from Nepal, Mitchell (1977) concluded that the subspecies *S. n. caurinus*, *S. n. pahari* and *S. n. centralis* are synonyms of *Soriculus nigrescens nigrescens* with which Hoffmann (1986) concurs.

This species occurs in the Himalayas between 1600 and 2700 m altitudes.

4. *Soriculus caudatus caudatus* (Horsfield)

1851. *Sorex caudatus* Horsfield, *Cat. Mammal. Mus. India Co.*, : 135 (Darjeeling district, West Bengal, India).

Common name : Hodgson's Brown-toothed Shrew (Eng.).

Material examined : North Sikkim : 1M, 1F, Lachen (c 2682m), coll. C. A. Crump, 23. XII. 1914, 1. 1. 1915.

Measurements : **External** : 1M, H & B 65; T1 63; Hf 14; E 8. 1F : H & B 65; T1 63; Hf 13; E 8. **Cranial** : Nil.

Distribution : India : Northern Uttar Pradesh, Sikkim and northern West Bengal. Besides Lachen, Wroughton (1916) also recorded the species from Chunthang in North Sikkim.

Elsewhere : Northern Myanmar.

Diagnostic characters : As mentioned in the key to the species above.

Remarks : This species is close to *Soriculus macrurus* (with which it is widely sympatric) in skull and body-size but the tail is shorter, being equal to or less than head and body length. The skull of *caudatus* differs from *macrurus* in its rostrum being longer than wide rather than quadrate in the latter species (Hoffmann 1986).

5. *Soriculus macrurus* Blanford

1888. *Soriculus macrurus* Blanford, *Fauna Brit. India, Mammalia, Part I* : 231 (Darjeeling district, West Bengal, India).

Common name : Indian Long-toothed Shrew (Eng.).

Material examined : North Sikkim : 1M, Lachen (c 2682m), coll. C. A. Crump, 26. XII. 1914.

Measurements : **External** : 1M : H & B 59; T1 92; Hf 16; E 9.

Diagnostic characters : Moderate-sized shrew, with pale grey pelage and a very long tail (more

than 140% of head and body length). Skull small, with short and broad rostrum; tip of all teeth except m^3 orange; i^1 having a prominent cingulum.

Distribution : India : Sikkim and northern West Bengal. Wroughton (1916) also recorded this species from Chunthang in North Sikkim.

Elsewhere : Nepal, Myanmar and China.

Remarks : Ellerman and Morrison-Scott (1951) put all the pale grey, long-tailed shrews belonging to the genus *Soriculus* under the species *S. leucops* Horsfield and synonymised *S. macrurus* with it. But, later, it was found that the type specimen of *S. leucops* is a large dark brown shrew, with the tail slightly longer than its body; whereas the type of *S. macrurus* Blanford is relatively pale grey, with a very long tail. Hence, Hoffmann (1986) revived the species *S. macrurus* Blanford and put all the long-tailed form under it.

Genus *Suncus* Ehrenberg, 1833

One species and subspecies of the genus *Suncus* namely, *Suncus murinus soccatus* is reported from Sikkim.

6. *Suncus murinus soccatus* (Hodgson)

1845. *Sorex soccatus* Hodgson, *Ann. Mag. nat. Hist.*, 15 : 270 (Central Nepal).

Common name : House Shrew (Eng.).

Material examined : 2M, 2F, Rongli, coll. C. A. Crump, 21-22. XI. 1914.

Measurements : **External** : 2M : H & B 117, 119; T1 65, 68; Hf 19, 20; E 12, 12.

Cranial : 2M : l 30.5-34.2 (32.3); pl 15.6-16.8 (16.2); cw 12.3-13.7 (13.0); nw 9.8-10.6 (10.2); TR 14.0-15.2 (14.6). 1M : l 30.5; pl 15.1; cw 12.5, mw 9.4, TR 13.8.

Diagnostic characters : Dorsal colour slaty brown; fur long, usually more than 8 mm in length.

Distribution : India : Sikkim, northern West Bengal, Arunachal Pradesh, Meghalaya, Assam and Nagaland.

Elsewhere : Nepal and Bhutan.

Genus *Chimarrogale* Anderson, 1877

The genus *Chimarrogale* is represented by three species of which one, namely, *C. himalayica* occurs in Sikkim.

7. *Chimarrogale himalayica* (Gray)

1842. *Crossopus himalayicus* Gray, *Ann. Mag. nat. Hist.*, 10 : 261 (Chamba, Himachal Pradesh, India).

Common name : Himalayan Water Shrew (Eng.).

Material examined : 1M, Rongli, coll. C. A. Crump, 21.XI. 1921.

Measurements : *External* : 1M : H & B 108; T1 92; Hf 23; E 7.

Diagnostic characters : Large shrew, head and body length 80-120mm and the tail 60-98mm. Body slaty brown above, paler below; tail bicoloured and thinly clad with short whitish hairs; ear conch hairy and entirely concealed by fur.

Distribution : India : Jammu and Kashmir, Himachal Pradesh, Sikkim and northern West Bengal.

Elsewhere : Myanmar, China, Borneo, Taiwan and Japan.

Remarks : Ellerman and Morrison-Scott (1951) treated *himalayica* as a subspecies of *C. platycephala*. But Corbet (1978) treated it as a full species.

Genus *Nectogale* Milne Edwards, 1870

The genus *Nectogale* is represented by a single species, *Nectogale elegans*. Out of the two subspecies, one occurs in Sikkim.

8. *Nectogale elegans sikhimensis* de Winton & Styan

1899. *Nectogale sikhimensis* de Winton & Styan, *Proc. zool. Soc Lond.*, 573 (Lathong c 3048m, Sikkim).

Common name : Szechuan Water-Shrew (Eng.).

Material examined : North Sikkim : 2M, Chunthang (c 1630m), coll. C. A. Crump, July

1914, 12.I.1915; 1M, 1F, Yumthang (c 3382m), coll. S. M. Ali, 4. VIII. 1978, 7. VIII. 1978.

Measurements : *External* : 1M : H & B 105; T1 111, Hf 25. 1F : H & B 95 ; T1 115 ; Hf 25. *Cranial* : 2M : *l* 25.0, 25.3; *on* 21.7, 22.5; *pl* 12.2, 12.7; *mw* 15.3, 15.5; *iw* 6.1, 6.3; *i*¹ – *m*³ 11.2, 11.3; *ml* 13.6, 14.0.

Diagnostic characters : A large shrew, head and body 90-128 mm and the tail 89-110mm in length. Body slaty grey with silvery gloss; toes webbed; pads on soles of feet enlarged into broad discs; fringes of white hairs present on sides, lower surface and terminal portion of the tail.

Distribution : India : Sikkim and northern West Bengal.

Elsewhere : Nepal and Bhutan.

Order CHIROPTERA

Chiroptera is the only order of mammals which has wings and is capable of undertaking true flight. It has two suborders, namely, Megachiroptera and Microchiroptera.

Suborder MEGACHIROPTERA

Family PTEROPODIDAE

The family Pteropodidae is characterised by the absence of both nose-leaf and tragus. Four genera of this family are known from Sikkim, namely, *Cynopterus*, *Sphaerias*, *Eonycteris* and *Rousettus*, each represented by a single species or subspecies.

Key to the genera and species of the family PTEROPODIDAE

1. Index finger possesses a claw 2
 Index finger devoid of a claw *Eonycteris*
2. Five upper and six lower cheekteeth present *Rousettus*
 Four upper and five lower cheekteeth present 3

3. Calcar present *Cynopterus*
 Calcar absent *Sphaerias*

Genus *Rousettus* Gray, 1821

The genus *Rousettus* is represented by a single species and subspecies in Sikkim.

9. *Rousettus leschenaulti leschenaulti* (Desmarest)

1820. *Pteropus leschenaulti* Desmarest, *Encycl. Meth. Mammal.*, 1 : 10 (Pondicherry, India).

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

Material examined : North Sikkim : 1M, 1F, Hedyang (c 1950m), coll. R. K. Ghose.

Measurements : **External** : 1M : Fa 84; E 22; Tb 41.2; F & cl 24.0. 1F : Fa 76; E 18; Tb 35.2; F & cl 24. **Cranial** : 1M : 1 37.9; cb 37.0; cr 11.5; mtr 162; zw 24.0.

Diagnostic characters : A medium-sized fruit bat (forearm around 80 mm), with longish muzzle, large eyes and reduced tail. Dorsum light brown; back of neck and shoulders sparsely haired; five upper and six lower cheekteeth present.

Distribution : India : Throughout the mainland including Sikkim.

Elsewhere : Pakistan, Sri Lanka, Nepal, Bhutan, Burma, S. China, Hong Kong, Thailand, Laos, Possibly Kampuchea and Vietnam.

Genus *Sphaerias* Miller, 1906

The genus *Sphaerias* is represented by only one species, namely, *S. blanfordi*.

10. *Sphaerias blanfordi* (Thomas)

1891. *Cynopterus blanfordi* Thomas, *Ann. Mus. Civ. Stor. nat. Genova*, 2, 10 : 884, 921-922, pl XI, figs 1-2 (Leito, Cheba, Karen Hills c 1000m, Myanmar).

Common name : Blanford's Fruit Bat (Eng.).

Material examined : East Sikkim : 5M, 4F, Tumin (c 1800m), coll. V. C. Agrawal, 24-28. IX. 1988.

Measurements : **External** : 5M : H & B 66-77

(72); Fa 50-52 (51); E 15-17 (16); Tb 18.5-20.5; F&cl 12-13 (12.4). 4M : H&B 71-74 (73); Fa 50-52 (51.£); E 15-18(17); Tb 18-20 (19); F&cl 12-13 (12).

Diagnostic characters : A small (forearm around 50 mm) fruit bat, without external tail and calcar; interfemoral membrane covered with soft, dense hairs and extends along the femur and upper part of tibia as a narrow stripe.

Distribution : India : Sikkim, West Bengal, Uttar Pradesh and Arunachal Pradesh.

Elsewhere : Nepal, Bhutan, China, Burma and Thailand.

Genus *Eonycteris* Dobson, 1873

The genus *Eonycteris* is represented by a single species in Sikkim.

11. *Eonycteris spelaea* (Dobson)

1871. *Macroglossus spelaeus* Dobson, *Proc. Asiat. Soc. Bengal*, 105, 106 (Farm Caves, Moulmein, Tenasserim, Myanmar).

Common name : Dobson's Long-tongued Fruit Bat (Eng.).

Material examined : Sikkim : 1M (subadult), coll. S. Mistry, 13. VIII. 1990.

Measurements : **External** : 1M : H & B 92, T1 11; F&cl 18; E 16; Fa 59; Tb 24.

Diagnostic characters : A medium-sized fruit bat, with a very long tongue, and index finger without a claw. Cheekteeth five in upper and six in lower jaw, on each side.

Distribution : India : Sikkim (Mistry 1991), Himachal Pradesh, northern Uttar Pradesh, Arunachal Pradesh and Andaman Island.

Elsewhere : Myanmar east to the Philippines and China.

Remarks : Mistry (1991) reported this species for the first time from Sikkim.

Genus *Cynopterus* F. Cuvier

The genus *Cynopterus* is represented by a single species and subspecies in Sikkim.

12. *Cynopterus sphinx* (Vahl)

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

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

Material examined : 2M, Sikkim, coll. S. Mistry, 17, 21.VIII. 1990.

Measurements : *External* : 2M : Fa 66.5, 69.1; Tl 9.1, 11.2; E 18.5, 18.8; F & cl 14.7, 15.9; Tb 25.5, 25.5. *Cranial* : 2M : I 31.4, 31.6; cb 29.4, 29.6; ccl 28.9, 28.9; cw 13.1, 13.3; mtr 10.6, 11.0; $m^3 - m^3$ 9.5, 9.6; zw 19.5, 20.0; iw 6.3, 6.8; $c^1 - c^1$ 6.5, 6.7; ml 22.0, 22.7.

Diagnostic characters : A medium-sized fruit bat (forearm around 70 mm), with white margins to ears; metacarpals and phalanges whitish. Dorsum from grey to greyish brown, paler ventrally, often with a broad rufescent area around the shoulders; tail reduced.

Distribution : India : Widely distributed throughout India including Sikkim.

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

Remarks : Mistry (1991) recorded this species for the first time from Sikkim.

Suborder MICROCHIROPTERA

The suborder Microchiroptera is represented in Sikkim by three families.

Key to the families of the suborder
MICROCHIROPTERA

1. Nose leaf present; tragus absent
..... RHINOLOPHIDAE
Nose leaf absent; tragus present 2
2. Tail entirely enclosed in interfemoral membrane VESPERTILIONIDAE
Distal portion of tail free from interfemoral membrane, emerging from its upper surface EMBALLONURIDAE

Family EMBALLONURIDAE

One genus of the family Emballonuridae is reported from Sikkim.

Genus *Taphozous* E. Geoffroy, 1818

The genus *Taphozous* is represented by a single species and subspecies in Sikkim.

13. *Taphozous nudiventris kachhensis* Dobson

1872. *Taphozous kachhensis* Dobson, *J. Asiat. Soc. Bengal*, 41 (pt 2) : 221 (Kutch district, Gujarat, India).

Common name : Naked-bellied Tomb Bat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Larger than *Taphozous longimanus* in size. Dorsum greyish brown. A small radio-metacarpal pouch present but gular sacs absent in both sexes.

Distribution : India : Sikkim (Ellerman & Morrison-Scott 1951), West Bengal, extending south to Karnataka in India.

Elsewhere : Pakistan.

Family RHINOLOPHIDAE

Small to rather large-sized bats, with complicated nose-leaf, large ears, small eyes, tail almost entirely enclosed in the interfemoral membrane, and devoid of tragus.

This family consists of two subfamilies.

Subfamily RHINOLOPHINAE

The subfamily Rhinolophinae consists of a single genus *Rhinolophus*.

Genus *Rhinolophus* Lacepede, 1799

Horse-shoe of the nose-leaf has a median notch and partially or completely covers the muzzle. Basal portion of outer margin of ears deeply notched to form a distinct antitragus.

Three species of the genus *Rhinolophus* are reported from Sikkim.

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

1. Connecting process of nose-leaf lies beneath the top of sella *R. Pearsoni*
Connecting process of nose-leaf as high or higher than top of sella 2
2. Metacarpals of all phalanges long, more than 73% of forearm length *R. Rouxi*
Metacarpals of all phalanges short, less than 73% of forearm length *R. Ferrumequinum*

14. *Rhinolophus rouxi rouxi* Temminck

1835. *Rhinolophus rouxi* Temminck, *Monogr. Mammal.*, 2 : 306 (Pondicherry and Calcutta, India).

Common name : Rufous Horse-shoe Bat (Eng.).

Material examined : East Sikkim : 1M, Tumin (c 1800m), coll. V. C. Agrawal, 24.IX.1988.

Measurements : External : 1M : H & B 60; TI 27; E 6.0; Fa 48; Tb 18; F & cl 11.

Diagnostic characters : As mentioned in the key to species above.

Distribution : India : Sikkim, West Bengal, throughout the Himalayas, South to Karnataka and Tamil Nadu.

Elsewhere : Nepal, Sri Lanka and Myanmar.

Remarks : This specimen constitutes the first record of the species from Sikkim.

15. *Rhinolophus pearsoni* Horsfield

1851. *Rhinolophus pearsoni* Horsfield, *Cat. Mammal. Mus. E. India Co.* : 33 (Darjeeling, West Bengal).

Common name : Pearson's Horse-shoe Bat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A medium-sized (forearm 50-55mm) horse-shoe bat, with broad

horse-shoe which completely covers the muzzle; sella not trifoliate.

Distribution : India : Sikkim (Hill 1987).

Elsewhere : Ranges from Nepal, east to Vietnam and South China, and southeast to Malaysia.

Remarks : Hill (1987) reported this species from Sikkim.

16. *Rhinolophus ferrumequinum tragatus* Hodgson

1835. *Rhinolophus tragatus* Hodgson, *J. Asiat. Soc. Bengal*, 4 : 669 (Nepal)..

Common name : Greater Horse-shoe Bat (Eng.).

Material examined : North Sikkim : 1M, 2F, Lachen (c 3048), coll. S. Chattopadhyay, 2. VIII. 1989.

Measurements : External : 2F : Fa 59.9, 61.8; TI 34.0, 39.5; Tb 26.3, 27.2; F & cl 12.1, 12.9; E 21.2, 23.9. Cranial : 2M : l 25.7, 26.3; cb 23.0, 23.6; cr 6.8; 7.4; cw 9.3, 9.5; mtr 9.4, 9.5; m³-m³ 9.3, 9.3; zw 13.0, 13.3; c¹ - c¹ 6.1-6.4; iw 2.8, 2.9; ml 17.3, 17.4.

Diagnostic characters : Skull large; on an average condylobasal length, maxillary width, upper tooth row and mandibular length 20, 9.0, 9.0, and 16 mm respectively.

Distribution : India : Sikkim, Himachal Pradesh (Chakraborty 1976) and Nagaland.

Elsewhere : China (Yunnan).

Remarks : Recently, Sinha (1973) and Chakraborty (1976) have discussed the taxonomic status of this species and subspecies in detail. Out of the two valid subspecies, *tragatus* occurs eastwards from Himachal Pradesh to Yunnan (China), and *proximus* westwards from Jammu & Kashmir to Iran through Pakistan.

Subfamily HIPPOSIDERINAE

One genus of the family Emballonuridae is reported from Sikkim.

Genus *Hipposideros* Gray, 1831

Anterior nose-leaf does not have a median notch; no distinct antitragus present.

Two species are reported from Sikkim.

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

Size large (forearm above 80 mm).
..... *H. Armiger*

Size small (forearm less than 45 mm)
..... *H. Pomona Gentilis*

17. *Hipposideros armiger armiger* (Hodgson)

1835. *Rhinolophus armiger* Hodgson, *J. Asiat. Soc. Bengal*,
4 : 699 (Nepal).

Common name : Great Himalayan Leaf-nosed
Bat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : As mentioned in the
key to species above.

Distribution : India : Sikkim (Blanford 1888-
91), West Bengal (Darjeeling), Assam, Meghalaya
and Uttar Pradesh.

Elsewhere : Nepal, Myanmar, SE China,
Thailand, Malaysia and Vietnam (Hill 1963).

Remarks : This species was reported by
Blanford (1888-91) to occur in Nepal and Sikkim.
The distribution of *H. a. armiger*, as given above,
is based on Hill (1963).

18. *Hipposideros pomona gentilis* Anderson

1918. *Hipposideros gentilis* Anderson, *Ann. Mag. nat. Hist.*,
2 : 380, 381 (Thayetmyo, Myanmar).

Common name : None.

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Posterior part of vomer
thickened; first lower premolar not reduced, length
more than one-half of second lower premolar.

Distribution : India : Sikkim, West Bengal
(Darjeeling district), Arunachal Pradesh, Assam
and Meghalaya.

Elsewhere : Myanmar, peninsular Malaysia,
Thailand and Vietnam (Hill *et al.* 1986).

Remarks : The specimens listed as
Hipposideros fulvus from Sikkim present in the
British Museum are actually of *Hipposideros*
pomona gentilis (Hill *et al.* 1986).

Family VESPERTILIONIDAE

Bats of the family Vespertilionidae have tragus
but no nose-leaf; tail subequal to forearm and
enclosed in interfemoral membrane from base to
tip.

Two subfamilies of family Vespertilionidae
occur in Sikkim.

**Key to the subfamilies of the family
VESPERTILIONIDAE**

Nostrils laterally elongated and tubular
..... MURININAE

Nostrils not elongated; second pharynx of third
finger not elongated
..... VESPERTILIONINAE

Subfamily MURININAE

The subfamily Murininae is represented by
two genera and three species in Sikkim.

**Key to the genera of the subfamily
MURININAE**

Last upper molar normal in size
..... *Murina*

Last upper molar reduced, often deciduous ..
..... *Harpiocephalus*

Genus *Harpiocephalus* Gray, 1842

The genus *Harpiocephalus* is represented in
Sikkim by a single species.

19. *Harpiocephalus harpia lasyurus* (Hodgson)

1847. *Noctulinia lasyura* Hodgson, *J. Asiat. Soc. Bengal*,
16 : 896

Common name : Hairy winged Bat (Eng.).

Material examined : Sikkim : 1F, Rivers Tackchom and Ro Ro, coll. P. R. MacLaren, 25. V. 1946.

Measurements : External : 1F : Fa 46.6; Tb 19.3; F & cl 10.7. Cranial : 1F : l 20.5; cb 19.9; ccl 19.7; pl 8.6; c-m³ 7.0; c-c 6.9; mw 7.4; zw 14.5; iw 5.5; cw 10.0.

Diagnostic characters : Larger than the tube-nosed bat; fur thick and woolly, extending to legs, tail, feet and interfemoral membrane. Colour bright rufous above, greyish buff below.

Distribution : India : Sikkim (Das 1986), West Bengal, Meghalaya, Tamil Nadu and Kerala.

Remarks : Das (1986) synonymised *H. h. madrassius* with *H. h. lasyurus*, with which the present authors agree.

Genus *Murina* Gray, 1842

Two species of the genus *Murina* occur in Sikkim

Key to the species of the genus *Murina*

Body colour rufous brown above, greyish below *M. Cyclotis*

Body colour black above, white below
..... *M. Aurata*

20. *Murina cyclotis cyclotis* Dobson

1872. *Murina cyclotis* Dobson, *Proc. Asiat. Soc. Bengal*, : 210 (Darjeeling district, West Bengal, India).

Common name : Round-eared Tube-nosed Bat (Eng.).

Material examined : North Sikkim : 1F, Yumthang (c 3680m), coll. S. M. Ali, 27. VIII. 1978.

Measurements : External : 1F : Fa 34; E 13.6; F & cl. 7.5; Tb 17.5. Cranial : 1F : l 17.3; cb 15.2; ccl 14.9; cw 7.9; mtr 5.9; ltr 6.8; zw 9.8; iw 4.7; m - m 5.8; c - c 4.4.

Diagnostic characters : A small bat, with diverging tubular nostrils opening laterally,

circular ears and long tragus. Body rufous brown above, greyish below; forearm, tail, leg, foot and interfemoral membrane clothed with golden brown hairs.

Distribution : India : Sikkim, West Bengal (Darjeeling district), Meghalaya and Andhra Pradesh (Ghosh 1989).

Elsewhere : Myanmar, Thailand, Laos, Vietnam, S. China and the Philippines.

21. *Murina aurata aurata* Milne Edwards

1872. *Murina aurata* Milne Edwards, *Rech. H. N. Mamm.*, 250, pl 37b, fig. 1 (Moupin, Szechuan, China).

Common name : Little Tube-nosed Bat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : First upper premolar smaller than second; upper one-third of outer margin of ear-conch convex or straight. Colour black above, with golden yellow tips; white below.

Distribution : India : Sikkim (Ellerman & Morrison-Scott 1951).

Elsewhere : Nepal to SW. China.

Subfamily VESPERTILIONINAE

Key to the genera of the subfamily VESPERTILIONINAE

1. Cheekteeth six on each side of upper and lower jaws *Myotis*
Cheekteeth less than six on each side of upper and lower jaws 2
2. Upper premolars two and lower three on each side *Plecotus*
Upper and lower premolars two on each side 3
3. Fifth finger a little longer than metacarpals of fourth and third *Nyctalus*
Fifth finger much longer than metacarpals of fourth and third 4

4. Ears joined *Barbastella*
 Ears separate *Pipistrellus*

Genus *Myotis* Kaup, 1829

Two species of the genus *Myotis* occur in Sikkim

22. *Myotis siligorensis siligorensis* (Horsfield)

1855. *Vespertilio siligorensis* Horsfield, *Ann. Mag. nat. Hist.*, 16 : 102 (Siliguri, Darjeeling district, West Bengal, India).

Common name : None.

Material examined : North Sikkim : 1M, Mangan (c 1524m), coll. A. G. K. Menon, 11.V.1959. West Sikkim : 1F, Yaksum (c 1754m), coll. R. K. Ghose, 24. IV. 1982; 4M, 9F, Bakhim (c 2743m), coll. S. Chattopadhyay, 15. VI. 1990.

Measurements : *External* : 4M : Fa 33.7-35.8 (34.7); Tb 12.6-13.5 (12.9); F & cl 6.9-7.7 (7.3); E 9.7-9.8 (9.75). 9M : Fa 33.7-37.2 (35.3); Tb 12.5-13.9 (13.3); F & cl 6.7-7.4 (7.0); E 9.1-11.8 (10.6). *Cranial* : 1M : l 13.1; cb 12.3; cw 6.3; cr 4.7; mtr 4.9; $m^3 - m^3$ 5.1; zw 8.0; iw 3.6; $c^1 - c^1$ 3.0; ml 9.0. 1M : l 13.9; cb 12.9; cw 6.4; cr 4.9; mtr 5.2; $m^3 - m^3$ 5.1; zw 7.8; iw 3.4; $c^1 - c^1$ 2.9; ml 9.4.

Diagnostic characters : Size small (forearm length less than 40 mm); body dark brown above and below; ears with distinct antitragal lobe; tragus long and pointed, about half the length of ears; tail-tip free; lower canine about equal in height to posterior lower molar.

Distribution : India : West Bengal, Meghalaya, and Sikkim.

Elsewhere : Nepal.

23. *Myotis muricola caliginosus* (Tomes)

1859. *Vespertilio caliginosus* Tomes, *Proc. zool. Soc. Lond.*, : 73 (Simla to Sikkim).

Common name : None.

Material examined : North Sikkim : 1M, 1F, Lachung (c 2438m), coll. W. T. Blanford (type of *Vespertilio blanfordi*); 1F, Lachen (c 3408m), coll. H. C. Ghosh, 11.X.1979.

Measurements : *External* : 1F : Fa 36.4; Tb 12.0; F & cl 6.9; E 12.4; tr 6.4. *Cranial* : 1F : l 13.8; cb 13.0; ccl 12.1; cw 6.4; mtr 5.2; $m^3 - m^3$ 5.5; zw 8.0; iw 3.4; $c^1 - c^1$ 3.1; ml 9.8.

Diagnostic characters : Size small (forearm less than 40 mm); dorsal pelage dark brown, tipped with shiny brown; ventral pelage tipped with ochraceous brown as against white in *M. m. mystacinus*.

Distribution : India : Jammu & Kashmir, Himachal Pradesh and Sikkim.

Elsewhere : Pakistan.

Remarks : Ellerman & Morrison-Scott (1951) treated *muricola* and *caliginosus* as subspecies of *Myotis mystacinus*. Hill (1983), however, amplified the view of Corbet (1978) that *mystacinus* and *muricola* are distinct species and treated *caliginosus* as a subspecies of *muricola*. But the distribution of *M. muricola muricola* (Nepal to Borneo) and *M. muricola caliginosus* (Pakistan to Sikkim) overlaps, hence, the species needs a detailed study.

Genus *Plecotus* Geoffroy, 1818

One species and subspecies of the genus *Plecotus* occurs in Sikkim.

24. *Plecotus auritus homochrous* Hodgson

1847. *Plecotus homochrous* Hodgson, *J. Asiat. Soc. Bengal*, 16 : 895 (Nepal).

Common name : Long-eared Bat (Eng.).

Material examined : North Sikkim : 3M, Yumthang (c 3475 m), coll. S. M. Ali, 26.VIII. 1978; 1M, 1F, Yumthang, coll. S. Chattopadhyay, 2. VII. 1989; 14M, 5F, Thangu (c 3750m), coll. S. Chattopadhyay, 14.VII. 1989.

Measurements : *External* : 6M : Fa 39.6-40.6 (40.2); Tb 18.5-20.3 (19.3); F & cl 8.0-9.2 (8.7); E 33.4-38.3 (36.0). 4M : Fa 39.8-42.1 (41.3); Tb 19.0-20.9 (19.6); F & cl 7.8-8.8 (8.4); E 35.2-38.5 (36.2). *Cranial* : 2M, l 16.4, 16.6; cb 14.7, 15.1; cw 7.2, 7.6; cr 3.4, 3.6; mtr 5.1, 5.2 $c^1 - c^1$

2.9, 3.1; *ccl* 14.0, 14.5; *ml* 9.8. 1M : *l* 16.9; *cb* 15.5; *cw* 7.5; *cr* 4.0; *mtr* 5.4; m^3-m^3 5.9; *zw* 8.4; *iw* 3.5; *ccl* 14.7; $c^1 - c^1$ 3.0; *ml* 10.3.

Diagnostic characters : A medium-sized bat, with very long ears., more than three-fourths of the length of forearm; tragus very long. Body greyish brown above, dirty white below.

Distribution : India : Sikkim, West Bengal (Darjeeling district), Meghalaya, Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir.

Elsewhere : Pakistan and Nepal.

Genus *Nyctalus* Bowdich, 1825

One species and subspecies of the genus *Nyctalus* is found in Sikkim.

25. *Nyctalus noctula labiatus* (Hodgson)

1835. *Vespertilio labiata* Hodgson, *J. Asiat. Soc. Bengal*, 4 : 700 (Nepal).

Common name : Noctula Bat (Eng.).

Material examined : Sikkim, 1F, coll. S. Mistry, 21. VIII. 1990.

Measurements : **External** : 1F; *Fa* 52.0; *Tb* 23.0; *F & cl* 9.7; *E* 11.1; *Tr* 6. **Cranial** : 1F : *l* 18.3; *cb* 17.9; m^3-m^3 8.2; *mtr* 7.3; *iw* 4.9; c^1-c^1 6.8; *ml* 13.4.

Diagnostic characters : Ears nearly as broad as long, tip broadly rounded; outer margin in front of tragus forms thickened convex lobe; tragus short and curved towards the tip, with a small triangular projection at base; nostrils wide apart. Dorsum yellowish brown, venter paler. Outer incisors, shortly tip directed inwards.

Distribution : India : Sikkim, West Bengal (Darjeeling district), Nagaland, Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir.

Elsewhere : Pakistan, Nepal and Myanmar.

Genus *Pipistrellus* Kaup, 1829

Only one species of the genus *Pipistrellus* is reported from Sikkim.

26. *Pipistrellus coromandra coromandra* (Gray)

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

Common name : Indian Pipistrelle (Eng.).

Material examined : East Sikkim : 1M, Pentong (c 1524m), Gangtok, coll. C. A. Crump, 29.I.1915.

Measurements : **External** : 1M : *Fa* 30.8; *Tl* 31.0; *E* 11.0; *F & cl* 6.4; *Tb* 11.4. **Cranial** : 1M : *l* 12.3. *cb* 11.6; *ccl* 11.2; *cw* 6.2; *iw* 3.4; *mtr* 3.9; m^3-m^3 5.2; c^1-c^1 3.5 ; *ml* 8.5.

Diagnostic characters : A small-sized pipistrelle (forearm about 31 mm in length), with dorsum blackish brown, tips of hairs rufescent; belly paler. Tragus curving forward and bluntly rounded.

Distribution : India : Sikkim, West Bengal and widely distributed throughout the mainland.

Elsewhere : Afghanistan, Pakistan, Nepal and Sri Lanka.

Genus *Barbastella* Gray, 1821

The genus *Barbastella* is represented in Sikkim by a single species.

27. *Barbastella leucomelas darjelingensis* (Hodgson)

1855. *Plecotus darjelingensis* Hodgson, in Horsfield, *Ann. Mag. nat. Hist.*, (2) 16 : 103 (Darjeeling, West Bengal, India).

Common name : Eastern Barbastell (Eng.).

Material examined : North Sikkim : 1F, Lachung (c 2438m), coll. W. T. Blanford 1872.

Measurements : **External** : 1F, *Fa* 40.6; *Tl* 43.4; *E* 15.7; *F&cl* 7.1; *Tb* 20.1. **Cranial** : 1F : *l* 15.3; *cb* 14.1; *ccl* 13.7; *iw* 3.9; *mtr* 4.8; m^3-m^3 5.6; c^1-c^1 3.2; *cw* 7.3.

Diagnostic characters : A medium-sized bat (forearm about 40 mm in length), with large, squarish, forwardly slanting ears; tragus half the length of ear, and triangular. Dorsal fur of body long, silky with blackish grey base and pale golden brown tips. Two dark lines present on interfemoral membrane from heel to base of pelvis.

Distribution : India : Sikkim, West Bengal, Meghalaya, Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir and Rajasthan.

Elsewhere : U.S.S.R., Afghanistan, Pakistan, Nepal, W. China and Japan.

According to Mistry (1991), three more species of fruit bats namely, *Macroglossus sobrinus*, *Megaerops niphanae* and *Pteropus giganteus* are likely to occur in Sikkim. Since he has not mentioned the locality where the above mentioned species were located or collected, these can not be taken as authentic records.

Order PRIMATES

Out of three families of the order Primates occurring in India, only a single family Cercopithecidae occurs in Sikkim.

Family CERCOPITHECIDAE

Two genera, namely, *Macaca* and *Presbytis* occur in Sikkim.

Key to the genera of family CERCOPITHECIDAE

Face red; Cheek pouches present; tail generally smaller than head and body ***Macaca***

Face black; cheek pouches absent; tail longer than head and body ***Presbytis***

Genus *Macaca* Lacepede

One species and subspecies of the genus *Macaca* is reported from Sikkim.

28. *Macaca assamensis pelops* Hodgson

1840. *Macacus (Pithecus) pelops* Hodgson, *J. Asiat. Soc. Bengal*, 9 : 1213 (Nepal).

Common name : Assamese Macaque (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Hindquarter of the body not brightly coloured than the forequarter;

buttocks clad up to the callosities; tail more than one-half of head and body length (Plate 2).

Distribution : India : Sikkim, West Bengal as far east as the greater bend of Brahmaputra river.

Elsewhere : Nepal, Bhutan and Bangladesh.

Remarks : Wroughton (1916) reported this species from Chunthang, Dikchu and Rongli valley of Sikkim. A party of the Zoological Survey of India observed a troop of this species at Geyzing (Biswas *et al.* 1985) and another near Singtam (c 300 m).

Genus *Presbytis* Eschscholtz., 1821

Out of five Indian species of the genus *Presbytis*, one, namely, *Presbytis entellus* occurs in Sikkim.

29. *Presbytis entellus schistaceus* (Hodgson)

1840. *Semnopithecus schistaceus* Hodgson, *J. Asiat. Soc. Bengal*, 9 : 1212 (Nepal Terai).

Common name : Hanuman Langur (Eng.).

Material examined : 2ex., Sikkim, coll. L. Mandelli, November 1875.

Measurements : Nil.

Diagnostic characters : Body except head dark slaty, darkest on the outer side of forelimbs and blackish on fingers; had off white; chin, throat and underparts yellowish; tail concolorous with back, becoming darker towards tip.

Distribution : India : Sikkim and northern Uttar Pradesh.

Elsewhere : Nepal.

Remarks : The above mentioned specimens were identified by Anderson (1881) as *P. e. schistaceus* (Hodgson). Khajuria (1954) however, identified them as of *P. e. achilles* (Pocock).

Wroughton (1916) reported this subspecies from Chuntang and Lachen, both in North Sikkim. A party of the Zoological Survey of India, however observed it at Yumthang (c 3382m) in August 1978.

Order CARNIVORA

Six families of the order Carnivora is represented in Sikkim.

Family CANIDAE

The family Canidae is represented, in Sikkim, by three genera.

Key to the genera of the family CANIDAE

1. No frontal sinus; postorbital process concave above; tail more than one-half of head and body length *Vulpes*
 A frontal sinus present; postorbital process smooth and convex above; tail less than one-half of head and body 2
2. Seven teeth in lower molar series *Canis*
 Six teeth in lower molar series *Cuon*

Genus *Canis* Linnaeus, 1758

One species of the genus *Canis* is reported from Sikkim.

30. *Canis aureus* Linnaeus

1758. *Canis aureus* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 40 (Iran).

Common name : Asiatic Jackal (Eng.).

Material examined : Nil.

Measurements : Nil.

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

Distribution : India : Throughout India including Sikkim (Wroughton 1916).

Remarks : The jackal was seen at Yaksum, Geyzing and Pelling in April, 1982 (Biswas and Ghose 1982), at Kabi, Gangtok and Geyzing in January, 1983 (Biswas *et al.* 1985), and at Tumin village, Phambang Lho wildlife sanctuary in September, 1988 by one of the authors.

Genus *Cuon* Hodgson, 1838

The genus *Cuon* is represented by one species, *Cuon alpinus* (Pallas). Out of nine subspecies, one occurs in Sikkim.

31. *Cuon alpinus primaevus* (Hodgson)

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

Common name : Indian Wild Dog (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Domestic dog like in appearance, with long, lanky body and short in legs and muzzle. Ears round and tail-tip bushy. Body deep red in colour.

Distribution : India : Northern Uttar Pradesh, Sikkim (Ellerman & Morrison-Scott 1951) and West Bengal (Agrawal *et al.* 1992).

Elsewhere : Nepal and Bhutan.

Remarks : No specimen of this species could be seen during recent surveys of Sikkim by any of the Zoological Survey of India parties.

Genus *Vulpes* Oken, 1816

One species of the genus *Vulpes* is reported from Sikkim.

32. *Vulpes vulpes montana* (Pearson)

1836. *Canis vulpes montana* Pearson, *J. Asiat. Soc. Bengal*, 5 : 313 (Himalayas).

Common name : Himalayan Red Fox (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A richly coloured fox, with long woolly fur. The back side of the upper half of ears black, and tail-tip white.

Distribution : India : From Jammu and Kashmir to northern Uttar Pradesh and Sikkim (Ellerman & Morrison-Scott 1951).

Elsewhere : Nepal, and China.

Remarks : This species is reported to occur in Sikkim (*vide* Ellerman & Morrison-Scott 1951), but no specimen of the same could be seen by any of the ZSI parties.

Family VIVERRIDAE

Four genera of the family Viverridae occur in Sikkim.

Key to the genera of the family VIVERRIDAE

1. Scent glands absent; m¹ small m² absent and m₁ with small heel **Prionodon**
Scent glands present; m¹ large, m² present and m₁ with large heel 2
2. Feet terrestrial; digitigrade; metatarsal pads absent; hindfoot hairy from heel downwards; anterior edge of ears widely separated; a definite pattern of dorsal stripes and lateral spots present **Viverra**
Feet scansorial; semiplantigrade; metatarsal pads present; hind foot naked. 3
- 3 Tail prehensile; hindfoot naked throughout including the heel backs of ears clothed with long hairs projecting as tufts; coat long and shaggy **Arctictis**
Tail not prehensile; heel of hindfoot hairy; coat not long and shaggy; eartufts absent; no pattern of stripes or spots **Paguma**

Genus **Arctictis** Temminck, 1824

One species of the genus *Arctictis* occurs in Sikkim.

33. *Arctictis binturong* (Raffles)

1821. *Viverra binturong* Raffles, *Trans. Linn. Soc. Lond.*, 13 : 253 (Malacca).

Common name : Binturong (Eng.).

Material examined : Nil.

Measurements : Nil.

Distribution : India : Sikkim and Arunachal Pradesh.

Elsewhere : Nepal, Bhutan, east to Vietnam and southeast to Indonesia.

Remarks : A pair of binturong was observed in Menshithang (c 3150m) and one in Hee Gyathang (c 1800m) both in North Sikkim in January, 1982 (Biswas and Ghose 1982).

Genus **Paguma** Gray, 1831

The genus *Paguma* is represented by only one species, *P. larvata*.

34. *Paguma larvata grayii* Bennett

1835. *Paradoxurus grayii* Bennett, *Proc. zool. Soc. Lond.*, : 118 (India).

Common name : Himalayan Palm Civet (Eng.).

Material examined : South Sikkim : 1M, 1F, Sosing, coll. S. Chattopadhyay, 25.V.1990.

Measurements : *External* : 10 : H & B 595; Tl 540; Hf 90; E 50. 10 : H&B 606; Tl 565; Hf 90, E 45. *Cranial* : 1M : l 112.5; cb 110.9; iw 20.8; pow 20.0; zw 57.3; c¹ – c¹ 19.4; 1M : l 115.5; cb 114.2; iw 22.5; pow 21.0; zw 65.3; cl – c¹ 21.7; pm⁴ 8.1; m₁ 9.4.

Diagnostic characters : Body grey, grizzled with white throughout; underparts greyish white; whiskers white. No spots or stripes on the body. Tail more than two-thirds of the length of head and body, terminal one-third black. Palate extending from behind last upper molars (about 120 mm).

Distribution : India : Sikkim, West Bengal, Arunachal Pradesh and Uttar Pradesh.

Elsewhere : Nepal.

Remarks : The masked civet cat has also been sighted by a party of the Zoological Survey of India at Singhik (c 1400m), Hee Gyathang (c 1800m) in the North, Yaksum (c 1800m) in the West, and Naya Bazar (c 400 m) in South Sikkim (Biswas and Ghose 1982).

Genus **Prionodon** Horsfield, 1822

The genus *Prionodon* is represented by a single species, *Prionodon pardicolor*.

35. *Prionodon pardicolor pardicolor* Hodgson

1842. *Prionodon pardicolor* Hodgson, *Calcutta J. N. H.*, 2 : 57 (Nepal).

Common name : Spotted Linsang (Eng.).

Material examined : West Sikkim : 1M, Yaksum (c 1800 m).

Measurements : External : 1M : H&B 387; T1 151; Hf 62; E 44. Cranial : Nil.

Diagnostic characters : Body slender; limbs shorter; tail as long as the body and cylindrical; ears short and rounded. Body fulvous, with large black spots above, unspotted white below; tail with 8-10 dark rings, separated by pale rings, limbs spotted outside, feet pale brown, unspotted.

Distribution : India : Sikkim and NE India. According to Blanford (1888-91), this species is not rare in the interior of Sikkim, probably at moderate elevations.

Elsewhere : Nepal, Myanmar and SE China.

Remarks : Wroughton (1916) reported this species from Chunthang and Dikchu, both in North Sikkim. A party of the Zoological Survey of India, sighted a spotted linsang at Lima (c 2300 m) in December, 1981 (Biswas & Ghose 1982).

Genus *Viverra* Linnaeus, 1758

Out of three species under the genus *Viverra*, one species, namely, *Viverra zibetha* occurs in Sikkim.

36. *Viverra zibetha* Linnaeus

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

Common name : Large Indian Civet (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Body markings indistinct and cloudy; tail with complete dark and light rings. A crest of long erectile black hairs present on the back; anterior edge of ears widely

separated. Anterior upper molar distinctly triangular.

Distribution : India : Sikkim and northeastern India.

Elsewhere : Nepal, Bangladesh, Myanmar, Thailand, Vietnam, Malaysia and Singapore.

Remarks : One individual of the Large Indian Civet was observed at Singhik in December, 1981, and a few more at Naya Bazar, Pelling and Yaksum in April, 1982 (Biswas & Ghose 1982).

Family MUSTELIDAE

Four genera of the family Mustelidae occur in Sikkim.

Key to the genera of the family MUSTELIDAE

1. Adapted to semiaquatic life; tail thick and muscular; hindfoot wider than forefoot; digits extensively webbed, with well developed claws *Lutra*
Adapted to terrestrial life; feet adapted for running, climbing and digging; 2
2. Claws short, sharp and partially retractile; metatarsal pads absent 3
Claws strong, long and non-retractile; metatarsal pads present; snout hog-like.
..... *Arctonyx*
3. Muzzle, limbs and tail relatively longer; body less elongated and cylindrical; ears larger
..... *Martes*
Muzzle, limbs and tail shorter; body more elongated and cylindrical; ears smaller
..... *Mustela*

Genus *Martes* Pinel, 1792

37. *Martes flavigula flavigula* (Boddaert)

1785. *Mustela flavigula* Boddaert, *Elench. Anim.*, 88 (locality unknown, traditionally fixed as Nepal).

Common name : Yellow-throated Marten (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Head and body length 40-63 cm, with an equally long tail. Fur black on top of head, neck, outside of limbs and tail; sides of neck bright creamy yellow, sharply contrasting from upper side of it.

Distribution : India : West Bengal, Sikkim, Assam, Arunachal Pradesh, Nagaland, Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir,

Elsewhere : Afghanistan, Pakistan, Nepal, Bhutan. Myanmar and China.

Remarks : Wroughton (1916) reported this species from Chunthang in North Sikkim. A pair was sighted at Phodong (c 1500 m), also in North Sikkim, in January, 1982 (Biswas & Ghose 1982).

38. *Martes foina intermedia* (Severtzov)

1873. *Mustela intermedia* Severtzov, *Mem. Soc. Amis. Sci. Nat. Moscow*, 8, 2 : 61 (Basin of Chu, Eastern Turkestan).

Common name : Stone Marten (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Head and body length 40-45 cm; tail roughly half as long. Body dark reddish chestnut.

Distribution : India : Sikkim (Blanford 1888-91), Jammu & Kashmir, Uttar Pradesh and West Bengal.

Elsewhere : Iran, USSR, Pakistan, Afghanistan, and China.

Remarks : Blanford (1888-91) reported a specimen of stone marten from Upper Sikkim procured by the late Mr. Mandelli. However, no specimen was observed in recent surveys.

Genus *Mustela* Linnaeus, 1758

One species of the genus *Mustela* was collected from Sikkim

39. *Mustela sibirica subhimachalana* Hodgson

1837. *Mustela (Putorius) subhimachalana* Hodgson, *J. Asiat. Soc. Bengal*, 6 : 563 (Nepal).

Common name : Himalayan Weasel (Eng.).

Material examined : West Sikkim : 1F, Dzongri, coll. S. Chattopadhyay, 8.VI.1990.

Measurements : *External* : 1F : H&B 232; T1 114; Hf 38; E 19. *Cranial* : 1F : l 45.5; cb 45.3; iw 9.5; pow 10.5; m¹-m¹ 14.4; c¹-c¹ 8.2; cw 20.4; pm⁴ 5.0; m¹ 5.3; m¹ 23.3.

Diagnostic characters : Coat velvety brown throughout, muzzle darker; paler below; soles of feet hairy round the pads in all seasons.

Distribution : India : Sikkim (West and North Sikkim) and West Bengal.

Elsewhere : Nepal and Bhutan.

Remarks : Wroughton (1916) reported this species from Lachen and Lachung, both in North Sikkim. One individual was also sighted at Lachen and another at the Hot Spring near Yumthang in January, 1982 (Anon 1989).

The teat in the above collected specimen was milking which shows that it had delivered its litter only a few days earlier, probably in the month of May.

Genus *Arctonyx* F. Cuvier, 1825

One species of the genus *Arctonyx* occurs in Sikkim.

40. *Arctonyx collaris collaris* F. Cuvier

1825. *Arctonyx collaris* F. Cuvier, *Hist. nat. Mamm.*, 3 : 51 (Bhutan Duars, Jalpaiguri district, India).

Common name : Hog Badger (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Size small, head and body length 55-70 cm; squat bear-like body, stumpy legs and long powerful claws. Snout long like that of a hog, mobile and naked towards the tip.

Distribution : India : West Bengal, Sikkim (Blanford 1888-91), Assam, Arunachal Pradesh, Nagaland and Manipur.

Elsewhere : Nepal and Bangladesh.

Remarks : No specimen of this species could be seen during the recent surveys.

Genus *Lutra* Brunnich, 1771

One species of the genus *Lutra* is reported from Sikkim.

41. *Lutra lutra* (Linnaeus)

1758. *Mustela lutra* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 45 (Upsala, Sweden).

Common name : Common Otter (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Moderately large-sized species, head and body length 500-800 mm; claws well-developed, projecting beyond toe pad. Hindfoot moderate in length, reaching up to 122 mm. Dorsal hairs long, rough, brownish and grizzled; undersurface paler.

Distribution : The Himalayas from Jammu & Kashmir to Arunachal Pradesh including Sikkim, south up to the north of the River Ganga; also West Bengal and southern India.

Remarks : This species is reported from Dikchu valley in South Sikkim and Phadong and Chunthang in North Sikkim (Agrawal *et al.*, in press). It was also observed in large streams near Hee Gyathang (North Sikkim) and Melli (South Sikkim) in January, 1982 (Biswas and Ghose 1982).

Family URSIDAE

One genus and one species of bear is reported from Sikkim.

Genus *Selenarctos* Heude, 1901

This genus is represented by only one species, *S. thibetanus*.

42. *Selenarctos thibetanus* (G. Cuvier)

1823. *Ursus thibetanus* G. Cuvier, *Ossements Foss.* 4 : 325 (Sylhet, Bangladesh).

Common name : Asiatic Black Bear (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A large-sized bear, 140-190 cm in length; coat short, smooth and black; claws black; a V-shaped breast patch present, white or buff in colour.

Distribution : Found in the Himalayas from Jammu & Kashmir eastwards to Assam including Sikkim.

Remarks : A party of the Zoological Survey of India observed black bear at Yaksum and Pelling in West Sikkim in April, 1982 (Biswas & Ghose 1982).

Family AILURIDAE

This family is represented in India by one genus and a single species.

Genus *Ailurus* F. Cuvier, 1825

43. *Ailurus fulgens fulgens* Cuvier

1825. *Ailurus fulgens* F. Cuvier, *Hist. Nat. Mamm.*, 5(50) : 3 (Locality unknown).

Common name : Red Panda (Eng.).

Material examined : North Sikkim : 1M, Lachen (c 3048), coll. C. A. Crump, 31.XII. 1914.

Measurements : External : 1M : H & B ; Hf 110; E 71.

Diagnostic characters : Rounded head, stumpy muzzle, large pointed ears and hairy sole characterises this animal. Fur bright chestnut above; face and lower lip white; a red stripe runs from above the eye to gape; tail ringed.

Distribution : India : West Bengal, Sikkim (North and West Sikkim) and Arunachal Pradesh.

Elsewhere : Nepal.

Remarks : Wroughton (1916) reported Red Panda from Chunthang, Lachen and Lachung, all in North Sikkim. Although this species has become endangered but was seen by a party of the Zoological Survey of India at Chunthang, Menshithang and Lachung areas of North Sikkim and Yaksum (West Sikkim) in 1981-82 (Biswas & Ghose 1982).

Family FELIDAE

Three genera of the family Felidae are reported from Sikkim.

Key to genera of family FELIDAE

1. Hyoidean apparatus modified by the conversion of the median part of the suspender into a long elastic tendon; paws with complete claw sheaths ***Panthera***

Hyoidean apparatus having the suspender consisting of a chain of bones, jointed end to end 2

2. Skull long and low, with short, blunt, widely separated frontal and zygomatic processes; canines long and postcanine space large ***Neofelis***

Skull having long and well-developed postorbital processes; canines relatively short and postcanine space normal ***Felis***

Genus *Felis* Linnaeus, 1758

Four species of the genus *Felis* are reported from Sikkim.

44. *Felis chaus affinis* Gray

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

Common name : Jungle Cat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Fur sandy to yellowish grey and devoid of any spot; tail ringed with black towards the end and tipped black. Coat luxuriant in winter.

Distribution : This subspecies occurs from Jammu & Kashmir to Sikkim, possibly northeastern India (Ellerman & Morrison-Scott 1951).

Elsewhere : Nepal.

Remarks : Wroughton (1916) reported this species from Lachung and Chunthang, both in North Sikkim. No specimen of this species, however, could be observed by any of the ZSI's parties in Sikkim.

45. *Felis bengalensis horsfieldi* (Gray)

1842. *Leopardus horsfieldi* Gray. *Ann. Mag. nat. Hist.*, 10 : 260 (Bhutan).

Common name : Leopard Cat (Eng.).

Material examined : South Sikkim: 1M, Menam; 1M, Yaksum (c 1800 m).

Measurements : *External* : 1M : H & B 542; TI 275; Hf 115; E 43. 1M (Juv.) : H & B 387; TI 151; Hf 62; E 44. *Cranial* : 1M : l 91.5; cb 84.7; zw 64.7; iw 16.2; pow 28.8; c¹-c¹ 22.2; m¹-m¹ 38.6; pm 4 11.3; m₁ 8.3.

Diagnostic characters : About the size of a domestic cat but with longer legs; tail about half the length of head and body. Coat colour pale fulvous, ornamented above with well defined spots; white below

Distribution : India : From Jammu & Kashmir to Sikkim.

Elsewhere : Nepal and Bhutan.

Remarks : Leopard cats are commonly seen in Sikkim (Biswas & Ghose 1982; Biswas et al. 1985).

46. *Felis marmorata charltoni* Gray

1846. *Felis charltoni* Gray. *Ann. Mag. nat. Hist.*, 18 : 211 (Darjeeling, West Bengal, India).

Common name : Himalayan Marbled Cat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A small-sized cat, head and body length 45-48 cm; body covered with irregular blotches; black spots present on outside of limbs and upper surface of tail; ears rounded.

Distribution : India: Sikkim (Ellerman & Morrison-Scott 1951) to Arunachal Pradesh.

Elsewhere : Nepal, Bhutan and Myanmar.

Remarks : During field trips to Sikkim in the years 1982 and 1983, Biswas *et al.* (1985) were unable to locate any marbled cat there but observed pug-marks of a cat resembling those of a marbled cat at Rabdanche Reserve Forest, Pelling, West Sikkim. The sighting of a marbled cat on a tree near a stream by local people at Rangtalao near Chunthang (North Sikkim) has also been reported.

47. *Felis temmincki temmincki* Vigors & Horsfield

1827. *Felis temmincki* Vigors & Horsfield, *Zool. J.*, 3 : 451 (Sumatra).

Common name : Golden Cat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A medium to large-sized cat, head and body 76-84 cm. Coat golden brown, bright red or grey; ears brownish black on outer side, with an ill-defined pale central spot; distinct pattern of greyish lines present on shoulders and flanks; a horizontal white cheek stripe, sometime edged with black, runs below the eye to behind the gape.

Distribution : India : West Bengal, Sikkim (Prater 1980), and northeastern India.

Elsewhere : Nepal, Bangladesh, Burma, China, Malaysia, Indonesia and Vietnam.

Remarks : Very rare. No specimen could be located by any of the ZSI parties surveying Sikkim. However, Biswas *et al.* (1985) mentioned about a specimen of this cat, collected by the State Forest Department of Sikkim from Nagdok area (10 km S of Gangtok) and displayed in the museum of the Gangtok Zoological Park. Poster

surveys suggested its occurrence around Legship (West Sikkim) and Lachung (North Sikkim).

Genus *Neofelis* Gray, 1867

This genus is represented by a single species, *Neofelis nebulosa*.

48. *Neofelis nebulosa macrosceloides* (Hodgson)

1853. *Felis macrosceloides* Hodgson, *Proc. zool. Soc. Lond.*, : 192, pl, 38 (Nepal).

Common name : Clouded Leopard (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A medium to large-sized cat, head and body length 66-117 cm; body covered with large, subovate, trapezoidal or irregularly shaped darker patches; tail with numerous dusky rings.

Distribution : India : Sikkim and West Bengal, east to northeastern India.

Elsewhere : Nepal, Myanmar, S. China and Malaysia.

Remarks : Rare. However, the pug-marks of the clouded leopard was located at Kalikhola (c 1450 m) in East Sikkim by a party of the Zoological Survey of India (Biswas *et al.* 1985).

Genus *Panthera* Oken, 1816

Two species of the genus *Panthera* are reported from Sikkim.

49. *Panthera uncia* (Schreber)

1776. *Felis uncia* Schreber, *Saugethiere*, 3 : pl 100, text 3 : 386, 1777 (Altai Mountains, USSR or Mongolia).

Common name : Snow Leopard (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Coat white; spots on body not well-developed except on the head; fur thick and bushy.

Distribution : Throughout the Himalayas from

Jammu & Kashmir to Arunachal Pradesh including Sikkim.

Elsewhere : Nepal, Bhutan, mountains of central Asia from Altai through Tien Shan and Pamir to China.

Remarks : Rare. A snow leopard was observed by a survey party of the Zoological Survey of India near Bop (alt c 2134 m) in North Sikkim. It is also occasionally seen in the Singalila Range, Darjeeling district, West Bengal.

50. *Panthera pardus pernigra* (Hodgson)

1863. *Leopardus pernigra* Gray, *Hodgson's Coll B. M.* ed 2 : 3 and preface, Page V (Sikkim c 1828-2438m India).

Common name : Leopard (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Coat coarser, thicker, more woolly in winter than in the subspecies *fusca*; rosettes large and bold.

Distribution : India : Sikkim and northern Uttar Pradesh.

Elsewhere : Nepal.

Remarks : None of the parties of the Zoological Survey of India could locate any leopard during recent surveys of the State.

Order PERISSODACTYLA

Perissodactyls are characterised by odd number of toes, and molars and premolars in one unbroken series.

The order Perissodactyla is represented by one family in Sikkim.

Family EQUIDAE

One genus occurs in Sikkim.

Genus *Equus* Linnaeus, 1758

One species namely, *Equus kiang* occurs in Sikkim.

51. *Equus kiang* Moorcroft

1841. *Equus kiang* Moorcroft, *Travels in the Himalayan Provinces*, 1 : 312 (Eastern parts of Ladak, Jammu & Kashmir, India).

Common name : Kiang or Tibetan Ass (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Larger and more robust than the Wild Ass, with short erect ears like that of a horse, uneven erect mane, heavily tail and large horse-like hooves. Winter coat dark brown and of summer reddish, outer side of legs light brown; muzzle, throat, belly, flanks and innerside of legs greyish white; innerside of ears dark; no dark ring on hooves.

Distribution : India : Jammu & Kashmir (Ladak) and Sikkim (Wilson and Reeder 1992). However, it was not seen by any party of the Zoological Survey of India.

Order ARTIODACTYLA

Even-toed ungulates; toes enclosed in horny hooves, giving the appearance of a single hoof, split down in middle.

Three families of the order Artiodactyla are represented in Sikkim.

Family MOSCHIDAE

Family Moschidae is represented by a lone genus *Moschus* Linnaeus.

Genus *Moschus* Linnaeus, 1758

One species of the genus *Moschus* is known from Sikkim.

52. *Moschus chrysogaster* Hodgson

1839. *Moschus chrysogaster* Hodgson, *J. Asiat. Soc. Bengal*, 8 : 203 (Nepal).

Common name : Musk Deer (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A small deer, about 50 cm high at the shoulders; devoid of horns but possesses a gall bladder, musk gland and outwardly projected canine teeth. Body hairs long, coarse, brittle and minutely wavy. Body colour dark brown. Forelimbs longer than hind.

Distribution : India : Sikkim, northern Uttar Pradesh and Jammu & Kashmir.

Elsewhere : Nepal, Bhutan and China.

Remarks : Blanford (1988-91) reported this species to occur in the forests of Sikkim at an elevation of 3650 m during the summer. Wroughton (1916) mentioned this species from Lachen (1M, 1F) and Lachung in North Sikkim.

Family CERVIDAE

One genus of the family Cervidae is reported from Sikkim.

Genus *Muntiacus* Rafinesque

The genus *Muntiacus* is represented, in India, by one species, namely, *Muntiacus muntjac*.

53. *Muntiacus muntjac vaginalis* (Boddaert)

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

Common name : Barking Deer (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Height at shoulders, in males, 50-75 cm, females a little smaller. Antlers placed on bony pedicels which extend down on either side of face as bony ridges. Coat colour deep chestnut, becoming darker on back; paler below.

Distribution : India : Sikkim, West Bengal, Arunachal Pradesh, Assam, Bihar, Uttar Pradesh, Meghalaya and Tripura.

Elsewhere : Bhutan, Bangladesh, northern Myanmar, China and Vietnam.

Remarks : The survey parties of the Zoological

Survey of India located this species at Pelling and Melli in South Sikkim in February 1983 (Biswas *et al.* 1985), and at Legship and Bakhim in West Sikkim in May-June, 1990.

Family BOVIDAE

Five genera of the family Bovidae are reported from Sikkim.

Genus *Nemorhaedus* H. Smith, 1827

54. *Nemorhaedus goral hodgsoni* Pocock

1908. *Nemorhaedus goral hodgsoni* Pocock, *Proc. zool. Soc. Lond.*; 195 (Sikkim).

Common name : Goral (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Height at the shoulders 65-75 cm. Coat golden to rufous brown, speckled with black; spinal stripe black, reaches to root of tail but indistinct on rump; tail black above. Both sexes have conical backwardly curved horns, 12-15 cm in length.

Distribution : India : Sikkim (Agrawal *et al.* 1992) and West Bengal.

Remarks : The survey parties of the Zoological Survey of India observed goral at Bop. North district of Sikkim in 1983 (Biswas *et al.* 1985), and at Onglakthang and Tolung Gompha in West district in 1990.

Genus *Hemitragus* Hodgson, 1821

One species of the genus *Hemitragus* is reported from Sikkim.

55. *Hemitragus jemlahicus schaeferi* Pohle

1844. *Hemitragus jemlahicus schaeferi* Pohle, *Zool. Anz.*, 144 : 184 (Chunthang, Sikkim, India).

Common name : Himalayan Tahr (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Males about 100 cm

height at the shoulder, females a little smaller. Body covered with long hairs, growing into a long mane on the neck and shoulders. Coat deep reddish brown, with a dark mid-dorsal streak. Ears narrow and erect. Horns compressed, wrinkled transversely and keeled in front.

Distribution : India : Sikkim and northern West Bengal. However, the nominate subspecies occurs in Jammu & Kashmir, Himachal Pradesh, northern Uttar Pradesh. A pair of Tahr was observed at BOP in North Sikkim by Biswas *et al.* (1985) in January 1983.

Elsewhere : Nepal

Remarks : Coughley (1970) did not recognise *schaeferi* as a separate subspecies and remarked that the differentiating pelage characters as mentioned by Pohle (1944) are only seasonal.

Genus *Ovis* Linnaeus, 1758

One species of the genus *Ovis* occurs in Sikkim.

56. *Ovis ammon hodgsoni* Blyth

1841. *Ovis hodgsonii* Blyth, *Proc. zool. Soc. Lond.*, 1840 : 65 (Tibet probably on Nepal Frontier).

Common name : Nayan (Eng.).

Material examined : North Sikkim : 1M (skull only), Lasser c 6 km N of Gaugong (Near Thangu), July, 1989.

Measurements : Nil.

Diagnostic characters : Long in the legs; horns in males never exceed a single circle (Plate 1). Male light brown, darker on withers; rump, caudal disc surrounding tail, throat, chest, belly and inner side of legs white. Old males develop a white ruff about the neck. Females have little mane and indistinct caudal disc.

Distribution : Northern Ladak to Sikkim.

Elsewhere : Nepal, Bhutan and Plateau of Tibet.

Remarks : A number of corpses were observed at Lasser c 6 km N of Gaugong in North Sikkim, probably killed in heavy snowfall.

Genus *Pseudois* Hodgson, 1846

The genus *Pseudois* is represented by a single species.

57. *Pseudois nayaur nayaur* (Hodgson)

1833. *Ovis nayaur* Hodgson, *Asiat. Res.*, 18, 2 : 135 (Tibetan frontier of Nepal).

Common name : Bharal (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Intermediate between sheep and goat. Head and underparts brownish grey, suffused with slaty blue; horns rounded and smooth nad curve backwards over the neck. No face gland.

Distribution : Himalayas from Ladak in Jammu & Kashmir to Sikkim.

Elsewhere : Nepal and Bhutan.

Remarks : Both Ellerman & Morrison-Scott (1951) and Prater (1980) reported Sikkim in the range of distribution of this species but none could be seen by any of the Zoological Survey of India's party.

Genus *Procapra* Hodgson, 1846

The genus *Procapra* is represented only by a single species.

58. *Procapra picticaudata picticaudata* Hodgson

1846. *Procapra picticaudata* Hodgson, *J Asiat. Soc. Bengal*, 15 : 334 (Hundes district of Tibet, China).

Common name : Tibetan Gazelle (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Coat short and slaty grey in summer, dense and pale fawn in winter, with a white rump patch. Horns rise ventrally and curve backwards.

Distribution : India : Himalayas from Ladak in Jammu & Kashmir through hills north of Kumaun in Uttar Pradesh to Sikkim.

Elsewhere : Nepal, China and Mongolia.

Remarks : Ellerman & Morrison-Scott (1951) mentions about the occurrence of Tibetan Gazelle in northern Sikkim. Though none of the party of the Zoological Survey of India could locate this animal there but the military personnel and the local people reported its presence around Gaygong in North Sikkim.

Order LAGOMORPHA

Characterised by the presence of two pairs of incisors in the upper jaw, placed one behind the other. Cheekteeth separated from incisors by a wide diastema. Tail short or absent.

Order Lagomorpha is represented by two families in Sikkim.

Key to the families of the Order LAGOMORPHA

Size large; ears and hindlimbs very long; tail short LEPORIDAE

Size small; ears and hindlimbs short; tail absent OCHOTONIDAE

Family LEPORIDAE

One genus of the family Leporidae namely, *Lepus* is reported to occur in Sikkim.

Genus *Lepus* Linnaeus, 1758

Key to the species of the genus *Lepus*

1. Size large; fur long, soft and curly; pelage sandy yellow, with white on rump, neck and ears; anterior arm of supraorbital rim of skull inflated *L. oiostolus*
- Size small; fur short, coarse and not curly; pelage sandy brown mixed with ochraceous; anterior arm of supraorbital rim of skull not so inflated 2
2. Muzzle long; first upper incisor having deep infolds; first upper premolar having antero-internal cusp not so extended anteriorly
..... *L. nigricollis*

- Muzzle short; first upper incisor having short infolds; first upper premolar having antero-internal cusp extended anteriorly
..... *L. hypsibius*

59. *Lepus nigricollis ruficaudatus* Geoffroy

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

Common name : Rufous-tailed Hare (Eng.).

Material examined : East Sikkim : 1F, Dickling (c 1525 m), coll. S. Chattopadhyay, 21. V. 1994.

Measurements : *External* : 1F; H & B 461; T1 52; Hf 90; E 87. *Cranial* : 1F : *on* 96.1; *cb* 82.0; *n* 41.5; *pf* 24.5, *orb* 28.2; *zw* 42.0; *iw* 17.7; *pow* 12.0; *nw* 32.7.

Diagnostic characters : Coat rufous brown, mixed with black on face and back, rufous on breast, legs and upper surface of tail; chin and underparts white; a grey patch on nape (Plate 2).

Distribution : India : Uttar Pradesh, Madhya Pradesh, Bihar, Orissa, Sikkim, West Bengal, Assam Tripura.

Elsewhere : Nepal.

Remarks : Occupies a wide range of habitats from open desert to thick jungle.

60. *Lepus hypsibius* Blanford

1875. *Lepus hypsibius* Blanford, *J. Asiat. Soc. Bengal*, 44(2) : 214 (Kium, Changchenmo Valley, Ladak, Jammu & Kashmir, India).

Common name : Blanford's Woolly Hare (Eng.).

Material examined : South Sikkim : 3 M, 3 F, Rabangla, coll. S. Chattopadhyay, 18-26. V. 1990.

Measurements : *External* : 2M : H & B 443, 470; T1 78, 99; Hf 85, 89; E 80, 96. 2F : H & B 442, 466; T 1 70, 80; Hf 85, 91; E 99, 101. *Cranial* : 2M : *on* 88.3, 89.3; *cb* 78.5 (in both); *n* 36.5, 37.0; *mtr* 15.4, 16.2; *b* 12.2, 12.6; *pf* 21.3, 22.5; *zw* 40.6, 41.0; *orb* 25.5; *nw* 29.0, 29.4. 1F. *on* 92.0; *cb* 81.3; *n* 39.8; *mtr* 16.6; *b* 12.4, *apf* 23.8; *zw* 43.5; *orb* 26.3; *nw* 30.0.

Diagnostic characters : As mentioned in the key to species above. Coat sandy brown, mixed with black on back; limbs and sides ochraceous; tail white with a broad brownish black stripe above; ears with a rufescent patch on inner half.

Distribution : India : From Ladak (Jammu & Kashmir) to Sikkim between 1000 and 2500m altitude.

Remarks : Ellerman and Morrison-Scott (1951) treated *Lepus hypsibius* as a subspecies of *L. oiostolus*. Subsequently, neither Honacki *et al.* (1982) nor Flux and Angerman (1990) dealt with its status. The above specimens differ from *L. oiostolus* in the fur being not woolly and the arms of supraorbital rim not inflated. Hence, we are provisionally treating *hypsibius* as a separate species.

61. *Lepus oiostolus* Hodgson

1840. *Lepus oiostolus* Hodgson, *J. Asiat. Soc. Bengal*, 9 : 1186 (Nepal or South Tibet).

Common name : Woolly Hare (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A moderately large hare, with long, curly fur. Coat Sandy yellow above; neck and rump grey, paler than the back; tail white; with a brown stripe above; ears dark brown in front and white behind.

Distribution : Found in India (Jammu & Kashmir and Sikkim).

Elsewhere : Nepal and China (Angermann 1967).

Remarks : Lives in mountains from 2500 to 5400 m altitude. Blanford (1888-91) observed this species in Sikkim near the Kongra Lama Pass. However, there is no recent record of its occurrence in Sikkim.

Family OCHOTONIDAE

Small, tailless, rat-like creatures, with small rounded ears. Possesses as usual, two pairs of upper incisors, placed one behind the other.

Genus *Ochotona* Link, 1795

Six species of Pikas are reported from Sikkim. Their identification below may however, be treated as tentative.

Key to the species of the genus *Ochotona*

1. Ear patch not meeting on nape..... 2
 - Ear patch meeting on nape 3
2. Ear patch rusty; coat sandy brown above, dirty white below; nose-tip and lips black ...
..... *O. curzoniae*
 - Ear-patch buffy; coat sandy brown above, pale grey below, with a mid-ventral buffy line
..... *O. nubrica*
 - Ear patch buffy but very small; coat dark russet brown, with light speckling
..... *O. thibetana*
 - Ear patch fulvous; coat greyish rufous above, whitish below but head and forepart rufous brown *O. roylei*
3. Ear patch dark grey; coat dark reddish in summer, dark grey in winter *O. forresti*
 - Ear patch buff; coat brownish grey above, with an ochre tinge; head and forepart pale russet *O. macrotis*

62. *Ochotona curzoniae* (Hodgson)

1858. *Lagomys curzoniae* Hodgson, *J. Asiat. Soc. Bengal*, 26 : 207 (Chumbi Valley,) Tibet, China).

Common name : Black-lipped Pika (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : As mentioned in the key to the species above.

Distribution : India : Sikkim (Smith *et al.* 1990).

Elsewhere : Nepal and China. Found in high alpine desert, steppe and meadows.

Remarks : Ellerman and Morrison-Scott (1951) treated *curzoniae* as a subspecies of *O. daurica*

but now it is considered as a distinct species (Smith *et al.* 1990).

63. *Ochotona nubrica* Thomas

1922. *Ochotona nubrica* Thomas, *Ann. Mag. nat. Hist.*, 9 : 187 (Nubra valley c 3048m, Ladak, Jammu & Kashmir, India).

