

*Conservation Area Series, 41*

**Faunal Diversity of  
Simbalbara Wildlife Sanctuary  
Himachal Pradesh**



**BIOLOGICAL SURVEY OF INDIA**

*Conservation Area Series, 41*

*Faunal Diversity of*  
**SIMBALBARA WILDLIFE SANCTURY**  
**Himachal Pradesh**

*Edited by the Director, Zoological Survey of India, Kolkata*



**Zoological Survey of India**  
**Kolkata**

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*Faunal Diversity of  
Simbalbara Wildlife Sanctuary (Himachal Pradesh),  
Conservation Area Series,*

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**Dr. H.S. Mehta**  
**Dr. A.K. Sidhu**  
**Dr. Indu Sharma**

## **FAUNA OF SIMBALBARA WILDLIFE SANCTUARY –AN OVERVIEW**

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### **INTRODUCTION**

The state of Himachal Pradesh is a part of Western Himalayas with varied physiography of foothills to the high mountain peaks and Trans Himalayan ranges and is endowed with a vast variety of flora and fauna. From times immemorial, this tract is known for its wilderness, landscapes, beautiful forests and wildlife. In Himachal Pradesh, out of the total geographical area of 55,670 sq kms, the forest area as per legal classification is 37,691 sq kms. At present there are 32 Sanctuaries, 2 National Parks. The Simbalbar Wildlife sanctuary falls under foothills or Shiwalik hills with natural thick forests, grasslands, agriculture fields and natural streams.

Simbalbara Wildlife Sanctuary located in East-west Part of Himachal Pradesh, is one of the best-preserved sanctuaries in Shiwalik hills of the State. It lies between 30° 24' to 30° 28' N latitude and between 77° 28' to 77° 32' E longitude in Sirmour district of Himachal Pradesh. It is situated on right side of Nahan Ponta Sahib Road, about 6km far from Puruwala. Ponta Sahib is about 18km from Sanctuary. The Government of Himachal Pradesh notified the Sanctuary on 27<sup>th</sup> March 1974. The sanctuary is with thick sal forests which provide food and shelter to animals like Elephants, Goral, Sambhar, Chittal, Spotted deer, barking deer, Neelgai, Leopard, wild boar, Pea fowl, Red jungle fowl and Patridges and many more animals located in Paonta Valley. It is a small sanctuary spread over an area of 19.03sq.Km with altitude ranging from 580 to 700 m. above msl. The sanctuary is triangular in shape and its southeast border is adjoined with Kalesar National Park in the state of Haryana. The sanctuary has subtropical climate with hot summer and severe winters. The summer temperatures touch as high as 46°C and plunges to 6°C during winters. Rain fall is heavy during monsoon months of July-September.

The sanctuary has been divided into five beats for effective administration and conservation of its biodiversity. The beats are Marusidh Reserve Forest, Danda Sukhchainpur Reserve Forest, Karve Ka Khala Reserve Forest, Gharuk Reserve Forest and Kaludeo Reserve Forest.

The two perennial streams, Karve ka Khala and Asarori Khala (locally *Khala* means stream) traverses the Sanctuary. These streams unite at Simbalbara and forms Nimbubala Khala that drains into river Yamuna in the State of Haryana. Small annual streams of the drainage system of the sanctuary are Merobala Nala, Marusidh Nala, Haddi Nala, Barubala Nala, Jamunawala Nala. The main *khalas* are wide-open, full of gravel and sand at several places. Most of the span of these khalas is dry. However, water seeps out at several places in the form of the small streams. Generally these small rivulets remain dry except during rains. There are several pool formations also in the main streams. The main streams provide sufficient water for the survival of wildlife. Three ponds have also been developed for storing rainwater for wildlife.

### VEGETATION

The forest cover of the sanctuary is lush green with thick undergrowth of herbs, shrubs and grasses. The moist deciduous forest occurs in the sanctuary. The main tree species of the forest are *Shorea robusta* (Sal), *Lagersrtoemia parviflora*, *Terminalia bellerica*, *Anogeissus latifolia*, *Terminalia tomentosa*, *Adina cordifolia*, *Cassia fistula*, *Ougeinia oojeinernsis*, *Embllica officinalis* (Amla), *Bauhinia variegata* (Kachnar), *Mallotlus philippinensis*, *Aegle marmelos* (Bel), *Butea monosperma* (Dhak), *Acacia* spp., *Eucalyptus* spp, etc. Shrub component of the sanctuary is chiefly thorny. *Lantana* spp, is growing in large patches on different slopes and parts of the hills. *Carrisa* sp., *Murrayya* sp., *Adhatoda vasica* and *Zizyphus* sp. are also growing in the sanctuary. Other vegetation in the sanctuary is of *Solanum nigrum* (Makoi), *Bamboosa arundinacea* (Bamboo), *Ageratum conyzoides*, *Ficus* spp., *Polygonum* sp., *Equisetum* sp.

### TOTAL SURVEY CONDUCTED BY HAZFS SOLAN

S. No.	Surveys	Period	Faunal groups studied	Observation on Mammals and Birds and Reptilia
1.	June, 2005	7 days	Oligochaeta, Mollusca, Crusatacea, Arachnida, Myripoda, Orthoptera, Lepidoptera, Coleptera, Odonata, Dermaptera, Hymenoptera Pisces and Amphibia	Reptiles (6), Aves (69) and Mammals (9)
2.	Sept., 2005	7 days	Oligochaeta, Crustacea, Arachnida, Scorpionida, Myripoda, Neuroptera, Dictyptera, Orthoptera, Lepidoptera, Coleptera,	Reptiles, Aves and Mammals

S. No.	Surveys	Period	Faunal groups studied	Observation on Mammals and Birds and Reptilia
3.	Dec., 2005	7 days	Odonata, Dermaptera, Hymenoptera Pisces and Amphibia Oligochaeta, Arachnida, Myriopoda, Neuroptera, Diptera, Orthoptera, Lepidoptera, Coleoptera, Odonata, Dermaptera, Hymenoptera Pisces and Amphibia	Reptiles, Aves (72) and Mammals (8)
4.	March-April, 2006	8 days	Oligochaeta, Arachnida, Myriopoda, Neuroptera, Diptera, Orthoptera, Lepidoptera, Coleoptera, Odonata, Dermaptera, Hymenoptera, Pisces and Amphibia	Reptiles, Aves (73) and Mammals (8)
5.	June, 2006	7 days	Oligochaeta, Arachnida, Myriopoda, Neuroptera, Diptera, Orthoptera, Lepidoptera, Coleoptera, Odonata, Dermaptera, Hymenoptera, Pisces and Amphibia	Reptiles, Aves (73) and Mammals (8)
6.	Sep., 2006	5 Days	Diptera, Orthoptera, Lepidoptera, Coleoptera, Odonata, Dermaptera, Hymenoptera, Pisces and Amphibia	
7.	Dec., 2006	8 days	Oligochaeta, Arachnida, Myriopoda, Neuroptera, Diptera, Orthoptera, Lepidoptera, Coleoptera, Odonata, Dermaptera, Hymenoptera Pisces and Amphibia	
8.	March, 2008	3 days	Lepidoptera, Hymneoptera	

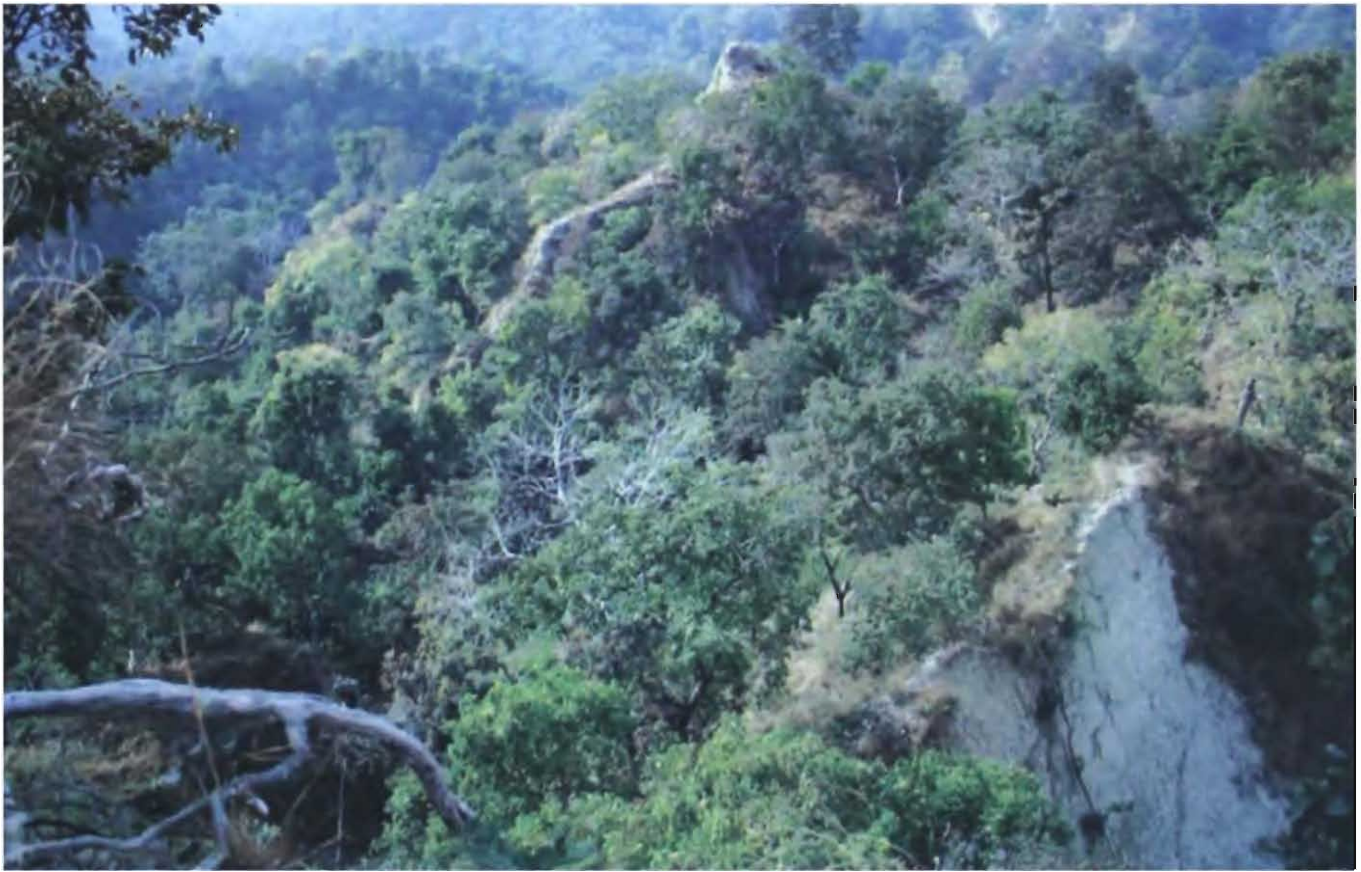
### FAUNAL EXPLORATIONS

S. No.	Faunal Group	No. of Genera	No. of Species
1	Oligochaeta	08	11
2	Odonata	12	18
3	Orthoptera	33	38
4	Lepidoptera	33	69
5	Pisces	10	14
6	Amphibia	7	8
7	Reptilia	16	17
8	Aves	131	210
9	Mammals	19	21

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(*Zool. Surv. India*, Kolkata) : 1-359+16





**Panoramic view of Simbalbara Wildlife Sanctuary**



**Water body in Simbalbara Wildlife Sanctuary**



Party making aquatic collection from the hill stream of Simbalbara Wildlife Sanctuary



A termite mound in sal forest



Party making fish collection from the hill stream of Simbalbara Wildlife Sanctuary



A caterpillar larvae in the forest



Fan throated lizard *Sitana ponticceriana*



*Aluarches miliaris*



*Eyprepocnemis alacris*



*Oxya fuscovitata*



*Acrida exaltata*



*Eupolea core*



*Kallima inachus*



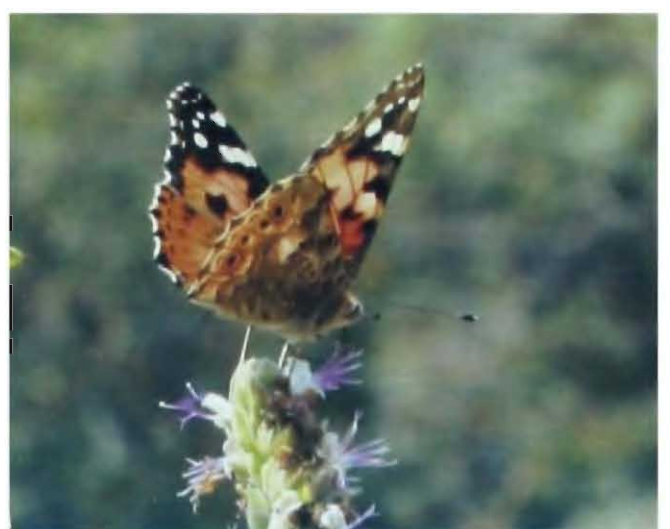
*Euthalia lubentina*



*Chilasa clytia dissimilis*



*Catopsilia pomona*



*Vanessa cardui*



*Puntius ticto*



*Brachydanio rerio*



*Noemacheilus botia*



**Cricket frog (*Fejervarya syhadrensis*)**



***Hoplobatracheis tigeriana***



***Bufo melanostictus***



*Ranatra* sp. Water scorpions (Aquatic Bugs) in the hill stream of sanctuary



*Barilius bendelisis* and *Barilius barila* in the hill stream of sanctuary



Pied wagtail feeding on aquatic insects

## ANNELIDA OLIGOCHAETA

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### INTRODUCTION

Earthworms are significant components of soil biota. Their role in promoting soil fertility make them probably the most important, in terms of their relevance to productivity, of all animal groups that share with mankind the earth's land surface (Bouche, in Lee, 1985). There is general reduction in diversity of earthworm species in agricultural land compared with the diversity of species in comparable soils under native vegetation (Lee, 1991). Conservation of natural resources in protected areas has gained relevance due to depleting biodiversity. But, understanding biodiversity *Status* of these areas is an imperative for their effective management. Significant taxonomic monographs on Indian Oligochaeta have been published by Stephenson (1923), Brinkhurst and Jamieson (1971), Gates (1972) and Julka (1988). Earthworm diversity of western Himalaya is known by 51 species (Paliwal and Julka 2005). Of these, 43 species are distributed in Himachal Pradesh. Some studies on the earthworm fauna of conservation areas of Himachal Pradesh have been carried out by Julka (1999-unpublished), Julka and Paliwal (2000) and Paliwal (2008). Conversely, the Simbalbara Wildlife sanctuary has not been explored for its earthworm diversity. Recently, during 2005-07, the surveys were undertaken to explore earthworm diversity of Simbalbara Wildlife Sanctuary.

Altogether 11 species of earthworms belonging to 8 genera spread over 3 families are documented from the sanctuary in this study. The key for identification of earthworms of the Simbalbara Wildlife Sanctuary along with brief information on their distribution is given below :

#### Key to the identification of earthworms of Simbalbara wildlife sanctuary

- 1 Setae lumbricine ..... 2
- Setae perichaetine ..... 7
2. Male pore paired, in 10/11, on the tip or protuberant porophore .....  
..... *Drawida nepaleensis*

- Male pores behind segment 15 ..... (Fam. Octochaetidae)
- 3. Males pores on segment 17; seminal grooves absent .....4
- Male pores on segment 18; seminal grooves present .....5
- 4. Spermathecal pores at ab .....*Eutyphoeus nicholsoni*
- Spermathecal pores at bc .....*Eutyphoeus waltoni*
- 5. Prostatic pores one pair, at anterior ends of short diagonal seminal grooves on segment 17 .....*Lenogaster chittagongensis*
- Prostatic pores two pair, at ends of seminal grooves on segments 17 and 19 .....6
- 6. Short worms, 19-23 mm long; clitellum 14-20; spermathecal pores in rows 7/8/9 .....*Dichogaster bolau*
- Long worms, 40-123 mm long; clitellum 13-17; spermathecal pores on segments 8 & 9 .....*Octochaetona eatrix*
- 7. Colour reddish to violet; nephridiopores obvious, holonephhric; gizzard vestigial in segment 5 or 6 .....*Perionyx excacatus*
- Colour brown to grey; nephridiopores inconspicuous, merioc; gizzard large in segment 8 .....8
- 8. Males pores discharging directly on to ody surface ..... *Amyntas alexandri*
- Male pores discharging in to copulatory pouches, opening on to body surface through secondary male pores .....9
- 9. Male pores on segment 20 .....*Metaphire anomala*
- Male pores on segment 18 ..... 10
- 10. Spermathecal pores in furrows 5/6/7/8; genital markings absent .....  
.....*Metaphire birmanica*
- Spermathecal pores in furrows 6/7/8/9; genital markings small, within copulatory pouches and spermathecal pore invaginations, recognizable internally by the presenced of stalked glands .....*Metaphire houletti*

**SYSTEMATIC LIST**

Phylum ANNELIDA

Class OLIGOCHAETA

Order MONILIGASTRIDA

Family MONILIGASTRIDAE

Genus *Drawida* Michaelsen1. *Drawida nepalensis* Michaelsen

*Material examined* : 3-4-10 FRH Simbalbara, 22 Sep., 2005, R. Paliwal; 0-1-4 Karve ka Khala, 25 Sep., 2005, R. Paliwal.

*Distribution* : India : Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Bihar, West Bengal, Sikkim, Arunachal Pradesh, Meghalaya, Assam, Tripura, Andaman & Nicobar Islands.

*Elsewhere* : Pakistan, Nepal, Myanmar, Bangla Desh, Indonesia.

*Remarks* : This is a native species believed to have originated in Central Himalaya. It also has some vermicomposting capabilities.

Order HAPLOTAXIDA

Sub order LUMBRICIANA

Family OCTOCHAETIDAE

Genus *Dichogaster* Beddard2. *Dichogaster bolau* (Michaelsen)

*Material examined* : 0-0-1 Karve ka Khala, 25 Sep., 2005, R. Paliwal.

*Distribution* : India : Cosmopolitan.

*Elsewhere* : Endemic in tropical Africa, distributed worldwide due to transportation.

*Remarks* : It inhabits topsoil with high organic matter; drains soil around compost pits, under litter, dung and stones, in rotten wood. It possibly plays an important role in converting organic matter into available nutrients.

Genus *Eutyphoeus* Michaelsen3. *Eutyphoeus nicholsoni* (Beddard)

*Material examined* : 0-0-2 FRH Simbalbara, 22, 24 Sep., 2005, R. Paliwal; 0-0-5 Sukha Khala, 23 Sep., 2005, R. Paliwal; 0-0-5 Karve ka Khala, 25 Sep., 2005, R. Paliwal; 0-0-3 Marusidh, 26 Sep., 2005, R. Paliwal.

*Distribution* : India : Gangetic Plains, foot hills of the Himalayas, Madhya Pradesh.

*Remarks* : This is a native species of Indo-Gangetic Plains region. Active during the rainy season it is found in slightly alkaline alluvial soil and forms tower like casts.

#### 4. *Eutyphoeus waltoni* Michaelsen

*Material examined* : 0-0-1 Marusidh, 26 Sep., 2005, R. Paliwal.