Common name : Nubra Pika (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Skull larger than that of *thibetana* but smaller than of *roylei*; rostrum short and interorbital width broad; palatal foramina widely expanded posteriorly; bulla relatively small and narrow. Coat colour as mentioned in the key to the species above.

Distribution : A Trans-Himalayan species, with a narrow range, stretching from Jammu & Kashmir to Sikkim in India.

Elsewhere : Nepal and Tibet (Smith *et al.* 1990).

Remarks : The species appear to be very rare in Sikkim. It was neither seen nor collected by any of the ZSI parties in Sikkim.

Thomas (1922) referred to *nubrica* as a small species in *roylei* group. Ellerman & Morrison-Scott (1951) assigned it to *O. pusilla* and Corbet (1978) to *O. thibetana*. However, recent studies by Smith *et al.* (1990) show that *nubrica* is a distinct species and differs from *O. thibetana* in being sandy brown above against rufous brown, and has a distinct light patch on outer surface of the ear rather than lacking in *thibetana*.

64. *Ochotona roylei* (Ogilby)

1839. *Lagomys roylei* Ogilby, *Royle's Ill Botany Himalaya*, XIX, p 14 (Choor Mountain, 96 Km N. of Saharanpur, Uttar Pradesh, India).

Common name : Royle's Pika (Eng.).

Material examined : West Sikkim : 2M (Juv.), Gomchen c 5 km West of Bakhim, coll. S. Chattopadhyay, 6. VI. 1990; 1F, Thangsing (c 3813m), coll. S. Chattopadhyay, 10.VI.1990.

Measurements : *External* : 2M (Juv.) : H & B 99, 112; Hf 22.5, 24.0; E 14, 20; wt 32, 33g. 1F : H & B 185; Hf 28; E 21; wt 154g; mammae 2+2 = 4. *Cranial* : 2M (Juv.) : on 19.2, 19.9. Skull badly damaged.

Diagnostic characters : Head, shoulders and forepart of the body bright chestnut; rest of dorsal surface dark greyish rufous; ventral surface from white to dark grey; winter pelage lacks rufous coloration. Ears moderate in size and sparsely haired. Frontal fenestrae present in juveniles but disappear in adults.

Distribution : Along the Himalayas from northwestern India to Sikkim.

Elsewhere : Nepal, China and Pakistan

This species lives at lower elevations than the large-eared pikas, occurring in rhododendron, deodar and spruce forests.

65. *Ochotona thibetana sikimaria* Thomas

1922. *Ochotona sikimaria* Thomas, *Ann. Mag. nat. Hist.* 9 : 191 (Lachen c 2682m, Sikkim).

Common name : Moupin Pika (Eng.).

Material examined : North Sikkim : 1M, 1F, Lachen (c 2985m), coll. R. K. Ghose, 28 & 29. III. 1979; 2M, Lachung (c 2620m), coll. R. K. Ghose, 5, 6. IV. 1979. West Sikkim : 5F, Yumthang, coll. S. Chattopadhyay, 1-6. VII. 1989; 2F, Thang, coll. S. Chattopadhyay, 17. VII. 1989; 1M, 1F, Dzongri (c 3355m), coll. S. Chattopadhyay, 8. VI. 1990; South Sikkim : 1F: Menam, coll. S. Chattopadhyay, 23.V. 1990. East Sikkim : 1M, Kyongnosla, 8. V. 1994; 1F, Tosangoo (c 3500m), coll. S. Chattopadhyay, 9. V. 1994.

Measurements : *External* 1M : H & B 125; Hf 24; E 20; wt 77g. 5F : H&B 126-178 (158); Hf 21-31 (27.4); E 20 (all). *Cranial* : 2M : on 35.4, 35.6; cb 33.9, 34.3; n 11.6; b 8.6, 9.0; pf 9.2; 9.2; zw 17.3, 17.7; mtr 6.7, 6.7. 8F : on 34.0-36.8 (35.5); cb 31.8-34.3 (33.2); n 11.3-12.7 (12.0); mtr 6.5-7.1 (6.8); b 8.5-9.8 (9.1); pf 8.4-9.3 (8.9); zw 17.1-17.9 (17.5).

Diagnostic characters : Summer coat dark russet brown with some light speckling; undersurface ochraceous buff; throat-collar russet; winter coat buffy to dull brown. Skull longer, zygomatic arch wider and interorbital width broader than those of *O. cansus*.

Distribution : India : Sikkim.

Elsewhere : Bhutan, China and northern Myanmar.

Occupies rhododendron and bamboo forests as low as 1800m to high elevation subalpine forests.

Remarks : Feng and Kao (1974), and Feng and Zheng (1985) placed *O. sikimaria* as a subspecies of the Gansu Pika, *O. cansus*, apparently because Thomas (1922) in his original description compared *sikimaria* to *O. sorella* a subspecies of *O. cansus*. However, based on an examination of the holotype and 19 other specimens from Sikkim, Smith *et al.* (1990) assigned *sikimaria* to *O. thibetana*.

66. *Ochotona forresti* Thomas

1923. *Ochotona forresti* Thomas, *Ann. Mag. nat. Hist.*, 11 : 662 (Likiang Range c 3962m (27°N, 100°30'E), Yunnan, China).

Common name : Forrest's Pika (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Very similar to *O. thibetana* but differs in the dark grey area behind ears meeting across the nape, foreclaws being longer, zygomatic arch wider and posterior end of nasals broader and rectangular in shape. Coat colour as mentioned in the key.

Distribution : India : Sikkim.

Elsewhere : Bhutan, northern Myarimar and China (Smith *et al.* 1990).

It inhabits mountain slopes at elevations between 2600 and 4400m in the forest belt (Feng *et al.* 1986).

Remarks : The Forrest's Pika, *O. forresti* has

been assigned to *O. thibetana* (Feng & Kao 1974, Honacki *et al.* 1982), to *O. pusilla* (Ellerman & Morrison-Scott 1951), and to *O. roylei* (Corbet 1978). However, Smith *et al.* (1990) provisionally consider it a distinct species, based on their studies as well as on the assessment of Feng and Zheng (1985), and Feng, Cai and Zheng (1986).

67. *Ochotona macrotis* (Günther)

1875. *Lagomys macrotis* Günther, *Ann. Mag. nat. Hist.*, 16 : 231 (Doba Kuenlun Mountains, S. Chinese Turkestan).

Common name : Large-eared Pika (Eng.).

Material examined : North Sikkim : 1M, Lhasar c 8 Km NE of Thangu, coll. S. Chattopadhyay, 20. VII. 1989.

Measurements : **External** : 1M : H & B 182; Hf 32; E 28; wt 135g. **Cranial** : on 43.4; cb 39.5, n 14.5, mtr 8.0; b 10.9; zw 21.4; pf 11.3.

Diagnostic characters : Averages larger than *O. roylei*. Coat colour as mentioned in the key. Innerside of ears thickly clad with long hairs and longer and broader than *O. roylei*. Usually two small oval fenestra present above and in front of the orbit at the anterior end of frontal bones.

Distribution : India : Himalayas from Jammu & Kashmir to Sikkim.

Elsewhere : China, Bhutan, Nepal, Pamir Mountains, Tien Shan, NE Afghanistan and Pakistan.

A high altitude rock dwelling pika; found in open alpine areas as well as within spruce forests between 2500 and 6000m altitude.

Remarks : The Large-eared Pika has been considered conspecific with Royle's Pika, *O. roylei* by Corbet (1978). However, Ellerman & Morrison Scott (1951), Honacki *et al.* (1982) and Smith *et al.* (1990) consider it as a distinct species.

Order RODENTIA

Rodents are characterised by the presence of a pair of chiselshaped incisors in each jaw, and a

distibit diastema between incisors and cheekteeth. They are world-wide in distribution.

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

Key to the families of the order RODENTIA

1. Fur modified into quills or long, stiff hairs; cheekteeth 4/4 in number HYSTRICIDAE
- Fur not modified into quills; cheekteeth except in the genus *Ratufa*, never 4/4 in number 2
2. Infraorbital foramen not or scarcely open for muscle transmission; cheek teeth except in the genus *Ratufa*, 5/4 in number .. SCIURIDAE
- Infraorbital foramen clearly open for muscle transmission; cheekteeth 3/3 in number MURIDAE

Family SCIURIDAE

Nine genera of the family Sciuridae are found in Sikkim.

Key to the genera of the family SCIURIDAE

1. Flying membrane present on each side of the body. 2
- Flying membrane absent 5
2. Molars having high crown and flat grinding surface; head and body more than 500 mm in length *Eupetaurus*
- Molars having low crown; grinding surface not flat; head and body less than 500 mm in length 3
3. Surface pattern of lower molars simple and possesses a central depression *Hylopetes*
- Surface pattern of lower molars excessively wrinkled and lacks a central depression 4
4. Interfemoral membrane absent; ear-tufts present; size small, less than 200 mm in head and body length *Belomys*
- Interfemoral membrane present; ear-tufts

absent ; size large, more than 300 mm in head and body length *Petaurista*

5. Body-size large, over 280 mm in head and body length; maxillary teeth 4 in number *Ratufa*
- Body-size small, less than 280 mm in head and body length; maxillary teeth 5 in number 6
6. Dorsal surface of body prominently striped; stripes more than one in number 7
- Dorsal surface of body unstriped or with a faint black stripe 8
7. Median stripe of body white or buff *Funambulus*
- Median stripe of body black *Tamias*
8. Length of nasals exceed interorbital width of skull *Dremomys*
- Length of nasals do not exceed interorbital width of skull *Callosciurus*

Genus *Belomys* Thomas, 1905

The genus *Belomys* is represented by a single species.

68. *Belomys pearsoni* (Gray)

1842. *Sciuropterus pearsonii* Gray, *Ann. Mac. nat. Hist.*, 10 : 263 (Darjeeling, West Bengal, India).

Common name : Hairy-footed Flying Squirrel (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : A small-sized flying squirrel, head and body length about 200 mm; a pencil of hair exceeding the length of ear present on the base of ear-conch. Fur rufous brown with pale tips above, and fulvous white below.

Distribution : India : Sikkim (Sclater 1891), West Bengal, Arunachal Pradesh, Assam and Nagaland.

Elsewhere : Bhutan.

Genus *Hylopetes* Thomas, 1908

One species of the genus *Hylopetes* occurs in Sikkim.

69. *Hylopetes alboniger alboniger* (Hodgson)

1836. *Sciuropterus alboniger* Hodgson, *J. Asiat. Soc. Bengal*, 5 : 231 (Nepal).

Common name : Parti-coloured Flying Squirrel (Eng.).

Material examined : 1M, Sikkim., coll. T. R. Sharma.

Measurements : **External** : Hf 37. **Cranial** : 1M : *on* 49.2; *n* 15.8; *pl* 25.8; *b* 7.8; *mtr* 9.1.

Diagnostic characters : Dorsum greyish to reddish brown; undersurface greyish; throat and chest whitish. Occipitonasal length of skull more than 45 mm.

Distribution : India : Sikkim (Wroughton 1916), West Bengal, Arunachal Pradesh, Manipur, Meghalaya and Nagaland.

Elsewhere : Nepal, Bhutan, Bangladesh, Myanmar and China.

Remarks : Ellerman (1961) recorded this species from Sikkim but the localities mentioned are Ambootia, Pashok and Darjeeling, all of which at present fall under Darjeeling district of West Bengal. Hence, the present specimen constitutes its first authentic record from Sikkim.

Genus *Eupetaurus* Thomas, 1988

The genus *Eupetaurus* is represented by one species, namely, *E. cinereus*.

70. *Eupetaurus cinereus* Thomas

1888. *Eupetaurus cinereus* Thomas, *J. Asiat. Soc. Bengal*, 57, 2(3) : 258 (Gilgit, Jammu & Kashmir, India).

Common name : Woolly Flying Squirrel (Eng.).

Material examined : Sikkim, 1 ex., no locality, *don.* J. S. Gill, 21.X.1967.

Measurements : Nil.

Diagnostic characters : A large, slaty grey, woolly flying squirrel, head and body length 500-600 mm. Interfemoral membrane absent. Cheekteeth 5/4 in number, hypsodont and having a flat grinding surface.

Distribution : India : Sikkim (Agrawal & Chakraborty 1970), and Jammu & Kashmir. The above specimen was donated to Z.S.I. by J. S. Gill in 1967 and the place of collection was mentioned as Sikkim.

Elsewhere : Tibet in China.

Genus *Petaurista* Link, 1795

Three species of this genus is reported from Sikkim.

Key to the species of the genus *Petaurista*

1. Small size, occipitonasal length of skull 66 mm or less; no shoulder patch. *P. caniceps*
- Large size, occipitonasal length of skull more than 65 mm; shoulder patch present 2
2. Shoulder patch extends beyond pectorals isolating a distinct saddle *P. nobilis*
- Shoulder patch confined to pectorals *P. magnificus*

71. *Petaurista caniceps* (Gray)

1842. *Sciuropterus caniceps* Gray, *Ann. Mag. nat. Hist.* 10 : 262 (Nepal).

Common name : Lesser Giant Flying Squirrel (Eng.).

Material examined : North Sikkim : 7M, 2F, Yumthang (c 1058m), coll. S. S. Saha, 6-9. VII. 1989. West Sikkim : 2M, Bakhim (c 2743m), coll. S. Chattopadhyay, 14. VI. 1990.

Measurements **External** : 9M : H & B 305-345 (335); T1 310, 353 (333); Hf 60-65 (63), E 43-49 (44). 2F : H & B 335, 345; T1 325, 335; Hf 60, 62; E 45, 45. **Cranial** : 4M: *on* 62.5-64.3 (63.6); *cb* 56.4-59.8 (58.6); *n* 19.7-20.5 (20.1); *pl* 31.0-32.8 (32.1); *mtr* 14.1-15.0 (14.4); *b* 11.8-

12.7 (12.4); zw 40.7-40.8; iw 11.7-14.2 (12.8); ml 36.9-38.3 (37.7). 1F : on 64.2; cb 59.3; n 19.7; pl 33.5; mtr 13.8; b 12.0; zw 40.4; iw 12.5; ml 37.8.

Diagnostic characters : Body brown above and reddish white below; head ashy grey; tail and feet rufous.

Distribution : India : Sikkim and West Bengal.

Elsewhere : Nepal.

Remarks : Ellerman (1961) treated *caniceps* as a subspecies of *Petaurista elegans*. But recently, Corbet and Hill (1993) have treated the Himalayan form as a distinct species, *P. caniceps* and the SE Asian form, *P. elegans*.

72. *Petaurista nobilis nobilis* (Gray)

1842. *Sciuropterus nobilis* Gray, Ann. Mag. nat. Hist., 10 : 263 (Darjeeling, West Bengal, India).

Common name : Gray's Giant Flying Squirrel (Eng.).

Material examined : East Sikkim : 1M, 1F, Singhik, coll. R. K. Ghose, 25.IV.1980; 1M, Tumin (c 1470m) coll. V. C. Agrawal, 1.X. 1988. South Sikkim : 1M, 1F, Rabangla (c 2010 m), coll. S. Chattopadhyay, 19.V. 1990; 1M, Ralang, coll. S. Chattopadhyay, 24.V. 1990; 1M, 2F, Damthang, coll. S. Chattopadhyay, 25.V. 1990.

Measurements : **External** : 4M : H. & B 370-430 (399); T1 431-466 (448); Hf 68-74 (71); E 41 (all). 3F : H & B 402-410 (405); T1 392-440 (425); Hf 71; E 42-44 (43). **Cranial** : 2M : on 69.5, 74.4; cb 64.5, 68.7; n 20.9, 22.8; pl 36.1, 39.2; mtr 15.9, 16.8; b 12.8, 13.0; zw 46.2, 47.5; iw 14.8, 15.8; ml 42.1, 46.0 2F : on 72.5, 73.5; cb 67.0, 68.5; n 21.4, 22.3; pl 37.0, 37.5; mtr 16.6, 16.7; b 12.3, 12.5; zw 47.0, 49.6; iw 15.5, 16.5; ml 43.8, 44.2.

Diagnostic characters : Saddle maroon, usually with a mid-dorsal stripe; undersurface buff; shoulder patch and sides of body yellow to orange buff.

Distribution : India : Sikkim and West Bengal.

Elsewhere : Nepal. Recently, another subspecies of *P. nobilis* has been described from Bhutan (Saha 1975).

Remarks : Included in *Petaurista magnificus* by most authors but seems to be clearly distinct (Ghose and Saha 1981).

73. *Petaurista magnificus magnificus* (Hodgson)

1836. *Petaurista magnificus* Hodgson, J. Asiat. Soc. Bengal, 5 : 231 (Nepal).

Common name : Hodgson's Giant Flying Squirrel (Eng.).

Material examined : West Sikkim : 1M, Geyzing, coll. R. K. Ghose, 12. V. 1980.

Measurements : **External** : 1M : H & B 320, T1 460; Hf 75; E 45.

Diagnostic characters : Upper surface of body reddish chestnut, with white grizzling; shoulder patch confined to pectorals and of bright golden yellow colour.

Distribution : India : Sikkim.

Elsewhere : Nepal.

Genus *Callosciurus* Gray, 1867

Two species of the genus occur in West Bengal.

74. *Callosciurus caniceps crumpi* Wroughton

1816. *Callosciurus crumpi* Wroughton. J. Bombay nat. Hist. soc., 24 : 425 (Sedonchen c. 2000 m. Sikkim).

Common name : Golden backed squirrel (Eng.).

Material examined : 2M, 1F, Sedonchen c 2000 m. Coll. C. A. Crump, 17.xi.1914.

Measurements : **External** : Holotype HB 205; tl 195; Hf 49; E 20. **Cranial** : Holotype : on 53; cb 48.5; cw 24; iw 19.5; n 16; m 11; d 11.5.

Diagnostic characters : Dorsum a grizzle of black and yellow, without golden tinge; facial region reddish brown; undersurface grey (not red); no flank patches; tail-tip black; upper incisors proodont.

Distribution : India : Sikkim.

Remarks : Moore and Tate (1965) synonymised this species with *callosciurus erythraeus*, but Chakraborty (1985) maintains it as a subspecies

of *collosciurus caniceps* due largely to its grey undersurface and proodont upper incisors.

75. *Callosciurus pygerythrus lokroides* (Hodgson)

1836. *Sciurus lokroides* Hodgson, *J. Asiat. Soc. Bengal*, 5 : 232 (Nepal).

Common name : Hoary-bellied Himalayan Squirrel (Eng.).

Material examined : East Sikkim : 1M, 1F, Tumin (c 1470m), coll. V. C. Agrawal, 1 X. 1988; 1F, Singtam, coll. T. D. Soota, 24. viii. 1977; 1F, Ranipal, coll. T. D. Soota, 1. ix. 1977.

Measurements : **External** : 1M : HB 180; Tl 190; Hf 43; E 19. 3F : HB 200-203; Tl 162-190; Hf 40-43; E 19-20; mammae 1+2 = 6. **Cranial** : 1M : *on* 47.7, *cb* 42.7; *n* 14.2; *pl* 22.8, *mtr* 10; *b* 9; *liv* 15.0; *zw* 27.3; *ml* 26.2. 3F : *on* 48.7-49.5; *n* 14.2-14.7; *pl* 23.3-24.0; *mtr* 9.6-10.0; *b* 9.5; *iw* 15.1-16.5; *zw* 28.7-29.5; *ml* 26.6-27.6.

Diagnostic characters : Body Speckled grey above, dull greyish with reddish tinge below; tail concolorous throughout, lacking a black tip; thigh rufous orange; thigh patch absent.

Distribution : India : Sikkim and West Bengal. In addition to the above mentioned locality, Wroughton (1916) reported it from Rongli, Gangtok and Dikchu.

Elsewhere : Nepal, Bhutan and Bangladesh (Posamentier 1989).

Genus *Tamiops* J. Allen. 1906

One species of the genus *Tamiops*, namely, *T. macclellandi* occurs in Sikkim.

76. *Tamiops macclellandi* (Horsfield)

1839. *Sciurus macclellandi* Horsfield, *Proc. zool. Soc. Lond.* : 152 (Assam, India).

Common name : Himalayan Striped Squirrel (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Dorsum striped;

median stripe being black. Ear-tufts black, with conspicuous white tip. Body size small, less than 120 mm in head and body length.

Distribution : India : Sikkim, West Bengal, Arunachal Pradesh, Assam, Meghalaya, Mizoram and Nagaland.

Elsewhere : Nepal, Bhutan and Burma.

Remarks : Wroughton (1916) reported 3M, 1F specimens of this species from Gangtok in South Sikkim, and 4M, 11F specimens from Chunthang in North Sikkim. However, no specimen of this species could be collected during recent surveys.

Genus *Dremomys* Heude, 1898

One species of the genus *Dremomys*, namely, *D. lokriah* occurs in Sikkim.

77. *Dremomys lokriah lokriah* (Hodgson)

1836. *Sciurus lokriah* Hodgson, *J. Asiat. Soc. Bengal*, 5 : 232 (Nepal).

Common name : Orange-bellied Himalayan Squirrel (Eng.).

Material examined : South Sikkim : 1F, Rabangla, coll. V. C. Agrawal, 5.X.1988. West Sikkim : 3M, 2F, Bakhim (c 2743m), coll. S. Chattopadhyay, 4 & 15. VI. 1990.

Measurements : **External** : 3M : H & B 191-195 (192); Tl 103-134 (123); Hf 39-42 (40); E 20-24 (22). 3M : H & B 175-195 (185); Tl 127-135 (131); Hf 40-43 (42); E 19-20 (19). **Cranial** : 3M *on* 48.4-50.4 (49.1); *cb* 44.1-44.7 (44.5); *n* 14.4-15.5 (14.9); *pl* 23.5-24.0 (23.8); *mtr* 8.4-8.9 (8.6); *b* 7.9-8.5 (8.1); *zw* 26.8-27.5 (27.3); *iw* 14.1-15.5 (15.0); *ml* 26.2-26.7 (26.4). 1F : *on* 50.4; *cb* 44.8; *n* 15.4; *pl* 24.0; *mtr* 8.7; *b* 8.6; *zw* 27.6; *iw* 14.8; *ml* 27.6.

Diagnostic characters : Similar to the Hoary-bellied Himalayan Squirrel except that the chest and belly being orange in colour and tail much smaller than head and body length.

Distribution : India : Sikkim (South and West Sikkim as above; also North Sikkim *vide* Wroughton (1916), West Bengal, Arunachal

Pradesh, Assam, Manipur, Meghalaya, Mizoram and Nagaland.

Elsewhere : Nepal, Bhutan and Myanmar.

Genus *Ratufa* Gray, 1867

One species of the genus *Ratufa* namely, *R. bicolor* occurs in Sikkim.

78. *Ratufa bicolor gigantea* (M'Clelland).

1839. *Sciurus gigantea* M'Clelland, *Proc. zool. Soc Lond.*, : 150 (Assam).

Common name : Malayan Giant Squirrel (Eng.).

Material examined : South Sikkim : 1M (skull only), Temi, coll. B. Biswas, 10.1.1953; 8 ex. (skins only), Sikkim, colls. L. Mandelli, H. J. Elwes and W. T. Blanford.

Measurements : Nil.

Diagnostic characters : A large diurnal squirrel; colour of body varies from brown to black above, and buff below.

Distribution : India : Sikkim (Wroughton 1916), West Bengal, Assam, Arunachal Pradesh, Meghalaya, Tripura, Mizoram and Nagaland.

Elsewhere : Bhutan, northern Myanmar east to Vietnam and northeast to Yunnan in China.

Remarks : In addition to the above mentioned locality, Wroughton (1916) reported this species to occur at Dikchu and Rongli in Sikkim. However, no specimen could be collected during recent surveys.

Genus *Marmota* Blumenbach, 1779

Out of two species of the genus *Marmota*, one namely, *Marmota himalayana* occurs in Sikkim.

79. *Marmota himalayana* (Hodgson)

1841. *Arctomys himalayanus* Hodgson, *J. Asiat. Soc. Bengal*, 10 : 777 (Nepal).

Common name : Himalayan Marmot (Eng.)

Material examined : West Sikkim : 1M,

Gaygong (c 4520m), coll. S. Chattopadhyay, 18. VII 1989; 1M (juv.); Lhasar c 8 km NE of Thangoo, coll. S. Chattopadhyay, 20. VII. 1989.

Measurements : *External* : 1M : H & B 550; T1 150; Hf 90; E 28. *Cranial* : 1M : *on* 105.0; *cb* 104.0; *n* 43.2; *pl* 57.8; *mtr* 22.8; *b* 17.6; *apf* 8.2; *zw* 65.2; *iw* 27.4; *ml* 68.4.

Diagnostic characters : A short-tailed marmot, tail less than one-third of head and body length. Orbit, in skull, more than one-third of occipitonasal length.

Distribution : India : Sikkim, northern Uttar Pradesh, Himachal Pradesh, and Jammu & Kashmir.

Elsewhere : Nepal and China.

Remarks : Ellerman (1961) maintained *himalayana* as a subspecies of *Marmota bobak* but Corbet & Hill (1986) treated it as a distinct species.

Family HYSTRICIDAE

Fur modified into long quills; angular process of mandible arises from the bony socket of lower incisor.

Out of two genera of the family Hystricidae found in India, only one, namely *Hystrix* occurs in Sikkim.

Genus *Hystrix* Linnaeus, 1755

One species of the genus *Hystrix* namely, *H. hodgsoni* = *H. brachyura* is reported from Sikkim.

80. *Hystrix brachyura* (Linnaeus)

1758. *Hystrix brachyura* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 57 (Malacca).

Common name : Himalayan Crestless Porcupine (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : No crest of bristles present on the crown; quills bear only one dark band in the middle, rest white.

Distribution : India : Sikkim (Sclater 1891; Ellerman & Morrison-Scott 1951), northern West Bengal, Arunachal Pradesh, Assam, Meghalaya and Nagaland.

Elsewhere : Nepal and Bangladesh.

Remarks : Van Weers (1979) synonymised *H. hodgsoni* (Gray, 1847) with *H. brachyura* Linnaeus, 1758. Lekagul & Mc Neely (1977), however, treated *H. hodgsoni* distinct from *H. brachyura* on the basis of lower crest (an age linked character) and quills having a wider black band (an individual variation). We have here followed Van Weers (1979).

Family MURIDAE

Family Muridae consists of 15 subfamilies in the world of which six subfamilies are found in India and two namely, Murinae and Arvicolinae occur in Sikkim.

Key to the subfamilies of the family MURIDAE

Cusps on maxillary teeth arranged in 3 longitudinal rows MURINAE

Cusps on maxillary teeth arranged in 2 longitudinal rows MICROTINAE

Subfamily MICROTINAE

The subfamily Arvicolinae is represented in India by four genera. Of these, one namely *Pitymys* occurs in Sikkim.

Genus *Pitymys* McMurtrie, 1831

The genus *Pitymys* is represented by one species in Sikkim.

81. *Pitymys sikimensis* (Hodgson)

1849. *Neodon sikimensis* Hodgson, *Ann. Mag. nat. Hist.*, 3 : 202 (Sikkim, India).

Common name : Sikkim Vole (Eng.).

Material examined : North Sikkim : 1M, 3F, Yumthang (c 1058m), coll. S. Chattopadhyay. 2 & 6. VII. 1989; 1F, Thangu (c 1141m), coll. S.

Chattopadhyay, 15. VII. 1989; 1M, 1F, Lachen (c 3500m), coll. S. Chattopadhyay, 30.VII.1989.

Measurements : **External** : 1M : H & B 116; T1 50; Hf 20; E 17; wt 37g. 4F : H & B 105-120 (111); T1 48-65 (55); Hf 20-22 (21); E 16-19 (17); wt 38-50 (43g) ; mammae 1+2 = 6. **Cranial** : 1M : *on* 26.0 ; *cb* 26.0; *pl* 15.3; *mtr* 6.4; *apf* 5.0; *iw* 4.2; *ml* 15.5.

Diagnostic characters : A dark, thick-furred vole, having moderately long ears (more than 13% of Head and body length), and tail relatively longer, more than 40% of head and body length.

Distribution : India : Sikkim (Hodgson 1849; Wroughton 1916 ; Ellerman 1961) and northern West Bengal (Khajuria 1959).

Elsewhere : Nepal and Bhutan.

Subfamily MURINAE

Four genera of the subfamily Murinae are reported from Sikkim.

Key to genera of the subfamily MURINAE

1. Incisors proodont; condylobasal length of skull normally equals to or exceeds occipitonasal length ***Bandicota***
- Incisors opisthodont; condylobasal length of skull less than occipitonasal length 2
2. First upper molar more than half the length of cheektooth row and its antero-internal cusp distorted inwards to reach the second lamina; third molars very small ***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 molars not reduced 3
3. Palate short, less than one-fifth of occipitonasal length; bulla short, less than 15% of occipitonasal length ***Niviventer***
- Palate long, more than one-fifth of occipitonasal length; bulla long, more than 15% of occipitonasal length ***Rattus***

Genus *Niviventer* Marshall, 1976

Three species of this genus occurs in Sikkim.

Key to species of the genus *Niviventer*

1. Tail not much elongated, less than 140% of head and body length *N. niviventer*
- Tail elongated, more than 140% of head and body length 2
2. Size small, occipitonasal length less than 32 mm *N. eha*
- Size large, occipitonasal length more than 32 mm *N. fulvescens*

Niviventer niviventer (Hodgson)

Out of five subspecies of *N. niviventer*, only one, namely, *lepcha* occurs in Sikkim.

82. *Niviventer niviventer lepcha* (Wroughton)

1916. *Epimys lepcha* Wroughton, *J. Bombay nat. Hist. Soc.*, **24** : 429 (Chuntang, Sikkim).

Common name : White-bellied Rat (Eng.).

Material examined : West Sikkim : 2M, 1F, Bakhim (c 2743m), coll. S. Chattopadhyay, 5. VI. 1990.

Measurements : *External* : 2M : H & B 135, 140; T1 142, 170; Hf 30 (in both); E 20 (in both). 1F : H & B 130; T1 150; Hf 30; E 20. *Cranial* : 1M : *on* 33.7; *cb* 32.1; *n* 11.0; *pl* 16.8; *mtr* 5.3; *b* 5.0; *apf* 5.3; *zw* 15.6; *iw* 5.6; *ml* 17.5.

Diagnostic characters : Body dark grey above and white below. Grey patches or streak present on thorax. Tail bicoloured.

Distribution : India : Sikkim (North and West districts).

Remarks : Wroughton (1916) reported this species from Chunthang and Lachen, both in North Sikkim.

Niviventer fulvescens (Gray)

The nominate subspecies in India including Sikkim.

83. *Niviventer fulvescens fulvescens* (Gray)

1847. *Mus fulvescens* Gray, *Cat. Hodgson Coll. Br. Mus.* : 18 (Nepal).

Common name : Chestnut Rat (Eng.).

Material examined : South Sikkim : 1F, (Rabangla, coll. V. C. Agrawal, 4.X.1988.

Measurements : *External* : 1F : H & B 125; T1 185; Hf 26; E 19; wt 60g. *Cranial* : 1F: *on* 33.2; *cb* 30.1; *n* 11.8; *pl* 16.2; *mtr* 5.5; *b* 4.5; *apf* 5.6; *zw* 15.5; *iw* 5.9; *ml* 16.2.

Diagnostic characters : Tail more than 140% of head and body length; toothrow generally less than 6.0mm in length. Tail unicoloured as reported by Bolanford (quoted by Fillermen 1961) for specimens from Sikkim.

Distribution : India : Sikkim (North and South Sikkim), Arunachal Pradesh, Meghalaya, northern West Bengal, northern Uttar Pradesh, and Himachal Pradesh.

Elsewhere : Nepal and Myanmar.

Remarks : Wroughton (1916) reported this species from Chuntang and Lachen, both in North Sikkim.

Niviventer eha (Wroughton)

The nominate subspecies occurs in Sikkim.

84. *Niviventer eha eha* (Wroughton)

1916. *Epimys eha* Wroughton, *J. Bombay nat. Hist. Soc.*, **24** : 428 (Lachen, Sikkim, India).

Common name : Little Himalayan Rat (Eng.).

Material examined : North Sikkim : 3M, 1F, Yumthang (c 3475m), coll. S. Chattopadhyay, 2 & 18. VII. 1989.

Measurements : *External* : 3M : H & B 120-125 (122); T1 180-201 (189); Hf 27-28 (27.6); E 21-22 (21.3). 1F : H & B 120; T1 170; Hf 28; E 20; Mammae 1+2 = 6. *Cranial* : 1F : *on* 31.5; *cb* 28.8; *n* 11.4; *pl* 15.2; *mtr* 5.0; *b* 4.8; *apf* 5.1; *zw* 15.2; *iw* 5.0; *ml* 15.3.

Diagnostic characters : Tail relatively long,

about 150% of head and body length. Dorsum having a reddish tinge and venter grey.

Distribution : India : Sikkim and northern West Bengal.

Elsewhere : Nepal.

Remarks : Wroughton (1916) described this species from Lachen, Sikkim. Latter, a few specimens were also collected from Thangu.

Genus *Rattus* Fischer, 1803

Three species of the genus *Rattus* occur in Sikkim.

Key to species of the genus *Rattus*

1. Tail bicoloured, dark above and paler below *R. turkestanicus*
- Tail unicoloured 2
2. Nasals less than 38% of occipitonasal length *R. rattus*
- Nasals more than 38% of occipitonasal length *R. nitidus*

Rattus rattus (Linnaeus)

Two subspecies of *Rattus rattus* are reported from Sikkim.

Key to the subspecies of *Rattus rattus*

- Undersurface of body white
 *R. r. brunneusculus*
- Undersurface of body grey *R. r. tistae*

85. *Rattus rattus brunneusculus* (Hodgson)

1845. *Mus brunneusculus* Hodgson, *Ann. Mag. nat. Hist.*, **15** : 276 (Nepal).

1919. *Rattus rattus sikimensis* Hinton, *J. Bombay nat Hist. Soc.*, **26** : 394 (Pashok, Darjeeling).

Common name : Hodgson's House Rat (Eng.).

Material examined : East Sikkim : 3F, Tumin (c 1470), coll. V. C. Agrawal, 24-27. IX.1988.

Measurements : **External** : 3F : H & B 152-160 (155); T1 170, 203; Hf 30 (in all); E 20-22

(21); wt 100-125 (108), mammae 3+3 = 12. **Cranial** : 3F : *on* 38.9-41.3 (39.7); *cb* 36.0-38.4 (37.0); *n* 13.3-14.5 (13.8); *pl* 20.6-21.8 (21.1); *mtr* 6.2-6.7 (6.6); *b* 6.5 (in all); *apf* 6.9-7.3 (7.1); *zw* 19.2-19.9 (19.4); *iw* 5.3-6.3 (5.8); *ml* 21.0-21.7 (21.5).

Diagnostic characters : As mentioned in the key to species above.

Distribution : India : Sikkim, West Bengal, northeastern States and Jammu & Kashmir.

Elsewhere : Nepal and Bhutan.

Remarks : Ellerman (1961) synonymised *R. rattus sikkimenses* Hinton with *R. r. brunneusculus*. However Musser & Heavey (1985) gave *sikkimenses* specific rank whereas Corbet & Hill (1992) treated it as a subspecies of *R. remotus*.

86. *Rattus rattus tistae* Hinton

1918. *Rattus rattus tistae* Hinton, *J. Bombay nat. Hist. Soc.*, **26** : 68 (Pashok, Darjeeling district, West Bengal, India).

Common name : Hinton's House Rat (Eng.).

Material examined : South Sikkim : 2M (juv.), 2F, Rabangla (c 2010m), coll. V. C. Agrawal, S. Chattopadhyay, 6.X.1990. 18-28.V.1990. West Sikkim : 1F, Yksum (c 1800m), coll. S. Chattopadhyay, 17.VI.1990.

Measurements : **External** : 3F: H & B 150-175 (165); T1 151-155 (153); Hf 32-35 (33); E 20-24 (22). **Cranial** : 1F : *on* 38.5; *cb* 35.8; *n* 15.1; *pl* 20.5; *mtr* 6.6; *b* 6.0; *apf* 6.7; *ml* 20.0.

Diagnostic characters : As mentioned in the key to species above.

Distribution : India : Sikkim, West Bengal and Northeastern States.

Elsewhere : Bhutan.

87. *Rattus nitidus nitidus* (Hodgson)

1845. *Mus nitidus* Hodgson, *Ann. Mag. nat. Hist.*, **15** : 267 (Nepal).

Common name : Himalayan Rat (Eng.).

Material examined : South dist. : 1M, 1F,

Gangtok (1829m), Cou. C. A. Crump, 30.XI.1914, 1.XII.1914.

Measurements : 1M : H & B 160, Tl 172, Hf 35, E 21. 1F : H & B 143, Tl 146, Hf 33, E 21.

Diagnostic characters : As mentioned in the key to species above.

Distribution : India : Sikkim (North and South dists.), Uttar Pradesh, Assam, Arunachal Pradesh and Tripura.

Elsewhere : China.

Remarks : Wroughton (1916) reported this species from Gangtok (South district) and Chuntang and Dikchu (North district).

88. *Rattus turkestanicus* (Satunin)

1903. *Mus turkestanicus* Satunin, *Ann. Mag. St. Peter.*, 7 : 558 (Uzbekistan).

Common name : Turkestan Rat (Eng.).

Material examined : North dist. : 1M, 1F, 4 Juv., Lachen (c 2750 m), coll. S. Chattopadhyay, 27, VII.-2. VIII. 1989; 1F, 1M, Chuntang (c 1630), coll. C. A. Crump, 16, 17.XII.1914.

Measurements : *External* : 2 : H & B 118, 120; Tl 119, 125; Hf 26, 30; E 19, 20. 2 : H & B 142, 160; Tl 163, 170; Hf 32, 36; E 19, 20. *Cranial* : 1F : *on* 39.4; *cb* 36.0; *n* 15.8; *pl* 21.0; *mtr* 6.7; *b* 6.0; *apf* 6.9; *zw* 18.8; *iw* 6.2; *ml* 20.4.

Diagnostic characters : Dorsum rufous to dark brown and venter slaty grey. It differs from that of the nominate subspecies where dorsum is paler and venter white. In one specimen even the tail is unicoloured.

Distribution : India : Sikkim (North district), Northern West Bengal, northern Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir.

Elsewhere : Pakistan, Afghanistan, Iran, Uzbekistan and Kazakhstan.

Remarks : Wroughton (1916) reported this species from Chuntang, North Sikkim.

Schlitter and Thonglongya (1971) treated the population of this species from Nepal, Sikkim, northwestern India and northern Pakistan as

Rattus turkestanicus vicerex (Bonhote). Chakraborty (1983), however, regarded *vicerex* as a full species on the basis of the tail being shorter than head and body, ventral surface of body white and mammae 4 pairs. Since the specimens from Sikkim have the tail longer than head and body, venter grey in colour and 5 pairs of mammae, these differ both from *vicerex* and *turkestanicus*.

Genus *Mus* Linnaeus, 1758

Two species of the genus *Mus* are reported from Sikkim.

Key to species of the genus *Mus*

Anterior palatal foramina short, less than one-fifth of occipitonasal length, and not extending between maxillary toothrows *M. pahari*

Anterior palatal foramina long, more than one-fifth of occipitonasal length, and extending between maxillary toothrows *M. musculus*

Mus pahari Thomas

Out of two subspecies, the nominate one occurs in Sikkim.

89. *Mus pahari pahari* Thomas

1916. *Mus pahari* Thomas, *J. Bombay nat. Hist. Soc.*, 24 : 414 (Batasia c 1828m, Darjeeling district, West Bengal, India).

Common name : Sikkim Mouse (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : As mentioned in the key to species above.

Distribution : India ; Sikkim (Chunthang vide Ellerman 1961), West Bengal, Assam and Nagaland.

Elsewhere : Myanmar.

Mus musculus Linnaeus

The subspecies of *mus musculus* occur in Sikkim.

Key to the subspecies of *Mus musculus*

Dorsum light brown; undersurface of body light grey *M. m. homourus*

Dorsum dark brown : undersurface of body brown *M. m. castaneus*

90. *Mus musculus castaneus* Waterhouse

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

Common name : House Mouse (Eng.).

Material examined : South Sikkim : 8M, 2F, Tadong, Gangtok.

Measurements : *External* : Nil. *Cranial* : 8M : *on* 18.1-21.3 (19.9); *cb* 16.9-20.0 (18.8); *n* 6.1-8.1 (7.2); *mtr* 3.0-3.5 (3.2); *b* 3.0-3.3 (3.1); *apf* 4.1-4.7 (4.4). 2F : *on* 19.4, 19.5; *cb* 18.0; 18.0, *n* 7.5, 7.5; *mtr* 3.0; 3.0; *apf* 3.8, 4.0; *b* 3.0, 3.0.

Diagnostic characters : As mentioned in the key to subspecies above.

Distribution : India : Sikkim, West Bengal, Assam, Uttar Pradesh, Rajasthan, Maharashtra, Tamil Nadu and Andaman Islands.

Elsewhere : Nepal and Sri Lanka.

91. *Mus musculus homourus* Hodgson

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

Common name : House Mouse (Eng.).

Material examined : North Sikkim : 1M, Yaksum (c 1800m), coll. S. Chattopadhyay, 17.VI.1990.

Measurements : *External* : 1M (Juv.) : H & B 56; T1 77; Hf 17; E 12. *Cranial* : *on* 17.5; *cb* 16.2; *n* 6; *mtr* 3.5.

Distribution : India : Sikkim, West Bengal, Meghalaya, Nagaland, Manipur, Uttar Pradesh and Tamil Nadu.

Elsewhere : Nepal, Myanmar, China, Vietnam and Java.

Genus *Bandicota* Gray, 1873

One species of the genus *Bandicota* is reported from Sikkim.

92. *Bandicota indica nemorivaga* (Hodgson)

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

Common name : Large Bandicoot Rat (Eng.).

Material examined : Nil.

Measurements : Nil.

Diagnostic characters : Length of nasals shorter than those of the nominate subspecies, being on an average less than 20 mm.

Distribution : India : Sikkim (Ellerman 1961), West Bengal, Assam, Bihar, Meghalaya and Manipur.

Elsewhere : Nepal, Bangladesh, Thailand and Formosa.

SUMMARY

An account of the mammalian fauna of Sikkim based mainly of old and recent collections present in the Zoological Survey of India as well as those recorded in literature, is given. A total of 92 species and subspecies belonging 63 genera. 23 families and 9 orders have been reported.

Keys and diagnostic characters for identification of each species have been given.

The distribution of each species has been furnished in India as well as outside.

The species, *Rhinolophus rouxi* and *Hylopetes alboniger* are recorded for the first time from Sikkim.

Taxonomic status of *Soriculus macrourus*, *Myotis murinus caliginosus*, *Rattus turkestanicus*, *Marmota himalayana*, *Hystrix brachyura*, *Lepus hypsibius*, *Ochotona nubrica*, *O. sikimaria*, *O. forresti* and *O. macrotis* has been discussed, A note on the breeding in *Mustela sibirica subhimachalana* has been incorporated.

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Plate-1

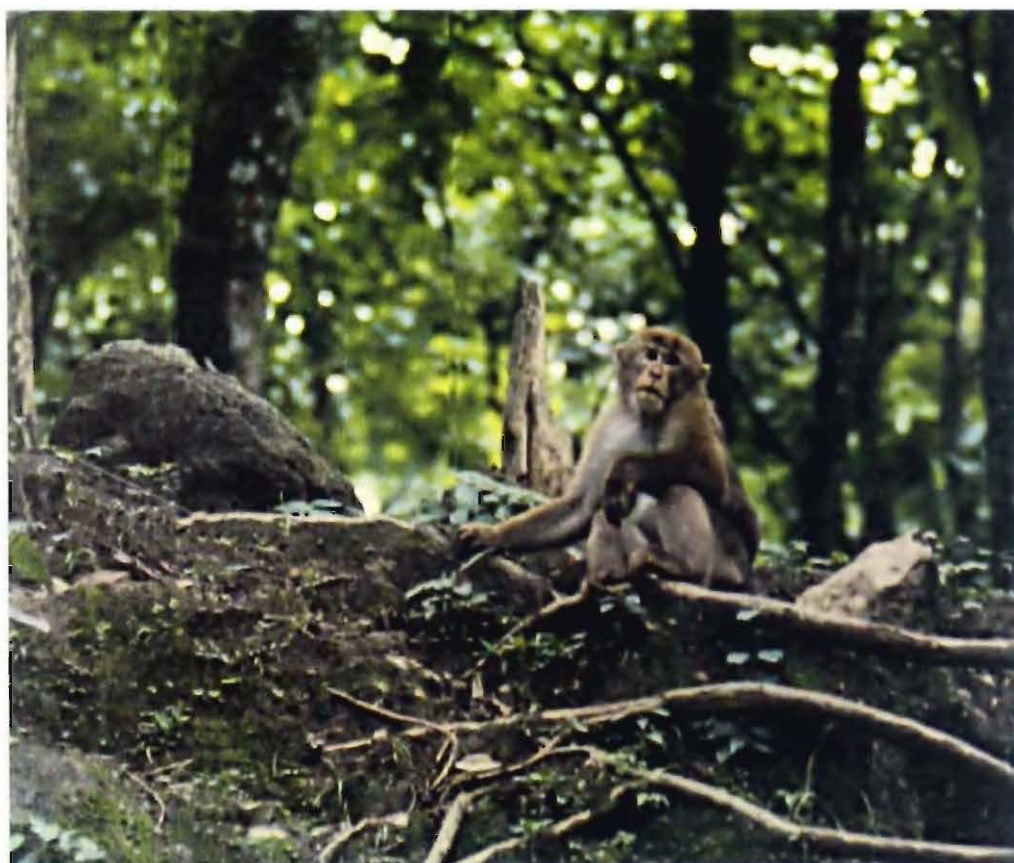


Skulls of *Ovis ammon hodgsoni*

Plate-2



Rufous-naped Hare, *Lepus nigricollis ruficaudatus*



Assamese Macaque, *Macaca assamensis pelops*

AVES

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INTRODUCTION

Sikkim, the land of mist, lies on the lap of the Great Himalayas. A tiny independent state with luxuriant forest engulfed by mist; century old Buddhist Monestry with chart by monks, "Om Moni Padma Hum" has been continuing its sleep till modern civilization spreads its tentacles in recent decades. Politically the princely state became twenty second state of the Union of India in 1975. Geographically the state of Sikkim lies between 27°3'–28°20'N latitude and 88°–88°58'E longitude.

Sikkim is bounded by the Tibet-China on the north, east by Bhutan, on the West by Nepal and by and by the district of Darjeeling of West Bengal on the south. The state is entirely mountainous together with deep gorges and valleys from where innumerable streams spring up to form rivers like Tista, Lachen, Lachung, Chala, Rangit etc.

Administratively the state of Sikkim is divided into four districts, viz. East, West, North and South with their Head-Quarters at Gangtok, Geyzing, Mangam and Namchi.

The mighty river Tista, which flows throughout the length of the state with a stretch of 144 Km, has immense influence on the flora, fauna and cultural heritage of the state of Sikkim.

The total area of the state is approximately 7096 Km² with average rainfall of 3,048 mm to 3,962 mm.

The climate ranges from the tropical heat of the valleys to the alpine cold of the snowy ranges. The almost level Gangetic delta permits the steady unobstructed inflow of SW monsoon directly thrashes entire Sikkim Himalayas and renders it as most humid region of the entire Himalayan Chain.

Vegetation :

Due to high precipitation of rainfall, the floral composition of Sikkim bears a greater similarity with the Malay Peninsula and Archipelago. There are broadly three altitudinal zones of vegetation in Sikkim.

1. Tropical Zone : Foothills — c.4000' (Deep valleys and gorges with dense evergreen jungle).
2. Above this belt, and upto 6,500' (Dense tall evergreen forest with heavy undergrowth).
3. Between 9,000' and 13,000' (Temperate Zone of mixed Conifer forest).

Fauna :

It is amazing to note that within such tiny geographical area all three altitudinal zones merge with one another which harbours extremely divergent and luxuriant avifauna in Sikkim and perhaps the richest area of its size anywhere in the world. Altogether 610 bird species are mentioned in this paper. This means about 50% percent of the aggregate bird species found in the Indian Union. Apart from above, the avifaunal resources of Sikkim enrich with more diversity due to curious parallelism exists between the

avifauna found in the moist Sikkim Himalaya, Mayanmar and Malay on the one hand and that of rain forest of southern Western Ghats on the other.

HISTORY OF ORNITHOLOGICAL EXPLORATION

"Sikkim Himalaya" with its excellent faunal wealth attracted naturalists and ornithologists as well since middle of the nineteenth century. Altogether if at that time, was a forbidden territory to all foreigner specially British, still a handful of naturalist ventured the state of Sikkim for faunal wealth and exotic beauty of the Great Himalayas as well. The pioneer was Brain Hodgson, who with the help of local collectors surveyed this untouched territory between 1845 and 1858. Hodgson was followed by Mandelli and W. T. Blanford during 1870. All these three ornithologists made a comprehensive collection of birds from Sikkim. J. A. Grammie in 1877 and E. W. Brooks in 1880 made some general and ornithological notes from Sikkim. Grammie with his twelve years uninterrupted residence in Sikkim noted that due to tea plantation in every direction

very little vergin forest remains under 6,000'. The comprehensive collection of birds from Sikkim was further enriched by several other ornithologists, viz., Col. F. M. Baily, Herbert Stevens, Frank Ludlow, Col. R. Meinertzhagen during 1923–1937; and lastly by Loke—Salim Ali bird survey of Sikkim. But perhaps most comprehensive and systematic collection of birds was made by Dr. Ernst Schafer during the two years immediately preceeding the second World War.

The Zoological Survey of India made several attempt to have complete faunal wealth of Sikkim. The "Daily Mail Himalayan Expedition" in 1952 and Mammal Survey with special reference to 'Lagomorph' in 1982 made stray collection of birds from Sikkim, and lastly a comprehensive collection of birds was made during 1991–1994.

AVIAN FAUNA

The avifauna of Sikkim is most divergent in nature due to its geographical condition which in ultimate leads to luxuriant and cosmopolitan floral wealth. Each floral niche harbours characteristic avifauna of its own.

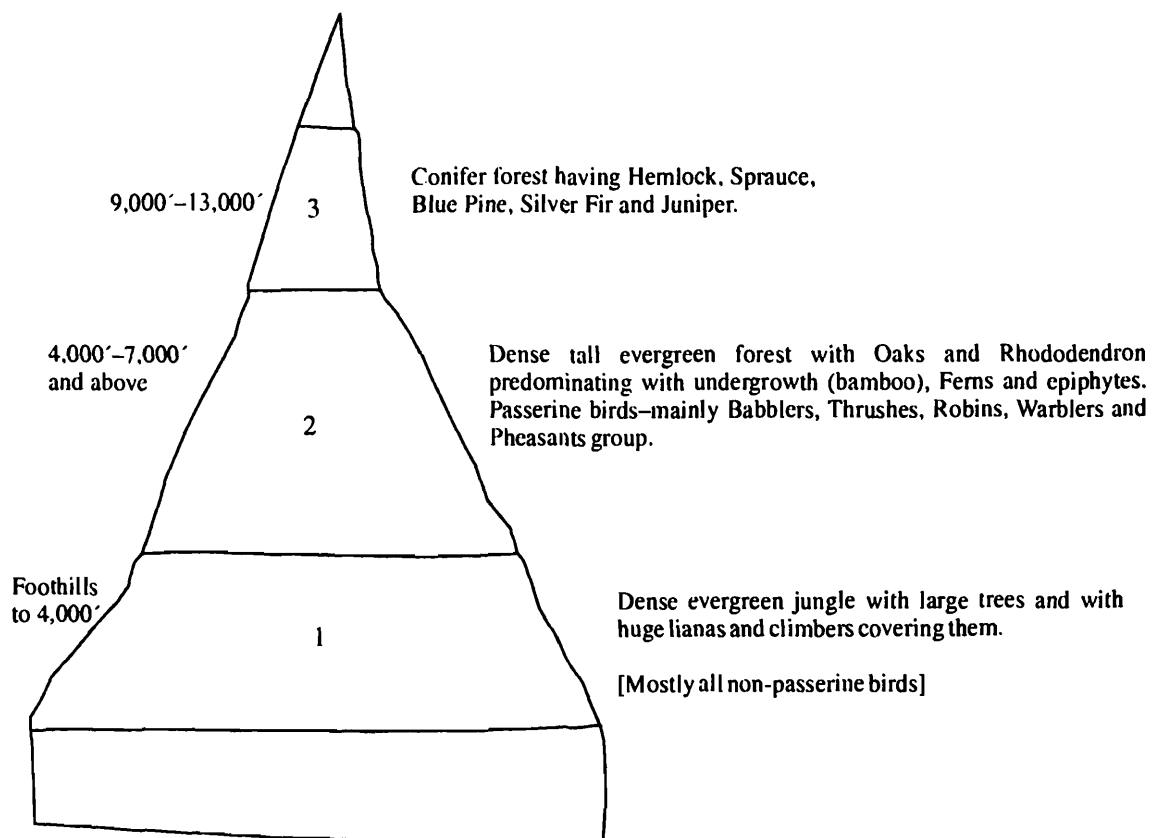


Fig. [* Typical high altitudinal birds consisting of both non-passerine and passerine birds—Snow pigeon, Blood-pheasant, Raven, Chough, Tits, Finches, Yuhinas, Parrotbills etc.]

All the geographical, vis.- a vis. floral Zones are virtually sandwiched with each other within small pocket of Sikkim Himalaya. This phenomenon was best described by Sir J.D. Hooker's "Himalayan Journals" published in 1891. The document is a classic of its kind—"The enthralling narrative of a most difficult and adventurous pioneering exploration and then unsettled territories of the Raja of Sikkim" Sir Hooker wrote, "From the bed of the Ratong in which grow palms with screw-pine and plantain, it is only seven miles in a direct line to the perpetual ice." Hence from this point of view of divergent and successive floral pattern ranging from terai grassland to temperate conifer forest, avifauna of each vegetation zone are found within small landmass of Sikkim.

Another major avifauna found in Sikkim are some species of birds which have disjunct distribution in between Sikkim Himalayas, Myanmar and Malayas and Southern Western Ghats.

Some well-known migratory birds have a small impact on the avifauna of Sikkim. The Lachen Valley in the north Sikkim is believed to be a traditional flyway for ducks and geese in spring migration. Some of them are known to spend a part of the winter at lower altitude of Sikkim.

A. Existing Protected Areas

1. Khangchendzonga NP (1,784 Km²)
2. Barsey Rhododendron WLS (104.00 Km²)
3. Fambong Lho WLS (51.76 Km²)
4. Kyongnosla Alpine WLS (31.00 Km²)
5. Maenam WLS (35.34 Km²)
6. Shingba (Rhododendron) WLS (43.00 Km²)

B. Proposed National Parks

1. Chho Lhamo Cold Desert (500.00 Km²)
2. Pangola (108.00 Km²)

C. Sikkim = 7096.00 Km²

- NP : 1 = 1784.00 Km² (25.14% of state area)
WLS : 5 = 265.10 Km² (3.74% of state area)

Family PODICIPEDIDAE

Greebes

India : 4 species & sub species

Sikkim : 1 species. 25% of Indian population

Dense and silky, black and slaty plumage with small wings and rudimentary tail and sharply pointed bill. Legs adapted for swimming. Sexes alike.

5. *Tachybaptus ruficollis* (Pallas)

Little Grebe

Family PHALACROCORACIDAE

Cormorants/Shags

India : 3 species

Sikkim : 2 species. 66% of Indian population

Duck like black and slaty water birds with long neck and slender hooked bill. Tail long and stiff. Plumage get soaked by prolonged immersion and required constant drying out. Gregarious. Single or in small party. Depends almost on fish.

27. *Phalacrocorax fuscicollis* Stephens

Indian Shag

28. *Phalacrocorax carbo* (Linnaeus)

Great Cormorant

Family ANHINGIDAE

Darters

India : 1 species.

Sikkim : 1 species. 100% of the Indian Population

Cormorant like water birds with long neck and slender pointed bill. Food consists mostly of fish, occasionally small amphibia and reptiles.

29. *Anhinga melanogaster* Pennant

Darter

Family ARDEIDAE

Herons, Egrets & Bitterns

India : 23 species and sub species

Sikkim : 10 species and sub species. 23% of the Indian population.

Long-legged, lanky wading birds with long slender flexible necks. Bill long, straight and pointed. Tarsi and toes long and slender. Plumage usually white, grey, purple or brown. Filamentous ornamental plumes are seen during breeding season in some cases. Sexes alike or nearly so. Gregarious. Single or in small parties. One member crepuscular and nocturnal except in breeding season. Food consists of insects, fish, frog, reptiles etc. Whole family members live in grassland and in marshland. 50% are Common (42, 44, 47-48, 49) and remaining are rare (33, 36, 38, 52, 56, 57)

49. *Egretta garzetta* (Linnaeus)
Little Egret

36. *Ardea cinerea rectirostris* Gould
Grey Heron

33. *Ardea insignis* Hume
White-bellied Heron

47, 48. *Mesophoyx intermedia* (Wagler)
Median Egret

44. *Bubulcus ibis* (Linnaeus)
Cattle Egret

42. *Ardeola grayii grayii* (Sykes)
Indian Pond Heron

38. *Butorides striatus javanicus* (Horsfield)
Little Green Heron

52. *Nycticorax nycticorax* (Linnaeus)
Black-crowned Night Heron

57. *Ixobrychus sinensis* (Gmelin)
Yellow Bittern

56. *Ixobrychus cinnamomeus* (Gmelin)
Chestnut Bittern

Family CICONIIDAE

Large, long-legged, diurnal birds chiefly terrestrial and marsh-haunting. Colour pattern mainly white and black. Bill long, massive, pointed, straight and ungrooved. Wings long, tail short, (HB), Some are resident and some migratory is nature. Storks are mainly Bird Cow altitude, and occasionally found in the Nepal terai and Bengal Duars adjacent Sikkim. Hence following

bird may visit Sikkim specially adjacent to Bengal Duars.

65. *Ciconia nigra* (Linnaeus)
Black Stork

63. *Ciconia coconia* (Linnaeus)
European White Stork

64. *Ciconia boyciana* Swinhoe
Oriental White Stork

66. *Ephippiorhynchus asiaticus* (Latham)
Black-nacked Stork

Family THRESKIORNITHIDAE

Comparatively long and bare-legged gregarious waterside or marsh birds related to and resembling storks, herons, and egrets. Plumage chiefly white or black or chestnut with metallic gloss. Bill long, slender. Sexes alike or nearly so (HB). This group of birds is not found in Sikkim. However following two birds may occasionally occur in the low land of Sikkim adjacent to Bengal Duars.

1. *Plegadis falcinellus* (Linnaeus)
Glossy Ibis

2. *Threskiornis melanocephalus* (Latham)
Oriental White Ibis

Family ANATIDAE

Ducks and Geese are not normally found in Sikkim. However Moinertzhagen (1972) recorded one male Common Merganser from Sikkim. Moreover Lachen Valley in the north Sikkim is believed to be the traditional flyway for ducks and geese in spring migration, and some of them are known to spend a part of the winter at lower altitude of Sikkim. Ali (1962) mentioned following ducks and geese supposed to occur in Sikkim.

82. *Anser indicus* (Latham)
Bar-headed Goose

90. *Tadorna ferruginea* (Pallas)
Brahminy Shelduck

101. *Anas strepera* Linnaeus
Gadwall

103. *Anas penelope* Linnaeus
Eurasian Wigeon

93. *Anas acuta* Linnaeus
Northern Pintail

94. *Anas crecca* Linnaeus
Common Teal

121. *Mergus merganser* Linnaeus
Common Merganser

General information : Rare winter visitor. Rarely seen in swift-flowing river and rivulets. Carnivorous (fish). Aquatic. Keeps mostly in pairs.

Collection records : Meinertzhagen (1927) mentioned 1♂ from Sikkim.

Remarks : Ali (1962) mentioned that it may breed in the Tibetanfacies of N. Sikkim.

Family ACCIPITRIDAE
**Hawks, Eagles, Buzzards, Old World
Vultures, Kites & Harriers**

India : 74 species and subspecies

Sikkim : 33 species and subspecies. c. 44% of the Indian population.

Family Accipitridae consists of six different groups of birds of prey. All diurnal and predatory by nature. All have large rounded wings for continuous flying or soaring; strong legs fitted with powerful hooked claws and have short, curved and strongly hooked bill; all mechanism for hunting or preying.

Food ranges from all living small vertibrated and large dead mammals. Overall colouration mostly brown–deep brown and grey-whitish grey pattern. Always lives singly or in pair in the breeding season and sometime in a large flock in case of Vultures. Hawks are smaller member and Vultures are larger and rest groups are in between. Almost all, Bearded Vulture is not only the largest but also lives in the highest limit of the Himalayas.

125. *Aviceda jerdoni jerdoni* (Blyth)
Jerdon's Baza

127. *Aviceda leuphotes leuphotes* (Dumont)
Black Baza

130. *Pernis ptilorhynchus ruficollis* Lesson
Oriental Honey-Buzzard

124. *Elanus caeruleus* (Desfontaines)
Black-shouldered Kite

133. *Milvus migrans govinda* Sykes
Black Kite

135. *Haliastur indus* (Boddaert)
Brahminy Kite

177. *Ichthyophaga humilis* (S. Muller & Schlegel)
Lesser Grey-headed Fish-Eagle

188. *Gypaetus barbatus* (Linnaeus)
Bearded Vulture

187. *Neophron percnopterus ginginianus* (Latham)
Egyptian Vulture

185. *Gyps bengalensis* (Gmelin)
Indian White-backed Vulture

184. *Gyps tenuirostris* (G.R. Gray)
Slender-billed Vulture

181. *Gyps himalayensis* Hume
Himalayan Griffon

179. *Aegypius monachus* (Linnaeus)
Cinereous Vulture

178. *Sarcogyps calvus* (Scopoli)
Red-headed Vulture

195. *Circaetus gallicus* (Gmelin)
Short-toes Snake-Eagle

196. *Spilornis cheela cheela* (Latham)
Crested Serpent Eagle

193. *Circus aeruginosus* (Linnaeus)
Western Marsh-Harrier

189. *Circus cyaneus* (Linnaeus)
Hen Harrier

190. *Circus macrourus* (S.G. Gmelin)
Pallid Harrier

144. *Accipiter trivirgatus* (Temminck)
Crested Goshawk

138. *Accipiter badius clussumieri* (Temminck)
Shikra

150. *Accipiter virgatus affinis* Hodgson
Besra Sparrowhawk

148. *Accipiter nisus melaschistos* Hume
Eurasian Sparrowhawk

136. *Accipiter gentilis* (Linnaeus)
Northern Goshawk

157. *Butastur teesa* (Franklin)
White-eyed Buzzard

153. *Buteo rufinus* (Cretzschmar)
Long-legged Buzzard

154. *Buteo hemilasius* Temminck & Schlegel
Upland Buzzard

172. *Ictinaetus malayensis* (Temminck)
Black Eagle

166. *Aquila chrysaetos* (Linnaeus)
Golden Eagle

163. *Hieraaetus fasciatus* (Vieillot)
Bonelli's Eagle

164. *Hieraaetus pennatus* (Gmelin)
Booted Eagle

165. *Hieraaetus kienerii* (E. Geoffroy)
Rufous-bellied Eagle

160. *Spizaetus cirrhatus limnaeetus* (Horsfield)
Changeable Hawk-Eagle

174. *Haliaeetus leucorhynchus* (Pallas)
Pallas's Fish-Eagle

General information : Extremely rare vagrant or summer migrant in the hillside forest and valleys between c. 4,500' and 9,000' Carnivorous. Arboreal. Keeps in single.

Other records : Stevens (1923/25) once obtained it in the Rungbong Valley c. 4,500' in June. Ali (1955) observed 1 example in the Lachen Valley, c. 9,000' in April.

188. *Gypaetus barbatus* (Linnaeus)
Bearded Vulture

General information : Uncommon resident at the higher elevation. Often as low as c. 4,000' Carnivorous. Arboreal. Keeps mostly in majestic flight in mountains and valleys.

Collection records : Schafer (1938/39) obtained 4♂ and 1 ♀. unsexed.

Meinertzhagen (1927) collected 1♂ and 1♀.

181. *Gyps himalayensis* (Hume)
Himalayan Griffon

General information : Rare resident in cliffs and open mountains between 6,000' and 16,000' Carnivorous. Keeps in pairs or small parties.

Collection records : Schafer (1938/39) obtained 5 examples at Gayamtashane Tso, c. 16,000', N. Sikkim.

Other records : Ali (1962) remarked that it often seen along the trade route to Tibet attracted by carcass of dead animals by the wayside.

178. *Sarcogyps calvus* (Scopoli)
Red-headed Vulture

General information : Status uncertain.

Other records : Ali (1962) met with it at Rangpo, Singtam and Martem up to 3,000'

196. *Spilornis cheela cheela* (Latham)
Crested Serpent Eagle

General information : Uncommon resident in the evergreen and deciduous hillside forests and cultivated valleys from the foothills up to c. 7,000' Carnivorous. Arboreal. Keeps mostly in single.

Collection records : Schafer (1938/39) obtained 1♂ at Gangtok in March.

189. *Circus cyaneus* (Linnaeus)
Hen Harrier

No collection record so far from Sikkim. Ali (1962) remarked that it may occur in Sikkim on passage.

144. *Accipiter trivirgatus indicus* (Hodgson)
Crested Goshawk

General information : Rare resident from the foothills up to c. 6,500' Carnivorous. Arboreal. Keeps in single.

Collection records : Meinertzhagen (1927) obtained specimen from Dikchu and Gangtok during October-December.

150. *Accipiter virgatus affinis* Hodgson
Besra Sparrowhawk

General information : Uncommon. A bird of

dense evergreen forest from foothill up to c. 6,600' Carnivorous. Arboreal. Keeps solitary.

Collection records : Meinertzhagen (1927) collected 2♀ at Gangtok, 6,600' and Denum, 4,700' in December to January. Schafer (1938/39) obtained 1♀ at Chungthang, 5,000' in June.

148. *Accipiter nisus melaschistos* Hume
Eurasian Sparrowhawk

General information : Passage migrant or winter visitor. A bird of dense deciduous forest edging human habitation. Carnivorous. Arboreal. Great glider. Keeps solitary.

Collection records : Stevens (1923/25) mentioned specimens from Nepal-Sikkim frontier, 10,160'; Rungbong Valley, 4,500' and Lachung during winter.

Schafer (1938/39) obtained 2♂ and 2♀ from Lachen during October to February.

Other records : Blanford (1870) noted it as common in Lachen and Lachung Valleys after mid September.

156. *Buteo buteo japonicus* (Temminck & Schlegel)
Common Buzzard

General information : Rare winter visitor in evergreen forest preferably in between c. 5,000' and 12,000' Carnivorous. Arboreal. Good gliders. Keeps in single.

Collection records : Schafer (1938/39) obtained 2♂ and 1♀ at Lachen and Gangtok during September–February.

Other records : Blanford (1870) noted it at Yumthang c. 13,000' in September.

153. *Buteo rufinus* (Cretzschmar)
Long-legged Buzzard

General information : Rare winter visitor. A bird of dense deciduous forest edging human habitation. Carnivorous. Arboreal. Great glider. Keeps solitary.

Collection records : Schafer (1938/39) obtained 1♂ at Manshitang, 5,000' in November.

172. *Ictinaetus malayensis* (Temminck)
Black Eagle

General information : Extremely rare resident (?) in the evergreen hillside forest and Valleys from the foothills up to c. 7,000' Carnivorous. Graceful sailers. Arboreal. Keeps in single.

Collection records : Schafer (1938/39) obtained 1♂ and 1♀ during April–June.

Other records : Ali (1962) noted solos frequent during November–April at Singtam, Martem, Dikchu, Kewzing and Gangtok between c. 1,000' and 6,500'

163. *Hieraaetus fasciatus* (Vieillot)
Bonelli's Eagle

General information : Extremely rare resident(?) in the evergreen hillside forest and Valleys from c. 2,000' to 7,000' Carnivorous. Excellent hunter and powerful glider. Arboreal. Keeps in single on the canopy of tall trees and cliffs.

Other records : Ali (1962) observed it at Gangtok in December.

164. *Hieraaetus pennatus* (Gmelin)
Booted Eagle

General information : Rare resident from the foothills up to c. 6,500' Carnivorous. Arboreal. Keeps in single.

Other records : Ali (1962) mentioned that it has been recorded and a similar status like (163) in Sikkim.

158. *Spizaetus nipalensis nipalensis* (Hodgson)
Mountain Hawk-Eagle

General information : Extremely rare resident (?) in the evergreen hillside forest and Valleys from c. 2,000' to 7,000' Carnivorous. Excellent hunter and powerful glider. Arboreal. Keeps in single on the canopy of tall trees or cliffs.

Collection records : Schafer (1938/39) obtained 1♀.

Family PANDIONIDAE
Osprey

India : 1 species

Sikkim : 1 species. 100% of the Indian population.

Family represented by only one species in India. Like other Eagles but with very powerful toes and long subequal strongly curved claws.

203. *Pandion haliaetus* (Linnaeus)

Osprey

Family FALCONIDAE

Falcons

India : 20 species and subspecies

Sikkim : 9 species and subspecies. 45% of the Indian population.

They are also birds of prey but certainly more sharp and accurate than hawks and eagles. Spindle—shaped streamlined bodies for extreme speed in chasing prey and all hunting apparatus are extremely adapted. Overall colouration brown, black and white. Most species are solitary.

Although Sikkim has seven different population, yet they are extremely rare in reality.

204. *Microhierax caerulescens* (Linnaeus)

Collared Falconet

223. *Falco tinnunculus interstinctus* McClelland

Common Kestrel

219. *Falco chiquera* Daudin

Red-headed Falcon

220. *Falco amurensis* Radde

Amur Falcon

213. *Falco subbuteo* Linnaeus

Eurasian Hobby

214. *Falco severus rufipedoides* Hodgson

Oriental Hobby

208. *Falco jugger* J.E. Gray

Laggar

209. *Falco peregrinus japonensis* Gmelin

Peregrine Falcon

211. *Falco peregrinus peregrinator* Sundevall

Eastern Peregrine Falcon

204. *Microhierax caerulescens* (Linnaeus)

Collared Falconet

General information : Rare resident in the outskirts of forest and cultivation with tall trees from the foothills up to c. 2,000' Carnivorous. Arboreal (Canopy bird). Keeps in pairs or small parties.