*Distribution* : India : Gangetic Plains, foot hills of the Himalayas, Gujarat, Madhya Pradesh.

*Elsewhere* : Pakistan (Lahore).

*Remarks* : This is also a native species of Indo-Gangetic Plains region. Found in slightly alkaline alluvial soil and active during rainy season. Forms Large-sized tower-like casts above surface.

#### Genus *Lennogaster* Gates

#### 5. *Lennogaster Chittagongensis* (Stephenson)

*Material examined* : 0-0-2 Sukha Khala, 23 Sep., 2005, R. Paliwal.

*Distribution* : Jammu & Kashmir, Himachal Pradesh.

*Elsewhere* : Bangladesh, Myanmar.

*Remarks* : It is a native species belonging to the Peninsular region. It is litter dwelling and remains within top 5 cm soil with high organic matter.

#### Genus *Octochaetona* Gates

#### 6. *Octochaetona Beatrix* (Beddard)

*Material examined* : 0-0-1 Karve Ka Khala, 25 Sep., 2005, R. Paliwal.

*Distribution* : India : Gangetic Plains, Foot hills of the Himalaya, Orissa, Madhya Pradesh, Gujarat, Maharashtra, Goa, Karnataka, Kerala.

*Elsewhere* : Pakistan, Nepal, Myanmar, Malay Peninsula, Philippines.

*Remarks* : It is a native species belonging to peninsular region. It commonly occurs in soil with low organic matter usually in grassy patches.

#### Family MEGASCOLECIDAE

#### Genus *Amyntas* Kingberg

#### 7. *Amyntas alexandri* (Beddard)

*Material examined* : 0-1-0 FRH Simbalbara, 24 Sep., 2005, R. Paliwal; 0-0-3 Karve Ka Khala, 25 Sep., 2005, R. Paliwal; 0-0-1 Kaludev, 11 Dec., 2006, R. Paliwal.

*Distribution* : India : Andaman & Nicobar Islands; Assam; Himachal Pradesh, Madhya Pradesh; Maharashtra; Nagaland; Uttarakhand; West Bengal.

*Elsewhere* : Myanmar, Thailand.

*Remarks* : It is an exotic species with its original home in Southeast Asia.

Genus *Metaphire* Sims & Easton

8. *Metaphire anomala* (Michaelsen)

*Material examined* : 0-0-FRH Simbalbara, 22 Sep., 2005, R. Paliwal, 1-0-0- Sukha Khala, 23 Sep., 2005, R. Paliwal; 0-0-1 FRH Simbalbara, 24 Sep., 2005, R. Paliwal; 0-0-2 Karve Ka Khala, 25 Sep., 2005, R. Paliwal; 0-0-1 Marusidh, 26 Sep., 2005, R. Paliwal.

*Distribution* : India : Himachal Pradesh, Uttarakhand, West Bengal, Madhya Pradesh.

*Elsewhere* : Myanmar, Thailand, Vietnam, China.

*Remarks* : Species is exotic in India, Original home of the species is in Southeast Asia.

9. *Metaphire birmanica* (Rosa)

*Material examined* : 0-0-1 Sukh Khala, 23 Sep., 2005, R. Paliwal; 0-1-0 FRH Simbalbara, 24 Sep., 2005, R. Paliwal.

*Distribution* : India : Himachal Pradesh, Uttarakhand.

*Elsewhere* : Myanmar.

*Remarks* : This species is usually found near; muddy soil. It is exotic species belonging to Southeast "Asia region.

10. *Metaphire houlleti* (Perrier)

*Material examined* : 6-14-21 FRH Simbalbara, 22 Sep., 2005, R. Paliwal; 0-0-10 Sukha Khala, 23 Sep., 2005, R. Paliwal; 0-2-6 FRH Simbalbara, 24 Sep., 2005, R. Paliwal; 0-1-7 Karve ka Khala, 25 Sep., 2005, R. Paliwal ; 0-0-1 Kaludev, 18 Dec., 2005, R.M. Sharma; 0-0-2 Kaludev, 11 Dec 2006, R. Paliwal; 0-0-21 FRH Simbalbara, 14 Dec., 2006, R. Paliwal.

*Distribution* : India : Lower altitudes of Western Himalayas and West Bengal, Meghalaya, Madhya Pradesh, Gujarat, Maharashtra, Tamil Nadu, Karnataka, Kerala, Andaman & Nicobar Islands.

*Elsewhere* : Indian Subcontinent, Southeast Asia, Australia, Madagascar, France, Bahamnas, Cuba, USA Salador, French Guyana Sierra Leone.

*Remarks* : The original home of the species is in Southeast Asia region. The species is quite common in soil common in soil rich in organic matter.

#### Genus *Perionyx* Perrier

##### 11. *Periionyx excavates* (Perier)

*Material examined* : 1-1-2-FRH Simbalbara, 14 June, 2005, R. Paliwal.

*Distribution* : Indian : Cosmopolitan.

*Elsewhere* : Southeast Asia, Indonesia, Philippines, Fiji, Samoa, Hawaii, South Africa, Madagascar, Comoro, Mauritius, Seychelles Archipelago, Reunion, Dominica.

*Remarks* : Commonly called Indian compost worm, it is a native peregrine species with its home in E. Himalaya. It thrives well in rich and moist organic materials (Litter, dung, and agricultural wasters) and can easily be used as an organic waste conditioner. As this species can easily be culture, it can also provide animal protein for utilization in poultry and fish feed.

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## INSECTA : ODONATA

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### INTRODUCTION

The odonata fauna of Himachal Pradesh has been mentioned by Fraser (1933, 1934 and 1936), Kumar and Prasad (1981), Kumar (2000 and 2005), Mitra (2002, 2003), Prasad and Varshney (1995). The present study is based upon a collection of odonates from Simbalbara Wildlife Sanctuary, which comprises 18 species and subspecies belonging to 12 genera and 5 families. The specimens were agreeing with the description provided by Fraser in *Fauna of British India, Odonata* (Vols. I, II and III) and specimens of other Indian localities present in National Zoological Collection, Zoological Survey of India, Kolkata. The specimens are deposited in High Altitude Zoology Field Station, Solan. Detailed geographical distribution of species could be obtained from Mitra (2002).

### SYSTEMATIC LIST

Order ODONATA

Suborder ZYGOPTERA

Superfamily COENAGRIONOIDEA

Family COENAGRIONIDAE

Genus *Agriocnemis* Selys

1 *Agriocnemis pygmaea pygmaea* (Rambur)

Genus *Ischnura* Charpentier

2. *Ischnura aurora aurora* (Brauer)

Genus *Pseudagrion* Selys

3. *Pseudagrion rubriceps rubriceps* Selys

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\*Zoological Survey of India, High Altitude Regional Centre, Solan 173211 (HP)

## Superfamily LESTOIDEA

## Family LESTIDAE

Genus *Lestes* Leach4. *Lestes umbrinus* Selys5. *Lestes viridulus* Rambur

## Superfamily CALOPTERYGOIDEA

## Family CALOPTERYGIDAE

Genus *Neurobasis* Selys6. *Neurobasis chinensis chinensis* (Linnaeus)

## Family CHLOROCYPHIDAE

Genus *Rhinocypha* Rambur7. *Rhinocypha quadrimaculata quadrimaculata* Selys

## SUBORDER ANISOPTERA

## Superfamily LIBELLULOIDEA

## Family LIBELLULIDAE

Genus *Brachythemis* Brauer8. *Brachythemis contaminata* (Fabricius)Genus *Cratilla* Kirby9. *Cratilla lineata lineata* (Brauer)Genus *Crocothemis* Brauer10. *Crocothemis servilia servilia* (Drury)Genus *Neurothemis* Brauer11. *Neurothemis tullia tullia* (Drury)Genus *Orthetrum* Newman12. *Orthetrum glaucum* (Brauer)13. *Orthetrum luzonicum* (Brauer)14. *Orthetrum pruinosum neglectum* (Rambur)15. *Orthetrum sabina sabina* (Drury)16. *Orthetrum triangulare triangulare* (Selys)

Genus *Trithemis* Brauer17. *Trithemis aurora* (Burmeister)18. *Trithemis festiva* (Rambur)

## SYSTEMATIC ACCOUNT

## Family COENAGRIONIDAE

1 *Agriocnemis pygmaea pygmaea* (Rambur)1842. *Agrion pygmaeum* Rambur, *Ins. Nevrop.*, p. 278.1983. *Agriocnemis pygmaea pygmaea*, Mitra, *Ent. Mon. Mag.* **119** : 30.

*Material examined* : 1 Female, Kaludar River bed, SWLS, 17.12.2005, Coll. R.M. Sharma.

*Distribution* : Throughout India.

2. *Ischnura aurora aurora* (Brauer)1865. *Agrion aurora* Brauer, *Verh. zool.-dot. Ges. Wein.*, **15** : 510.1991. *Ischnura aurora aurora*, Tsuda, *A Distributional list of World Odonata*, p. 34.

*Material examined* : 1 Male, SWLS, 12.06.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

3. *Pseudagrion rubriceps rubriceps* Selys1876. *Pseudagrion rubriceps* Selys, *Bull. Acad. Belg.*, (2) **42** : 510.1933. *Pseudagrion rubriceps rubriceps*, Fraser, *Fauna Brit. India Odonata*, **1** : 296-299.

*Material examined* : 1 Female, Pallad village, SWLS, 19.12.2005, Coll. R.M. Sharma; 1 Female, Gharatwali (Marusidh Reserve Forest), Kaludar River, SWLS, 06.04.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

## Family LESTIDAE

4. *Lestes umbrinus* Selys1891. *Lestes umbrina* Selys, *Ann. Mus. Civ. Genova*, (2) **10** (30) : 497-498.1995. *Lestes umbrinus*, Prasad and Varshney, *Oriental Insects*, **29** : 395.

*Material examined* : 1 Female, Gharatwali (Marusidh Reserve Forest), Kaludar River, SWLS, 06.04.2006, Coll. D.K. Sharma; 1 Female, SWLS, 12.06.2006, Coll. D.K. Sharma; 1 Female, Ra-Majra Reserve Forest, SWLS, 12.12.2006, Coll. Indu Sharma; 1 male, Pallad village, SWLS, 19.12.2005, Coll. R.M. Sharma.

*Distribution* : Throughout India.

### 5. *Lestes viridulus* Rambur

1842. *Lestes viridula* Rambur, *Ins. Nevrop.*, p. 252-253.

1995. *Lestes viridulus*, Prasad and Varshney, *Oriental Insects*, 29 : 395.

*Material examined* : 1 Female, Kaludev River, SWLS, 17.12.2005, Coll. R.M. Sharma.

*Distribution* : Throughout India.

## Family CALOPTERYGIDAE

### 6. *Neurobasis chinensis chinensis* (Linnaeus)

1758. *Libellula chinensis* Linnaeus, *Syst. Nat.*, 1 : 545.

1934. *Neurobasis chinensis chinensis* Fraser, *Fauna Brit. India Odonata*, 2 : 121-124.

*Material examined* : 1 Female, Kaludev River, SWLS, 13.09.2005, Coll. D.K. Sharma; 1 Male, Karweka nala, SWLS, 25.09.2006, Coll. Indu Sharma; 1 Female, Dhudwala nala, SWLS, 09.12.2006, Coll. Indu Sharma; 1 Female, Kaludar temple, SWLS, 11.12.2006, Coll. Indu Sharma; 1 Female, Karweka khala, SWLS, 14.12.2006, Coll. Indu Sharma.

*Distribution* : Throughout India.

## Family CHLOROCYPHIDAE

### 7. *Rhinocypha quadrimaculata quadrimaculata* Selys

1853. *Rhinocypha quadrimaculata* Selys, *Bull. Acad. Belg.*, 20 (Annexe) *Syn. Calopt.*, p. 60.

2006. *Rhinocypha quadrimaculata quadrimaculata*, Mitra, *Handb. Common Indian Dragonflies*, pp. 32.

*Material examined* : 1 Male, Gharatwali (Marusidh Reserve Forest), SWLS, 06.04.2006, Coll. D.K. Sharma; 4 Male, 1 Female, Kaludev River, SWLS, 04.06.2006, Coll. D.K. Sharma; 2 Male, SWLS, Simbalwara, Sirmour, 12.06.2006, Coll. D.K. Sharma; 1 male, 1 Female, Dhuduwala nala, SWLS, 09.12.2006, Coll. Indu Sharma.

*Distribution* : Eastern India and Northern India.

## Suborder ANISOPTERA

## Family LIBELLULIDAE

### 8. *Brachythemis contaminata* (Fabricius)

1793. *Libellula contaminata* Fabricius, *Ent. Syst.*, 2 : 382.

1936. *Brachythemis contaminata*, Fraser, *Fauna Brit. India, Odonata*, 3 : 365-366.

*Material examined* : 1 Male, Kaludev River, SWLS, 01.04.2006, Coll. D.K. Sharma; 1 Female, Dhuduwala Khala, SWLS, 05.06.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

### 9. *Cratilla lineata lineata* (Brauer)

1878. *Orthemis lineata* Brauer, *Sitzungsber. Akad. Wien.*, **70** : 9.

1954. *Cratilla lineata lineata*, Lieftinck, *Treubia*, **22** (suppl.) : 134.

*Material examined* : 1 Female, Gharatwali (Maruidh Reserve Forest), SWLS, 6.04.2006, Coll. D.K. Sharma; 1 male, Karweka khala Reserve Forest, SWLS, 08.06.2006, Coll. D.K. Sharma; 1 Female, Dhuduwala nala, SWLS, 09.12.2006, Coll. Indu Sharma.

*Distribution* : Eastern India, Northern India, and Southern India.

### 10. *Crocothemis servilia servilia* (Drury)

1770. *Libellula servilia* Drury, III. *Exotic Ins.*, **1** : 112-113.

1936. *Crocothemis servilia servilia*, Fraser, *Fauna Brit. India, Odonata*, **3** : 345-347.

*Material examined* : 1 Female, Sukhron Reserve Forest, SWLS, 20.12.2005, Coll. R.M. Sharma; 1 male, Karweka khala Reserve Forest, SWLS, 08.06.2006; 1 Male, SWLS, Simbalwara, Sirmour, 12.06.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

### 11. *Neurothemis tullia tullia* (Drury)

1773. *Libellula tullia* Drury, III. *Exot. Ins.*, **2** : 85.

1936. *Neurothemis tullia tullia*, Fraser, *Fauna Brit. India, Odonata*, **3** : 360-362.

*Material examined* : 1 Female, Dhuduwala Khala, SWLS, 05.06.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

### 12. *Orthetrum glaucum* (Brauer)

1865. *Libellula glauca* Brauer, *Verh. zool.-bot. Ges. Wein*, **15** : 1012.

1936. *Orthetrum glaucum*, Fraser, *Fauna Brit. India, Odonata*, **3** : 307-309.

*Material examined* : 1 Female, SWLS, 12.06.2005, Coll. D.K. Sharma; 2 male, Pallad village, SWLS, 19.12.2005, Coll. R.M. Sharma; 1 Female, Sutchron Reserve Forest, SWLS, 20.12.2005, Coll. R.M. Sharma; 1 Male, Dhandā Sukhunpur, SWLS, 21.12.2005, Coll. R.M. Sharma; 1 Male, Gharatwali (Marusidh Reserve Forest), Kaludar River, SWLS, 06.04.2006, Coll. D.K. Sharma; 1 Male, Karweka khala Reserve Forest,

SWLS, 08.06.2006, Coll. D.K. Sharma; 1 Male, Asaradika khala, SWLS, 09.06.2006, Coll. D.K. Sharma; 1 male, Karweka nala, SWLS, 25.09.2006, Coll. Indu Sharma; 1 male, Dhuduwala nala, SWLS, 09.12.2006, Coll. Indu Sharma; 1 male Kaludar temple, SWLS, 11.12.2006, Coll. Indu Sharma.

*Distribution* : Throughout India.

### 13. *Orthetrum luzonicum* (Brauer)

1868. *Libellula luzonica* Brauer, *Verh. zool.-bot. Ges. Wein*, 18 : 169, 732.

1991. *Orthetrum luzonicum*, Tsuda, *A Distributional List of World Odonata*, : 171.

*Material examined* : 1 Female, Kaludev River, SWLS, 17.12.2005, Coll. R.M. Sharma.

*Distribution* : Throughout India.

### 14. *Orthetrum pruinosum neglectum* (Rambur)

1842. *Libellula neglecta* Rambur, *Ins..Neurop.*, : 86.

1936. *Orthetrum pruinosum neglectum*, Fraser, *Fauna Brit. India, Odonata*, 3 : 311-313.

*Material examined* : 1 Female, Gharatwali (Marusidh Reserve Forest), SWLS, 06.04.2006, Coll. D.K. Sharma; 1 male, SWLS, Simbalwara, Sirmour, 12.06.2006, Coll. D.K. Sharma; 1 Female, Kaludev River, SWLS, 12.09.2006, Coll. D.K. Sharma & H.S. Mehta; 1 Female, Dhuduwala nala, SWLS, 09.12.2006, Coll. Indu Sharma; 1 male, Karweka khala, SWLS, 14.12.2006, Coll. Indu Sharma.

*Distribution* : Throughout India.

### 15. *Orthetrum sabina sabina* (Drury)

1770. *Libellula sabina* Drury, *III, Exot. Ins.*, 1 : 114-115.

1991. *Orthetrum sabina sabina*, Tsuda, *A Distributional list of world Odonata* : 172.

*Material examined* : 1 Male, Kaludev River, SWLS, 17.12.2005, Coll. R.M. Sharma; 1 male, Kaludev River, SWLS, 04.06.2006, Coll. D.K. Sharma; 2 male, Gharatwali Reserve Forest, SWLS, 07.06.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

### 16. *Orthetrum triangulare triangulare* (Selys)

1878. *Libellula triangularis* Selys, *Mitt. Mus. Dresden*, p. 314.

1936. *Orthetrum triangulare triangulare*, Fraser, *Fauna Brit. India, Odon.*, 3 : 305-307.

*Material examined* : 1 Male, 1 Female, Dhuduwala Khala, SWLS, 05.06.2006, Coll. D.K. Sharma.

*Distribution* : Eastern India, Northern India, and Southern India.

17. *Trithemis aurora* (Burmeister)

1839. *Libellula aurora* Burmeister, *Handb. Ent.*, 2 : 859.

1936. *Trithemis aurora*, Fraser, *Fauna Brit. India, Odonata*, 3 : 383-385.

*Material examined* : 1 Female, Dhuduwala Khala, SWLS, 05.06.2006, Coll. D.K. Sharma.

*Distribution* : Throughout India.

18. *Trithemis festiva* (Rambur)

1842. *Libellula festiva* Rambur, *Ins. Neurop.*, : 92.

1936. *Trithemis festiva*, Fraser, *Fauna Brit. India, Odonata*, 3 : 387-389.

*Material examined* : 1 Female, SWLS, 12.06.2005, Coll. D.K. Sharma; 1 male, 1 Female, Gharatwali (Marusidh Reserve Forest), SWLS, 06.04.2006, Coll. D.K. Sharma; 4 male, Kaludev River, SWLS, 04.06.2006, Coll. D.K. Sharma; 1B&, Kaludev River, SWLS, 12.09.2006, Coll. D.K. Sharma & H.S. Mehta; 3 male, Dhuduwala nala, SWLS, 09.12.2006, Coll. Indu Sharma; 1 male, Kaludev temple, SWLS, 11.12.2006, Coll. Indu Sharma.