Collection records : Ali (1962) obtained 1 ♀.

222. *Falco tinnunculus tinnunculus* Linnaeus

Common Kestrel

General information : Uncommon resident in the open hillside forests and valleys with human habitation from the foothills up to c. 13,000' Carnivorous. Arboreal (canopy bird). Keeps in single.

Collection records : Schafer (1938/39) collected 2♂, 3♀ and 4 unsexed at Lachen, Mānshitang, Lachung and Gangtok during October–December.

Ali (1962) obtained 1 ♀.

Other records : Meinertzhagen noted it at 4,000' and at Changu, c. 12,500' in winter. Betts noted it at Thangu, 13,000' Ali (1962) noted it springly at Rangpo, Martem, Dikchu, Gangtok, Gezing and Kewzing from c. 1,000' to 11,800' during November–April.

NZC, 1 ♀ Rinchinpong, Rangit valley, Sikkim, c. 1600 m 05.01.1953.

209. *Falco peregrinus japonensis* Gmelin

Peregrine Falcon

General information : Extremely rare resident (?) in the outskirts of forest and cultivation with tall trees from the foothills up to c. 2,000' Carnivorous. Arboreal (Canopy bird). Keeps in pairs or small parties.

Collection records : Meinertzhagen (1927) obtained 1♂ near Lachung, c. 9,000' in February.

Other records : Ali (1962) remarked that a few unconfirmed sight records between November and April at 5,000'–8,000'

Family PHASIANIDAE

Pheasants, Partridges, Quails

India : 71 species and subspecies.

Sikkim : 13 species and subspecies. c. 19% of the Indian population.

Wonderful avian family, popularly known as 'Game birds' for their luxuriant feathers and delicious meat for which men since time immemorial have been hunting them. The only reason by which, all these beauties of the nature are now rare or extinct from the good earth or have now taken shelter in the impenetrable areas from the snow-clad mountains to the deep remote forest. Most of the 'Game birds' barring a few representatives of 'Partridges' and 'Quails' of the plains, are now living in the 'Himalayas'.

Colourful feather (male), rounded wings, short neck and short and thick bill are characteristic. Diagnostic short legs with one or more spurs in the male, and strong claws are meant for their traditional food habit.

227. *Lerwa lerwa* (Hodgson)
Snow Partridge
230. *Tetrao gallus tibetanus aquilonifer* R.&A. Meinertzhagen
Sikkim Snowcock
239. *Francolinus francolinus melanotus* Hume
Black Francolin
249. *Perdix hodgsoniae hodgsoniae* (Hodgson)
Tibetan Partridge
270. *Arborophila rufogularis rufogularis* (Blyth)
Rufous-throated Hill-Partridge
273. *Arborophila mandellii* Hume
Red-breasted Hill-Partridge
282. *Ithaginis equestus affinis* Beebe
Sikkim Blood Pheasant
286. *Tragopan satyra* (Linnaeus)
Satyr Tragopan
290. *Lophophorus impejanus* (Latham)
Impeyan Monal
299. *Gallus gallus murghi* Robinson & Kloss
Red Junglefowl
295. *Lophura leucomelanos melanota* (Hutton)
Kaleej Pheasant

309. *Polyplectron bicalcaratum bakeri* Lowe
Grey Peacock-Pheasant

311. *Pavo cristatus* Linnaeus
Indian Peafowl

227. *Lerwa lerwa* (Hodgson)
Snow Partridge

General information : Rare resident in the open hillside alpine pastures intermixed with lichen, ferns and grass from c. 1,000' to 15,000' Omnivorous (mostly vegetarian and partly insectivorous). Ground feeder. Keeps in moderate parties.

Collection records : Schafer (1938/39) obtained 14♂. Ali (1962) collected 1♀.

230. *Tetrao gallus tibetanus aquilonifer*
R. & A. Meinertzhagen
Sikkim Snowcock

General information : Extremely rare resident in open rocky scrubbed hillside field and alpine pastures. Omnivorous (vegetable shoots and insect). Ground feeders. Extremely shy. Keeps in pairs or small parties.

Collection records : Schafer (1938/39) obtained 1♀ at Gangtok.

267. *Arborophila torqueola torqueola*
(Valenciennes)
Common Hill-Partridge

General information : Common resident in the dense evergreen forest with heavy undergrowth between c. 6,000' and 9,000' Omnivorous (Vegetable shoots and insects). Ground feeder, shy and fickle. Keeps in small parties.

Collection records : Stevens (1923-25) obtained 1 example at Gangtok, c. 12,000' Schafer (1938/39) collected 7♂ and 1♀. Z.S.I (1952) collected 1♂ and 1♀

271. *Arborophila rufogularis intermedia*
(Blyth)

Rufous-throated Hill-Partridge

General information : Common resident in the dense evergreen forest with heavy undergrowth between c. 6,000' and 9,000' Omnivorous

(Vegetable shoots and insects). Ground feeder, shy and fickle. Keeps in small parties.

Collection records : Ali (1962) examined specimens collected at Linglam (5,500'-6,000') by the Suydm cutting Expedition (1931).

273. *Arborophila mandellii* Hume
Red-breasted Hill-Partridge

General information : Common resident in the dense evergreen forest with heavy undergrowth between c. 6,000' and 9,000' Omnivorous (vegetable shoots and insects). Ground feeder, shy and fickle. Keeps in small parties.

Collection records : Stevens (1923-25) procured one example at Lingtam, c. 6,000' in February, 1931.

282. *Ithaginis eucuentus affinis* Beebe
Sikkim Blood Pheasant

General information : Common resident of the conifer forest with heavy junifer shrub and rhododendron between c. 9,000' and 15,000' Vegetarian (Moss, lichen and ferns). Ground feeder. Gregarious, swift runner and fickle. Keeps in pair or small parties.

Collection records : Schafer (1938/39) collected 8♂ and 3♀. Ali (1962) obtained 2♂ and 1♀. Z.S.I (1952) collected 5♂ and 2♀ from Dombang. N.Z.C. 1♂ Chubba, Lachung, N. Sikkim, (10,500') 22.01.1953, 3♂, 1♀. Thangu, N. Sikkim, 16. 07. 1989, 2.08. 1989

Remarks : Schafer (1938/39) collected 1 example as low as in Chungthang, c. 5,000' in December.

286. *Tragopan satyra* (Linnaeus)
Satyr Tragopan

General information : Extremely rare resident in the upper ridges of evergreen forest with dense shrubby undergrowth from c. 8,000' to 12,000' Omnivorous (vegetable shoots and insects). Ground feeder. Extremely shy and fickle. Keeps mostly in pairs, often in small family parties.

Collection records : Schafer(1938/39) obtained 4♂ and 2♀. Ali (1962) collected 1♀. N.Z.C. 1♂.

Lachen, N. Sikkim (8900'), 31.03.1979; 1♀. Menam, S. Sikkim, 27.05.1990.

Remarks : Schafer (1938/39) obtained 1 example as low as in Manshiltang, c. 6,000' in December.

290. *Lophophorus impejanus* (Latham)
Impeyan Monal

General information : Extremely rare resident in the upper ridges of the evergreen forest with dense shrubby undergrowths from c. 8,000' to 12,000' Omnivorous (vegetable shoots and insects). Ground feeder. Extremely shy and fickle. Keeps mostly in pairs, often in small family parties.

Collection records : Schafer (1938/39) obtained 2♂ and 4♀. Ali (1962) collected 1♂ and 1♀.

Other records : Blanford (1870) noted it 14,000'-15,000' in September.

299. *Gallus gallus murghi* Robinson & Kloss
Red Junglefowl

General information : Common resident in shrub jungle and edge of the hillside cultivation. Omnivorous. Ground feeder.

Collection records : Schafer (1938/39) procured 2♀.

295. *Lophura leucomelanos melanota* (Hutton)
Kaleej Pheasant

General information : Rare resident in the hillside forest with dense scrub from the foot hills up to c.6,000' Omnivorous. Ground feeder. Shy. Keeps in pairs or in small family parties.

Collection records : Schafer(1938/39) procured 6♂ and 6♀ at Lachen, c. 9,000' during June and November.

Family TURNICIDAE. Buttonquails,
Bustardquails

India : 6 species and subspecies.

Sikkim : 3 species and subspecies. 50% of the Indian population.

Small quail-like grassland birds with long bustard-like feet having only three toes. Poor flies. Food consists of vegetable matters including insects. Sexes unlike. Female larger and brighter.

313. *Turnix sylvatica* (Desfontaines)

Small Buttonquail

314. *Turnix tanki tanki* Blyth

Yellow-legged Buttonquail

316. *Turnix suscitator plumbipes* (Hodgson)

Common Buttonquail

Family GRUIDAE

Cranes

India : 7 species and subspecies

Sikkim : 1 species. c. 12.5% of the Indian population.

This family of 'Cranes' is only represented by a solo migratory species. The Black-necked Crane is a palaearctic migrant to Sikkim. It is supposed to be found in Sikkim but this rare migrant is recorded from Bhutan and Arunachal Pradesh of the eastern himalaya.

321. *Grus nigricollis* Przevalski

Black-necked Crane

Family RALLIDAE

Rails, Crakes, Moorhens, Coots

India : 21 species and subspecies

Sikkim : 8 species and subspecies. c. 39% of the Indian population.

All members of the family are aquatic by nature. Some like the marshes full of weeds and other prefers plain water bodies. Plumages ranges from deep blackish brown to chocolate brown and deep purplish blue. Wing short and tail even shorter and less than half length of the wing. Tarsus slender, but shorter than middle toe with claw. Toes long and slender. They are generally found in all kinds of wetlands along the foothills of Sikkim himalayas.

332. *Rallina eurizonoides* (Lafresnaye)

Slaty-legged Crane

329. *Grallirallus striatus albiventer* Swainson
Blue-breasted Rail

343. *Amaurornis phoenicurus chinensis*

(Boddaert)

White-breasted Waterhen

341. *Porzana bicolor* (Walden)

Elwes's Crake

397. *Porzana pusilla* (Pallas)

Baillon's Crake

346. *Gallicrex cinerea* (Gmelin)

Watercock

347. *Gallinula chloropus indica* Blyth

Common Moorhen

350. *Fulica atra* Linnaeus

Common Coot

Family OTIDIDAE

This small family is represented by bustards and floricans, and are not found in Sikkim. But it is presumed that Bengal Florican which are usually found in the Bengal Duars, may occur in lower Sikkim.

1. *Hoobaropsis bengalensis* (Gmelin)

Bengal Florican

Family JACANIDAE

Jacanas

India : 2 species and subspecies

Sikkim : 2 species and subspecies. 100% of the Indian population.

This family is represented by two species in India and both of them are found in Sikkim. Both are absolutely marsh bird with enormous spiderly toes. Common english names of them suggest diagnostic characters.

358. *Hydrophasianus chirurgus* (Scopoli)

Pheasant-tailed Jacana

359. *Metopidius indicus* (Latham)

Bronze-winged Jacana

Family ROSTRATULIDAE

Painted-Snipes

India : 1 species

Sikkim : 1 species. 100% of the Indian population.

This family is represented by a solo resident species within Indian limit. Female is always larger and brighter coloured than male. Bill is always shorter than true snipe. Diagnostic by white bands over shoulder to side of breast.

429. *Rostratula benghalensis* (Linnaeus)
Greater Painted Snipe

Family CHARADRIIDAE
Plovers, Dollerels, Lapwings

India : 21 species and subspecies.

Sikkim : 5 species and subspecies. c. 24% of the Indian population.

Most of the family members are migratory in nature. Plovers are found in swamp and river-beds while Lapwings prefer semi-arid tracts.

373. *Pluvialis fulva* (Gmelin)
Pacific Golden-Plover
380. *Charadrius dubius jerdoni* (Legge)
Little Ringed Plover
384. *Charadrius mongolus* Pallas
Lesser Sand Plover
369. *Vanellus duvaucelii* (Lesson)
River Lapwing
366. *Vanellus indicus* (Boddaert)
Red-wattled Lapwing
384. *Charadrius mongolus* Pallas
Lesser Sand Plover

General information : Uncommon summer visitor in boggy ground and marshy land of high elevation of N. Sikkim. Insectivorous. Terrestrial. Keeps in pairs or small parties.

Collection records : Schafer (1938/39) procured 4♂ and 2♀.

369. *Vanellus duvaucelii* (Lesson)
River Lapwing

General information : Common residents of river beds and open cultivation up to c. 1,000' Insectivorous. Terrestrial. Good runner. Keeps in pairs or small parties.

Collection records : Ali (1962) collected 1♂ and 1♀.

Family SCOLOPACIDAE
Sandpipers, Stints, Snipes, Godwits & Curlews

India : 41 species and subspecies

Sikkim : 15 species and subspecies. c. 38% of the Indian population.

This family includes Sandpipers, Snipes, Stints, Godwits and Curlews. Most of them are winter visitor to India, some breed in the entire himalayan range and Curlews have an almost worldwide distribution. All of them have long, slender decurved bills. Tarsus reticulated. Toes webbed as base and middle is much longer than others.

411. *Scolopax rusticola* Linnaeus
Eurasian Woodcock
404. *Gallinago solitaria* Hodgson
Solitary Snipe
405. *Gallinago nemoricola* Hodgson
Wood Snipe
406. *Gallinago stenura* (Bonaparte)
Pintail Snipe
409. *Gallinago gallinago* (Linnaeus)
Common Snipe
410. *Lymnocyrtus minimus* (Brunnich)
Jack Snipe
392. *Tringa erythropus* (Pallas)
Spotted Redshank
394. *Tringa totanus* (Linnaeus)
Common Redshank
395. *Tringa stagnatilis* (Bechstein)
Marsh Sandpiper
396. *Tringa nebularia* (Gunner)
Common Greenshank
397. *Tringa ochropus* Linnaeus
Green Sandpiper
398. *Tringa glareola* Linnaeus
Wood Sandpiper
401. *Actitis hypoleucos* Linnaeus
Common Sandpiper

417. *Calidris temminckii* (Leisler)
Temminck's Stint

426. *Philomachus pugnax* (Linnaeus)
Ruff

394. *Tringa totanus* Linnaeus
Common Redshank

General information : Uncommon summer visitor in boggy ground and marshy land of high elevation of N. Sikkim. Insectivorous. Terrestrial. Keeps mostly in pairs.

Collection records : V. S. La Personne (1931) procured 1♂ and 1♀ at Thangu c. 14,000' in May. Schafer (1938/39) procured 6♂, 5♀ from Gyagong, Gayamtashanna Lake, c. 16,000'-17,000' during July–August. Ali (1962) procured 1 example at Singtam in December.

411. *Scolopax rusticola* Linnaeus
Eurasian Woodcock

General information : Uncommon resident in well-wooded damp forest from c. 4,000' to 9,000'. Terrestrial. Largely crepuscular and nocturnal. Keeps usually in pairs or often in separated parties.

Collection records : Ali (1962) obtained 1♂.

404. Solitary Snipe. *Gallinago solitaria* Hodgson.

General information : Rare resident in the marshland and water bodies between c. 9,000' and 15,000'. Altitudinal (seasonal) movement. Insectivorous. Terrestrial. Swamp-dwelling. Keeps always solitary.

Collection records : Schafer (1938/39) procured 1♂. Ali (1962) obtained 1♀.

Other records : Ali (1962) reported that specimens collected at Thangu, Zemu and Lachung in winter.

397. *Tringa ochropus* Linnaeus
Green Sandpiper

General information : Uncommon. Spring and autumn passage migrant at higher elevation. Insectivorous. Terrestrial. Keeps solos or in pairs.

Collection records : Schafer (1938/39)

procured 1♂ and 1♀ at Gyagong, c. 16,000' in July–August.

Other records : Ali (1962) noted it rare but further states that solos are seen at Rangpo and Singtam.

401. *Actitis hypoleucos* Linnaeus
Common Sandpiper

Ali (1962) reported that it is occasionally seen singly on the river beds or stream at Rangpo and Singtam.

417. *Calidris temminckii* (Leisler)
Temminck's Stint

Schafer (1938/39) procured specimens at Kiang-Lager, c. 17,000' N. Sikkim in October.

Ali (1962) remarked that the presence of this bird in Sikkim is most probably as passage migrant.

Family RECURVIROSTRIDAE
Ibisbill, Avocets & Stilts

India : 3 species and subspecies

Sikkim : 2 species and subspecies. c. 66% of the Indian population.

Lanky birds with diagnostic enormous long legs as well as long slender and sometimes decurved (Ibisbill) bills. Wings long and pointed. Tail short and even. Keeps mostly in single. Sexes dissimilar at adult stage (Stilts).

433. *Ibidorhyncha struthersii* Vigors
Ibisbill

430. *Himantopus himantopus himantopus*
(Linnaeus)

Black-winged Stilt

433. *Ibidorhyncha struthersii* Vigors
Ibisbill

General information : Rare summer (breeding) resident on flat, rock-pebble river beds between c. 8,500' and 14,000'. Altitudinal (seasonal) migrant. Insectivorous (+ mollusca). Terrestrial. Slow and sluggish. Keeps in pair or small parties of 3–4 birds.

Collection records : Schafer (1938/39) procured 3♂ and 1♀ (a pair at Kiang-Lager, 16,500', N. Sikkim in October)

NZC. 1♀, 1 unsexed. Yuthang, N. Sikkim, 3475 m. 05.07.2005.

Family GLAREOLIDAE
Coursers & Pratincoles

India : 6 species and subspecies

Sikkim : 1 species. c. 17% of the Indian population.

Sandy grey bird with pointed, swallowlike wings and slightly forked tail. Sexes alike.

444. *Glareola lactea* Temminck
Small pratincole

Family PTEROCLIDIDAE
Sandgrouse

India : 8 species and subspecies

Sikkim : 1 species. c. 13% of the Indian population.

A sandy coloured pigeonlike terrestrial bird with a long pointed tail. Sexes dissimilar.

485. *Syrhaptes tibetanus* Gould
Tibetan Sandgrouse

Family COLUMBIDAE
Pigeons & Doves

India : 45 species and subspecies. 13 species and subspecies. c. 37% of the Indian population.

Plump-bodied birds with small head and bill. Flight swift and powerful. Sexes alike in most species. Food consists of seeds, fruits and grains.

517. *Columba livia* Gmelin
Blue Rock Pigeon

515. *Columba rupestris* Pallas
Hill Pigeon

*514. *Columba leuconota* Vigors
Snow Pigeon

520. *Columba hodgsonii* Vigors
Speckled Wood-Pigeon

523. *Columba pulchricollis* Blyth
Ashy Wood-Pigeon

*530. *Streptopelia orientalis* (Latham)
Oriental Turtle-Dove

537. *Streptopelia chinensis suratensis* (Gmelin)
Spotted Dove

526. *Macropygia unchall* (Wagler)
Barred Cuckoo-Dove

542. *Chalcophaps indica indica* (Linnaeus)
Emerald Dove

495. *Treron curvirostris* (Gmelin)
Thick-billed Green-Pigeon

493. *Treron apicauda* Blyth
Pin-tailed Green-Pigeon

494. *Treron sphenura* (Vigors)
Wedge-tailed Green-Pigeon

510. *Ducula badia insignis* Hodgson
Mountain Imperial-Pigeon

515. *Columba rupestris* Pallas
Hill Pigeon

General information : Rare resident of open rocky country in the Tibetan facies of extreme N. Sikkim. Arboreal. Gregarious. Gramnivorious. Keeps in small to large parties.

Collection records : Schafer (1938/39) procured 5♂ and 6♀ at Gyagong.

513. *Columba leuconota* Vigors
Snow Pigeon

General information : Uncommon resident mostly in cliffs and barren fields in between c. 6,000' (winter) to 16,000' (summer) Diagnostic altitudinal (seasonal) movement. Arboreal. Gramnivorious. Keeps in large flocks.

Collection records : Schafer (1938/39) procured 4♂ and 5♀. Ali (1962) obtained 1♂ and 2♀.

520. *Columba hodgsonii* Vigors
Speckle Wood-Pigeon

General information : Uncommon resident in the dense evergreen and conifer forest from c. 5,000' to 13,000' Arboreal. Frugivorous. Some seasonal movement. Keeps in small to large flocks.

Collection records : Elwes (1870) obtained examples at Tankra La, c. 13,000' in September. Schafer (1938/39) procured 4♂ and 4♀.

***523. *Columba pulchricollis* Blyth
Ashy Wood-Pigeon**

General information : Extremely rare resident in the dense evergreen and conifer forest between 4,000' and 10,000' Arboreal. Shy and silent. Frugivorous. Keeps solitary or in pairs.

Collection records : No collection records so far from Sikkim. N.Z.C. 1♀. Sikkim.

**532. *Streptopelia orientalis agricola* (Tickell)
Oriental Turtle Dove**

General information : Common resident in open forest and cultivation from the foothills up to c. 13,000' (Summer). Marked seasonal movement. Gramnivorous. Terrestrial. Keeps in pair or small to large flocks.

Collection records : Schafer (1938/39) collected 10 example from N. Sikkim during June-September. Ali (1962) procured 2♂ and 1♀

**537. *Streptopelia chinensis suratensis* (Gmelin)
Spotted Dove**

General information : Common summer visitor in open forest and cultivation up to c. 5000' Terrestrial. Gramnivorous. Keeps solitary or in flocks.

Collection records : Schafer (1938/39) procured 4 examples. NZC. 1♂ Yaksam, W. Sikkim. 30.05.2005.

**526. *Micropygia unchall* (Wagler)
Barred Cuckoo-Dove**

General information : Uncommon resident in the open deciduous forest and edge of the forest from the foothills up to c. 9000' Arboreal. Silent. Frugivorous. Keeps in pairs or often small flocks.

Collection records : Schafer (1938/39) obtained 1♂ and 2♀.

**542. *Chalcophaps indica indica* (Linnaeus)
Emerald Dove**

General information : Uncommon resident in

evergreen and deciduous forest up to c. 6,000' Terrestrial. Shy. Swift in flight. Gramnivorous. Keeps solitary or in pairs.

Collection records : Schafer (1938/39) collected 1♂ in Dikchu.

**493. *Treron apicauda* Blyth
Pin-tailed Green Pigeon**

General information : Common resident in the evergreen and deciduous biotope from the foothills up to c. 6,500' Arboreal. Frugivorous. Keeps in small to large flocks. Some seasonal movement.

Collection records : Schafer (1938/39) obtained 1♀ at Lachen, c. 9,000' in September.

**494. *Treron sphenura* (Vigors)
Wedge-tailed Green-Pigeon**

General information : Common resident in the evergreen and deciduous biotope from the foothills up to c. 6,500' Arboreal. Frugivorous. Keeps in small to large flocks. Some seasonal movement.

Collection records : Schafer (1938/39) procured 1♂ and 3♀

**510. *Ducula badia* (Raffles)
Mountain Imperial-Pigeon**

General informations : Common resident in the evergreen and deciduous biotope from the foothills up to c. 6,500' Arboreal. Frugivorous. Keeps in small to large flocks. Some seasonal movement.

Collection records : Schafer (1938/39) procured 1 example at Gangtok in February.

**Family PSITTACIDAE. Parakeets &
Hanging-Parrots**

India : 21 species and subspecies.

Sikkim : 7 species and subspecies. c. 33% of the Indian population.

Arboreal fruit and grain eating birds. Overall green plumage, short and strongly hooked bill.

Feet zygodactylous. Most are gregarious with swift flight. Maintains small to very large flocks which disperse in small parties for food but again comes together in the roosting place in evening. Sexes alike.

Plum-headed Parakeet (557) is expected to be found in Sikkim terai. Blossom-headed Parakeet (559) though distributed in Sikkim, but no collection so far from any where since description in 1951 and Intermediate Parakeet (561) is completely unknown. Originally described from a single trade skin (the type) from unknown provenance—allegedly 'Native Sikkim'. Recent studies have shown that this bird is a hybrid between Slaty-headed and Plum-headed Parakeets.

566, 567. *Loriculus vernalis* (Sparraman)

Indian Hanging-Parrot

545. *Psittacula eupatria nipalensis* (Hodgson)

Alexandrine Parakeet

562. *Psittacula himalayana* (Lesson)

Slaty-headed Parakeet

561. *Psittacula intermedia* Rothschild

Intermediate Parakeet

557. *Psittacula cyanocephala bengalensis*
(Forster)

Plum-headed Parakeet

559. *Psittacula roseata roseata* Biswas

Blossom-headed Parakeet

551. *Psittacula alexandri fasciata*

(P.L.S. Muller)

Red-breasted Parakeet

562. *Psittacula himalayana* (Lesson)

Slaty-headed Parakeet

Ali (1962) reported it as a local migrant and noted it as uncommon and patchy at Martem, Dikchu and Singhik between c. 2,000' and 4,500' in Winter.

551. *Psittacula alexandri* (Linnaeus)

Red-dreasted Parakeet

G. E. Shaw obtained it in the Teesta Valley up to 3,500' Ali (1962) reported it as a local migrant in Sikkim.

Family CUCULIDAE

Cuckoos, Malkohas & Coucals

India : 32 Species and subspecies

Sikkim : 19 Species and subspecies. c.60% of the Indian population.

Only family of having parasitism and seasonal migratory habit. Mostly remains silent during non-breeding season and also in the deep forest. Not easy to locate in the non-breeding season. Movement is mostly regulated by the monsoon. Sexes alike. Feed on insects, molluscs and small vertebrates.

570. *Clamator jacobinus serratus* (Sparrman)

Pied-crested Cuckoo

569. *Clamator coromandus* (Linnaeus)

Red-winged Crested Cuckoo

572. *Hierococcyx sparveroides* (Vigors)

Large Hawk-Cuckoo

573. *Hierococcyx varius varius* Vahl

Brainfever Cuckoo

575. *Hierococcyx fugax* (Horsfield)

Hodgson's Hawk-Cuckoo

576. *Cuculus micropterus* Gould

Indian Cuckoo

579. *Cuculus canorus canorus* Linnaeus

Common Cuckoo

580. *Cuculus saturatus sarturatus* Blyth

Oriental Cuckoo

581. *Cuculus poliocephalus* Latham

Lesser Cuckoo

582. *Cacomantis sonneratii sonneratii* (Latham)

Banded Bay Cuckoo

584. *Cacomantis passerinus* (Vahl)

Indian Plaintive Cuckoo

585. *Cacomantis merulinus* (Scopoli)

Rufous-bellied Plaintive Cuckoo

586. *Chrysococcyx maculatus* (Gmelin)

Asian Emerald Cuckoo

588. *Surniculus lugubris dicrucoides* (Hodgson)

Drongo Cuckoo

590. *Eudynamys scolopacea scolopacea*
Asian Koel

593. *Phaenicophaeus tristis tristis* (Lesson)
Large Green-billed Malkoha

597. *Phaenicophaeus leschenaultii infuscata*
Blyth
Sickeer Malkoha

600. *Centropus sinensis* (Stephens)
Greater Coucal

605. *Centropus bengalensis* (Gmelin)
Lesser Coucal

572. *Hierococcyx sparverioides* (Vigors)
Large Hawk-Cuckoo

General information : Rare with uncertain status. A bird of open wooded biotope between c. 3,000' and 6,500' Arboreal. Silent. Noisy during breeding season. Insectivorous. Keeps solitary.

Collection records : Schafer (1938/39) procured 1♀. Ali (1962) obtained 1♂, 1♀ and 1 unsexed. N.Z.C 1♂ 1♀. Barnyak, Rinchongpong, Kalet Valley, Sikkim. 2, 4.01.1953. 1♂. Menam, S. Sikkim. 27.05.1990.

575. *Hierococcyx fugax* (Horsfield)
Hodgson's Hawk-Cuckoo

No records from Sikkim except 1 example by Schafer (1938/39) at Gangtok c. 6,300' in June.

576. *Cuculus micropterux* Gould
Indian Cuckoo

General information : Rare with uncertain status. A bird of open wooded biotope between c. 3,000' and 6,500'. Arboreal. Silent. Noisy during breeding season. Insectivorous. Keeps solitary.

No Collection record so far from Sikkim.

N.Z.C. 1♀. Rabangla, S. Sikkim. 17.05.2005

579. *Cuculus canorus bakeri* Hartert
Common Cuckoo

General information : Very uncommon. Largely migratory. Available datas for Sikkim, less dependable. A bird of open wooded biotope.

Collection records : Schafer (1938/39) collected 1♂ at Gangtok in June.

Other records : Ali (1962) noted its call at Pakyons, Arita (Eastern Sikkim) and Chungthang in April.

580. *Cuculus s. saturatus* Blyth
Oriental Cuckoo

General information : Uncommon seasonal migrant (partial) in open wooded country from the foothills upto c. 9000' Arboreal. Silent. Noisy during breeding season. Insectivorous. Keeps solitary.

Collection records : Schafer (1938/39) procured 2♂ at Gangtok in June.

581. *Cuculus poliocephalus* Latham
Lesser Cuckoo

General information : Rare, with uncertain status. A bird of open wooded country. Arboreal. Insectivorous. Keeps solitary.

Collection records : Schafer (1938/39) procured 1♂ and 1♀ at Dikchu, c. 2,000' and Gangtok in June. Ali (1962) examined one specimen from Chungthang in May.

Other records : Ali (1962) reported that it is heard at Temi, c. 2,000' and Gangtok during mid April.

N.Z.C. 1♂. Rabangla, S. Sikkim. 17.05.2005; 1♀. Menam, S. Sikkim. 23.05.2005.

*584. *Cacomantis passerinus* (Vahl)
Indian Plaintive Cuckoo

General information : Rare with uncertain status. A bird of open wooded country. Arboreal. Insectivorous. Keeps solitary.

N.Z.C. 1♀. Rabangla, S. Sikkim. 20.05.1990.

No Collection record so far from Sikkim.

586. *Chrysococcyx maculatus* (Gmelin)
Asian Emerald Cuckoo

General information : Extremely rare. Status uncertain. A bird of dense evergreen forest up to

c. 7,000' Arboreal. Shy and silent. Insectivorous. Keeps solitary.

Other records : Stevens (1923-25) noted it in the Sikkim Himalayas between c. 4,250' and 4,750' in April.

Ali (1962) noted it at Chungthang, c. 7,000' in April.

588. *Surniculus lugubris dieruroides* (Hodgson)
Drongo Cuckoo

General information : Extremely rare. Status uncertain. A bird of dense evergreen forest up to c. 7,000' Arboreal. Shy and silent. Insectivorous. Keeps solitary.

No Collection record so far from Sikkim.

593. *Phaenicophaeus tristis tristis* (Lesson)
Large Green-billed Malkoha

General information : Uncommon resident in dense evergreen and deciduous forest from the foothills up to c. 6,500' Arboreal. Insectivorous.

Collection records : Schafer (1938/39) obtained 1 ♂ at Gangtok in February. N.Z.C. 1 unsexed. Sankukhola, Tista Valley, Sikkim. 5.12.1952

Other records : Stevens (1923-25) noted it in the Rungbong Valley up to 3,600'

Family TYTONIDAE
Barn Owls

India : 4 Species and subspecies

Sikkim : 2 Species and subspecies. 50% of the Indian population

Moderately common Owl family. It differs from Owl family for not having ear-tufts and facial-disc well developed and large and entirely surrounded by a ruff and stiff feathers. Middle claws pectinate on inner side. Sexes alike.

608. *Tyto capensis* (A. Smith)
Grass Owl

609. *Phodilus badius saturatus* Robinson
Oriental Bay-Owl

609. *Phodilus badius* (Horsfield)
Oriental Bay-Owl

General information : Extremely rare resident in dense foothills forest up to c. 2,000' Arboreal. Nocturnal. Carnivorous.

Other records : G.E. Shaw (1915) recorded it in the Teesta Valley, c. 2,000' in November.

Stevens (1923-25) reported that it is confined in the deep foothills forest of Sikkim.

Family STRIGIDAE
Owls

India : 48 Species and subspecies.

Sikkim : 17 Species and subspecies. c. 36% of the Indian population.

Owls are nocturnal birds of prey with large head fitted with forwardly directed large facial disc. Short and strongly hooked bill. Toes mostly feathered with powerful talons. Plumage mostly sandy or brown with bars and spots. Sexes alike but female larger. Food mainly consists of rodents and other small vertebrates. Size ranges from a 'Quail' to a large 'Eagle'.

612. *Otus spilocephalus spilocephalus* (Blyth)
Spotted Scops-Owl

616. *Otus sunia sunia* (Hodgson)
Oriental Scops-Owl

624. *Otus bakkamoena lettia* (Hodgson)
Collared Scops-Owl

626. *Bubo bubo tibetanus* Bianchi
Eurasian Eagle-Owl

628. *Bubo nipalensis nipalensis* Hodgson
Forest Eagle-Owl

630. *Bubo coromandus* (Latham)
Dusky Eagle-Owl

633. *Ketupa flavipes* (Hodgson)
Tawny Fish-Owl

658. *Strix leptogrammica newarensis* (Hodgson)
Brown Wood-Owl

662. *Strix aluco nivicola* (Blyth)
Tawny Wood-Owl

635. *Glaucidium brodiei* (Burton)
Collared Owlet

639. *Glaucidium cuculoides cuculoides* (Vigors)
Asian Barred Owllet

640. *Glaucidium cuculoides austerum* Ripley
Asian Barred Owllet

636. *Glaucidium radiatum radiatum* (Tickell)
Jungle Owllet

649. *Athene noctua* (Scopoli)
Little Owl

650. *Athene brama indica* (Franklin)
Spotted Owllet

642. *Ninox lugubris scutulata* (Tickell)
Brown Hawk-Owl

664. *Asio flammeus* (Pontoppidan)
Short-eared Owl

612. *Otus spilocephalus spilocephalus* (Blyth)
Spotted Scops Owl

Ali (1962) noted it as not uncommon between c. 3,000' and 6,000' and recorded in the Teesta and Rungbong Valleys.

624. *Otus bakkamoena lettia* (Hodgson)
Collared Scops-Owl

General information : Uncommon resident in the open foothills forest near cultivation. Arboreal. Nocturnal. Carnivorous. Keeps solitary or often in pairs.

Collection records : Schafer (1938/39) procured 1♂ at Gangtok. Ali (1962) obtained 1♂.

628. *Bubo nipalensis nipalensis* Hodgson
Forest Eagle-Owl

General information : Rare resident (?) in heavy evergreen and tropical forest up to c. 7,000' Arboreal. Crepuscular and nocturnal. Carnivorous. Keeps solitary.

Collection records : Steven (1923-25) examined two specimens from Sikkim.

633. *Ketupa flavipes* (Hodgson)
Tawny Fish-Owl

General information : Rare resident (?) in heavy evergreen and tropical forest up to

c. 7,000' Arboreal. Crepuscular and nocturnal. Carnivorous. Keeps solitary.

Collection records : Schafer (1938/39) obtained 1♀ at Gangtok in June.

Other records : Ali (1962) noted it twice at Martem, c. 3,000' in December and March.

635. *Glaucidium brodiei* (Burton)
Collared Owllet

General information : Common resident in the open forest and edge of the forest near cultivation between c. 2,000' and 7,000' Arboreal. Largely diurnal. Carnivorous. Keeps mostly single or often in pairs.

Collection records : Schafer (1938/39) obtained 3 examples.

Ali (1962) collected 1♂ and examined 2♀ (Chicago Natural History Museum).

662. *Strix aluco nivicola* (Blyth)
Tawny Wood-Owl

General information : Rare resident in the open forest from the foothills up to c. 7,000' Arboreal. Nocturnal. Carnivorous.

Collection records : Schafer (1938/39) obtained 1♂ at Zalang (c. Lachen) in September.

Other records : Ali (1962) remarked that it is recorded between 6,000' and 14,000' in the Sikkim Himalayas.

63. *Glaucidium cuculoides cuculoides* (Vigors)
Asian barred Owllet

General information : Common resident in the open forest and edge of the forest near cultivation between c. 2,000' and 7,000' Arboreal. Largely diurnal. Carnivorous. Keeps mostly single or often in pairs.

Collection records : Schafer (1938/39) procured 1♀. Ali (1962) obtained 2♀. NZC. 1♀ Rabangla, S. Sikkim, 2010 m. 06.10.1988.

638. *Glaucidium castanonotum* (Blyth)
Chestnut-backed Owllet

General information : Rare resident in the

open forest from the foothills up to c. 7,000' Arboreal. Nocturnal. Carnivorous.

Collection records : Schafer (1938/39) obtained 1 example at Gangtok, c. 6,300' in December.

Other records : Ali (1962) remarked that it is recorded from the base of the hills up to 13,000' in Sikkim.

664. *Asio flammeus* (Pontoppidan)
Short-eared Owl

Ali (1962) reported it as irregular winter visitor and passage migrant in the Rungbong Valley and in the foothills of Sikkim up to c. 6,000' during winter.

Family PODARGIDAE
Frogmouths

India : 2 Species and subspecies.

Sikkim : 1 Species. 50% of the Indian population.

A family of rare birds. Mostly nocturnal. Plumage soft and silky. The swollen bill is triangular with a wide gape.

667. *Batrachostomus hodgsoni* (G. R. Gray)
Hodgson's Frogmouth

General informations : Extremely rare resident in dense humid and shady evergreen forest between c. 4000'- 5000' Arboreal. Crepuscular and nocturnal. Sluggish. Insectivorous. Keeps in single or in pairs.

Collection records : No collection records so far from Sikkim.

Other records : Hodgson noted it in the Great Rangeet Valley at 3000'– 4000'

Mandelli noted its nest with eggs at Namche.

Family CAPRIMULGIDAE
Nightjars

India : 10 Species and subspecies.

Sikkim : 4 Species and subspecies. 40% of the Indian population.

Nightjars are soft-plumaged, long winged, crepuscular and nocturnal birds with longish tail,

short legs and bills with enormous gapes. Plumages overall mottled, vermiculated, barred and streaked with buff, grey, black and white.

670. *Caprimulgus indicus hazarae* Whistler & Kinnear

Indian Jungle Nightjar

675. *Caprimulgus macrurus albonotatus* Tickell

Large-tailed Nightjar

680. *Caprimulgus asiaticus asiaticus* Latham
Common Indian Nightjar

682. *Caprimulgus affinis* Horsfield
Franklin's Nightjar

670. *Caprimulgus indicus* Latham
Indian Jungle Nightjar

General information : Uncommon resident in open forest and glades from c. 6,500' to 11,000' Altitudinal migrant. Arboreal. Crepuscular and nocturnal. Silent. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) obtained 1 ♀ at Chungthang, c. 5,000' in December.

Other records : Stevens (1923-25) reported it to occur up to 7,000' or 8,000' in the Sikkim Himalayas during breeding seasons. Ali (1962) remarked it as possible altitudinal migrant. Noted its call at Lachen, c. 9,000' in April.

675. *Caprimulgus macrurus* Horsfield
Large-tailed Nightjar

Stevens (1923-25) reported that G. F. Shaw obtained it in the Teesta Valley from 2,500' to 3,750'

Family APODIDAE
Swifts

India : 21 Species and subspecies

Sikkim : 7 Species and subspecies. 33% of the Indian population.

The most arial of all birds. Looks like Swallows but have larger wings which are long, narrow and pointed. Sexes alike. Feeds on insects taken on the wings.

683. *Collocalia brevirostris brevirostris*
(Horsfield)

Himalayan Swiftlet

692. *Zoonavena sylvatica* (Tickell)
White-rumped Needletail-Swift

688. *Hirundapus caudatus* (Latham)
White-throated Needletail-Swift

707. *Cypsiurus batasiensis batasiensis* (J.E. Gray)
Asian Plam-Swift

694. *Tachymarptis melba rubifuga* Koelz
Alpine Swift

700. *Apus pacificus leuco* (Blyth)
Pacific Swift

705. House Swift. *Apus affinis nipalensis*
(Hodgson)

683. *Collocalia b. brevirostris* (Horsfield)
Himalayan Swiftlet

General information : Uncommon resident in the open cultivation and human habitation from the foothills up to c. 12,000' Seasonal migrant. Arboreal. Gregarious. Insectivorous. Keeps in large flocks.

Collection records : Schafer (1938/39) procured 4 examples in June.

Other records : Blanford (1870) noted it from the Chola Range, c. 12,000' in August and also in the Teesta Valley in autumn. NZC. 7♂ Yunthang. N. Sikkim. 4-6. 07. 1989; Rabangla, S. Sikkim. 18.05.1990; Yaksum, W. Sikkim. 20.06.1990.; 8♀. Yumthang, N. Sikkim. 5.07.1989; Bakhim, W. Sikkim. (9000'). 5.06.1990.

692. *Zoonavena sylvatica* (Tickell)
White-rumped Needletail-Swift

Ali (1962) mentioned its status in Sikkim as unknown and noted a flock at Temi in March.

688. *Hirundapus caudatus* (Latham)
White-throated Needletail-Swift

General information : Uncommon with uncertain status due to enormous foraging range. Appear in anywhere from the foothills up to

c.13,000' Arboreal. Insectivorous. Extremely gregarious. Keeps in large flocks.

Other records : F. N. Betts noted a large flock at Thangu, c. 13,000' in May.

Ali (1962) noted it at Pakong, Temi and Rinchinpong during March–April.

700. *Apus pacificus leuconyx* (Blyth)
Pacific Swift

General information : Uncommon with uncertain status due to enormous foraging range. Appear in anywhere from the foothills up to c. 13,000' Arboreal. Insectivorous. Extremely gregarious. Keeps in large flocks.

Collection records : Schafer (1938/39) procured 1 example at Gangtok in June.

705. *Apus affinis nipalensis* (Hodgson)
House Swift

General information : Uncommon summer resident between c. 4,500' and 6,500' Arboreal. Gregarious. Insectivorous. Keeps in flocks.

No collection record so far from Sikkim

Family TROGONIDAE
Trogons

India : 6 Species and subspecies

Sikkim : 1 Species. c. 17% of the Indian population.

The family of crimson-coloured birds. Arboreal in habit. Short wings and long, square-cut graduated tail. Bill short, weak and broad. Sexes unlike. Always keeps solitary and occasionally in pair in deep, evergreen, moist and shady forest.

713. *Harpactes erythrocephalus hodgsonii*
(Gould)

Red-headed Trogon

General information : Rare resident in the moist and dense evergreen and mixed forest from c. 2,000' to 6,500' Arboreal. Partial crepuscular. Shy and sluggish. Insectivorous. Keeps solo or in pairs.

Collection records : Schafer (1938/39) obtained 4♂ and 4♀.

Family **ALCEDINIDAE**
Kingfishers

India : 28 Species and subspecies

Sikkim : 9 Species and subspecies. c. 30% of the Indian population.

The family of colourful fish-eating birds. Large head with diagnostic massive, long and pointed bill. Short syndactyl feet. Sexes alike.

721. *Alcedo hercules* Laubmann
Blyth's Kingfisher

723. *Alcedo atthis bengalensis* Gmelin
Small Blue Kingfisher

725. *Alcedo meninting coltarti* Baker
Blue-eared Kingfisher

727. *Ceyx erithacus erithacus* (Linnaeus)
Oriental Dwarf Kingfisher

730. *Halcyon capensis capensis* (Linnaeus)
Short-billed Kingfisher

733. *Halcyon coromanda coromanda* (Latham)
Ruddy Kingfisher

736. *Halcyon smyrnensis fusca* (Boddaert)
White-breasted Kingfisher

717. *Megaceryl lugubris continentalis* Hartert
Greater Pied Kingfisher

719. *Ceryle rudis leucomelanura* Reichenbach
Lesser Pied Kingfisher

General information : Uncommon resident in open wooded country with streams within from the foothills up to c. 3,000' Arboreal. Silent. Carnivorous (fish). Keeps solo.

Collection records : Ali (1962) obtained 1 ♀.

Other records : Stevens (1923-25) noted it at Rungbong, c. 4750'

Family **MEROPIDAE**
Bee-eaters

India : 9 Species and subspecies.

Sikkim : 3 Species and subspecies. c. 33% of the Indian population.

A small family of the insect-eating gregarious birds with slender body and green plumage. Bill

long, narrow and decurved. Legs and feet feeble syndactyle. Sexes alike.

753. *Nyctyornis athertoni* (Jardine & Selby)
Blue-bearded Bee-eater

750. *Merops orientalis orientalis* Latham
Small Bee-eater

744. *Merops leschenaulti leschenaulti* Vieillot
Chestnut-headed Bee-eater

753. *Nyctyornis athertoni* (Jardine & Selby)
Blue-breasted Bee-eater

General information : Uncommon resident (?) in the open and hillside forest near cultivation from the foothills up to c. 5,000' Seasonal movement. Arboreal. Gregarious. Keeps in flocks.

No Collection record from Sikkim.

Family **CORACIIDAE**
Rollers

India : 7 Species and subspecies.

Sikkim : 2 Species and subspecies. c. 29% of the Indian population.

Stout colourful birds with strong bills. Sexes alike. Always keeps single near out-skirt of the forest and cultivated field. Feed chiefly on insects.

757. *Coracias bengalensis affinis* Horsfield
Indian Roller

758. *Eurystomus orientalis cyanicollis* Vieillot
Oriental Broad-billed Roller

758. *Eurystomus orientalis cyanicollis* Vieillot
Oriental Broad-bill Roller

General information : Extremely rare resident in the heavy secondary tropical forest up to c. 2,000' Arboreal. Partial crepuscular. Insectivorous. Keeps solo.

Other records : G. E. Shaw obtained in the Teesta Valley up to 2,000'

Family **UPUPIDAE**
Hoopoes

India : 4 Species and subspecies.

Sikkim : 1 Species. 25% of the Indian population.

Rufous plumage with black and white bands.
Diagnostic black-tipped fan-like erectile crest.
Slender decurved bill. Sexes alike.

764. *Upupa epops saturata* Lonnberg
Common Hoopoe

General information : Uncommon summer visitor in the open field of N. Sikkim. Terrestrial. Insectivorous. Keeps solitary or in pairs.

Collection records : Schafer (1938/39) procured 3♂ at Lachen, c. 9,000' during September - October; 1♂, Kiang-Lager, c. 16,500' in October.

Ali (1962) examined 1 ♀ from Thangu, 13,000' in May, 1931 (Chicago Natural History Museum)

Other records : Stevens (1923-25) noted it as autumn passage migrant between c. 3,500' and 4,700' during September - October.

Family BUCEROTIDAE
Hornbills

India : 9 Species and subspecies

Sikkim : 4 Species and subspecies. 45% of the Indian population.

Large arboreal forest birds with large strong wings and long broad tail. Diagnostic massive decurved bill, sometimes surrounded by a large casque. Mostly frugivorous.

767. *Ocyrceros birostris* (Scopoli)
Indian Grey Hornbill

774. *Anthraceroceros albirostris* (Shaw)
Oriental Pied Hornbill

771. *Aceros nipalensis* (Hodgson)
Rufous-necked Hornbill

Stevens (1923-25) noted one in the Sikkim Himalaya at c. 1,800'

776. *Buceros bicornis* Linnaeus
Great Pied Hornbill

Ali (1962) remarked that it is springly distributed at the lower elevation (Mantam, Toong, Dikchu). Stevens (1923-25) remarked that it is found in the Teesta Valley up to c. 4,500'

Family CAPITONIDAE
Barbets

India : 14 Species and subspecies.

Sikkim : 6 Species and subspecies. c. 43% of the Indian population.

Stocky arboreal birds with large head and heavy bill. Plumage overall green and brown with some amount of variable crimson patch. Sexes alike. Mostly frugivorous. Diagnostic loud and endless repeated call.

778. *Megalaima virens magnifica* Baker
Great Barbet

784. *Megalaima lineata hodgsoni* Bonaparte
Lineated Barbet

787. *Megalaima franklinii* (Blyth)
Golden-throated Barbet

788. *Megalaima asiatica* (Latham)
Blue-throated Barbet

789. *Megalaima australis* (Horsfield)
Blue-eared Barbet

792. *Megalaima haemacephala* (P.L.S. Muller)
Coppersmith Barbet

778. *Megalaima virens magnifica* Baker
Great Barbet

General information : Uncommon resident in the tall evergreen and mixed forest from 1,500' to 7,000' Arboreal. Frugivorous. Keeps solitary or in small parties.

Collection records : Schafer (1938/39) procured 4♂ and ♀.

Ali (1962) collected 1♂ and 1♀.

N.Z.C. 1♂. Menam, S. Sikkim. 27.05.1990.

787. *Megalaima franklinii* (Blyth)
Golden-throated Barbet

General information : Uncommon resident in the tall evergreen and mixed forest from 1,500' to 7,000' Arboreal. Frugivorous. Keeps solitary or in small parties.

Collection records : Schafer (1938/39) obtained 12♂ and ♀

Ali (1962) collected 1♀

788. *Megalaima asiatica* (Latham)
Blue-throated Barbet

General information : Uncommon resident in the tall evergreen and mixed forest from 1,500' to 7,000' Arboreal. Frugivorous. Keeps solitary or small parties.

Collection records : Schafer (1938/39) obtained 2 examples.

Ali (1962) collected 2♂.

Family INDICATORIDAE
Honeyguides

India : 3 Species and subspecies

Sikkim : 1 Species. c. 33% of the Indian population.

A very little known family of small, dull-coloured arboreal birds with finch-like bill and zygodactyl feet. Feed on honey, beewax and bees etc.

794. *Indicator xanthonotus* Blyth
Yellow-rumped Honeyguide

Not recorded so far since 1878/79. Old skin records in the British Museum without any data.

Family PICIDAE
Woodpeckers

India : 55 Species and subspecies

Sikkim : 19 Species and subspecies. c. 35% of the Indian population.

The family of birds best known for its unique habit of boring holes in trees for food. Continuous boring sound and occasional cracking call notes prove its presence in the forest. Woodpeckers are arboreal birds with large head and strong chisel-like bill. Presence of zygodactyl feet and wedge-shaped stiff tail. Sexes mostly differ.

796. *Jynx torquilla* Linnaeus
Eurasian Wryneck

798. *Picumnus innominatus innominatus* Burton
Speckled Piculet

800. *Sasia ochracea ochracea* Hodgson
Rufous Piculet

849. *Dendrocopos canicapillus semicoronatus*
Malherbe
Grey-capped Pygmy Woodpecker

845. *Dendrocopos macei macei* (Vieillot)
Fulvous-breasted Pied Woodpecker

847. *Dendrocopos mahrattensis* (Latham)
Yellow-fronted Pied Woodpecker

833. *Dendrocopos hyperythrus hyperythrus*
(Vigors)
Rufous-bellied Pied Woodpecker

840. *Dendrocopos cathpharius cathpharius*
(Blyth)
Crimson-breasted Pied Woodpecker

838, 839. *Dendrocopos darjellensis* (Blyth)
Darjeeling Pied Woodpecker

803. *Celeus brachyurus phaiiceps* Blyth
Rufous Woodpecker

815. *Picus chlorolophus chlorolophus* Vieillot
Small Yellow-naped Woodpecker

813. *Picus flavinucha flavinucha* Gould
Large Yellow-naped Woodpecker

808. *Picus xanthopygaeus* (J.E. Gray & G.R. Gray)
Little Scaly-bellied Green Woodpecker

810. *Picus canus gyldenstolpei* Baker
Black-naped Green Woodpecker

824. *Dinopium shorii* (Vigors)
Himalayan Golden-backed Woodpecker

861. *Chrysocolaptes lucidus guttacristatus*
(Tickell)
Greater Golden-backed Woodpecker

827. *Gecinulus grantia* (Horsfield)
Pale-headed Woodpecker

857. *Blythipicus pyrrhotis* (Hodgson)
Bay Woodpecker

828. *Mulleripicus pulverulentus mohun* Ripley
Great Slaty Woodpecker

798. *Picumnus innominatus* Burton
Speckled Piculet

General information : Rare, resident in the

tropical mixed forest upto c. 6000' Arboreal. Insectivorous. Keeps singly or in pairs.

Collection Record : Schafer (1938/39) collected 3♂, 1♀ at Gangtok in January.

Other records : Stevens (1923-25) noted it at Singhik.

Ali (1962) noted it at Dikchu, Singtam and Temi.

**800. *Sasia ochracea* Hodgson
Rufous Piculet**

General information : Rare, resident in the tropical mixed forest upto c. 6000' Arboreal. Insectivorous. Keeps singly or in pairs.

Collection Record : Schafer (1938/39) obtained 2♂.

**803. *Celeus brachyurus phaiiceps* Blyth
Rufous Woodpecker**

General information : Uncommon, resident in mixed secondary forest from the foothill upto c. 2000' Arboreal. Silent. Insectivorous. Keeps singly.

Collection Record : Schafer (1938/39) procured 2♂, 1♀ at Gangtok, c. 6000' during Jan-Feb.

Other Record : Gammie noted its breeding in the Teesta Valley, c. 2000'

**849. *Dendrocopos canicapillus semicoronatus*
(Malherbe)**

Grey-capped Pigmy Woodpecker

General information : Common, resident in open forest and secondary jungle. Arboreal. Silent. Insectivorous. Keeps in pair.

Collection Record : Schafer (1938/39) obtained 1 example at Penlom La, c. 6000' in March. Ali (1962) collected 5♂, 1♀.

**845. *Dendrocopos macei macei* (Vieillot)
Fulvous-breasted Pied Woodpecker**

Stevens (1923-25) mentioned it to occur in the Rungbong Valley up to c. 3500'

**833. *Dendrocopos hyperythrus* (Vigors)
Rufous-bellied Pied Woodpecker**

General information : Uncommon, resident in

the pine and conifer forest between c. 8000' and 13,500' Arboreal. Silent. Insectivorous. Keeps singly or in pairs.

Collection Record : Schafer (1938/39) obtained 1♂, 1♀. Ali (1962) examined 1♂, 1♀ (Chicago Natural History Museum).

N.Z.C. 1♂, 1♀ Menam, S. Sikkim. 23. 27.05.1990.

**840. *Dendrocopos cathpharius* (Blyth)
Crimson-breasted Pied Woodpecker**

General information : Uncommon, resident in the pine and conifer forest between c. 8000' and 13500'. Arboreal. Silent. Insectivorous. Keeps singly or in pairs.

Collection Record : Stevens (1923-25) obtained 1 example at Lingtam, c. 6000' Schafer (1938/39) procured 8♂, 5♀ at Dikchu, Manshitang, Gangtok, Lachen and Thangu between c. 2000' 13,500' during June April.

N.Z.C. 1♂. Ralang, S. Sikkim. 19.05.1990.

Other records : F.N. Bells noted it near Lachung, c. 7000' in May. Stevens (1923-25) noted it in the Sikkim Himalaya between c. 5000' 6000'

**838. *Dendrocopos darjellensis* (Blyth)
Darjeeling Pied Woodpecker**

General information : Uncommon, resident in the high evergreen and conifer forest between c. 6000' and 10,000' Arboreal. Silent. Insectivorous. Keeps singly or in pairs.

Collection Record : Meinertzhagen (1927) procured specimen at Thangu, c. 13000' Schafer (1938/39) obtained 2♂, 6♀ at Thangu, c. 13000' Ali (1962) collected 1♂.

N.Z.C. 1♂. Menam, S. Sikkim. 27.05.1990.

**815. *Picus chlorolophus chlorolophus* Vieillot
Small Yellow-naped Woodpecker**

General information : Common resident in the mixed evergreen and deciduous forest upto c. 6500' Arboreal. Insectivorous. Keeps in pairs.

Collections Record : Schafer (1938/39) procured 1♂. Ali (1962) obtained 1♀.

Other records : Stevens (1923-25) reported it in the Rungbong Valley, upto c. 5000'

813. *Picus flavinucha flavinucha* Gould
Large Yellow-naped Woodpecker

General information : Common resident in the mixed evergreen and deciduous forest upto c. 6500' Arboreal. Insectivorous. Keeps in pairs.

Collection Record : Schafer (1938/39) obtained 4♀. Ali (1962) collected 1♂, 1♀.

810. *Picus canus gyldenstolpei* Baker
Black-naped Green Woodpecker

General information : Common resident in the mixed evergreen and deciduous forest upto c. 6500' Arboreal. Insectivorous. Keeps in pairs.

Collection Record : Schafer (1938/39) obtained 1♂, 2♀. Ali (1962) collected 2♀.

824. *Dinopium shorii* (Vigors)
Himalayan Golden-backed Woodpecker

Ali (1962) reported it as rare and confined to low foothills upto c. 2000'

861. *Chrysocolaptes lucidus guttacristatus*
(Tickell)
Greater Golden-backed Woodpecker

General information : Common resident in the hillside forest and open jungle from the foothills upto c. 5000' Arboreal. Noisy. Insectivorous. Keeps in pairs.

Collection Record : Schafer (1938/39) obtained 1♀. Ali (1962) collected 1♀.

827. *Gecinulus grantia* (Horsfield)
Pale-headed Woodpecker

Ali (1962) reported it as not uncommon and noted it at Rangpo, Singtam and Martam.

857. *Blythipicus pyrrhotis* (Hodgson)
Bay Woodpecker

General information : Rare, resident in the dense evergreen forest from c. 2000' to 6000'

Seasonal movement. Arboreal. Silent. Insectivorous. Keeps singly or in pairs.

Collection Record : Steven (1923-25) obtained specimens. Schafer (1938/39) obtained 2♀ at Gangtok, c. 6300' in December. Ali (1962) examined 1♂, 1♀ collected at Lingtam and Chungthang (Chicago Natural History Museum).

Other records : F.N. Betts noted it at Dikchu.

828. *Mulleripicus perverulentus mohun* Ripley
Great Slaty Woodpecker

Ali (1962) reported it as rare and stated to remain in the heavily forested tracts and foothills upto c. 2000'

864. *Serilophus lunatus* (Gould)
Hodgson's Broadbill

General information : Extremely rare, resident in mixed and dense evergreen forest from the foothills up to c. 3500' Arboreal. Partial crepuscular. Silent. Insectivorous. Keeps in small parties.

Family EURYLAIMIDAE
Broadbills

India : 2 Species

Sikkim : 2 Species. 100% of the Indian population.

Brightly coloured dumpy insectivorous arboreal birds. Bill with a wide gap. Strong syndactyl feet. Sexes alike.

864. *Serilophus lunatus* (Gould)
Hodgson's Broadbill

865. *Psarisomus dalhousiae* (Jameson)
Long-tailed Broadbill

General information : Extremely rare, resident in mixed and dense evergreen forest from foothill upto c. 3500' Arboreal. Partial crepuscular. Silent. Insectivorous. Keeps in small parties.

Collection Record : Schafer (1938/39) obtained 2 examples. Ali (1962) collected 1♂, 3♀.

Family PITTIDAE
Pittas

India : 5 Species and subspecies

Sikkim : 3 Species and subspecies. 60% of the Indian population.

Stout-bodied terrestrial birds with almost all colours in their plumage. Always keeps single in dense undergrowth. Feed mostly on insect.

866. *Pitta nipalensis* (Hodgson)
Blue-naped Pitta

869. *Pitta sordida cucullata* Hartlaub
Hooded Pitta

867. *Pitta brachyura* (Linnaeus)
Indian Pitta

866. *Pitta nipalensis* (Hodgson)
Blue-naped Pitta

General information : Rare, resident in the dense secondary jungle from the foothills upto c. 6500' Terrestrial. Silent. Carnivorous. Keeps singly.

Collection Record : Schafer (1938/39) procured 3 ♀.

Family ALAUDIDAE
Larks

India : 34 Species and subspecies.

Sikkim : 4 Species and subspecies. c. 12% of the Indian population.

The family of sparrow-like dull brown terrestrial birds, invading open country and cultivated field in small and large flocks. Most members have prominent crests. Well known for their calls and soaring song-flight. Larks mostly are the birds of arid environment, hence less represented in Sikkim. Out of four representatives two described from Sikkim and remaining two are winter visitor in high himalayas.

*894. *Melanocorypha maxima* Blyth
Long-billed Calandra-Lark

888. *Calandrella acutirostris tibetana* Brooks
Hume's Short-toed Lark

906. *Alauda gulgula inopinata* Bianchi
Easter Skylark

897. *Eremophila alpestris elwesi* (Blanford)
Horned Lark

894. *Melanocorypha maxima maxima* Blyth
Long-billed Calandra-Lark

Meinertzhagen (1927) obtained 2♂ at Yumthang, c. 11,650 in December. Ali (1962) noted its feeding near Lachung River.

886. *Calandrella brachydactyla dukhunensis*
(Sykes)
Greater Short-toed Lark

Ali (1962) reported its status in Sikkim as intermediate. Blanford (1870) noted a large flock of several hundreds at Yumthang (c. 12000'); Mome Samdong (c. 15000') and Phalung (c. 16000') during september and October.

888. *Calandrella acutirostris tibetana* Brooks
Hume's Short-toed Lark

General information : Rare summer resident in the open, stony, barren Tibetan plateau of N. Sikkim between c. 15000' and 16500' Terrestrial. Gregarious. Insectivorous. Keeps large flocks (migration).

Collection Record : Schafer (1938/39) obtained 7♂, 3♀ at Gyagong, Kiang-Lager during July-August.

903. *Alauda arvensis dulcivox* Brooks
Eurasian Sky Lark

Ali (1962) reported its status in Sikkim as uncertain Meinertzhagen (1927) noted a small flock at Thangu, c. 13,100' in November and obtained one example.

897. *Eremophila alpestris elwesi* (Blanford)
Horned Lark

General information : Rare summer resident in the open, stony, barren Tibetan Plateau of N. Sikkim between c. 15000' and 16500' Terrestrial. Gregarious. Insectivorous. Keeps large flocks (migration).

Collection record : Blanford (1870) obtained it at Dongkia La, 18000' in September. Schafer (1938/39) collected 6♂, 1♀ at Chungthang, c. 5000' in January.

N.Z.C. 1♂ Gaybong, N. Sikkim (c 4550 m)
22.07.1989.

Remarks : It seldom descends beyond 10000' even in extreme cold. But Ali and Biswas procured materials as below as c 5000'

Family HIRUNDINIDAE
Swallows & Martins

India : 22 Species and subspecies.

Sikkim : 7 Species and subspecies. c. 36% of the Indian population.

The family of gregarious and arial birds with strong and swift flight. Superficially they are similar to swift but with shorter wings and different wing-stroke. Colonial in habit and strictly insectivorous. Sexes alike.

912. *Riparia paluciola* (Vieillot)
Plain Martin

913. *Hirundo rupestris* Scopoli
Eurasian Crag-Martin

917. *Hirundo rustica gutturalis* Scopoli
Common Swallow

921. *Hirundo smithii* Leach
Wire-tailed Swallow

925. *Hirundo daurica nipalensis* Hodson
Red-rumped Swallow

931. *Delichon dasypus* (Bonaparte)
Asian House Martin

932. *Delichon nipalensis* Horsfield & Moore
Nepal House Martin

917. *Hirundo rustica gutturalis* Scopoli
Common Swallow

General information : Rare summer visitor in the foothills and upto c. 6500' Arboreal. Gregarious. Insectivorous. Keeps small to large flocks.

Collection record : Schafer (1938/39) obtained 2♂ at Gangtok in June.

925. *Hirundo daurica nipalensis* Hodgson
Red-rumped Swallow

General information : Common resident

(summer) from the foothills upto c. 7000' Arboreal. Gregarious. Insectivorous. Keeps small to large flocks.

Collection record : Schafer (1938/39) obtained 5♂, ♀ at Gangtok in June.

931. *Delichon dasypus* (Bonaparte)
Asian House-Martin

General information : Rare, resident of high elevation between 9000' and 16,000' Arboreal. Sociable. Gregarious. Insectivorous. Keeps small parties.

Collection record : Schafer (1938/39) procured 8♂, ♀ at Thangu. Ali (1962) examined Sikkim specimens (Chicago Natural History Museum). Ali (1962) recorded it at Lachen, Thangu, Yumthang, Gnatong and Gyagong.

932. *Delichon nipalensis* (Horsfield & Moore)
Nepal House-Martin

General information : Uncommon resident in between c. 1000' and 6500' Arboreal. Sociable. Gregarious. Insectivorous. Keeps small parties.

Collection record : Ali (1962) collected 1♂, 1♀, 1 unsexed.

Family MOTACILLIDAE
Wagtails & Pipits

India : 41 Species and subspecies

Sikkim : 10 Species and subspecies. c. 22% of the Indian population.

The family of small slender-bodied terrestrial and migratory birds with elongated hind toe. Most species share the habit of 'wagging' their long tail. Diet mostly insects for which they are found in the grass near marsh. Sexes mostly alike.

1874. *Dendronanthus indicus* (Gmelin)
Forest Wagtail

1885-90. *Motacilla alba* Linnaeus
White Wagtail

1891. *Motacilla maderaspatensis* Gmelin
Large pied Wagtail

1881-83. *Motacilla citreola* Pallas
Citrine Wagtail

1884. *Motacilla cinerea* Tunstall
Grey Wagtail

1859. *Anthus rufulus* Vieillot
Paddyfield Pipit

1867. *Anthus similis jerdoni* Finsch
Brown Rock Pipit

1854. *Anthus trivialis trivialis* (Linnaeus)
Eurasian Tree Pipit

1852. *Anthus hodgsoni hodgsoni* Richmond
Oriental Tree Pipit

1865. *Anthus roseatus* Blyth
Rosy Pipit

1887. *Motacilla alba alboides* Hodgson
White Wagtail

General information : Uncommon. Summer (breeding) visitor in the high elevation of Sikkim between c. 9,000' and 16,500' and sparingly winter visitor on the passage in the foothills upto c. 1,000'. Terrestrial. Restless. Insectivorous. Keeps in pairs or scattered mixed parties.

Collection records : Schafer (1938/39) obtained 5♂ and 3♀ at Lachen, Thangu and Gnagong between c. 9,000'–16,500' during July and August.

N.Z.C. 1♂. Yumthang. N. Sikkim (3475 m), 30.06.1989. 1 unsexed. Singtam, Tista Valley, Sikkim (c. 500 m) 07.12.1952

Other records : Blanford (1870) obtained it at Lachung Valley c. 12,000' in September. Ali (1962) noted it at Rangpo and Singtam in Winter.

F.N. Betts observed it (?) at Yakthang, 12,000' in May.

1890. *Motacilla alba baicalensis* Swinhoe
White Wagtail

Ali (1962) reported it as a passage migrant in Sikkim.

Schafer (1938/39) obtained 3♂ and 2♀ at Lachen, c. 9,000' and Kiang Lager, c. 16,500' in September.

1891. *Motacilla maderaspatensis* Gmelin
Large Pied Wagtail

Ali (1962) mentioned it as not uncommon and met with only on the Teesta River at Rangpo, c. 12,000' between November and April.

Z.S.I obtained 2 unsexed examples at Rangpo.

1883. *Motacilla citreola calcarata* Hodgson
Citrine Wagtail

General information : Uncommon summer (breeding visitor in the higher elevation of Sikkim up to c. 16,000'). Terrestrial. Agile. Insectivorous. Keeps in pair or mixed parties.

Collection records : Schafer (1938/39) procured 10♂ and 4♀ at Gyagong, c. 16,000' in August; at Kiang-Lager, c. 16,500' in October at Lachen, 9,000' in September–October.

1884. *Motacilla cinerea* Tunstall
Grey Wagtail

Schafer (1938/39) obtained 1♂, 4♀ at Lachen, 9,000' in September and at Gangtok, 6,300' in December–January.

Ali (1962) noted it as uncommon passage migrant in small numbers in Sikkim. Arrives in September and leaves in April. Ali also noted a single bird at Martem, c. 2,000' in December.

1884. *Motacilla cinerea* Tunstall
Grey Wagtail

General information : Sporadic winter visitor in the foothills up to c. 2000 m in open river beds and c. nullas etc. Terrestrial. Insectivorous. Sexes dissimilar with winter (male) and summer (female) plumage.

NZC. 1 unsexed. Rinchingpong, Rangit Valley, Sikkim (c. 1600 m). 04.01.1953.

Remarks : Present collection records may be a passage migrant.

1863. *Anthus godlewskii* (Taczanowski)
Blyth's Pipit

General information : Rare passage migrant (southward passage). Terrestrial. Agile. Insectivorous. Keeps in small to large flocks.

Collection records : Schafer (1938/39) collected 7♂ and ♀ at Lachen in September.

Other records : Blanford (1870) noted it in Sikkim at c. 7000' in September and also at Phalung, above 15,000' in October.

1852. *Anthus hodgsoni hodgsoni* Richmond
Oriental Tree Pipit

General informations : Uncommon summer visitor (breeding) visitor (Stresmann) in the high altitude (9,000'–13,000') and common wintering bird from the foothills upto 6,500' Terrestrial. Insectivorous. Keeps small to large flocks.

Collection records : Schafer (1938/39) obtained 12♂ at Thangu, c. 13,000' in July; at Lachen, c. 9,000' in August, Chungthung 5,000' in November; Gangtok, 6,300' in December to January.

Ali (1962) collected 5♂ at Rangpo, Singtam, Temi, Rinchinpong and Chungthang between 1,000' and 6,500' during November-February. N.Z.C. 1♂, 1♀. Yumthang, N. Sikkim (c 3475 m) 3, 9.07.1989; 2♂, Somdong, Changne Khanpu, Glacier, N.Sikkim (16500'), 2.09.1978. Dzongri, W. Sikkim, (13200') 7.06.1990.

Other records : Meinertzhagen (1927) noted it as abundant in Sikkim between 5,000' and 6,000' during November–January.

Remarks : Both the sub-species, Viz., *hodgsoni* and *yunnanensis* are found simultaneously in different season and altitudes of Sikkim. Both Schafer and Ali collected both sub-species in Sikkim and some times in the same locality. Sub-specific difference is practically based on the black-bold streak on the upper plumage which is, in turn, is very misleading as black-spot streak greatly varies on the individual specimen of both the forms.

1853. *Anthus hodgsoni yunnanensis* Uchida & Kuroda
Oriental Tree Pipit

General information : Scarce winter visitor in the foothills up to c. 200 m. in open cultivated

field and pastur land. Mostly terrestrial. Insectivorous. Keeps in small to large flocks. Sexes alike.

NZC. 2♂. Chunthang, N. Sikkim (c. 560 m). 25.01.1953.; 1 unsexed. Rinchinpong, Rangit Valley (c. 1600 m.). 02.01.1953; 1♀. Tumin, E. Sikkim (1800 m.). 25.09.1988.

Remarks : Although no collector except Z.S.I., found it in Sikkim, it may be taken as granted that it is a regular winter visitor in lower Sikkim.

1865. *Anthus roseatus* Blyth
Rosy Pipit

General informations : Rare summer visitor in the Alpine pastures and boddy meadows from c. 12,000' to 16,500' Uncommon passage migrant between 5,500' and 9,000' Terrestrial. Agile. Insectivorous. Keeps in small to large flocks.

Collection records : Schafer (1938/39) collected 1♂ and 3♀.

N.Z.C. 1♂. Yoma, Somedong, N. Sikkim. 4.07.1989

Other records : Ali (1962) obtained it at Chungthang, Lachen, Gangtok and Karponang between October and April.

Family CAMPEPHAGIDAE
Cuckoo-Shrikes, Flycatcher-Shrikes, Trillers, Minivets & Woodshrikes

India : 34 Species and subspecies.

Sikkim : 9 Species and subspecies. 34% of the Indian population.

Small to medium sized birds with heavy and hooked bill. Long graduated tail. Mostly slaty or black and white arboreal birds while the Minivets are bright red, black and yellow. Always keeps singly or in pair but occasionally in small parties. Feed mostly on insects. Sexes are alike except male Minivet are red and black while female are yellow. Pied Flycatcher-Shrike are smallest member (c. 15 cm/ 5.5") Large Cuckoo-Shrike are largest member (c. 30 cm / 12").

1073. *Coracina macei nipalensis* (Hodgson)
Large Cuckoo-Shrike

1089. *Pericrocotus roseus* (Vieillot)
Rosy Minivet

1088. *Pericrocotus solaris* Blyth
Grey-chinned Minivet

1086. *Pericrocotus ethologus laetus* Mayr
Long-tailed Minivet

1084. *Pericrocotus brevirostris* (Vigors)
Short-billed Minivet

1080. *Pericrocotus flammeus speciosus*
(Latham)
Scarlet Minivet

1064. *Hemipus picatus capitalis* (Horsfield)
Pied Flycatcher-Shrike

1067. *Tephrodornis gularis pelvica* (Hodgson)
Large Woodshrike

1070. *Tephrodornis pondicerianus*
pondicerianus (Gmelin)
Common Woodshrike

1064 and 1089 are rare and 1089 represent so far by one winter record from the Sikkim terai. Overall Minivets are commoner than Shrikes (1064, 1067 and 1070) and almost all 1088 and 1086 are commoner than the rest.

1077. *Coracina melachislos* (Hodgson)
Black-winged Cuckoo-Shrike

General information : Uncommon resident in the open hill-side forest from the foothill upto c. 6000' Arboreal. Insectivorous. Keeps single or in pairs.

Collection record : Schafer (1938/39) procured 4♂. Ali (1962) obtained 1♂.

1064. *Hemipus picatus capitalis* (Horsfield)
Pied Flycatcher-Shrike

General information : Common resident in the hill-side mixed forest from the foothills up to c. 5000' Arboreal. Insectivorous. Keeps in pairs or small parties.

Collection record : Ali (1962) obtained 1 unsexed specimen.

N.Z.C. 1♂. Dentam, Kolet Valley, Sikkim. (c. 1400 m), 1.01.1953.

1067. *Tephrodornis gularis pelvica* (Hodgson)
Large Woodshrike

General information : Common resident in the hill-side mixed forest from the foothills upto c. 5000' Arboreal. Insectivorous. Keeps in pairs or small parties.

Other records : Ali (1962) noted at Singtam, Martam, Dentam and Rinchinpong during November January.

1088. *Pericrocotus solaris* Blyth
Grey-chinned Minivet

General information : Uncommon resident in the open hill-side forest and near cultivation from c. 2300' to 10,000' Partial altitudinal movement. Arboreal. Gregarious. Noisy. Insectivorous. Keeps in pairs or small parties.

Collection record : Blanford (1870) obtained 1♀ at Lachung, c. 10000' in September. Schafer (1938/39) procured 3♂, 1♀ at Gangtok in December. Ali (1962) collected 2♂. N.Z.C. 1♂. Rabangla, S. Sikkim. 25.05.1990

Other records : Ali (1962) noted it at Dikchu (c. 2300'); Temi and Chungthang between 3500' and 5000'

1086. *Pericrocotus ethologus laetus* Mayr
Long-tailed Minivet

General information : Uncommon resident in the open hill-side forest from the foothills upto c. 6000' with partial altitudinal movement. Arboreal. Insectivorous. Keeps single or in pairs.

Collection record : Schafer (1938/39) collected 17♂, 10 ♀.

N.Z.C. 2♂, 3♀. Rabangla, S. Sikkim. 17-25. 05.1990.; 5♀. Yumthang. N. Sikkim. 1-4.08.1989.

1080. *Pericrocotus flammeus speciosus*
(Latham)

Scarlet Minivet

General information : Uncommon resident in the open hill-side forest from the foothill upto

c. 6000' Arboreal. Insectivorous. Keeps single or in pairs.

Collection record : Schafer (1938/39) obtained 7♂, 2♀. Ali (1962) collected 1♂, 1♀.

N.Z.C. 1♂, 1♀ Yaksam, W Sikkim. 31.05.1990 and 17.06.1990.

Family PYCNONOTIDAE Bulbuls & Finchbills

India : 34 Species and subspecies.

Sikkim : 9 Species and subspecies. c. 27% of the Indian population.

Bulbuls are agile medium sized birds. Size c. 18 cm (7'') 23 cm. (9''). Plumages mostly black, brown and slaty. Diagnostic shorter tarsus and presence of crest of some hairs on nape, pointed wings, slender bills except the short Finch-like bill of Crested Finchbill (1111). Mostly noisy species with a variety of musical notes of some members. Always in pairs or small parties of 5-6 birds, occasionally larger party of even c. 30 birds in non-breeding season. Food consists of fruit berries, nectar and insects. Sexes are mostly alike.

1133. *Pycnonotus striatus striatus* (Blyth)
Striated Bulbul

1115. *Pycnonotus melanicterus flaviventris*
(Tickell)
Black-crested Bulbul

1121. *Pycnonotus jocosus emeria* (Linnaeus)
Red-whiskered Bulbul

1125. *Pycnonotus leucogenys leucogenys* (Gray)
Himalayan Bulbul

1131. *Pycnonotus cafer bengalensis* Blyth
Red-vented Bulbul

1140. *Alophoixus flaveolus* (Gould)
White-throated Bulbul

1147. *Hemixos flavala* Blyth
Brown-eared Bulbul

1146. *Hypsipetes maclellandii* Horsfield
Rufous-bellied Bulbul

1148. *Hypsipetes leucocephalus psaroides* Vigors
Black Bulbul

1121 and 1125 are abundant in the edge of the forest near cultivation and gardens.

1133. *Pycnonotus striatus striatus* (Blyth)
Striated Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection record : Schafer (1938/39) obtained 5 specimens.

1115. *Pycnonotus melanicterus flaviventris*
(Gmelin)
Black-crested Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection record : Ali (1962) obtained 10♀.

1125. *Pycnonotus leucogenys* (Gray)
Himalayan Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection record : Schafer (1938/39) procured 10♂, ♀. Ali (1962) obtained 1♂.

N.Z.C. 1♂, Martam, Rongni Valley, Sikkim, (c. 650 m), 15.12. 1952; 2♂. Dentam, Kalet Valley, Sikkim. (c.1400 m). 1.01.1953; Temi, Paung Valley, Sikkim. (c. 1480 m). 8.01.1953.

1131. *Pycnonotus cafer bengalensis* Blyth
Red-vented Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection record : Schafer (1938/39) obtained 10♂, 3 ♀ Ali (1962) collected 2♂, 1♀. N.Z.C. 1♂, 1♀. Martem, Rongni Valley, Sikkim, (650 m). 13,16.12.1952.

1140. *Alophoixus flaveous* (Gould)
White-throated Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection record : Schafer (1938/39) obtained 1♂.

Other records : Mandelli noted its nest at 4000' in Sikkim.

1147. *Hemixos flavela* Blyth
Brown-eared Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection Record : Ali (1962) obtained 1♂, 1♀.

N.Z.C. 1♂, 1 unsexed. Martem, Rongni Valley, Sikkim. (650 m) 16,17. 12.1952; 1 unsexed. Sankukhola, Singtum, Tista Valley, 10.12.1952; 1♀. Temi, Papung Valley, Sikkim. (c.1480 m) 9.01.1953

1146. *Hypsipetes maclellandi* Horsfield
Rufous-bellied Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection Record : Schafer (1938/39) obtained 5 examples. Ali (1962) collected 1♀.

N.Z.C. 1♂. Rinchongpong, Rangit Valley, Sikkim, (c. 1600 m). 3.01.1953.

1148. *Hypsipetes leucocephalus psaroides* Vigors
Black Bulbul

General information : Common resident in mixed jungle, scrub and bush near cultivation upto c. 5000' Arboreal. Frugivorous. Keeps in pair or small parties.

Collection Record : Schafer (1938/39) obtained 16♂, 2♀. Ali (1962) collected 1♂, 1♀.

N.Z.C. 1♂, 1♀. Yansum, W. Sikkim. (5,840') 31.05,17.06.1990.

Family IRENIDAE
Ioras, Chloropsis /Leafbird, Fairy-Bluebird

India : 13 Species and subspecies.

Sikkim : 4 Species and subspecies. c. 33% of the Indian population.

Brightly coloured small to medium-sized arboreal birds. Most members are with overall green colouration while Asian Fairy-Bluebird has the combination of black and ultramarine colour. Sexes are unlike, the females duller. Non-breeding male resembles the female but retains his black tail (Iora) smaller member-Common Iora c. 14 cm. (5.5'') Larger member-Asian Fairy-Bluebird c. 27 cm. (11'').

1098. *Aegithina tiphia tiphia* (Linnaeus)
Common Iora

1103. *Chloropsis aurifrons aurifrons* (Temminck)
Gold-fronted Chloropsis

1106. *Chloropsis hardwickii* Jardine & Selby
Orange-bellied Chloropsis

1109-10. *Irena puella* (Latham)
Asian Fairy-Bluebird

1103. *Chloropsis aurifrons aurifrons* (Temminck)
Gold-fronted Chloropsis

General information : Uncommon resident in open hillside jungle from the foothills upto c. 2500' Arboreal. Silent and shy. Omnivorous (Insect + Fruits). Keeps in pairs or small parties.

1106. *Chloropsis hardwickii* Jardine & Selby
Orange-bellied Chloropsis

General information : Uncommon resident in open hillside jungle from the foothills upto c. 2500' Arboreal. Silent and shy. Omnivorous (Insect + Fruits). Keeps in pairs or small parties.

Collection Record : Schafer (1938/39) collected 7♂, ♀ Ali (1962) obtained 2♂, 1♀.

N.Z.C. 1♀. Rongpo, Sikkim. 18.12.1952.

1110. *Irena puella* (Latham)
Asian Fairy-Bluebird

General information : Extremely rare. Status uncertain in Sikkim. A bird of open evergreen forest from the foothills upto c. 4000' Arboreal (Canopy bird). Frugivorous. Keeps single or in pairs.

Family LANIIDAE
Shrikes

India : 14 Species and subspecies.

Sikkim : 4 Species and aubspecies. c. 29% of the Indian population.

Popularly known as 'Butcher Birds' for its typical habit and its strong, decurved bill with a large tooth and deep notch near the tip. Mostly winter visitor in our limit and strickly territory minded bird. Keeps mostly in single. Sexes alike.

949. *Lanius cristatus cristatus* Linnaeus
Brown Shrike

940. *Lanius vittatus vittatus* Valenciennes
Indian Bay-backed Shrike

948. *Lanius schach tricolor* (Hodgson)
Rufous-backed Shrike

945. *Lanius tephronotus tephronotus* (Vigors)
Grey-backed Shrike

949. *Lanius cristatus cristatus* Linnaeus
Brown Shrike

General information : Uncommon winter visitor in the open hillside forest and cultivation from the foothills up to c. 5,000' Arboreal (canopy bird). Insectivorous. Keeps single.

Collection records : Ali (1962) obtained 1 ♀ at Rinchingpong, c. 5,000' in January.

Other records : Stevens (1923-25) noted it as a winter visitor in the hills and valleys of Sikkim at moderate elevation.

948. *Lanius schach tricolor* (Hodgson)
Rufous-backed Shrike

General information : Uncommon resident in open scrub country and cultivation between 4,000' and 6,000' (winter). No summer data. Arboreal. Insectivorous. Shy and silent. Keeps single.

Collection records : Schafer (1938/39) obtained 3 ♂ and 2 ♀.

Ali (1962) procured 1 ♂.

N.Z.C. 1 ♂. Rinchingpong, Rangit Valley, Sikkim (c. 1600 m), 3.01.1953.

Other records : Meinertzhagen (1927) found it at Lachung, c. 7,000' in December.

Ali (1962) noted it at Temi, Dentam, Chungthang and Gangtok in winter.

945. *Lanius tephronotus tephronotus* (Vigors)
Grey-backed Shrike

General information : Uncommon resident in open scrubby jungle and secondary growth and edge of the cultivation from c. 8,000' to 15,000' Marked altitudinal (seasonal) migrant. Arboreal. Agile. Insectivorous. Keeps single or in paris.

Collection records : Schafer (1938/39) obtained specimens at Chungthang, Lachen and Thangu during June to September. Ali (1962) collected 1 ♂ and 1 unsexed. N.Z.C. 1 unsexed. Yumthang. N. Sikkim, 3.07.1989. 1 ♂. Lachung, N. Sikkim. (8600') 4.04.1979.

Other records : Blanforrd (1870) noted it common at Lachung, c. 8,000'-9,000' in September but leaves at the end of the month.

Ali (1962) noted it at Rangpo, Singtam, Martem, Chungthang, Gangtok and Lachung during November to April.

Family CINCLIDAE
Dippers

Sikkim : 2 Species and subspecies.

Dippers dip in the streams for food. A bird of swift, undisturbed and remote streams from the foothills to c. 2700 m. in Sikkim. Overall very thick dark chocolate brown plumage, narrow straight bill, short and rounded wing and also very short tail. Solitary or in pairs. Sexes alike.

1773. *Cinclus cinclus cashmeriensis* Gould
White-throated Dipper

1775. *Cinclus pallasii tenuirostris* Bonaparte
Brown Dipper

1774. *Cinclus cinclus przewalskii* Bianchi
White-throated Dipper

General information : Uncommon resident in the high elevation swift mountain torrents and streams between c. 9,000'-15,000'. Partial altitudinal migrant. Terrestrial. Agile. Insectivorous. Keeps single or in separated pairs.

Collection records : Stevens (1923-25) collected 5 examples at Gnatong, c. 12,500' and Gyagong.

Other records : Meinertzhagen (1927) noted it at Gyagong, c. 15,700' and Changu Lake, 12,300'

Ali (1962) noted it at Thangu, c. 13,000'

1775. *Cinclus pallasii tenuirostris* Bonaparte
Brown Dipper

General information : Uncommon resident in the high elevation swift mountain torrents and streams between c. 9,000'-15,000'. Partial altitudinal migrant. Terrestrial. Agile. Insectivorous. Keeps single or in separated pairs.

No collection secured so far from Sikkim.

Family TROGLODYTIDAE

One of the smallest family comprising of a single species having three geographical races. Small bird with weak and slender bill, very short wing and shorter tail. Plumage mainly rufous-brown and conspicuous eye-ring. Keeps solitary and intensely restless and largely terrestrial. Sexes alike.

1. *Troglodytes troglodytes nipalensis* Blyth
Winter Wren

1771. *Troglodytes troglodytes nipalensis* Blyth
Winter Wren

General information : Uncommon resident by the side of rocky stream, bushy and stony pastures and glacier moraines between c. 8,000' and 10,000'. Terrestrial. Restless. Silent. Insectivorous. Keeps single.

Collection records : Schafer (1938/39) procured 10♂ and ♀.

Ali (1962) obtained 2♂ and 2♀.

Family PRUNELLIDAE
Accentors

India : 12 Species and subspecies

Sikkim : 6 Species and subspecies. 50% of the Indian population.

The small family of birds comprises of a single genus, *Prunella*. Popularly called as Accentor. Small and slim birds of high altitude with some vertical movement depending upon coldness of the habitat. Bill pointed and slightly notched. Always keeps single. Sexes alike. Rarely seen in the high altitude of Sikkim.

1779. *Prunella collaris nipalensis* (Blyth)
Alpine Accentor

1780. *Prunella himalayana* (Blyth)
Altai Accentor

1781. *Prunella rubeculoides* (Moore)
Robin Accentor

1783. *Prunella strophiiata strophiiata* (Blyth)
Rufous-breasted Accentor

1785. *Prunella fulvescens ocularis* (Radde)
Brown Accentor

1788. *Prunella immaculata* (Hodgson)
Maroon-backed Accentor

1779. *Prunella collaris nipalensis* (Blyth)
Alpine Accentor

General information : Rare resident (?) in the alpine country and rocky forest between c. 8,000' and 16,000'. Altitudinal migrant. Mostly terrestrial. Agile and silent. Keeps single or in loose parties.

Collection records : Schafer (1938/39) obtained 6 ♂ and 4 ♀ at Gyagong, c. 16,000' during July–August. Ali (1962) collected 1♂. N.Z.C. 1♂, 1♀. Yangbi, Thangsing, W. Sikkim (16,000') 11.06.1990.

1780. *Prunella himalayana* (Blyth)
Altai Accentor

General information : Rare resident(?) in the alpine country and rocky forest between c. 8,000' and 16,000'. Altitudinal migrant. Mostly terrestrial. Agile and silent. Keeps single or in loose parties.

Collection records : Ali (1962) collected 2 ♂ and 2 ♀ and also examined a specimen collected at Gnatong, c. 12,500' by the Suydam Cutting Expedition.

Other records : Meinertzhagen (1927) noted it at Yumthang, c. 11,650' in December. Ali (1962) noted a flock of about 50 birds between Chungthang and Lachung at 6,800' in January.

1781. *Prunella rubeculoides* (Moore)

Robin Accentor

General information : Rare resident(?) in the alpine country and rocky forest between c. 8,000' and 16,000' Altitudinal migrant. Mostly terrestrial. Agile and silent. Keeps single or in loose parties.

Collection records : Schafer (1938/39) obtained 15 ♂ and 7 ♀ at Gyagong, c. 16,000' in July and August and a specimen at Singhik, c. 4,000' in October. Ali (1962) procured an example at Lachen, 8,500' in February.

Other records : Meinertzhagen (1927) noted it at Thangu, Yumthung and Gyagong between 13,000' and 16,000'

1783. *Prunella strophiiata strophiiata* (Blyth)

Rufous-breasted Accentor

General information : Rare resident in conifer and rhododendron and juniper jungle from c. 5,500' to 13,000' Altitudinal migrant. Mostly terrestrial. Insectivorous. Keeps in pairs or small parties.

Collection records : Schafer (1938/39) obtained 1 ♂ and 3 ♀ at Changu, c. 12,000' in February and at Thangu, c. 13,000' in July August. Ali (1962) collected 2 ♂ and examined specimens collected by the Shydam Cutting Expedition at Gnatong, c. 12,500' in March, 1931. N.Z.C. 5 ♂, Samdong, Sikkim, 4, 20.07.1989; Dzongri, W. Sikkim, (15000'), 9, 12, 13.06.1990; 2 ♀ Samdong, Sikkim, 4.07.1989; Dzongri, W. Sikkim (15,000'), 13.07.1990

Other records : Blanford (1870) noted it in the Chola Range, c. 12,500' in September.

1786. *Prunella immaculata* (Hodgson)

Maroon-backed Accentor

Stevens (1923-25) noted it as springly distributed bird and of irregular occurrence between 7000' and 8000' Baker (1927) reported that it breeds in Sikkim at 10,000' and upwards.

1788. *Prunella immaculata* (Hodgson)

Maroon-backed Accentor

General information : Scarcely resident with total vertical movement from 2100 m (winter) upto c. 4200 (summer) in humid, mossy conifer forest. Omnivorous (insect + seeds). Arboreal. Keeps single or in pair.

Collection record : Z.S.I. party collected 1 ♂ in Yumthang, N. Sikkim on 03.07.1989.

Remarks : So far, no collection records from Sikkim except present collection.

1788. *Prunella immaculata* (Hodgson)

Maroon-backed Accentor

Stevens (1923-25) noted it as sparingly distributed bird and of irregular occurrence between 7,000' and 8,000' Backer (1927) reported that it breeds in Sikkim at 10,000' upwords.

Family TURDINAE

Thrushes, Shortwings, Robins, Forktails, Wheters

India : 120 Species and subspecies.

Sikkim : 56 Species and subspecies. c. 48% of the Indian population.

Family comprises of Thrushes (True and whistling), Shortwings, Robins, Forktails and Wheters. Size ranges from Myna to Sparrow. All living in between Sikkim terai and Sikkim himalaya. Food consists of insects and berries. Sexes mostly alike but female smaller and duller.

Whistling Thrush lives on the edge of the forest and mostly seen moving on the road. True Thrushes are mainly mountain birds having vertical movements. Shortwings are small birds with short wings and tail. Robins are small to median-sized birds often found in bushes and

open country. Forktails have black and white plumage with deeply forked tail and found in and around shady streams.

1722. *Monticola saxatilis* (Linnaeus)
Rufous-tailed Rock-Thrush
1723. *Monticola cinclorhynchus* (Vigors)
Blue-headed Rock-Thrush
1724. *Monticola rufiventris* (Jardine & Selby)
Chestnut-bellied Rock-Thrush
1726. *Monticola solitarius pandoo* (Sykes)
Blue Rock-Thrush
1729. *Myiophonus caeruleus temminckii* (Vigors)
Blue Whistling-Thrush
1731. *Zoothera wardii* (Blyth)
Pied Thrush
1733. *Zoothera citrina citrina* (Latham)
Orange-headed Thrush
1739. *Zoothera mollissima mollissima* (Blyth)
Plain-backed Thrush
1740. *Zoothera dixonii* (Seeböhm)
Long-tailed Thrush
1741. *Zoothera dauma dauma* (Latham)
Scaly Thrush
1745. *Zoothera monticola* (Vigors)
Greater Long-billed Thrush
1746. *Zoothera marginata* Blyth
Lesser Long-billed Thrush
1748. *Turdus unicolor* Tickell
Tickell's Thrush
1749. *Turdus albocinctus* Royle
White-collared Thrush
1750. *Turdus boulboul* (Latham)
Grey-winged Blackbird
1752. *Turdus merula maximus* (Seeböhm)
Eurasian Blackbird
1758. *Turdus rubrocanus rubrocanus* G.R.Gray
Chestnut Thrush
1760. *Turdus kessleri* Przevalski
Kessler's Thrush
1762. *Turdus obscurus* Gmelin
Eye-browed Thrush
- 1763-64. *Turdus ruficollis* Pallas
Dark-throated Thrush
1635. *Brachypteryx stellata* Gould
Gould's Shortwing
1636. *Brachypteryx hypertythra* Jerdon & Blyth
Rusty-bellied Shortwing
1639. *Brachypteryx leucophryx* (Temminck)
Lesser Shortwing
1640. *Brachypteryx montana* Horsfield
White-browed Shortwing
1643. *Luscinia calliope* (Pallas)
Siberian Rubythroat
1648. *Luscinia pectoralis confusus* (Hartert)
Himalayan Rubythroat
1644. *Luscinia svecia svecia* (Linnaeus)
Bluethroat
- 1650, 1651. *Luscinia brunnea* (Hodgson).
Indian Blue Robin
1655. *Tarsiger cyanurus rufilatus* (Hodgson)
Orange-flanked Bush-Robin
1658. *Tarsiger chrysaeus chrysaeus* (Hodgson)
Golden Bush-Robin
1659. *Tarsiger indicus* (Vieillot)
White-browed Bush-Robin
1660. *Tarsiger hyperythrus* (Blyth)
Rufous-breasted Bush-Robin
1661. *Copsychus saularis saularis* (Linnaeus)
Oriental Magpie-Robin
1667. *Copsychus malabaricus indicus* (Baker)
White-rumped Shama
1672. *Phoenicurus ochruros* (Gmelin)
Black Redstart
1674. *Phoenicurus hodgsoni* (Moore)
Hodgson's Redstart
1676. *Phoenicurus schisticeps* (Gray)
White-throated Redstart
1677. *Phoenicurus aureus* (Pallas)
Daurian Redstart

1678. *Phoenicurus erythrogaster* (Guldenstaedt)
Guldenstaedt's Redstart

1675. *Phoenicurus frontalis* (Vigors)
Blue-fronted Redstart

1716. *Chaimarrornis leucocephalus* (Vigors)
White-capped Redstart

1679. *Rhyacornis fuliginosus* (Vigors)
Plumbeous Redstart

1680. *Hodgsonius phaenicuroides* (Gray)
White-bellied Redstart

1681. *Myiomela leucura* (Hodgson)
White-tailed Robin

1682. *Cinclidium frontale* Blyth
Blue-fronted Robin

1683. *Grandala coelicolor* Hodgson
Grandala

1684. *Enicurus scouleri* Vigors
Little Forktail

1685. *Enicurus immaculatus* (Hodgson)
Black-backed Forktail

1686. *Enicurus schistaceus* (Hodgson)
Slaty-backed Forktail

1687. *Enicurus leschenaulti* (Vieillot)
Leschenault's Forktail

1689. *Enicurus maculatus guttatus* Gould
Spotted Forktail

1690. *Cochoa purpurea* Hodgson
Purple Cochoa

1691. *Cochoa viridis* Hodgson
Green Cochoa

1697. *Saxicola torquata indica* Blyth
Common Stonechat

1705. *Saxicola ferrea* Gray
Grey Bushchat

1709. *Ananthe deserti* (Temminck)
Desert Wheastear

1723. *Monticola cinclorhynchus* (Vigors)
Black-headed Rock-Thrush

General information : Uncommon winter

visitor(?) in the moist tall evergreen jungle between c. 5,000' and 10,000' Arboreal. Silent. Insectivorous. Keeps single.

Collection records : Schafer (1938/39) collected 1♂ and 1♀ at Gangtok in June.

1724. *Monticola rufiventris* (Jardine & Selby)
Chestnut-bellied Rock-Thrush

General information : Uncommon resident in the damp hill-side forest and edge of the forest near cultivation between c. 5,000' and 10,000' Arboreal. Silent. Insectivorous. Keeps solo.

Collection records : Schafer (1938/39) obtained 3♂ and 3♀. Ali (1962) collected 1♂. N.Z.C. 1 unsexed. Raleng, S. Sikkim. 19.05.1990

1726. *Monticola solitarius pandoo* (Sykes)
Gould's Shortwing

General information : Uncommon winter visitor(?) in the edge of the forest and forest clearings with stone quarried from the foothills up to c. 3,500' Mostly terrestrial. Shy and sedentary. Insectivorous. Keeps solitary.

Collection records : Ali (1962) obtained 1 unsexed at Rangpo, c. 1000' in December.

Other records : Steven (1923-25) noted that it is found in the Teesta Valley between 1.1.00' and 3,500' during winter.

1729. *Myiophonus caeruleus temminckii* (Vigors)
Blue Whistling Thrush

General information : Common resident in the open evergreen and hillside mixed forest from the foothills up to c. 9,000' Partial seasonal migrant. Mostly terrestrial. Shy and silent. Insectivorous. Keeps mostly single.

Collection records : Schafer (1938/39) collected 17♂ and ♀ (1 example from Thangu, c. 12,000' in July). Ali (1962) procured 1♀. N.Z.C. 1♂. Lachen, N.Sikkim. 3.07.1989.

1733. *Zoothera citrina citrina* (Latham)
Orange-headed Thrush

General information : Uncommon resident in the hillside deciduous and evergreen forest with

shrubby undergrowths and ravines from c. 3,000' to 6,000' Terrestrial. Shy and silent. Omnivorous. (mostly insects). Keeps single.

Collection records : Schafer (1938/39) procured 2 example.

**1739. *Zoothera mollissima mollissima* (Blyth)
Plain-backed Thrush**

General information : Rare resident (?) in the open bush country, edge of the cultivation and moist meadows from the foothills upto c. 12,000' Altitudinal migrant. Terrestrial. Shy and silent. Keeps single.

Collection records : Schafer (1938/39) and Ali (1962) obtained altogether 3♂ and 2♀. N.Z.C. 3♀. Zoktukhola, Thangsing, W. Sikkim. (10,500') 11.06.1990; 1♀. Yumthang, N. Sikkim. 3.07.1989.

**1740. *Zoothera dixonii* (Seeborn)
Long-tailed Thrush**

General information : Rare resident (?) in the open bush country, edge of the cultivation and moist meadows from the foothills upto c. 12,000' Altitudinal migrant. Terrestrial. Shy and silent. Keeps single.

Collection records : Schafer (1938/39) procured 1♂ and 5♀. Ali (1962) procured 2♂. N.Z.C. 1♂. Thangu, N. Sikkim. 17.07.1989.

**1741. *Zoothera dauma dauma* (Latham)
Scally Thrush**

General information : Uncommon resident in the hillside deciduous and evergreen forest with shrubby undergrowths and ravines from c. 3,000' to 6,000' Terrestrial. Shy and silent. Omnivorous (mostly insects). Keeps single.

Collection records : Schafer (1938/39) procured 2 example. Ali (1962) obtained 2♂ and 2♀.

**1745. *Zoothera monticola* Blyth
Greater Long-billed Thrush**

General information : Rare resident (?) in the open bush country, edge of the cultivation and

moist meadows from the foothills upto c. 12,000' Altitudinal migrant. Terrestrial. Shy and silent. Keeps single.

Collection records : Schafer (1938/39) procured 1♂.

Other records : Blanford (1871-72) noted it in the Lachung Valley, c. 10,000' in September. Meinertzhagen (1927) noted it at Rinchinpong, c. 5,600' in January and at Singhik, c. 4,000' in October and December. Stevens (1923-25) noted one example in the Teesta Valley, c. 3,500' in October. Schafer (1938/39) noted also at Singhik, c. 4,000' in October and December.

**1746. *Zoothera marginata* Blyth
Lesser Long-billed Thrush**

Ali (1962) noted it as a lower elevation Thrush. Meinertzhagen (1927) noted it at Chacung, W. Sikkim in January.

**1748. *Turdus unicolor* Tickell
Tickell's Thrush**

General information : Sumner (breeding) visitor from the foothills upto c. 2100 m. in open forest with grassy ground. Mostly terrestrial. Insectivorous. Keeps in pairs or in small flocks.

Collection records : N.Z.C. 3♂, 2♀. Rabangla, S. Sikkim. 17-22.05.1990; 1♀ Yaksam, W. Sikkim, 5840' 20.06.2005.

**1749. *Turdus albocinctus* Royle
White-collared Blackbird**

General information : Rare in the conifer forest and rhododendron bush in summer and in open evergreen forest during winter. Ranges between c. 5,000' (winter) to 13,500' (summer). Terrestrial. Shy and silent. Insectivorous. Keeps single or often in small flocks.

Collection records : Schafer (1938/39) obtained 1♂ and 4♀. N.Z.C. 1♂, 2♀. Yumthang, N. Sikkim. 3.07.1989.

Other records : Blanford (1871-72) noted in summer at Chola Range up to c. 13,500' F.N.Betts noted it at Yumthang and Thangu.

1750. *Turdus bouboul* (Latham)**Grey-winged Blackbird**

General information : Rare in the conifer forest and rhododendron bush in summer and in open evergreen forest during winter. Ranges between c. 5,000' (winter) to 13,500' (summer). Terrestrial. Shy and silent. Insectivorous. Keeps single or often in small flocks.

Collection records : Schafer (1938/39) obtained 12♂ and 4♀. Ali (1952) collected 1♂ and 1♀. N.Z.C. 2♂. Rabangla, S. Sikkim. 17.05.1990. 5♀. Soshing, Temi, Sikkim. (2128 m). 7.01.1953; Yumthang, N. Sikkim. 6.07. 1989; Yaksam, W. Sikkim. 31.05.1990, 2.06.1990.

Other records : Grammie (1877) noted its breeding in Sikkim.

1752. *Turdus merula maximus* (Seeböhm)**Urasian Blackbird**

Meinertzhagen (1927) noted it to the east of the Yumthang between 14,000' and 15,000' in winter.

1758. *Turdus rubrocanus rubrocanus* Hodgson
Chestnut Thrush

Z.S.I (Biwas) obtained one specimen at Kewizing, c. 5,500' in January, 1953. Ali (1962) noted it as rare and winter visitor (?) in Sikkim.

1760. *Turdus kessleri* Przevalski**Kessler's Thrush**

Meinertzhagen (1927) noted a party of four birds near Changu, c. 12,100' in December, 1925, and obtained 1♂ from there.

Remarks : It is the only record of its occurrence in India.

1763. *Turdus ruficollis atrogularis* Jarocki**Dark-throated Thrush**

General information : Rare winter visitor in the hillside evergreen damp forest with heavy undergrowths and nearby water meadows between c. 4,000' c. 14,000'. Altitudinal migrant. Mostly terrestrial. Gregarious. Shy and silent. Omnivorous. (Insect + lower invertebrate). Keeps small mixed parties.

Collection records : Schafer (1938/39) obtained 2♂ and 3♀. Ali (1962) collected 1♂ and 1♀.

Other records : Meinertzhagen (1927) noted a huge flock in SW Sikkim between 3,000' - 4,500' in January.

1764. Dark-throated Thrush. *Turdus ruficollis ruficollis* Pallas.

Ali (1962) noted it as uncommon summer visitor in the NE Himalaya, although Schafer (1938/39) obtained 4♂ and 2♀ from Sikkim.

1635. *Brachypteryx stellata* Gould**Gould's Shortwing**

Ali (1962) mentioned it as seretive and apparently uncommon. A bird of high elevations (c. 9,000'-14,000'), eg. Yumthang, Zemu, Gnetong and Changu. But Schafer (1938/39) obtained specimens as low as in Dikechu, c. 1,800' in February.

1636. *Brachypteryx hyperythra* Jardine & Blyth
Rusty-bellied Shortwing

Ali (1962) noted it as very rare and little known species in Sikkim.

1639. *Brachypteryx leucophrys* (Temminck)**Lesser Shortwing**

Stevens (1923-25) mentioned that it is found above c. 5000' in the Sikkim Himalayas during breeding season. Ali (1962) noted it as rare in Sikkim.

1640. *Brachypteryx montana* Horsfield**White-browed Shortwing**

General information : Uncommon resident in scrubby and mossy forest with heavy moist undergrowths from the foothills upto c. 11,000'. Marked altitudinal migrant. Mostly terrestrial. Great skulker. Shy and silent. Keeps mostly single.

Collection records : Ali (1962) obtained 2♂.

1643. *Luscinia calliope* (Pallas)**Siberian Rubythroat**

Blanford (1871-72) noted it occasionally in september and more in October as southward

passage migrant in N. Sikkim, and obtained a specimen at Mome Shamdong, c. 15,000' in September.

1648. *Luscinia pectoralis confusus* Hartert
Himalayan Rubythroat

General information : Rare summer (breeding) visitor in the conifer forest with dense undergrowth between 8,000' and 11,000'. Terrestrial. Great skulker. Insectivorous. Keeps single or separated pairs.

Other records : Blanford (1870) noted it as common on the Chola Range and stated as less abundant in N. Sikkim, at c. 12,000' in August.

1649. *Luscinia pectoralis tschedbaiewi*
(Przevalski)
Himalayan Rubythroat

Ali (1962) reported that it was obtained from Native Sikkim by Mandelli in March, 1878 and may breed at the higher elevation of N. Sikkim.

1650. *Luscinia brunnea* (Hodgson)
Indian Blue Robin

General information : Rare summer (breeding) visitor in the conifer forest with dense undergrowth between 8,000' and 11,000'. Terrestrial. Great skulker. Insectivorous. Keeps single or separated pairs.

Other records : Ali (1962) mentioned its breeding within Lachen and Lachung during summer.

1655. *Tarsiger cyanurus rufilatus* (Hodgson)
Orange-flanked Bush-Robin

General information : Rare summer (breeding) migrant in the conifer forest and rhododendron scrub, between c. 10,000' and 14,000' and occasionally wintering in the bushy jungle between c. 2,500' and 7,000'. Mostly terrestrial. Shy. Insectivorous. Keeps always single.

Collection records : Schafer (1938/39) obtained 6♂ and 12♀. Ali (1962) collected 1♂ and 2♀. N.Z.C. 1♀. Yumthang, N. Sikkim. 8.07.1989. 1♀. Thangu, N. Sikkim. 16.07.1989.

1658. *Tarsiger chrysaeus chrysaeus* Hodgson
Golden Bush-Robin

General information : Rare summer (breeding) migrant in the conifer forest and rhododendron scrub, between c. 10,000' and 14,000' and occasionally wintering in the bushy jungle between c. 2,500' and 7,000'. Mostly terrestrial. Shy. Insectivorous. Keeps always single.

Collection records : Schafer (1938/39) collected 8♂ and 7♀. N.Z.C. 1♂, 1♀. Yumthang, N. Sikkim. 2.07.1989; 1♂, Dzongri, W. Sikkim (13,200'), 8.06.1990.

Other records : Hicklay noted its nest as low as c. 8,000' above Gangtok.

1659. *Tarsiger indicus* (Vieillot)
White-browed Bush-Robin

General information : Rare summer (breeding) migrant in the conifer forest and rhododendron scrub, between c. 10,000' and 14,000' and occasionally wintering in the bushy jungle between c. 2,500' and 7,000'. Mostly terrestrial. Shy. Insectivorous. Keeps always single.

Collection records : Schafer (1938/39) procured 3♂ and 1♀. Ali (1962) procured 1♂. N.Z.C. 2♂. Rabangla, S. Sikkim, 18.05.1990.

Other records : Schafer (1938/39) noted it at Changu, c. 12,500' in February.

1660. *Tarsiger hyperythrus* (Blyth)
Rufous-breasted Bush-Robin

General information : Rare summer (breeding) migrant in the conifer forest and rhododendron scrub, between c. 10,000' and 14,000' and occasionally wintering in the bushy jungle between c. 2,500' and 7,000'. Mostly terrestrial. Shy. Insectivorous. Keeps always single.

Collection records : Schafer (1938/39) procured 3♂. N.Z.C. 2♂, 1♀. Dongri, W. Sikkim. (13200'). 9, 12.06.1990.

Other records : Ali (1962) noted it at Singhik, Toong, Gangtok, Karponang and Changu.

1661. *Copsychus saularis* (Linnaeus)
Oriental Magpie-Robin

General information : Uncommon resident in

the open country edge of the cultivation from the foothills upto c. 5,000'. Arboreal. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 3♂. Ali (1962) procured 1♀ (?)

1670. *Phoenicurus caeruleocephalus* (Vigors)
Blue-capped Redstart

Stevens (1923-25) noted it on the Sikkim Nepal frontier at 11,500' in February, 1912.

1672. *Phoenicurus ochruros rufiventris* (Vieillot)
Black Redstart

Blanford (1870) noted it as abundant passage migrant in Lachen and Lachung Valley in September and one in the Teesta-Valley, c. 4,000' in October. Schafer (1938/39) obtained specimens at Gyagong c. 14,000'-16,000' in July and October; and at Lachen, c. 7,500' in November. Ali (1962) noted it as a rare passage migrant in autumn and spring (?)

1674. *Phoenicurus hodgsoni* (Moore)
Hodgson's Redstart

General information : Rare winter visitor in the dry river-bed, hill-streams, open rocky, Scrub and bush country (winter) up to c. 8,000'. Mostly terrestrial. Insectivorous. Keeps single or in pairs.

Collection records : Ali (1962) obtained 3♂ and 1♀.

1676. *Phoenicurus schisticeps* (Gray)
White-throated Redstart

General information : Common resident in open bush and grassland and scrubby hillside forest with streams from c. 5,000' c. 15,000'. Altitudinal (seasonal) migrant. Mostly terrestrial. Restless. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 3♂ and ♀. Ali (1962) procured 1♂ and 2♀.

1677. *Phoenicurus aureus* (Pallas)
Daurian Redstart

Meinertzhagen (1927) noted a small flock at Nata La c. 14,000' and secured 2♀.

Ali (1962) noted it as rare passage migrant in Sikkim.

1678. *Phoenicurus erythrogaster* (Guldenstaedt)
Guldenstaedt's Redstart

General information : Rare resident in the rocky moraines above tree line (summer) and down to the bushy and scrubby country and open pastures in the winter between c. 5,000' (winter) and 16,500' (summer). Mostly terrestrial. Agile. Insectivorous. Keeps single or in separated pairs.

Collection records : Meinertzhagen (1927) procured specimens at Gyagong and at Mome Shamdong during November - December. Schafer (1938/39) obtained specimens at Gyagong, c. 15,500' during June-August. Ali (1962) collected 3♂ and 4♀ at Lachung, c. 10,500' and Chungthang, c. 5,000' in January.

Other records : Blanford (1871-72) noted it at Dongkya La, Kangra Lama La, c. 14,000' - 16,000' during September-October.

1675. *Phoenicurus frontalis* (Vigors)
Blue-fronted Redstart

General information : Uncommon resident in rocky pastures, juniper and rhododendron scrub in summer (c. 15,000') and down to open moraines pastureland in winter (c. 3,000'). Mostly arboreal. Agile. Insectivorous. Keeps single or in widely separated pairs.

Collection records : Schafer (1938/39) obtained 16 ♂ and 9♀. Ali (1962) collected 3♂ and 1♀. N.Z.C. 3♂. Somdong (4250 m), Sikkim. 4.07.1989; 1♂. Dzongri, W. Sikkim, (13200'). 8.06.1990.; 2♀. Lhasar (?), Sikkim. 20.07.1989; 2♂, Yumthang, N. Sikkim (11,780'), 27.08.1978.

1716. *Chaimarrornis leucephalus* (Vigors)
White-capped Redstart

General information : Common resident by the side of the rocky streams and open bushy country and pastures between c. 5,000' (winter) and 16,000' (summer). Mostly terrestrial. Agile. Insectivorous. Keeps single.

Collection records : Schafer (1938/39) obtained 18 ♂ and ♀. Ali (1962) procured 1 ♂. N.Z.C. 1 ♂, 1 ♀. Yumthang, N. Sikkim. 25.07.1978, 2.07.1989; 1 ♀, Dzongri, W. Sikkim (13200'), 7.06.1990.

1679. *Rhyacornis fuliginosus* (Vigors)
Plumbeous Redstart

General information : Common resident by the side of the rocky stream and open bushy country and pastures between c. 5000' (winter) and 16,000' (summer). Mostly terrestrial. Agile. Insectivorous. Keeps single.

Collection records : Schafer (1938/39) collected 7 ♂ and 2 ♀. Ali (1962) obtained 1 ♂.

1680. *Hodgsonius phoenicuroides* (Gray)
White-bellied Redstart

Stevens (1923-25) noted it in the Sikkim Himalaya between c. 3,000' and 5,000' during September–February. Ali (1962) noted it as apparently rare in Sikkim.

1681. *Myiomela leucura* (Hodgson)
White-tailed Robin

General information : Common resident in the hillside shady forest and bush along the hillside streams between c. 3,500' and 8,000'. Terrestrial. Shy and silent. Insectivorous. Keeps single.

Collection records : Schafer (1938/39) procured 1 ♂. Ali (1962) procured 1 ♂. N.Z.C. 3 ♂. Rabangla, S. Sikkim (2010 m) 6-8.10.1988; 1 ♂, Tumin, E. Sikkim. (1800 m). 26.09.1988; 1 ♂. Rabangla, S. Sikkim. 17.05.1990; 1 ♂. Ralang, S. Sikkim. 19.05.1990.

1682. *Cinclidium frontale* Blyth
Blue-fronted Robin

Ali (1962) noted it as rare and little known and also reported specimens (2 ♂ and 2 ♀) from Sikkim now in the British Museum.

1683. *Grandala coelicolor* Hodgson
Grandala

General information : Rare resident, perhaps above the tree line and high alpine zone, form

c. 15,000' to 17,000'. Mostly arboreal. Gregarious. Frugivorous. Keeps in small to very large flocks.

Collection records : V.S. La Personne (1931) collected 7 ♂ and 4 ♀ at Thangu, c. 18,000'. Ali (1962) obtained 6 ♂ and 3 ♀ during May–July.

Other records : Meinertzhagen (1927) noted some flocks (all ♀) in N. Sikkim in December. Ali (1962) noted more than thousand birds in one instance at Lachen in February, 1952.

1684. *Enicurus scouleri* Vigors
Little Forktail

General information : Common resident in the mountain streams in moist, shady jungle from 2,000'–8,500'. Terrestrial. Restless. Shy. Keeps single or in pairs.

Collection records : Schafer (1938/39) collected 6 ♂ and ♀. N.Z.C. 1 ♂. Dzongri, W. Sikkim (13,200') 10.06.1990.

1685. *Enicurus immaculatus* (Hodgson)
Black-backed Forktail

Ali (1962) reported its presence at Dentam, c. 4,000'.

1686. *Enicurus schistaceus* (Hodgson)
Slaty-backed Forktail

General information : Common resident in the mountain streams in moist, shady jungle from 2,000' to 8,500'. Terrestrial. Restless. Shy. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 1 ♂ and 2 ♀. Ali (1962) obtained 2 ♂ and 1 ♀.

1687. *Enicurus leschenaulti* (Vieillot)
Leschenault's Forktail

1689. *Enicurus maculatus guttatus* Gould
Spotted Forktail

General information : Common resident in the mountain streams in moist, shady jungle from 2,000' to 8,500'. Terrestrial. Restless. Shy. Keeps single or in pairs.

Collection records : Schafer (1938/39) collected 6 ♂ and ♀. N.Z.C. 1 ♂, 1 ♀. Tumin, W. Sikkim. (c.1800 m). 24, 28. 09.1988.

1690. *Cochoa purpurea* Hodgson.**Purple Cochoa**

General information : Status undetermined. Rare in the tall evergreen forest with heavy moist undergrowth between c. 4,000' and 10,000' Arboreal (?). Silent. Omnivorous (? insect + fruits). Keeps single.

Collection records : Schafer (1938/39) obtained 2♂ at Gangtok and 1 example at Chungthang during June.

Other records : Blanford (1870) obtained it at Chola Range (Kapup ?) c. 10,000' in August.

1691. *Cochoa viridis* Hodgson**Green Cochoa**

General information : Status undetermined. Rare in the tall evergreen forest with heavy moist undergrowth between c. 4000' and 10,000' Arboreal (?). Silent. Omnivorous (? insect + fruits). Keeps single.

Collection records : Schafer (1938/39) obtained 1♂ at Singhik in June. Ali (1962) examined 1♂, coll. V.S.La Personne, at Toong, 6,000'

Other records : Stevens (1923-25) referred to specimens from the Sikkim Himalaya (Gokh, Romman Valley, (2,500'–3,000'), collected in July, 1870 (now in British and Tring Museums).

Family TIMALIINAE

**Babblers, Laughingthrushes, Babblers,
Barwings & Yuhinas**

India : 203 species and subspecies.

Sikkim : 64 species and subspecies. c. 32% of the Indian population.

This family is one of the prominent group of birds in the 'Sikkim Himalaya'. Mostly bright coloured birds. Size ranges from a sparrow to common Myna. Most species are noisy and gregarious in nature. Always keeps in flock from small to very large. Diet mainly includes varieties of insects. Most species have distinctive calls, useful for field identification. Bills varies species to species and typically adopted for foods.

1274. *Garrulax albogularis albogularis* (Gould)
White-throated Laughingthrush1283. *Garrulax leucolophus leucolophus*
(Hardwicke)**White-crested Laughingthrush**1275. *Garrulax monileger monileger* (Hodgson)
Lesser Necklaced Laughingthrush1278. *Garrulax pectoralis melanotis* Blyth
Greater Necklaced Laughingthrush*1281. *Garrulax striatus sikkimensis* (Ticehurst)
Striated Laughingthrush1303. *Garrulax ruficollis* (Jardine & Selby)
Rufous-necked Laughingthrush1294. *Garrulax rufogularis rufogularis* (Gould)
Rufous-Chinned Laughingthrush1299. *Garrulax ocellatus ocellatus* (Vigors)
Spotted Laughingthrush1300. *Garrulax caerulatus caerulatus* (Hodgson)
Grey-sides Laughingthrush1315. *Garrulax lineatus setafer* (Hodgson)
Streaked Laughingthrush1319. *Garrulax squamatus* (Gould)
Blue-winged Laughingthrush1320. *Garrulax subnicolor* (Blyth)
Scaly Laughingthrush1323. *Garrulax affinis bethelae* Rand & Fleming
Black-faced Laughingthrush*1326. *Garrulax erythrocephalus nigrimentus*
(Oates)**Red-headed Laughingthrush**1331. *Liocichla phoenicea phoenicea* (Gould)
Red-faced Liocichla1167. *Malacocincla abbotti* Blyth
Abbott's Babbler*1153. *Pellorneum ruficeps mandelli* Blanford
Spotted Babbler1183. *Pomatorhinus erythrogenys haringtoni* Baker
Rusty-cheeked Scimitar-Babbler1169. *Pomatorhinus schisticeps schisticeps* Hodgson
Hodgson's Scimitar-Babbler

1179. *Pomatorhinus ruficollis godwini* Kinnear
Rufous-necked Scimitar-Babbler
1186. *Pomatorhinus ferruginosus ferruginosus* Blyth
Coral-billed Scimitar-Babbler
1191. *Xiphirhynchus superciliaris superciliaris* Blyth
Slender-billed Scimitar-Babbler
1193. *Rimator malacoptilus* Blyth
Long-billed Wren-Babbler
- *1207. *Sphenocichla humei humei* (Mandelli)
Wedge-billed Wren-Babbler
1209. *Stachyris rufifrons* Hume
Rufous-fronted Babbler
1210. *Stachyris ruficeps* Blyth
Rufous-capped Babbler
1212. *Stachyris chrysea chrysea* Blyth
Gold-headed Babbler
1214. *Stachyris nigriceps nigriceps* Blyth
Grey-throated Babbler
1228. *Macronous gularis* (Horsfield)
Yellow-breasted Babbler
1229. *Timalia pileata* Horsfield
Red-capped Babbler
1257. *Turdoides longirostris* (Moore)
Slender-billed Babbler
1333. *Leiothrix argenteauris argenteauris* (Hodgson)
Silver-eared Leiothrix
- 1336, 1337. *Leiothrix lutea calipyga* (Hodgson)
Red-billed Leiothrix
1338. *Myzornis pyrrhura* Blyth
Fire-tailed Myzornis
1339. *Cutia nipalensis* Hodgson
Cutia
1340. *Pteruthius rufiventer* Blyth
Rufous-billed Shrike-Babbler
1341. *Pteruthius flaviscapis* (Temminck)
Red-winged Shrike-Babbler
1343. *Pteruthius xanthochlorus xanthochlorus* Gray
Green Shrike-Babbler
1345. *Pteruthius melanotis* Hodgson
Chestnut-throated Shrike-Babbler
1347. *Gampsorhynchus rufulus* Blyth
White-hooded Babbler
1348. *Actibidya egertoni egertoni* Gould
Rusty-fronted Barwing
1353. *Actinodura nipalensis vinctura* Ripley
Hoary-throated Barwing
1362. *Minla cyanouroptera* (Hodgson)
Blue-winged Minla
1359. *Minla strigula strigula* (Hodgson)
Bar-throated Minla
1357. *Minla ignotincta* Hodgson
Red-tailed Minla
1376. *Alcippe chrysotis chrysotis* (Blyth)
Gold-breasted Tit-Babbler
1378. *Alcippe cinerea* Blyth
Yellow-throated Tit-Babbler
1379. *Alcippe vinipectus chumbiensis* (Kinnear)
Rufous-Winged Tit-Babbler
1392. *Alcippe nipalensis nipalensis* (Hodgson)
Nepal Tit-Babbler
1395. *Heterophasia annectans* (Blyth)
Rufous-backed Sibia
1398. *Heterophasia capistrata bayleyi* (Kinnear)
Rufous Sibia
1401. *Heterophasia picaoides* (Hodgson)
Long-tailed Sibia
1363. *Yuhina castaniceps rufigenis* (Hume)
Striated Yuhina
1366. *Yuhina bakeri* Rothschild
White-naped Yuhina
- 1368, 1369. *Yuhina flavicollis flavicollis* Hodgson
Yellow-naped Yuhina
1372. *Yuhina gularis gularis* Hodgson
Stripe-throated Yuhina
1373. *Yuhina occipitalis* Hodgson
Rufous-vented Yuhina
1374. *Yuhina nigrimenta* Hodgson
Black-chinned Yuhina

1375. *Yuhina zantholeuca* (Hodgson)
White-bellied Yuhina

1274. *Garrulax albogularis albogularis* (Gould)
White-throated Laughingthrush

General Information : Uncommon, resident in open and scrubby hill-side forest and edge of the cultivation between c. 5500' and 9000'. Patchy and local. Arboreal, Gregarious. Noisy, keeps small to large flocks.

Collection record : Schafer (1938/39) obtained 13♂, ♀.

1283. *Garrulax leucolophus leucolophus*
(Hardwicke)
White-crested Laughingthrush

General information : Fairly common, resident in open forest, edge of the forest cultivation and forest clearings from the foothills up to c. 7000'. Mostly arboreal. Sociable and gregarious. Noisy. Insectivorous. Keeps small to large flocks.

Collective Record : Schafer (1938/39) obtained 9♂, ♀ at Gangtok, c. 5800' in December. Ali (1962) procured, 1♂, 1♀. N.Z.C. 1♂ Yaksam, W. Sikkim. 17.05.1990.

1275. *Garrulax moniliger moniliger* (Hodgson)
Lesser Necklaced Laughingthrush

General information : Uncommon, resident of dense scrub jungle, edge of the forest near cultivation upto c. 5500'. Arboreal. Gregarious. Noisy. Insectivorous. Keeps small to large flocks.

1278. *Garrulax pectoralis melanotis* Blyth
Greater Necklaced Laughingthrush

General information : Uncommon, resident in dense scrub jungle, edge of the forest near cultivation upto c. 5500'. Arboreal. Gregarious. Noisy. Insectivorous. Keeps small to large flocks.

Collection record : Ali (1962) obtained 1♂, 2♀.

1281. *Garrulax striatus sikkimensis* (Ticehurst)
Striated Laughingthrush

General information : Uncommon, resident in dense scrub jungle, edge of forest near cultivation upto c. 5500'. Arboreal. Gregarious. Noisy. Insectivorous. Keeps small to large flocks.

Collection record : Schafer (1938/39) obtained 14♂ ♀, Ali (1962) collected 2♀.

1303. *Garrulax ruficollis* (Jerdine & Selby)
Rufous-necked Laughingthrush

General information : Uncommon, resident in dense scrub jungle and edge of the cultivation between c. 3500' and 6000'. Maintain ecological (Altitudinal) niche. Arboreal, social, Insectivorous. keeps in small flocks.

Collection record : Schafer (1938/39) procured 1♂. Ali (1962) obtained 1♂.

1294. *Garrulax rufogularis rufogularis* (Gould)
Rufous-chinned Laughingthrush

General information : Uncommon, resident in dense evergreen forest with heavy undergrowth from 2000' to 45000' and rarely upto c. 11,600'. Local and patchy. Altitudinal migrant. Arboreal. Insectivorous. Keeps in pairs or small parties.

Collection record : Meinertzhagen (1927) procured specimens at Yumthang, c. 11,600' in December. Ali (1962) obtained 1♂, 1♀.

Other records : Ali (1962) noted it in West Sikkim between c. 2000' and 4000' during November-February.

1299. *Garrulax ocellatus ocellatus* (Vigors)
Spotted Laughingthrush

General information : Rare, resident in the conifer forest between c. 9000' and 12,000'. Arboreal, Great Skulker. Insectivorous. Keeps in small flocks.

Collection record : Schafer (1938/39) obtained 2♂, 1♀. Ali (1962) obtained 1♀.

N.Z.C. 1♂. Lachen, N. Sikkim. 1.08.1989.

1300. *Garrulax caerulatus caerulatus* (Hodgson)
Grey-sided Laughingthrush

General information : Uncommon, resident in dense scrub jungle and edge of the cultivation between c. 3500' and 6000'. Maintain ecological (Altitudinal) niche. Arboreal, social, Insectivorous. Keeps in small flocks.

Collection record : Schafer (1938/39) obtained 3 specimens from Gangtok in February and June. Ali (1962) examined 1♂, 1♀ (Chicago Natural History Museum).

1315. *Garrulax lineatus setafer* (Hodgson)
Streaked Laughingthrush

General information : Very rare, resident in open scrub country and cultivation from the foothills upto 4700'. Seasonal migrant. Arboreal. Insectivorous. Keeps small flocks.

Other record : Meinertzhagen (1927) noted once a small party near Dentam, c. 4700'

1319. *Garrulax squamatus* (Gould)
Blue winged Laughingthrush

General information : Very rare, resident in the upper level of dense evergreen forest between c. 4000' and 8000'. Arboreal. Shy. Insectivorous. Keeps small parties.

1320. *Garrulax subnicolor* (Blyth)
Scaly Laughingthrush

General information : Rare, resident in the lower level of conifer forest from c. 5000' to 12000'. Arboreal. Shy. Insectivorous. Keeps large flocks.

Collection record : Schafer (1938/39) obtained 7♂, ♀. N.Z.C. 2♂. Menson, S. Sikkim. 23.05.1990; Bakhim, W. Sikkim (9000') 15.06.1990.

1323. *Garrulax affinis bethelae* Rand & Fleming
Black-faced Laughingthrush

General information : Rare, resident in the alpine pastures, fir biotope and ringal bamboo jungle from c. 9000' to 1300'. Partial altitudinal migrant. Arboreal. Insectivorous. Keeps small parties.

Collection record : Schafer (1938/39) obtained 28♂, ♀. Ali (1962) collected collected 1♂, 1 unsexed. N.Z.C. 2♂. Yumthang, N. Sikkim. 6, 17.07.1989. 1♀. Dzongri, W. Sikkim (13,200') 8.06.1990.

Remarks : Ali (1962) noted it at as low as c. 5500' at Gangtok in February. Although Ali

mentioned it as height altitudinal living laughing thrush.

1326. *Garrulax erythrocephalus nigrimentus*
(Oates)

Red-headed Laughingthrush

General information : Rare, resident in the alpine pastures, fir biotope and ringal bamboo jungle from c. 9000' to 13000'. Partial altitudinal migrant. Arboreal, Insectivorous. Keeps small parties.

Collection record : Schafer (1938/39) obtained 12♂, ♀. Ali (1962) collected 1♂, 4♀. N. Z. C. 3♂. Rabangla, S. Sikkim. 17,22.05.1990; Lumthang, N. Sikkim, 3.07.1990; 2 ♀ Rabangla, S. Sikkim (2010 m). 7.10.1988.

Other records : Ali (1962) noted it as the commonest laughing thrush in Lachung during February-March.

1331. *Liocichla phoenicea phoenicea* (Gould)
Red-faced Liocichla

General Information : Uncommon, resident in the dense scrubby jungle, forest clearing and edge of the cultivation from the foot hills upto c.6000'. Arboreal. Insectivorous. Keeps in pairs or small parties.

1153. *Pellorneum ruficeps mandelli* Blanford
Spotted Babbler

General Information : Uncommon. Resident of secondary scrub jungle from the foothills upto c. 3500'. Terrestrial. Insectivorous. Keeps in small parties.

1183. *Pomatorhinus erythrogenys haringtoni*
Baker
Rusty-cheeked Scimitar-Babbler

General information : Fairly common. Resident of the dense scrub jungle and open forest from c. 1000' to 7000'. Arboreal. Insectivorous. Keeps in small parties.

Collection record : Schafer (1938/39) obtained 9♂, ♀ specimens. Ali (1962) collected 2♂ specimens.

1169. *Pomatorhinus schisticeps schisticeps*
Hodgson

Hodgson's Scimitar Babbler

General information : Uncommon. Resident of the secondary scrub jungle from the foothills upto c. 3500' Terrestrial. Insectivorous. Keeps in small parties.

Collection record : Meinertzhagen (1927) obtained 1♂ at Gangtok, c 6400', in December.

1179. *Pomatorhinus ruficollis godwini* Kinnear
Rufous-necked Scimitar-Babbler

General information : Uncommon. Resident of the dense forest with heavy undergrowth from c.2000' to 10,000' Sporadic. Maintain altitudinal niche. Terrestrial. Shy and silent. Keeps in small parties.

Collection record : Schafer (1938/39) obtained 3 specimens. Ali (1962) collected 2♂ specimens.

N.Z.C. 1♂. Tunin, E. Sikkim (1800 m), 27.09.1988.

1186. *Pomatorhinus ferruginosus ferruginosus*
Blyth

Coral-billed Scimitar-Babbler

General information : Rare. Resident of dense bushy jungle and hill-side forest from c. 5000' to 12,600' Partial altitudinal migrant. Arboreal. Shy, Insectivorous. Keeps in small parties.

Collection record : Meinertzhagen (1927) obtained specimens at Lachen, c. 11,700' and Thangu, c. 12,600', during November-December.

Other records : Gammie (1877) noted its breeding in the Teesta Valley, c. 500'

1191. *Xiphirhynchus superciliaris superciliaris*
Blyth
Slender-billed Scimitar-Babbler

General information : Rare. Resident of the upper evergreen forest and thick ringal bamboo jungle between c. 5000' and 10,000' Arboreal. Noisy. Insectivorous. Keeps in small parties.

Collection record : Schafer (1938/39) procured 6♂, ♀ specimens.

1193. *Rimator malacoptilus* Blyth
Long-billed Wren-Babbler

General information : Rare. Resident (?) of dense forest and abandoned clearings upto c. 5000' Terrestrial. Great skulker. Insectivorous. Keeps in paris.

1198. *Pneopyga albiventer albiventer* (Hodgson)
Greater Scaly-breasted Wren-Babbler

General information : Rare. Resident (?) of the moist hill-side forest with heavy undergrowth from c. 2000' to 1200' Altitudinal migrant. Terrestrial. Insectivorous. Keeps singly.

Collection record : Schafer (1938/39) procured 2 examples. Ali (1962) obtained 2♂, ♀ specimens.

1199. *Pneopyga pusilla* Hodgson
Lesser Scaly-breasted Wren-Babbler

General information : Resident in heavy humid evergreen forest with dense undergrowth from c. 1000' to 6000' Altitudinal migrant, occasionally upto c. 11700' Terrestrial. Skulker. Restless. Insectivorous. Keeps singly.

Collection record : Meinertzhagen (1927) obtained specimens at Karponang, c. 9000' and Changu, c. 11700' in December. Ali (1962) collected 2♂, 1♀, 2 unsexed.

1200. *Spelaeornis candatus* (Blyth)
Rufous-throated Wren-Babbler

Ali (1962) remarked that it is rare and very little known and recorded for Sikkim at considerable heights.

1206. *Spelaeornis formosus* (Walden)
Spotted Wren-Babbler

Ali (1962) noted it as rare and very little known, made a sight record from kewzing, c. 7700' in March.

1207. *Sphenocichla humei humei* (Mandelli)
Wedge-billed Wren-Babbler

Ali (1962) noted it as very rare. No collection records so far from Sikkim except Mandell's type material.

1209. *Stachyris rufifrons* Hume
Rufous-fronted Babbler

Ali (1962) reported that it occupies low altitudinal zone in Sikkim between c. 2000' and 3000'

1210. *Stachyris ruficeps* Blyth
Rufous-capped Babbler

General information : Common. Resident in scrub and bamboo jungle with thick undergrowth from c. 2000' to 7000'. Arboreal, Social, Active. Insectivorous. Keeps in small parties.

Collection record : Schafer (1938/39) obtained 10♂, ♀.

1212. *Stachyris chrysaea chrysaea* Blyth
Gold-headed Babbler

General information : Common. Resident in scrub and bamboo jungle with thick undergrowth from c. 2000' to 7000'. Arboreal, Social, active. Insectivorous. Keeps in small parties.

Collection record : Schafer (1938/39) obtained 3 specimens.

1214. *Stachyris nigriceps nigriceps* Blyth
Grey throated Babbler

General information : Common. Resident in scrub and bamboo jungle with thick undergrowth from c. 2000' Arboreal, Social, Active. Insectivorous. Keeps in small parties.

Collection record : Schafer (1938/39) collected 3 specimens. Ali (1962) obtained 1 specimen.

1228. *Macronous gularis* (Horsfield)
Yellow-breasted Babbler

Ali (1962) reported it as a low elevation species and found at Rangpo, c. 1200'. Stevens (1923-25) remarked that it probably does not occur beyond the base of the foothills.

1229. *Timalia pileata* Horsfield
Red-capped Babbler

Ali (1962) reported it as a dweller of plains and upto c.3000'. Stevens (1923-25) noted that it may be recorded at lower hills along the southern border of Sikkim.

1333. *Leiothrix argentea argentea* (Hodgson)
Silver eared Leiothrix

General information : Uncommon, resident in the dense scrubby jungle and secondary jungle upto c. 7000'. Arboreal. Insectivorous. Keeps mixed hunting flocks with others.

Collection record : Schafer (1938/39) obtained 3♂.

1336. *Leiothrix lutea calipyga* (Hodgson)
Red-billed Leiothrix

General information : Fairly common resident in the secondary jungle and overgrown hill-side forest between c.3000' and 7000'. Arboreal, Insectivorous. Keeps mixed hunting flocks with others.

Collection Records : Ali (1962) obtained 1 ♀

1339. *Cutia nipalensis* Hodgson
Cutia

General information : Rare resident in the upper limit of the moist evergreen forest between 6,000' and 12,000'. Arboreal. Insectivorous. Keeps in pair or small parties.

Collection records : Schafer (1938/39) obtained 3♂, 4♀ at Gangtok, 6000'-7000' during January-March.

Ali (1962) collected 1♂.

Other records : Ali (1962) noted it near Singhik, c.4500'

1340. *Pteruthius rufiventer* Blyth
Rufous-billed Shrike-Babbler

General information : Rare resident in the open hill-side forest between c.6000' and 8000'. Arboreal (canopy bird). Insectivorous. Keeps small flocks.

Collection records : Schafer (1938/39) procured 1♂, 1♀ at Gangtok. N.Z.C 1♂. Rabangla, S. Sikkim (2010 m). 7.10.1988.

1241. *Pteruthius flaviscapis* (Temminck)
Rufous-winged Shrike-Babbler

General information : Common resident in

the mixed evergreen hill-side forest from the foot hills upto c.6000' Arboreal. Insectivorous. Keeps in mixed hunting flocks.

Collection records : Schafer (1938/39) procured 5♂, 1♀. Ali (1962) obtained 1♀. N.Z.C. 1♀. Tong, Tista Valley, Sikkim (c.1600 m).

Other records : Stevens (1923-25) noted it as high as 9500' in winter.

1343. *Pteruthius xanthochlorus xanthochlorus*
Gray

Shrike-Babbler

General information : Rare resident in the open hill side evergreen forest upto c.9500' Arboreal. Insectivorous. Keeps in pair or small parties.

Collection records : Schafer (1938/39) obtained 5♂, 8♀, at Gangtok, Lachen, Lachung and Manshitang.

1345. *Pteruthius melanotis* Hodgson
Chestnut-throated Shrike-Babbler

General information : Rare resident in the open hill-side evergreen forest up to c.9500' Arboreal. Insectivorous. Keeps in pairs or small parties.

Collection records : Ali (1962) secured 2♂, 1♀.

1347. *Gampsorhynchus rufuhis* Blyth
White-hooded Babbler

Ali (1962) noted as not common in the lower elevation (Teesta Valley) of Sikkim.

1348. *Actinodura egertoni egertoni* Gould
Rusty-fronted Barwing

General information : Common resident in the evergreen forest and dense secondary jungle between c. 3500' and 6000' Arboreal. Insectivorous. Keeps in small flocks.

Collection records : Schafer (1938/39) procured 7♂, ♀.

1353. *Actinodura nipalensis vinctura* Ripley
Hoary-throated Barwing

General information : Common resident in

the evergreen forest and dense secondary jungle between c. 3,500' and 6,000. Arboreal. Insectivorous. Keeps in small flocks.

Collection records : Schafer (1938/39) procured 18♂, ♀.

N.Z.C. 2♂, Ralang, S. Sikkim. 19.05.1990; Deoraly, Rabangla, S. Sikkim. 24.05.1990.

1362. *Minla cyanouroptera* (Hodgson)
Blue-winged Minla

General information : Common resident in the dense evergreen and hill-side secondary jungle between c. 2000' and 9,000' Altitudinal (seasonal) migrant. Arboreal, Sociable. Insectivorous. Keeps in mixed hunting flocks.

Collection records : Schafer (1938/39) obtained 7♂ and ♀. Ali (1962) procured 4♀ and 2 unsexed.

1358. *Minla strigula simlaensio* Meinertzhagen
Bar-throated Minla

General information : Common resident in the dense evergreen and hill side secondary jungle between c.2000' and 9000' Altitudinal (seasonal) migrant. Arboreal. Sociable. Insectivorous. Keeps in mixed hunting flocks.

Collection records : Ali (1962) obtained 1♂, 3♀.

1359. *Minla strigula strigula* (Hodgson)
Blue-throated Minla

General information : Common resident in the dense evergreen and hill-side secondary jungle between c.2000' and 9,000' Altitudinal (seasonal) migrant. Arboreal. Sociable. Insectivorous. Keeps in mixed hunting flocks.

Collection records : Schafer (1938/39) obtained 12♂ and ♀ at Changu, c.12,500' (Cho La Range) in February.

Ali (1962) collected 1♂, 1♀ and 2 unsexed. N.Z.C. 1 unsexed. C. Lachung, N. Sikkim. 24.01.1953; 1♂. Menam, S. Sikkim, 27.5.1990; 1♂ and 7♀, Rabangla, S. Sikkim, 2010m', 17.22.5.1990, 04-07.10.1988.

1357. *Minla ignotincta* Hodgson
Red-tailed Minla

General information : Common resident of well-wooded area between c.2000' and 9000'. Seasonal altitudinal movement. Insectivorous. Mostly not climb up above c. 6000' in winter. Arboreal and sociable. Keeps large mixed feeding flocks with others.

Collection records : Ali (1962) collected 1♂ and 3♀.

N.Z.C. 1♂ and 1♀ Lachen, N. Sikkim, 30.7.1989; 3♂ and 5♀ Rabangla, S. Sikkim, 2010 m. 06, 07.10.1988, 17.5.1990, 4-6. 10. 1988.

1376. *Alcippe chrysotis chrysotis* (Blyth)
Gold-breasted Tit-Babbler

General information : Rare resident in densely grown hill-side forest and thick bamboo patches between 6,000' and 10,000' Arboreal. Agile. Insectivorous. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 7♂ and ♀ at Gangtok, Penlom La and Manshitang between c. 6,000' and 7,000'.

Other records : Stevens (1923-25) noted it as not common in between c.6,500' and 10,000' in Sikkim.