*Distribution* : Throughout India.

## SUMMARY

The present study revealed 18 species and subspecies of Odonata belonging to 12 genera under 5 families of two suborder from the Simbalbara Wildlife Sanctuary, located in the Paonta valley of Shiwalik hills of Dist. Sirmour, Himachal Pradesh, India. All the species are reported for the first time from this Sanctuary.

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## **INSECTA : ORTHOPTERA**

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### **INTRODUCTION**

Grasshoppers occur in a wide variety of habitats, from low-elevation, hot, dry deserts to high-elevation, cool, moist meadows and woodlands. 1,750 species of Orthoptera nearly 10 % of the orthopteran fauna of World are known from India (Tandon and Hazra, 1998). Many authors like Bolivar (1917), Henary (1940), Chopard (1969), Tandon and Shishodia (1974, 1976), Bhowmik (1967, 1970, 1977, 1985), Hazra *et.al.* (1993), Julka *et.al.* (1985), Bhowmik and Halder (1984) and Bhowmik (1985) studied the Orthoptera of Himachal Pradesh. However, no consolidated record available on the Orthoptera of Simbalbara Wild Life Sanctuary. The present communication is based on the General Faunastic surveys undertaken by High Altitude Zoology Field Station to explore the fauna of sanctuary from June 2005 to March 2007 during different seasons. Present study represented by 38 species. Caelifera suborder, grasshopper fauna is composed of 30 recognized species. The family Acrididae is represented by the subfamilies Acridinae (02 spp), Oxyinae (2 spp), Catantopinae (2 spp), Oedipodinae (3 spp), Eyprepocnemidinae (4 spp), Cyrtacanthacridinae (3 spp) Coptacridinae (1 sp), Tropidopolinae (1 sp), Hemiacridinae(2 spp) and Gomphocerinae (1 sp). Family Pyromorphidae (4 spp) and Tetrigidae (5 spp). In Ensifera suborder, crickets, katydids and bush crickets are represented by 8 species grouped in family Gryllotalpidae (1 sp), Gryllidae (6 spp) and Tettigonidae (1 sp). A systematic account of the same is presented below :

### **SYSTEMATIC ACCOUNT**

Order ORTHOPTERA

Sub Order CAELIFERA

Super family ACRIDOIDEA

Family ACRIDIDAE

Sub family ACRIDINAE

### 1 *Acrida exaltata* (Walker)

1914. *Acrida exaltata* Kirby, *Fauna British India, Orth.*, 1 : 99, fig.80.

1954. *Acrida exaltata* Dirsh V.M. *Bull. Soc. Funad Ler Entom.*, 38 : 149-151.

2003. *Acrida exaltata* Yin, X.; Hsia *et al.*, *Fauna Sinica, Insecta*, 32 : 224.

*Material examined* : 12 exs, 07.IV.2006 Marusidh, Coll. D.K. Sharma & party, 13.IX.2006 Kaludev RF, Coll. D.K.Sharma & party, 18.IX.2006 Dhanda Sukhchainpur RF, Coll. T.R. Sharma & party , 20.XII.2005 SWLS, Coll R.M. Sharma & party.

*Characters* : One of the commonest grasshoppers in India. Head conically ascending, basal part narrow, fastigium of vertex broad. Body length (in mm) 28.5, head 5.0, Pronotum 5.0 to 8.0, hind femur 16-17, hind tibia 15.0. This is also known from Saudi Arabia, Iran, Afganistan, Pakistan, S.E. Tibet, Sri Lanka, Yemen, Nepal, and Bangladesh.

### 2. *Ceracris nigrocornis nigrocornis* Walker

2001. *Ceracris nigricornis nigricornis* Ingrisich & Garai. *Esperiana, Schwanfeld*, 8 : 763.

*Material examined* : 1 ex, 13.IX.2006 Kaludev RF, Coll. D.K. Sharma & party.

*Characters* : Olive green in colour, face and Pronotum coarsely punctured, Anal field of tegmina apple green or olive green, hind femora with a narrow pale pre apical ring, preceded by a narrow blackish ring, knee black. This is distributed almost all over India.

*Elsewhere* : Afghanistan, S.China, Myanmar,Taiwan, Thailand and Vietnam.

### Sub Family OXYINAE

### 3. *Oxya fuscovittata* (Marschall)

1836. Marschall. *Annalen des Naturhistorischen Museums in Wien*. 1 (2) : 211.

1986. Bhowmik. *Zool. Surv. India, Tech. Monogr.*, 14 : 109

*Material examined* : 3exs, 06.VI.2006 Marusidh RF, Coll. D.K. Sharma & party.

*Characters* : General colouration is green in fresh specimen. Its broad, compressed and apically somewhat bifid male cercus distinguish the species; and the short, tooth like spines on the ovipositor valves of females and absence of lateral longitudinal ridges of sub genital plates on ventral side.

### 4. *Oxya velox* (Walker)

2004. Ingrisich; F.M.H. Willemse & Shishodia. *Tijdschrift voor Entomologie.*, 147 : 290.

2006. Li. Hongchang; Hsia *et al.*, *Fauna Sinica, Insecta*, 43 : 66.

*Material examined* : 1 ex, 17.XII.2005 Kaludev River, Coll R.M. Sharma & party.

*Characters* : Interocular distance as wide as or slightly wider than frontal ridge near median ocellus. Prozona longer than metazon, circus short conical with sub acute apex.

#### Sub family CATANTOPINAE

##### 5. *Xenocatantops h. humilis* (Serville)

1839. *Acridium humile* Serville, *Ins. Orth.*, : 662.

1953. *Xenocatantops humilis humilis*: Dirsh and Uvarov, *Tijdschr.Ent.*, 96(3) : 237.

*Material examined* : 7 exs, 26.IX.2005 SWLS, Coll Indu Sharma & party.

*Characters* : Body finely rugose, posterior femur stout with a external and 9-10 internal black tipped spines. Supra anal plates roughly triangular with a median groove extending beyond middle of it. Uniqueness of species is male circus.

##### 6. *Catantops pinguis innotabilis* Stal

1870. *Acridium innotabile* Walker, *Cat. derm. salt. Br. Mus.*, 4 : 629.

1935. *Catantops pinguis innotabilis* : Dirsh and Uvarov, *Tijdschr, Ent.*, 96 (3) : 233.

*Material examined* : 6 exs, 08.VI.2006 SWLS, Coll. D.K. Sharma & party.

*Characters* : Eyes big, lateral brown and approximating an dorsum supra anal plate triangular with a median longitudinal groove. Posterior tibia with 10-11 internal and 9-10 external black tipped spines. The species is distinguishable by its parallel-sided frontal ridge.

#### Sub family OEDIPODINE

##### 7. *Gastrimargus a. africanus* (Saussure)

2001. Ingrisch & Garai.. *Esperiana*, Schwanfeld. 8 : 763.

2004. Baccetti.. *Redia*. 86 : 32.

*Material examined* : 15 exs, 22.IX.05 Marusidh RF, Coll Indu Sharma & party, 21.XII.05 Dhanda Sukhchaikpur, Coll, R.M. Sharma & party, 10.VI.06 Kaludev temple, Coll. D.K. Sharma & party.

*Characters* : Fastigium of vertex concave, Pronotum moderately tectiform, longer tegmina, bright yellow coloration of wings.

##### 8. *Gastrimargus transverses* (Thunberg)

1815. Thunberg. *Mem. Acad. Imp. Sci. St. Peterburg*, 5 : 233.

1982. Ritchie, J.M. *Bull. Br. Mus. (Nat. Hist.) Ent.*, 44 (4) : 262.

*Material examined* : 1 ex, 26.IX.2005 Kaludev river, Coll, R.M. Sharma & party.

*Characters* : Hind tibia with 12 spines, eyes prominent, tegmina with half pinkish and half blackish coloration, Pronotum tactiform.

### 9. *Sphingonotus longipennis* (Saussure)

1914. Kirby, W.F. *Fauna of British India, including Ceylon and Burma. Orthoptera (Acrididae)*, 156.

1986. Bhowmik.. *Zool. Surv. India, Tech. Monogr.*, **14** : 85.

2001. Ingrisch & Garai. *Esperiana, Schwanfeld.*, **8** : 763.

*Material examined* : 8 exs, 22.IX.05 SWLS, Coll. Indu Sharma & party.

*Characters* : Head rounded, Interocular distance distinctly wider than width of frontal ridge, Antenna filiform with elongated segments. The species is unique in having bluish base of wings.

### Sub family EYPREPOCNEMIDINAE

### 10. *Tylotropidius varicornsis* (Walker)

1986. Bhowmik. *Zool. Surv. India, Tech. Monogr.*, **14** : 168.

1998. Jiang, G. & Z. Zheng. *Grasshoppers and Locusts from Guangxi.*, 182.

*Material examined* : 3 exs, 12.IX.2006 Kaludev temple, Coll. D.K. Sharma & party.

*Characters* : The species is easily recognizable by having fastigium of vertex with two depressions at base, Body finely rugose. Antennae filiform slightly compressed, posterior tibia with external 14 black tipped spines.

### 11. *Choroedocus illustris* (Walker)

1910. Kirby, W.F. *Synonymic Catalogue of Orthoptera (Orthoptera Saltatoria, Locustidae vel Acridiidae)*. **3** (2) : 555.

1984. Bhowmik & Halder. *Rec. zool. Surv. India*, **81**(1-2) : 182.

*Material examined* : 3 exs, 9.VI.2006 SWLS, Coll. D.K. Sharma & party.

*Characters* : Fastigium of vertex parabolic with obtuse apex and slight depression and mostly with a median carinula. Pronotum compressed laterally, Posterior tibia with 12 external spines.

### 12. *Eyprepocnemis a. alacris* (Serville)

1910. Kirby, W.F. *Synonymic Catalogue of Orthoptera (Orthoptera Saltatoria, Locustidae vel Acridiidae)*. **3**(2) : 560.

1957. Willemse, C. *Publicaties van her natuurhistorisch Genootschap im Limburg.*, **10** : 241.

*Material examined* : 1 ex, 12.IX.06 Karve ka khala RF, Coll. D.K. Sharma & party.

*Characters* : Antenna filiform, longer than head and Pronotum. Frontal ridge flat, Pronotum also flat, Cercus broad based, narrowing toward apex.

### 13. *Eyprepocnemis rosea* Uvarov

1942. *Eyprepocnemis roseus* Uvarov. Annals and Magazine of Natural History, London. **11** (9) : 597.

*Material examined* : 1 ex, 22.IX.05 Dhanda Sukhchaikpur, Coll, R.M. Sharma & party.

*Characters* : Antenna filiform, Fastigium of vertex short, slightly concave with broadly parabolic apex. Pronotum flat, Supra anal plate elongated triangular in male. Cercus moderately broad at base.

### Sub family CYRTACANTHACRIDINAE

### 14. *Pachyacris vinosa* (Walker)

1870. *Acridium vinosum* Walker, *Cat. Derm. Salt. Brit. Mus.*, **3** : 588.

1922. *Pachyacris vinosa* : Uvarov, *Ann. Mag. Nat. Hist.*, **11** (9) : 478.

*Material examined* : 2 exs, 06.IV.06 SWLS, Coll. D.K. Sharma & party.

*Characters* Size moderately large, Antenna filiform, Fastigium of vertex flat, tegmen with apex obliquely truncate, tibia spines are yellowish in one side but their tips and backsides black. Cercus conical thin, very acute spine like incurved.

### 15. *Chondracris rosea* (De Geer)

1773. De Geer. *Mémoires pour servir à l'histoire des insectes*, **3** : 488.

2006. Li, Hongchang, Hsia & et al., *Fauna Sinica, Insecta*, **43** : 460.

*Material examined* : 1 ex, 13.XII.2006 Village Palhori, Coll. Indu Sharma & party.

*Characters* : Large size, body granulated, antenna filiform, much larger than head and Pronotum taken together. Pronotum highly tectiform, posterior femur long, slender, dentate. Posterior tibia with 10 spines on each margin.

### 16. *Cyrtacanthacris tatarica* (Linnaeus)

1758. Linnaeus. *Systema Naturae per Regna tria naturae* (10th ed.) **1** : 432.

1999. Ingrisch. *Esperiana*, **7** : 356.

*Material examined* : 1 ex, 22.IX.05 Gharuk RF, Coll. D.K. Sharma & party.

*Characters* : Large size, fatigium of vertex rounded, interocular distance narrow. The species is unique in having a whitish coloration on posterior femora and on lateral lobes of Pronotum and reticulated brownish patches on tegmina.

## Sub family COPTACRIDINAE

17. *Eucoptacra saturate* (Walker)

1870. Walker, F. *Catalogue of the Specimens of Dermaptera Saltatoria in the Collection of the British Museum*, 4 : 704.
1910. Kirby, W.F. *A Synonymic Catalogue of Orthoptera (Orthoptera Saltatoria, Locustidae vel Acridiidae)* 3(2) : 469.

*Material examined* : 1 ex, 06.IV.06 Kaludev RF, Coll. D.K. Sharma & party.

*Characters* : Fastigium of vertex narrow, concave in middle, sloping with sharp lateral carinulae, frons stright almost vertical slightly inclined backwards. Frontal ridge wide. Cercus compressed.

## Sub Family TROPIDOPOLINAE

18. *Oxyrrhepes obtuse* (Haan)

1842. Haan. In : Temminck. *Verhandelingen over de natuurlijke geschiedenis der Nederlandsche overzeesche bezittingen Zoologie* : 155, 156.
1998. Jiang, G. & Z. Zheng. Grasshoppers and Locusts from Guang xi 66.
2006. Li, Hongchang, Hsia & et al., *Fauna Sinica, Insecta*, 43 : 16.

*Material examined* : 1 ex, 09.VI.06 Kaludev RF, Coll. D.K. Sharma & party.

*Characters* : Tegmina yellowish with brown venations. Posterior tibia with 12 external yellowish spines with black tips. Head as wide as Pronotum in front, frons moderately oblique, punctured.

## Sub Family HEMIACRIDINAE

19. *Spathosternum pr. prasiniferum* (Walker)

1996. *Spathosternum prasiniferum*; Sharma, B. & N. Gupta. *Journal of Insect Science*, 9(2) : 156.
2006. Li, *Spathosternum prasiniferum prasiniferum* Hongchang; Hsia et al., *Fauna Sinica, Insecta*, 43 : 179.

*Material examined* : 2 exs, 06.VI.2006, Marusidh RF, Coll. D.K. Sharma & party.

*Characters* : Broad blackish or stripe running behind the lower part of the eyes and below the lateral carinae of the Pronotum, hind femora with a dark longitudinal band on the outer area, hind tibia with 11 spines.

20. *Hieroglyphus banian* (Fabricius)

1798. *Gryllus banian*, Fabricius. *Supplementum Entomologiae Systematicae. Supp.*, 1 : 194.
1986. Bhowmik. Zool. Surv. India, *Tech. Monogr.*, 14 : 99.
1998. *Hieroglyphus banian* Jiang, G. & Z. Zheng. *Grasshoppers and Locusts from Guangxi.*, 110.

*Material examined* : 2 exs, 9.VI.2006, SWLS, Coll D.K. Sharma & party.

*Characters* : Pronotum smooth, antenna with the basal joint yellowish green the rest dark green tipped with yellow. Hind tibia blue with black tipped spines. The three sub terminal ventral segments with silky tufts of hair on the middle.

#### Sub family GOMPHOCERINAE

##### 21. *Dnopherula (aulacobothrus) luteipes* (Walker)

1871. *Stenobothrus luteipes* Walker, *Cat. Derm. Salt.Br. Mus.*, 5 : 82.

1971. *Dnopherula (Aulacobothrus) luteipes* : Jago, *Proc. Sci. Nat. Philad.*, 123 (8) : 243.

*Material examined* : 1 ex, 17.XII.2006 , Kaludev RF, Coll. Indu Sharma & party

*Characters* : Small Size, body finely pitted. Antennae filiform, longer than head and pronotum together. Fastigium of vertex almost trapezoidal with truncate apex. Frontal ridge almost flat to a little sulcate below middle ocellus parallelsided; impress punctuate, about 2 times wider than antennal scape. Tegmen as long as tip of posterior femur, posterior femur stout and smooth. Posterior tibia with 11 external and 12 internal spines. Supra anal plate triangular.

#### Family PYRGOMORPHIDAE

##### 22. *Aularches punctatus* Drury

1977. Kevan, D.K.M. [Ed.]. In Beier [Ed.]. *Orthopterorum Catalogus*, 16 : 284.

1984. *Aularches punctatus* Yin, X. *Insects of Qinghai Tibetan Plateau*, 30.

*Material examined* : 3 exs, 13.IX.06, SWLS, Coll D.K. Sharma & party.

*Characters* : Body almost entirely shining black above, a broad yellow band running across the face below the antennae and across the sides of the Pronotum, tegmina light brown.

##### 23. *Aularches miliaris* (Linnaeus)

1995. *Aularches miliaris* Li, Hongchang & Jupeng Liu. In Liu, Jupeng *et al.*, *Studies on acridoids of Hainan Island*, 127.

1998. *Aularches miliaris* Jiang, G. & Z. Zheng. *Grasshoppers and Locusts from Guangxi.*, 46.

*Material examined* : 2 exs, 12.IX.06, SWLS, Coll D.K.Sharma & party.

*Characters* : Head yellowish or more or less mottled with brown above, Pronotum yellow on the sides, tegmina light brown, very thickly reticulated with yellow nervures and with a variable number of large and small yellow spots. Hind knees marked with black on the sides.

#### 24. *Atractomorpha crenulata* (Fabricius)

1793. *Truxalis crenulatus* Fabricius. *Supplementum Entomologiae Systematicae*, 2 : 28.

2001. *Atractomorpha crenulata* Ingrisch & Garai. *Esperiana, Schwanfeld*, 8 : 761.

*Material examined* : 13 exs, 23.IX.05, Kaludev Temple, Coll D.K.Sharma & party, 06.VI.06, Karve ka Khala RF, Coll D.K.Sharma & party and 14.IX.06 , Gharuk RF, Coll. D.K.Sharma & party.

*Characters* : Green pubescent, Antenna rather short and stout , Pronotum punctured and sparingly granulated, , head and Pronotum with the sides slightly sloping, crenulated behind the eyes the crenulation often pale or pink, legs long and slender.

#### 25. *Chrotogonus tr. trachypterus* (Blanchard)

1836. *Ommexecha trachypterus* Blanchard, E. *Annales de la Société Entomologique de France*. 5 : 618  
2001. Ingrisch. *Senckenbergiana biologica*. 81 : 155.

*Material examined* : 3 exs, 13.IX.2006, SWLS, Coll D.K. Sharma & party.

*Characters* : Brown, rugose and tuberculate. Eyes very prominent, Brown shining, occupying three quarters the length of head, pronotum short broad with a great no. of small crowded tubercles, sternum yellowish, spotted with blackish, hind legs short, femora as long as the abdomen.

### Family TETRIGIDAE

#### 26. *Eucriotettix grandis* (Hancock)

1912. Hancock, J.L., *Mem. Dept. Agric. India (Ent. Ser.)* 4(2) : 132.

2005. Zheng, Z. *Fauna of the Tetrigoidea from Western China*, 96.

2008. Buzzetti & Devriese. *Boll. Mus. civ. St. nat. Verona*, 32 : 163.

*Material examined* : 3 exs, 14.IX.06, Gharuk RF, Coll. D.K. Sharma & party.