1378. *Alcippe cinerea* (Blyth)
Yellow-throated Tit-Babbler

General information : Rare resident in the dense secondary jungle and mixed evergreen forest up to c. 4,000' Arboreal. Insectivorous. Agile, keeps in small flocks.

Collection records : Schafer (1938/39) procured 1♀ at Manshitang, c. 5,850'.

Other records : Stevens (1923-25) reported that it is distributed in the hot, moist valleys upto c. 4,000.

1379. *Alcippe castaneiceps* (Hodgson)
Rufous-winged Tit-Babbler

General information : Uncommon resident in the moist and dense evergreen forest up to c. 9,000' Arboreal. Insectivorous. Keeps in large flocks.

Collection records : Schafer (1938/39) obtained 18♂ and ♀ at Gangtok, Chungthang, Lachung and Karponang between c. 5,000' and 8,000'.

Other records : Stevens (1923-25) noted it at Rungbong Valley. Ali (1962) noted it at Singhik, Temi and Kewzing between c. 500' and 7,700'.

1382. *Alcippe vinipectus chumbiensis* (Kinnear)
White-browed Tit-Babbler

General information : Common resident in the conifer and rhododendron forest from c. 7,000' to 12,000' Arboreal. Agile. Insectivorous. Keeps in flocks.

Collection records : Schafer (1938/39) procured 20 ♂ and ♀.

Ali (1962) procured 2♂ and 4♀.

1392. *Alcippe nipalensis nipalensis* (Hodgson)
Nepal Tit-Babbler

General information : Common resident in secondary moist jugle with thick undergrowth and evergreen forest from c. 2,000' to 7,000' Arboreal. Agile and noisy. Insectivorous. Keeps in small flocks.

Collection records : Schafer (1938/39) obtained 3 examples.

Ali (1962) collected 1♂ and 1♀.

1395. *Heterophasia annectans* (Blyth)
Rufous-backed Sibia

Ali (1962) noted it as rare in Sikkim and resident (?) between 2,000' and 6,000'.

1398. *Heterophasia capistrata bayleyi* (Kinnear)
Rufous Siba

General information : Common resident in tall secondary forest with dense secondary growth. Altitudinal movement. Arboreal. Restless and noisy. Keeps in mixed flocks.

Collection records : Schafer (1938/39) procured 12♂ and ♀. Ali (1962) obtained 2♂ and 1♀.

N.Z.C. 1♂, 1♀ Tumin, E. Sikkim. 25, 28.09.1988; 3♂, 1♀. Rabangla, S. Sikkim. 24, 27.05.1990; 3, 6, 10.1988; 1♂, 2♀. Bakhim, W. Sikkim. (9000'). 15.06.1990.

1401. *Heterophasia picaoides* (Hodgson)
Long-tailed Sibia

General information : Common in open scrub forest with tall trees from the foothills upto c. 3,000' Arboreal. Insectivorous. Keeps in small parties.

Collection records : 2♂, Yumthang, N. Sikkim, 2.8.1989; Yaksam, W. Sikkim. 2.06.1990.

Other records : Stevens (1923-25) noted its breeding in the Rungbong Valley, c. 3000' Ali (1962) noted it at Rangpo and Singtam.

1363. *Yuhina castaniceps rufigenis* (Hume)
Striated Yuhina

General information : Common resident in the dense evergreen and hill-side secondary jungle between c. 2,000' and 9000' Altitudinal (seasonal) migrant. Arboreal. Sociable. Insectivorous. Keeps in mixed hunting flocks.

Collection records : Ali (1962) obtained 1♀.

1366. *Yuhina bakeri* Rothschild
White-naped Yuhina

General information : Uncommon resident in the secondary jungle, edge of the forest and overgrown forest clearing between c. 2,000' and 6,000' Arboreal. Sociable. Insectivorous. Keeps in mixed flocks.

Collection records : Schafer (1938/39) procured 1 unsexed example. Ali (1962) obtained 2♂ and 2♀.

1368. *Yuhina flavicollis flavicollis* Hodgson
Yellow-naped Yuhina

General information : Uncommon resident in the secondary jungle, edge of the forest and overgrown forest clearings between c. 2,000' and 6,000' Arboreal. Sociable. Insectivorous. Keeps in mixed flocks.

Collection records : Schafer (1938/39) obtained 19♂ and ♀. Ali (1962) collected 1♂ and 3♀.

1372. *Yuhina gularis gularis* Hodgson
Stripe throated Yuhina

General information : Common in the mixed

conifer forest and shrubby rhododendron jungle from c. 6,000' to 13,000' Arboreal. Insectivorous. Keeps in mixed flocks.

Collection records : Schafer (1938/39) obtained 12♂ and ♀.

Ali (1962) collected 1♂ and 2 unsexed.

N.Z.C. 1♂, C. Chumthang. N. Sikkim. 18.01.1953.

1373. *Yuhina occipitalis* Hodgson
Rufous-vented Yuhina

General information : Common in the mixed conifer and shrubby rhododendron jungle from c. 6,000' to 13,000' Arboreal. Insectivorous. Keeps in mixed flocks.

Collection records : Schafer (1938/39) procured 3 examples.

Ali (1962) collected 1♂ and 2 unsexed.

1374. *Yuhina nigrimenta* Hodgson
Black-Chinned Yuhina

General information : Common resident in the secondary jungle, edge of the cultivation and shrubby country from the foothills upto c. 3,000' Arboreal. Sociable. Insectivorous. Keeps in small flocks.

Collection records : Ali (1962) obtained 1♂ and 3♀.

1375. *Yuhina zantholeuca* (Hodgson)
White-bellied Yuhina

Stevens (1923-25) reported that it occurs in the Teesta Valley up to c. 3,300'

Ali (1962) noted it at Rangpo; c. 12,000', Singtam, c. 18,000'; Kewzing, c. 5,000' and bellow Lachen, c. 7,500'

1338. *Myzornis pyrrhoura* Blyth
Firetailed Myzornis

General information : Rare resident in the upper limit of moist evergreen forest between 6000' and 12,000' Arboreal. Insectivorous. Keeps in pair or small parties.

Collection record : Schafer (1938/39) procured 2♂ at Gangtok.

N.Z.C. 1♂. Zoktakhol, Phamgoing, W. Sikkim. (10,500'), 11.06.1990.

Family PANURINAE

Parrotbills

India : 16 species and subspecies.

Sikkim : 8 species and subspecies. 50% of the Indian population.

This family consists of birds with heavy, stout parrot-like bills. Size ranges from common Myna to Sparrow. Birds of heavy dense forest or bamboo forest of high himalaya. Always keeps in flocks and noisy in habit. Sporadically found elsewhere in the Sikkim himalaya.

1236. *Conostoma aemodium* Hodgson

Great Parrotbill

1237. *Paradoxornis unicolor* (Hodgson)

Brown Parrotbill

1249. *Paradoxornis gularis gularis* Gray

Grey-headed Parrotbill

1251. *Paradoxornis flaviventris* Gould

Black-breasted Parrotbill

1238. *Paradoxornis fulvifrons fulvifrons*

(Hodgson)

Fulvous-fronted Parrotbill

1241. *Paradoxornis nipalensis humii* (Sharpe)

Black-throated Parrotbill

1245. *Paradoxornis atrosuperciliaris* (Godwin-

Austen)

Lesser Rufous-headed Parrotbill

1247. *Paradoxornis ruficeps ruficeps* Blyth

Greater Rufous-headed Parrotbill

1236. *Conostoma aemodium* Hodgson

Great Parrotbill

General information : Rare. Resident in the dense thick and rhododendron scrubs between c. 10,000' and 12,000' Altitudinal (seasonal) migrant. Arboreal. Graminivorous. Keeps in pairs or small parties.

Collection record : Stevens (1923-25) obtained 2♂, 1♀ at Gnatong.

1237. *Paradoxornis unicolor* (Hodgson)

Brown Parrotbill

General information : Rare. Resident in the dense thick and rhododendron scrub between 10000' and 12000' Altitudinal (seasonal) migrant. Arboreal. Graminivorous. Keeps in pairs or small parties.

Collection record : Meinertzhagen (1927) obtained one specimen near Changu, c. 11,200' in December. Stevens (1923-25) procured 4♂, 1♀. Schafer (1938/39) collected 1♂ at Lachen in August. N. Z. C. 2♂. Bakhim, W. Sikkim, (9000') 05.06.1988.

1249. *Paradoxornis gularis gularis* Gray

Grey-headed Parrotbill

General information : Rare. Resident in the dense thick and rhododendron scrub between c. 10000' and 12000' Altitudinal (seasonal) migrant. Arboreal. Graminivorous. Keeps in pairs or small parties.

Collection record : Schafer (1938/39) obtained 4 specimens at Gangtok in January.

1251. *Paradoxornis flavirostris* Gould

Black-breasted Parrotbill

Ali (1962) noted it as resident from the foothills upto c.7000' in Sikkim.

1238. *Paradoxornis fulvifrons fulvifrons*

(Hodgson)

Fulvous-fronted Parrotbill

General information : Rare. Resident of the dense thick and rhododendron scrub between 10000' and 12000' Altitudinal (seasonal) migrant. Arboreal. Graminivorous. Keeps in pairs or small parties.

Collection record : Stevens (1923-25) collected specimens from Sikkim.

1240. *Paradoxornis nipalensis humii* (Sharpe)

Black-throated Parrotbill

General information : Rare in the dense thick and rhododendron scrub between 10000' and 12000' Altitudinal (seasonal) migrant. Arboreal. Graminivorous. Keeps in pairs or small parties.

Collection record : Meinertzhagen (1927) procured 1 specimen near Chango, c. 11,200' Schafer (1938/39) obtained 5 specimens.

1245. *Paradoxornis atrosuperciliaris oatesi*
(Sharpe)

Lesser Rufous-headed Parrotbill

Ali (1962) noted it as rare and remarked that it has been obtained from Sikkim, and believed to be a resident at c. 7000' elevation.

1247. *Paradoxornis ruficeps ruficeps* Blyth
Greater Rufous-headed Parrotbill

Ali (1962) reported that it is locally distributed between c. 2000' and 5000' in Sikkim.

Family SYLVIINAE

Goldcrests, Prinias, Tesias & Warblers

India : 143 species and subspecies.

Sikkim : 45 species and subspecies. c. 33% of the Indian population.

Large family of dull-coloured small to median sized birds. Mostly lives in small bushes grasslands, reeds and undergrowths. Bills thin and pointed. Plumage colour ranges from brown, buff and olive-grey.

Goldcrests are very small birds with dense, soft plumage. Resident of the himalayas. Tesias are ground warblers. They are tail-less birds of the undergrowth. Always solitary, restless, never skulking in dense undergrowth. Leaf-warblers and Tailorbirds are mostly arboreal and keep in low bushes. Tailbirds are with long, thin bill and with narrow tail, cocked frequently. Warblers are dull brown with long pointed bills and mostly keep in grass and reeds.

*1630. *Regulus regulus sikkimensis* R. & A.
Meinertzhagen
Goldcrest

1498. *Cisticola juncidis cursitans* (Franklin)
Streaked Fantail-Warbler

1527. *Prinia criniger criniger* Hodgson
Brown Prinia

1529. *Prinia atrogularis atrogularis* (Moore)
Black-throated Prinia

1507. *Prinia cinereocapilla* (Moore)
Hodgson's Prinia

1501. *Prinia rufescens* Blyth
Beavan's Prinia

1502. *Prinia hodgsonii rufula* Godwin-Austen
Franklin's Prinia

1516. *Prinia socialis inglisi* Whistler & Kinnear
Ashy Prinia

1512. *Prinia inornata fusca* (Hodgson)
Plain Prinia

1479. *Tesia castaneocoronata* (Burton)
Chestnut-headed Tesia

1472. *Tesia olivea* (McClelland)
Slaty-bellied Tesia

1471. *Tesia cyaniventer* Hodgson
Grey-bellied Tesia

1474. *Cettia pallidipes pallidipes* (Blanford)
Blandford's Bush-Warbler

1478. *Cettia fortipes fortipes* (Hodgson)
Brown-flanked Bush-Warbler

1479. *Cettia major major* (Moore)
Chestnut-crowned Bush-Warbler

1481. *Cettia flavolivacea flavolivacea*
(Hodgson)
Aberrant Bush-Warbler

1484. *Cettia acanthizoides* (Verreaux)
Yellow-bellied Bush-Warbler

1486. *Cettia brunnifrons brunnifrons*
(Hodgson)
Grey-sided Bush-Warbler

1490. *Bradypterus thoracicus* (Blyth)
Spotted Bush-Warbler

1493. *Bradypterus luteoventris* (Hodgson)
Brown Bush-Warbler

1562. *Hippolais caligata caligata* (Lichtenstein)
Booted Warbler

1541. *Orthotomus cuculatus* Temminck
Mountain Tailorbird

1535. *Orthotomus sutorius guzuratus* (Latham)
Common Tailorbird

1540. *Orthotomus atrogularis* Temminck
Black-necked Tailorbird
1575. *Phylloscopus collybita tristis* Blyth
Common Chiffchaff
1584. *Phylloscopus fuscatus weigoldi* Stresemann
Dusky Warbler
1582. *Phylloscopus fulgiventer fulgiventer*
(Hodgson)
Smoky Warbler
1579. *Phylloscopus affinis* (Tickell)
Tickell's Warbler
- 1588, 1589. *Phylloscopus pulcher pulcher* Blyth
Orange-barred Leaf-Warbler
1599. *Phylloscopus maculipennis maculipennis* (Blyth)
Grey-faced Leaf-Warbler
1596. *Phylloscopus chloronotus newtoni* Gathe
Lemon-rumped Warbler
1592. *Phylloscopus inornatus* (Blyth)
Yellow-browed Warbler
1591. *Phylloscopus humei mandellii* (Brookes)
Hume's Warbler
1602. *Phylloscopus trochiloides viridansus* Blyth
Greenish Leaf-Warbler
1607. *Phylloscopus coronatus* (Temminck & Schlegel)
Eastern Crowned Warbler
1609. *Phylloscopus reguloides reguloides* (Blyth)
Blyth's Leaf-Warbler
1615. *Seicercus burkii* (Burton)
Gold-spectacled Flycatcher Warbler
1617. *Seicercus xanthoschistos xanthoschistos*
(Gray)
Grey-headed Flycatcher-Warbler
1613. *Seicercus affinis* (Moore)
White-spectacled Flycatcher-Warbler
1620. *Seicercus poliogenys* (Blyth)
Grey-cheeked Flycatcher-Warbler
1621. *Seicercus castaniceps* (Blyth)
Chestnut-crowned Flycatcher-Warbler
1627. *Tickellia hodgsoni* (Moore)
Broad-billed Flycatcher-Warbler
1526. *Abroscopus albogularis* (Moore)
Rufous-faced Flycatcher-Warbler
1624. *Abroscopus schisticeps schisticeps* (Gray)
Black-faced Flycatcher Warbler
- *1622. *Abroscopus superciliaris flaviventris*
(Jerdon)
Yellow-bellied Flycatcher-Warbler
1630. *Regulus regulus sikkimensis*
R & A Meinertzhagen
Goldcrest
- General information* : Uncommon resident in the tall evergreen forest from c. 5,000' to 10,000' Sparse and patchy. Arboreal (Canopy bird) restless. Insectivorous. Keeps mixed hunting parties.
- Collection records* : Meinterzhagen (1927) procured specimen at Thangu, c. 12,800' in November. Ali (1962) mentioned 1 unsexed specimen collected by Syndum Cutting Expedition at Gnatong, c. 12,500' in March.
- Other records* : Ali (1962) noted it as not uncommon during November to May at Kewzing, Lachen and Lachung.
1529. *Prinia atrogularis atrogularis* (Moore)
Black-throated Prinia
- General information* : Fairly common resident in the open hillside bushy jungle and edge of the forest near cultivation between c. 4,500' and 8,500' Altitudinal migrant. Arboreal. Agile but skulker. Keeps single or in pairs.
- Collection records* : Schafer (1938/39) obtained 7♂ and ♀.
- Ali (1962) procured 1♂.
1501. *Prinia rufeseens* Blyth
Beavan's Prinia
- General information* : Common resident in the open and bushy jungle from the foothills upto c. 3,500' Arboreal. Agile but skulker. Insectivorous. Keeps single or in pairs.

Collection records : Ali (1962) obtained 2 ♀ and 1 unsexed.

Other records : Ali (1962) noted it at Rangpo, Singtam and Martem during November-December.

1473. *Tesia castaneocoronata* (Burton)
Chestnut-headed Tesia

General information : Uncommon resident in dense and moist evergreen forest with heavy undergrowth from c. 3,000' Arboreal. Agile. Insectivorous. Keeps in pairs or small parties.

Collection records : Stevens (1923-25) obtained 5 ♂ and 6 ♀.

Ali (1962) collected 1 ♀ and 1 unsexed.

Other records : Blanford (1971) noted it as altitudinal migrant.

Ludlow (1937) noted it frequently between c. 10,000' and 11,000' in Sikkim.

1471. *Tesia cyaniventer* Hodgson
Grey-bellied Tesia

General information : Common resident in hillside forest tangled with humid undergrowth of ferns and weeds up to c. 6,000. Arboreal. Insectivorous. Keeps in small parties.

Collection records : Ali (1962) obtained 1 ♂, 1 ♀ and 1 unsexed at Rangpo and Singtam in December.

N.Z.C. 2 ♂, 1 unsexed, Dikchu, Tista Valley, Sikkim. (c. 675 m.) 15.01.1953 and 1.02.1953.

1474. *Cettia pallidipes pallidipes* (Blanford)
Blanford's Bush-Warbler

Ali (1962) recorded its breeding between c.4,000' and 5,000' in Sikkim and further stated that specimens collected from Sikkim are in British Museum.

1478. *Cettia fortipes fortipes* (Hodgson)
Brown-flanked Bush-Warbler

General information : Common resident in the hill-side scrub forest mixed with bamboo jungles bramble thickets between 6,500' and

8,000' Terrestrial. Agile. Insectivorous. Keeps in single.

Collection records : Schafer (1938/39) obtained 2 ♂.

1479. *Cettia major major* (Moore)
Chestnut-crowned Bush-Warbler

General information : Uncommon resident in dense rhododendron jungle and confer forest up to c. 13,000' Arboreal. Agile. Insectivorous. Keeps in pairs or small parties.

Collection records : Ali (1962) reported specimens from Sikkim (British Museum).

Other records : Ali (1962) recorded its breeding at Lachung, c. 9,000'

1481. *Cettia flavolivacea flavolivacea* (Hodgson)
Aberrant Bush-Warbler

General information : Rare in the mixed tall grass and bracken scrub at the edge of the forest from 3,500' to 10,000' Terrestrial. Shy. Insectivorous. Keeps single.

Collection records : Schafer (1938/39) obtained 2 examples at Lachen, c. 9,200'

Other records : Stevens (1923-25) noted it at Rungbong Valley, c. 3,500' and at Sikkim-Nepal frontier, c. 10,000'

1484. *Cettia acanthizoides* (Verreaux)
Yellow-bellied Bush-Warbler

General information : Common resident in the hill-side scrub forest mixed with bamboo jungles and bramble thickets between 6500' and 8000' Terrestrial. Agile. Insectivorous. Keeps single.

Collection records : Stevens (1923-25) procured it at Karponang, c. 10,000' Mandelli collected specimens from Sikkim (British Museum).

1456. *Cettia brunifrons brunifrons* (Hodgson)
Grey-sided Bush-Warbler

General information : Common resident in the rhododendron scrub, grass thickets in forest clearings from c. 3,500' to 12,500' Arboreal.

Skulker. Insectivorous. Keeps in pairs or small parties.

Collection records : Schafer (1938-39) obtained 6♂ and 3♀ at Chungthang, Gangtok, Lachen, Lachung, Thangu and Changu during October to July.

1490. *Bradypterus thoracicus thoracicus* (Blyth)
Spotted Bush Warbler

Ali (1962) noted it as uncommon and status uncertain in Sikkim.

1493. *Bradypterus luteoventris* (Hodgson)
Brown Bush-Warbler

Ali (1962) noted that it has the same status with that of 1481.

1541. *Orthotomus cuculatus* Temminck
Mountain Tailorbird

Ali (1962) mentioned that it is resident and probably at low and medium elevation of Sikkim. Sikkim specimens are now preserved in British Museum.

1536. *Orthotomus sutorius patia* Hodgson
Common Tailorbird

General information : Common resident in the hillside bushy jungle and edge of the cultivation from the foothills up to c. 3,000', springly up to c. 6,000' Arboreal. Agile. Insectivorous. Keeps single or in pairs.

Collection records : Ali (1962) obtained 2♂, 2♀ in December-January.

1586. *Phylloscopus fuscatus fuscatus* (Blyth)
Dusky Warbler

Ali (1962) reported it as winter visitor and reported that Dr. Ticehurst has examined winter specimens from low elevations in Sikkim.

1582. *Phylloscopus fulgiventor fulgiventor*
(Hodgson)
Smoky Warbler

General information : Rare passage migrant in the higher elevation of Central and Southern Sikkim. Terrestrial. Insectivorous. Keeps single or in pairs.

Collection records : Blanford (1970) obtained a specimen at Mome Samdong, c. 14,000' in September.

Meinertzhagen (1927) procured 1 example near Teesta Bridge (1,000') in December. Schafer (1938/39) collected specimens at Thangu, c. 13,000' in July.

1579. *Phylloscopus affinis* (Tickell)
Tickell's Warbler

General information : Rare passage migrant in the higher elevation of Central and Southern Sikkim. Terrestrial. Insectivorous. Keeps single or in pairs.

Collection records : Blandford (1870) procured 2/3 specimens at Lachen and Lachung Valleys, c. 8,000'-9,000' in September. Ludlow (1937) procured specimens at Gangtok in April. Schafer (1938/39) obtained 5♂ and 4♀ at Thangu and Gyagong in July and Lachen during October to November.

1589. *Phylloscopus pulcher pulcher* Blyth
Orange-barred Leaf-Warbler

General information : Fairly common resident in the open hill-side forest and bushy jungle from c. 1,000' to 10,000' Altitudinal (seasonal) migrant. Arboreal. Agile. Noisy insectivorous. Keeps single or in pairs.

Collection records : Blanford (1870) procured specimens at Chola Range in September. Schafer (1938/39) obtained one example at Thangu, c. 13,000'

N.Z.C 2♂, 2♀, 1 (unsexed) Yumthang, N. Sikkim. 6.07.1989; 3♂ Dzongri, W. Sikkim (13,200'). 6-8.06.1990; 1♀. Tumin, E. Sikkim (1800m), 27.09.1998.

Other records : Ali (1962) noted its breeding at Thangu, 13,000'

1599. *Phylloscopus maculipennis*
maculipennis (Blyth)
Grey-faced Leaf-warbler

General information : Fairly common in the open hill-side forest and bushy jungle from

c. 1,000' to 10,000' Altitudinal (seasonal) migrant. Arboreal. Agile. Noisy. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) obtained 9♂ and 4♀ near Lachen in September. Ali (1962) examined 6♂ and 1♀.

Other records : Ali (1962) noted it as fairly common at Lachen and Thangu in the last week of April.

1596. *Phylloscopus chloronotus newtoni* Gatke
Lemon-rumped Warbler

General information : Fairly common resident in the open hill-side forest and bushy jungle from c. 1,000' Altitudinal (seasonal) migrant. Arboreal. Agile. Noisy. Insectivorous keeps single or in pairs.

Collection records : Stevens (1923-25) procured specimens from Gnatong, c. 12,500' Schafer (1938/39) obtained 9♂ and 11♀ at Thangu, c. 13,000'

Ali (1962) collected 2♂.

1592. *Phylloscopus inornatus* (Blyth)
Yellow-browed Warbler

General information : Probable winter migrant. Arboreal. Agile. Noisy. Keeps single or in pairs.

Collection records : Ali (1962) obtained 1♂ at Rinchinpong, c. 5,000' in January.

1♂, Tumin, E. Sikkim. (1800 m.). 27.09.1988; N.Z.C. 1♂, 1♂♀ and 2 unsexed. Rabangla, S. Sikkim. 17.05.1990;

1604. *Phylloscopus trochiloides trochiloides*
(Sundevall)
Greenish Leaf-Warbler

General information : Common summer migrant from the foothills up to 13,000' Arboreal. Agile. Noisy. Keeps single or in pairs.

Collection records : Blanford (1870) obtained specimens at Chola Range and Lachung Valley, 10,000'-14,000' in September.

Meinertzhagen (1927) procured specimens at Dentam, c. 4,600' in January.

Stevens (1923-25) obtained specimens at Thangu, c. 14,000' in May and Yumthang, 13,000' in June. Ludlow (1937) procured specimens at Gangtok, 6,000' in April and Chango, 11,000' in May. Schafer (1938/39) collected 13♂ and 10♀ at Thangu, 13,000' between July-October and Lachen, 9,200' in September.

1601. *Phylloscopus magnirostris* Blyth
Large-billed Leaf-Warbler

General information : Uncommon summer (breeding) visitor in the high elevation forest mixed with bush and shrub between c. 8,000'-13,000' Arboreal. Agile. Noisy. Keeps single or in pairs.

Collection records : Schafer (1938/39) obtained 1♂.

N.Z.C. 1♂, Bakhim, W. Sikkim (9000') 6.06.1990; 1♀ Tumin, E. Sikkim (1800 m) 27.09.1988; 3♀. Yumthang, N. Sikkim. 2, 3.07.1989.

1607. *Phylloscopus coronatus* (Temminck & Schlagel)
Eastern Crowned Warbler

General information : Scarce winter visitor in this foothills up to c. 2000 m in the deep evergreen forest. Arboreal. Always keeps in pairs. Sexes alike.

Collection records : N.Z.C. 3♂, Tumin, E. Sikkim, 1800 m. 25, 27.09.1988.

Remarks : After Meinertzhagen (1925), Z.S.I. collected specimen from Sikkim.

1607. *Phylloscopus coronatus* (Temminck & Schlegel)
Eastern Crowned Warbler

Ali (1962) stated its status as uncertain and a possible winger visitor.

Meinertzhagen (1927) obtained 1 example at Rangpo, 2, 100' and another of Gangtok, 6,400' in December and June respectively.

1609. *Phylloscopus reguloides reguloides* (Blyth)
Blyth's Leaf-Warbler

General information : Uncommon summer

(breeding) visitor in the high elevation forest mixed with bush and shrub between 8,000-13,000' Arboreal. Agile. Noisy. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 3♂ and 4♀ at Gangtok in June and Lachen, c. 9,200' in September.

Ali (1962) obtained 1♂, 2♀ and Sington and Martem between 1,500' and 3,000' in December.

1612. *Phylloscopus cantator* (Tickell)
Black-browed Leaf-Warbler

Ali (1962) reported it as possible summer (breeding) visitor at the higher elevation of Sikkim. Schafer (1938/39) obtained 1♂ at Gangtok in June. H. G. Alexander noted it at Rangpo, c. 1,000' in November.

1615. *Seicercus burkii* (Burton)
Gold-Spectacled Flycatcher Warbler

General Information : Uncommon resident in the upper limit of evergreen forest with shrubby growth and conifer forest from the foothills up to 12,000' Altitudinal migrant. Arboreal. Agile. Insectivorous. Keeps single or in mixed hunting flocks.

Collection records : Schafer (1938/39) obtained 9♂ and 10♀ Ali (1962) procured 3♂ and 2 unsexed.

N.Z.C. 2♂, 1 unsexed. Tumin (1800 m), E. Sikkim. 25.09.1988; 1♂. Rabangla, S. Sikkim 19.05.1990.

1617. *Seicercus xanthoschistos xanthoschistas*
(Gray)

Grey-headed Flycatcher-Warbler

General information : Uncommon resident in the upper limit of evergreen forest with shrubby growth and conifer forest from the foothills upto 12,000' Altitudinal migrant. Arboreal. Agile. Insectivorous. Keeps single or in mixed hunting flocks.

Collection records : Schafer (1938/39) procured 7♂ and ♀. Ali (1962) obtained 2♂.

N.Z.C. 2♀ Tumin (1800m), E. Sikkim 27.28.09. 1988.

1613. *Seicercus affinis* (Moore)
White-spectacled Flycatcher-Warbler

Ali (1962) mentioned that it is recorded from the Teesta Valley up to c. 6,000'

1620. *Seicercus poliogenys* (Blyth)
Grey-cheeked Flycatcher-Warbler

Stevens (1923-25) reported to occur in the Rungbong Valley, c. 4,7000' in moderate numbers.

1621. *Seicercus castaniceps* (Blyth)
Chestnut-crowned Flycatcher-Warbler

General information : Common resident in the evergreen forest with dense foliage between c. 6,300' and 8,000' Arboreal (canopy bird). Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 1♂ at Gangtok, c.6,300' in June.

Ali (1962) obtained 5♀ and 1 unsexed. N.Z.C. 1♀. Bakhim, W. Sikkim (9000'). 15.06.1990.

1627. *Tickellia hodgsoni* (Moore)
Broad-billed Flycatcher-Warbler

B. B. Osmaston noted its breeding in Sikkim at c. 6,800' in June.

Stevens (1923-25) noted it between 3,800' (July) and 6,000' (March) and procured 1♂ at Jeluk, c. 9,000' in April.

1622. *Abroscopus supercilialis flaviventris*
(Jerdon)

Yellow-bellied Flycatcher Warbler

General information : Uncommon resident in the mixed bamboo forest from the foothills up to c. 3,500' Arboreal. Agile. Noisy. Insectivorous. Keeps single or in pairs.

Collection records : Ali (1962) obtained 1♂ and 1 unsexed.

Other records : Stevens (1923-25) and Ali (1962) noted it at Rangpo, Singtan and Mortan during November-April.

1624. *Abroscopus schisticeps schisticeps* (Gray)
Black-faced Flycatcher-Warbler

Gammie (1877) noted its breeding in Sikkim at c. 5,500' in May.

Stevens (1923-25) noted it as uncommon in the Sikkim Himalaya up to c. 5,500'

Family MUSCICAPINAE
Flycatchers

India : 45 species and subspecies.

Sikkim : 23 species and subspecies. c. 49% of the Indian population.

The family of true/typical flycatchers. Small to medium sized arboreal birds. Diagnostic flat, triangular bill with strong bristle at gape. Plumage mostly slaty, blue and ashy in male but brown in female. Food consists of insects. Mostly seasonal or altitudinal migrant in habit.

1406. *Muscicapa sibirica cacabata* Penard
Sooty Flycatcher

1408. *Muscicapa muttui* (Layard)
Brown-breasted Flycatcher

1410. *Muscicapa ferruginea* (Hodgson)
Ferruginous Flycatcher

1418. *Ficedula hodgsonii* (Verreaux)
Slaty backed Flycatcher

1414. *Muscicapa strophciata* (Hodgson)
Orange-gorgeted Flycatcher

1412. *Ficedula parva albicilla* pallas
Red-throated Flycatcher

1415. *Ficedula monileger monileger* (Hodgson)
White-gorgeted Flycatcher

1417. *Ficedula hyperythra* (Blyth)
Rufous-breasted Blue Flycatcher

1419. *Ficedula westermanni collini* Rothschild
Little Pied Flycatcher

1422. *Ficedula superciliaris aestigma* Gray
Ultramarine Flycatcher

1424. *Ficedula tricolor minuta* (Hume)
Slaty-blue Flycatcher

1426. *Ficedula sapphira* (Blyth)
Sapphire Flycatcher

1445. *Eumyias thalassina* (Swainson)
Verditer Flycatcher

1428. *Niltava grandis* (Blyth)
Large Niltava

1430. *Niltava macgrigoriae signata* (Horsfield)
Small Niltava

1432. *Niltava sundara sundara* (Hodgson)
Rufous-bellied Niltava

1433. *Niltava vivida* (Swinhoe)
Vivid Niltava

1436. *Cyornis polioegenys polioegenys* (Brooks)
Brook's Flycatcher

1439. *Cyornis unicolor* Blyth
Pale Blue-Flycatcher

1440. *Cyornis rubeculoides* (Vigors)
Blue-throated Flycatcher

1441. *Cyornis banyumas* (Horsfield)
Large-billed Blue-Flycatcher

1447. *Muscicapella hodgsoni* (Moore)
Pigmy Blue-Flycatcher

1448. *Culicicapa ceylonensis calochrysea*
Oberholser
Grey-headed Flycatcher

1406. *Muscicapa sibirica cacabata* Penard
Sooty Flycatcher

General information : Uncommon summer resident in open and flat bush, scrub and open jungle from c. 6000' to 13,000' Arboreal. Altitudinal migrant. Insectivorous. Keeps in pairs.

Collection record : Schafer (1938/39) obtained 2♂, 1♀ at Thangu (c.13000') in July and at Lachen (c 9000') in August. Ali (1962) examined two specimens from Chungthang (c.5500') in May (Chicago Natural History Museum).

Other records : Blanford (1870) noted it at Lachung Valley, c. 9000' in September. Stevens (1923-25) noted its breeding between 6000' and 7000'

Remarks : Ali (1962) remarked that it rarely straggling as low as 2000'

1410. *Muscicapa ferruginea* (Hodgson)
Ferruginous Flycatcher

General information : Rare. A bird of bush and open jungle upto c.6300'. Seasonal migrant. Arboreal. Partial crepuscular. Restless. Insectivorous. Keeps in pairs.

Collection record : Meinertzhagen (1927) collected a pair at Dentan, c.1500' in January. Schafer (1938/39) obtained 1♂ at Gangtok, c.6300' in June.

Other records : Inglish obtained it at Rinchinpong, c. 6000'

1414. *Ficedula strophilata* (Hodgson)
Orange-gorgeted Flycatcher

General information : Common in open jungle, bush, scrub, hill side stream and near cultivation from the foot hills upto c.1200'. Altitudinal (seasonal) migrant. Arboreal. Restless. Insectivorous. Keeps single.

Collection record : Schafer (1938/39) procured 15♂, ♀. Ali (1962) obtained 3♂.

N.Z.C 1♂. Rabangla, S. Sikkim (2010 m), 8.10.1988; 2♂. Yumthang, N. Sikkim, 06.07.1989; 1♂ and 1♀. Lachen, N. Sikkim, 04.08.1989.

1415. *Ficedula monileger monileger* (Hodgson)
White-gorgeted Flycatcher

General information : Rare resident (?) in bush jungle, shady hill-streams, cultivation and mixed scrub jungle from the foothills upto c. 6000'

Collection record : Meinertzhagen (1927) obtained specimens at Rinchinpong, c. 5000' in January. Schafer (1938/39) procured 1♂, 1♀ at Gangtok, c. 6300' in June and December.

1417. *Ficedula hyperythra* (Blyth)
Rufous-breasted Blue Flycatcher

General information : Rare resident (?) in bush jungle, shady hill-streams, cultivation and mixed scrub jungle from the foot hills upto c.6000'

Collection record : Meinertzhagen (1927)

obtained 1♂ at Singhik, c.4500' in October. Schafer (1938/39) collected 1♀ at Gangtok, c.6300' in June.

N.Z.C. 1♀. Rabangla, S. Sikkim (2010 m.), 04.10.1988

Other records : Stevens (1923-25) noted it as summer migrant on the outer Sikkim Himalaya upto c.7000'. Ali (1962) met with it at Chungthang, c.5500' in February.

1422. *Ficedula superciliaris aestigma* (Gray)
Ultramarine Flycatcher

General information : Rare resident (?) in bush jungle, shady hill-streams, cultivation and mixed jungle from the foot hills upto c. 6000'

Other records : Ali (1962) noted it once at Rongpo, c. 1000' in November.

1424. *Ficedula tricolor minuta* (Hume)
Slaty-blue Flycatcher

General information : Rare resident (?) in bush jungle, shady hill-streams, cultivation and mixed scrub jungle from the foot hills upto c. 6000'

Collection record : Schafer (1938/39) obtained 4♂ at Thangu, c. 13000' in July and at Lachen, c 9000' in September.

Other records : Stevens (1923-25) remarked that it occurs in the outer range of the Sikkim Himalaya, c. 3500' to 10,000'. Ali (1962) noted it at Rangpo and Gangtok between November to April.

1426. *Ficedula sapphira* (Blyth)
Sapphire Flycatcher

General information : Common resident in the open jungle, bush and scrubby jungle from c.1000' to 5500'. Altitudinal (seasonal) migrant. Arboreal. Insectivorous. Keeps single or in pairs.

Collection record : Ali (1962) obtained 3♂, 3♀.

1445. *Eumyias thalassia* (Swainson)
Verditer Flycatcher

General information : Common, summer

(breeding) visitor in the open hill side forest and bushy jungle between c.2000' and 10,500' Arboreal. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 6♂, 3♀. N.Z.C. 2♂. Tumin (1800 m), E. Sikkim. 23.09.1988; 1♂. Rabangla, S. Sikkim. 17.05.1990.

1428. *Niltava grandis* (Blyth)

Large Naltava

General information : Common, resident of the open jungle, bush and scrubby jungle from c. 1000' to 5800' Altitudinal (seasonal) migrant. Arboreal. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 13♂, 3♀ around Gangtok, c.6000' during December-June.

N.Z.C. 1♂. Tumin, E. Sikkim (1800 m.) 24.09.1988.

Other records : Ali (1962) noted at Temni, Kewzing, Rinchinpong, Pemoinche and Gangtok in winter.

1430. *Niltava macgrigoriae signata* (Horsfield)

Small Naltava

General information : Common, resident of the open jungle, bush and scrubby jungle between c 1000' to 5500' Altitudinal (seasonal) migrant. Arboreal. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 4♂, 2♀. Ali (1962) collected 1♂, 2♀.

1432. *Niltava sundara sundara* (Hodgson)

Rufous-bellied Niltava

General information : Common, resident of the open jungle, bush and scrubby jungle from c.1000' to 5000' Altitudinal (seasonal) migrant. Arboreal. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 4♂, 4♀ at Lachen, c 9000' in September. Ali (1962) procured 2♂, 3♀.

N.Z.C. 3♂, 2♀. Temi, E. Sikkim (1800 m), 24-28. 09.1988; 2♂, 2♀. Rabangla, S. Sikkim, 17, 19, 23, 17.05.1990;

Other records : Ali (1962) noted it at Rangpo,

Singtam, Martam, Kewzing, Dentam and Gangtok during November-April.

1439. *Cyornis unicolor* Blyth

Pale Blue-Flycatcher

General information : Common, resident of the open jungle, bush and scrubby jungle from c. 1000' to 5500' Altitudinal (seasonal) migrant. Arboreal. Insectivorous. Keeps singly or in pairs.

Collection record : Meinertzhagen (1927) obtained specimens at Dikchu, Singhik and Gangtok during October-November.

Other records : Ali (1962) noted it at Temu and Kewzing in March.

1440. *Cyornis rubeculoides* (Vigors)

Blue-throated Flycatcher

General information : Possibly summer migrant. Status uncertain. A bird of bush, scrub and jungle upto c. 3750' Arboreal. Insectivorous. Keeps singly or in pairs.

Collection record : Meinertzhagen (1927) obtained specimens at Rangpo, c1000' and Gangtok, c. 6000' in October.

Other records : Stevens (1923-25) remarked that it does not go higher than the foothills. Ali (1962) noted it at Singtam, c.100' in April.

1477. *Muscicapella hodgsoni* (Moore)

Pigmy Blue Flycatcher

General information : Very rare. Possibly altitudinal (seasonal) migrant. Status undetermined. A bird of open forest or edge of the forest with bush and scrub upto c.7000' Arboreal. Restless. Insectivorous. Keeps singly.

Collection record : Ali (1962) collected 2♂.

Other records : Ali (1962) noted it near Rangpo and Singtam in December.

1448. *Culicicapa ceylonensis calochrysea*

Oberholser

Grey-headed Flycatcher

General information : Uncommon, resident of open wooded country and forest glades upto

c. 9000' Arboreal. Restless. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) procured 6 specimens. Ali (1962) obtained 2♂, 1 unsexed.

N.Z.C. 1♂, 2♀. Tumin, (1800 m) E. Sikkim. 25, 27.09.1988; 1♂. Rabangla, S. Sikkim, 23.05.1990.

**1450. *Rhipidura hypoxantha* Blyth
Yellow-bellied Fantail-Flycatcher**

General information : Uncommon. Resident of open wooded country and forest glades upto c. 9000' Restless. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 15♂, ♀ at Lachen, c. 9000', in August. Ali (1962) procured 2♂, 1 unsexed.

**Family MONARCHINAE Monarch
Flycatchers & Paradise Flycatchers**

India : 8 species and subspecies.

Sikkim : 2 species 25% of the Indian population.

A small family represented by two diverse type of flycatchers with depressed bill, swollen at base, rictal bristles long, coarse and numerous, short and stout tarsus, young without any spot. Sexes different.

**1463. *Terpriphone paradisi saturation*
(Salomonsen)**

Asian Paradise-Flycatcher

**1465. *Hypothymis azurea styani* (Hart Lanb)
Black-naped Monarch-Flycatcher**

**Family RHIPIDURINAE
Fan tail-Flycatchers**

India : 10 species and subspecies.

Sikkim : 3 species c. 30% of the Indian population.

This is a small family of flycatchers with large bill, thrice the width at base, with numerous long rictal bristles, wing shorter than tail, graduated tail long and broad, distinctly cocked and fanned. Young not spotted.

**1450. *Rhipidura hypoxantha* Blyth
Yellow-bellied Fantail-Flycatcher**

**1451. *Rhipidura aureola aureola* Lesson
White-browed Fantail-Flycatcher**

**1455. *Rhipidura albicollis albicollis* (Vieillot)
White-throated Fantail-Flycatcher**

**1455. *Rhipidura albicollis albicollis* (Vieillot)
White-throated Fantail-Flycatcher**

General information : Uncommon. Resident of open wooded country and forest glades upto c. 9000' Arboreal. Restless. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 7♂, ♀. Ali (1962) collected 1♀.

N.Z.C. 1♂. Temi, E. Sikkim (1800m.) 26.09.1988. 2♀. Temi, E. Sikkim (1800m) 26.09.1988; Rabangla, S. Sikkim. 20.05.1990.

**Family AEGITHALIDAE
Long-tailed Tits**

India : 6 species and subspecies.

Sikkim : 2 species c. 33% of the total population.

This family in Sikkim is represented by two species characteristic feature being short and stout bill, curved culmen, graduated tail, longer than wing.

**1819. *Aegithalos concinus rubricapillus*
(Ticehurst)**

Red-headed Tit

**1823. *Aegithalos iouschistos* (Blyth)
Rufous-fronted Tit**

**1829. *Aegithalos concinnus rubricapillus*
(Ticehurst)**

Red-headed Tit

General information : Rare resident (?) in the conifer forest and upper limit of evergreen forest from c. 5,000' Arboreal. Insectivorous. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 9♂ and ♀.

Ali (1962) collected 1♂ and 1♀; and examined 3♂ and 2♀ (Chicago Natural History Museum).

N.Z.C. 4♂. C. Luchung, N. Sikkim, 24.01.1953; Tumin, E. Sikkim (c. 1800), 27.09.1988; Rabangla, S. Sikkim, 17.05.1990. 1♀. Tumin, E. Sikkim (c.1800), 26.09.1988.

1813. *Aegithalos iouschistos* (Blyth)
Rufous-fronted Tit

General information : Rare resident in the bushy alpine pastures, rhododendron forest between 9,000' and 12,000' Partial altitudinal migrant. Arboreal. Insectivorous. Keeps in small flocks.

Collection records : Schafer (1938/39) collected 22♂ and ♀ at Lachen and Lachung.

N.Z.C. 1♂. Lachen, N. Sikkim, 30.07.1989. 1♂. Lachung, N. Sikkim (c.2600m.) 24.01.1953.

Family REMIZIDAE
Penduline-Tits

India : 3 species and subspecies.

Sikkim : 1 species c. 33% of the Indian population.

A very small family of penduline tits with short, pointed, straight bill, short tail and wing. Tarsus with transverse scale.

1816. *Cephalopyrus flamniceps olivaceus*
Rothschild
Fire-capped Tit

Ali (1962) noted it as uncommon and recorded it at Rangpo and Dentam, from 1,000' to 4,500' between November and May.

Family PARIDAE
Tits

India : 23 species and subspecies.

Sikkim : 7 species and subspecies. c. 31% of the Indian population.

A group of small, restless arboreal birds with small and conical bills. Largely insectivorous. always keeps in small to large flocks. Plumage mainly combination of black, grey, white and yellow. Presence of prominent crest. Sexes generally alike.

*1806. *Parus rubidiventris beavani* (Jerdon)
Rufous-bellied crested Tit

1808. *Parus dichrous dichrous* Hodgson
Brown Crested Tit

1793. *Parus major nipalensis* Hodgson
Great Tit

1799. *Parus monticolus* Vigors
Green-backed Tit

1812. *Parus spilonotus spilonotus* Bonaparte
Black-spotted yellow Tit

1814. *Sylviparus modestus* Burton
Yellow-browed Tit

1789. *Melanochlora sultanea* (Hodgson)
Sultan Tit

1806. *Parus rubidiventris beavani* (Jerdon)
Rufous-bellied Crested Tit

General informations : Uncommon resident in the scurby conifer forest from c. 9,000' to 12,500' Arboreal. Restless. Insectivorous. Keeps in small parties.

Collection records : Schafer (1938/39) procured 12♂ and ♀. Ali (1962) obtained 3♂.

N.Z.C. 2♂, C. Lachen, N. Sikkim, 30.07.1989; Dzongri, W. Sikkim, (13,200'), 8.06.1990; 2♀. Pethang, Bakhim, W. Sikkim, (13,200'), 8.06.1990; 2♀. Pethang, Bakhim, W. Sikkim, 6.07.1990; 2 unsexed, Yumthang, N. Sikkim, 6.07.1989. 1♂. Lachung, N. Sikkim (c.2600m.) 21.01.1953.

1803. *Parus ater* Linnaeus
Coal Tit

General informations : Uncommon resident in the scrubby conifer forest from c. 9,000' to 12,000' Arboreal. Restless. Insectivorous. Keeps in small parties.

Collection records : Ali (1962) obtained 4♂ and 2♀ N.Z.C. 3♂. Lachung, N. Sikkim (c. 2600m), 20.01.1953; Yumthang, N. Sikkim, 6.07.1989; 2♀. Lachung, N. Sikkim (c. 2600 m), 22.01.1953; Yunthang, N. Sikkim, 3.08.1989.

1808. *Parus dichrous dichrous* Hodgson
Brown-crested Tit

General informations : Uncommon resident in the scrubby conifer forest from c. 9,000' to 12,500' Arboreal. Restless. Insectivorous. Keeps in small parties.

Collection records : Schafer (1938/39) procured 6♂ and ♀.

Ali (1962) collected 1♂.

N.Z.C. 2♂. Yumthang, N. Sikkim. 3.07.1989.

1799. *Parus monticolus* Vigors
Green-backed Tit

General informations : Common resident in the open wooded country, edge of the cultivation from c. 1,500' to 9,000' Altitudinal migrant. Arboreal. Sociable but agile. Insectivorous. Keeps in pairs or in small flocks.

Collection records : Schafer (1938/39) obtained 24♂ and ♀.

N.Z.C. 8♂, Lachung, (c.8600'), 6.04.1979; Tumin, E. Sikkim (1800m.), 25.09.1988; Lachen, N. Sikkim, 1.08.1989; Rabangla, S. Sikkim, 19-25. 05.1990; 3♀, Tumin, E. Sikkim (1800 m), 24.09.1988; Rabangla, S. Sikkim, 18, 19.05.1990. 3 unsexed, c. Lachung, N. Sikkim, 18.01.1953; Tumin, E. Sikkim (1800 m), 23.09.1988; Rabangla, S. Sikkim, 20.05.1990.

1812. *Parus spilornatus spilornatus* Bonaparte
Black-spotted Yellow-Tit

General informations : Uncommon resident in the open bushy jungle and edge of the cultivation between 4,000' and 8,000' Arboreal. Agile. Noisy, Insectivorous. Keeps in small parties.

Collection records : Meinertzhagen (1927) obtained 1 specimen at Changu, c. 12,000' in December. Schafer (1938/39) obtained 1♂ and 1♀ at Gangtok.

N.Z.C. 1♀, Menan, S. Sikkim, 27.05.1990; 1 unsexed. Sikkim, 28.06.1875.

1814. *Sylviparus modestus modestus* Burton
Yellow-browed Tit

General informations : Rare resident (?) in

conifer forest and upper limit of evergreen forest from c. 5,000' to 9,500'. Arboreal. Insectivorous. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 9♂ and ♀. Ali (1962) collected 1♂ at Chungthan in January.

1789. *Melanochlora sultanea* (Hodgson)
Sultan Tit

General information : Uncommon resident in the open deciduous forest and edge of the cultivation from the foothills up to c. 3,500' Arboreal (canopy bird). Agile. Insectivorous. Keeps in or small prties.

Collection records : (1938/39) obtained 2♂ and 2♀ at Gangtok.

Ali (1962) collected 2♀. N.Z.C. 1♂, Martam, Rongni Valley, Sikkim 16.12.1952.

Family SITTIDAE
Nuthatches, Wallcreepers

India : 13 species and subspecies.

Sikkim : 5 species and subspecies. c. 40% of the Indian population.

This family of small typical climbing birds with slender bill and short, truncated tail. Feeds mostly on insects. Sexes nearly alike.

1828. *Sitta nagaensis cinnamoventris* Blyth
Chestnut-vented Nuthatch

1834. *Sitta himalayensis himalayensis* Jardine
& Selby

White-tailed Nuthatch

1838. *Sitta frontalis* Swainson
Velvet-fronted Nuthatch

1837. *Sitta formosae* Blyth
Beautiful Nathatch

1839. *Tichodroma muraria* (Linnaeus)
Wallcreeper

1828. *Sitta castanea cinnamoventris* Blyth
Chestnut-bellied Nuthatch

General information : Common resident in

open wooded jungle with tall trees from the foothills up to c. 5,500'. Arboreal. Restless. Insectivorous. Keeps in pairs or in small parties.

Collection records : Ali (1962) obtained 3♂.

1834. *Sitta himalayensis himalayensis* Jardine & Selby

White-tailed Nuthatch

General information : Common resident in tall and dense evergreen forest from 3,000' to 11,000'. Altitudinal (seasonal) migrant. Arboreal. Restless. Insectivorous. Keeps in pairs or in mixed parties.

Collection records : Schafer (1938/39) obtained 3♂ 30♂ and ♀ at Gangtok, Chungthung, Lachen, Manshitang, Penlom La and Karponang. Ali (1962) collected 2♀ at Chungthang. N.Z.C. 2♀. Tumin. E. Sikkim, (1800 m), 23.09.1988; Lachen, N. Sikkim, 4.08.1989.

1838. *Sitta frontalis* Swanson
Velvet-fronted Nuthatch

General information : Rare, resident, occurs in open deciduous forest from the foot hills upto 5500'. Partial altitudinal migrant. Arboreal. Insectivorous. Keeps in pairs or small parties.

Collection record : Ali (1962) obtained 1♂.

Other records : Stevens (1923-25) noted it in the Teesta valley upto 2500'

Ali (1962) noted it as most common between 1000' and 2000' and also noted it at Singhik, 4500' and Gangtok, between 5500' and 6000' in December and February.

1837. *Sitta formosa* Blyth
Beautiful Nuthatch

Meinertzhagen (1927) obtained it at Rangpo, 1,100'

Ali (1962) stated it as very rare in Sikkim.

1839. *Tichodroma muraria* (Linnaeus)
Wallcreeper

General information : Rare and sporadic. A bird of boulders and rocky streams, gorges and cliffs from the foothills up to c. 12,000'. Marked

altitudinal migrant. Arboreal. Restless. Insectivorous. Keeps single or in separated pairs.

Collection records : Ali (1962) obtained 1♂.

Family CETHIIDAE
Tree-creepers, Creepers

India : 12 species and subspecies.

Sikkim : 3 species and subspecies. 25% of the Indian population.

The family of small, dull-coloured arboreal birds with slender, decurved bill. Tail stiff and graduated. Good climber on tree-trunks. Insectivorous and sexes alike.

1843. *Certhia familiaris mandellii* Brooks
Eurasian Tree-Creeper

1851. *Certhia nipalensis* Blyth
Rusty-flanked Tree-Creeper

1849. *Certhia discolor* Blyth
Brown-throated Tree-Creeper

1843. *Certhia familiaris mandellii* Brooks
Eurasian Tree-Creeper

General information : Uncommon, resident, affects conifer forest with tall trees from c. 5500' to 13,500'. Altitudinal migrant. Arboreal, Insectivorous. Restless. Keeps in pairs or family parties.

Collection record : Ali (1962) obtained 2♀, 1 unsexed, also examined 4♂ (Chicago Natural History Museum).

N.Z.C. 5♂. Yumthang, N. Sikkim, 3.5.07.1989; 1♀. Deorali, Bakhim, W. Sikkim, 6.06.1990; 1 unsexed, Yumthang, N. Sikkim, 6.07.1989.

1851. *Certhia nipalensis* Blyth
Rusty-flanked Tree-creeper

General information : Uncommon. Resident. Affects conifer forest with tall trees from c. 5500' to 13,500'. Altitudinal migrant. Arboreal. Insectivorous. Keeps in pairs or family parties.

Collection records : Meinertzhagen (1927) obtained specimens at Rinchingpong, Chungthang, Lachen and Changu between 5200' and 10,500' during November-January.

Other records : Stevens (1923-25) noted it from 6500' to 10,000' in winter.

1849. *Cethia discolor discolor* Blyth
Brown throated tree-creeper

General information : Uncommon. Resident. Affects conifer forest with tall trees from c. 5550' to 13,500' Altitudinal migrant. Arboreal Insectivorous. Restless. Keeps in pairs or family parties.

Collection records : Ali (1962) collected 3♂, 1♀, 1 unsexed.

Other records : Meinertzhagen (1927) noted it at Karponang and Changu 9000' and 12000' in December.

Family DICAEDAE
Flowerpeckers

India : 10 species and subspecies.

Sikkim : 6 species and subspecies. 60% of the Indian population.

The family of small arboreal birds with short and stout bill. Always restless and active in habit. Feed on insects, nectar etc. Sexes unlike.

1892-94. *Dicaeum agile* (Tickell)
Thick-billed Flowerpecker

1895. *Dicaeum chrysorrheum* Temminck
Yellow-vented Flowerpecker

1896. *Dicaeum melanoxanthum* (Blyth)
Yellow-bellied Flowerpecker

1901. *Dicaeum concolor olivaceum* Walden
Plain Flowerpecker

1905. *Dicaeum ignipectus* (Blyth)
Fire-breasted Flowerpecker

1904. *Dicaeum cruentatum* (Linnaeus)
Scarlet-backed Flowerpecker

1996. *Dicaeum melanoxanthum* (Blyth)
Yellow-bellied Flowerpecker

General information : Rare. Resident. Abounds dense bushy jungle from c. 5500' to 9000' Arboreal. Frugivorous. Keeps in pairs.

Collection records : Stevens (1923-25)

obtained specimens at Lingtam between 5500' and 6000'

Schafer (1938/39) collected 2♂, 2♀ at Lachen in September.

1905. *Dicaeum ignipectus* Blyth
Fire-breasted Flowerpecker

General information : Fairly common. Resident. Affects dense bushy jungle with hilly streams and edge of the forest from 3500' to 10,000' Altitudinal (seasonal) migrant. Arboreal. Prefers insects and berry. Keeps in pairs or in small party.

Collection record : Schafer (1938/39) obtained 3♂, 2♀. Ali (1962) collected 4♂.

Other records : Stevens (1923-25) stated that it is generally distributed between 3500 and 10,000' in Sikkim.

Baker (1927) reported its breeding upto 12,000' in Sikkim.

Family NECTARINIIDAE
Sunbirds & Spiderhunters

India : 26 species and subspecies.

Sikkim : 9 species and subspecies. c. 33% of the Indian population.

The family of small arboreal birds with deep long curved bill. Sexes dimorphic. Males brightly coloured and females dull. Feed on insects and nectar.

1906. *Anthreptes singalensis* (Gmelin)
Ruby-cheeked Sunbird

1917. *Nectarinia asiatica asiatica* (Latham)
Purple Sunbird

1919. *Aethopyga gouldiae gouldiae* (Vigors)
Mrs. Gould's Sunbird

1923. *Aethopyga nipalensis nipalensis* (Hodgson)
Green-tailed Sunbird

1925. *Aethopyga saturata saturata* (Hodgson)
Black-throated Sunbird

1927. *Aethopyga siparaja seheriae* (Tickell)
Crimson Sunbird

1930. *Aethopyga ignicauda* (Hodgson)
Fire-tailed Sunbird

1931. *Arachnothera longirostris* (Latham)
Little Spiderhunter

1932. *Arachnothera magna* (Hodgson)
Streaked Spiderhunter

1919. *Aethopyga gouldiae gouldiae* (Vigors)"
Mrs. Gould's Sunbird

Stevens (1923-25) found it in Sikkim between c.4000' and 10000'

Schafer (1938/39) obtained 2♂ at Lachen, c. 9000'

Ali (1962) noted it once below Lachen, c.6500' in February.

1923. *Aethopyga nipalensis nipalensis* (Hodgson)
Green-tailed Sunbird

General information : Common resident from the foothills up to c. 3600 m in open scrubs jungle. Arboreal. Food consists of nectar. Keeps mostly in pairs. Sexes dissimilar.

Collection record : N.Z.C. 2♂. Martam, Rangit valley, Sikkim (c. 650m.) 17, 18.12.1952; 1♀ Yumthang, N. Sikkim 07.08.1980.

*1924. *Aethopyga nipalensis nipalensis*
(Hodgson)

Green-tailed sunbird

General information : Common, resident in the dense evergreen forest and secondary jungle from the foothills upto c.6500' Arboreal. Agile. Mostly insectivorous. Keeps in pairs.

Collection record : Schafer (1938/39) obtained 20♂, 14♀ (1 example from changu, c.12000' in February). ali (1962) procured 2♂, 2♀.

N.Z.C. 2♂, Martem, Rongi Valley, Sikkim (c. 650m), 18.12.1952; 3♂. Temi, Singtan, Papung Valley, Sikkim (c. 1480 m), 9.01.1953; 1♂. Rabangla, S. Sikkim (2010 m). 5.10.1989.

1925. *Aethopyga saturata assamensis* (Mc
Clelland)

Black-throated Sunbird

General information : Common, resident in

the dense evergreen forest and secondary jungle from the foothills upto c.6500' Arboreal. Agile. Mostly Insectivorous. Keeps in pairs.

Collection record : Schafer (1938/39) obtained 1♂, 1♀. Ali (1962) collected 2♂.

N.Z.C. 1♀. Rabangla, S. Sikkim 6.10.1989.

1930. *Aethopyga ignicauda* (Hodgson)
Fire-tailed Sunbird

General information : Rare. Resident. Affects upper slope of dense evergreen forest and conifer forest from c.4500' and 12,000' Arboreal. Rustless. Mostly insectivorous. Keeps in pairs.

Collection records : Schafer (1938/39) obtained 15♂, 2♀.

Ali (1962) procured 2♂. N.Z.C. 1♂, 1♀. Yumthang, N. Sikkim. 3.07.1989. 1♀, Rabangla, S. Sikkim (2010 m), 6.10.1988.

Other records : Blanford (1870) noted it at Chola Range in August.

1932. *Arachnothera magna* (Hodgson)
Streaked Spiderhunter

General information : Uncommon, resident in tropical foothill forest with wild banana plants between c.1500' and 5000' Arboreal. Active. Insectivorous. Keeps singly or in pairs.

Collection record : Schafer (1938/39) obtained 1♀.

Family ZOSTEROPIDAE

A small family of two species having five geographical races. Very small bird with yellow-olive plumage and short pointed bill. Diagnostic white eye-ring. Keeps in pairs or in small parties. Entirely arboreal. Sexes alike.

1933. *Zosterops palpebrosus palpebrosus*
(Temminck)

Oriental White-eye

1933. *Zosterops palpebrosus palpebrosus*
(Temminck)

Oriental White-eye

General information : Common, resident in

open secondary forest and edge of the cultivation from the foothills upto c.8000' Arboreal. Sociable. Agile. Insectivorous. Keeps in small flocks.

Collection record : Schafer (1938/39) obtained 2♂. Ali (1962) collected 1♀.

Family EMBERIZINAE

India : 19 species and subspecies.

Sikkim : 6 species and subspecies. c. 34% of the Indian population.

The family of small sized birds with thick conical bills. Mostly remains in high altitudes and seasonal migrants. Gregarious in habit and always keeps in flocks. Mostly graminivorous. Sexes may be alike or unlike.

2060. *Melophus lathamii* (Gray)
Crested Bunting

2053. *Emberiza godlewskii khamensis* Sushkin
Godlewski's Bunting

2045. *Emberiza rutila* Pallas
Chestnut Bunting

2046. *Emberiza aureola* Pallas
Yellow-breasted Bunting

2047. *Emberiza spodocephala* Pallas
Black-faced Bunting

2056. *Emberiza pusilla* Pallas
Little Bunting

General information : Uncommon, passage migrant (?) from c.4800' to 6500' Mostly terrestrial. Graminivorous. Keeps in flocks.

Collection record : Schafer (1938/39) procured 1♂, 3♀ at Gangtok, c. 6300' between December and January. Ali (1962) obtained 2 unsexed examples and also examined 1♂, 1♀ collected by Baker in May 1904 (B.N.H.S. Coll). N.Z.C. 1 unsexed, Chungthang, Lachung, Sikkim, 18.01.1953.

Other records : Stevens (1923-25) noted it as a irregular passage migrant in Sikkim. Ali (1962) noted it at Temi and Kewzing in January.

2047. *Emberiza spodocephala* Pallas
Black-faced Bunting

Meinertzhagen (1925) obtained 3♂ at

Karponang, c.9000' in December. Ali (1962) noted it as accidental straggler in Sikkim.

Family FRINGILLIDAE Finches

India : 50 Species and subspecies

Sikkim : 27 Species and subspecies c. 54% of the Indian population.

The family of small sized, colourful, arboreal or terrestrial birds with short, massive and conical bills. Generally remains in high himalayas and descends in lower altitudes during cold season. Sexes are unlike.

1990. *Carduelis spinoides* Vigors
Yellow-breasted Greenfinch

1993. *Carduelis thibetana* (Hume)
Tibetan Sikkim

1996. *Carduelis flavirostris rufostriata*
(Walton)

Twite

2000. *Leucosticte nemoricola nemoricola*
(Hodgson)

Hodgson's Mountain-Finch

2003, 2004. *Leucosticte brandti haematopygia*
(Gould)

Black-headed Mountain-Finch

1997. *Callacanthus burtoni* (Gould)
Spectacled Finch

2016. *Carpodacus rubescens* (Blandford)
Blandford's Rosefinch

2015. *Carpodacus nipalensis nipalensis*
(Hodgson)

Dark-breasted Rosefinch

2011. *Carpodacus erythrurus roseatus* (Blyth)
Common Rosefinch

2023. *Carpodacus pulcherrimus* (Moore)
Beautiful Rosefinch

2017. *Carpodacus rodochrous* (Vigors)
Pink-browed Rosefinch

*2025. *Carpodacus edwardsii* Verreaux
Dark-rumped Rosefinch

2019. *Carpodacus rodopeplus* (Vigors)
Spot-winged Rosefinch

*2021. *Carpodacus thura thura* Bonaparte &
Schlegel
White-browed Rosefinch

2028. *Carpodacus rubicilloides* Przevalski
Streaked Great Rosefinch

2027. *Carpodacus rubicilla* (Guldenstaedt)
Common Great Rosefinch

2031. *Carpodacus puniceus puniceus* (Blyth)
Red-fronted Rosefinch

2033. *Propyrrhula subhimachala* (Hodgson)
Crimson-browed Finch

2034. *Haematospiza sipahi* (Hodgson)
Scarlet Finch

2032. *Loxia curvirostra* Linnaeus
Red Crossbill

2036, 2037. *Pyrrhula nipalensis nipalensis*
Hodgson
Brown Bullfinch

2039. *Pyrrhula erythrocephala* Vigors
Red-headed Bullfinch

2038. *Pyrrhula erythaca* Blyth
Beavan's Bullfinch

1983. *Mycerobas affinis* (Blyth)
Collared Grosbeak

1986. *Mycerobas melanozanthos* Hodgson
Spotted-winged Grosbeak

1985. *Mycerobas carnicaps carnicaps* (Hodgson)
White-winged Grosbeak

2035. *Pyrrhoptes epauletta* (Hodgson)
Gold-naped Black Finch

1990. *Cardulis spinoides spinoides* Vigors
Yellow-breasted Green Finch

General information : Uncommon resident in the open hillside forest, bushy jungle of oak, rhododendron and conifers between c. 5,000' and 9000' Terrestrial. Gregarious. Graminivorous. Keeps in flocks.

Collection records : Schafer (1938/39) obtained

8♂ and 7♀. Ali (1962) examined 1♀ collected at Yumthang, 12,800'

Other records : Ali (1962) reported that the first Mt. Everest Expedition obtained it at 12,500' in May.

1993. *Carduelis thibetana* (Hume)
Tibetan Siskin

General information : Status uncertain. Rare in Sikkim. Only winter records. Gregarious. Terrestrial. Graminivorous. Keeps in flocks.

Collection record : Stevens (1923-25) obtained 7♂, 2♀ at Lingtam. Z.S.I. (1953) collected 2♀, 1 unsexed at Temi.

Other records : Ali (1962) reported that it is observed or collected only in winter, between c. 5000' to 10,000' at Temi, Lachen, Lingtam and Changu.

2000. *Lecosticte nemoricola nemoricola*
(Hodgson)

Hodgson's Mountain-Finch

General information : Rare resident above the tree line between c. 12,000' and 18,000'

Collection records : Schafer (1938/39) obtained 15♂ and 12♀ at N. Sikkim. Ali (1962) collected 5♂ and 5♀. N.Z.C. 9♂, 7♀ and 2 unsexed; Thongga, Yome Samdong, Yumthang, Lachung, Singalila, and Chunthang, N. Sikkim; 31.12.1952, 18, 19, 20 and 24.01.1953, 2, 4, 15, 20.07.1989.

2004. *Leucosticte brandti haematopygia* (Gould)
Black-headed Mountain-Finch

General information : Rare resident above the tree line between c. 12,000' and 18,000'

Collection records : Schafer (1938/39) obtained 19♂ and 13♀ including type at Gyagong in July and August and at Yubuk, Zemu Glacier, c. 13,000' in November.

Other records : Blanford (1871-72) noted it on the Kangra Lama Pass in September. Meinertzhagen (1927) noted it common in large flocks at Gyagongh, 15,750' in November. Ludlow (1937) noted it at Changu in May. Ali (1962) reported that first Mt. Everest Expedition obtained up to 17,500' in May.

2005. *Leucosticte brandti pallidior* Bianchi
Black-headed Mountain-Finch

Collection record : Meinertzhagen (1927) obtained a specimen near Lachen, c. 9,000' in February (J.B.N.H 5 (1) : 273).

Remarks : It is the only record from Sikkim and may be an accidental straggler.

2016. *Carpodacus rubescens* (Blanford)
Blanford's Rosefinch

General information : Rare resident in the open bushy country and cultivation and alpine meadows from c. 4,500' to 10,000' Altitudinal migrant. Partly arboreal. Gregarious. Graminivorous. Keeps in flocks.

Collection records : Stevens (1923-25) obtained 1♂ and 3♀ at Gnatong, c. 12,500' in March.

2015. *Carpodacus nipalensis nipalensis*
(Hodgson)
Dark-breasted Rosefinch

General information : Common resident in the open bushy country and cultivation and alpine meadows from c. 4,500' to 10,000' Altitudinal migrant. Partly arboreal. Gregarious. Graminivorous. Keeps in flocks.

Collection records : Ali (1962) obtained 2♂ and 2♀. N.Z.C. 8♂, 9♀ and 1 unsexed. Yumthang, Dzongri, Lachen, Yoma Samdong and Temi Papung Valley Sikkim. 10.01.1953; 30.06.1989; 4, 9.07.1989; 1, 4.08.1989; 7, 9 12, 13.06.1960.

Other records : Ali (1962) noted it at Yumthang 11,500' in June and Chola Range, 13,000' 14,000' in August.

2011. *Carpodacus erythrinus roseatus* (Blyth)
Common Rosefinch

General information : Status uncertain. Passage migrant. Occurs between 4000' to 13,000' Partly terrestrial. Gregarious. Feeds on fruits and nectar. Keeps in flocks.

Collection records : Schafer (1938/39) procured 1♂ at Thangu, 13,000' in July. N.Z.C. 2♂, 1♀.

Thangu and Singhik-Sikkim. 8, 9.04.1979; 15.07.1989.

Other records : F.N. Betts (1943) examined a male form Yumthang, 11,500' in May.

2023. *Rosefinch Carpodacus pulcherrimus pulcherrimus* (Moore)
Beautiful

Ali (1962) reported it to be found locally in winter from c. 8000' to 12,000' at Lachung etc.

2017. *Carpodacus rodochrous* (Vigors)
Pink-Browed Rosefinch

Ali (1962) noted it as rare in Sikkim.

2025. *Carpodacus edwardsii rubicunda*
(Greenway)
Dark-rumped Rosefinch

General information : Uncommon resident. Occurs mainly in Rhododendron and Bamboo forest from c. 8000' to 13,000' Partly arboreal. Graminivorous. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 1♂, 1♀. Ali (1962) procured 2♂, 1♀. N.Z.C. 3♂, Khambokhagra and Lachen. N. Sikkim. 4.08.1989; 8.06.1990.

2021. *Carpodacus thura thura* Bonaparte & Schlegel
White-browed Rosefinch

General information : Common resident, a bird of the tree line in juniper, fir and rhododendron forest between c. 10,000' and 14,000' occasionally at c. 6,300' Altitudinal migrant. Partly terrestrial. Fruit and seed eater. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 5♂, 11♂, 1♀ (Juv.). Ali (1962) procured 1♂, 1♀. N.Z.C. 3♂, 1♀, Dzongri N. Sikkim. 7, 9, 13.06.1990.

Other records : Blanford (1871-72) noted it at Chola Range, 12,000' in August.

2028. *Carpodacus rubicilloides* Przevalski
Streaked Great Rosefinch

Ali (1962) included it in Sikkim on the basis

of collection as follow. Meinertzhagen (1925) obtained 1♂ and 1♀ at Chungthang in November. V.S.La Personne (1931) procured 1♂ at Thangu, 14,500' in March.

2028. *Carpodacus rubicilloides* Prezevalski
Streaked Great Rosefinch

General information : Scarce and rare resident in the high altitudes of Tibetan Plateau and adjacent Sikkim. Observed in Sikkim at 4800 (HB). Keeps in pairs. Sexes dissimilar.

Remarks : Meinertzhagen obtained a ♂ and ♀ on 21 November 1925. The Chicago Museum of Natural History has a 1♂ 18.03.1931, Thangu, 14,500', collected by V.S.La Personne.

2027. *Carpodacus rubicilla* (Guldenstaedt)
Common Great Rosefinch

Ali (1962) included it in Sikkim, on the basis of four specimens collected by Schafer at Gyagong and Kiang - Lafer act. 15,800' and 16,500' during July, August and October. Biwas (1953) also collected a vagrant specimen at Chungthung, 5,200' in January.

2027. *Carpodacus rubicilla* (Guldenstadt)
Common Great Rosefinch

General information : Rare resident in the high altitudes of Sikkim. Always keeps in small flocks.

Remarks : Schafer obtained four specimens at c. 15,800 and 16,500 ft., in the Tibetan Plateau facies of N. and E. Sikkim (Gyagong and 'Kiang Lager') in July, August and October.

2031. *Carpodacus puniceus puniceus* (Blyth)
Red-Fronted Rosefinch

General information : Extremely rare. Resident. Occurs above tree line between c. 13,000' and 16,000' Shy. Partly terrestrial. Graminivorous. Keeps in pair or small parties.

Collection records : Schafer (1938/39) obtained 4♂, 1♀ at Thangu 13,000' and Gyagong, 16,000' in July.

Other records : Blandford (1870) obtained it

on Chola Range, c. 14,000' in August. Meinertzhagen (1925) noted it at Nathu La, 14,500' in December.

2033. *Propyrrhula subhimachala* (Hodgson)
Crimson-browed Finch

No sight or collection records from Sikkim.

2034. *Haematospiza sipahi* (Hodgson)
Scarlet Finch

General information : Rare resident (?) in the open hillside bushy jungle and edge of the cultivation between c. 2,000' and 6,500' Arboreal. Social. Gregarious. Graminivorous. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 4♂ and 5♀. Ali (1962) collected 3♂ and 1♀. N.Z.C. 2♂, N. Sikkim. 4.08.1989.

2032. *Loxia curvirostra* Linnaeus
Red Crossbill

General information : Status uncertain. Vagrant. Occurs in higher elevation between c. 2000' and 12,000' Partly arboreal. Gregarious Restless. Graminivorous. Keeps in small flocks.

Collection records : Ali (1962) reported specimens from Sikkim, collected by Mandelli during January–May (British Museum) and V.S.La Personne (1931) collected 1 specimen from Lachen, c. 9000' in May (Chicago Nat. Hist. Mus.).

2036. *Pyrrhula nipalensis nipalensis* Hodgson
Brown Bullfinch

General information : Extremely rare resident (?) in the conifer forest, rhododendron bush from c. 6,000' to 13,000' Altitudinal migrant. Gregarious. Graminivorous. Keeps in small flocks.

Collection records : Schafer (1938/39) procured 1♀ at Thangu, 13,000' in July and specimens at Gangtok, c. 6,000' in March. Ali (1962) examined 2♂ and 1♀ collected by the Suydam Cutting Expedition at Lachung, 9,000' – 10,000' in June, 1931. N.Z.C. 3♂, 3♀ Lachen–Sikkim. 1, 2, 4.08.1989

2039. *Pyrrhula erythrocephala* Vigors
Red-headed Bullfinch

General information : Common resident in the conifer forest up to c. 13,000' (summer) and in the open bush jungle down to c. 4000' (winter). Arboreal. Gregarious. Graminivorous. Keeps in small parties.

Collection records : Schafer (1938/39) obtained 9♂ and 10♀. N.Z.C. 4♂, 1♀. Yumthang, N. Sikkim; Dzongri, W. Sikkim; Bakhin, W. Sikkim. 26, 27, 28.08.1978; 13.06.1990.

2038. *Pyrrhula erythaca* Blyth
Beavan's Bullfinch

General information : Extremely rare resident (?) in the conifer forest, rhododendron bush from c. 6000' to 13,000'. Altitudinal migrant. Gregarious. Graminivorous. Keeps in small parties.

Collection records : Meinertzhagen (1927) collected only specimens in Sikkim except the type, 1♂, collected on 9th January, 1926.

1983. *Mycerobas affinis* (Blyth)
Collared Grosbeak

Ali (1962) noted it only at Thangu, 13,000' in April.

1986. *Mycerobas melanozanthos* Hodgson
Spotted-winged Grosbeak

General information : Uncommon resident in the tall conifer forest up to c. 12,000' (summer) and down to the tall evergreen forest at 6,000' (winter). Arboreal. Gregarious. Noisy. Frugivorous (nuts + seeds). Keeps in small to large flocks.

Collection records : Schafer (1938/39) obtained specimens at Gangtok, c. 6,000' in January and June. Elwes (1870) obtained it at Yumthang, 11,000' in September. N.Z.C. 2♂, 6♀. Yuksum - W. Sikkim. 31.05.1990; 3, 20.06.1990.

1985. *Mycerobas carniceps carniceps* (Hodgson)
White-winged Grosbeak

General information : Uncommon resident in the tall conifer forest up to c. 12,000' (summer)

and down to the tall evergreen forest at 6,000' (winter). Arboreal. Gregarious. Noisy. Frugivorous (nuts + seeds). Keeps in small to large flocks.

Collection records : Schafer (1938/39) obtained 3♂ and 1♀ N.Z.C. 2♂, 2♀ Thangu, Laxmipokhari- W. Sikkim. 18.07.1989; 9.06.1990.

Other records : Meinertzhagen (1927) examined a large series collected from Sikkim.

2035. *Pyrrhoplectes epauletta* (Hodgson)
Gold-naped Black Finch

General information : Status uncertain, Vagrant. Occurs in higher elevation between c. 9000' and 12,000' Partly arboreal. Gregarious. Restless. Graminivorous. Keeps in small flocks.

Other information : Blanford (1870) obtained it in Chola Range, 11,000' in August. Meinertzhagen (1927) obtained it at Lachen 8,500' in November and at Changu, 11,900' in December. Ali (1962) examined one specimen collected at Yumthang 11,000' in June (Chicago Natural History Museum)

Collection records : 1♂, 1♀. Yumthang N. Sikkim, 28.08.1976; 15.06.1990.

Family PASSERINAE
Sparrows and Snowfinches

India : 15 Species and subspecies.

Sikkim : 9 Species and subspecies. 60% of the Indian population.

The family of Sparrows and Snowfinches. Sparrows mostly live in foothills and plains while Snowfinches are exclusive resident of high himalayas. Mostly gregarious in habit and always remains in flocks. Mainly seed eater. Sexes unlike.

1939. *Passer domesticus parkini* Whistler
House Sparrow

1946. *Passer rutilans cinnamomeus* (Gould)
Cinnamon Tree Sparrow

1942. *Passer montanus malaccensis* Dubois
Eurasian Tree Sparrow

1943. *Passer monatanus tibetanus* Baker
Eurasian Tree Sparrow

1952. *Montifringilla adamsi* Adams
Tibetan Snow Finch

1953. *Pyrgilauda taczanowskii* (Prezevalski)
Mandelli's Snowfinch

1954. *Pyrgilauda ruficollis* Blanford
Rufous-necked Snowfinch

1955. *Pyrgilauda blanfordi* Hume
Plain-backed Snowfinch

1956. *Pyrgilauda davidiana* (Verreaux)
Small Snowfinch (EL)

1946. *Passer rutilans cinnamomeus* (Gould)
Cinnamon Tree Sparrow

Meinertzhagen (1927) obtained 4 specimens in January. Schafer (1938/39) collected 2♂, 1♀ at Gangtok in September.

1942. *Passer montanus malaccensis* Dubois
Urasian Tree Sparrow

General information : Uncommon, resident in the field and cultivation from the foothills upto c. 9000'. Altitudinal migrant. Arboreal. Graminivorous. Keeps in large flocks.

Collection records : Meinertzhagen (1927) obtained 6♂, 5♀. Schafer (1938/39) collected 13♂, ♀.

1952. *Montifringilla adamsi* Adams
Tibetan Snow Finch

Schafer (1938/39) obtained 6 specimens at Gayamthashana Tso, c. 16,300' in August.

1955. *Pyrgilauda blanfordi* Hume
Plain-backed Snow Finch

Ali (1962) mentioned the following records:

(i) By Mt. Everest Expedition at c. 15,200' in North Sikkim.

(ii) Meinertzhagen (1927) noted it at Natu La, East Sikkim, c. 14,100' in December.

(iii) Gyagong, Gayamthashana Tso, c. 16,000' 16,500', North Sikkim during July - October, 1938.

1954. *Pyrgilauda ruficollis* Blanford
Rufous-necked Snow Finch

Blanford (1870) obtained it at Kangra Lama

and Phalung, between c. 15,000' and 16,000' in September. Meinertzhagen (1927) recorded it at Natu La, c. 14,000' in December.

1956. *Pyrgilauda davidiana* (Verreaux)
Small Snow Finch

Meinertzhagen (1927) procured a specimen at Lachen, c. 9000' in March.

Family PLOCEINAE
Weavers

India : 4 Species and subspecies

Sikkim : 1 Species. 25% of the Indian population.

Small sized arboreal birds. Typically thick and conical bills. Gregarious in habit granivorous. Sexes differ.

1961. *Ploceus benghalensis* (Linnaeus)
Black-breasted Weaver

1967. *Lonchura striata acuticauda* (Hodgson)
White-rumped Munia

General information : Common, resident in the open grassland and cultivation and bushy country from the foothills upto c. 6000'. Mostly arboreal. Sociable. Agile. Keeps in small to large flocks.

Collection records : Ali (1962) obtained 2♂, 1♀.

Other records : Stevens (1923-25) noted it in the Rungbong Valley upto c. 6000'

1974. *Lonchura punctulata punctulata*
(Linnaeus)

Spotted Munia

General information : Common, resident in the open grassland and cultivation and bushy country from the foothills upto c. 6000'. Mostly arboreal. Sociable. Agile. Keeps in small to large flocks.

Collection record : Schafer (1938/39) obtained 2♂, 1♀ at Gangtok in June. N.Z.C. 1♂ Yaksum, W. Sikkim (5,840'), 19.06.1990; 1♀. Singhik, N. Sikkim, (4600') 8.04.1979.

Family PLOCEINAE

Small family of weavers birds. Looks like female of finches and sparrow. Male with bright yellow head (breeding) Bill thick. Sexes more or less similar (Non - breeding).

2060. *Ploceus megarhynchus megarhynchus*

Hume

Finn's Weaver

2060. *Ploceus megarhynchus megarhynchus*

Hume

Finn's Weaver

General information : Uncommon, summer visitor in the open grassy hillsides, cultivation and pastures from the foothills upto c. 6000'. Mostly terrestrial. Graminivorous. Keeps in small to large flocks.

Collection record : Schafer (1938/39) obtained 4♂ at Gangtok, c. 6300' in June and February.

Other records : Gammie (1877) noted its breeding in the Teesta Valley in May. C.M. English noted it at Dentam, c. 5000' in August.

Family STURNIDAE

Starlings & Mynas

India : 31 Species and subspecies

Sikkim: 6 Species and subspecies. c. 20% of the Indian population.

984. *Saroglossa spiloptera* (Vigors)

Spot-winged Starling

987. *Sturnus malabaricus malabaricus*

(Gmelin)

Grey-headed Starling

1006. *Acridotheres tristis tristis* (Linnaeus)

Common Myna

1008. *Acridotheres ginginianus* (Latham)

Bank Myna

1009. *Acridotheres fuscus fuscus* (Wagler)

Jungle Myna

1015. *Gracula religiosa* Linnaeus

Common Hill-Myna

984. *Saroglossa spiloptera* (Vigors)

Spot-winged Starling

Stevens (1923-25) recorded it in the Teesta

Valley up to c. 3,800' Ali (1962) stated it as resident (?) in Sikkim.

1006. *Acridotheres tristis tristis* (Linnaeus)

Common Myna

General information : Common in the locality and in thin jungle upto c. 7,500'. Mostly terrestrial. Tame. Omnivorous. Keeps in pair or in flocks.

Collection records : Schafer (1938/39) obtained 5♂ and 1♀ at Gangtok. N.Z.C. 1♂. Yaksam, W. Sikkim. (5842'). 4.06.1990.

1015. *Gracula religiosa intermedia* A. Hay

Common Hill-Myna

General information : Uncommon resident in the open jungle with tall trees up to c. 4,000. Arboreal. Noisy. Agile. Frugivorous. Keeps small to large flocks.

Collection records : Schafer (1938/39) obtained 1♂ at Rangpo in February.

Other records : Ali (1962) noted a flock of 25-30 birds in three consecutive years at Rangpo, c. 1,000' between November and March.

Family ORIOLIDAE

Orioles

India : 6 Species and subspecies

Sikkim : 4 Species and subspecies. c. 66% of the Indian population.

Small family of colourful arboreal birds with musical notes. Plumage mostly black and yellow with one exception of Maroon Oriole. Mainly frugivorous. Sexes mostly differ.

953. *Oriolus oriolus kundoo* Sykes

Eurasian Golden Oriole

955. *Oriolus tenuirostris* Blyth

Slender-billed Oriole

958. *Oriolus xanthornus xanthornus* (Linnaeus)

Black-headed Oriole

961. *Oriolus traillii* (Vigors)

Maroon Oriole

961. *Oriolus traillii* (Vigors)

Maroon Oriole

General information : Common resident in

the dense evergreen forest from the foothills up to c. 7,000' Arboreal (Canopy bird). Mostly frugivorous. Keeps single or in mixed parties.

Collection records : Schafer (1938/39) obtained 4♂. Ali (1962) procured 2♂ and 1♀. N.Z.C. 1♂. Martem, Rongri Valley, Sikkim (650 m) 14.12.1952; 1♀. Rinchingpong, Rangit Valley. Sikkim. (c 1600 m). 5.01.1953

Family DICRURIDAE
Drongos

India : 9 Species and subspecies

Sikkim : 8 Species and subspecies. c. 89% of the Indian population.

A family of all black birds with aggressive nature to maintain its territory and each with distinguishing tail shape. Mostly insectivorous. Sexes alike. Excellent mimic habit of other birds.

962. *Dicrurus macrocercus albirictus* (Hodgson)
Black Drongo

965. *Dicrurus leucophaeus longicaudatus* Hay
Ashy Drongo

967. *Dicrurus caerulescens caerulescens*
(Linnaeus)
White-bellied Drongo

970. *Dicrurus annectans* (Hodgson)
Crow-billed Drongo

971. *Dicrurus aeneus* Vieillot
Bronzed Drongo

972. *Diucrurus remifer* (Temminck)
Lesser Racket-tailed Drongo

973. *Dicrurus hottentottus* (Linnaeus)
Spangled Drongo

976. *Dicrurus paradiseus grandis* (Gould)
Greater Racket-tailed Drongo

962. *Dicrurus macrocerus* Vivillot
Black Drongo

General information : Uncommon resident from the foothills (winter) upto c. 2100 m. (summer). Arboreal. Strictly by territory minded. Always keeps in single. Sexes alike.

Collection records : NZC 1♂. Yumthang, N. Sikkim. 06.07.1989; 1♂, 1♀. Bakhim, N. Sikkim (9000'). 05.06.1990; 2♀. Rorang, Rabangla, S. Sikkim. 25.05.1990.

Remarks : Collection records from Yumthang and Bakhim are so far highest altitudinal records in Sikkim.

965. *Dicrurus leucophaeus longicaudatus* Hay
Ashy Drongo

General information : Uncommon. Resident from the foothills, upto c. 3300 m. Arboreal. Insectivorous. Strictly territory minded. Always keeps single. Sexes alike.

Collection records : N.Z.C. 2♂. Tumin, E. Sikkim (1800 m). 23, 27.05.1988.

966. *Dicrurus leucophaeus hopwoodi* Baker
Ashy Drongo

General information : Common resident in open forest and cultivation from the foothills up to c. 9,000' Partial altitudinal migrant. Arboreal (canopy bird). Strict territory minded. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 8♂ and 3♀. Ali (1962) obtained 1♂.

971. *Dicrurus aeneus* Vieillot
Bronzed Drongo

General information : Common resident in open forest and cultivation from the foothills up to c. 9,000' Partial altitudinal migrant. Arboreal (canopy bird). Strict territory minded. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) procured 1♀ at Gangtok in July. Ali (1962) obtained 1♀. N.Z.C. 1 unsexed. Dikchu, Sikkim (c.600 m) 31.01.1953.

972. *Dicrurus remifer* (Temminck)
Lesser Racket-tailed Drongo

General information : Common resident in all kinds of dense forest from the foothills up to c. 3,000' Arboreal. Insectivorous. Keeps in pairs or small parties.

Collection records : Schafer (1938/39) procured 3♂. Ali (1962) obtained 1♂ and 1♀. N.Z.C. 1♂. Martam, Rongni Valley, Sikkim. (c.650 m) 18.12.1952.

Other records : Stevens (1923-25), Schafer (1938/39) and Ali (1962) noted at Rangpo, Martem and Dikchu between November – May.

Remarks : Gammie (1877) noted a nest at Rashap (Teesta Valley), c. 1,800' which is the highest limit so far in Sikkim.

973. *Dicrurus hottentotus* (Linnaeus)
Spangled Drongo

General information : Common resident in open forest and cultivation from the foothills up to c. 9,000'. Partial altitudinal migrant. Arboreal (canopy bird). Strict territory minded. Insectivorous. Keeps single or in pairs.

Collection records : Schafer (1938/39) obtained 3♂ and 1♀. Ali (1962) collected 4♂.

Family ARTAMIDAE
Woodswallow/Swallow-Shrikes

India : 2 Species and subspecies.

Sikkim : 1 Species. 50% of the Indian population.

Birds with bill like Shrike and flight resembles with Swallow. Mostly seen perched in wires. Birds with chunky body and soft plumage.

982. *Artamus fuscus* Vieillot
Ashy Woodswallow

General information : Rare summer visitor in the open forest and edge of the cultivation from the foothills up to c. 5,500'. Arboreal. Insectivorous. Keeps in small parties.

Other records : Stevens (1923-25) mentioned it as summer visitor in Sikkim up to c. 5,500'. Arrives in the Rungbong Valley during March April and leaving the valley in the late October. Ali (1962) noted it between Kewzing and Pemionche in March – a party of about 15 birds.

Family CORVIDAE

Crows, Jays, Treepies Magpies and Chough

India : 24 Species and subspecies

Sikkim : 12 Species and subspecies. 50 % of the Indian population.

The family of largest passerine birds with stout and powerful bills. Crows and most Magpies lives within vicinity of human habitation, while Jays live in the forest. Gregarious and Omnivorous in habit. Sexes mostly alike.

1021. *Garrulus glandarius interstinctus* Hartert
Eurasian Jay

1026. *Urocissa flavirostris flavirostris* (Blyth)
Yellow-billed Blue Magpie

1023. *Cissa chinensis* (Boddaert)
Common Green Magpie

1032. *Dendrocitta vagabunda vagabunda*
(Latham)

Indian Treepie

1038, 1039. *Dendrocitta formosae himalayensis* Blyth
Grey Treepie

1035. *Dendrocitta frontalis* Horsfield
Black-browed Treepie

1044. *Nucifraga caryocatactes macella* Thayer & Bangs
Spotted Nutcracker

1046, 1047. *Pyrrhocorax pyrrhocorax himalayanus* (Gould)
Red-billed Chough

1045. *Pyrrhocorax graculus* (Linnaeus)
Yellow-billed Chough

1049. *Corvus splendens splendens* Vieillot
House Crow

1054. *Corvus macrorhynchos intermedius* Adams
Jungle crow

1060. *Corvus corax tibetanus* Hodgson
Common Raven

1021. *Garrulus glandarius interstinctus* Hartert
Urasian Jay

General information : Uncommon resident in the conifer forest from 7,000' to 11,000' in summer and semi-tropical jungle down to c. 3,500' in winter. Arboreal. Sociable. Omnivorous. Keeps in pairs or in mixed hunting flocks.

Collection records : Ali (1962) obtained 1♂ and 1♀ at Lachung, 9,000'

1026. *Urocissa flavirostris flavirostris* (Blyth)
Yellow-billed Blue Magpie

General information : Uncommon resident in the conifer forest from 7,000' to 11,000' in summer and semitropical jungle down to c. 3,500' in winter. Arboreal. Sociable. Omnivorous. Keeps in pairs or in mixed hunting flocks.

Collection records : Schafer (1938/39) obtained 12♂ and ♀. Ali (1962) secured 1♂. N.Z.C. 2♀, Lachung, N. Sikkim, 2600 m. (approx.), 20.06.1953; Menam, S. Sikkim, 23.05.1990.

1027. *Urocissa erythrorhyncha occipitalis* (Blyth)
Red-billed Magpie

Ali (1962) reported that it may extends into Western Sikkim, but is rare.

1023. *Cissa chinensis* (Boddaert)
Common Green Magpie

General information : Common resident in all types of forest including edge of the cultivation from the foothills up to c. 5,500' Arboreal. Mostly curnivorous. Keeps single or in mixed parties.

Collection records : Schafer (1938/39) obtained 10♂ and ♀. N.Z.C. 2♂, Yakum, W. Sikkim, 5840', 20.06.1989; 19.06.1990; 3♀, 10 unsexed, Gangtok, Dikchu and Rinchinpong Valley, Sikkim; 15, 31.01.1953; 27.08.1977.

1038. *Dendrocitta formosae himalayensis* Blyth
Grey Treepie

General information : Common resident in all types of forest and open cultivation from the

foothills up to 7,000' Arboreal. Sociable. Omnivorous. Keeps single or in pairs.

Collection records : N.Z.C. 2♂ Yaksum, W. Sikkim, 5840', 16.06.1990. 1♀ Tumin, E. Sikkim, 1800 m., 24.04.1988; 2♂, Gyalshing, W. Sikkim, Ranipal, Sikkim. 18, 22.05.1978.

1035. *Dendrocitta frontalis* Horsfield
Black-browed Treepie

Ali (1962) noted it as uncertain status in Sikkim, but stated to be recorded from Sikkim at 5,000' elevation.

1030. *Pica pica bottanensis* (Delessert)
Black-billed Magpie

Ali (1962) remarked that according to Baker (F.B.I. 1 : 41) it is distributed and also breed in Sikkim between 10,000' and 15,000' Ali further reported of Mandelli's collection (2 example) from Sikkim in 1873 and another in 1874 from Tibetan frontier. Since then there is no record.

1041. *Pseudopodoces humilis* (Hume)
Hume's Groundpecker

Meinertzhagen (1927) and Schafer (1938/39) recorded it at Gyagong, c. 14,800' 15,750' and obtained 3♂ and 3♀. Hingston and Bailey also recorded it at Thangu, 14,300'

1044. *Nucifhraya caryocatactes macella*
Thayer & Bangs
Spotted Nutcracker

General information : Uncommon residents in the tall conifer forest with alpine meadows between 9,000' and 12,000' Arboreal (canopy bird). Restless and noisy. Graminivorous (Pine seeds). Keeps single or in pairs.

Collection records : Schafer (1938/39) obtained 19♂ and ♀. Z.S.I (1953) procured 1♂ and 1 unsexed at Lamteng and Lachen.

1047. *Pyrrhocorax pyrrhocorax himalayanus*
Gould
Red-billed Chow

General information : Common resident in open rocky hillsides and alpine pastures from

c. 9,000' to 18,000' Marked altitudinal migrant. Terrestrial. Omnivorous. Keeps in small to very large flocks.

Collection records : Meinertzhagen (1927) obtained 2♂. N.Z.C. 1♂, Lachung, N. Sikkim, c. 2600 m. (approx.) 19.01.1957; 3♀. Thangoo, 14 - 15.07.1989; Gayagong, c 4520 m. (approx) 15, 22.07.1989.

1045. *Pyrrhonorax graculus* (Linnaeus)
Yellow-billed Chow

General information : Common resident in open rocky hillsides and alpine pastures from c. 9,000' to 18,000' Marked altitudinal migrant. Terrestrial. Omnivorous. Keeps in small to very large flocks.

Collection records : N.Z.C. 1♂. Gayagong, 4520 m., 22.07.1989.

1049. *Corvus splendens splendens* Vieillot
House Crow

General information : Resident and local migrant, up to c. 5,800'

Collection records : Schafer (1938/39) collected 1♂ and 1 unsexed at Gangtok.

Other records : Ali (1962) noted a population at Gangtok, c. 5,800' F.N. Betts noted a vagrant pair at Lachung, c. 9,900'

1054. *Corvus macrorhynchos intermedius* Adams
Jungle Crow

General information : Fairly common in the forest country and villages from the foothills up to c. 10,000'

Collection records : Meinertzhagen (1927) and Schafer (1938/39) collected specimens at Lachen and Gangtok. N.Z.C. 1♀. Dzongri, W. Sikkim, 10,200', 10.6.1990.

Remarks : Both the sub-species *intermedius* and *levallanti* are distributed in Sikkim. *levallanti* is a form of lower altitude whereas *intermedius* is of higher altitudes.

1056. *Corvus macrorhynchos tibetosinensis*
Kleinschmidt & Weigold
Tibetan Jungle Crow

Collection records : N.Z.C. 2♀. Yumthang, N. Sikkim, 02.07.1989; Deorali, S. Sikkim, 24.05.1990.

1060. *Corvus corax tibetanus* Hodgson
Tibet Raven

Collection records : N.Z.C. 1♀ Gayagong, 4520 m. 22.07.1989.

1060. *Corvus corax tibetanus* Hodgson
Common Raven

Ali (1962) noted it as resident, between 13,000' and 16,000' in the topical tibetan plateau country in N. Sikkim.

SUMMARY

This paper is dealt with the collections now preserved in the National Zoological Collection. Altogether 610 species and subspecies of birds are listed in this paper, out of which 422 species and subspecies of birds are dealt with in ornithological account. These 422 species and subspecies of birds either have collection records or noted by different ornithologist from time to time.

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REPTILIA

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INTRODUCTION

Owing to its topography, geographical positions, high rainfall and humidity, the state of Sikkim occupies an interesting place in the study of reptilian fauna of India. Except a few stray reports by some earlier workers like Gray (1853), Shaw *et. al.* (1939), Frazier (1986), and Smith's works on the reptilian fauna of India (1931, 35 and 1943), no other consolidated account of reptilian fauna of Sikkim is available in literature.

So this will be the first consolidated faunal account of reptiles of Sikkim which is mainly based on the studies on the reptilian collections made by different survey parties of Zoological Survey of India from 1949 to 1992. A few example collected prior to that and available with the named collections of Reptilia Section of the department have also been utilized for giving a complete account of the reptilian fauna of Sikkim. However, present study includes 31 species under 23 genera and 7 families. Species marked with asterisk have been reviewed from literature.

The authors feel that number of species may increase, if survey and study can be undertaken in some difficult terrains in the state that are still left unexplored for reptilia due to some reasons.

MATERIAL AND METHOD

Reptiles are either aquatic, terrestrial or arboreal. Aquatic form has been collected by the help of water net cast net, and fishing hook. Both terrestrial and arboreal forms have been collected by hand of long survey forceps. The reptiles

reported in this paper have been collected by parties of Zoological Survey of India from different ecological niches of Sikkim State. In the field, notes have been taken regarding the habits and habitats of reptiles. For collection aquatic vegetations, scraby jungles, heap of rotton leaves or straw burrows, dark corners of village huts, under surface of barks of trees, soil under stones etc. are explored. Nocturnal forms has been explored by the help of lamps. The collected material are first cloroformed and then put into 5% formalin solution at least for 24 hours for fixation. Before putting in formalin, an incision on the abdomen for the bigger specimens, and injection of 10% formalin solution inside abdomen for smaller specimens are given for the fixation of vicera. The fixed material alongwith labels containing the data of locality, altitude, habitat, date of collection and name of the collector, are packed properly and kept in 5% formalin solution again. The materials collected in the field are brought to laboratory. After unpacking the materials, they are washed thoroughly in water and placed them in 95% rectified spirit. The materials are studied and identified with the help of literature in the laboratory.

SYSTEMATIC LIST

(* Species likely to occur; not yet recorded)

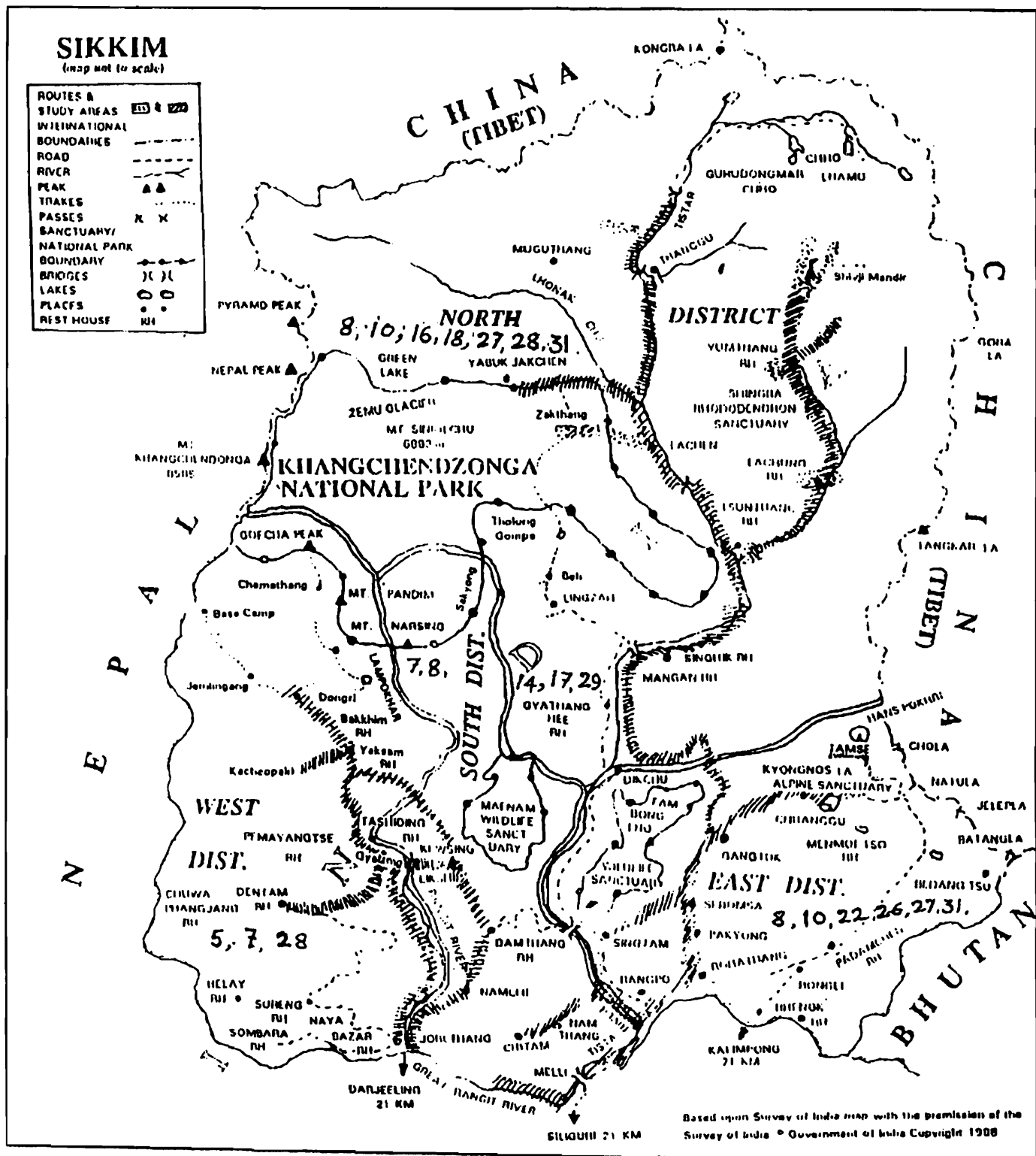
Class REPTILIA

Order TESTUDINES

Suborder CRYPTODIRA

Family 1. TRIONYCHIDAE

*1. *Lissemys punctata andersoni* Webb.



Map showing locality-wise distribution of the species

Order SQUAMATA

Suborder SAURIA

Family 2. GEKKONIDAE

- *2. *Hemidactylus bowringii* Gray
- *3. *Hemidactylus brooki* Gray
- 4. *Hemidactylus garnoti* Dumeril & Bibron
- 5. *Hemidactylus frenatus* Dumeril & Bibron
- *6. *Cosymbotus platyurus* (Schneider)

Family 3. AGAMIDAE

- 7. *Calotes versicolor* (Daudin)
- 8. *Japalura variegata* Gray
- 9. *Japalura tricarinata* (Blyth)

Family 4. SCINCIDAE

- 10. *Scincella Sikimmensis* Blyth
- 11. *Sphenomorphus indicus* (Gray)
- *12. *Sphenomorphus maculatum* (Blyth)
- *13. *Mabuya carinata* (Schneider)

Suborder SERPENTES

Family 5. TYPHLOPIDAE

- 14. *Ramphotyphlops braminus* (Daudin)
- 15. *Typhlops porrectus* Stoliczka

Family 6. COLUBRIDAE

- 16. *Amphiesma platyceps* (Blyth)
- 17. *Amphiesma stolata* (Linnaeus)
- 18. *Amphiesma khasiensis* (Boulenger)
- 19. *Xenochrophis piscator* (Schneider)
- 20. *Dendrelaphis tristis* (Boulenger)
- 21. *Ophitis aulicus* (Linnaeus)
- 22. *Oligodon albocinctus* (Cantor)
- 23. *Pseudoxenodon macrops* (Blyth)
- 24. *Rhabdophis subminiatus* (Schlegel)
- 25. *Sibynophis collaris* (Gray)
- 26. *Trachischium fuscum* (Blyth)
- 27. *Trachischium guentheri* Boulenger
- 28. *Elaphe porphyracea* (Cantor)
- 29. *Liopeltis rappi* (Gunther)
- 30. *Dinodon gammiei* (Blanford)

Family 7. VIPERIDAE

- 31. *Trimeresurus monticola* Gunther

SYSTEMATIC ACCOUNT

Class REPTILIA

Order TESTUDINES

Suborder (i) CRYPTODIRA

Family 1. TRIONYCHIDAE

Genus 1. *Lissemys* Smith, 1931

*1. *Lissemys punctata andersoni* Webb.
Indian Flap-shell Turtle

1788. *Testudo punctata* lace'pe'de, *Hist Quad. Ovip.* 2 : 446.

1931. *Lissemys punctata* Smith, *Fauna Brit. Ind.* 1 : 157.

1982. *Lissemys punctata andersoni* Webb *Amphibia-Reptilia* 3 : 179-184.

Material examined : Nil; description based on the published literature.

Description : Carapace is olive-green with dark yellow blotches, cream or pale yellow below. The head is olive yellow blotches.

Distribution : The Indian flapshell turtle is widely distributed in the Indian subcontinent. The subspecies *andersoni* is found in northern India, Pakistan, Bangladesh and Nepal, in areas watered by the Indus, Ganga, Brahmaputra, and their tributaries.

Remarks : A commercially valuable and heavily exploited species still abundant in any areas in the region, perhaps because of its ability to adopt to variety of environments.

Status : Still common in many relatively undisturbed environments. Protected under Schedule I of the Indian Wildlife (Protection) Act, 1972.

Order SQUAMATA

Suborder (ii) SAURIA

Key to families of suborder SAURIA

- 1. Tongue slender, forked VARANIDAE
- Tongue neither slender nor forked 2
- 2. Top of head with symmetrical shields 3

- Top of head without symmetrical shields.....
..... AGAMIDAE
- 3. Femoral pores present GEKKONIDAE
- Femoral pores absent SCINCIDAE

Family 2. GEKKONIDAE

Key to genera of family GEKKONIDAE

- 1. Digits free HEMIDACTYLUS
- Digits webbed COSYMBOTUS

Genus 2. *Hemidactylus* Oken, 1987

Key to species of genus *Hemidactylus*

- 1. Enlarged dorsal tubercles numerous, strongly keeled, arranged in regular longitudinal series *brookii*
- Enlarged dorsal tubercles not numerous, feebly keeled, not arranged in regular longitudinal series 2
- 2. Tail with denticulated lateral edge
..... *garnoti*
- Tail without denticulated lateral edge 3
- 3. Inner toe not half the length of the second ..
..... *frenatus*
- Inner toe more than half the length of the second *bowringii*

*2. *Hemidactylus bowringii* (Gray)

- 1845. *Doryura bowringii* Gray, *Catal. spec. Liz. Brit. Mus.* 156.
- 1890. *Menidactylus bowringii* Boulenger, *Fauna Brit. Ind.* 93.

Material examined : Nil; report from published literature.

Description : Inner toe more than half the length of the second. Belly with smooth, rounded, imbricate scales. Light brown above with darker spots arranged to form four longitudinal streaks down the back. A dark streak along the side of the head.

Distribution : India : Sikkim, Darjeeling (W. Bengal).

Elsewhere : Chittagong (Bangladesh), Myanmar (Burma); Hongkong ; S. China.

Status : Indeterminate

*3. *Hemidactylus brookii* (Gray)

Brooks Gecko

- 1845. *Hemidactylus brookii* Gray *Catal. Spec. Liz. Coll. Brit. Mus.* : 153.

- 1935. *Hemidactylus brooki* Smith, *Fauna of British India*, 2 : 89-91.

Material examined : Nil; description based on the published literature.

Description : Head moderate large; body flattened dorsolaterally; Enlarged dorsal tubercles numerous, strongly keeled, arranged in regular longitudinal series. Colour brown or varying shades of gray with brown spots, whitish below.

Distribution : India : Sikkim.

Elsewhere : Occuring throughout the Indian subregion.

Remarks : It is a domestic Gecko, often found quite away from human buildings. It lives in a variety of habitats, on trees, rocks, under stones and on buildings.

Status : Common.

4. *Hemidactylus garnoti* Dumeril & Bibron.

Assam greyish-Brown Gecko

- 1836. *Hemidactylus garnotii* Dum & Bir., *Erpital Gen. paris* 3. : 368

Material examined : 2 ex., Sikkim, Coll. Stoliczka, 2 ex., Sikkim Coll. H. E. Lord Carmichal.

Diagnostic character : Head large, snout obtusely pointed 11 to 13 upper & 9 to 12 lower labials; outer pair of postmentals not in contact with the infralabials; back with unifrom small granules, belly with smooth rounded, imbricate. Greyish-brown above speckled or indistinctly marbled with darker; small white spots, commonly present; a dark streak along the side of the head. Whitish below. Tail with denticulated lateral edge.

Distribution : India : Sikkim as mentioned in the material examined Darjeeling (West Bengal); Assam.

Status : Common.

***5. *Hemidactylus frenatus* Dumeril & Bibron
Southern House Gecko**

1836. *Hemidactylus frenatus* Dumeril & Bibron *Erpital Gen. paris* 3 : 366

Material examined : 1 ex., Nayabazar, W. Sikkim, 16.iii.1992, coll. S. Sur.

Diagnostic character : Head large, snout obtusely pointed 10-12 upper and 8-10 lower labials; hinder part of the head covered with small granules, snout with larger ones; back with small granules intermixed with scattered rounded tubercles. Dark brownish dorsally and dirty whitish below. A dark stripe through the eye to the sides of groin. Flanks with dark spots. Inner toe not half the length of the second.

Distribution : India : Sikkim (First record) as mentioned in the material examined; widely distributed in South India.

Elsewhere : Sri Lanka, Southern Indo-China.

Remarks : This species is found quiet often in the bark of trees, beneath debris in outdoor locations.

Status : Common.

Genus 3 *Cosymbotus* Fitzinger, 1843

***6. *Cosymbotus platyurus* (Schneider)
Frimed House Gecko**

1792. *Stellio platyhrus* Schneider, *Amphib. physiol* 2 : 30.

1922. *Cosymbotus platyurus* Taylor, *Liz. Philipp. Is* : 59.

Material examined : Nil; description based on the published literature.

Description : Head moderate, snout obtusely pointed, distinctly longer than the distance between the eye and the ear-opening. Grey or greyish-brown above, marbled and spotted with darker, a vertebral series of large, dark paired spots often present, continued on to the tail as dark cross-bars.

Distribution : India : Sikkim, Darjeeling district (West Bengal).

Elsewhere : Nepal; Indo-China; Hong-Kong.

Remarks : Smith reports it from Sikkim.

Status : Common.

Family 3. AGAMIDAE

Key to genera of family AGAMIDAE

Dorsal scales equal *Calotes*

Dorsal scales unequal *Japalura*

Genus 4 *Calotes* Rafinesque, 1815

7. *Calotes versicolor* (Daudin)

Indian Garden Lizard

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

1853. *Calotes versicolor* : Jerdon, *J. Asiat Soc. Beng.* 22 : 470.

Material examined : 4 ex., Nayabazar, West Sikkim, 16.iii.1992; Coll. S. Sur, 2 ex., Milli, S. Sikkim, 18.iii.1992, Coll. S. Sur, 3 ex., Sikkim, 7.ix.1904. coll. R. A. Hodgort.

Diagnostic character : Body compressed, dorsal scales strongly keeled and more or less larger than ventrals. Two spines separated from each other on ear. Dorsal nuchal crest well developed extending far behind. Tail long and rounded. Adult greyish brown above with dark transverse bars. Belly whitish, with dark streaks. Tail dark brown with cross bars.

Distribution : India : Sikkim as mentioned in the material examined.

Elsewhere : Widely distributed throughout the Indian subcontinent and most of SE Asia.

Remarks : An arboreal, diurnal lizard of gardens, hedges, scrubby jungles and forest.

Status : Common.

Genus 5. *Japalura*, Grey, 1853

Key to species of genus *Japalura*

Tympanum concealed *Variegata*

Tympanum naked *Tricarinata*

**8. *Japalura variegata* Gray
East Himalayan Mountain Lizard**

1853. *Japalura variegata* Gray, *Ann. Mag. Nat. Hist.* (2)
12 : 388.

Material examined : 1 ex., Jumin, East Sikkim, 28.ix.1988, coll. V. C. Agrawal, 1 ex., Rabangla, South Sikkim, Coll. V. C. Agrawal, 2 ex., Chumthang, North Sikkim, 15.iv.1992. J. K. Prasad.

Diagnostic Character : Head scales keeled; tympanum concealed with small scales, Body compressed; dorsal scales small, unequal, keeled with larger ones. Leg reaches to the eye or beyond, scales of gular sac very small nuchal crest of male set on a fold of skin; usually a black spot on the throat. Olive brown or green above with lighter and darker markings, a white stripe along the side of the neck.

Distribution : India : Sikkim as mentioned in the material. It also found in Darjeeling and Jalpaiguri district, (West Bengal).

Remarks : Its habits were chiefly terrestrial. It has considerable power of changing its colour.

Status : Indeterminate.

**9. *Japalura tricarinata* Blyth
Sikkims Mountain Lizard**

1854. *Calotes tricarinatus* Blyth, *Jour. Asiatic. Soc. Bengal.* 22 : 650.

1935. *Japalura tricarinata* Smith *Fauna Brit. Ind.* 2 : 169.

Material examined : 1 ex. Sikkim, Oct. 1871, Coll. W. S. Alkinson.

Diagnostic character : Head scales large unequal; a prominent crest of 6 or 8 conical scales on each side of the back of the head, 5 to 7 upper labials. Tympanum necked. Body not compressed, dorsal scales very unequal, the larger ones strongly keeled. No trace of a gular pouch. No nuchal or dorsal crest. Tail round covered with keeled scales. Pale brownish above, uniform or with dark brown, V-shaped marking upon the back, tail dirty whitish below.

Distribution : India : Sikkim as mentioned in the material. It is also found in Darjeeling district (West Bengal).

Remarks : A terrestrial species. It is found generally under large stones.

Status : Indeterminate.

Family 4. SCINCIDAE

Key to genera of family SCINCIDAE

1. Pterygoid bones separated from one another, the palatal notch extending forwards to the level of the centres of the eyes ***Mabuya***
Pterygoid bones usually in contact anteriorly, the palatal notch not reaching to the level of the centres of the eyes 2
2. Limb usually well developed, tympanum sunk, Lower eyelid scaly ***Sphenomorphus***
Lower eyelid with a transparent disc ***Scincella***

Genus 6 *Scincella* Mittleman, 1950

**10. *Scincella sikkimensis* (Blyth)
Bronzy-brown Ground Skink**

1953. *Mococa sikkimensis* Blyth *Jour. Asiatic. Soc., Bengal* 22 : 652.

1952. *Scincella sikkimense* Mittleman, *smithsonian, Misc. Coll.* washington 117 (17) : 30.

Material examined : 3 ex., Jumin, E. Sikkim, 28.vii. to 1.x.1988. Coll. V. C. Agarwal, 2 ex., N. Sikkim 1978, Coll. S. M. Ali.,

Diagnostic character : Ear without projecting lobules, ear opening small, 22 to 24 scales round the body, digits more compressed, 15 to 17 lamellae beneath the 4th toe. Lower eyelid with a transparent disc. Back is with small gold spots arranged in longitudinal series; a dark-brown streak on the dorso-lateral aspects of head, neck and body; flanks are generally with white spots.

Distribution : India : Sikkim : as mentioned in the material examined. It is also found in Darjeeling dist. (West Bengal), North Bengal, Bihar.

Remarks : Strictly terrestrial (300 to 1000 metres) subarboreal, insectivorous diurnal and oviparous.

Status : Common.

Genus 7. *Sphenomorphus* Fitzinger, 1843

Key to species of genus *Sphenomorphus*

1. Rostral convex 30-38 scales round the body *Indicus*
- Rostral flat or concave 38-42 scales round the body *Maculatus*

**11. *Sphenomorphus indicus* (Gray)
East-Himalayan Forest Skink**

1853. *Hinulia indicus* Gray, *Ann. Mag. Nat. Hist. London* 2, 12 : 388.

1912. *Sphenomorphus indicus* J. Van Denburgh *Proc. California Acad. Sci. San Francisco Ser. 4* (3) : 230.

Material examined : 1 ex., Sikkim, Coll. T. D. Lalouche.

Diagnostic character : Snout short obtuse, rostral convex, prefrontals always separated from one another 7 supralabials, the 5th & 6th below the eye, body scales are smooth 30 to 38 scales round the body. Colouration is uniform brownish or with small brown or black spots arranged in longitudinal series, a black or dark brown stripe along the lateral aspect of head and tail.

Distribution : India : Sikkim as mentioned in the material. Darjeeling Dist. (West Bengal).

Elsewhere : The whole of Indo-Chinese sub region.

Remarks : Insectivorous, terrestrial and oviparous.

Status : Becoming rare on account of habitat loss.

***12. *Sphenomorphus maculatus* (Blyth)
Sikkimese Forest Skink**

1853. *Lissonota maculata* Blyth, *Jour. Asiatic. Soc. Bengal, Calcutta*, 22 : 653.

1935. *Sphenomorphus maculatus* Pope, *Rept. China*, New York : 483.

1935. *Sphenomorphus maculatus* Smith, *Fauna Brit. Ind.* 2 : 285-286.

Material examined : Nil; description based on published literature.

Description : Snout is short and obtusely pointed; Rostral flat or concave, 38-42 scales round the body; a pair of large preanal scales is present; tail tapering gradually to point, almost two times longer than the head and body, the median row of scales on the underside are transversely enlarged. The dorsal colouration is bronzy or dark brown, generally with faint, small golden-green spot and two median series of small black spots. Lower flanks are profusely dotted with black and white, belly is whitish.

Distribution : India : Sikkim, Asam, West Bengal, Andaman and Nicobar Islands.

Elsewhere : Myanmar (Burma), Southern China, Thailand, South Vietnam, North Vietnam.

Remarks : This is a terrestrial, low-mountain dwelling species, ascends upto 800 metres. Insectivorous, diurnal and oviparous.

Status : Population is reducing on account of habit loss.

Genus 8. *Mabuya*, Fitzinger, 1826.

***13. *Mabuya carinata* (Schneider)
Common Indian Skink**

1801. *Scincus carinatus* Schneider, *Hist. Amphib.* 2 : 183.

1935. *Mabuya carinata*, Smith, *Fauna Brit. Ind.* 2 : 266-268.

Material examined : Nil; description based on published literature.

Description : Head with enlarged scales arranged symmetrically. Body covered with cycloid imbricate scales. Lower eye-lid scaly, No femoral or preanal pores. Limbs well developed. Colouration is olivaceous-brown or of shining bronze colour dorsally; a longitudinal lines along the lateral margin of the scales. Lateral aspects are dark brown of slightly lighter in colour generally with brown spots.

Distribution : India : Sikkim. Cachar, Naga Hills and Sibsagar in Assam.

Elsewhere : Indo-Chinese subregion.

Remarks : Insectivorous, diurnal, terrestrial and viviparous. Observation made on in the field survey by the author.

Suborder (iii) SERPENTES

Family 5. TYPHLOPIDAE

Key to genera of Family TYPHLOPIDAE

Nasal suture terminating at the edge of preocular *Ramphotyphlops*

Nasal suture not terminating at the edge of preocular *Typhlops*

Genus 9 *Ramphotyphlops*, Fitzinger, 1843

14. *Ramphotyphlops braminus* (Daudin) Common Blind Snake

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

1980. *Ramphotyphlops braminus* Nussbaum, *Herpetologica*, Lawrence 36 : 215.

Material examined : 3 ex., Jorhang, S. Sikkim, 17.iii.1992; Coll. S. Sur.,

Diagnostic character : Head bluntly rounded. Eyes indistinct. Rostral large, snout rounded; 4 upper labials, last two in contact with ocular, Nasal suture terminating at the edge of preocular. Body uniformly cylindrical. Tail very short ending in a small sharp still points brown or blackish brown above, lighter below; snout, anal region and end of tail pale.

Distribution : India : Sikkim : as mentioned in the material.

Elsewhere : Throughout the Oriental region, Africa, Mexico and New Guinea.

Remarks : Liver beneath the soil, or stones or debris. They have also been found in floodplain forest under logs. Often seen inside houses.

Status : The most widespread species of the genus.

Genus 10 *Typhlops* Dumeril and Bibron, 1844

15. *Typhlops porrectus* Stoliczka Slender Worm Snake

1871. *Typhlops porrectus* stoliczka, *Jour. Asiatic. Soc. Bengal. Calcutta* : 11 : 426.

Material examined : 1 ex., Sikkim, Coll : Lord Carmeicheal.

Diagnostic character : Breadth of rostral 1/3 to 1/2 that of the head, nasal incompletely divided, 18 scales round the body, the diameter of which is contained 50 to 60 times in the total length. Blackish or brown above, pale below; snout; chin and anal region usually whitish.

Distribution : India : Sikkim : as mentioned in the material. Punjab, Bihar, Orissa, Bengal, Maharashtra, Bangalore (Karnataka).

Elsewhere : Sri Lanka, Upper Myanmar (Burma).

Status : Common.

Family 6. COLUBRIDAE

Key to the genera of Family COLUBRIDAE

1. Hypapophyses developed throughout the vertebral column 2
2. Hypapophyses not developed on the posterior dorsal vertebral 3
3. Dentary bone freely movable on the articular; 30-50 maxillary teeth present
..... *Sibynophis*
- Dentary bone not freely movable on the articular; usually less than 30 maxillary teeth 4
4. Posterior maxillary teeth longest 5
5. Posterior maxillary teeth equal 9
6. Scales in 15-19 rows, not disposed obliquely 7
7. Hemipenis extending to the 7th caudal plate *Rhabdophis*
- Hemipenis extending beyond 7th caudal plate 8

8. Inner nasal distinctly narrowed anteriorly *Xenochrophis*
 – Inner nasal broadly truncate anteriorly *Amphiesma*
9. Maxillary teeth 20-22, those in the middle not longer than the others *Trachischium*
10. Some of the anterior maxillary teeth enlarged and fang-like; pupil vertically elliptic *Ophites*
11. Scales with apical pits *Oligodon*
 – Scales in 17 rows *Dinodon*
 – Scales without apical pits *Liopeltis*
12. Scales in 19-27 rows *Elaphe*
 – Scales in 13-15 rows *Dendrelaphis*

Genus 11. *Amphiesma* Dumeril & Bibron, 1854

Key to species of genus *Amphiesma*

1. Posterior maxillary teeth gradually enlarged *Khasiensis*
2. Last 2 or 3 maxillary teeth abruptly enlarged 3
3. Internasals much narrowed anteriorly *Stolata*
 – Internasals not narrowed anteriorly *Platycephs*

16. *Amphiesma platycephs* (Blyth)

Mountain Keelback

1854. *Tropidonotus platycephs* Blyth. *Jour. Asiatic Soc. Bengal, Calcutta* 23 : 297.

1960. *Amphiesma platycephs* Malnate, *Proc. Acad. Nat. Sci. Philadelphia*, 112 : 50

Material examined : 1 ex., Chunthang, North Sikkim, 2.viii.1979, 2 ex., Changme, Khamphu glacier, N. Sikkim, August-Sept., 1978, All collected by S. M. Ali.

Diagnostic character : Body slender, nostrils lateral, internasals not narrowed anteriorly.

Colouration very variable. Olive brown above with small black spots. Lips white or yellow, belly yellowish, with or without blackish dots.

Distribution : India : Sikkim as stated in the material. India (From Kashmir eastward to Assam).

Elsewhere : Nepal, China.

Status : A Common snake in Darjeeling district (West Bengal) at between 5,000 to 6000ft.

17. *Amphiesma stolata* (Linnaeus)

Striped Keelback

1758. *Coluber stolatus* Linnaeus *Syst. Nat. ed*, 10, 1 : 219.

1854. *Amphiesma stolatum* Dumeril and Bibron, *Erpetol. Gen. paris*, 7 (1) : 727

Material examined : 1 ex., Milli, S. Sikkim, 22.iii.1992, Coll. S. Sur.,

Diagnostic character : No nuchal groove, internasals narrowed anteriorly, 1 preocular, 8 supralabials 3rd, 4th and 5th touching the eye. Scales in 19 rows, strongly keeled except the outer row. Body tapers to vent, pupil round, flecked with gold. A pair of conspicuous buff stripes covering one whole or two half rows of scales front neck or forebody to tip of tail. Some black or blackish irregular cross-bars on body. Head olivaceous brown. Belly white with some small scattered black spots.

Distribution : India : Sikkim as stated in the material. Found throughout India both in the plains and hills.

Elsewhere : Also from Sind in the west to south China in the east, Indochina.

Remarks : It inhabits banks of rivers etc. and marshy areas.

Status : Common.

18. *Amphiesma khasiensis* (Boulenger)

Khasi Keelback

1890. *Tropidonotus khasiensis* Boulenger, *Fauna Brit. India, Rept. Batrach.*, London : 344.

1960. *Amphiesma khasiensis* Malnate, *Proc. Acad. Nat. Sci. Philadelphia*, 112 : 50.

Material examined : 1 ex., Toong 5 miles North of Manual alt 4,953, N. Sikkim, 21.v.1949, Coll. Dr. A. G. K. Menon.

Diagnostic character : Body slender; scales in 19 rows, keeled scales except the outer rows, temporals 1+1, 9 supralabials, 4th, 5th, and 6th touching the eye, Blackish-brown above with dorsolateral strips; ventrals and subcaudal yellowish, the outer margins brown; labials white in the middle, black on the borders.

Distribution : India : Sikkim as mentioned in the material. Assam.

Elsewhere : Myanmar (Burma), China, Laos and Vietnam.

Status : Common.

Genus 12. *Xenochrophis* (Gunther), 1864

19. *Xenochrophis piscator* (Schneider) Checkered Keelback

1999. *Hydrus piscator* Schneider, *Hist. Amph.* 1 : 247.

1935. *Natrix, piscator* pope, *Rept. China.* 120.

1965. *Xenochrophis piscator*, Malnate and Minton. *Proc. Acad. Nat. Sci. Philadelphia* 117 : 19

Material examined : 1 ex., Sikkim, 1915-16. Capt. Dracott.

Diagnostic character : Head distinct from neck, snout bluntly pointed, rostral wider than high, nostrills between nasals. One large loreal, eye with round pupil. Internasals distinctly narrowed anteriorly, 10 upper labials. 4th & 5th touching eye. 19 scale rows at midbody, scales of lateral rows smooth, those of median rows feebly keeled. Colour olive brown with five rows of small spots varying in size sometime occupying most of the back. Head olive brown with two black streaks one below and one behind the eye.

Distribution : India : Sikkim as mentioned in the material. It is found throughout the Indian subcontinent from Baluchistan to Assam.

Elsewhere : Upper Myanmar (Burma).

Remarks : It is very common in tanks, paddy fields, pools and river.

Status : The commonest freshwater snake.

Genus 13. *Dendrelaphis* Boulenger, 1890

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

1803. *Coluber tristis* Daudin, *Hist. Nat. Rept.* 6 : 430.

1894. *Dendrelaphis tristis*, Boulenger, *Catal. Snakes. Brit. Mus.* 2 : 88.

Material examined : 1 ex., Sikkim, Coll. C. H. Dracott.

Diagnostic character : Snout broadly rounded. Internasals shorter than the prefrontals, 15 scales at midbody. 9 upper labials, 5th & 6th touching the eye. Neck distinctly constricted, body long. Belly ridged on either side. Tail long and tapering. The back is bronze-brown in colour, which is marked with a distinctive dark stripe on the side. A yellow, back bordered flank stripe from neck to vent, upper lip yellow. A roundish yellow spot on parietal suture. Belly uniform cream yellow.

Distribution : India : Sikkim : As mentioned in the material. Peninsular India from Sind in north west and Darjeeling in the north east.

Elsewhere : Sri Lanka.

Remarks : It lives almost entirely on trees and shrubs. A diurnal snake and feed mainly on lizards and tree frogs.

Status : Common in the Himalayan foothills.

Genus 14. *Ophites* wagler, 1830

21. *Ophites aulicus* (Linnaeus) Common Wolf Snake

1758. *Coluber aulicus* Linnaeus, *Syst. Nat., ed.* 10 Stockholm, 1 : 220.

1923. *Ophites aulicus* Wall sp. zeylan., Colombo 12 : 257

Material examined : 1 ex., Sikkim, 1915-16; coll. C.H. Dracott.

Diagnostic character : Snout more or less spatulate and projecting beyond the lower jaw; anterior and posterior nasals subequal; loreal in contact with the internasal not touching the eye; 1 preocular. 17 scales at midbody, angulate laterally, 9 supralabials. Head depressed and

pearshaped. Neck slightly constricted. The colour is brown or grayish-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.

Distribution : India : Sikkim : as mentioned in the material. The whole of Indian subcontinent.

Elsewhere : Sri Lanka, Maldives-Islands, Myanmar (Burma) to Indo-China, South China, Malaya, Indonesia, Philippines.

Remarks : The snake most often seen near and in human habitations.

Status : One of the commonest snakes of the Indian plains.

Genus 15. *Oligodon* Boie, 1827

22. *Oligodon albocinctus* (Cantor)

White-barred Kukri Snake

1839. *Coronella albocincta* Cantor, *Proc. zool. Soc.*, London : 50.

1923. *Oligodon albocinctus* Wall, *Rec. Indian. Mus.*, Calcutta, 25 : 326.

Material examined : 2 ex., Jumin E. Sikkim, 24.ix.1988. Coll. Dr. V. C. Agrawal.

Diagnostic character : Ventral scales 177-208; subcaudals 40-69. 7 supralabials, 3rd and 4th touching the eye. Two distinct colour forms can be defined (Smith, 1943). Brown above with black or dark brown black-edged cross-bars; these may be simple bars, or large rounded spots. The dark cross-bars may disappear entirely with age, leaving the upper parts an almost brown colouration.

Distribution : India : Sikkim : as mentioned in the material. It is found in the E. Himalayas up to 5000ft.

Elsewhere : Myanmar.

Remarks : Mainly diurnal and seen often during the rainy season.

Status : A common snake in the Eastern Himalayas.

Genus 16. *Pseudoxenodon* Boulenger, 1890

23. *Pseudoxenodon macrops* Blyth

Darjeeling False Cobra

1854. *Tropidonotus macrops* Blyth, *Jour. Asiatic. Soc. Bengal Calcutta*, 23 : 296.

1890. *Pseudoxenodon macrops* Boulenger, *Fauna Brit. India, Rept. Batrach.*, London : 340.

Material examined : 1 ex., Sikkim, 7.i.1918. Coll. C. H. Dracott.

Diagnostic character : Head distinct from neck; eye large with round pupil. Body cylindrical; scales on the anterior part of the body disposed obliquely; keeled, 19 rows, ventral 151 to 180, caudal 55-80, body without cross bars. Brownish above a dorsolateral series of black spots, more or less distinct chevron-shaped mark on the nape yellowish below, posterior part of belly and tail coloured with black or dark gray.

Distribution : India : Sikkim as mentioned in the material. Darjeeling (West Bengal); Assam.

Elsewhere : Nepal through Myanmar and Thailand to Vietnam, south to Malay Peninsula.

Remarks : When excited it can flatten the neck in a marked degree.

Status : Common.

Genus 17. *Rhabdophis* Fitzinger, 1843

24. *Rhabdophis subminiatus* (Schlegel)

Red-necked keelback

1837. *Tropidonotus subminiatus*, Schlegel, *Essai Physion Serp.* The Hague, 2 : 313

1960. *Rhabdophis subminiata* Malnate, *Proc. Acad. Nat. Sci. Philadelphia*, 112 : 49

Material examined : 1 ex. Sikkim; Coll. C. H. Dracott.

Diagnostic character : Nuchal scales enlarged; nostrils lateral; 1 preocular; temporals 2+2, 8 supralabials 3rd, 4th and 5th touching the eye; scales in 19 rows, strongly keeled the outer row smooth. Olive brown above, black and yellow reticulations, and oblique black bar below the eye, belly yellowish.

Distribution : India : Sikkim : as stated in the material.

Elsewhere : India east through Indochina, South through Malay Peninsula and Indonesia.

Status : Common.

Genus 18. *Sibynophis*, Fitzinger, 1843

25. *Sibynophis collaris* (Gray)

Collared Black-headed Snake

1853. *Psammophis collaris* Gray, *Ann. Mag. Nat. Hist., London Ser. 2*, 12 : 390.

1930. *Sibynophis collaris*, Smith, *Bull. Raffles Mus., Singapore*, 3 : 40.

Material examined : 1 ex., Sikkim, 1915-16, Coll C. H. Dracott;

Diagnostic character : 1 anterior temporal in contact with the 9th labials supralabial; 4th to 6th touching the eye; parietal touches upper preocular only. Ventral scales 155 to 186, caudal 100 to 125. Brown above usually with a vertebral series of small black spots; head with small black spots and two black transverse bars, one behind the eye, the other across the occiput; nape black, bordered with yellow behind; upper lip white or yellow.

Distribution : India : Sikkim : as stated in the material. It is also found in Simla, Assam.

Status : Common in the eastern Himalayas.

Genus 19. *Trachischium* Gunther, 1858

Key to the Species of genus *Trachischium*

Belly dark brown*fuscum*

Belly not dark brown (Yellow)*guentheri*

26. *Trachischium fuscum* Blyth
Darjeeling Oriental Work Snake

1854. *Calamaria fusca* Blyth *Jour. Asiatic. Soc. Bengal, Calcutta*, 23 : 288.

1890. *Trachischium fuscum*, Boulenger, *Fauna Brit. India, Rept. Batrach.*, London : 285.

Material examined : 2 ex., Gangtok, E. Sikkim,

31.x.1928. Coll. F. M. Bailey, 1 ex., Jumin; East Sikkim; 26.x.1988. Coll Dr. V. C. Agrawal.

Diagnostic character : Prefrontal single, 1 postocular, temporals 1+2; Scales in 13 rows, base of the tail distinctly keeled. V 150-165, C 28-42. Dark brown or blackish above and below, more or less iridescent with or without indistinct light longitudinal streaks above.

Distribution : India : Sikkim : as stated in the material. It is found in the Himalayas from Gilgit to Darjeeling and Assam in the east.

Status : Common.

27. *Trachischium guentheri* Boulenger
Guenther's Oriental Worm Snake

1890. *Trachischium guentheri* Boulenger, *Fauna Brit. India. Rept. Batrach.*, London : 285.

Material examined : 6 ex., Tumin, East Sikkim; 26.x.1988, Coll. Dr. V. C. Agrawal, 6 ex., Zeema, N. Sikkim; 28.vii.1989, Coll. S. Chattapadhyaya, 3 ex., Rabangle, E. Sikkim, 7-8.x.1988, Coll. Dr. V. C. Agrawal.

Diagnostic character : Scales in 13 rows; strongly keeled in male on either side of the ventral, V. 132-154; C-30-43. Dark brown or reddish brown above with longitudinal streaks, yellowish below.

Distribution : India : Sikkim : as stated in the material. Darjeeling district (West Bengal).

Status : Common in the eastern Himalayas.

Genus 20. *Elaphe* Fitzinger, 1833

28. *Elaphe porphyracea* (Cantor)
Black-striped Trinket Snake

1839. *Coluber porphyraceus* Cantor, *Proc. Zool. Soc. London*, : 51.

1909. *Elaphe porphyracea* Vandemburgh, *Proc. California Acad. Sci. San Francisco*, Ser. 4, 3 : 53.

Material examined : 1 ex., Mangar, N. Sikkim, 11.iv.1992. Coll. J. K. Prasad, 1 ex., Gazing, W. Sikkim, 13.x.1959, Coll. Dr. B. K. Tikadar.

Diagnostic character : Scales in 19 rows, loreal a little longer than high, 8 supralabials, 4th and 5th touching the eye, V 190-218; C 52-76. A-2. Brownish above with cross bars, two black parallel dorsolateral lines present on the hinder part of the body and tail, a black stripe down the middle of the head and another on each sides, lower parts uniform yellowish.

Distribution : India : Sikkim : as stated in the material. Arunachal Pradesh Andaman.

Elsewhere : Myanmar to Thailand, Laos and northern Vietnam; Malay Peninsula and Indonesia.

Status : Common in the eastern Himalayan range.

Genus 21. *Liopeltis* Fitzinger, 1843

29. *Liopeltis rappi* (Gunther)

Himalayan Striped-neck Snake

1860. *Ablabes rappi* Gunther, *Proc. Zool. Soc. London* : 154.

1924. *Liopeltis rappi* Wall, *Jour. Bombay Nat Hist. Soc.* 29 (4) : 865.

Material examined : 1 ex., Ligship 16 km. west of Kewzin, S. Sikkim. 18.v.1962, Coll. G. Ramakrishna.

Diagnostic character : Head depressed; snout projecting twice as long as the eye; nostril large, 6 supralabials, 3rd and 4th touching the eye, 5th largest, temporals 1+1, Scales in 15:15:15 rows. v 178-195, C 60-76, A 2. Brown above with small black spots and lateral transverse bars on the anterior part of the body.

Distribution : India : Sikkim : as stated in the material. It is also found in the eastern western Himalayas, (Darjeeling) West Bengal, Assam.

Status : Common in the Himalayan range specially in the eastern zone.

Genus 22. *Dinodion*, Dumeril, 1853

30. *Dinodon Gammiei* (Blanford)

Sikkim False Wolf Snake

1978. *Ophites gammiei* Blanford, *Jour. Asiatic. Soc. Bengal, Calcutta*, 47 : 130

1923. *Dinodon gammiei* Wall, *Jour. Bombay Nat. Hist. Soc.* 29 : 615.

Material examined : 1 ex., Cinchona plantation, Sikkim; Coll. W. T. Blanford.

Diagnostic character : Head slightly distinct from neck, eye moderate with vertically elliptic pupil, body elongate; scale in 17 : 17 : 15 rows; loreal elongate; 1 pre and 2 post-oculars, temporals 2+2; 8 supralabials, 3rd ; 4th & 5th touching the eye, Body with white annuli irregular outline. Body with alternating black and yellow rings with very irregular margins, head black with light spots on most of the shields, a large light spot on each side of the posterior part of the head.

Distribution : India : Sikkim : as mentioned in the material. It is also found in the Eastern Himalayas.

Status : Indeterminate

Family 7. VIPERIDAE

Genus 23. *Trimeresurus* Lacepede, 1804

31. *Trimeresurus monticola* Gunther

Blotched Pit Viper

1864. *Trimeresurus monticola* Gunther, *Rept. Brit. India*, London : 388

Material examined : 2 ex., Tumin, East Sikkim, 24.ix.1988, Coll. V. C. Agrawal. 1 ex., Chunthang, N. Sikkim, 15.iv.1992, Coll. J. K. Prasad.

Diagnostic character : Eye with vertical pupil, head distinct from neck, upper surface of head covered with unequal smooth scales; ventral scales 127 to 176, caudal 36-62; subocular broken up into small scales. Brown above, with large, squarish dark brown spots or markings upon the back.

Distribution : India : Sikkim : As stated in the material. Common in the Eastern Himalayas as far west as Sikkim.

Elsewhere : The whole of the Indo-Chinese subregion.

Status : A common snake in the Himalayas.

SUMMARY

The paper deals with the reptilian fauna of Sikkim state based on the collections made from different areas in Sikkim between the years 1949 to 1992. A few examples collected prior to that and available with the named collections of reptilia section have also been utilized. It comprises 31 species under 23 genera and 7 families. *Hemidactylus frenatus* recorded for the first time from Sikkim. A chart and a map showing the distribution of the species in districtwise have also been provided in the paper.

Out of 31 species, 25 species have actually been collected from the above region, 6 species namely *Lissemys punctata andersoni*, *Hemidactylus bowringi*, *Hemidactylus brookii*,

Cosymbotus platyurus, *Sphenomorphus maculatum* and *Mabuya carinata* have been included in this paper are known otherwise from adjacent region and are likely to occur in Sikkim. Keys and short diagnostic characters of the species have been given in the paper for determination of the species.