*Characters* : Head slightly exserted, antenna filiform and located on the inferior margin of eyes. Eyes globular and a little elevated above the vertex. Pronotum angularly excavate slightly in the middle.

#### 27. *Ergatettix dorsiferus* (Walker)

1871. *Tettix dorsiferus* Walker, F. *Catalogue of the Specimens of Dermaptera Saltatoria in the Collection of the British Museum*, 5 : 825.

2005. *Ergatettix dorsiferus*. Zheng, Z. *Fauna of Tetrigoidea from Western China*, 422.

*Material examined* : 2 exs, 14.IX.06, Gharuk RF, Coll. D.K. Sharma & party.

*Characters* : Head a little or distinctly exserted above the surface of Pronotum, Pronotum truncate anteriorly, first segment of posterior tarsi generally longer than the third, hind femora with one or two small dark brown spots behind the middle of superior margin.

### 28. *Hedotettix gracilis* (De Haan)

1842. *Acridium (Tetrix) gracilis* Haan. In : Temminck. Verhandelingen over de natuurlijke geschiedenis der Nederlandsche overzeesche bezittingen. *Zoologie* : 167, 169.

2002. *Hedotettix gracillis*; Zheng, Z. & G. Jiang. *Dong wu xue yan jiu [Zoological Research]*, **23**(5) : 414.

*Material examined* : 1 ex, 4.IV.2006, Kaludev RF, Coll. D.K. Sharma & party.

*Characters* : Antennae filiform, inserted below the middle of eyes, eyes in profile sub-concoidal or globose. Pronotum obtuse, angulated anteriorly, extended posteriorly up to the apex of hind femora. Posterior femora elongate, first tarsal segment of hind tarsi longer than third.

### 29. *Hedotettix attenuatus* Hancock

1904. Hancock. J.L. *Spolia Zeylanica*, **2** : 151.

2001. Ingrisch. *Senckenbergiana Biologica*, **81** : 179.

2005. Zheng, Z. *Fauna of the Tetrigoidea from Western China*, 263.

*Material examined* : 1 ex, 14.IX.2006, Gharuk RF, Coll. D.K. Sharma & party.

*Characters* : Vertex narrower than an eye. Antennae filiform placed below the middle of eyes, frontal Costa bifurcate behind the paired ocelli, pronotum sub truncate or truncate anteriorly. Anterior femora elongate, very finely granulate on margins.

### 30. *Teredorus frontalis* Hancock

1915. Hancock. J.L. *Rec. Indian Mus.*, **11** : 110.

2001. Ingrisch. *Senckenbergiana Biologica*, **81** : 168.

*Material examined* : 2 exs, 14.IX.2006, Gharuk RF, Coll. D.K. Sharma & party.

*Characters* : Head a little exserted from the surface of Pronotum, vertex narrower in front, more or less triangular in shape. Eyes oval in shape, frontal costa bifurcate behind the paired ocelli, antenna below the eyes. First and second hind tarsal segment equal in length.

## Sub Order ENSIFERA

## Family GRYLLOTALPIDAE

### 31 *Gryllotalpa africana* Beauvois

1805. *Gryllotalpa africana* Beauvois, *Ins. Afr. Amer.*, : 229.

1967. *Gryllotalpa africana* : Chopard. *Orthopterorum Catalogus*, Part 12 : 449.

*Material examined* : 1 ex, 6.VI.2006, Marusidh RF, Coll. D.K. Sharma & party.

*Characters* : Coloration rufous brown, termina veins in male somewhat diverging and simply curved at the base, anterior tibia armed with four dactyl.

### Family GRYLLIDAE

#### 32. *Gryllus bimaculatus* De Geer

1773. *Gryllus bimaculatus*, De Geer, *Mem. Ins.*, 3 : 521.

1964. *Gryllus bimaculatus*, Bandell, *Canad. Ent.*, 96 : 1592.

*Material examined* : 3 exs, 06.VI.2006, Marusidh RF, Coll. D.K. Sharma & party.

*Characters* : Body large typically black with a yellow spot at the base of each tegmina. Posterior metatarsi at least half as long as posterior tibia. This is most common species generally known by calling song i.e. loud and shrill.

#### 33. *Loxoblemmus detectus* (Serville)

1838. *Platyblemmus detectus*, Serville, *Ins. Orth.*, 356.

1969. *Loxoblemmus detectus*, Chopard, *Fauna Ind Grylloidea*, 2 : 123.

*Material examined* : 2 exs, 14.IX.2006, Gharuk RF, Coll. D.K. Sharma & party.

*Characters* : Frontal rostrum projected, arcuate, face strongly flattened oblique, maxillary palpi long, knees of posterior femora blackish. First joint of antenna without process.

#### 34. *Pteronemobius fascipes* (Walker)

1869. *Eneoptera fascipes* Walker, F. *Catalogue of the Specimens of Dermaptera Saltatoria in the Collection of the British Museum*, 1 : 67.

2001. Ingrisch. *Senckenbergiana biologica*. 81 : 154.

*Material examined* : 1 ex, 01.IV.2006, Kaludev river, Coll. D.K. Sharma & party.

*Characters* : Head small, first antennal segment black the rest pale brown, 1st to third segments of maxillary palpi black. Pronotum narrow in front. Posterior femora yellow with three blackish bands. Posterior tibia with three external spines.

#### 35. *Teleogryllus mitratus* (Burmeister)

1838. *Gryllus mitratus* Burmeister. *Handbuch der Entomologie.*, 2(2) : I-VIII : 734.

2001. Ingrisch & Garai. *Esperiana*, Schwanfeld., 8 : 758.

*Material examined* : 2 exs, 13.IX.2006, SWLS, Coll D.K. Sharma & party.

*Characters* : General coloration is reddish brown, tegmina and legs often paler. Head with a faint yellowish band along internal margin of eyes, Pronotum wider than long, anterior ocellus horizontal, tegmina reaching up to apex of abdomen.

### 36. *Teleogryllus occipitalis* (Walker)

1838. *Gryllus occipitalis* Serville, *Ins. Orth.*, 339.

1980. *Teleogryllus occipitalis* : Townsend, *J. nat. Hist.*, 14 : 154.

*Material examined* : 3 exs, 04.VI.2006, Kaludev RF, Coll D.K. Sharma & party.

*Characters* : Head dark brown to black, lateral ocelli obscured by a broad yellowish band on inner margin of each eye. Posterior tibia with 6-7 external spines. Tegmina reaching up to the apex of abdomen.

### 37. *Plebeigryllus guttiventris* (Walker)

1871. *Gryllus guttiventris*, Walker, *Cat. Derm. Salt. Br. Mus.*, 5 (Supp.).

1967. *Plebeigryllus guttiventris*, Chopard, *Orth. Cat.*, 10 : 94.

*Material examined* : 3 exs, 17.XII.2006, Marusidh RF, Coll. Indu Sharma & party.

*Characters* : Head shining, frontal rostrum twice as wide first antennal segments, face convex, maxillary palpi black, legs stout, Pronotum concave anterior, tegmina a little shorter than abdomen. Distal spines of posterior tibia are longer than proximal ones.

## Family TETTIGONIDAE

### 38. *Elimaea securigera* (Brunner)

1878. *Elimaea securigera* Brunner von Wattenwyl. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien.*, 28 : 93.

*Material examined* : 3 exs, 04.VI.2006, Kaludev RF, Coll D.K. Sharma & party.

*Characters* : Fatigium of vertex cone shaped, posterior margin of Pronotum semicircular, both edges of tegmina straight, epiproct with acute apex.

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- Mehta, H.S., Mattu, V.K. and Thakur, S.K. 2002. Orthopteran diversity of Kalatop Khajjiar Wild Life Sanctuary, Chamba, Himachal Pradesh. *Bionotes*, **4**(3) : 60.
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- Shishodia, M.S. 2000. Short and Long Horned Grasshoppers and Crickets of Bastar District, Madhya Pradesh, India. *Rec. zool. Surv. India*, **98**(1) : 27-80.
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## INSECTA : LEPIDOPTERA (RHOPALOCERA )

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### INTRODUCTION

Seventy species of butterflies of Simbalbara Wildlife Sanctuary has been listed by Kittur (2006) and forty eight species by Sharma (2007). During surveys made by scientists of High altitude zoology field station, Solan during 2007-2008, 69 species have been collected and identified, adding thirteen more species to the list, the data of which is presented below in tabulated form.

**Table 1** : Butterflies of Simbalwara Wildlife sanctuary.

S. No.	Name of Species	Kittur <i>et al.</i> 2006	Sharma 2007	Presently collected
	Family PAPILIONIDAE			
1.	<i>Chilasa clytia clytia</i>	+		+
2.	<i>Chilasa clytia dissimilis</i>	+		+
3.	<i>Papilio demoleus demoleus</i>	+		+
4.	<i>Pathysa nomius</i>	+		+
5.	<i>Papilio polytes</i>	+	+	+
6.	<i>Papilio polyctor</i>		+	
7.	<i>Graphium agamemnon</i>		+	
8.	<i>Pachliopta aristolochiae</i>		+	
	Family PIERIDAE			
9.	<i>Catopsilia pyranthe</i>	+	+	+
10.	<i>Colias fieldii</i>		+	+
11.	<i>Catopsilia pomona</i>	+	+	+
12.	<i>Catopsilia florella</i>	+		+
13.	<i>Delias eucharis</i>	+	+	+

S. No.	Name of Species	Kittur <i>et al.</i> 2006	Sharma 2007	Presently collected
14.	<i>Pieris canidia</i>	+	+	+
15.	<i>Pieris brassicae</i>	-	-	+
16.	<i>Anaphaeis aurota</i>	+	+	.
17.	<i>Cepora nerissa</i>	+	-	
18.	<i>Colotis etrida</i>	+	-	-
19.	<i>Eurema blanda</i>	+	-	
20.	<i>Eurema brigitta</i>	+	-	
21.	<i>Eurema hecabe</i>	+	+	+
22.	<i>Eurema laeta</i>	+	+	+
23.	<i>Leptosia nina</i>	+	+	+
24.	<i>Gonepteryx rhamni</i>		+	+
25.	<i>Catopsilia crocale</i>			+
	Family LYCAENIDAE			
26.	<i>Arhopala amantes amantes</i>	+	+	+
27.	<i>Curetis acuta dentate</i>	+		+
28.	<i>Rapala iarbus</i>	+	+	+
29.	<i>Prosotas nora nora</i>	-		+
30.	<i>Spindasis elima elima</i>			+
31.	<i>Narathura atrax</i>		-	+
32.	<i>Castalius rosimon rosimon</i>	+	+	+
33.	<i>Tarucus callinara</i>		-	+
34.	<i>Catochrysops strabo</i>		-	+
35.	<i>Pseudozizeeria maha maha</i>	+	+	+
36.	<i>Everes lacturnus</i>	-	-	+
37.	<i>Abisara echerius</i>	+		
38.	<i>Acytolepis puspa</i>	+	-	+
39.	<i>Camena cleobis</i>	+		
40.	<i>Chilades pandava</i>	+		
41.	<i>Euchrysops cnejus</i>	+	+	

S. No.	Name of Species	Kittur <i>et al.</i> 2006	Sharma 2007	Presently collected
42.	<i>Freyria trochylus</i>	+		
43.	<i>Lampides boeticus</i>	+	+	+
44.	<i>Narathura sp.</i>	+		-
45.	<i>Spindasis vulcanus</i>	+	+	
46.	<i>Zizeeria karsandra</i>	+		+
47.	<i>Jamides celeno</i>		+	+
48.	<i>Freyeria putli</i>		+	
	Family NYMPHALIDAE			
49.	<i>Cupha erymanthis</i>	+		+
50.	<i>Cynthia cardui</i>	+		+
51.	<i>Cyrestis thyodamas</i>	+		+
52.	<i>Danaus genutia</i>	+	+	+
53.	<i>Danaus chrysippus</i>	+	+	+
54.	<i>Elymnias hypermnestra</i>	+		+
55.	<i>Euploea core</i>	+	+	+
56.	<i>Euthalia aconthea</i>	+		
57.	<i>Euthalia nais</i>	+		
58.	<i>Hypolimnas bolina</i>	+	+	+
59.	<i>Hypolimnas misippus</i>	+	+	+
60.	<i>Junomia almana</i>	+	+	+
61.	<i>Junonia iphita</i>	+	+	+
62.	<i>Junonia hierta</i>	+	+	
63.	<i>Junonia lemonias</i>	+		+
64.	<i>Junonia orithya</i>	+	+	
65.	<i>Kallima inacus</i>	+	+	+
66.	<i>Kaniska canace</i>	+		
67.	<i>Limenitis procris</i>	+	+	+
68.	<i>Melantia leda</i>	+		+
69.	<i>Mycalesis perseus</i>	+		+

S. No.	Name of Species	Kittur <i>et al.</i> 2006	Sharma 2007	Presently collected
70.	<i>Neptis hylas</i>	+	+	+
71.	<i>Pantoporia hordonia</i>	+		+
72.	<i>Parantica aglea</i>	+	+	+
73.	<i>Phalanta alcippe</i>	+	-	-
74.	<i>Phalanta phalantha</i>	+	+	+
75.	<i>Polyura athanas</i>	+		
76.	<i>Tanaecia lepidea</i>	+		
77.	<i>Ypthima asterope</i>	+		-
78.	<i>Ypthima baldus</i>	+		-
79.	<i>Ypthima huebneri</i>		-	+
80.	<i>Tirumala limniace</i>	+	+	+
81.	<i>Symphedra nais</i>		+	+
82.	<i>Euthalia lubentina</i>		-	+
83.	<i>Pseudergolis wedah</i>		-	+
84.	<i>Athyma opalina opalina</i>			+
85.	<i>Ariadane ariadane</i>		+	
86.	<i>Junonia atlites</i>		+	
87.	<i>Tirumala septentrionis</i>	-	+	
	Family ERYCINIDAE			
88.	<i>Libythea myrrha</i>		+	
	Family RIODINIDAE			
89.	<i>Abisara echerius</i>			+
	Family HESPERIIDAE			
90.	<i>Hyarotis adrastus</i>	+		
91.	<i>Matapa aria</i>	+		
92.	<i>Notocrypa feisthamelii</i>	+		
93.	<i>Sarangesa dasahara</i>	+	+	-
94.	<i>Taractrocera maevius</i>	+		
95.	<i>Gangara thyrsis</i>		+	

**SYSTEMATIC ACCOUNT**

The systematic account of the thirteen species added to the list of Simbalbara Wildlife Sanctuary in the present studies is as below :

**Family PIERIDAE****1. *Catopsilia florella* (Fabricius)**

1775. *Papilio florella* Fabricius, *Syst. Ent.*, : 479.

1957. *Catopsilia florella* Wynter-Blyth, *Butterflies of Indian Region* : 447.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 14.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Throughout India.

**2. *Pieris brassicae* (Linnaeus)**

1758. *Papilio brassicae* Fabricius, *Syst. Ent.*, : 467.

2006. *Pieris brassicae* Arora *et. al.*, *Biodiversity in Shiwalik Ecosystem of Punjab* : 594.

*Material examined* : 3 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : North to East India.

**3. *Prosotas nora nora* (C. Felder)**

1860. *Lycaena nora* C. Felder, *Sber. Akad. Wiss. Wien*, **40** (11) : 458.

1957. *Nacaduba nora* Wynter-Blyth, *Butterflies of Indian Region* : 298.

1992. *Prosotas nora* Hirowatari, *Bull. Univ. Osaka Pref., Ser. B* : 29.

*Material examined* : 2 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Throughout India.

**4. *Spindasis elima elima* (Moore)**

1877. *Aphnaeus elima* Moore, *Ann. Mag nat Hist.*, **20** (4) : 51.

1957. *Spindasis elima* Wynter-Blyth, *Butterflies of Indian Region* : 333.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Throughout India.

### 5. *Narathura atrax* (Hewitson)

1862. *Amblypodia atrax* Hewitson, *Spec. Cat. Lep. Lycaenidae Brit. Mus.*, : 13.

1974. *Narathura atrax* Lewis, *Butterflies of the World* : pl. 179.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 14.III.2008, 3ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : North to East India.

### 6. *Tarucus callinara* Butler

1886. *Tarucus callinara* Butler, *Ann. Mag. nat. Hist.*, (5) 18 : 185.

1957. *Tarucus callinara* Wynter-Blyth, *Butterflies of Indian Region* : 263.

*Material examined* : 2 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Himachal to Bengal.

### 7. *Catochrysops Strabo* (Fabricius)

1793. *Hesperia strabo* Fabricius, *Ent. Syst.*, 3 (1) : 287.

1957. *Catochrysops Strabo* Wynter-Blyth, *Butterflies of Indian Region* : 289.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Throughout India.

### 8. *Everes lacturnus* (Godart)

1824. *Polyommatus lacturnus* Godart, *Encyclopédie Méthodique.*, 9 (2) : 608.

1963. *Everes lacturnus* Cantlie, *Lyc. Butts Revised* : 38.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Throughout India.

### 9. *Ypthima huebneri* Kirby

1871. *Ypthima huebneri* Kirby, *Syn. Cat. diurn. Lep.*, : 95.

1957. *Ypthima huebneri* Wynter-Blyth, *Butterflies of Indian Region* : 116.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Throughout India.

10. *Euthalia lubentina* (Cramer)

1777. *Papilio lubentina* Cramer, *Uitl. Kapellen*, 2(9-16) : 92.

1957. *Euthalia lubentina* Wynter-Blyth, *Butterflies of Indian Region* : 168.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Kangra to Myanmar, South India.

11. *Pseudergolis wedah* (Kollar)

1844. *Pseudergolis wedah* Kollar, in Hugel, *Kaschmir und das Reich der Siek*, 1 : 506.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Kulla to Burma.

12. *Athyma opalina opalina* (Kollar)

1844. *Limenitis opalina* Kollar, in Hugel, *Kaschmir und das Reich der Siek*, 4 (2) : 427.

1997. *Athyma opalina* Arora, *Fauna of nanda Devi Biosphere Reseave, lepidoptera; Rhopalocera* : 79.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Kashmir to Kumaon.

13. *Abisara echerius* (Stoll)

1790. *Papilio echerius* Stoll, *Aanhaangsel Werk, Uitl. Kapellen*, (2-5) : 140.

1957. *Abisara echerius* Wynter-Blyth, *Butterflies of Indian Region* : 243.

*Material examined* : 1 ex, Simbalbara Wildlife Sanctuary, 15.III.2008, Coll. A.K. Sidhu and party.

*Distribution* : Chamba to Asaam, Peninsular India.

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## PISCES

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### INTRODUCTION

Study on the Ichthyo-fauna of the Simbalbara WLS is undertaken for the first time. The whole Simbalbara Wildlife Sanctuary is intruded by many small rivulets. Two perennial streams viz. Kaludev River and Asarori Khala (locally *Khala* means stream) traverses the Sanctuary. These streams unite at Simbalbara to form Nimbubala Khala that drains into river Yamuna in the State of Haryana. The seasonal streams are Gharuk, Karve Ka Khala and Danda Sukhchainpur. Kaludev River is a perennial river and bottom of the stream is irregular with small stones, pebbles and sand. The stream is shallow and following a distance of one Kilometer near Palori village where a small pool is formed.