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S. No.	Species	North Sikkim	South Sikkim	East Sikkim	West Sikkim	Undivided Sikkim	Remarks
*1.	<i>Lissemys punctata andersoni</i>	—	—	—	—	—	
*2.	<i>Hemidactylus bowringii</i>	—	—	—	—	—	
*3.	<i>Hemidactylus brooki</i>	—	—	—	—	—	
4.	<i>Hemidactylus garnoti</i>	—	—	—	—	2	
5.	<i>Hemidactylus frenatus</i>	—	—	—	1	—	
*6.	<i>Cosymbotus platyurus</i>	—	—	—	—	—	
7.	<i>Calotes versicolor</i>	—	2	—	4	3	
8.	<i>Japalura variegata</i>	2	1	1	—	—	
9.	<i>Japalura tricarinata</i>	—	—	—	—	—	
10.	<i>Scincella sikimensis</i>	2	—	3	—	—	
11.	<i>Sphenomorphus indicus</i>	—	—	—	—	1	
*12.	<i>Sphenomorphus maculatus</i>	—	—	—	—	—	
*13.	<i>Mabuya carinata</i>	—	—	—	—	—	
14.	<i>Ramphotyphlops braminus</i>	—	3	—	—	—	
15.	<i>Typhlops porrectus</i>	—	—	—	—	1	
16.	<i>Amphiesma platyceps</i>	3	—	—	—	—	
17.	<i>Amphiesma stoleta</i>	—	1	—	—	—	
18.	<i>Amphiesma khasiensis</i>	1	—	—	—	—	
19.	<i>Xenochrophis piscator</i>	—	—	—	—	1	
20.	<i>Dendrelaphis tristis</i>	—	—	—	—	1	
21.	<i>Ophitis aulicus</i>	—	—	—	—	1	
22.	<i>Oligodon albocinctus</i>	—	—	2	—	—	
23.	<i>Pseudoxenodon macrops</i>	—	—	—	—	1	
24.	<i>Rhabdophis subminiatus</i>	—	—	—	—	1	
25.	<i>Sibinophis collaris</i>	—	—	—	—	1	
26.	<i>Trachischium fuscum</i>	—	—	3	—	—	
27.	<i>Trachischium guentheri</i>	6	—	9	—	—	
28.	<i>Elaphe porphyracea</i>	1	—	—	1	—	
29.	<i>Leopeltis rappi</i>	—	1	—	—	—	
30.	<i>Dinodon gammiei</i>	—	—	—	—	1	
31.	<i>Trimeresurus monticola</i>	1	—	2	—	—	

*Species likely to occur, not yet recorded.

AMPHIBIA

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INTRODUCTION

Owing to their topography, geographical positions, high rainfall and humidity, the state of Sikkim occupy an interesting place in the study of Indian amphibian fauna. Except a few stray reports like Gunther (1860), Anderson (1871), Boulenger (1882, 1896, 1906, 1920), consolidated account of amphibian fauna of Sikkim is not available in literature. Chanda (1986) published an account on the amphibian fauna of Darjeeling and Sikkim Himalayas.

The present work attempts to fill this lacunae and incorporates the results of the study of amphibia collections made in different areas in Sikkim during the period 1992-1993. However, the large tracts of the area practically unknown with regard to the amphibian fauna. There are several localities in the valley yet to be surveyed and future survey shall undoubtedly reveal many more species. However, present study includes 21 species under 12 genera and seven families. Species marked with as terisk have been reviewed from literature and during the survey works sincere attempts have been made to collect those species but the author was unable to collect the same.

SYSTEMATIC LIST

Class AMPHIBIA

Order ANURA

Family PELOBATIDAE

Genus I *Megophrys* (Boulenger)

1. *Megophrys parva* (Boulenger)

Genus II. *Scutiger* Theobald

2. *Scutiger sikkimensis* (Blyth)

Family MICROHYLIDAE

Genus III. *Microhyla* Tschudi

3. *Microhyla ornata* Dum. & Bibron

Genus IV. *Uperodon* Dumeril & Bibron

4. *Uperodon globulosum* (Gunther)

Family BUFONIDAE

Genus V. *Bufo* Laurenti

5. *Bufo himalayanus* Gunther

6. *Bufo melanostictus* Schneider

Family RANIDAE

Genus VI. *Amolops* Cope

7. *Amolops afghanus* (Gunther)

Genus VII. *Rana* Linnaeus

8. *Rana alticola* Boulenger

9. *Rana cyanophlyctis* Schneider

10. *Rana gerbillus* annandale

11. *Rana livida* (Blyth)

12. *Rana limnocharis* Boiesduval

13. *Rana liebigii* Gunther

14. *Rana macrodon* Dumeril & Bibron

15. *Rana sikkimensis* Jerdon

Family RHACOPHORIDAE

Genus VIII. *Philautus* Gistel

16. *Philautus annandalii* Boulenger

Genus IX. *Polypedates* Tschudi

- 17.
- Polypedates leucomystax*
- (Gravenhorst)

Genus X. *Rhacophorus* Kuhl

- 18.
- Rhacophorus jerdonii*
- (Gunther)

- 19.
- Rhacophorus maximus*
- (Gunther)

Family I CHTHYOPHIDAE

Genus XI. *Ichthyophis* Fitzinger

- 20.
- Ichthyophis sikkimensis*
- Taylor

Order CAUDATA

Family SALAMANDRIDAE

Genus XII. *Tylototriton* Anderson

- 21.
- Tylototriton verrucosus*
- Anderson

MATERIAL AND METHODS

Amphibians are either aquatic, terrestrial, arboreal or fossorial in habit. Aquatic forms have been collected by the help of water-net fitted with a metal ring fixed at the end of a long bamboo-pole, cast-net as well as by fishing hook. Both terrestrial and arboreal forms are collected by hand or long forcep and the burrowing forms are collected by digging the soil. The collected material are first chloroformed and then put in 5% formaldehyde solution at least for 24 hours for proper fixation. Before putting in the formaldehyde solution a small incision (for bigger material) was given on the belly to penetrate the solution inside the viscera for their proper preservation. After fixation for two to three days the material was taken out from the solution and washed properly in water and then put in 90% alcohol for permanent preservation for study.

SYSTEMATIC ACCOUNTS

Family PELOBATIDAE

Diagnosis : Upper jaw toothed, lower jaw toothless. Diapophyses of sacral vertebra strongly dilated. Terminal phalanges of fingers and toes free, simple and pointed. Omosternum small, cartilagenous. Sternum with or without a bony style. Vertebrae procoelous or opsthoceolous.

Key to the genera of family PELOBATIDAE

Parotoid gland present; tongue rounded in shape *Scutiger*

Parotoid gland absent; tongue subround in shape *Megophrys*

Genus *Megophrys* Kuhl & V. Hass, 1822

1822. *Megophrys* Kuhl & V. Hass., *Alg. Knnst. en Letterbode* : 102.

Diagnosis : Skin tuberculated. Tongue subround, entire and free behind. Pupil vertical. Tympanum indistinct or hidden. Parotoid gland absent. Fingers free. Toes free or minutely webbed. Tips of fingers and toes not dilated. Outer metatarsals united but partly separated by web. Sternum cartilagenous, sometimes calcified.

1. *Megophrys Parva* (Boulenger, 1893)

1893. *Leptobrachium parva* Boulenger, *Ann. Mus. Civ. Stor. Nat. Genova*, (2)13 : 344

1985. *Megophrys parva* Frost, *Amphibian species of the world* : 416.

Material : Based on literature.

Diagnosis : Dorsally more or less brown with dark markings. An indistinct triangular spot present between the eyes. Limbs with more or less distinct cross bars. Skin smooth with a number of scattered minute conical tubercles. Upper eyelids with sharp raised edges. Head broader than long. Tympanum feebly distinct. Fingers with feebly swollen tips. Tibiotarsal articulation reaching beyond mouth. Toes blunt and minutely webbed. An indistinct inner metatarsal tubercle present, outer metatarsal tubercle absent. Snout to vent length 33-39 mm.

Distribution : India : Sikkim, Darjeeling, Meghalaya, Arunachal Pradesh.

Elsewhere : Nepal.

Remarks : Chanda (1986) recorded the species for the first time from Sikkim. During the present study efforts were made to collect the same from the above area but did not yield any result. It is a rare species of Sikkim.

Genus *Scutiger* Theobald, 18681868. *Scutiger* Theobald, *J. Asiat. Soc. Beng.*, : 83.

Diagnosis : Skin laterally thick and glandular and tuberculated. Tongue round. Vomerine teeth generally absent, sometimes present. Pupil horizontal. Tympanum hidden. Paratoid gland present. Fingers free; toes webbed ; tips of fingers and toes without prominent discs.

2. *Scutiger sikkimensis* (Blyth) 18541854. *Bombinator sikkimensis* Blyth, *J. Asiat. Soc. Beng.*, 23 : 3001863. *Scutiger sikkimensis* Theobald, *J. Asiat. Soc. Beng.*, 3 : 88.

Material : Based on literature.

Diagnosis : Colour dorsally yellowish to brown; Posterior portion more brownish than the anterior part. Entire hind part of the body including belly and throat yellowish with conspicuous black spots. Skin with large porous warts forming irregular longitudinal series on the back. Head broader than long. Tympanum hidden. Parotoid glands small. Tympanum hidden. Fingers free with slightly swollen tips. Tibiotarsal articulation reaching shoulder. Toes half-webbed. Oval shaped inner metatarsal tubercles present. From snout to vent 45mm-47mm.

Distribution : India : Meghalaya, Sikkim.

Elsewhere : Nepal.

Remarks : This species was originally recorded as *bombaynator sikkimensis* from Sikkim (Blyth 1834) Subsequently, Inger and Dutta (1986) mentioned its distribution from Sikkim. Chanda (1986) also recorded it in Sikkim. During the present study efforts were made to collect the species from different areas of Sikkim but did not yield any result. It seems to be rare species of Sikkim.

Family MICROHYLIDAE

Diagnosis : Vomerine teeth absent. Jaws toothless. Pupil vertical and circular. Terminal phalanges of fingers and toes simple or T-shaped. Omosternum rudimentary or absent. Vertebrae

procoelous or diplasio-coelous. Diapophyses of sacral vertebra dilated.

Key to the genera of the family
MICROHYLIDAE

Pupil vertical and circular; tympanum hidden
..... *Microhyla* Tschudi

Pupil vertical; tympanum indistinct, sometimes hidden *Uperodon* (Dum. & Bibron)

Genus *Microhyla* Tschudi, 18381838. *Microhyla* Tschudi, *Mem. Soc. Sc. Nat. Nauchatal*, 2 : 28.

Diagnosis : Skin smooth or with small warts. Tongue narrow and elliptical, free and entire behind. Vomerine teeth absent. Pupil vertical and circular. Tympanum hidden. Fingers free, toes free. Webbed to a greater or lesser extent. Tips of fingers and toes more or less dilated.

3. *Microhyla ornata* (Dum & Bibron, 1841)1841. *Engystoma ornata* Dum. & Bibron, *Erp. Gen.*, 8 : 745.1985. *Microhyla ornata* Frost, *Amphibian species of the world* : 84.

Material : 2 exs. Loc. Nayabazar, Sikkim, 14.3.1992, coll. S. K. Chanda.

Diagnosis : Colour varying from olive to greyish-brown with dark markings. Limbs with incomplete dark cross-bands. Skin smooth, sometimes with small tubercles. Head broader than long. Tympanum hidden. Fingers free. Tibiotarsal articulation reaching slightly in front of shoulder. Toes with only rudiment of webs. Tips of toes dilated into small discs. An oval shaped inner metatarsal tubercle present.

Distribution : Throughout the Indian region.

Elsewhere : Sri Lanka, China, Malaysia.

Remarks : According to Iger & Dutta (1986) this species has been found to occur throughout the Indian region. During the present study the author recorded the species for the first time in Sikkim.

Genus *Uperodon* (Dum. & Bibron, 1841)1841. *Uperodon* Dumeril & Bibron, *Erp. Gen.* 8 : 746.

Diagnosis : Skin smooth or slightly tuberculated. Tongue oval and free behind. Vomerine teeth absent. Pupil vertical. Tympanum indistinct, sometimes hidden. Fingers free, toes webbed at the base.

4. *Uperodon globulosum* (Gunther, 1864)1864. *Cacopus globulosum* Gunther, *Rept. Brit. India.*, : 416.1986. *Uperodon globulosum* Inger & Dutta, *J. Bombay nat. Hist. Soc.*, 83 (Supplement) : 137.

Material : 1 ex. Nayabazar, Sikkim, 14.3.92. coll. S. K. Chanda.

Diagnosis : Head broader than long; snout rounded. Interorbital width about thrice the width of upper eyelid. Tympanum hidden. Fingers free, toes with rudiment of web. Tibiotarsal articulation not reaching shoulder. Dorsum smooth or slightly tuberculated and reddish brown in colour. Ventrally dull whitish.

Distribution : India : Assam, Madhya Pradesh, Maharashtra, Gujarat, Karnataka, Orissa, Sikkim.

Remarks : This species mostly found under the soil, and is a rare species. It has been recorded for the first time in Sikkim.

Family BUFONIDAE

Diagnosis : Tongue oval; skin rough and tuberculated. Pupil horizontal; vomerine teeth absent. Jaws toothless. Diapophyses of sacral vertebrae dilated. Terminal phalanges of fingers and toes obtuse or T-shaped. Vertebrae procoelous.

Genus *Bufo* Laurenti, 17681768. *Bufo* Laurenti, *Synopsis Rept. Vienna* : 25.

Diagnosis : Skin rough and tuberculated. Tongue elliptic, entire. Vomerine teeth absent. Pupil horizontal. Tympanum distinct. Parotoid gland large and prominent. Fingers free, toes more or less webbed. Diapophyses of sacral vertebrae more or less dilated.

Key to the species of the genus *Bufo*

Tympanum large and very distinct, more than two-third diameter of eyes; tibiotarsal articulation reaching eyes.

..... *melanostictus* Schneider

Tympanum very small and indistinct, less than half the diameter of eyes; tibiotarsal articulation reaching nearly tip of snout.

..... *himalayanus* Gunther

5. *Bufo himalayans* Gunther, 18641864. *Bufo himalayans* Gunther, *Rept. Brit. Ind.*, : 422.

Material : Based on literature.

Diagnosis : Dorsally uniform brown to yellowish. Venter yellowish. Dorsal skin rough with prominent warts and tubercles. Ventrally smooth. Tympanum very small and indistinct, less than half the diameter of eyes. Parotoid glands large and prominent. Fingers free; toes two-third webbed. Tibiotarsal articulation reaching nearly tip of snout.

Distribution : India : Arunachal Pradesh, Meghalaya, Sikkim, West Bengal, Kerala.

Remarks : Although the species has been found to occur in Sikkim, during the present study efforts were made to collect from the above area but did not yield any result.

6. *Bufo melanostictus* Schneider, 17991799. *Bufo melanostictus* Schneider, *Hist. Amph. I. Jena*, : 216.

Material : 2 exs, Sambaria, Sikkim; 16.3.92, coll. S. K. Chanda; 4 exs, Tashiding, Sikkim, 20.3.92, coll. S. K. Chanda; 7 exs, Rongpoh, Sikkim, 12.11.93, coll. S. K. Chanda.

Diagnosis : Dorsally yellowish brown. Ventral surface yellowish. Skin rough with prominent spiny warts and tubercles of various sizes. Tympanum large and very prominent, more than two-third diameter of eyes. Parotoid glands very large and prominent. Tibiotarsal articulation reaching eyes. Fingers free; toes blunt and half-

webbed. A moderately large inner and a small outer metatarsal tubercle present.

Distribution : Throughout Indian region.

Elsewhere : Myanmar; Sri Lanka; China; Sumatra; Java; Borneo; Malaysia Indonesia; Phillippines.

Remarks : Common throughout the plains as well as hills throughout the Indian region. It has been recorded upto an elevation of 3040m in Sikkim Himalayas (Boulenger, 1890). Terrestrial and nocturnal in habit, found in and near water during the breeding season.

Family RANIDAE

Diagnosis : Upper jaw toothed, lower one nearly always toothless. In most species of this family, fingers perfectly free but the toes more or less completely webbed. Terminal phalanges of fingers and toes of various shapes and sizes.

Key to the genera of the family RANIDAE

- Tips of fingers and toes with circum-marginal groove *Amolops* Cope
- Tips of fingers and toes simple without any groove *Rana* Linn.

Genus *Amolops* Cope, 1865

1965. *Amolops* Cope, *Nat. Hist. Rev.* (N.S). 5 : 97.

Diagnosis : Skin smooth, sometimes tuberculated. Pupil horizontal. Tympanum distinct. Paratoid glands absent. Fingers free; toes more or less webbed. Tips of fingers and toes with circum-marginal grooves, separating upper from the lower surface.

7. *Amolops afghanus* (Gunther, 1858)

1858. *Polypedates afghanus* Gunther, *Cat. Batr. Sal. Brit. Mus.* London., : 160.

1985. *Amolops afghanus* Frost, *Amphibian species of the World* : 453.

Material : Based on literature.

Diagnosis : Dorsum dark-olive to brown.

Ventre yellowish. Skin smooth, very often with warts on sides. Tympanum small, distinct and nearly one-third the diameter of eyes. Fingers free with prominent dermal boarder and large discs with well developed grooves, seperating upper from the lower surface. Tibiotarsal articulation reaching beyond the tip of snout. Subarticular tubercles large and prominent. Toes with well developed grooves seperating upper from the lower surface.

Distribution : Assam, Arunachal Pradesh, Meghalaya, Mizoram, Tripura, Sikkim, West Bengal.

Remarks : This is a rare species, nocturnal in habit and generally found to occur near the stream.

Genus *Rana* Linnaeus, 1758

1758. *Rana* Linnaeus, *Syst. Nat. ed. 10 Holmiae* : 210.

Diagnosis : Skin not smooth. Tongue free, deeply notched and bifid behind. Vomerine teeth present (rarely absent). Pupil horizontal. Tympanum distinct, sometimes hidden. Paratoid gland absent. Fingers free. Toes webbed (rarely nearly free). Terminal phalanges obtuse or T-shaped. Omosternum and sternum with a bony style.

Key to the species of the genus *Rana*

1. Head broader than long 2
 - Head as long as or longer than broad 6
2. Tympanum half the diameter of eye 3
 - Tympanum two-third to three-fourth of eye 4
3. First and second fingers equal; tibiotarsal articulation reaching beyond tip of snout *liebigii*
 - First finger much longer than second; tibiotarsal articulation reaching eye *macrodon*
4. Toes fully webbed 5
 - Toes partly webbed; fingers with rudimentary web *sikkimensis*

5. Toes fully webbed; tibiotarsal articulation reaching in between eye and nostril.....
 *cyanophlyctis*
- Toes half-webbed; tibiotarsal articulation reaching tip of snout *limnocharis*
6. Oval shaped, well developed pad present on the innerside of first finger; Tibiotarsal articulation reaching beyond tip of snout; toes fully webbed *livida*
- Absent of pad on the innerside of first finger 7
7. First finger slightly longer than second; tibiotarsal articulation reaching beyond the tip of snout *alticola*
- First finger shorter than second; tibiotarsal articulation reaching eye *gerbillus*

8. *Rana alticola* Boulenger, 1882

1882. *Rana alticola* Boulenger, *Cat. Bat. Sal. Brit. Mus.*, : 62.

Material : 2 exs; Sadam, Sikkim; 21.3.92, coll. S. K. Chanda.

Diagnosis : Dorsally yellowish to light brown. Ventrally almost white. Head longer than broad. Tympanum very distinct, two-third diameter of eye. Fingers free. First finger longer than second. Tibiotarsal articulation beyond tip of snout. Toes entirely webbed. Both inner and outer metatarsal tubercles present.

Distribution : India : Assam, Meghalaya, Tripura, Sikkim, Orissa, Andaman.

Elsewhere : Sri Lanka; Nepal; China; Japan; Indonesia; Malayasia.

Remarks : This is a rare species and the tadpoles found to occur in small streams. Tadpoles are more abundantly available in comparison to the adults.

9. *Rana cyanophlyctis* Schneider

1799. *Rana cyanophlyctis* Schneider, *Hist. Amph.*, I : 137.

Material : 8 exs. Sadam, Sikkim; 21.3.92, coll. S. K. Chanda 15 exs. Sambaria, 16.3.92, coll. S. K. Chanda.

Diagnosis : Head broader than long. Nostril rquidistant from the eye and tip of snout. Tympanum distinct, nearly once the diameter of eye. Fingers free. Tibiotarsal articulation reaching in between eye and nostril. Toes fully webbed. A pointed digit-like inner metatarsal tubercle present. Outer metatarsal tubercle absent. Dorsum darker with small warts. Venter surface whitish and smooth.

Remarks : It is the commonest species of frogs, floating in ponds, ditches and other water bodies throughout the Indian region. Boulenger (1920) recorded the species at an altitude of 1900 m. It has the peculiar habit of skipping over the surface of water, this accounts its peculiar name "Skipper frog"

10. *Rana gerbillus* Annandale, 1912

1912. *Rana gerbillus* Annandale, *Rec. Indian Mus.*, 8 : 10.

Material : 2 exs. Rongpoo, Sikkim, 12.11.1993, coll. S. K. Chanda.

Diagnosis : Head as long as broad. Nostrill slightly closer to the tip of snout than eye. Interorbital width equals to upper eyelid. Fingers free, first finger shorter than second. Tibiotarsal articulation reaching eye. Toes almost completely webbed. A flat oval inner metatarsal tubercle present. Outer metatarsal tubercle absent. Dorsum grey marbled with black. Dorsum dark grey.

Distribution : India : Arunachal Pradesh, Meghalaya, Sikkim, West Bengal.

Remarks : It is a rare and nocturnal species, generally found to occur near the hill streams of the hilly regions.

11. *Rana livida* (Blyth, 1855)

1855. *Polypedates livida* Blyth, *J. Asiat. Soc. Beng.*, 24 : 718.

1985. *Rana livida*, Frost, *Amphibian species of the world* : 500.

Material : Based on literature.

Diagnosis : Head as long as broad. Nostril much closer to tip of snout than eyes. Tympanum

distinct, nearly two-third diameter of eye. Fingers free. Tibiotarsal articulation reaching beyond tip of snout. Toes fully webbed. A well developed, pad present on the innerside of the first finger. Oval shaped inner metatarsal tubercle present. Outer metatarsal tubercle absent.

Distribution : India : Assam, Meghalaya, Manipur, Sikkim, West Bengal.

Remarks : Inger & Dutta (1986) mentioned its occurrence in Sikkim. During the present study, efforts were made to collect the same from the above area but did not yields any result.

12. *Rana limnocharis* Boisduval, 1835

1835. *Rana limnocharis* Boisduval, *Nova. Acta. Acad. Leop.*, : 255.

Material : 5 exs. Melly, Sikkim, 20.3.92, coll. S. K. Chanda 10 exs. Sadam, Sikkim, 21.3.92, coll. S. K. Chanda; 8 exs, Singtam, Sikkim, 28.3.92 coll. S. K. Chanda.

Diagnosis : Head as long as broad. Nostril closer to tip of snout than eye. Tympanum distinct, nearly two-third diameter of eye. Fingers free, first finger longer than second. Tibiotarsal articulation reaching tip of snout. Toes half webbed. A distinct oval shaped inner metatarsal tubercle and a feebly distinct outer metatarsal tubercle present. Dorsum greyish and venter whitish in colour.

Distribution : Throughout the Indian region.

Elsewhere : Sri Lanka; Malaysia; Indonesia; Philippines.

Remarks : This is the commonest and most widely distributed of the Indian frogs and has been recorded from 2133 m. in Sikkim (Boulenger, 1920).

13. *Rana liebigii* Gunther, 1860

1860. *Rana liebigii* Gunther, *Proc. zool. Soc.*, London : 157.

Material : Based on literature.

Diagnosis : Head broader than long. Nostril slightly nearer to tip of snout than eye. Tympanum

indistinct, about half the diameter of eye. Fingers free. First and second finger equal size. Tibiotarsal articulation reaching beyond the tip of snout. Toes entirely webbed. A long inner metatarsal tubercle present. Outer metatarsal tubercle absent. Dorsally brown in colour. Ventral surface light brownish.

Distribution : India : Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttar Pradesh, West Bengal.

Remarks : It appears to a hill species. It is found to occur in dense herbage in the Eastern Himalayas at an altitude of 1219-1828 m.

14. *Rana macrodon* Dumeril & Bibron, 1841

1841. *Rana macrodon* Dum. & Bibron, *Erp. Gen.*, : 382.

Material : Based on literature.

Diagnosis : Head broader than long. Tympanum distinct, half the diameter of eye. Fingers moderates, obtusely pointed. First finger much longer than second. Tibiotarsal articulation reaching the eye or slightly infront of eye. Toes broadly webbed. A strong fold above the tympanum. Brown or blackish above.

Distribution : India : Sikkim.

Elsewhere : Myanmar; Malaysia.

Remarks : Chanda (1986) recorded the species for the first time in India from Sikkim. During the present study efforts were made to collect it from different areas of Sikkim but did not yield any result.

15. *Rana sikkimensis* Jerdon, 1870

1870. *Rana sikkimensis* Jerdon, *Proc. Asiat. Soc. Bengal.*, : 83.

Material : Based on literature.

Diagnosis : Head broader than long. Nostril equidistant from the eye and tip of snout. Tympanum distinct, half the diameter of eye. Fingers with rudimentary web. First finger equals to the second. Toes partly webbed, Tibiotarsal articulation reaching beyond the tip of snout. Dorsum reddish brown, venter dull white.

Distribution : India : Meghalaya, Sikkim, West Bengal.

Elsewhere : Nepal.

Remarks : Boulenger (1920) reports three examples of frogs (Two are present in the collection of Z.S.I. Calcutta) as *Rana assamensis* from Darjeeling District. According Boulenger (1920) it is very common inside the dense herbage at the edge of shady jungle streams in the Eastern Himalayas.

Family RHACOPHORIDAE

Diagnosis : Upper jaw toothed, Lower jaw toothless. Vomerine teeth present or absent. Tongue free and deeply bifurcated behind. Tympanum distinct. Intercalary cartilagenous present between the penultimate and terminal phalanges. Fingers obtusely to fully webbed. Toes two-third to fully webbed. Tips of fingers and toes dilated into prominent discs or rounded tips.

Key to the genera of family RHACOPHORIDAE

1. Vomerine teeth present 2
- Vomerine teeth absent *Philautus*
2. Toes not fully webbed interspace between vomerine process narrow *Polypedates*
- Toes fully webbed, interspace between vomerine process wide *Rhacophorus*

Genus *Philautus* Gistel, 1848

1848. *Philautus* Gistel, *Naturgesch. Thierr.* : 10

Diagnosis : Skin smooth, Vomerine teeth absent. Pupil horizontal. Tympanum distinct or hidden. Fingers free or minutely webbed at the base. Omosternum or sternum with a bony style.

16. *Philautus annandalii* (Boulenger, 1906)

1906. *Ixalus annandalii* Boulenger, *J. Asiat. Soc. Bengal.*, 2 : 385.

1931. *Philautus annandalii* Ahl. *Tierreich*, Anura III : 71.

Material : 2 exs. Namchi, Sikkim, 3.11.93 coll. S. K. Chanda.

Diagnosis : Head broader than long; nostril equidistant from the eye and tip of snout. Interorbital width much broader than the upper eyelid. Tympanum not very distinct, smaller than the diameter of the eye. Fingers free; first finger shorter than second, tips of finger dilated into distinct discs; subarticular tybercles of fingers and toes not distinct. Toes half webbed, Inner metatarsal tubercle feebly prominent, outer metatarsal tubercle absent. Tibiotarsal articulation reaching between the eye and tip of snout. Skin smooth. Dorsum dark brown and ventral surface dull white, granular.

Distribution : India : Assam, Sikkim, West Bengal (Darjeeling).

Remarks : So far it has been recorded from Assam and West Bengal (Darjeeling). During the present study the author recorded the species for the first time in Sikkim. It is a rare and nocturnal species of Sikkim.

Genus *Polypedates* Tschudi, 1838

1838. *Polypedates* Tschudi, *Classif. Batr.* : 34.

Diagnosis : Skin smooth, sometimes tuberculated. Fingers free or webbed. Toes webbed. Circum-marginal grooves distinct. Vomerine teeth present.

Key to the species of the genus *polypedates*

Parieto-squamosal arch absent; Skin on head ossified *leucomystax*

A more or less distinct parieto-squamosal arch present; skin on head mostly free
..... *maculatus*

17. *Polypedates leucomystax* (Gravenhorst, 1829)

1829. *Hyla leucomystax* Gravenhorst, *Delic. Mus. Vratislav.*, 1 : 26.

1889. *Polypedates leucomystax* Boulenger, *Proc. zool. Soc. London* : 29.

Material : 1 ex. Namchi, Sikkim, 4.11.93. coll. S. K. Chanda. 1 ex. Nayabazar. Sikkim, 14.3.92, coll. S. K. Chanda.

Diagnosis : Head broader than long, skin on head rugose; nostril closer to tip of the snout than the eye. Interorbital width much broader than upper eyelid. Fingers free, first and second finger equal. Tips of fingers and toes bears horse-shoe shaped distinct discs. Subarticular tubercles of fingers and toes distinct. Toes three-fourth webbed. Tibiotarsal articulation reaching in between eye and tip of snout. Dorsum light chocolate and smooth. Ventre whitish and granular.

Distribution : India : Arunachal Pradesh, Assam, Sikkim, West Bengal.

Remarks : It is a nocturnal species. It prefers dark and moist atmosphere of lavatory and also found under the leaves of plants and roofs of thatched village huts.

18. *Polypedates maculatus* (Gray, 1832)

1832. *Hyla maculata* Gray, *Indian Zoology*. 1 : 82.

1936. *Polypedates maculatus* Inger & Dutta, *J. Bombay nat. Hist. Soc.*, (N.S) 5 (2) : 149

Material : Based on literature.

Diagnosis : Head broader than long. Nostril closer to tip of snout than eye. Interorbital width broader than upper eyelid. Tympanum distinct about three-fourth the diameter of eye. Fingers with rudimentary web. First and second fingers equal. Tips of fingers and toes horseshoe shaped distinct discs. Subarticular tubercles of fingers and toes distinct. Toes less than three-fourth webbed. Tibiotarsal articulation reaching posterior end of snout and tip of snout. Dorsum brownish with light darker spots and smooth. Ventre dull whitish and granular.

Distribution : India : Assam, Arunachal Pradesh, Meghalaya, Sikkim, West Bengal.

Elsewhere : Sumatra, Java, Borneo.

Remarks : It is nocturnal in habit, generally found inside thick bushes. Sarkar (1984) gives a detailed account regarding its habit and habitat.

Genus *Rhacophorus* Kuhl and Van Hasselt, 1822

1822. *Rhacophorus* Kuhl and Van Hasselt, *Algemeene Konst-en-Letter-Bode*, 7 : 104.

Diagnosis : Skin smooth, sometimes tuberculated. Tongue and deeply notched behind, vomerine teeth usually present (exceptionally absent). Pupil horizontal. Tympanum generally distinct.

Key to the species of RHACOPHORUS

1. Fingers entirely webbed *maximus*
Fingers with at the base *jerdonii*

19. *Rhacophorus jerdonii* (Gunther, 1875)

1875. *Polypedates jerdonii* Gunther, *Proc. zoll. Soc. London*, : 571

1831. *Rhacophorus jerdonii* Ahl. *Tierreih* 55, Anura III : 114.

Material : 1 ex. Nayabazar, Sikkim, 14.3.92, coll. S. K. Chanda.

Diagnosis : Head slightly broader than long. Nostril equidistant from eye and tip of snout. Interorbital width broader than upper eyelid. Tympanum distinct, one-third the diameter of eye. Fingers webbed at the base Subarticular tubercles of fingers and toes moderate. Toes two-third webbed. Tips with distinct discs. Tibiotarsal articulation reaches the eye. Ventre dull white, spotted brown on the throat, granular on the belly.

Distribution : Arunachal Pradesh, Assam, West Bengal, Sikkim.

Remarks : Previously this species was found to occur in Arunachal Pradesh and Assam of northeast India and West Bengal. During the present study the author recorded the species for the first time in Sikkim.

Family ICHTHYOPHIIDAE

Diagnosis : Tail distinct. Adults are terrestrial and oviparous. Three pairs of branching lateral gills developed in the egg and the larvae with one or two gill-slits. Three or four dental series present. Vent transverse or longitudinal. Internal fertilization.

Genus *Ichthyophis* Fitzinger, 18261826. *Ichthyophis* Fitzinger, *Neue Classif. Rept.*, : 136.

Diagnosis : Tail distinct. Medium or large sized species measuring a length of more than half a metre. Four series of teeth present. Tentacles situated anterior to the eye. Eye is in socket. Scales invariably present.

20. *Ichthyophis sikkimensis* Taylor, 19601960. *Ichthyophis sikkimensis* Taylor, *Univ. Kansas Sci. Bill.* 40 : 91-92.

Material : Based on literature.

Diagnosis : This is a medium sized species. Colour is dark brown. Tentacular aperture is very close to the lip and its distance from the eye is less than its distance from the nostril. Eye is distinct. A pair of nuchal collars fused together. Tip of the tail conical and the vent is longitudinal. A pair of anal gland present on each side of the vent. Teeth in four series : Premaxillary-maxillary, 23-23; prevomeropalatine, 21-21; dentary, 20-21; splenial, 10-10.

Distribution : India : Sikkim, West Bengal.

Remarks : It is a rare species. Although this species was recorded from Sikkim, during the present study efforts were made to collect the same from the above area but did not yield any result.

Family SALAMANDRIDAE

Diagnosis : No gills. Maxillary teeth present. Both the jaws toothed. Eyelids present.

Genus *Tylototriton* Anderson, 18711871. *Tylototriton* Anderson, *Proc. zool. Soc.*, London : 423.

Diagnosis : Tongue small, subcircular and free on the sides and slightly behind. Palatine teeth in two oblique series meeting in front. Toes five and tail compressed.

21. *Tylototriton verrucosus* Anderson, 18711871. *Tylototriton verrucosus* Anderson, *Proc. zool. Soc.*, London : 423.

Material : Based on literature.

Diagnosis : Head broader than long. Nostril closer to tip of snout than eye. Tympanum indistinct. Fingers and toes moderate and free, tips blunt. Body three to three and half times the length of head. Tail flat, as long as or slightly longer than head and body. A broad and porous vertebral ridge present. Anal opening is a longitudinal slit and the borders not much swollen. Underside of the limbs and lower edge of tail is orange yellow in colour.

Distribution : India : Arunachal Pradesh, Manipur, Sikkim, West Bengal (Darjeeling).

Elsewhere : Nepal, Myanmar, Thailand, Western China.

Remarks : This is a rare and Endangered species and generally found in pools in the Eastern Himalayas at an altitude between 1260m-2220m. Daniel (1962) and Tikader (1983) give a detailed account on its habit and habitat.

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FISHES

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INTRODUCTION

The state of Sikkim, lying in the Eastern Himalayas, has a total geographical area of 7096 sq.km. It is a small state, lying between latitude 27°5' and 28°9'N and longitude 86.59 and 88°56'E. This mountainous state lies in between Tibet in the north, Bhutan on the east, Nepal on the west and West Bengal on the south. The topography is wholly undulating with varying altitudes from 300m in the subtropical belt to 5500m in the temperate alpine zone.

The state has vast water resources in the form of lakes, snow-fed rivers, streams and marshy area. The main rivers of this state are Lachen, the Lachung, the Zemu, the Talung, the Rangit, the Rangoli and the Rangpo. The Teesta river, which originates from Lhamo lake and ultimately enters North Bengal, accumulates water from many of them. The two major rivers of Sikkim, Teesta and Rangit have a total length of about 900km. These rivers originate from the glaciers of North and West Sikkim. Along with a good number of tributaries, these rivers harbour a diversified and rich fish fauna. Most important of these are the Snow Trout, the Mahaseer, the cat fishes and a number of cyprinids. The lower belt of the Teesta and Rangit rivers harbour one of the most popular game fish, *Tor putitora*. This important game fish population has already dwindled and the species is already under threat.

Since the majority of the rivers and streams of Sikkim originate from glaciers, about two third of the river length along with a number of high altitude lakes fall 6000' above msl and are virgin

due to the absence of indigenous fish fauna. The temperate and the subtropical regions of the state within an elevation range of 300-600' above msl is very conducive for warm water fish culture. Because of its location in the wettest part of the Himalayas, Sikkim receives excellent monsoon rains from May till October. As a result, the marshy lands and paddy fields remain inundated with water far more than 3 to 4 months a year, which is suitable for fish culture. In order to make the best use of these water bodies, three major culture fishery systems have been introduced by state fisheries department. These are of 1) common carps; 2) Indian major carps and 3) Chinese carps.

In 1845, McClelland described two species of the genus *Puntius* viz., *Puntius spinulosus* (McClelland) and *Puntius clavatus* (McClelland) and one anabantid, *Ctenops nobilis* McClelland from rivers of the foot of Sikkim mountain on the northern frontiers of Bengal. Gunther (1868) mentioned the distribution of *Tor mosal* (Hamilton-Buchanan), *Danio aequipinnatus* (McClelland) and *Noemacheilus rupecula* (McClelland) from this state. Day (1878) made a mention of these species and also showed the distribution of *Labeo dyocheilus* (McClelland) in Sikkim. Hora (1923) recorded one specimen of *Glyptothorax gracilis* from Rangit River, Sikkim and further in 1935 described two new loaches viz, *Noemacheilus devdevi*, Hora and *N. inglisi* Hora from Sikkim. Hora and Silas (1951, 52) recorded *Glyptothorax maculatum*. (Regan) from Sikkim. Menon (1954) attributed the distribution of *Glyptothorax striatus* (McClelland) and

Glyptothorax gracilus (Günther) to the same place. Menon (1964) mentioned that *Garra lamta* (Hamilton-Buchanan) exists in this state. Tilak (1972) prepared a list of 26 species of fishes from Sikkim with the help of collections lying in the Zoological Survey of India and also including those mentioned in the literature. Among these systematic notes on 20 species were also given. Kundu (2000) reported 11 species belonging to 10 genera under 3 families from a hill stream at the confluence of the river Ramam with the river Rangit at Nayabazar (Jorthang) district, West Sikkim. Among these, *Crossocheilus latius latius* (Hamilton - Buchanan), *Laguvia shawi* Hora, *Pangio pangia* (Hamilton-Buchanan) and *Tor putitora*, (Hamilton-Buchanan) were recorded first time from the state.

The present contribution includes earlier identified and registered fish collection available in the National Zoological Collection of the Zoological Survey of India (collections made by W. S. Atkinson, B. L. Chowdhury, S. L. Hora, T. D. Soota, C. B. Srivastava, R. K. Ghosh, D. K. Kundu and others). During preparation of this faunal work I have made use of all the earlier informations available in the literature.

The present systematic list of the fishes of Sikkim includes 7 orders, 15 families 43 genera and 64 species of which 22 species under 15 genera are recorded for the first time from Sikkim.

An attempt has been made in this present study to provide an upto date classification, nomenclature, diagnosis, distribution pattern, fishery information along with species identification keys.

SYSTEMATIC LIST

Class OSTEICHTHYS

Sub class ACTINOPTERYGII

Order CYPRINIFORMES

Family CYPRINIDAE

1. *Amblypharyngodon mola* (Hamilton-Buchanan)

- *2. *Aspidoparia jaya* (Hamilton-Buchanan)
- *3. *A. morar* (Hamilton-Buchanan)
4. *Barilius barna* (Hamilton-Buchanan)
5. *B. bendelisis* (Hamilton-Buchanan)
6. *B. shacra* (Hamilton-Buchanan)
7. *B. vagra* (Hamilton-Buchanan)
8. *Brachydanio rerio* (Hamilton-Buchanan)
9. *Carassius auratus*, (Linnaeus)
10. *Catla catla* (Hamilton-Buchanan)
- *11. *Chagunius chagunio* (Hamilton-Buchanan)
12. *Cirrhinus mrigala* (Hamilton-Buchanan)
13. *Crossocheilus latius latius* (Hamilton-Buchanan)
14. *Ctenopharyngodon idellus* (Valenciennes)
- *15. *Cyprinion semiplotum* (McClelland)
16. *Cyprinus carpio* Linnaeus
17. *Danio aequipinnatus* (McClelland)
18. *Garra annandalei* Hora
19. *G. gotyla gotyla* (Gray)
20. *G. lamta* (Hamilton-Buchanan)
- *21. *G. nasuta* (McClelland)
22. *Hypophthalmichthys molitrix* (Valenciennes)
- *23. *Labeo dero* (Hamilton-Buchanan)
24. *L. dyocheilus* (McClelland)
25. *L. rohita* (Hamilton-Buchanan)
26. *Neolissocheilus hexagonolepis* (McClelland)
27. *N. hexastichus*, (McClelland)
28. *N. spinulosus*, (McClelland)
27. *Puntius clavatus* (McClelland)
- *30. *P. conchoniis* (Hamilton-Buchanan)
- *31. *P. sarana sarana* (Hamilton-Buchanan)
- *32. *P. sophore* (Hamilton-Buchanan)
- *33. *P. ticto* (Hamilton-Buchanan)
34. *Schizothorachthys progastus*. (McClelland)
35. *Schizothorax richardsonii* (Gray)
36. *Tor mosal* (Hamilton-Buchanan)

37. *T. putitora* (Hamilton-Buchanan)

Family BALITORIDAE

*38. *Aborichthys elongatus* (Hora)39. *Nemacheilus devdevi* Hora40. *N. multifasciatus* Day41. *N. rupecola* (McClelland)42. *Tryplophysa gracilis* (Day)

Family COBITIDAE

43. *Pangio pangia* (Hamilton-Buchanan)*44. *Somileptes gongota* (Hamilton-Buchanan)

Order SILURIFORMES

Family SISORIDAE

45. *Bagarius bagarius* (Hamilton-Buchanan)46. *Euchiloglanis hodgarti* (Hora)47. *Glyptosternum maculatum* (Regan)48. *Glyptothrax gracile* (Gunther)49. *G. striatus* (McClelland)50. *Laguvia shawi* Hora51. *Pseudecheneis sulcatus* (McClelland)

Family SILURIDAE

*52. *Silurus cochinchinensis* (Valenciennes)

Family OLYRIDAE

*53. *Olyra longicaudata* Mc Clelland

Order SALMONIFORMES

Family SALMONIDAE

54. *Salmo trutta fario* Linnaeus

Family POECILIDAE

55. *Poecilia (Lebistes) reticulata* Peters

Order SYNBRANCHIFORMES

Family SYNBRANCHIDAE

*56. *Ophisternon bengalense* McClelland

Order PERCIFORMES

Family AMBASSIDAE

*57. *Pseudambassis baculis* (Hamilton-Buchanan)*58. *P. ranga* (Hamilton-Buchanan)

Family NANDIDAE

*59. *Badis badis* (Hamilton-Buchanan)

Family BELONTIIDAE

60. *Ctenops nobilis* McClelland*61. *Colisa sota* (Hamilton-Buchanan)

Order CHANNIFORMES

Family CHANNIDAE

*62. *Channa orientalis* Bloch & Schnieder*63. *C. punctatus* (Bloch)

Order MASTACEMBELIFORMES

Family MASTACEMBELIDAE

*64. *Mastacembelus armatus* (Lacepede)

SYSTEMATIC ACCOUNT

Class OSTEICHTHYS

Sub class ACTINOPTERYGII

Subdivision TELEOSTEI

Order CYPRINIFORMES

Family CYPRINIDAE

Genus *Amblypharyngodon* Bleeker, 1860

1860. *Amblypharyngodon* Bleeker, *Natuurk Tijdschr Ned. India*, 20 : 433 (type species : *Cyprinus mola* Hamilton-Buchanan).

Body rather elongate and somewhat compressed. Abdomen rounded. Mouth more or less superior, upper lip absent. Barbels absent. Dorsal fin very short, inserted slightly behind pelvic fin base, with 7 branched rays. Anal fin short, with 5 to 6 branched rays. Lateral line incomplete.

1. *Amblypharyngodon mola* (Hamilton-Buchanan)

1822. *Cyprinus mala* Hamilton-Buchanan, *Fishes of Ganges* : 334, 392, pl. 38, fig. 92 (type-locality : ponds and rivers of Gangetic provinces).

1991. *Amblypharyngodon mola* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 338.

* Recorded for the first time from Sikkim.

Diagnosis : Dii-iii 7; A ii-iii 5-6; Pi 13-15; Vi 8. Body elongate, its depth 3.5 to 3.8 in standard length. Eye diameter 3.5 to 4 in head length. Scales small; lateral line incomplete, 65 to 90 scales in lateral series, 9 to 10 rows of scales between lateral line and pelvic fin base.

Geographical Distribution : India : throughout.

Elsewhere : Bangladesh; Myanmar; Pakistan.

Fishery Information : It attains a length of about 10 cm and used as a food fish specially in Eastern India.

Genus *Aspidoparia* Heckel, 1843

1843. *Aspidoparia* Heckel *Abbild. Fenzl. Thiere. Pill. Syriens Fishes* : 186 (type-species : *Aspidoparia sardina* Heckel = *Cyprinus morar* Hamilton-Buchanan).

Body elongate and sub-cylindrical; abdomen rounded. Mouth small and inferior. Lower jaw without a lip but with a sharp crescentic bony edge. Barbels absent. Dorsal fin inserted posterior to pelvic fin, with 9 to 10 rays; anal fin with 9 to 10 rays. Lateral line greatly curved, running in the lower half of caudal peduncle with 38 to 60 scales.

Key to the species of Genus *Aspidoparia*

- 1(a) Lateral line scales 38 to 42; anal fin with 8 to 10 branched rays *A. morar*
- (b) Lateral line scales 52 to 60; anal fin with 7 branched rays. *A. jaya*

2. *Aspidoparia jaya* (Hamilton-Buchanan)

- 1822.. *Cyprinus jaya* Hamilton-Buchanan, *Fishes of Ganges* : 333, 392, (type-locality : northern Bihar).

1991. *Aspidoparia jaya* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 339.

Diagnosis : Dii 7; A ii 7; P i14; Vi 7.

Body elongate and subcylindrical. Mouth inferior; jaws short. Dorsal fin insertead above the origin of pelvic fins. Lateral line complete, with 52 to 60 scales.

Geographical Distribution : India : Gangetic provinces, Assam, Sikkim.

Elsewhere : Nepal; Bangladesh.

Fishery Information : It attains a length of about 15 cm. A tasty fish, but rare in catches.

3. *Aspidoparia morar* (Hamilton-Buchanan)

1822. *Cyprinus morar* Hamilton-Buchanan, *Fishes of Ganges* : 264, 384, pl. 31, fig. 75 (type-locality : Yamuna river and Tista river).

1991. *Aspidoparia morar* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 340, fig. 119.

Diagnosis : D. ii-iii 7-8; A ii 8-10; P : i14, Vi 7. Body elongate and sub-cylindrical. Mouth inferior; jaws short. Dorsal fin inserted well behind pelvic fin base. Lateral line with 38 to 42 scales.

Geographical Distribution : India : throughout northern part.

Elsewhere : Iran; Pakistan; Nepal; Bangladesh; Myanmar and Thailand.

Fishery Information : It attains a length of about 17.5 cm and is of no interest to fisheries.

Genus *Barilius* Hamilton-Buchanan, 1822

1822. *Barilius* Hamilton-Buchanan, *Fishes of Ganges* : 266, 384 (type-species : *Cyprinus barila* Hamilton-Buchanan).

Body elongate, laterally compressed, with rounded abdomen. Mouth moderate and terminal; maxilla extends to below or slightly beyond anterior margin of eye. Barbels 1 or 2 pairs or absent. Dorsal fin inserted opposite to interspace between pelvic and anal fin, often extending over anal fin. Dorsal fin with 9 to 13 and anal fin with 9 to 17 rays. Lateral line concave and complete, with 38 to 75 scales. Body usually with dark spots or bands.

Key to the species of genus *Barilius*

1. Barbels present 2
 - Barbels absent. Body with 7 to 9 vertical bars *B. barna*
2. Barbels 4, Lateral line scales 38-44 3
 - Barbels 4, Lateral line scales 59-70 *B. shacra*

3. Anal fin short with 9-11 rays, each scale with a black spot *B. bendelisis*
 – Anal fin long, with 13-15 rays. 10 vertical bars present *B. vagra*

4. *Barilius barna* (Hamilton-Buchanan)

1822. *Cyprinus (Barilius) barna* Hamilton-Buchanan, *Fishes of Ganges* : 268, 384 (type locality : Jamuna river and Brahmaputra river).
 1991. *Barilius barna* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 344-345.

Diagnosis : D ii 7 ; A iii 10-11; Pi 14; Vi 8. Body depth 3.4 to 4.0 in standard length. Barbels absent, often rudimentary. Dorsal fin inserted in advance of anal fin. Scales moderate; lateral line with 39 to 42 scales; pre-dorsal scales 15 to 16. Well developed tubercles on snout and lower jaw. 7 to 11 well defined vertical bars on the body.

Geographical Distribution : India : Ganga and Brahmaputra river system, Mahanadi.

Elsewhere : Nepal; Bangladesh and Myanmar.

Fishery Information : It attains a length of about 8 cm and is of no interest to fisheries.

5. *Barilius bendelisis* (Hamilton-Buchanan)

1807. *Cyprinus bendelisis* Hamilton-Buchanan, *Journey in Mysore*, 3 : 345, pl. 32 (type-locality : Vedawati stream, headwaters of Krishna river near Heriuru, Mysore).
 1991. *Barilius bendelisis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 346-347.

Diagnosis : D ii 7 ; A ii-ii 7-8; Pi 14; Vi 8. Body depth 3.8 to 4.2 in standard length. Two pairs of short barbels, the rostral pair reduced or often absent. Dorsal fin inserted entirely in advance of anal fin, nearer to base of caudal fin than to tip of snout. Lateral line scales 40 to 45; predorsal scales 18 to 20.

Geographical Distribution : India : throughout

Elsewhere : Pakistan; Nepal; Bangladesh and Srilanka.

Fishery Information : It attains a length of 16 cm, is one of the principal commercial hill stream fishes.

6. *Barilius shacra* (Hamilton-Buchanan)

1822. *Cyprinus (Barilius) shacra* Hamilton-Buchanan, *Fishes of Ganges* : 271, 385 (type-locality : Kosi river, Uttar Pradesh).
 1991. *Barilius shacra* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 351, fig. 121.

Diagnosis : Dii 7, A ii-iii 8; P i 14; Vi 8. Body elongate, its depth 4.3 to 4.6 in standard length. Jaws long, maxilla reaches to anterior margin of orbit. Two well-developed pairs of barbels; maxillary pair as long as eye, rostral barbels slightly longer. Dorsal fin inserted in advance of anal fin. Scales with many radii, lateral line with 59 to 70 scales; predorsal scales 22 to 25. About 12 vertical bars present.

Geographical Distribution : India : Ganga, Yamuna and Brahmaputra drainages; Sikkim, Tripura, Meghalaya, Mizoram, Nagaland.

Elsewhere : Bangladesh; and Nepal

Fishery information : It attains a length of about 12.5 cm and is of no interest to fisheries.

7. *Barilius vagra* (Hamilton-Buchanan)

1822. *Cyprinus (Barilius) vagra* Hamilton-Buchanan, *Fishes of Ganges* : 269, 385 (type-locality : Ganges river at Patna).
 1991. *Barilius vagra* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 253.

Diagnosis : D ii-iii 7; A ii-iii 10-12; Pi 14-15; Vi 8. Body elongate, its depth 4.5 to 4.6 in standard length. Two pairs of barbels; rostral shorter than eye diameter, maxillary pair very short. Dorsal fin inserted almost anterior to anal fin; pectoral fin slightly shorter than head. Lateral line with 38 to 44 scales; predorsal scales 21 to 26, 10 to 14 vertical bars which usually remain much above lateral line.

Geographical Distribution : India : Himalaya and sub-Himalayan rivers.

Elsewhere : Afghanistan; Pakistan; Nepal; Bangladesh and Sri Lanka.

Fishery Information : It attains a length of about 13 cm and is of no interest to fisheries.

However, the colour of the fish in living condition with beautiful combination of different shades, is very attractive.

Genus *Brachydanio* Weber & de Beaufort

1916. *Brachydanio*, Weber and de Beaufort, *Fishes of Indo-Australian Archipelago*, 3 : 85 (type-species, *Nuria albalineata* Blyth) (as a subgenus).

Body elongate and compressed. Mouth small, directed obliquely upwards. Maxilla not extending to vertical from anterior margin of eye. Lower jaw with symphyseal knob. Barbels one to two pairs, or absent. Dorsal fin short, inserted anterior to origin of anal fin. Anal fin with 9 to 14 branched rays. Lateral line incomplete or entirely absent.

8. *Brachydanio rerio* (Hamilton-Buchanan)

1822. *Cyprinus rerio* Hamilton-Buchanan, *Fishes of Ganges* : 323, 390 (type-locality : Kosi river, Uttar Pradesh).
1991. *Brachydanio rerio* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 360.

Diagnosis : Dii 6-7; A ii-iii 12-13; Pi 11-12, Vi6. Body elongate, slim and compressed; its depth 3.4 to 4.2 in standard length. Head length 3.8 to 4.4 in standard length. Eye diameter 3.0 to 3.5 in head length. Two pairs of well-developed barbels. Maxillary barbels extend beyond half of pectoral fin. Lateral line usually absent. Rows of scales on lateral line series 28 to 30. Pre-dorsal scales 15 or 16.

Geographical Distribution : India : Eastern parts from West Bengal to Krishna River system ; Tripura, Meghalaya, Nagaland, Sikkim.

Elsewhere : Pakistan; Bangladesh ; Nepal.

Fishery information : It attains a length of about 7 cm, is hardy and easy to breed and maintain. This danio with blue and horizontal stripes, is one of the most popular aquarium fishes with its active and graceful habit, this zebra danio is probably the finest small tropical aquarium fish known.

Genus *Carassius* Jarocki

1822. *Carassius* Jarocki, *Zoologia*, 4 : 71 (type-species : *Cyprinus carassius* Linnaeus).

Body stout, deep and moderately compressed. Head more or less small and top is depressed. Small and terminal mouth; lips thick and fleshy. Barbels absent. Eyes large, dorsolateral and not visible from underside of head. Dorsal fin very long, with 18 to 25 rays, its last simple ray strong, osseous and serrated on posterior side. Anal fin short, with 11 rays. Pelvic fin originated well forward. Lateral line straight, with 23 to 31 scales.

9. *Carassius auratus* (Linnaeus)

1758. *Cyprinus auratus* Linnaeus, *Systema naturae* ed. 10, 1 : 323 (type locality : rivers of China and Japan).
1991. *Carassius auratus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 161-162.

Diagnosis : D. iii 16-18 ; A ii-iii 5; Pi16 ; V i 8. Body stout, more or less high and compressed, its dorsal and ventral profiles almost equally arched. Head small, slightly depressed on top. Mouth small and terminal, upper jaw protractile. Dorsal fin inserted nearer to snout tip than to caudal fin base. Dorsal spine strong & serrated. Anal fin squarish. Pectoral fins rounded. Lateral line with 28 scales.

Geographical Distribution : China and Japan; introduced in almost all country of the world including India.

Fishery Information : The best known and most extensively cultivated member of family : cyprinidae and indeed, of aquarium fishes in general. A handy, extremely adaptable fish, it can be kept indoor or out.

Genus *Catla* Valenciennes 1844

1844. *Catla* Valenciennes *Hist. nat. Poiss.*, 18 : 140 (type-species : *Catla buechanani* Valenciennes = *Cyprinus catla* Hamilton-Buchanan).

Body deep, laterally compressed, its depth more than length of head. Head very large, snout rounded. Eyes large, lateral in position, visible from underside of head. Mouth wide, terminal in position; upper lip absent, lower lip very thick. Barbels absent. Gill rakers long and fine. Dorsal fin originated slightly in advance of pelvic fins,

with 18 or 19 rays, the simple rays non-osseous. Anal fin short. Caudal fin forked. Lateral line scales 40 to 43.

10. *Catla catla* (Hamilton Buchanan)

1822. *Cyprinus catla* Hamilton-Buchanan, *Fishes of Ganges*, 287, 318, pl. 13, fig 81 (type-locality : rivers and tanks of Bengal).

1991. *Catla catla* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 163-165, fig. 62.

Diagnosis : D iii-iv 14-16 ; A iii 5, Pi 20; Vi 8. Body deep, its depth 2.5 to 3.0 times in standard length. Head very large. Mouth wide and terminal; with prominent protruding lower jaw. Pectoral fin extends to pelvic fins. Scales large; lateral line scales 40-43.

Geographical Distribution : India : North India; introduced to some of the rivers of Peninsular India, Notably river Cauvery.

Elsewhere : Pakistan; Bangladesh; Nepal; Myanmar; Sri Lanka and China.

Fishery information : It is one of the fastest growing among the Indian major carps. It is considered excellent eating. In India catla was originally confined to plains of north of Krishna, but during last four decades it has been introduced to practically all river systems and many of the tanks and reservoirs. Catla is non-predatory and its feeding is restricted to the surface and midwaters.

Genus *Chagunius* Smith, 1938

1938. *Chagunius* Smith, *Proc. Biol. Soc. Wash.*, 51 : 157 (type species : *Cyprinus chagunio* Hamilton-Buchanan).

Body elongate and more or less compressed. Eyes on upper half of head. Mouth narrow and sub-terminal, lips fleshy with tiny papillae; post labial groove incomplete. Two long pairs of barbels present. Pharyngeal bone with three rows of broadly faced teeth. Dorsal fin with 13 rays, its last simple ray osseous and serrated. Pelvic fin with 9 and anal fin with 8 or 9 rays. Lateral line scales 44 to 48. Pronounced sexual dimorphism found in fin shape and tuberculation.

11. *Chagunius chagunio* (Hamilton-Buchanan)

1822. *Cyprinus chagunio* Hamilton-Buchanan, *Fishes of Ganges* ; 295, 387 (type-locality : Yamuna river and northern rivers of Bihar and Bengal).

1991. *Chagunius chagunio* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 167-168, fig. 63.

Diagnosis : D. V. 8; A iii 5; Pi 15; Vi 8. Body elongate, its depth little more than head length. Mouth narrow, subterminal. Two pairs of barbels, longer than orbit. Eye diameter 5.0 to 6.5 in head. Dorsal spine strong and serrated. Lateral line scales 44 to 47; scales between lateral line and pelvic 6. Tubercles of snout and cheeks of females smaller than those of males.

Geographical Distribution : India : Brahmaputra and Ganga drainages along the Himalaya foot hills, Tripura, Meghalaya, Nagaland, Sikkim.

Fishery information : It attains a length of about 50 cm, is generally found in large rivers characterised by rocky bottom, clear and fast flowing water. It offers a good sport on small hook.

Genus *Cirrhinus* Cuvier, 1817

1817. *Cirrhinus* Oken *Isis* : 1833 (On *Les Cirrhinus* Cuvier) *Regne Animale*, 2 : 193) (type-species : *Cyprinus cirrhinus* Bloch).

Body elongate; abdomen rounded. Snout depressed, often with pores. Mouth wide; lower jaw with a small symphyseal knob. Upper lip not continuous with lower lip around corners of mouth. Barbels one or two pairs or absent. Dorsal fin inserted anterior to pelvic fins with 10 to 19 rays, last simple ray non-osseous and non-serrated. Anal fin with 7 to 8 rays. Lateral line complete, with 35 to 45 scales.

12. *Cirrhinus mrigala* (Hamilton-Buchanan)

1822. *Cyprinus mrigala* Hamilton-Buchanan *Fishes of Ganges* : 279, 386, pl.6, fig. 79 (type-locality : ponds and freshwater rivers of Gangetic provinces).

1981. *Cirrhinus mrigala* : Jayaram, *The freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka* : 126-127.

Diagnosis : D. iii-iv 12-13, A iii 5; P i 17; Vi 8. Body stream lined; its depth almost equal to length of head. Snout often with pores. Mouth broad, lower lip indistinct. A single pair of rostral barbel. Dorsal fin as high as body; pectoral fin shorter than head; caudal fin deeply forked. Lateral line scales 40-45; lateral transverse $6-7\frac{1}{2}$ -6.

Geographical Distribution : India : northern India from Punjab to West Bengal and Assam. Also successfully introduced in peninsular India and other states.

Elsewhere : Pakistan and Bangladesh.

Fishery Information : It attains a length of about one metre and weight of 13 kg and is an important major carps in India. A large number of intergeneric hybrids have been produced at the Central Inland Fisheries Research Institute, Barrackpore.

Genus *Crossocheilus* Kuhl et van Hasselt, 1823

1823. *Crossochilus* Kuhl et van Hasselt, *Algemeine Konst. en Letter Borde*, 2 (35) : 132 (type-species : *Crossocheilus oblongus* Kuhl et van Hasselt).

Body moderately elongate with a rounded abdomen. Head rather small; snout obtusely rounded. Mouth inferior; upper lip well developed, lower lip fleshy. Usually one pair of rostral barbel. Dorsal fin inserted in advance of pelvic fins, with 10 to 11 soft rays and without a spine. Anal fin with 7 rays. Lateral line complete, with 33 to 46 scales.

13. *Crossocheilus latius latius* (Hamilton-Buchanan)

1822. *Cyprinus latius* Hamilton-Buchanan, *Fishes of Ganges* : 345, 393 (type-locality : Tista river at the base of Darjeeling Himalaya).

1991. *Crossocheilus latius latius* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 416.

Diagnosis : D. iv 8; A ii 5; Pi 13; Vi 8. Body elongate, its depth 4.3 to 5.9 in standard length. Head flat anteriorly and compressed, its length 4.4 to 5.3 in standard length. Eye diameter 3.1 to 4.0 in head length. Mouth inferior, barbels two

pairs. Rostral barbels short, may be rudimentary. Lateral line scales 39 to 41.

Geographical Distribution : India : The Ganga and Brahmaputra in northern India; Mahanadi in Orissa; Western Ghats, south to the head waters of Krishna river; Manipur, Mizoram, Nagaland, Sikkim.

Fishery Information : This species attains a length of about 12.5 cm; of little interest to fisheries.

Genus *Ctenopharyngodon* Steindachner 1866

1866. *Ctenopharyngodon* Steindachner, *Verh. Zool. bot. Ges. Wien*, 16 : 782 (type-species : *Ctenopharyngodon laticeps*. Steindachner = *Leuciscus idella* Valenciennes).

Body elongate; head broad. Operculum large. Eyes large, often visible from underside of head. Mouth wide and terminal. Lower lip distinct only at corners of mouth; post labial groove restricted around corners of mouth only. Barbels absent. Gill rakers short and spiny, arranged biserially. Dorsal fin short, inserted opposite to or slightly anterior to pelvic fins, with 10 rays; its last simple ray non-osseous. And fin with 10 to 11 rays. Caudal fin forked. Lateral line complete with 40 to 42 scales.

14. *Ctenopharyngodon idellus* (Valenciennes)

1844. *Leuciscus idella* Valenciennes, *Hist. nat. Poiss.*, 17 : 362 (type-locality : China).

1991. *Ctenopharyngodon idellus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 175, fig. 66.

Diagnosis : D iii7; A iii 7-8; P i17; V i8. Body elongate and stout; its depth 4.0 to 4.8 in standard length. Dorsal and ventral profile equally arched. Head broad; mouth subterminal; upper jaw slightly protractile. Dorsal fin inserted slightly nearer to tip of snout than to caudal fin base. Caudal fin forked. Lateral line scales 40 to 42. Fins dark in colour.

Geographical Distribution : India : introduced into most of the states and union territories.

Elsewhere : Naturally occurring in China (Flat land rivers) and U.S.S.R (lower reaches of river Amour). Introduced into many countries in recent times.

Fishery information : The first ever consignment of grass carp came to India from Hongkong to the pond culture Division of Central Inland Fisheries Research Institute, Cuttack during 1959. They were successfully bred at Cuttack by hypophysation in 1962 and thereafter fry of grass carp were distributed in various states. It attains a length of about 86 cm when they are three years old. It is of considerable economic importance as source of protein as well as in weed control.

Genus *Cyprinion* Heckel 1842

1842. *Cyprinion* Heckel, In : *Russeger, Reisen in Europa, Asien and Africa*, 1 (2) : 1015 (type-species : *Cyprinion macrostomus* Heckel).

Body extremely deep and laterally compressed. Mouth usually ventral, of great width and overhanging. Snout prominent. A single maxillary pair of barbels present or entirely absent. Eyes large, not visible from underside of head; dorsal fin inserted above posterior third of pectoral fin, with 10 to 25 branched rays. Last simple dorsal ray osseous and often serrated. Anal fin stout with 5 to 7 branched rays. Lateral line complete with 27 to 36 scales.

15. *Cyprinion semiplotum* (Mc Clelland)

1839. *Cyprinus semiplotus* Mc Clelland, *Asial. Res.* 19 (2) : 274, 346 pl 37, fig. 2 (type-locality : Brahmaputra river : Upper Assam).
1982. *Cyprinion semiplotum*, *Bull. Br. Mus. nat. Hist (Zool)*, 42 (4) : 331, fig. 1a, b & c.

Diagnosis : D iii 24-25; A ii7; Pi15; Vi 9. Body extremely deep and laterally compressed. Overhanging mouth; obtuse and broad snout. Very wide and inferior mouth. At the symphysis of lower jaw, a small knob present. A single small maxillary pair of barbel present. Dorsal fin long, its last simple ray strong osseous and entire. Scale large sized; lateral line scales 27 to 33.

Geographical Distribution : India : Assam, Arunachal Pradesh, Meghalaya, Nagaland, North-Bengal and Sikkim.

Elsewhere : Nepal and Upper Myanmar.

Fishery Information : It attains to a large size (about 60 cm) and contributes a small fishery in North-Eastern States.

Genus *Cyprinus* Linnaeus 1758

1758. *Cyprinus* Linnaeus, *Systema Naturae* ed 10, 1 : 320 (type-species : *Cyprinus carpio* Linnaeus).

Body robust, elongate and compressed. Abdomen rounded. Head relatively small with a bluntly rounded snout. Eyes moderate, placed on the upper half of the head. Mouth small, terminal. Barbels 2 pairs, rostral and maxillary. Dorsal fin very long, inserted opposite to pelvic fins with 3 spines and 18 rays. Anal fin short with 3 spines and 5 rays. Scales large; lateral line with 30 to 40 scales.

16. *Cyprinus carpio* Linnaeus

1758. *Cyprinus carpio* Linnaeus, *Systema Naturae*, ed. 10, 1 : 320 (type-locality : Europe)
1991. *Cyprinus carpio* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 184-186.

Diagnosis : D iii-iv 18-20; A iii5; Pi 15; Vi8. Body stout; head moderate; snout obtusely rounded. Mouth small, protrusible; lips thick and fleshy. Two pairs of barbels. Dorsal fin inserted midway between tip of snout and caudal fin base. Dorsal spine stout, serrated posteriorly. Pectoral fins large and rounded. Caudal fin deeply emarginate. Lateral line scales 30 to 40.

Geographical Distribution : Naturally found in China; Korea; Japan; Thailand; Europe; America; introduced in India for culture.

Fishery Information : It attains a length of about 1 metre and a maximum 10 kg body weight. Cultivated in freshwater impoundments all over the world.

Genus *Danio* Hamilton-Buchanan, 1822

1822. *Danio* Hamilton-Buchanan, *Fishes of Ganges* : 321, 390 (type-species : *Cyprinus dangila* Hamilton-Buchanan).

Body more or less elongate and compressed. Mouth anterior, small and directed obliquely upwards. Lower jaw with symphysial knob. Maxilla extends upto anterior margin of eye. Barbels 2 pairs, 1 pair or absent. Dorsal fin with 6 to 17 and anal fin with 11 to 20 rays. Caudal fin emarginate, lunate or forked. Lateral line complete, incomplete or absent; with 32 to 65 scales.

17. *Danio aequipinnatus* (McClelland)

1839. *Perilampus aequipinnatus* McClelland, *Asiat. Res.* 19 (2) : 393, pl. 60, fig. 1 (type-locality : Assam).
1991. *Danio aequipinnatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 364-365, fig. 128.

Diagnosis : Dii-iii 9-12; A ii-iii 14-16; Pi 11-12; Vi6. Body elongate and compressed; its depth 2.9 to 3.5 in standard length. Head length 3.5 to 4.3 in standard length. Eye diameter 3.0 to 4.0 in head length. A pre-orbital spine present. Mouth small, directed upwards; two pairs of very small barbels. Dorsal fin inserted well in advance of origin of anal fin, extending to over anterior anal fin rays. Lateral line complete; with 35 to 37 scales. Predorsal scales 14 to 15.

Geographical Distribution : India : throughout.

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

Fishery Information : It attains a length of about 150 mm and is a widely distributed beautiful fish of our area. This also proves to be hardy aquarium fish.

Genus *Garra* Hamilton-Buchanan 1822

1822. *Garra* Hamilton-Buchanan, *Fishes of Ganges* : 343, 393 (type-species : *Cyprinus lamta* Hamilton-Buchanan).

Body elongate, sub-cylindrical. Under surface of head and body flattened. Mouth inferior,

transverse and semicircular; a suctorial disc present on chin. A proboscis may or may not be present. Barbels 1 or 2 pairs or absent. Dorsal fin inserted in advance of pelvic fins, with 9 to 12 rays and no spine. Paired fins horizontally placed. Anal fin with 6 to 8 rays. Lateral line complete, with 32 to 40 scales.

Key to the species of genus *Garra*

1. Proboscis present 2
- Proboscis absent 3
2. Proboscis trilobed, 2 pairs of barbels
..... *G. nasuta*
- Proboscis single projection; well developed with well defined lateral tubular area
..... *G. gotyla gotyla*
3. Lateral line with 31 to 34 scales. Tip of the snout marked off by a deep transverse groove *G. lamta*
- Lateral line with 33 or 34 scales. Tip of the snout not marked out by a deep transverse groove. Dorsal and caudal fins without any marking *G. annandalei*

18. *Garra annandalei* Hora

1877. *Discognathus lamta* (nec Hamilton-Buchanan) Day (partim), *Fishes of India* : 527.
1921. *Garra annandalei* Hora, *Rec. Indian Mus.*, 22 (5) : 657 (type-locality : Mahananda river, below Darjeeling).

Diagnosis : D iii 7-8; A ii 5, Pi 12-14; Vi7. Body subcylindrical, slightly depressed. Head more or less depressed, its length 4.2 to 4.4 in standard length. Mouth small, mental disc well developed. Two pairs of barbels, shorter than eye diameter. Dorsal fin inserted nearer to tip of snout than to caudal fin base. Pectoral fin shorter than head, caudal fin deeply emarginate. Lateral line scales 33 to 34. Predorsal scales 9 to 10.

Geographical Distribution : India : Sikkim, Northern Bengal, Bihar, Assam, Mizoram, Nagaland.

Elsewhere : Eastern Nepal, Kosi drainage and Bangladesh.

Fishery Information : It attains a length of about 23 cm and is of no interest to fisheries.

19. *Garra gotyla gotyla* (Gray)

1832. *Cyprinus gotyla* Gray, *Illustr. Indian Zool.* 1 : Pl 88, figs. 3, 3a (type-locality : Northern India).

1964. *Garra gotyla gotyla* Menon. *Mem. Indian Mus.*, 14 (4) : 233, pl. 13, figs 1-4.

Diagnosis : Diii 7-8, A ii5; Pi14; Vi8. Body elongate, its depth 3.7 to 4.5 in standard length. Head depressed, its length 3.5 to 4.2 in standard length. Snout with well developed median proboscis and a transverse lobe at tip. Several large spiny tubercles present on proboscis and lateral side of head in front of nostrils. Barbels 2 pairs, shorter than eye diameter. Dorsal fin inserted nearer tip of snout than caudal fin base. Lateral line scales 32 to 35; predorsal scales 9 or 10.

Geographical Distribution : India : All along Himalayas, Chotanagpur plateau and Vindhya-Satpura mountains of peninsular India.

Elsewhere : Bangladesh, Upper Myanmar.

Fishery Information : It attains a length of about 14 cm, of minor interest to fisheries. It is found in the streams and lakes of Himalayas and is highly valued as food fish.

20. *Garra lamta* (Hamilton-Buchanan)

1822. *Cyprinus (Garra) lamta* Hamilton-Buchanan, *Fishes of Ganges* : 343, 393 (type-locality : Rapti river, Gorakhpur, U.P.)

1991. *Garra lamta* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 426-427.

Diagnosis : Diii 7-8. A ii5; Pi 12; Vi 7-8. Body sub-cylindrical, more or less flattened on under surface; its depth 3.5 to 4.5 in standard length. Head short, its length 3.6 to 4.3 in standard length; snout rounded and smooth; its tip marked off by deep transverse groove. Transverse lobe at tip and sides of snout in front of nostrils covered with horny tubercles. Mouth wide, mental disc small and well developed. Barbels 2 pairs, shorter than eye diameter. Dorsal fin inserted nearer to tip of snout than to caudal fin base. Lateral line scales 31 to 34. Predorsal scales 8 to 10.

Geographical Distribution : India : Darjeeling and Kumaon Himalaya, Assam, Sikkim.

Elsewhere : Eastern Nepal.

Fishery Information : It attains a length of about 15 cm. It is found in the streams and lakes of the Himalaya and highly valued as food fish owing to its high fat content.

20. *Garra nasuta* (McClelland)

1839. *Platycaura nasuta*, McClelland, *J. Asiat. Soc. Beng.*, 7(2) : 947, pl. 55, figs 2, 2a, 2b (type locality : Khasi Hills, Meghalaya).

1991. *Garra nasuta* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 430-431.

Diagnosis : Dii 8-9; A i-ii 5; Pi14; Vi7. Body strongly depressed; its depth 3.9 to 5.7 in standard length. Head length 3.9 to 4.6 in standard length. Snout with prominent trilobed proboscis. Mouth small, mental disc well developed. Two pairs of small barbels. Dorsal fin inserted nearer to tip of snout than to caudal fin base. Caudal fin deeply emarginate. Scales very thin. Lateral line scales 33 to 34. Predorsal scales 9 or 10. Breast and belly scaled.

Geographical Distribution : India : Assam, Meghalaya, Arunachal Pradesh, Manipur, Nagaland, Mizoram, Sikkim.

Elsewhere : Myanmar, South China and Vietnam.

Fishery information : It attains a length of about 13 cm and is of no interest to fisheries.

Genus *Hypophthalmichthys* Bleeker 1860

1860. *Hypophthalmichthys* Bleeker, *Natuurk. Tijdschr. Ned. Indie*, 20 : 283 (type-species : *Leuciscus molitrix* Valenciennes).

Body elongate and compressed. Abdomen keeled either throughout or partly. Mouth terminal. Eyes small, on the lower half of the head. Operculum long, its outer surface strongly ridged. Gill membranes joined to each other. Dorsal fin small with 10 rays, inserted slightly behind origin of pelvic fin. Anal fin with 14 to 17 rays. Caudal fin forked. Scales minute. Lateral line complete.

Key to species of genus *Hypophthalmichthys*

1. Entire abdomical edge carinated; gill rakers continuous. Head rather small *H. molitrix*
- Only postventral edge of abdomen carinated; gill rakers free. Head large *H. nobilis*

22. *Hypophthalmichthys molitrix*
(Valenciennes)

1844. *Leuciscus molitrix* Valenciennes, *Hist. nat. Poiss*, 17 : 360 (type-locality : China).
1981. *Hypophthalmichthys molitrix* : Howes, *Bull. Br. Mus. nat. Hist. (Zool.)*, 41 (1) : 45, fig. 33 a.

Diagnosis : D iii 7; A ii-iii 12-14; Pi 17 ; V. i.7. Body elongate, stout and compressed. Abdomen keeled from throat to vent. Head rather small; snout blunt, obtusely rounded anteriorly. Mouth terminal; lower jaw slightly longer than upper. Gill rakers continuous, forming a broad crescentic, horny membrane. Dorsal fin short, inserted slightly behind pelvic fins. Lateral line scales 110 to 115.

Geographical Distribution : China. Introduced recently into India, Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar and many other countries.

Fishery Information : The first ever consignment of silver carp came to India from Japan in 1959 to the pond culture Division of Central Inland Fisheries Research Institute, Cuttack, where they were successfully bred by hypophysation and fry were distributed to various states. It is a pelagophil and planktophagous species. This carp is of considerable economic importance as source of protein. It attains a length of about 82 cm within a period of four years.

Genus *Labeo* Cuvier, 1817

1817. *Labeo* Cuvier, *Regne Animale*, 2 (ed1) : 194 (type-species : *Cyprinus niloticus* Forsskal = *Cyprinus refescens* Hasselquist).

Body elongate, cylindrical. Abdomen rounded. Generally overhanging mouth; inferior, transverse and semicircular. Snout broadly rounded or

obtusely pointed. Lips thick, covering the jaws, continuous at the angle of mouth. Barbels one or two pairs, or absent; when single pair, always maxillary. Dorsal fin inserted anterior to pelvic fins, with 11 to 26 rays, devoid of spine. Lateral line complete with 36 to 85 scales.

Key to the species of genus *Labeo*

1. Lower lip separated from isthmus by a post-labial groove. Branched dorsal rays 12 to 13. Lateral line scales 40 to 42 *L. rohita*
- Lower lip not separated from isthmus by a post labial groove. Branched dorsal rays 8 to 10 2
2. No horny covering inside lower jaw. Eyes 6.0 to 9.0 in head length *L. dyocheilus*
- A thin horny covering inside lower jaw. Eyes 4.5 to 5.0 in head length *L. dero*

23. *Labeo dero* (Hamilton-Buchanan)

1822. *Cyprinus dero* Hamilton-Buchanan, *Fishes of Ganges* : 227, 385, pl. 22., fig. 78 (type-locality : Brahmaputra river).
1991. *Labeo dero* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 204-205.

Diagnosis : D ii-iii 9-12; A ii-iii 5; Pi 16-17; Vi 7. Body elongate, its dorsal profile more convex than the ventral. Head length 4.5 in standard length. Mouth over hanging with a distinct groove across it and usually covered with pores. Eyes not visible from underside of head; its diameter 4.5 to 5.0 times in head length. Mouth inferior and narrow; lips thick and continuous; lower lip papillated internally. One pair of small maxillary barbels. Dorsal fin inserted midway between tip of snout and origin of anal fin. Caudal fin deeply forked. Lateral line scales 40 to 44. 7 or 8 rows of scales between lateral line and base of pelvic fin.

Geographical Distribution : India : all along the Himalayas, Meghalaya, Arunachal Pradesh, Nagaland, Sikkim.

Elsewhere : Pakistan; Sri Lanka; Bangladesh; Myanmar and China.

Fishery Information : It attains a length of about 75 cm. Its flesh is well flavoured and highly esteemed as food. Anglers commonly use it as bait for *Raimas bola* and *Tor putitora*.

24. *Labeo dyocheilus* (McClelland)

1839. *Cyprinus (Labeo) dyocheilus* McClelland, *Asiat. Res.*, 19(2) : 268, 330; pl. 37, fig. i (type-locality : Brahmaputra river).

1991. *Labeo dyocheilus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 207-208.

Diagnosis : D ii-iii 10-11; A ii 5; Pi 16; Vi 8. Body elongate. Snout projecting beyond mouth, with a distinct lateral lobe. Eyes not visible from underside of head, its diameter 6.0 to 9.0 in head length. Mouth wide and inferior, lips thick, not fringed. One short maxillary pair of barbels. Dorsal fin inserted equidistant between tip of snout and caudal fin base. Pectoral fin extends to pelvic fins. Caudal fin deeply forked. Lateral line scales 42 to 43. 5 to 6 rows of scales between lateral line and pelvic fin.

Geographical Distribution : India : all along the Himalaya, Assam, Sikkim and also Mahandi and Damodar rivers.

Elsewhere : Pakistan; Bangladesh and Nepal.

Fishery Information : It attains a length of about 90 cm. It is a common species in the Himalaya upto Sikkim and Assam.

25. *Labeo rohita* (Hamilton-Buchanan)

1822. *Cyprinus rohita* Hamilton-Buchanan, *Fishes of Ganges* : 301, 388, pl. 36, fig. 85 (type-locality : freshwater rivers of Gangetic provinces)

1991. *Labeo rohita* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 219-220, fig. 78.

Diagnosis : D iii-iv 12-14; A ii-iii 5; P i 16-18; Vi 8. Body more or less elongate, its dorsal profile more arched than ventral. Snout projects beyond mouth, devoid of lateral lobe. Eyes not visible from underside of head, its diameter 4.0 to 6.0 in head. Mouth small and inferior; lips thick and fringed. A pair of small maxillary barbels concealed in lateral groove. Dorsal fin inserted midway between tip of snout and caudal

fin base. Pectoral fin shorter than head. Caudal deeply forked. Lateral line scales 40 to 44. 6 to 6½ rows of scales between lateral line and pelvic fin base.

Distribution : India : north and central provinces.

Elsewhere : Pakistan; Bangladesh; Nepal and Myanmar.

Fishery Information : It is one of major carps in India. It attains a length of about one metre. It has been transplanted into number of rivers in peninsular India, Andamans, Maharashtra and also tanks of north-eastern states. Rohu is a bottom feeder and prefers plant matter including decaying vegetation. Rohu of river is more active and stronger than of tank.

Genus *Neolissocheilus* Rainboth

1962. *Acrossocheilus* (nec Oshima) Misra, *Rec Indian Mus.*, 57 : 148.

1985. *Neolissocheilus* Rainboth, *Reaufortia* 35 (3) : 26 (type-species : *Barbus stracheyi* Day)

Body anteriorly broad, trunk and peduncle smoothly tapered. Eyes on upper half of head; visible from ventral side, checks with numerous tubercles. Head broad, snout blunt, mouth oblique and near terminal to horizontal and inferior, two long pairs of barbels. Dorsal fin with 13 rays, last unbranched ray not serrated. Anal fin with 8, pectoral fin with 13 to 17 and pelvic fin with 8 rays. Lateral line scales 22 to 31

Key to the species of genus *Neolissocheilus*

1. Mouth nearly truncate, lower jaw edge sharp; last un-branched finray osseous and strong ..
..... *N. hexagonolepis*
- Mouth smoothly rounded, lower jaw edge blunt 2
2. Last unbranched dorsal finray osseous and strong; dorsal fin inserted nearer to tip of snout than to base of caudal fin
..... *N. hexastichus*
- Last unbranched dorsal finray non-osseous and weak. Scale rows 6 between back and lateral line *N. spinulosus*

26. *Neolissocheilus hexagonolepis* (McClelland)

1839. *Barbus hexagonolepis* McClelland, *Asiat. Res.* **19** (2) : 270, 340, pl. 41, fig. 3 (type-locality : Upper Assam)

1991. *Neolissocheilus hexagonolepis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 229-230, fig. 80.

Diagnosis : Div 9; A iii 5; Pi 16; vi 8. Body moderately elongate, & laterally compressed, its depth 3.0 to 4.5 in standard length. Head broad, its length 3.5 to 4.3 in standard length. Eye diameter 2.6 to 4.2 in head length. Mouth truncate, lower labial fold widely interrupted in middle. Two pairs of barbels, longer than orbit. In adult, dorsal fin inserted equidistant to the tip of snout and caudal fin base or often nearer of caudal fin base. Last unbranched dorsal ray osseous and strong. Lateral line scales 28 to 32. 2.5 to 3.5 rows of scales between lateral line and base of pelvic fin. Predorsal scales 8 to 10.

Geographical Distribution : India : Eastern Himalaya and Assam, Manipur, Mizoram, Nagaland, Sikkim.

Elsewhere : Bangladesh; Nepal; Myanmar; Thailand; Malaysia, Sumatra and China.

Fishery Information : It attains a length of about 60 cm; an esteemed game fish with omnivorous feeding habit. This species breeds from April to October with peak during August and September.

27. *Neolissocheilus hexastichus* (McClelland)

1839. *Barbus hexastichus* McClelland, *Asiat. Res.*, **19** (?) : 269, 333; pl. 39, fig. 2 (type-locality : great rivers in the plains of India).

1991. *Neolissocheilus hexastichus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 230.

Diagnosis : Div 9; A iii 5; Pi 16, Vi 8. Body elongate, its depth 3 in standard length. Head broad, its length 4.0 to 5.0 in standard length. Mouth rounded; lips thick, lower labial fold continuous. Two long pairs of barbels. Dorsal fin inserted slightly nearer to the tip of snout than to caudal fin base; its last unbranched ray osseous

and strong. Lateral line scales 25 to 26; predorsal scales 10.

Geographical Distribution : India : rivers from Kashmir to Sikkim and Assam along Himalayan foot hills, Meghalaya, Nagaland, Manipur.

Elsewhere : Myanmar.

Fishery Information : It attains a length of 90 cm and contributes a minor fishery along the Himalayan foot hills.

28. *Neolissocheilus spinulosus* (McClelland)

1845. *Barbus spinulosus* McClelland, *Calcutta J. nat. Hist.*, **5** : 280, pl. 21, fig. 3 (type-locality : Sikkim).

1985. *Neolissocheilus spinulosus* : Rainboth, *Beaufortia*, **35**(3) : 29 (status recognised).

Diagnosis : D v 9; A iii 5; P i 14; Vi 8. Body elongate; its depth about 4 in standard length. Head broad, its length 4.3 in standard length. Mouth rounded. Two long pairs of barbels. Dorsal fin inserted equidistant between tip of snout and caudal fin base; its last unbranched ray non osseous. Lateral line scales 32. 6 rows of scales between back and lateral line.

Geographical Distribution : India : Sikkim and also in the Ganga.

Fishery Information : It is an rare carp and further information on it is still lacking.

Genus *Puntius* Hamilton-Buchanan, 1822

1822. *Puntius* Hamilton-Buchanan, *Fishes of Ganges* : 310, 388 (type-species : *Cyprinus sophore* Hamilton Buchanan).

Body short or moderately elongate often deep and slightly compressed; with rounded abdomen. Mouth terminal to inferior; lips thin devoid of horny covering. Symphysial knob or tubercle absent. Barbels 2 pairs, 1 pair or absent. Dorsal fin short, inserted nearly opposite to pelvic fins, with 9 to 13 rays and with or without spine. Anal fin with 7 to 9 rays. Lateral line complete or incomplete, with 20 to 47 scales in longitudinal series.

Key to the species of the genus *Puntius*

1. Barbels present 2
- Barbels absent 3
2. Two pairs of barbels. Dorsal spine as long as depth of body. Lateral line scales 42
..... *P. clavatus*
- Two pairs of barbels. Dorsal spine shorter than depth of the body. Lateral line scales 30 to 33 *P. sarana sarana*
3. Dorsal spine serrated 4
- Dorsal spine smooth. Body depth 3.5 to 3.75 in total length. A round black blotch at the root of the caudal fin *P. sophore*
4. Branched ray in dorsal fin 8. About 12 rows of transverse scales. No band on body 5
5. Body depth 2.4 in total length. Pre-dorsal scales 9. Lateral line incomplete. One black spot *P. conchoni*
- Body depth 3.0 to 3.5 in total length. Predorsal scales 11. Lateral line incomplete. Two black spots *P. ticto*

29. *Puntius clavatus* (McClelland)

1845. *Barbus clavatus* Mc Clelland, *Calcutta J. nat. Hist.*, 5 : 280, pl. 21, fig. 2 (type-locality : Sikkim mountains on northern frontier of Bengal).

1991. *Puntius clavatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 265-266.

Diagnosis : D iv 8; A iii 5; Pi 14; Vi 8. Body more or less elongate and strongly compressed, its depth 2.8 to 3.1 in standard length. Mouth terminal. 2 pairs of barbels, rostral minute and maxillary one about 1/3rd of orbit. Dorsal fin inserted nearer to tip of snout than to caudal fin base. Last unbranched dorsal ray osseous, robust and strongly serrated. Lateral line complete with 35 to 37 scales.

Geographical Distribution : India : North Bengal below the Himalayan foot hills, Sikkim, Manipur, Nagaland.

Elsewhere : Nepal; Bangladesh and Myanmar.

30. *Puntius conchoni* (Hamilton-Buchanan)

1822. *Cyprinus conchoni* Hamilton-Buchanan, *Fishes of Ganges*, pp. 317, 389 (type-locality : ponds of north east Bengal; Kosi river and Ami river).

1991. *Puntius conchoni* : Jayaram, Revision of the genus *Puntius*, Hamilton from the Indian Region. *Rec. Zool. Surv. India*, Occ. Paper No. 135 : 27-29.

Diagnosis : D iii 8; A ii-iii 5; P i 18; Vi 8. Body deep and compressed, its depth 2.2 to 2.5 in standard length. Head length 4.1 to 4.5 in standard length. Barbel absent. Dorsal fin inserted equidistant between tip of snout and caudal fin base, its last unbranched ray osseous, strong and serrated. Lateral line incomplete, ceases after 10th to 13th scales, 24 to 26 scales in longitudinal series.

Geographical Distribution : India : Ganga, Brahmaputra, Mahandi and Cauvery river systems.

Elsewhere : Pakistan, Nepal and Bangladesh.

Fishery Information : It attains a length of about 100 mm. This is one of the most important ornamental *Puntius* and a beautiful aquarium fish.

31. *Puntius sarana sarana* (Hamilton-Buchanan)

1822. *Cyprinus sarana* Hamilton-Buchanan, *Fishes of Ganges* : 307, 388 (type-locality : ponds and rivers of Bengal).

1991. *Puntius sarana sarana* : Jayaram, Revision of the genus *Puntius* Hamilton from the Indian Region. *Rec. zool. Surv. India*, Occ. Paper No 135 : 113-118.

Diagnosis : D iii-iv 8; A iii 5; Pi 14-16; V 18. Body deep, its depth 2.7 to 3.0 in standard length. Head small, its length 4.0 to 4.7 in standard length. Eye diameter 3.5 to 4.5 in head. Two pairs of barbels, rostral one as long as orbit, maxillary one much longer. Dorsal fin inserted slightly nearer to the tip of snout than to caudal fin base; its last unbranched ray osseous, strong and finely serrated posteriorly. Lateral line complete, with 30 to 33 scales. Prodorsal scales 11 to 12.

Geographical Distribution : India : throughout except peninsular India south of Krishna river.

Elsewhere : Pakistan; Nepal; Bangladesh and Bhutan.

Fishery Information : It attains a length of about 30 cm. A barb of significant fisheries importance.

32. *Puntius sophore* (Hamilton-Buchanan)

1822. *Cyprinus sophore* Hamilton-Buchanan, *Fishes of Ganges* : 310, 389 pl.19, fig.86 (type-locality : ponds and rivers of Gangetic provinces).

1991. *Puntius sophore* : Jayaram, Revision of the genus *Puntius* Hamilton from the Indian Region. *Rec. zool. Surv. India*, Occ. Paper No. 135 : 15-20.

Diagnosis : D iii-iv 8-9; A iii 5; Pi 14-18; Vi8. Body deep, its dorsal profile more convex than ventral, its depth 2.7 to 3.0 in standard length. Head length 3.8 to 4.1 in standard length. Mouth terminal; barbels absent. Dorsal fin inserted equidistant between tip of snout and caudal fin base; its last unbranched ray osseous and smooth. Lateral line complete with 22 to 27 scales. Predorsal scales 8 to 10.

Geographical Distribution : India : throughout.

Elsewhere : Pakistan; Nepal; Bangladesh; Myanmar and China.

Fishery Information : It attains a length of about 13 cm and is of minor fishery value. This fish is considered of medicinal value in Tamil Nadu.

33. *Puntius ticto* (Hamilton-Buchanan)

1822. *Cyprinus ticto* Hamilton-Buchanan, *Fishes of Ganges* : 314, 398, pl.8, fig. 87 (type-locality : south-eastern parts of Bengal).

1991. *Puntius ticto* : Jayaram, Revision of the genus *Puntius* Hamilton from Indian Region. *Rec. zool. Surv. India*, Occ. Paper No. 135 : 22-26.

Diagnosis : D iii-iv 8; A ii-iii 5; Pi 12-14; Vi8. Body more or less deep, high backed, its depth 2.4 to 2.9 in standard length. Head length 3.5 to 4.0 in standard length. Mouth small and

terminal; barbels absent. Dorsal fin originated slightly posterior to pelvic fin origin; its last unbranched ray osseous, strong and serrated posteriorly. Lateral line usually ceases after six to eight scales; 23 to 25 scales in longitudinal series. Predorsal scales 9 to 11.

Geographical Distribution : India : throughout.

Elsewhere : Pakistan; Nepal; Sri Lanka; Bangladesh; Myanmar and Thailand.

Fishery Information : It attains a length of about 10 cm, a popular barb in the aquaria.

Genus *Schizothoracichthys* Misra 1962

1962. *Schizothoracichthys* Misra, *Rec. Indian Mus.*, **57** : 48 (type-species : *Schizothorax esocinus* Heckel).

Body elongate, subcylindrical; head large; snout obtuse. Mouth arched, inferior or subinferior; lips thick and fleshy, continuous at angle of mouth. Absence of a strip of hard papillated structure on the chin. Lower jaw without a horny edge. Two pairs of barbels. Dorsal fin inserted more or less opposite to pelvic fins; last undivided dorsal ray osseous and serrated posteriorly. Scales very small, 95 to 190 in lateral line.

34. *Schizothoracichthys progastus* (McClelland)

1839. *Oreinus progastus* McClelland, *Asiat. Res.*; **19** : 274, 343, pl. 40. fig.4 (type-locality : upper Assam).

1982. *Schizothoracichthys progastus* : Tilak and Sharma, *Game Fishes of India and Angling* : 77, figs. 25-27; Tilak, 1987, *Fauna of India : Pisces : Schizothoracinae*, 178, figs 90-93.

Diagnosis : D iii 8; A iii 5; P i16; Vi 10. Body elongate, subcylindrical, its depth 3.8 to 4.9 in standard length. Head narrow anteriorly; snout pointed. Mouth subterminal, arch shaped and protractile. Lips thick and fleshy; lower labial fold uninterrupted and trilobed. Two pairs of barbels, much longer than eye diameter. Dorsal fin inserted nearer to snout tip than to caudal fin base. Dorsal spine strong and serrated behind. Lateral line scales 110 to 114.

Geographical Distribution : India : Jammu and Kashmir valley, Ganga river in Uttar Pradesh, Brahmaputra river in Assam, Sikkim.

Fishery Information : It attains a length of about 50 cm. It breeds in the higher reaches of the river and travels down after breeding. It is a game fish and its flesh is liked by the people. In western Himalayas, this fish is relished and forms an important food-fish of the hilly regions.

Genus *Schizothorax* Heckel 1838

1838. *Schizothorax* Heckel (Partim), *Fische ous Cashmir* 11 (type-species : *Schizothorax plagiostomus* Heckel = *Cyprinus richardsonii* Gray).

Body elongate and sub-cylindrical. Head short, somewhat cone shaped and blunt. Snout covered with warts in male. Interorbital region broad and flat. Mouth inferior, wide and more or less arched ; lips fleshy and continuous. Lower lip papillated. Lower jaw covered with hard horny cartilage. Barbels two pairs. Dorsal fin inserted more or less opposite to pelvic fins, its last unbranched ray osseous, strong and serrated posteriorly. Scales very small.

35. *Schizothorax richardsonii* (Gray)

1832. *Cyprinus richardsonii* Gray, *Illustrations of Indian Zoology* (10) : pl.14, fig.2 (type-locality : not known).
1987. *Schizothorax richardsonii* : Tilak, *Fauna of India, Pisces* : 50, fig 12-24.

Diagnosis : Diii8; A iii 5; Pi 15-16; Vi 9. Body streamlined, its depth 4.1 to 6.2 in standard length. Head length 4.0 to 5.0 in standard length. Eye diameter 4.0 to 5.4 in head length. Mouth inferior, transverse and slightly arched. Hard cartilaginous covering below lower jaw extends between corners of mouth. Two pairs of barbels, usually shorter than eye diameter. Dorsal fin inserted midway between tip of snout and caudal fin base. Dorsal spine strong and serrated behind. Lateral line scales 85 to 110.

Geographical Distribution : India : Sikkim, along the Himalaya from Jammu and Kashmir to Assam, Manipur, Nagaland.

Elsewhere : Bhutan; Nepal; Pakistan and Afghanistan.

Fishery Information : It attains a length of about 60 cm and is a well known game fish. It is primarily a bottom feeder, breeds during April-May before the monsoons flood in the rivers and streams. The flesh of this fish is much relished.

Genus *Tor* Gray, 1834

1834. *Tor* Gray *Illustrations of Indian Zoology*, 2 : 196 (type-species : *Cyprinus tor* Hamilton-Buchanan).

Body elongate, deep anteriorly, the trunk and peduncle smoothly tapered. Head small, with a prominent snout. Mouth inferior to sub-inferior. Upper jaw often protractile. Lips thick, well developed; lower lip with a distinct fleshy median lobe. Two pairs of well developed barbels. Dorsal fin inserted opposite to pelvic fins, with 12 to 13 rays and a smooth and strong spine. Anal fin with 7 to 8 rays. Lateral line complete, with 22 to 37 scales.

Key to the species of genus *Tor*

1. Length of head considerably greater than body depth; lower fins yellowish..... *T. putitora*
2. Length of head almost equal to body depth, snout smooth, eyes not visible from underside of head. No tubercles on cheeks
..... *T. mosal*

36. *Tor mosal* (Hamilton-Buchanan)

1822. *Cyprinus mosal* Hamilton-Buchanan, *Fishes of Ganges* : 306, 388 (type-locality : Kosi river, Uttar Pradesh).
1982. *Tor mosal* : Tilak and Sharma, *Game fishes of India and Angling* : 45, fig. 7.

Diagnosis : Div 8-9; A iii 5; Pi 15; Vi 7-8. Body more or less elongate, its depth 3.3 to 4.0 in standard length. Head length almost equal to body depth. Eyes small, not visible from underside of head. Lips fleshy, continuous at the corners of mouth. Two pairs of short barbels. Scales large, lateral line scales 23 to 26. Transverse scale rows 4/2½

Geographical Distribution : India : rivers of the Himalaya, Assam, Sikkim.

Elsewhere : Myanmar

Fishery Information : Grows to an average weight of 11kg; fairly common in the Ramganga river of Uttaranchal.

37. *Tor putitora* (Hamilton-Buchanan)

1822. *Cyprinus putitora* Hamilton-Buchanan, *Fishes of Ganges* : 203, 388 (type-locality : eastern parts of Bengal).

1982. *Tor putitora* : Tilak and Sharma, *Game fishes of India and Angling* : 39, fig.4, 5 & 6.

Diagnosis : Div 8; Aii5; Pi 16-17; Vi 8. Streamlined, somewhat compressed body. Both dorsal and ventral profiles greatly arched. Body depth 5.5 to 7.0 in total length. Head broadly pointed, its length more than body depth, 3.0 to 3.6 in standard length. Eyes not visible from underside of head. Mouth small; lips fleshy and continuous at the corners of mouth. Two pairs of barbels, equal to eye diameter. Scales large, lateral line scales 25 to 28; lateral transverse rows $4\frac{1}{2}$ / $2\frac{1}{2}$.

Geographical Distribution : India : All along Himalaya.

Elsewhere : Afghanistan; Pakistan; Nepal and Bangladesh.

Fishery Information : It grows up to 2.7m. It is the most common mahaseer of Himalaya and known as Golden mahaseer. This attractive sport-fish with excellent food value is fast going towards extinction in the streams and lakes of northern India. In Assam also population of this fish is fast depleting.

Family BALITORIDAE

Genus *Aborichthys* Chaudhuri 1913

1913. *Aborichthys* Chaudhuri, *Rec. Indian. Mus.*, 8(3) : 244 (type-species : *Aborichthys kempfi* Chaudhuri).

Body greatly elongated and compressed. The body and tail of uniform height throughout. Abdomen rounded. Eyes small, situated dorsally,

not visible from underside of head. Mouth inferior, narrow and transverse. Lips thick and papillated, continuous at the angles of mouth. Lower lip interrupted in the middle. Three pairs of barbels, two pairs maxillary and one rostral pair. Dorsal fin inserted slightly behind origin of pelvic fins devoid of any spine. Pelvic fin extends considerably beyond anal opening. Paired fins horizontal, provided with pad on ventral side. Caudal fin rounded. Lateral line incomplete and indistinct.

38. *Aborichthys elongatus* Hora

1921. *Aborichthys elongatus* Hora, *Rec. Indian. Mus.*, 22 (5) : 735, fig. (type-locality : Reang river, base of Darjeeling Himalaya).

1991. *Aborichthys elongatus* : Talwar and Jhingran; *Inland Fishes of India and Adjoining Countries* : 457.

Diagnosis : Dii7, A ii5; Pi9; Vi7. Body greatly elongated and compressed. Dorsal and ventral profiles more or less parallel and horizontal. Depth of body 6.8 to 7.8 in standard length. Eyes small, its diameter 4.7 to 6.3 in head, mouth semicircular, lips rather fleshy. Three pairs of barbels, almost as long as eye. Dorsal fin inserted equidistant between snout tip and caudal fin base. Scales minute and embedded. Lateral line complete. Vent situated nearer to caudal fin base than to tip of snout.

Geographical Distribution : India : Darjeeling Himalaya, Sikkim.

Fishery Information : It attains to a length of 5.4 cm in standard length and is of no interest to fisheries.

Genus *Noemacheilus* Blecker, 1823

1823. *Noemachilus khul* et van Hasselt, *Algemeine konst en Letter bode* 2 (35) : 133 (type-species : *Noemacheilus fasciatus* Kuhl et van Hasselt).

Body elongate, more or less cylindrical and somewhat depressed. Mouth small and inferior; eye minute to small. Pre-orbital spine on head absent. Barbels 2 to 4 pairs. Dorsal fin inserted opposite to pelvic fins, with 8 to 20 soft rays and no spine. Anal fin with 6 to 8 soft rays. Caudal

fin emerginate, truncate or lunate. Scales minute. Lateral line complete or incomplete.

Key to the species of genus *Noemacheilus*

1. Lateral line complete 2
- Lateral line incomplete. Body marked with six saddle-shaped bands, extending only to middle of side of body; lateral line ending above pelvic fins *N. devdevi*
2. Body marked with 14 to 16 vertical black bands, broader than interspaces; caudal fin truncate; dorsal and caudal fins with rows of spots *N. multifasciatus*
- Body with 9 to 12 vertical black bands; bands anterior to dorsal fin not broken up into narrow bars. Caudal fin truncate or slightly emerginate. A black spot at the base of dorsal finrays; dark streaks on outer rays of dorsal and caudal fins *N. rupecola*

39. *Noemacheilus devdevi*, Hora

1935. *Nemacheilus devdevi* Hora, *Rec. Indian Mus* 37 (1) : 54, pl. 3, fig.5 & 6 (type-locality : small streams below Darjeeling and in Sikkim, Eastern Himalaya).

1987. *Noemacheilus devdevi* : Menon, *Fauna of India Pisces*, 4 : 59, pl. 1., fig.7.

Diagnosis : Diii 8; A ii 5; Pi 18, Vi6. Body long and slender, its depth 5.4 to 7.3 in standard length. Eyes small, not visible from underside of head. Mouth semicircular, lips moderately fleshy, lower lip interrupted in the middle. Well developed barbels. Dorsal fin inserted nearer base of caudal fin than to tip of the snout. Scales small and indistinct, absent on ventral side. Lateral line incomplete.

Geographical Distribution : India : Eastern Himalaya.

Fishery Information : It attains a length of about 2.75 cm in standard length and more or less common in Teesta Valley. It is of no interest to fisheries.

40. *Noemacheilus multifasciatus*, Day

1878. *Nemacheilus multifasciatus* Day (partim), *Fishes of*

India : 617, pl. 153, fig.7 (type-locality : Darjeeling and Assam).

1987. *Noemacheilus multifasciatus* : Menon, *Fauna of India, Pisces*, 4 : 52, pl. 1, figs 3&4.

Diagnosis : Dii8; Aii5; Pi 10-11; V i 7-8. Body slender, its depth 6.4 to 10 in standard length. Eyes small, not visible from underside of head; mouth semicircular, lips moderately fleshy, lower lip interrupted in the middle. Well developed barbels; nasal barbels prominent. Dorsal fin inserted slightly nearer to caudal fin base than tip of the snout. Caudal fin slightly emerginate. Scales small and indistinct, absent on ventral side. Lateral line complete.

Geographical Distribution : India : Eastern Himalaya from Teesta, throughout the base of Nepal Himalaya, as far as the Ghaghra and Kali drainage.

Fishery Information : It attains a length of about 9.8 cm in standard length and of no interest to fisheries.

41. *Noemacheilus rupecola* (McClelland)

1838. *Schistura rupecola* McClelland, *J. Asiat. Soc. Beng.*, 7 : 948, pl. 55, fig.3 (type-locality : Simla).

1987. *Noemacheilus rupecola* : Menon, *Fauna of India, Pisces*, 4, 49, pl.13, fig.6.

Diagnosis : Dii 8; Aii 5; Pi 11; Vi 7. Body elongate, its depth 5.4 to 9.0 in standard length. Eyes small, not visible from underside of head. Mouth semicircular, lips moderately fleshy, lower lip interrupted in the middle. Well developed barbels. Dorsal fin inserted equidistant from tip of snout and caudal fin base. Caudal fin slightly emarginate. Scales small and indistinct, absent on ventral side. Lateral line complete.

Geographical Distribution : India : Kumaon through Garhwal Himalaya to Yamuna, Sutlej and Beas drainages of Himachal Pradesh and Sikkim.

Fishery Information : It attains a length of about 6.6 cm in standard length and is of no interest to fisheries.

Genus *Trypophysa* Rendahl 1933

1933. *Trypophysa* Rendahl, *Ark. Zool.*, 25A(ii) : 21 (type species : *Nemacheilus hutjert juensis*, Rendahl).

Body elongate, belly rounded, caudal peduncle slightly compressed, often whip like. Dorsal fin inserted in advance of pelvic fins, with 6 to 9 branched rays. Body fully naked. Lateral line usually complete. Mottled colour pattern on flanks.

42. *Trypophysa gracilis* (Day)

1876. *Nemacheilus gracilis* Day, *Proc. zool. Soc. Lond.* : 798 (type-locality : Basgo, headwaters of Indus river, Pakistan).
1987. *Trypophysa gracilis* : Menon, *Fauna of India*, Pisces, 4 : 202.

Diagnosis : D iii 7; A iii 5; Pi 11; Vi 7. Body long and slender; anterior part of the body depressed, tail compressed. Dorsal profile slightly arched, ventral more or less straight. Caudal peduncle long and narrow. Eyes small. Mouth lunate and horizontal; lips thick; lower lip widely interrupted in the middle. Barbels short and stumpy. Dorsal fin inserted slightly nearer to caudal fin base than tip of the snout. Caudal fin truncate. Lateral line complete.

Geographical Distribution : India : Kashmir Valley, Ladakh and Sikkim.

Elsewhere : Pakistan.

Fishery Information : It attains a length of about 11 cm in standard length and is of no interest to fisheries.

Family COBITIDAE

Genus *Pangio* Blyth 1861

1861. *Pangio* Blyth *J. Asiat Soc. Beng.*, 29 : 169 (type-species : *Cobitis cinnamomeum*. McClelland = *C. pangia* Hamilton-Buchanan).

Body very much elongate and laterally compressed. Head short. Eyes minute, covered with transparent skin. An erectile bifid spine present in a groove below eye. Anterior nostril tubular. Mouth small and inferior; three pairs of barbels. Dorsal fin short with 8 rays. It is situated

in posterior half of body well behind origin of pelvic fins. Caudal fin truncate or rounded. Scales minute, head naked. Lateral line absent.

Key to the species of genus *Pangio*

1. Pelvic fin with five rays; head length about 6.2 times in standard length; lower lip with a pair of leaflike lobes *P. goaensis*
- Pelvic fin with six/seven rays; head length 7 to 8 times in standard length; leaf like lobes absent on lower lip *P. pangia*

43. *Pangio pangia* (Hamilton-Buchanan)

1822. *Cobitis pangia* Hamilton-Buchanan, *Fishes of Ganges* : 355, 394 (type-locality : North-East Bengal).
1991. *Pangio pangia* : Talwar and Jhingran, *Inland Fishes of India and Adjoining countries* : 531.

Diagnosis : D ii 6; A ii 5-6; Pi 9-10; Vi 5-6.

Body very much elongate and laterally compressed. Head small; its length 7 to 8 times in standard length. Eyes minute. Mouth small and inferior; lips thick. Three pairs of barbels. Dorsal fin small. Caudal fin truncate. Scales minute, embedded in skin.

Geographical Distribution : India : North-eastern Bengal, Assam, Manipur and Sikkim.

Elsewhere : Bangladesh and Myanmar.

Fishery Information : It attains a length of about 8.5 cm and is of very little interest to fisheries. But consumed by local people at Manipur and sold in the fish market there.

Genus *Semileptes* Swainson 1839

1823. *Semileptes* Swainson, *Natural History Animals Fishes*, 2 : 211 (type-species : *Semileptes bispinosa* Swainson = *Cobitis gongota* Hamilton-Buchanan).

Body stout, elongate, cylindrical; posterior portion narrower. Eyes large, bulging, covered with skin. A bifid suborbital spine present. Mouth small, inferior; lips fleshy, continuous. Three pairs of barbels. Dorsal fin with 11 rays, inserted behind base of pelvic fins. Anal fin with 7 rays. Caudal fin more or less rounded. Scales large, head naked. Lateral line complete.

44. *Somileptes gongota* (Hamilton-Buchanan)

1822. *Cobitis gongata* Hamilton-Buchanan, *Fishes of Ganges* : 351, 394 (type-locality : rivers of northern Bengal towards Himalaya).

1991. *Somileptes gongota* : Talwar and Jhingran, *Inland Fishes of India and Adjoining countries* : 532, fig.175.

Diagnosis : D iii 8; A ii 5; p i 10; Vi 6. Body stout, elongate, cylindrical; broad anteriorly, narrower towards posterior side. Head swollen, wider than deep; snout long. Eyes large and bulging. Mouth narrow, inferior, horseshoe shaped; lips fleshy, upper lip thickly papillated. Three pairs of short barbels. Dorsal fin inserted much nearer to base of caudal fin than to tip of the snout. Pectoral fins with fleshy peduncle at inner base; simple ray fairly thick and stiff. Caudal fin more or less rounded.

Geographical Distribution : India : North Bengal, Uttar Pradesh, Meghalaya and Sikkim.

Elsewhere : Bangladesh.

Fishery Information : It attains a length of 10 cm, is of no interest to fisheries.

Order SILURIFORMES**Family SISORIDAE****Genus *Bagarius* Bleeker 1853**

1853. *Bagarius* Bleeker, *Verh. batav. Genoot. kunst. Wet.*, **25** : 121 (type-species : *Bagarius buchanani* Bleeker = *Pimelodus bagarius* Hamilton-Buchanan).

Head broad, strongly depressed. Head and body covered by keratinised skin superficially differentiated into unculiferous plaques or tubercles. Eyes small, covered with skin, not visible from underside of head. Mouth broad, more or less inferior. Four pairs of barbels. Maxillary barbel large and stiff based. Gill openings wide, continued far forward ventrally, gill membranes free. Dorsal fin with smooth and non-serrate spine and 7 soft rays. Dorsal and pectoral fins and caudal fin lobes with filamentous extensions. Three pigmented bands or blotches on the body.

45. *Bagarius bagarius* (Hamilton-Buchanan)

1822. *Pimelodus bagarius* Hamilton-Buchanan, *Fishes of Ganges* : 186, 378, pl. 7, fig.62. (type-locality : Ganga river and its tributaries).

1991. *Bagarius bagarius* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 622.

Diagnosis : D 1.7; A iii 9-12; P I 9-12; Vi 5. Body more or less elongate; its depth 5.6 to 7.2 in standard length. Head depressed, its length 2.9 to 3.3 in standard length. Mouth inferior and crescentic. Four pairs of barbels. Dorsal fin inserted nearer to adipose fin than to tip of the snout. Pelvic fin inserted anterior to base of last dorsal finray. Abdominal vertebrae 17 to 20.

Geographical Distribution : India : Ganga river and its tributaries.

Elsewhere : Laos; Malay Peninsula.

Fishery Information : It attains to a length of about 20 cm in standard length; primarily an entomophagous species. This fish is mainly an inhabitant of rapids and rocky pools. Specimens are usually caught by line fishing. Due to stiffness and fibrous nature, the flesh is not much relished as food.

Genus *Euchiloglanis* Regan 1907

1907. *Euchiloglanis* Regan, *Rec. Indian Mus.*, **1** : 158 (type-species : *Chimarrichthys davidi* Sauvage).

Body elongate, ventrally flattened upto base of pelvic fins. Head small and depressed; snout broadly rounded. Eyes small, covered with skin, not visible from underside of head. Nostrils close to each other separated by a flap. Gill opening narrow, present on dorsal side of head, gill membranes free from each other, but confluent with isthmus. Mouth vertical; lips thick, fleshy and papillated. Four pairs of barbels; maxillary barbel with broad base. Fins without spine. Pair fins broad, rounded and horizontally placed. Caudal fin somewhat rounded. Skin soft, minutely papillated on ventral surface.

46. *Euchiloglanis hodgarti* Hora

1923. *Glyptosternum hodgarti* Hora, *Rec. Indian Mus.*, **25** (1) : 38, pl.2, figs 1-3 (type-locality : Pharping, Nepal; rivers below Darjeeling, and Abor Hills).

1991. *Euchiloglanis hodgarti* Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 632.

Diagnosis : Dii5; A ii6, Pi 16-17; Vi 5. Body elongate, ventrally flattened. Mouth inferior, teeth in bands on jaws. Four pairs of barbels, maxillary barbels not reaching pectoral fins. Gill opening narrow, its lower angle above base of pectoral fin. Long adipose dorsal fin, its base more than double to rayed dorsal fin base. Pectoral fin extends to pelvic fin. Caudal fin lunate. Caudal peduncle as long as deep.

Geographical Distribution : India : Rivers below Darjeeling, Sikkim, Abor Hills (Assam) and Kali river (Uttar Pradesh).

Elsewhere : Bangladesh.

Fishery Information : It attains a length of about 6.5 cm, of no interest to fisheries.

Genus *Glyptosternum* McClelland 1842

1842. *Glyptosternon* McClelland, *Calcutta J. nat. Hist.*, **2** : 584 (type-species : *Glyptosternon reticulatus* McClelland).

Body elongate, ventrally flattened upto pelvic fin base. Head moderately small and depressed. Eyes very small, subcutaneous, not visible from underside of head. Nostrils close to each other separated by a flap. Mouth ventral, lips thick, fleshy and papillated, lower labial fold interrupted in the middle. Four pairs of barbels, maxillary barbels with broad bases. Gill openings wide, extend to ventral surface of body. Gill membrane free from each other, but confluent with isthmus. Dorsal fin devoid of any spine. Adipose dorsal long; paired fins horizontal, broadly rounded. Caudal fin truncate or more or less rounded. Skin smooth.

47. *Glyptosternum maculatum* (Regan)

1905. *Parexostoma maculatum* Regan, *Ann. Mag. nat. Hist.*, (7) **15** : 183 (type-locality : Lhasa, Tibet).

1991. *Glyptosternum maculatum* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 640, fig. 207.

Diagnosis : Di 6; Ai5; Pi 12; Vi 5. Body elongates, its depth 3.6 to 5.1 in standard length. Mouth inferior. Eyes minute, not visible from underside of head. Four pairs of barbels, maxillary barbels extend beyond pectoral fin base. Adipose dorsal fin long and low, not confluent with caudal fin. Pectoral fin far from reaching pelvic fin base. Caudal fin more or less truncate. Least height of caudal peduncle 2 times its length.

Geographical Distribution : India : Brahmaputra drainage in Sikkim.

Elsewhere : Tibet : Lhasa and Gyangtse.

Fishery Information : It attains a length of about 25 cm and of no interest to fisheries.

Genus *Glyptothorax* Blyth, 1861

1861. *Glyptothorax* Blyth *J. Asiat. Soc. Beng.*, **29** : 154 (type-species : *Glyptothorax trilineatus* Blyth).

Body laterally depressed or cylindrical. Eyes very small, dorsal in position. A prominent thoracic sucking disc present often with a central pit. Mouth inferior, transverse and narrow, lips thick and fleshy. Four pairs of barbels; maxillary barbel with broad base. Gill membrane confluent with isthmus. Rayed dorsal fin with 1 spine and 5 to 7 rays. A short adipose dorsal present. Pectoral fin with a short spine denticulated internally. Anal fin with 7 to 14 rays. Lateral line complete.

Key to the species of genus *Glyptothorax*

1. Sucking apparatus appears not only on chest but also on lower surface of outer rays of paired fin 2
- Sucking apparatus present only on chest between pectoral fins 3
2. Skin on head and body rough. Adhesive thoracic apparatus as long as broad. Occipital process distinctly separated from basal bone of dorsal fin *G. striatus*

3. Skin on head and body rough. Adhesive thoracic apparatus longer than broad, devoid of central pit. Dorsal fin distinctly higher than body depth, pectoral fins as long as head extend to pelvic fins *G. gracile*

48. *Glyptothorax gracile* (Gunther)

1864. *Glyptosternon gracile* Gunther, *Cat. Fishes Br. Mus.*, 5 : 186 (type-locality : Nepal).
1991. *Glyptothorax gracile* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 653.

Diagnosis : Di 6; Aii 12; Pi 10; Vi 5. Body elongate, its depth 5.0 to 5.5 in standard length. Head much depressed, longer than broad. Mouth inferior; lips non-papillated. Four pairs of barbels, maxillary barbels longer than head, extend to the middle of pectoral fins. Adhesive thoracic apparatus longer than broad without central pit. Dorsal fin much higher than depth of body. Paired fins non-plaited on ventral surface. Pectoral fins almost equal to head length, extend to pelvic fins. Caudal fin forked. Skin granulated.

Geographical Distribution : India : Sikkim.

Elsewhere : Nepal.

Fishery Information : It attains a length of about 13 cm and of no interest to fisheries.

49. *Glyptothorax striatus* (McClelland)

1842. *Glyptosternon striatus* McClelland, *Calcutta J. nat. Hist.*, 2 : 587, pl.6, fig.1 (type-locality : Kashya Hills, Meghalaya).
1991. *Glyptothorax striatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 663.

Diagnosis : DI 6; A ii9; PI 11; Vi5.

Body elongate; head depressed; occipital process does not reach basal bone of dorsal fin. Mouth inferior, lips not papillated. Four pairs of barbels; maxillary barbels extend to the middle of pectoral fins. Adhesive thoracic apparatus well-developed, as long as broad; central pit absent. Dorsal spine weak and smooth. Paired fins plaited ventrally. Pectoral spine equals to head length. Caudal fin forked. Skin tuberculated.

Geographical Distribution : India : Khasi and Garo Hills of Meghalaya; Sikkim.

Fishery Information : This fish attains a length of about 22 cm and of minor interest to fisheries.

Genus *Laguvia* Hora 1921

1921. *Laguvia* Hora 1921, *Rec. Indian Mus.*, 22 (5) : 739 (type-species : *Pimelotus asperus* McClelland).

Body more or less elongate and subcylindrical. Head slightly depressed. Ventral surface of body corrugated forming a poorly developed adhesive apparatus. Eyes very small, subcutaneous, not visible from underside of head. Mouth subterminal; lips thick and fleshy. Four pairs of barbels; maxillary barbels with broad bases. Gill openings wide; gill membranes free from each other but united narrowly with isthmus. Rayed dorsal fin with a strong spine and 5 to 6 soft rays. Anal fin short with 9 or 10 soft rays. Caudal fin truncate or slightly emerginate. Skin mostly small, but with free bony tubercles on sides of the body.

50. *Laguvia shawi* Hora

1921. *Laguvia shawi* Hora, *Rec. Indian Mus.*, 22 (5) : 740, pl 29, fig.2 (type-locality : Mahananda and Sivoke rivers, Darjeeling Himalaya).
1991. *Laguvia shawi* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 672, fig.214.

Diagnosis : D I 5-6; Ai8; P I 7; Vi 5. Body more or less elongate and sub-cylindrical. Eyes very small, about 8 in head length. Mouth inferior. Four pairs of barbels. Maxillary barbels extend to the base of pectoral fins. Thoracic adhesive apparatus poorly developed. Dorsal spine strong and smooth. Pectoral spine strong and serrated internally. Pelvic fins distinctly nearer caudal fin base than to tip of snout. Caudal fin lunate or semicircular. Skin tuberculated.

Geographical Distribution : India : Tista drainage, Darjeeling Himalaya, Sikkim.

Fishery Information : It attains a length of about 3cm and of no interest to fisheries.

Genus *Pseudecheneis* Blyth 1861

1861. *Pseudecheneis* Blyth, *J. Asiat. Soc. Beng.*, 29 : 154 (type-species : *Glyptosternon sulcatus* McClelland).

Body subcylindrical, flattened ventrally up to pelvic fins. Head short and depressed. Thoracic apparatus broad and oval, composed of series of well-developed transverse muscular folds of skin. Eyes small, subcutaneous, dorsolateral, not visible from underside of head. Mouth inferior and small; lips thick, fleshy and papillated, continuous around mouth. Four pairs of barbels. Gill opening narrow; gill membranes confluent with isthmus. Rayed dorsal fin with a weak spine; adipose fin short and high, well developed. Pectoral fins horizontal, broadly rounded. Caudal fin emerginate. Skin smooth.

51. *Pseudecheneis sulcatus* (McClelland)

1842. *Glyptosternon sulcatus* McClelland, *Calcutta J. nat. Hist.*, 2 : 587, pl.6, fig. (type-locality : Khasi Hills, Meghalaya).

1991. *Pseudecheneis sulcatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 679.

Diagnosis : DI 6; A ii-iv 7-9; P I 13; Vi5. Body elongate, ventrally flattened up to pelvic fins. Head small. Thoracic apparatus broad and oval. Mouth small and inferior. Four pairs of barbels, base of maxillary barbel broad. Dorsal spine weak. Paired fins large and expanded, outer pelvic finrays with striated skin ventrally. Caudal fin emerginate, its lobes pointed, the lower lobe longer.

Geographical Distribution : Doon Valley, North Bengal, Khasi Hills and Sikkim.

Elsewhere : Nepal and Bangladesh.

Fishery Information : It attains a length of about 20 cm and of no interest to fisheries.

Family SILURIDAE

Genus *Silurus* Linnaeus 1758

1758. *Silurus* Linnaeus, *Systema naturae*, 10th ed : 304 (type-species : *Silurus glanis* Linnaeus).

Body elongate and laterally compressed. Head broad and depressed. Mouth terminal or sub-terminal. Barbels 2 to 3 pairs. Maxillary barbels well developed and extending beyond gill opening. Eye small, not visible from underside of head,

covered with skin, lying above corner of mouth. Dorsal fin very short with 1 to 4 rays. Anal fin very long with 58 to 85 rays, confluent with caudal fin or not. Pectoral fin with 7 to 11 soft rays. Caudal fin rounded or truncate.

52. *Silurus cochinchinensis* (Valenciennes)

1839. *Silurus cochinchinensis* Valenciennes, *Hist. nat. Poiss.*, 14 : 352 (type-locality : Cochinchina).

1981. *Silurus cochinchinensis* : Jayaram, The freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka. A Hand book : 210-211, fig. 108, *Zoological Survey of India*.

Diagnosis : D 4, P.I., 11; V 10; A ii 60-62; C. 17. Body elongate and laterally compressed. Head broad and depressed. Teeth on pre-vomer in a continuous band. Two mandibular barbels present, premaxillary band of teeth continuous in a narrow band.

Distribution : India : Eastern Himalaya, Kalimpong Duars, Siliguri Terai, Teesta river drainage system in North Bengal, Sikkim.

Elsewhere : Myanmar : hills above, Akyab, Tenasserim.

Fishery Information : It attains a length of about 13 cm. This fish appears to be mainly confined to hilly region. The fishery value is very little.

Family OLYRIDAE

Genus *Olyra* McClelland 1842

1842. *Olyra* McClelland, *Calcutta Jour. nat. Hist.* 2 : 588 (type-species : *Olyra longicaudata* McClelland).

Body slender and long, flattened in front of pelvic fins, but compressed behind. Head small and depressed; snout obtusely rounded, mouth narrow. Gill membranes confluent with each other across isthmus. Pectoral spine serrated on both edges.

53. *Olyra longicaudata*, McClelland

1842. *Olyra longicaudata* McClelland, *Calcutta Jour. nat. Hist.* 2 : 588, pl.21, fig.1 (type-locality : Khasi Hills, Meghalaya).

1991. *Olyra longicaudata* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 695-696.

Diagnosis : Di 6-7 ; Aiii 15-20; P I 4-6; Vi5. Body elongate, its depth 9 to 13 in standard length. Mouth terminal; teeth villiform on jaw and a continuous band on palate. Four pairs of barbels; maxillary extend to base of pectoral fins. Pectoral spine strong, serrated on both sides. Caudal fin lanceolate.

Geographical Distribution : India : base of Darjeeling Himalaya, Sikkim, Meghalaya and Assam.

Elsewhere : Myanmar.

Fishery Information : Attains a length of about 11cm in standard length, is generally found in small rocky streams at the base of hills and of no fishery value.

Order SALMONIFORMES

Family SALMONIDAE

Genus *Salmo* Linnaeus 1758

1758. *Salmo* Linnaeus *Systema Natural*, 1 ed. 10 : 308 (type-species : *Salmo salar* Linnaeus).

Body elongate. Head of moderate size. Mouth large, its cleft extends to front margin of eye. Well developed conical teeth on jaws, palate and tongue. Dorsal fin inserted above pelvic fins, with 12 to 14 rays; adipose dorsal small. Anal fin short with 8 to 12 rays. Caudal fin forked. Lateral line with 115 to 160 scales.

54. *Salmo trutta fario* Linnaeus

1758. *Salmo fario* Linnaeus, *Systema Natural* 1 ed. 10 : 309 (type-locality : Rivers of Switzerland).

1982. *Salmo trutta fario* : Tilak and Sharma; Game fishes of India and Angling : 149, figs 55, 55a.

Diagnosis : D iii-iv 9-11; A iii 7-9; Pi 12, Vi8. Body torpedo-shaped, moderately compressed. Mouth wide. Eye diameter about 4.3 in head length. Dorsal fin inserted fairly in advance of pelvic fins. Adipose dorsal fin situated above posterior part of anal fin. Pectoral fins much shorter than head. Caudal fin usually emarginate.

Scales minute, firmly embedded in skin. Lateral line scales 115 to 130.

Geographical Distribution : Western Europe; introduced into India, Japan, Newzealand, U.S.A., etc.

Fishery Information : This brown trout was brought to India from U.K. in 1899 and 1901. It is an inhabitant of cold mountain streams with high Oxygen content and with a gravelly bottom. It attains at least 40cm in length. This fish spawns in autumn and early winter. It is much esteemed as food and has also considerable economic importance.

Order CYPRINODONTIFORMES

Family POECILIIDAE

Genus *Poecilia* Bloch and Schneider 1801

1801. *Poecilia* Bloch and Schneider, *Syst. Ichth.*, 2 : 452 (type-specimen : *Poecilia vivipara* Bloch and Schneider).

Projecting lower jaw. Dorsal and anal fins short and of almost equal length. Dorsal fin originates in advance of anal fin. Any distinctive marking on dorsal and caudal fins absent.

55. *Poecilia (Lebistes) reticulata* Peters

1859. *Poecilia reticulata* Peters, *K. Preussischen Akad. Wiss.*, Berlin : 412 (type-locality : Venezuela).

1991. *Poecilia (Lebistes) reticulata* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 758.

Diagnosis : Body more or less cylindrical. Mouth moderate; projecting lower jaw. Small teeth on jaws. Dorsal fin short, originates in advance of the anal fin. Young males are easily distinguished from females by their orange red and black dots all over the body and fins.

Geographical Distribution : India : introduced.

Elsewhere : The Netherlands Antilies, the Venezuelan Islands, Trinidal and British Guana.

Fishery Information : It was introduced in India from South America in 1908 for mosquito control. It attains a length of about 3 cm in male and 6 cm in female. It is a beautiful, most

popular type fish. It is very hardy, active, extremely fertile and dependable breeder.

Order SYNBRANCHIFORMES

Family SYNBRANCHIDAE

Genus *Ophisternon* McClelland, 1845

1845. *Ophisternon* McClelland, *Calcutta J. nat. Hist.*, 5 (18) : 175, 196 (type-species : *Ophisternon bengalensis* McClelland).

Eel like body. Head small and compressed. A simple crescentic transverse gill opening free from isthmus. Gill opening confined to ventral surface of the head. Eye small. Caudal fin hardly conspicuous. Scales absent. No accessory breathing apparatus.

56. *Ophisternon bengalense* McClelland

1845. *Ophisternon bengalensis* McClelland, *Calcutta. J. nat. Hist.*, 5 (18) : 197, 220, pl. 11, fig. 1 (type-locality : Hooghly river, West Bengal).
1991. *Ophisternon bengalense* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 780.

Diagnosis : Eel like robust body. Eye minute, covered with skin. Mouth large, upper jaw slightly longer than lower; lips fleshy; teeth on the jaws small and pointed. Palatine teeth on band. Vent in the posterior side of the body. Lateral line conspicuous.

Geographical Distribution : Indo Malayasian region and Philippines.

Fishery Information : It attains to a length of about 100 cm. This species is very common in West Bengal, however, of no interest to fisheries.

Order PERCIFORMES

Family AMBASSIDAE

Genus *Pseudambassis* Bleeker 1874

1874. *Pseudambassis* Bleeker, *Natuurk. Verh. Holl. Maatsch. Wetensch.*, 2(2) : 86 (type-species : *Chanda lala* Hamilton-Buchanan).

Body elongate and compressed. Supraorbital ridge dentate, pre-orbit dentate on both ridge and

edge; sub-orbit dentate. Preopercular ridge either entire or dentate; interoperculum usually entire. Mouth moderate; tongue edentate. Scales very small or moderate. Lateral line complete with 47 to 90 scales.

Key to the species of genus *Pseudambassis*

1. Lateral line scales about 90 2
- Lateral line scales less than 70 3
2. Body yellowish-green on back, silvery on flanks and belly, with a silvery lateral band on flank; fins hyaline. Lower gill rakers about 11 *P. baculis*
3. Preopercular hind edge small, often with few serrations; lower gillrakers 15 or 16 *P. ranga*

57. *Pseudambassis baculis* (Hamilton-Buchanan)

1822. *Chanda baculis* Hamilton-Buchanan, *Fishes of Ganges* : 112, pl.22, fig.7 (type-locality : north-eastern parts of Bengal).
1991. *Pseudambassis baculis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 803.

Diagnosis : D vi + I 12-13, AIII 12-13, Pi 11-12, VI5. Body rather slender. Mouth oblique, lower jaw included when mouth closed. Lower gill rakers about 11. Scales small. Lateral line scales about 90. Seven transverse rows of scales on cheek.

Geographical Distribution : Himalayan and Indo-Gangetic plains.

Fishery Information : This glass fish attains a length of about 5 cm in standard length. Common in catches, but of very little interest to fisheries.

58. *Pseudambassis ranga* (Hamilton-Buchanan)

1822. *Chanda ranga* Hamilton-Buchanan, *Fishes of Ganges* : 113, 371, pl.16, fig.38 (type-locality : freshwaters of all parts of Gangetic provinces).
1991. *Pseudambassis ranga* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 805.

Diagnosis : D VII+I 11-14; A III 13-15; Pi 11-12; VI5. Body stout, deep and compressed. Hind

edge of pre-opercle smooth, with one or two serrations at angle. Mouth oblique. Lower gillrakers 15 or 16. Scales small; lateral line scales 47 to 63. Seven transverse scale-rows on cheek.

Geographical Distribution : India : throughout.

Elsewhere : Pakistan; Bangladesh; Myanmar; Thailand and Malaysia.

Fishery Information : It attains a maximum length of about 7 cm, rarely exceeds 5cm. It does fairly well in aquarium. During rain it breeds in all water bodies.

Family NANDIDAE

Genus *Badis* Bleeker, 1853

1853. *Badis* Bleeker, *Verh betav. Genoot. Kunst. wet*; 25 : 253 (type-species : *Badis buchanani* Bleeker = *Labrus badis* Hamilton-Buchanan).

Body fairly elongate and slightly compressed. Mouth small and slightly protrusible. Operculum triangular, its posterodorsal corner with a prominent spine. Dorsal fin large with 16 to 18 spines and 7 to 10 soft rays. Anal fin with 3 spines and 6 or 8 soft rays. Caudal fin wedge-shaped. Lateral line interrupted or absent. 26 to 33 scales on longitudinal series.

59. *Badis badis* (Hamilton-Buchanan)

1822. *Labrus badis* Hamilton-Buchanan, *Fishes of Ganges* : 70, 368, pl.25, fig.23 (type-locality : Gangetic provinces).
1991. *Badis badis* : Talwar and Jhingran, *Inland Fishes of India and Adjoining Countries* : 882.

Diagnosis : D xvi-xviii 7-10; A iii 6-8; P-12, VI5. Body elongate, low and slightly compressed. Eyes large; mouth small, teeth villiform on jaws; tongue edentate. Dorsal spines slender; anal spines short. Caudal fin rounded. Lateral line interrupted, often absent. On longitudinal series, 26 to 30 scales present.

Geographical Distribution : India.

Elsewhere : Pakistan; Nepal; Bangladesh and Myanmar.

Fishery Information : It attains a length of

about 8 cm and is of no interest to fisheries, but established itself as an aquarium fish.

Family BELONTIIDAE

Genus *Ctenops* McClelland 1845

1845. *Ctenops* McClelland, *Calcutta J. nat. Hist*; 5 : 281 (type-species : *Ctenops nobilis* McClelland).

Body elongate and compressed. Small mouth; jaws containing fixed conical teeth. Angle and lower margin of preoperculum finely denticulated. Dorsal fin containing 4 to 6 spines and 6 to 8 soft rays placed above middle of soft anal fin. Anal fin with 4 to 5 spines and 23 to 28 soft rays. Pelvic fin inserted slightly in advance of pectoral fins. First ray produced into a filament. Scales large, lateral line vestigial.

60. *Ctenops nobilis* McClelland

1845. *Ctenops nobilis* McClelland, *Calcutta J. nat. Hist.*, 5 : 281, pl.21, fig.1 (type-locality : rivers of Sikkim, passing on northern frontier of Bengal).
1991. *Ctenops nobilis* : Talwar and Jhingran, *Inland Fishes of India and Adjoining countries* : 1001, fig.285.

Diagnosis : D IV-VI 6-8; A IV-V 23-28; P-13; VI5. Body elongate, more or less deep and strongly compressed. Eyes large and prominent. Mouth moderate, jaws elongate. Dorsal fin short-based, inserted on posterior half of the body. Lateral line irregularly piercing scales. 28 to 33 scales in longitudinal scales.

Geographical Distribution : India : North-eastern Bengal, Assam, Sikkim and Bihar.

Elsewhere : Bangladesh.

Fishery Information : It attains a length of about 10 cm and rather rare; therefore unable to catch the attention of the aquarists.

Genus *Colisa* Curier, 1831

1831. *Colisa*, Cuvier, *Hist. nat. Poiss.*, 7 : 359 (type-species : *Trichopodus colisa* Hamilton-Buchanan = *Trichogaster fasciatus* Schneider)

Body oblong and compressed. Mouth small, terminal, upwardly directed and protrusible. Ventral border of preopercle serrated. Dorsal fin

long, with 15-18 spines and 6 to 14 soft rays. Anal fin with 15 to 22 spines and 11 to 20 soft rays. Pelvic fin in the form of a single elongated filiform ray. Caudal fin slightly emarginate or truncate. Lateral line when present interrupted with 27 to 31 scales.

61. *Colisa sota* (Hamilton-Buchanan)

1822. *Trichopodus sota* Hamilton-Buchanan, *Fishes of Ganges* : 120, 375 (type-locality : Ganges river).

1991. *Colisa sota* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 1007.

Diagnosis : Dxvii-xviii 6-9; A xviii-xxii 11-13; P 9. Body oblong and compressed. Mouth strong and protrusible. Serration present on preorbital. Dorsal spine increasing in length posteriorly. Caudal fin more or less emarginate. Anal fin with scales at base. 27 to 29 scales in longitudinal series.

Geographical Distribution : India : Gangetic provinces, Assam, Manipur, Sikkim.

Elsewhere : Bangladesh.

Fishery Information : It attains a length of about 5 cm. This is an uncommon species and is of no interest to fisheries.

Order CHANNIFORMES

Family CHANNIDAE

Genus *Channa* Scopoli 1777

1977. *Channa* Scopoli, *Introd. Hist. Nat.*, 459 (type-species : *Channa orientalis* Bloch & Schneider).

Body elongate, more or less cylindrical anteriorly and somewhat compressed posteriorly. Head large with plate like scales. Cephalic pits present. Mouth fairly large, lower jaw protruding beyond upper jaw. Dorsal and anal fin long based, both spineless and free from caudal fin. Dorsal fin inserted almost above pectoral fin with 29 to 55 rays. Anal fin with 21-36 rays. Caudal fin rounded.

Key to the species of genus *Channa*

1. 4 to 5 scales between orbit and angle of preopercle. 12 to 13 predorsal scales 2

2. Pelvic fin less than half length of pectoral fin. Anal fin with 21 to 23 rays. Dorsal fin with 32 to 37 rays. No black spot on scales *C. orientalis*

- Pelvic fin more than half length of pectoral fin. Pectoral fin plain *C. punctatus*

62. *Channa orientalis* Bloch & Schneider

1801. *Channa orientalis* Bloch and Schneider, *Syst. Ichth* : 406, pl.90, fig.2 (type-locality : India).

1991. *Channa orientalis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries* : 1019, pl.289.

Diagnosis : D 32-37; A 20-23, P 14-15; V 6. Body elongate and more or less rounded in transverse section. Eye diameter 5.0 to 6.0 in head length. Mouth large. Pectoral fins extend to anal fin. Pelvic fin less than 50% of pectoral fin length. Caudal fin rounded. 4 or 5 rows of scales between preopercular angle and posterior border of orbit. Predorsal scales 12; lateral line scales 40 to 50.

Geographical Distribution : India : throughout.

Elsewhere : Afghanistan; Iran; Pakistan; Nepal; Sri Lanka; Bangladesh; Myanmar and East Indies.

Fishery Information : It attains a length of about 20 cm and is of minor interest of fisheries in the Indian region.

63. *Channa punctatus* (Bloch)

1793. *Ophicephalus punctatus* Bloch *Naturges ausland Fische.*, (7) : 139, pl. 358, (type-locality : rivers and lakes of Coromandel coast).

1991. *Channa punctatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 1020, pl.290.

Diagnosis : D 28-33; A 20-30; P 15-18; V6. Body elongate and more or less rounded in transverse section. Eye diameter 7.0 to 8.5 in head length. Mouth large. Pectoral fins extends to anal fin; pelvic fin about 3/4 of pectoral fin length. Caudal fin rounded. Scales on summit of head large. 5 rows of scales between preopercular angle and posterior border of orbit. Predorsal scales 12. Lateral line scales 37 to 40.

Geographical Distribution : India : throughout.

Elsewhere : Afghanistan; Pakistan; Sri Lanka; Nepal; Bangladesh; Myanmar and China.

Fishery Information : It attains a length of about 30 cm; very common throughout the plains of India and is of moderate interest to fisheries in Indian region.

Order MASTACEMBELIFORMES

Family MASTACEMBELIDAE

Genus *Mastacembelus* Scopoli, 1777

1777. *Mastacembelus* Scopoli *Introductio Historium Naturalem* : 458 (type-species : *Ophidium mastacembelus* Solandar).

Body elongate, eel-like and compressed. Mouth inferior, cleft narrow. The long fleshy appendage of the snout not transversely striated below. Pre-orbital spine present. Dorsal fin inserted above middle of pectoral fin, with 24 to 39 detached spine and 50 to 90 soft rays. Anal fin with 3 spines and 31 to 98 soft rays. Caudal fin rounded.

64. *Mastacembelus armatus* (Lacepede)

1800. *Macrognathus armatus* Lacepede, *Hist. nat. Poiss.* 2 : 286 (type-locality : not known).

1991. *Mastacembelus armatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries* : 1031.

Diagnosis : D XXXII-XL, 64-92; A III 64-90; P 21-27; C 14-17. Body elongate, compressed. Preopercle with 2 or 3 spines, may be embedded in skin. Preorbital spine strong and usually piercing skin. Mouth small, extending to below posterior nostril or at least to its anterior margin. Sharp teeth in bands on both jaws. Spinous dorsal fin inserted above middle or posterior third of pectoral fins. Last dorsal spine small and may hide beneath skin. Dorsal and anal fins join caudal fin.

Geographical Distribution : India : throughout.

Elsewhere : Pakistan; Sri Lanka; Nepal; Myanmar; through Thailand and Malaya to South China.

Fishery Information : It attain a length of about 65 cm and is the largest spiny eel. It is reported to be good food fish specially when freshly caught.

SUMMARY

An attempt has been made in the present contribution to provide an upto date classification, scientific nomenclature, distributional records, fishery information along with species identification keys and diagnosis of each species. During the preparation of this faunal work, I have made use of all the earlier informations available in the literature in addition to the fish material present in the Registered National Zoological Collection of the Zoological Survey of India. In all 64 species belonging to 7 orders, 15 families and 43 genera have been dealt with in detail in this work. Out of these, 22 species under 15 genera are recorded for the first time from Sikkim.

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