A perusal of literature reveals that the fish fauna of the state has been described by several workers and some of them are McClelland (1842), Steindachner (1867), Day (1878), Menon (1962), Tilak and Hussain (1977a), Johal (2002) and Mehta and Uniyal (2005). Tilak and Hussain (1977b), Mehta and Uniyal (*opcit.*) and Sharma and Mehta (2008) has compiled the fish fauna of the dist. Sirmour in particular and recorded 42, 57 and 71 species respectively. During the present studies 14 species belonging to five families were determined from the sanctuary alone. The fishes were collected from various ecological niches like running streams, pools and puddles and small ponds. The occurrence of species like *Garra gotyla gotyla*, which is equipped with a strong sucker, represents a typical hill stream form and *Mastacembalus armatus* was collected from deep shoals. The fishes like *Channa orientalis* occur in small puddle of the streams which remain cut off from the main stream during dry periods. The most commonly observed species in the sanctuary were *Barilis bendelisis*, *Noemacheilus botia* and *Puntius ticto* throughout the season. The Status of the fish fauna is illustrated as per the CAMP (1998). All the fourteen species recorded are new report to the sanctuary.

### MATERIAL AND METHODS

The samples of the fish were collected in all the seasons as per the surveys undertaken by HAZFS, Zoological Survey of India, Solan (H.P.) from the different

ecological niche of the streams. The fishes were collected with the help of cast net and preserved in 10% formalin. The identification was based on the Talwar and Jhingran (1991), Tilak (1987) and Menon (1987) and Jayram (1981).

### SYSTEMATIC ACCOUNT

The systematic account with description is given below :

#### Order CYPRINIFORMES

#### Family CYPRINIDAE

#### Subfamily CYPRININAE

#### 1 *Labeo boga* (Hamilton-Buchanan)

1822. *Cyprinus boga* Hamilton-Buchanan, Fishes of Ganges : 286, 386, pl. 28, fig. 80. (Type-locality : Brahmaputra river).

*Material examined* : 2 exs, Kaludev River near Kaludev RF, SWLS, 10.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body elongated, Head covered with large pores, Eyes large, Barbels maxillary pair only and very small, Dorsal fin placed nearer to snout tip than to base of caudal fin, Lateral line scales 37 to 39. Scales medium.

*Distribution* : India : Through Indian Subcontinent.

*Elsewhere* : Pakistan, Bangladesh, Eastern Nepal and Myanmar.

*Status* : CAMP : LRnt.

*Common Name* : Boga Labeo.

*Vernacular Name* : Morahu.

#### 2. *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).

*Material examined* : 3exs Dhudunala, SWLS, 9.XII.2006, Indu Sharma and Party, 4 exs, Kaludev WLS, 14.XII.2006, Indu Sharma and Party, 12 exs, Kaludev River, 10.XII.2006, Indu Sharma and Party, 2 exs, Kaludev river near Kaludev RF, 27.VII.2007, T.R. Sharma and Party, 7 exs, Kaludev River near Kalu Mahadev Temple, 26.VII.2007, T.R. Sharma and Party, 8 ex, Palori R.F., 14.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body moderately elongated, Mouth small and terminal, Barbels absent, Dorsal fin placed posterior to pelvic fin origin, Last unbranched ray strong and serrated at its posterior edge, Scales medium.

SHARMA AND MEHTA : *Pisces*

*Distribution* : India : Through Indian Subcontinent.

*Elsewhere* : Pakistan, Sri Lanka, Thailand, Bangladesh, Thailand.

*Status* : CAMP : LRnt.

*Common Name* : Ticto barb.

*Vernacular Name* : Ticto, Puthi.

### 3. *Puntius sophore* (Hamilton-Buchanan)

1822. *Cyprinus sophore* Hamilton-Buchanan, *Fishes of Ganges* : 310, 389 (Type-locality : Ponds and rivers in Gangetic provinces).

*Material examined* : 3 exs, Kaludev river near Kaludev Temple SWLS, 11.XII.2006, Indu Sharma and Party, 3 exs, Kaludev river near Kaludev WLS, 10.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body deep, Head short, Barbels absent, Dorsal fin placed equidistance between tip of snout and base of caudal fin, Predorsal scales 8 to 10, A deep black blotch present at base of caudal fin and middle of the dorsal fin or anterior part of the body.

*Distribution* : India : Through Indian Subcontinent.

*Elsewhere* : Pakistan, China, Nepal, Bangladesh, Myanmar.

*Status* : CAMP : LRnt.

*Common Name* : Spot fin swamp barb.

*Vernacular Name* : Puthi, Chidu.

### 4. *Puntius sarana sarana* (Hamilton-Buchanan)

1822. *Cyprinus sarana* Hamilton-Buchanan, *Fishes of Ganges* : 307, 388 (Type-locality: Ponds and Rivers of Bengal).

*Material examined* : 2 exs, Kaludev River near Kaludev RF, SWLS, 10.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body elongated, barbels two pairs, Maxillary pair long, Dorsal fin inserted near to tip of snout than to base of caudal fin, Pre dorsal scales 11 or 12, A dull spot before base of caudal fin.

*Distribution* : India : Through Indian Subcontinent.

*Elsewhere* : Pakistan, Bangladesh, Bhutan, China, Nepal, Myanmar, Sri Lanka, Thailand.

*Status* : CAMP : VU.

*Common Name* : Olive barb.

*Vernacular Name* : Puthia, Sarian.

#### Subfamily RASBORINAE

##### 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).

*Material examined* : 3 exs, Kaludev River near Kaludev RF, 14.XII.2006, Indu Sharma and Party, 2 exs, Kaludev River near Kaludev Temple, 11.XII.2006, Indu Sharma and Party, 5 exs, Kaludev River near FRH, 10.XII.2006, Indu Sharma and Party, 1 ex, SWLS, 26.VII.2007, T.R. Sharma and Party, 07 exs, Palori, SWLS, 14.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body fairly elongated, Maxilla extends to below anterior-third of orbit, Barbels two pairs and short, Dorsal fin placed nearer to base of caudal fin than to snout tip, Anal fin long having 10-12 branched rays, Scales moderate.

*Distribution* : India : Himachal Pradesh, Jammu & Kashmir, Assam, Maghlaya, Bihar, Haryana, Karnataka, Kerala, Orissa, Punjab, Rajasthan, Sikkam, Tamil Nadu, Uttar Pradesh, West Bengal, Maharashtra.

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

*Status* : CAMP : LRnt.

*Common Name* : Hamilton's barila.

*Vernacular Name* : Bhiral, Patha.

##### 6. *Barilius barila* (Hamilton-Buchanan)

1822. *Cyprinus (Barilius) barila* Hamilton-Buchanan, *Fishes of Ganges* : 267, 384 (type-locality : rivers of northern Bengal).

*Material examined* : 2 exs, Kaludev, 13.XII.2006, Indu Sharma and Party, 3 exs, Dhudunala, SWLS, 9.XII.2006, Indu Sharma and Party, 2 exs, Kaludev, WLS, 14.XII.2006, Indu Sharma and Party, 9exs, Kaludev River, 10.XII.2006, Indu Sharma and Party, 2 exs, Palori, 14.XII.2006, Indu Sharma and Party, 4 exs, Kaludev river, 12.IX.2006, H.S. Mehta and Party, 5 exs, Kaludev River near Kalu Mahadev Temple, 4.VI.2006, D.K. Sharma and Party, 1 ex, Gharout Bala R.F., 7.VI,2006, D.K. Sharma and Party, 6 exs, Asharodi Ka Khala, 9.VI.2006, D.K. Sharma and Party.

*Diagnostic Characters* : Body shallow, Barbels two pairs, Rostral pair short, Maxillary pair reaches up to anterior third of orbit, Pectoral fin as long as head, Body with 14 or 15 vertical bars, Bars long and extends from back to lateral line, Caudal fin forked and lower lobe slightly longer than upper.

*Distribution* : India : Himachal Pradesh, Jammu and Kashmir, Delhi, Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Assam, Manipur, Nagaland and Orissa, Burma.

*Elsewhere* : Nepal, Bangladesh, Burma and Myanmar.

*Status* : CAMP : VU.

*Common Name* : Barred baril.

*Vernacular Name* : Patha.

### 7. *Barilius vagra* (Hamilton-Buchanan)

1822. *Cyprinus (Barilius) vagra* Hamilton-Buchanan, *Fishes of Ganges* : 269, 385 (Type-locality : Ganga river at Patna).

*Material examined* : 3 exs, Kaludev, 13.XII.2006, Indu Sharma and Party, 2 exs, Palori, WLS, 14.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body shallow, Barbels two pairs and short, Pectoral fin slightly shorter than head, Scales moderate, Body with 10 to 14 vertical bars and end above the lateral line, Scales modest.

*Distribution* : India : Himachal Pradesh, Jammu & Kashmir, Assam, Bihar, Punjab, Uttar Pradesh, West Bengal, Sikkim.

*Elsewhere* : Bangladesh, Pakistan, Nepal, Sri Lanka.

*Status* : CAMP : Vu.

*Common Name* : Vagra baril.

*Vernacular Name* : Chal, Patha and Lahani.

### 8. *Brachydanio rerio* (Hamilton-Buchanan)

1822. *Cyprinus rerio* Hamilton-Buchanan, *Fishes of Ganges* : 323, 390 (Type-locality : Kosi river, U.P.).

*Material examined* : 6 exs, Kaludev River near Kaludev Temple, 10.XII.2006, Indu Sharma and Party, 1 ex, Kaludev River near Kaludev RF, SWLS, 27.VII.2007, T.R. Sharma and Party, 2 exs, Palori, SWLS, 14.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body elongated and slightly compressed, Mouth small, Barbels two pairs, Maxillary pair reaches beyond half of the pectoral fin, Scales moderate in size, Body with four well defined shining gold longitudinal bands from head to caudal fin.

*Distribution* : India : Himachal Pradesh, Uttar Pradesh, Andhra Pradesh, Bihar, Karnataka, Orissa, Punjab, Sikkim, Tamil Nadu, West Bengal.

*Elsewhere* : Bangladesh, Nepal, Pakistan and Myanmar.

*Status* : CAMP : LRnt.

*Common Name* : Zebrafish.

*Vernacular Name* : Chahal.

#### Subfamily GARRINAE

#### 9. *Crossochielus latius latius* (Hamilton-Buchanan)

1822. *Cyprinus latius* Hamilton-Buchanan, *Fishes of Ganges* : 345.393 (Type-locality : Tista rive at base of Dajeeling Himalaya).

*Material examined* : 4 exs, Kaludev SWLS, 13.XII.2006, Indu Sharma and Party 3 exs, Dudunala SWLS, 9.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body elongated, Head flat and compressed, Barbels two pairs, Scales moderate, Dorsal fin inserted before to that of pelvic fin. Upper lip well developed, Jaws narrow, Horny jaw sheaths present but without sharp cutting edge, Scales moderate.

*Distribution* : India : Maharashtra, Orissa.

*Elsewhere* : Bangladesh, Nepal, Pakistan.

*Status* : CAMP : DD (Data Deficient).

*Common Name* : Gangetic latia.

*Vernacular Name* : Taler, Telaria.

#### 10. *Garra gotyla gotyla* (Gray)

1832. *Cyprinus lamta* Hamilton-Buchanan, *Illustr. Indian Zool.*, 1 : pl. 88, fig. 3, 3a (Type-locality : Rapti River, Gorakhpur, U.P.).

*Material examined* : 4 exs, Kaludev SWLS, 13.XII.2006, Indu Sharma and Party, 3exs, Dudunala SWLS, 9.XII.2006, Indu Sharma and Party, 2 exs, Kaludev River, 14.XII.2006, Indu Sharma and Party, 4 exs, Kaludev WLS, 10.XII.2006, Indu Sharma and Party, 3 exs, Palori 14.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body elongated, Head depressed, Snout with well developed median-proboscis and teraservers lobe at tip, Transverse lobe and lateral side of head covered with several large spiny tubercle, Barbles two pairs.

Dorsal fin inserted near to tip of snout than to caudal fin base. Pectoral fin equal or shorter than head length.

*Distribution* : India : Himachal Pradesh, Jammu and Kashmir, Assam, Bihar, Delhi, Manipur, Nagaland, Punjab, Rajasthan, Sikkim, Uttar Pradesh, Madhya Pradesh, West Bengal, Manipur.

*Elsewhere* : Bangladesh, Burma, Nepal, Pakistan.

*Status* : CAMP : VU.

*Common Name* : Gotyla.

*Vernacular Name* : Kurka.

Family HOMALOPTERIDAE

Subfamily NOEMACHEILINAE

11. *Noemacheilus botia* (Hamilton-Buchanan)

1822. *Cobitis botia* Hamilton-Buchanan, *Fishes of Ganges* : 350, 394 (Type- locality : Rivers of north-eastern Bengal).

*Material examined* : 4 exs, Kaludev River 13.XII.2006, Indu Sharma and Party, 1 ex, Dudunala, 9.XII.2006, Indu Sharma and Party, 15 exs, Kaludev River, 14.XII.2006, Indu Sharma and Party, 5 exs, Kaludev WLS, 10.XII.2006, Indu Sharma and Party, 5 exs, Kaludev reserve forest, 27.VII.2007, T.R. Sharma and Party, 3 exs, Kaludev reserve forest, T.R. Sharma and Party, 26.VII.2007, 1 ex, Palori, 14.XII.2006, Indu Sharma and Party, 2 exs, Kaludev river, 12.IX.2006, H.S. Mehta and Party, 1 ex., Asarodi Ka Khala, 9.VI.2006, D.K. Sharma and Party.

*Diagnostic Characters* : Body slender, Lower lip interrupted in middle, Barbels well developed, Dorsal fin inserted nearer to snout tip than base of caudal fin, Body with irregular blotches, lateral line complete, Caudal fin slightly emarginated, Scales minute.

*Distribution* : India : Through out Indian states.

*Elsewhere* : Pakistan.

*Status* : CAMP : LRnt.

*Vernacular Name* : Nai.

Family COBITIDAE

Subfamily COBITINAE

12. *Lepidocephalus guntea* (Hamilton-Buchanan)

1822. *Cobitis guntea* (Hamilton-Buchanan) *Fishes of Ganges* : 253, 394 (Type-locality : Bengal).

*Material examined* : 3 exs, Kaludev River near Kaludev RF, SWLS, 10.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body elongated and slightly compressed, Barbels three pairs and well developed, Dorsal fin inserted near to caudal fin base than to snout-tip, Caudal fin cut square with rounded corners, Black blotch at base of caudal fin, Scales very small.

*Distribution* : India : Throughout northern States.

*Elsewhere* : Pakistan, Sri Lanka, Nepal, Bangladesh.

*Common Name* : Guntea loach.

*Vernacular Name* : Jiwal.

## Order SILURIFORMES

### Family CHANNIDAE

#### 13. *Channa orientalis* Bloch and Schneider

1801. *Channa orientalis* Bloch and Schneider, *Syst. Ichth.* : 496, pl. 90, fig. 2 (Type-locality : India).

*Material examined* : 6 exs, Kaludev River, Kaludev WLS, 10.XII.2006, Coll. Indu Sharma and Party, 4 exs, Palori, Simbalbara WLS, 14.XII.2006, Coll. Indu Sharma and Party.

*Diagnostic Characters* : Body elongated, Pectoral fin reaches up to anal fin, Predorsal scales 12, Dorsal fin rays 32 to 37, Length of pelvic fin less than 50% of pectoral fin length, Caudal fin rounded.

*Status* : CAMP : VU.

*Common Name* : Asiatic snakehead.

*Vernacular Name* : Dorrah.

### Family MASTACEMBALIDAE

#### 14. *Mastacembelus armatus* (Lacepede)

1800. *Macragnathus armatus* Lacepede, *Hist. nat. Poiss.* 2 : 186.

*Material examined* : 1 ex, Kaludev River near Kaludev RF, 14.XII, 2006, Indu Sharma and Party, 5 exs, Palori, SWLS, 14.XII.2006, Indu Sharma and Party.

*Diagnostic Characters* : Body eel-like and much elongated, Mouth small, Spinous dorsal fin inserted above middle of pectoral fins, Caudal fin merged with dorsal and anal fin, Caudal fin rounded, Scales present.

*Distribution* : India : Through out Indian Subcontinent.

*Elsewhere* : Pakistan, Sri Lanka, Nepal, Burma, Southern China.

*Common Name* : Tire-track spiny eel.

*Vernacular Name* : Godh, Baam.

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## AMPHIBIA

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### INTRODUCTION

The present study enumerates 8 species, representing 7 genera belonging to three families collected from various ecological niches like water bodies, ditches, pools, bushes and thick forests.

The nomenclature followed here is after Frost (2006) except species of *Bufo*.

### SYSTEMATIC ACCOUNT

Family BUFONIDAE

1. *Bufo melanostictus* Schneider 1799

**Common Indian toad**

1799. *Bufo melanostictus* Schneider, *Hist. Amph. J. Iena*, : 216.

*Material examined* : 2 exs, Kaludev reserve forest, 27.07.2007, T.R. Sharma and Party, 4 exs, Kaludev river, 12.09.2006, H.S. Mehta and Party.

*Diagnosis* : There is considerable colour variation, but the species is easily identified by the presence of pronounced paratoid glands (a raised ridge behind the eye) and the lines of warts along the sides and ventrum. Pale yellow to brownish toad; head broader than long with bony cornified black ridges; snout pointed, shorter than ocular diameter, nostrils at tip of snout; eyes large, interorbital width more than height of upper eyelid; tympanum large and circular; paratoid glands long, kidney-shaped; toes nearly two-third webbed; premaxillaries overlapped by nasals; suprascapula equals scapula in width; clavicles rod-like and held almost at an angle of 40 degree.

*Distribution* : Ranges from Sri Lanka to Southern China, and down through Thailand, West Malaysia and Singapore western Indonesia and the island of Borneo.

*Remarks* : One of the commonest of true toads in Southeast Asia, it occurs in a variety of habitats in both rural and urban areas. At night it can easily be found on grass lawns, and on paths and roads. Concretized drains are also a favored habitat, and the species can withstand brackish water.

**2. *Bufo stomaticus* Lutken 1864**  
**Indus Valley toad**

1864. *Bufo stomaticus* Lutken, *Vidensk. Medd. Naturhist. Foren.*, Ser., 2 : 4 : 305.

1871. *Bufo andersonii*, Boulenger, *Ann. Mag. nat. Hist. Ser.*, 12. (5) xii : 163.

*Material examined* : 2 exs, Kaludev reserve forest, 27.07.2007, T.R. Sharma and Party, 1ex, Gharout Bala R.F., 7.06,2006, D.K. Sharma and Party.

*Diagnosis* : Dirty white to grayish toad; a whitish tubercle at the angles on lower and upper jaws; bony ridges on head absent, head slightly wider than long; snout obtusely pointed, nostrils nearer the anterior part of snout; eyes large, and prominent, interorbital width narrow; tympanum large and circular; first finger longer than second; hind limbs short, tarsal fold absent, ties two-third webbed; premaxillaries slightly overlapped by nasals; clavicles held almost at an angle of 30 degree each.

*Distribution* : This species is widely distributed in Pakistan, India, Nepal and Bangladesh.

*Remarks* Found in a wide variety of habitats including; open plains, grasslands, scrubland, forest, suitable agricultural land and human habitations. Breeding occurs in permanent and seasonal pools and slow-flowing streams. Adults hide under rocks and in crevices. It is a very adaptable species that may be found in houses.

Family MICROHYLIDAE

**3. *Microhyla ornata* Dum. & Bibron, 1821**  
**Narrow mouthed Toad**

1841. *Engystoma ornatum*, Dummeril & Bibron, *Erpet. Genl.*, VIII : 745.

*Material examined* : 1 ex, Kaludev reserve forest, 27.07.2007, T.R. Sharma and Party, 4 exs, Kaludev river, 12.09.2006, H.S. Mehta and Party.

*Diagnosis* : Small-sized frogs; pink with specific black streak dorsally; head slightly broader than long; snout rounded and projecting beyond mouth; nostrils almost at the tip of the snout; eyes large, ocular diameter more than length of snout; tympanum indistinct; first finger smallest; subarticular tubercles of fingers prominent; two metacarpal tubercles well developed; inner metatarsal tubercle prominent; precoracoid not distinct, coracoids thin in the middle and broad distally; metasternum short; xiphisternum knob-like.

*Distribution* : Bangladesh; Bhutan; Cambodia; China; Hong Kong; India; Indonesia; Japan; Lao People's Democratic Republic; Macau; Malaysia; Myanmar; Nepal; Pakistan; Taiwan, Province of China; Thailand; Vietnam, India, Sri Lanka, Northeast Montane Regions, Thai-Lao, Southeast Asian Lowlands, Tenneserim, Sundaland, Sulawesi, Lesser Sunda and Philippines.

#### 4. *Uperodon systoma* (Schneider, 1799)

##### Marbled balloon frog

1799. *Rana systoma*. *Hist. Amph.*, 1 : 144.

*Material examined* : 1 ex, Gharout Bala R.F., 7.06,2006, D.K. Sharma and Party, 4 exs, Kaludev river, 12.09.2006, H.S. Mehta and Party, 1 ex, SWLS, 26, 07.2007, T.R. Sharma and Party.

*Diagnosis* : Smooth, shiny, toad-like form, head slightly broader than long; snout broadly pointed and shorter than ocular diameter; interorbital width twice the height of upper eyelid; a supratemporal fold from eye to shoulder, bifurcating posteriorly; first finger smaller than second, subarticular tubercles of fingers well developed, subarticular tubercle of toes moderately developed; inner and outer metatarsal tubercles well developed and subarticular tubercles of toes moderately developed; inner and outer metatarsal tubercles well developed and blade-like, outer metatarsal tubercle smaller than inner; suprascapula shorter in width than scapula, scapula broad, long at the suprascapular articulation; clayicles, tomosternum and episternum absent.

*Distribution*: Southern and Eastern India as far north as the valley of the Ganges and Himachal Pradesh; Sri Lanka; presumably in western Bangladesh; reported from the foot of the Shakarparian Hills, Islamabad, Pakistan; reported for 15 km east of Mahendranagar, Nepal.

#### Family RANIDAE

#### 5. *Euphlyctis cyanophlyctis* (Schneider, 1799)

##### Indian Skipper Frog

1799. *Rana cyanophlyctis*, *Hist. Amph.*, 1 : 137.

2005. *Limnonectes cyanophlyctis*, *Fauna Punjab Shiwalik*, Punjab State Council for Science & Technology : 699.

*Material examined* : 04 exs, Kaludev River, Kaludev WLS, 10.12.2006, Coll. Indu Sharma and Party, 4 exs, Kaludev river, 12.09.2006, H.S. Mehta and Party.

*Diagnosis* : Dark brown to olive green frog; head as long as wide arrow-shaped; snout obtusely pointed, nostrils equidistant from eyes and the anterior part of snout;

eyes large, interorbital width smaller than upper eyelid; tympanum circular, two-third in ocular diameter; first finger nearly equals or smaller in length, finger pointed at tips, subarticular tubercles of the fingers weakly developed; hind limbs long; tips of toes blunt, toes completely webbed, inner metatarsal tubercle digitiform.

*Distribution* : The species is widely distributed from Arabia to South Asia and South-East Asia.

*Remarks* : The Indian Skipper frog or Skittering frog (*Euphlyctis cyanophlyctis*) is a common frog found in South Asia. They are slimy and are often seen at the edge of waterbodies with their eyes above the water. They noisily move away from the banks of the waterbodies when disturbed giving them their common name. They are rarely seen outside water.

#### 6. *Fejervarya syhadrensis* (Annandale, 1919)

##### Southern cricket frog

1829. *Rana limnocharis syhadrensis*, Annandale, *Rec. Indian Mus.*, 16 : 123.

2005. *Limnonectes limnocharis Fauna Punjab Shiwalik, Punjab State Council for Science & Technology* : 699.

*Material examined* : 1 ex, 13.XII.2006 Village Palhori, Coll.Indu Sharma & party. 02 exs, Kaludev River, Kaludev WLS, 10.12.2006, Coll. Indu Sharma and Party.

*Diagnosis* : Light gray to brownish, small-sized frogs; head as long wide or slightly longer, arrow-shaped; snout obtusely pointed and projecting beyond lower jaw, nostrils nearer the snout; eyes large, equal to length of snout, interorbital width equals height of upper eyelid; tympanum distinct, nearly half in the ocular diameter; a strong supratemporal fold from eye to tympanum and shoulder; first finger longer than second; subarticular tubercles of the fingers prominent; three metacarpal tubercles at the base of palm; hind limb short; tibia slightly longer than femur; toes half-webbed.

*Distribution* : Eastern and western India, eastern Pakistan, Bangladesh, and Nepal, at low to moderate elevations.

#### 7. *Hoplobatrachus tigerinus* (Daudin, 1802)

##### Indian Bull Frog

1802. *Rana tigerina*, *Hist. Rain. Gren Crep.*, 64.

2005. *Dicroglossus tigerina, Fauna Punjab Shiwalik, Punjab State Council for Science & Technology*, 699.

*Material examined* : 1 ex, 13.XII.2006 Village Palhori, Coll.Indu Sharma & party. 4exs, Kaludev river, 12.09.2006, H.S. Mehta and Party.

*Diagnosis* : Green or brown with yellow or black spots, a yellow vertebral streak from snout to vent; head as long as broad arrow-shaped, one-third in total length; snout long, projecting beyond mouth; nostrils nearer the anterior part of snout than eyes; ocular diameter less than length of snout, inter orbital width narrower than height of upper eyelid; fingers obtuse, subarticular tubercles prominent; tarsal fold distinct, inner metatarsal tubercles well developed; omosternum forked at the base.

*Distribution* : This species is found throughout most wetland areas of India, Bangladesh and much of northern Pakistan, and is recorded from the southern parts of Nepal, and from upper and northern central Myanmar. It has also been reported from Afghanistan.

*Remarks* : A principally lowland species, it is found at elevations between 25 and 800m ASL, over much of its range, although it may occur up to 2,000m ASL in Nepal.

### 8. *Sphaerotheca breviceps* (Schneider, 1799)

#### **Burrowing Frog**

1799. *Rana breviceps* Schneider, *Hist. Amph. Nat.*, : 140.

2005. *Tomopterna breviceps* Schneider, *Fauna Punjab Shiwalik*, Punjab State Council for Science & Technology, 699.

*Material examined* : 4 exs, Kaludev river, 12.09.2006, H.S. Mehta and Party, 1 ex, 13.XII.2006 Village Palhori, Coll. Indu Sharma & party.

*Diagnosis* : A toad-like form; dark brown to white in color; head slightly broader than long; snout rounded, nostrils equidistant from eyes and anterior part of snout; ocular diameter equals to length of snout, inter orbital width narrower than height of upper eyelid; tympanum circular, more than half the diameter of the eye; a strong supra temporal fold from eye to shoulder; first finger longer than second and equals third, subarticular tubercles of fingers prominent; inner metatarsal tubercle blade-like.

*Distribution* : Bangladesh, India, Myanmar, Pakistan, and Sri Lanka.

*Remarks* : This burrowing frog inhabits relatively humid parts and is found in abundance along the Himalayan foothills in the northwest. It is essentially nocturnal emerging at dusk from of its burrow, which it excavates, in soft sandy soil with the help of its broad shovel-shaped inner metatarsal tubercle. It is insectivorous, and is often seen devouring centipedes and millipedes, which are common in its habitat.

### **SUMMARY**

The present study enumerates 8 species of frogs and toads, representing 7 genera to three families from the sanctuary.

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## REPTILIA

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### INTRODUCTION

In the state of Himachal Pradesh, reptiles probably are the least explored vertebrate group. It was Prashad (1914) who first attempted to record the reptilian fauna of the erstwhile Shimla-Hill state. In *The Fauna of the British India*, Smith (1935,1943) reported several reptile species from various parts of Himachal Pradesh. A few workers like Acharjee and Kripalini (1951), Waltner (1975a, 75b, 75c & 75d), Mahajan and Agrawal (1976) and Agrawal (1979) studied geographic and altitudinal distribution of reptile fauna along the Himalayas including Himachal Pradesh. Recent scattered studies have added several species to the reptilian fauna of the state (Saikia *et al.* 2005, Saikia *et al.*2007). Currently, 55 reptile species belonging to 15 families are known from Himachal Pradesh (Saikia *et al.* in press). However, because of the inadequacy of comprehensive surveys, a reasonably complete documentation of the reptile fauna of the state remains obscure and new records continue to emerge. The present account deals with the Reptilian diversity of Simbalbara Wildlife Sanctuary, a mixed deciduous forest patch in Sirmour district of Himachal Pradesh. No previous report on the reptilian fauna of the sanctuary is available although Mehta (2000) reported 14 reptile species from nearby Renuka wetland area.

### METHODOLOGY

The study was carried out as part of the general faunistic survey plan of High Altitude Zoology Field Station, Zoological survey of India, Solan. Field Surveys were carried out from April 2005 to July 2007. In each season *ie.* Spring, Summer, Monsoon and Winter, one survey of 7-8 days duration was conducted. Visual encounter surveys (Heyer *et al.* 1994) was employed for most part supplemented by opportunistic observations on any species. A few specimens of non scheduled species especially lizards were collected as vouchers after euthanizing in chloroform and preserved in 70% alcohol. Abundance information presented here is based on frequency of sightings in the field.

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## SYSTEMATIC LIST

The inventory presented here contains 17 species belonging to 10 families. Classification and nomenclature followed in the text is as per Schleich and Kastle (2002) and Das (2003). The common names given here are as per Das (1997). Those species marked with asterisk were not observed by the authors but are included in the list on the basis of reliable secondary information. It would be pertinent to mention that two species of lizards namely *Ophisops jerdoni* and *Eurylepis taeniolatus* and one species of turtle *Melanochelys trijuga indopeninsularis* recorded from the sanctuary are new records for the state of Himachal Pradesh (Saikia *et al.* in press).

## SYSTEMATIC ACCOUNT

Class REPTILIA

Order CHELONIA

Family BATAGURIDAE

1 *Melanochelys trijuga indopeninsularis* (Annandale, 1913)

**Eastern black turtle**

1913. *Geoemyda trijuga* Annandale, *Rec. Ind. Mus.*, 9 : 63-78, pl. 5-6.

1964. *Melnochelys trijuga* McDowell, *Proc. Zool. Soc. London*, 143(2) : 239-279.

*Diagnostic Characters* : This is a comparatively large sized subspecies reaching a carapace length of 340 mm and width of 230mm (Tikader and Sharma, 1997, Schleich and Kastle, 2002). Carapace and plastron colour is dark brown or black often with yellow margin in the later which disappears with age. Head colour grey or brownish. Carapace moderately depressed and tricarinate, lateral margins are more or less turned upward. Nuchal shield is very small. Limbs covered with enlarged scales, digits fully webbed. Tail very short.

*Material examined* : 1 ex, Stream near Forest House, SWLS, killed by night passing vehicle, 14.VI.2005.

*Distribution* : Assam, Meghalaya, Uttarakhand (Das, 1991), Chotanagpur (Jharkhand) and Jalpaiguri district (West Bengal) (Tikader and Sharma, 1997), in Himachal Pradesh : Sirmour district.

*Abundance Status* : Possibly common in the sanctuary. Although only a single specimen was seen throughout the survey period, forest staff reported that the species is commonly seen in Monsoon period.

*Conservation Status* : IWPA, 1972 : Schedule IV, CAMP-1998 : LR1c.

Order SQUAMATA  
Sub-order SAURIA  
Family GEKKONIDAE

2. *Hemidactylus flaviviridis* Ruppel, 1840  
**Yellow-green house gecko**

1835. *Hemidactylus flaviviridis* Ruppel, *Neue Wirb. Faun. Abyss* : 18, pl. 6, fig. 2 (type loc. Massauna, Eritrea).

1871. *Hemidactylus bengalensis* Anderson, *J. Asiat. Soc. Bengal*, (2) 40 : p. 14 (type loc. Bengal).

1935. *Hemidactylus flaviviridis*, Smith, *Fauna Brit. Ind.*, 2 : p. 98.

*Diagnostic Characters* : A large gecko measuring up-to 190mm in total length. Dorsal coloration may be light or yellowish grey. Typical dorsal pattern consists of five irregularly undulated dark transverse bands. Venter is yellowish. The most important characteristic for identification of this gecko is the tail which is widens remarkably after its narrow base (Schleich and Kastle, 2002).

*Material examined* : 2 exs, Forest Rest House, SWLS, Coll. U. Saikia, 12.VI.2005. 1 ex, Forest Rest House, SWLS, Coll. U. Saikia, 7.VI.2006.

*Distribution* : The whole of India, but widely distributed in North India above 20°N (Sharma, 2002); in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Locally very common, very common in other parts of range (Sharma, 2002).

*Conservation Status* : CAMP-1998 : LRIc.

3. *Hemidactylus brookii* Gray, 1845  
**Brook's house gecko**

1845. *Hemidactylus brooki* Gray, *Cat. Liz. Brit. Mus.*, : 153 (type loc. Borneo).

1905. *Hemidactylus subtriedroides* Annandale, *Ann. Mag. Nat. Hist.*, (7) 15 : p.29.

1935. *Hemidactylus brookii*, Smith, *Fauna Brit. Ind.*, 2 : p. 89.

*Diagnostic Characters* : A comparatively smaller gecko that reaches a total length of about 120 mm. Dorsum is brown or light grey with dark spots arranged in an irregular pattern. Dark lines run along the sides of the head, venter white to pink grey. This species can be differentiated from other geckos by the presence of sub-triangular and strongly keeled dorsal tubercles which are arranged in longitudinal rows (Schleich & Kastle, 2002)

*Material examined* : 1 ex, Marusidh RF, SWLS, Coll. U. Saikia, 13.VI. 2005. 1 ex, Forest Rest House, SWLS, Coll. U. Saikia, 7.VI.2006.

*Distribution* : Whole of India; in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Very common locally and other parts of the country (Sharma, 2002).

*Conservation Status* : CAMP-1998 : LRlc.

#### Family AGAMIDAE

#### 4. *Calotes versicolor* (Daudin, 1802)

##### Indian garden lizard

1802. *Agama versicolor* Daudin, *Hist. Nat. Rept.*, 3 : p. 395, pl. 44 (type loc. India).

1846. *Calotes viridis* Gray, *Ann. Mag. Nat. Hist.*, 18 : p. 429 (type locality Madras).

1921. *Calotes versicolor major* Annandale, *Rec. Ind. Mus.*, 22 : p. 331.

1935. *Calotes versicolor*, Smith, *Fauna Brit. Ind.*, 2 : p. 189.

*Diagnostic Characters* : A large and long tailed lizard with head body length of 120-140 mm and tail length of 300-350 mm. Basic colour is light brown, olive or greyish. There is a dorsolateral white streak on each side with dark brown patches above and below it. Body is compressed, head large and males with gular sac. Head scales irregular, juxtaposed and dorsal scales keeled, imbricate with pointed tips. A dorsal crest is present which is more prominent in males (Sharma, 2002).

*Material examined* : 2 exs, Near Deer enclosure, SWLS, Coll. U. Saikia, 12.VI.2005. 1 ex, SWLS, Coll. Indu Sharma, 14.XI.06.

*Distribution* : Whole of India; in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Very commonly seen in the sanctuary, most common throughout its range (Sharma, 2002).

*Conservation Status* : CAMP-1998 : LRnt.

#### 5. *Sitana ponticeriana* Cuvier, 1844

##### Fan throated lizard

1864. *Sitana minor* Gunther, *Rept. Brit. Ind.*, : 135, pl.14, Fig. A (type loc. Madras).

1870. *Sitana decanensis* Jerdon, *P. Asiat. Soc. Beng.*, : 76 (type loc. Deccan).

1935. *Sitana ponticeriana*, Smith, *Fauna Brit. Ind.*, 2 : 144.

*Diagnostic Characters* : A small lizard with a standard length of 40-80 mm and tail length of 60-170 mm. Easily identifiable from other genus by the absence of 5<sup>th</sup> toe.

Dorsum is brown with a series of dark-brown, black margined and rhomboidal dark spots. Males have a gular fan brilliantly coloured in blue and brown, belly is whitish. Body compressed, with a low nuchal crest in males but without a dorsal crest. Tail is very long compared to head and body length.

*Material examined* : 3 exs, SWLS, Coll. D.K. Sharma, 13.VI.05. 2 exs, SWLS, Coll. D.K. Sharma, 6.VI.06. 4 exs, SWLS, Coll. Indu Sharma, 14.XII.06.

*Distribution* : Most of India, however, not recorded in eastern India; in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Very common both locally and in other parts of range (Sharma, 2002).

*Conservation Status* : IWPA, 1972 : not listed, CAMP, 1998 : LRlc.

*Remarks* : The specimens collected from the sanctuary are smaller in size (below svl of 50 mm) and apparently belong to the smaller form as mentioned by Smith (1935). However, recently three new species of smaller *Sitana* namely *Sitana sivalensis* Schleich, Kastle & Shah, 1998, *Sitana fusca* Schleich & Kastle, 1998 and *Sitana schleichi* Anders & Kastle, 2000 have been described from Nepal that are clumped in *Sitana sivalensis* complex. Although the present series specimens apparently do not belong to any one of the above mentioned species, studies are required to determine their exact taxonomic status.

## 6. *Laudakia tuberculata* (Hardwicke and Gray, 1827)

### Kashmir rock agama

1827. *Agama tuberculata* Hardwicke and Gray, *Zool. Journ.*, 3 : 218 (type loc. Bengal).

1871. *Stellio dayanus* Stoliczka, *P. Asiat. Soc. Beng.*, : 194 (type loc. Hardwar, U.P.).

1935. *Agama tuberculata*, Smith, *Fauna Brit. Ind.* 2 : p. 214.

2003. *Laudakia tuberculata*, Das, *J. Bombay nat. Hist. Soc.*, 100(1&2) : 461.

*Diagnostic Characters* : A sturdy agamid with flattened head and body. It reaches a maximum SVL length of 128 mm and tail length is 1.6 to 1.9 times the SVL (Minton, 1966). Normal colour is brownish grey to grayish black with whitish dorsal spots although it is extremely variable. Males have typical bluish tinge on the dorsum. Upper head scales are unequal, convex, smooth or keeled. Dorsum with keeled enlarged scales which are as large as ventral scales of the body. Flanks have few enlarged scales. An elongated patch of enlarged scales are present on the belly.

*Material examined* : Nil, observed in the sanctuary.

*Distribution* : Western Himalayas (Kashmir, Uttaranchal, Northern Punjab); in Himachal Pradesh : throughout the state including the Trans-Himalayan districts of Lahaul & Spiti and Kinnaur

*Abundance Status* : Occasionally observed in the sanctuary, very common in some parts of range.

*Conservation Status* : CAMP : 1998 : LRlc.

#### Family SCINCIDAE

#### 7. *Mabuya macularia* (Blyth, 1853)

#### Bronze grass skink

1853. *Euprepes macularius* Blyth, *J. Asiat. Soc. Beng.*, 22 : 652 (type loc. Rangpur, Bengal).

1875. *Euprepes brevis* Gunther, *Proc. Zool. Soc. London* : 225 (type loc. Travancore and Anaimalai hills).

1909. *Lygosoma dawsoni* Annandale, *Rec. Ind. Mus.*, 3 : p. 257 (type loc. Maddathorey, Travancore).

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

*Diagnostic Characters* : A medium sized skink with a body length of 60-75 mm. The skink is brown, olive or bronzy with a light dorsolateral stripe on the side. Sides of the neck and flanks dark brown spotted with white. Supranasals are apart, prefrontals rarely touch each other and a pair of nuchals always present. Dorsal scales with 5-9 strong keels, 28-35 rows round the midbody. Digits long with 12-17 obtusely keeled lamellae beneath the forth toe.

*Material examined* : 1 ex, Kaludev RF, SWLS, Coll. U. Saikia, 10.VI.2005. 2exs, Near Forest House, SWLS, Coll. U. Saikia, 13.XI.2006.

*Distribution* : Whole of India; in Himachal Pradesh : Sirmour.

*Abundance Status* : Common locally, very common

*Elsewhere* (Sharma, 2003).

*Conservation Status* : CAMP-1998 : LRlc.

#### 8. *Lygosoma punctatum* (Gmelin, 1799)

#### Spotted supple skink

1799. *Scincus punctatus* Gmelin, *Hist. Amphib.*, : 197 ( Based on Seba's fig. 2, pl. 12, fig. 6).

1845. *Riopa punctata*, Gray, *Cat. Brit. Mus.*, : 96.

1887. *Lygosoma punctatum*, Boulenger, *Cat. Liz. Brit. Mus.*, 3 : 310.

1935. *Riopa punctata*, Smith, *Fauna Brit. Ind.*, 2 : 318.

2002. *Lygosoma punctatum*, Eremchenko, *Amphibians and Reptiles of Nepal* : 748.

*Diagnostic Characters* : A slim lizard with elongate body and short limbs. Standard body length 85 mm and tail length 92 mm (Sharma, 2002) Dorsum is brown, each

scales with a black basal spot. Belly is yellowish white with black dots. Lower eyelid with a semitransparent disc. Supranasals are in contact with each other behind the rostral. Scales smooth with 24-28 rows round the body, 62-76 down the middle of the back. Digits long, fourth toe is longer than the third with 11-14 keeled lamellae beneath it.

*Material examined* : 1 ex, Kaludev RF. SWLS, Coll. U. Saikia, 13.vi.2005. 2 exs, SWLS, Coll. D.K. Sharma, 1.IV.2006. 1 ex, SWLS, Coll. Indu Sharma, 13.XII.2006.

*Distribution* : Whole of India; in Himachal Pradesh: throughout the state except Trans-Himalaya.

*Abundance Status* : Very common in all parts of the range (Sharma, 2002), commonly seen in the sanctuary area.

*Conservation Status* : CAMP-1998 : LRlc.

### 9. *Eurylepis taeniolatus* (Blyth, 1854)

#### Yellow-bellied mole skink

1854. *Eurylepis taeniolatus* Blyth, *J. Asiat. Soc. Beng.*, **23** : 4709 (type loc. Salt. Range, Punjab, Pakistan).

1872. *Eumeces taeniolatus*, Stoliczka, *P. Asiat. Soc. Beng.*, : 184.

1935. *Eumeces taeniolatus*, Smith, *Fauna Brit. Ind.*, **2** : p. 342.

2000. *Eurylepis taeniolatus*, Griffith *et al.*, *Russian. J. Herptol.*, **7**(1) : p. 1.

*Material examined* : 1 ex, Kaludev, SWLS, Coll. U. Saikia, 12.VI.2006.

*Diagnostic Characters* : A small lizard reaching a snout to vent length of 45 mm (Smith, 1935). Dorsum is olive brown with two golden lateral stripes, the upper one extending from supraciliary margin to the tail, the lower one extending from upper lip to the base of the hind limb. The space between the stripes is spotted with black, belly yellowish white. The upper head scales are strongly keeled and striated, only single frontonasal is present. 28-35 scales round the middle of the body. A large preanal plate is present.

*Distribution* : Cutch, Rajasthan, Punjab, Kashmir; in Himachal Pradesh : Sirmour, Kangra.

*Abundance Status* : Local *Status* uncommon, uncommon in other parts of range (Sharma, 2002).

*Conservation Status* : CAMP-1998 : DD.

*Remarks* : A single specimen was collected from beneath a rotten log embedded in sand on a hot noon. A very agile skink that can conceal itself very fast.

## Family LACERTIDAE

10. *Ophisops jerdoni* Blyth, 1853**Snake-eyed lacerta**

1853. *Ophisops jerdoni* Blyth, *J. Asiat. Soc. Beng.*, **22** : 653 (type loc. Mhow, Indore, M.P.).

1870. *Pseudophiops theobaldi* Jerdon, *P. Asiat. Soc. Beng.*, : 71 (type loc. Alpine Punjab).

1935. *Ophisops jerdoni*, Smith, *Fauna Brit. India*, **2** : 377.

2003. *Ophisops jerdoni*, Das, *J. Bombay nat. Hist. Soc.*, **100**(2 & 3) : 468.

*Diagnostic Characters* : A large skink with snout to vent length of 120-150 mm and tail length of 120 mm. The dorsal colour is sandy to light bronze, richly speckled with cream colour, tail variegated with black or brown and underparts shiny yellow. Head is small with pointed snout. This species can be differentiated from others in the genus by the fact that only a single rows of broad median vertebral scales present and the third toe is longer than the forth.

*Material examined* : 1 ex, Kaludev, SWLS, Coll. U. Saikia, 12.VI.2006

*Distribution* : Andhra Pradesh, Tamilnadu, Maharashtra, Madhya Pradesh, Rajasthan, Cutch; in Himachal Pradesh : Sirmour.

*Abundance Status* : Local status uncommon, common in parts of it's range (Sharma, 2002).

*Conservation Status* : Not evaluated both in IWPA, 1972 and CAMP, 1998.

*Remarks* : A single specimen was collected from a dry riverbed at noon on a very hot day in May.

## Family VARANIDAE

11. *Varanus bengalensis* (Linnaeus, 1758)**Bengal monitor**

1758. *Lacerta monitor* Linnaeus, *Syst. Nat. Ed.*, **10** : p. 201 (type loc. India).

1935. *Varanus monitor*, Smith, *Fauna Brit. Ind.*, **2** : p. 402.

1966. *Varanus bengalensis*, Minton, *Bull. Amer. Mus. Nat. Hist.*, **134** : 112.

*Diagnostic Characters* : A huge lizard reaching a snout to vent length of 750 mm and a tail length of about 1000 mm (Smith, 1935). Brownish or olive above usually with black dots. Lower parts yellowish, uniform or spotted with black. The head and neck is long with pointed snout. Nostril is like a oblique slit and nearer to the orbit than the tip of the snout unlike other species of the genus. Limbs are long, strong and digits elongate. Tail is compressed laterally with a low double toothed crest of scales above except at the base and tail.

*Material examined* : Nil, no specimen collected.

*Distribution* : Whole of India; in Himachal Pradesh: throughout the state except the Trans-Himalaya.

*Abundance Status* : Uncommon in the sanctuary. Although commonly seen in most parts of range, however, due to rampant killing for meat and skin has) become endangered (Sharma, 2002).

*Conservation Status* : WLPA 1972 : Schedule I, CAMP-1998 : Vu.

Sub-order SERPENTES

Family TYPHLOPIDAE

12. *Ramphotyphlops braminus* (Daudin, 1803)

**Brahminy worm snake**

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

1806. *Typhlops braminus* var. *arenicola* Annandale, *Mem. Asiat. Soc. Bengal* 1, p. 192.

1966. *Ramphotyphlops braminus* Robb, *Ann. Mag. Nat. Hist.*, 13 (9) : 675.

*Diagnostic Characters* : A very slender snake resembling an earthworm. The maximum length recorded from India is 162 mm (Wall, 1921). Dorsum is brown, blackish brown or black. Snout, tip of the tail and cloacal area is white. Venter is lighter. Rostral scale is very narrow and connects the prefrontal. The nasals are completely divided. Four supralabials and 3rd and 4<sup>th</sup> are in contact with the ocular. Body scales are smooth, highly polished and arranged in 20 rows round the body. A triploid parthenogenetic species without any male Kabisch (2002).

*Material examined* : 1 ex, SWLS, coll. D.K. Sharma, 3.IV.2006. 1 ex, SWLS, coll. Indu Sharma, 14.XII.2006.

*Distribution* : Whole of India; in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Very common locally. Common in other parts of the range (Sharma, 2002).

*Conservation Status* : WLPA, 1972 : Schedule IV, CAMP, 1998 : LRnt.

Family PYTHONIDAE

13. *Python molurus molurus* (Linnaeus, 1758)

**Indian Rock Python**

1758. *Coluber molurus* Linnaeus, *Syst. Nat.* 10<sup>th</sup> ed. : 225.

1899. *Python molurus* Werner, *Zool. Garten* xl : 24.

1943. *Python molurus molurus* Smith, *Fauna Brit. Ind.* 3 : p 108.

**Diagnostic Characters** : Heaviest of all Indian snakes reaching a maximum length of 7620 mm (Deuve, 1970) although normally adult reaches 3000 mm in length (Whitaker and Captain 2004). Head is distinct from neck, snout long and rounded. Sensory pits are present on the scales of snout tip and upper lip. Pupil is vertical. Supralabials are in contact with eyes which serve as a distinguishing character from other subspecies ie *P. m. bivittatus* in which these scales are separated from eyes by small suboculars. Dorsum yellowish to brown with asymmetrical dark brown blotches. On the flanks, there are smaller rounded or irregular shaped dark brown spots with light centres.

**Material examined** : Nil, the species is recorded on the basis of two sighting reports by the forest staff on June, 2005 and July 2007.

**Distribution** : Throughout India except the islands up to 2000 m (Whitaker and Captain, 2004).

**Abundance Status** : Apparently uncommon in the sanctuary, common in parts of range.

**Conservation Status** : WLPA, 1972 : Schedule I.

#### Family COLUBRIDAE

#### 14. *Ptyas mucosa* (Linnaeus, 1758)

#### Indian rat snake

1758. *Coluber mucosus* Linnaeus, *Mus. Ad. Frid.* i : 37, pl. 23.

1864. *Ptyas mucosus*, Gunther, *Rept. Brit. Ind.* : 249.

1914. *Zaocys mucosus*, Wall, *J. Bombay. nat. Hist. Soc.*, Xxiii : 168.

1943. *Ptyas mucosus*, Smith, *Fauna Brit. Ind.*, 3 : 159.

2002. *Ptyas mucosa*, Das, *J. Bombay nat. Hist. Soc.*, 100(1 & 2) : 480.

**Diagnostic Characters** : A large slender snake that reaches a maximum length of 3500 mm (Whitaker and Captain, 2004). Head distinctly broader than neck. Body colour variable from olive, brown, grey or black. Venter is cream coloured or dirty white with dark cross bars. Midbody scale rows 17, 18 or 19 : 17 or 16 : 14 (Whitaker and Captain, 2004), smooth or keeled. Anal scale divided, subcaudals 100-146, paired. Normally 2-3 temporals present.

**Material examined** : Nil, no specimen collected but abundantly observed in the sanctuary.

**Distribution** : Throughout India; in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Very common in the sanctuary, Common in all parts of range (Whitaker & Captain, 2004).

*Conservation Status* : WLPA, 1972 : Schedule II.

### 15. *Amphiesma stolatum* (Linnaeus, 1758)

#### **Buff-striped keelback**

1758. *Coluber stolatus*, Linnaeus, *Syst. Nat.*, 10<sup>th</sup> Ed. : 219.

1921. *Rhabdophis stoltus*, Wall, *Sn. Ceylon* : 105.

1943. *Natrix stolata*, Smith, *Fauna Brit. Ind.*, 3 : 303.

2003. *Amphiesma stolatum*, Das, *J. Bombay nat. Hist. Soc.*, 100(1&2) : 473.

*Diagnostic Characters* : A slender bodied snake with snout to vent length well below 1000 mm. Dorsal colour is brown with two distinct ribbon like yellow stripes from neck to tail. Throat white or yellow, head light brown or olive. Underside white, sometimes with black spots on the scale. Scales in 19:19:17 rows, keeled. Anals usually divided. Internasal truncate but distinctly narrowed anteriorly, supralabials 8, 3<sup>rd</sup> to 5<sup>th</sup> touching the eye.

*Material examined* : Nil.

*Distribution* : All over mainland India (Whitaker and Captain, 2004); in Himachal Pradesh: throughout the state except Trans-Himalaya.

*Abundance Status*: Common in the sanctuary and in other parts of range (Whitaker and Captain, 2004)

*Conservation Status* : WLPA, 1972 : Schedule II, CAMP-1998 : LRnt.

*Remarks* : This species can be seen commonly around the water bodies in the sanctuary especially in the monsoon. The variety found in the area has bluish interscale colour (typica forma) as mentioned in Whitaker & Captain (2004).

### 16. *Xenochrophis piscator* (Schneider, 1799)

#### **Checkered keelback**

1799. *Hydrus piscator* Schneider, *Hist. Amph.*, i : 247 (type loc. East Indies).

1940. *Natrix piscator piscator*, Smith, *Rec. Ind. Mus.*, Xlii : 483.

1943. *Natrix piscator*, Smith, *Fauna Brit. Ind.*, 3 : 293.

2003. *Xenochrophis piscator*, Das, *J. Bombay nat. Hist. Soc.*, 100(2 & 3) : 481.

*Diagnostic Characters* : A fairly robust freshwater snake that hardly exceeds one meter in length, although the maximum recorded length is 1750 mm (Whitaker and

Captain, 2003). Body colour is olive green, olive brown, yellowish, brown or black usually with a checkered pattern. Underside glossy or yellowish white. Two bold black streaks, one below and other behind the eye are characteristics of the species. Scales 19 rows at midbody, keeled. Anal scale divided, subcaudals 60-97, paired. Supralabials 9. There is one preocular and three postocular.

*Material examined* : Nil.

*Distribution* : Throughout India except Kashmir; in Himachal Pradesh : throughout the state except Trans-Himalaya.

*Abundance Status* : Common.

*Conservation Status* : WLPA, 1972 : Schedule II, CAMP-199 : LRlc.

#### Family ELAPIDAE

#### 17. *Naja naja* (Linnaeus, 1758)

#### Spectacled cobra

1758. *Coluber naja* Linnaeus, *Syst. Nat.*, 10<sup>th</sup> ed. 221.

1943. *Naja naja naja* Smith, *Fauna Brit. Ind.* 2 : 427.

1996. *Naja naja* Wuster, *Toxicon*, 34 : 399-406.

*Diagnostic Characters* : A large snake reaching a maximum length of 2200 mm (Deraniyagala, 1960). The head is elliptical, depressed and less distinct from neck. The neck can be dilated to form a hood with a distinctive spectacle mark although sometimes absent. Colour pattern variable with shades of brown, yellow, gray or black. Typically (not always) a single cuneate (wedge shaped) scale on the infralabials helps to distinguish it from non venomous look alike.

*Material examined* : Nil, included on the basis of sighting records by locals which appear to be authentic.

*Distribution* : Throughout mainland India excluding Northeast, in Himachal Pradesh: probably in the lower parts of the state.

*Abundance Status* : Common in parts of range, probably uncommon in the sanctuary.

*Conservation Status* : WLPA, 1972 : Schedule II, CAMP-1998 : LRnt.

Abbreviations : IWPA : Indian Wildlife Protection Act, 1972, CAMP: Conservation Assessment and Management Plan, 1997, DD : Data Deficient, Vu : Vulnerable, LRnt : Lower risk near threatened, LRlc : Lower risk least concerned, NE : Not evaluated.

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## AVES

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### INTRODUCTION

The avifauna of Himachal Pradesh is represented by over 600 species (Rahmani, 2004) which is approximately 50% of the total species recorded from India indicating a very significant diversity compared to the total geographical area of the state. This high avifaunal diversity is essentially a function of wide altitudinal variations and consequent changes in the habitat structures and also overlapping of three avifaunal realms- the Indo-Malayan, the Palaearctic and the Afrotropical regions in this part of western Himalaya (Besten, 2004). Besides, presence of many large natural and man made wetlands is also a contributing factor of this mesmerizing avifaunal diversity as significant proportion of avifauna of the state is composed of wetland associated species. A myriad array of migratory birds from far off Siberia and Central-East Asia winter in these wetlands in large numbers that significantly add to the diversity.

Compared to many other animal groups, avifauna of Himachal Pradesh is relatively well documented. English ornithologist Hugh Whistler (1926a, b) was first to publish an account of birds of Kangra and Kullu districts in erstwhile Punjab. Ali and Ripley (1983) in their monumental work presented a summarized account of the avifauna of Himachal Pradesh particularly areas like Shimla, Dalhousie, Dharamshala etc. Subsequently, many studies were conducted on various aspects of avifauna of the state like geographical and altitudinal distribution pattern (Narang, 1989; Mahabal, 1992a, b, 1996; Mahabal and Mukherjee, 1991; Mahabal and Sharma, 1992; Suyal, 1992; Thakur *et al.*, 2008), seasonal changes in diversity (Sharma and Mahabal, 1997), status (Gaston *et al.*, 1981) etc. Avifauna of conservation areas like wildlife sanctuaries and national parks of Himachal Pradesh has also been studied to some extent by Pandey (1989a, b), Mahabal (2000), Mahabal and Sharma (1993), Thakur *et al.* (2002), Bhargav *et al.* (2007), Tak and Paliwal (2008) etc.

Simbalbara Wildlife Sanctuary is an important conservation area in the Shiwalik hills of the state. The avian diversity of Simbalbara Wildlife Sanctuary was not known until two recent works of Bhargav *et al.* (2007) reported 117 species, and Ghosh *et al.* (2007) listed 131 species totaling to 169 spp. from the area. Of these, 79 species of

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birds were common in both the works. However, during the course of field work from 2005-07, the present authors could record 153 species belonging to 15 orders and 45 families, and added another 51 spp. to the list of birds from the sanctuary.

A total of eight surveys of 8-10 days duration were conducted from 2005-2007 covering four seasons *viz.* spring, summer, monsoon and winter. Observations on the bird fauna were made during morning hours using 10x50 binoculars. During the survey period transect were walked along all habitats of the sanctuary. Seasonal occurrence, status (resident/ migratory, breeding, local abundance (frequency) and the habitat for each species as observed by us were also briefly recorded. Breeding was established only after observing either nest or eggs or young ones of a species. Kazmierczak and van Perlo (2000) was used to confirm identification of different species in the field. The taxonomic arrangement and common names in the text follows Manakadan and Pittie (2001).

A consolidated systematic list of avifauna of Simbalbara Wildlife Sanctuary comprising 210 species distributed over 15 orders and 46 families is presented here. Earlier records of avifauna from the sanctuary have been marked in the list. Order Passeriformes is the largest which is represented by 116 species, whereas, two orders namely Pelecaniformes and Gruiformes are represented by single species each.

Although globally threatened birds like Indian White-backed Vulture (11) and Slender-billed Vulture (13) were observed in Simbalbara WLS (Bhargav *et al.*, 2007), they were not sighted during the present study. The sanctuary also harbors a small population of Oriental Pied Hornbill, which is also the northernmost limit of the species in India. The abundant Sal trees in the sanctuary also provide good nesting sites for Grey Hornbill. The area also supports an excellent breeding population of Crested Serpent Eagle that can be seen throughout the year. A few noteworthy sightings include Orange-flanked Bush-Robin which is normally seen above 1000 m msl.

**Table 1:** Systematic list of birds of Simbalbara Wildlife Sanctuary, Himachal Pradesh, India.

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
		I. Order PELECANIFORMES				
		1. Family PHALACROCORACIDAE				
1.	28	<i>Phalacrocorax niger</i> Little Cormorant		W	M, 1	A
		II. Order CICONIIFORMES				
		2. Family ARDEIDAE				
2.	49	<i>Egretta garzetta</i> Little Egret	1, 2	S	R, 2	A

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
3.	44	<i>Bubulcus ibis</i> Cattle Egret	1, 2	T	R, 3	A, D, WL
4.	42-42a	<i>Ardeola grayii</i> Indian Pond-Heron	2	W	R, 2	A
5.	52	<i>Nycticorax nycticorax</i> Black-crowned Night-Heron	1			
6.	55	<i>Ixobrychus minutus</i> Little Bittern		W	M, 1	A
3. Family CICONIIDAE						
7.	65	<i>Ciconia nigra</i> Black Stork	2	S	M, 1	A
III Order FALCONIFORMES						
4. Family ACCIPITRIDAE						
8.	132-134	<i>Milvus migrans</i> Black Kite	2			
9.	135	<i>Haliastur indus</i> Brahminy Kite	1			
10.	186-187	<i>Neophron percnopterus</i> Egyptian Vulture	1, 2	A	R, 1	R, WL
11.	185	<i>Gyps bengalensis</i> Indian White-backed Vulture	2			
12.	182	<i>Gyps indicus</i> *Long-billed Vulture	1			
13.	184	<i>Gyps tenuirostris</i> *Slender-billed Vulture	2			
14.	181	<i>Gyps himalayensis</i> Himalayan Griffon		W	M, 1	HM
15.	180, 183	<i>Gyps fulvus</i> Eurasian Griffon		A	R, 1	HM

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
16.	179	<i>Aegypius monachus</i> Cinereous Vulture	2			
17.	178	<i>Sarcogyps calvus</i> Red-headed Vulture	2	W	M,1	HM
18.	195	<i>Circaetus gallicus</i> Short-toed Snake-Eagle		W	R,1	HM
19.	196-200	<i>Spilornis cheela</i> *Crested Serpent-Eagle	1, 2	A	RB,2	M
20.	137-140	<i>Accipiter badius</i> *Shikra	1, 2	A	RB,2	M
21.	172	<i>Ictinaetus malayensis</i> Black Eagle		W	M,1	HM
22.	168	<i>Aquila rapax</i> *Tawny Eagle	1			
23.	169	<i>Aquila nipalensis</i> *Steppe Eagle		W	M,1	HM,G
24.	160-162	<i>Spizaetus cirrhatus</i> Changeable Hawk-Eagle	2			
25.	158-159	<i>Spizaetus nipalensis</i> Mountain Hawk-Eagle		W	M,1	M
5. Family FALCONIDAE						
26.	222-224	<i>Falco tinnunculus</i> Common Kestrel	1, 2	A	RB,2	M
27.	209-211	<i>Falco peregrinus</i> Peregrine Falcon		W	M,1	HM
IV. Order GALLIFORMES						
6. Family PHASIANIDAE						
28.	244-246	<i>Francolinus pondicerianus</i> Grey Francolin	2	A	RB,2	D,M,S

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
29.	252	<i>Coturnix coromandelica</i> Rain Quail		S	RB,1	GS
30.	299-300	<i>Gallus gallus</i> Red Junglefowl	1, 2	A	RB,2	M,S
31.	293-298	<i>Lophura leucomelanos</i> Kaleej Pheasant	1, 2	A	RB,1	M,S
32.	311	<i>Pavo criStatus</i> Indian Peafowl	1, 2	A	RB,2	M,G,R,S
		V. Order GRUIFORMES				
		7. Family RALLIDAE				
33.	350	<i>Fulica atra</i> Common Coot		S	M,1	A
		VI. Order CHARADRIIFORMES				
		8. Family CHARADRIIDAE				
34.	379-380	<i>Charadrius dubius</i> Little Ringed Plover	1, 2	W	M,1	A,R
35.	369	<i>Vanellus duvaucelii</i> *River Lapwing	1, 2	W	M,1	A,R,WL
36.	366-368	<i>Vanellus indicus</i> Red-wattled Lapwing	1, 2	A	RB,2	A,R
		9. Family SCOLOPACIDAE				
37.	411	<i>Scolopax rusticola</i> Eurasian Woodcock	2			
38.	396	<i>Tringa nebularia</i> Common Greenshank	2	W	M,1	A,
39.	397	<i>Tringa ochropus</i> Green Sandpiper	2			
40.	401	<i>Actitis hypoleucos</i> Common Sandpiper		A	RB,2	A,

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
		VII. Order COLUMBIFORMES				
		10. Family COLUMBIDAE				
41.	516-517	<i>Columba livia</i> Blue Rock Pigeon	1, 2	A	RB,2	M,S
42.	530-533	<i>Streptopelia orientalis</i> Oriental Turtle-Dove	1, 2	A	RB,2	M,S
43.	541	<i>Streptopelia senegalensis</i> Little Brown Dove	2			
44.	537-540	<i>Streptopelia chinensis</i> Spotted Dove	1, 2	A	RB,2	M,S
45.	535-536	<i>Streptopelia tranquebarica</i> Red Collared-Dove		A	RB,2	M,S
46.	534	<i>Streptopelia decaocto</i> Eurasian Collared-Dove	1, 2	A	RB,2	M,S
47.	542-544a	<i>Chalcophaps indica</i> Emerald Dove	1, 2	S	RB,2	M,S
48.	503-505	<i>Treron phoenicoptera</i> Yellow-legged Green-Pigeon	1	A	RB,2	M
		VIII. Order PSITTACIFORMES				
		11. Family PSITTACIDAE				
49.	545-548	<i>Psittacula eupatria</i> Alexandrine Parakeet		A	RB,2	M,D
50.	549-550	<i>Psittacula krameri</i> Rose-ringed Parakeet	1, 2	A	RB,2	M,D
51.	557-558	<i>Psittacula cyanocephala</i> Plum-headed Parakeet	1, 2	A	RB,2	M,D
		IX. Order CUCULIFORMES				
		12. Family CUCULIDAE				
52.	570-571	<i>Clamator jacobinus</i> Pied Crested Cuckoo	1			

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
53.	573-574	<i>Hierococcyx varius</i> Brainfever Bird	1	S	M,2	M
54.	576	<i>Cuculus micropterus</i> Indian Cuckoo	1	S	M,2	M
55.	577-579	<i>Cuculus canorus</i> Common Cuckoo	1	S	M,2	M
56.	580-580a	<i>Cuculus saturatus</i> Oriental Cuckoo		S	M,1	M
57.	588-589	<i>Surniculus lugubris</i> Drongo Cuckoo	1			
58.	590-592	<i>Eudynamys scolopacea</i> Asian Koel	1	S	M,1	M
59.	600-602	<i>Centropus sinensis</i> *Greater Coucal	1, 2	A	R,1	BW,D
60.	605	<i>Centropus bengalensis</i> *Lesser Coucal	2			
X. Order STRIGIFORMES						
13. Family STRIGIDAE						
61.	616-618b	<i>Otus sunia</i> Oriental Scops-Owl	1	A	RB,1	M
62.	658-660	<i>Strix leptogrammica</i> Brown Wood-Owl		W	RB,1	M
63.	639-641	<i>Glaucidium cuculoides</i> Asian Barred Owlet	1	A	RB,2	M
64.	636-637	<i>Glaucidium radiatum</i> *Jungle Owlet	1	A	RB,2	M
65.	642-645	<i>Ninox scutulata</i> Brown Hawk-Owl	1			

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
XI. Order CAPRIMULGIFORMES						
14. Family CAPRIMULGIDAE						
66.	670-672a	<i>Caprimulgus indicus</i> Indian Jungle Nightjar	1			
67.	675, 678-679	<i>Caprimulgus macrurus</i> *Large-tailed Nightjar	1, 2	W	M,3	M,S
68.	680-681	<i>Caprimulgus asiaticus</i> Common Indian Nightjar	1	W	M,3	M,S
XII. Order APODIFORMES						
15. Family APODIDAE						
69.	702-706	<i>Apus affinis</i> House Swift		A	R,2	HM
16. Family HEMIPROCNIDAE						
70.	709	<i>Hemiprogne coronata</i> *Crested Tree-Swift		A	R,1	M
XIII. Order CORACIIFORMES						
17. Family ALCEDINIDAE						
71.	722-724	<i>Alcedo atthis</i> Small Blue Kingfisher	1, 2	A	R,2	A
72.	730-732	<i>Halcyon capensis</i> Stork-billed Kingfisher	1, 2	A	M,1	A
73.	735-738	<i>Halcyon smyrnensis</i> White-breasted Kingfisher	1, 2	A	RB,2	A
74.	717-718	<i>Megaceryle lugubris</i> Greater Pied Kingfisher	1, 2			
75.	719-720	<i>Ceryle rudis</i> Lesser Pied Kingfisher	2			
18. Family MEROPIDAE						
76.	753	<i>Nyctornis athertoni</i> Blue-bearded Bee-eater	2			

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
77.	749-752	<i>Merops orientalis</i> Small Bee-eater	1, 2	S	M,3	HM,M,S
78.	744-745	<i>Merops leschenaulti</i> Chestnut-headed Bee-eater	1	S	M,2	HM,M,S
		19. Family CORACIIDAE				
79.	755-757	<i>Coracias benghalensis</i> Indian Roller	1, 2	W	M,1	BW,D,R,S
		20. Family UPUPIDAE				
80.	763-766	<i>Upupa epops</i> Common Hoopoe	1, 2	W	M,1	D,G,S,WL
		21. Family BUCEROTIDAE				
81.	767	<i>Ocyrceros birostris</i> Indian Grey Hornbill	1, 2	A	RB,2	M
82.	774	<i>Anthracoceros albirostris</i> *Oriental Pied Hornbill	1, 2	A	RB,2	M
		XIV. Order PICIFORMES				
		22. Family CAPITONIDAE				
83.	777-779	<i>Megalaima virens</i> Great Barbet	2	W	M,2	HM,M
84.	780-782	<i>Megalaima zeylanica</i> Brown-headed Barbet	1, 2	A	RB,2	HM,M
85.	783-784	<i>Megalaima lineata</i> Lineated Barbet		A	RB,2	HM,M
86.	788	<i>Megalaima asiatica</i> Blue-throated Barbet		A	RB,1	HM,M
87.	792	<i>Megalaima haemacephala</i> Coppersmith Barbet	2			
		23. Family PICIDAE				
88.	798-799	<i>Picumnus innominatus</i> Burton, 1836 Speckled Piculet				

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
89.	851-854	<i>Dendrocopos nanus</i> Brown-capped Pygmy Woodpecker	2			
90.	848-850	<i>Dendrocopos canicapillus</i> Grey-capped Pygmy Woodpecker	1	W	M,1	M
91.	845-846	<i>Dendrocopos macei</i> Fulvous-breasted Pied Woodpecker	1			
92.	802-804	<i>Celeus brachyurus</i> Rufous Woodpecker		W	M,1	M
93.	824	<i>Dinopium shorii</i> Himalayan Golden-backed Woodpecker	2	W	RB,1	M
94.	860-863	<i>Chrysocolaptes lucidus</i> Greater Golden-backed Woodpecker	1, 2			
XV. Order PASSERIFORMES						
24. Family PITTIDAE						
95.	867	<i>Pitta brachyura</i> Indian Pitta	1	W	M,1	M
25. Family ALAUDIDAE						
96.	878	<i>Eremopterix grisea</i> Ashy-crowned Sparrow-Lark		S	RB,1	GR,WL
26. Family HIRUNDINIDAE						
97.	916-918	<i>Hirundo rustica</i> Common Swallow		A	RB,1	HM,R, WL
98.	921	<i>Hirundo smithii</i> Wire-tailed Swallow	1			
27. Family MOTACILLIDAE						
99.	1885-1890	<i>Motacilla alba</i> White Wagtail	1, 2	W	M,1	A,D,GR,WL
100.	1891	<i>Motacilla maderaspatensis</i> Large Pied Wagtail	1, 2	W	M,2	A,D,GR,WL

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
101.	1875-1880	<i>Motacilla flava</i> Yellow Wagtail		W	M,2	A,D,GR,WL
102.	1884	<i>Motacilla cinerea</i> Grey Wagtail	1, 2	W	M,2	A,D,GR,WL
103.	1854-1855	<i>Anthus trivialis</i> Eurasian Tree Pipit		W	M,1	G,M,S
104.	1852-1853	<i>Anthus hodgsoni</i> Oriental Tree Pipit	2			
28. Family CAMPEPHAGIDAE						
105.	1072-1075	<i>Coracina macei</i> *Large Cuckoo-Shrike	2	S,W	RB,2	M
106.	1077	<i>Coracina melaschistos</i> Black-winged Cuckoo-Shrike		W	RB,2	M
107.	1078-1079	<i>Coracina melanoptera</i> Black-headed Cuckoo-Shrike	1			
108.	1090-1095	<i>Pericrocotus cinnamomeus</i> Small Minivet	1, 2	A	RB,1	HM,M,S
109.	1096	<i>Pericrocotus erythropygus</i> White-bellied Minivet		W	RB,1	HM,M,S
110.	1085-1087	<i>Pericrocotus ethologus</i> Long-tailed Minivet	1, 2	W	M,1	HM,M,S
111.	1080-1083	<i>Pericrocotus flammeus</i> Scarlet Minivet	1, 2			
112.	1064-1066	<i>Hemipus picatus</i> Pied Flycatcher-Shrike	1, 2	W	RB,1	M
113.	1067-1068	<i>Tephrodornis gularis</i> Large Woodshrike	1, 2			
114.	1069-1071	<i>Tephrodornis pondicerianus</i> Common Woodshrike	1, 2	A	R,2	HM,M

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
29. Family PYCNONOTIDAE						
115.	1115-1117	<i>Pycnonotus melanicterus</i> Black-crested Bulbul	1, 2	S,W	M,1	HM,M
116.	1125	<i>Pycnonotus leucogenys</i> Himalayan Bulbul	1, 2	A	M,3	D,HM,M,S
117.	1126-1132	<i>Pycnonotus cafer</i> Red-vented Bulbul	1, 2	A	RB,3	D,HM,M,S
118.	1148-1151	<i>Hypsipetes leucocephalus</i> *Black Bulbul	1, 2	W	M,2	HM,M
30 Family IRENIDAE						
119.	1097-1101	<i>Aegithina tiphia</i> Common Iora	1, 2	S	RB,2	M,S
120.	1103-1105	<i>Chloropsis aurifrons</i> Gold-fronted Chloropsis	1, 2	A	RB,2	HM,M,
31. Family LANIIDAE						
121.	939-940	<i>Lanius vittatus</i> Bay-backed Shrike		A	RB,2	S
122.	946-948	<i>Lanius schach</i> Rufous-backed Shrike	2	A	RB,2	S
32. Family MUSCICAPIDAE						
Subfamily TURDINAE						
123.	1723	<i>Monticola cinclorhynchus</i> Blue-Headed Rock-Thrush		W	RB,1	HM,
124.	1724	<i>Monticola rufiventris</i> Chestnut-bellied Rock-Thrush		W	RB,1	HM,M
125.	1729-1730	<i>Myiophonus caeruleus</i> Blue Whistling-Thrush	1, 2	W	RB,2	D,HM,R
126.	1733-1736	<i>Zoothera citrina</i> Orange-headed Thrush	1, 2	W	M,1	M

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
127.	1741-1744	<i>Zoothera dauma</i> Scaly Thrush	2	W	M,1	M
128.	1745	<i>Zoothera monticola</i> Greater Long-billed Thrush		W	M,1	M
129.	1748	<i>Turdus unicolor</i> Tickell's Thrush	2			
130.	1750	<i>Turdus bouboul</i> Grey-winged Blackbird	1, 2	W	M,1	M
131.	1763-1764	<i>Turdus ruficollis</i> Dark-throated Thrush	2			
132.	1647-1649	<i>Luscinia pectoralis</i> Himalayan Rubythroat	2			
133.	1654-1656	<i>Tarsiger cyanurus</i> Orange-flanked Bush-Robin		S	RB,1	BW,M
134.	1661-1664	<i>Copsychus saularis</i> Oriental Magpie-Robin	1, 2	A	RB,2	M,S
135.	1665-1668	<i>Copsychus malabaricus</i> White-rumped Shama	1, 2	A	RB,2	M
136.	1717-1721	<i>Saxicoloides fulicata</i> Indian Robin	2	A	RB,2	BW,M,S
137.	1670	<i>Phoenicurus caeruleocephalus</i> Blue-capped Redstart	2			
138.	1671-1672	<i>Phoenicurus ochruros</i> Black Redstart	2			
139.	1716	<i>Chaimarrornis leucocephalus</i> White-capped Redstart	1, 2			
140.	1679	<i>Rhyacornis fuliginosus</i> Plumbeous Redstart	1, 2	W	M,1	A,BW
141.	1682	<i>Cinclidium frontale</i> Blue-fronted Robin		W	M,1	BW,S

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
142.	1695-1698	<i>Saxicola torquata</i> Common Stonechat		A	RB,2	BW,S
143.	1700-1703	<i>Saxicola caprata</i> Pied Bushchat	1	A	RB,2	BW,S
144.	1705	<i>Saxicola ferrea</i> Grey Bushchat	2	A	RB,1	S
Subfamily TIMALIINAE						
145.	1312-1316	<i>Garrulax lineatus</i> Streaked Laughingthrush		A	RB,2	D,S,WL
146.	1152-1159	<i>Pellorneum ruficeps</i> Spotted Babbler	1, 2			
147.	1261-1265	<i>Turdoides striatus</i> Jungle Babbler	1, 2	A	RB,2	D,G,M,S
148.	1367-1370	<i>Yuhina flavicollis</i> Yellow-naped Yuhina	2			
Subfamily SYLVIINAE						
149.	1502-1505	<i>Prinia hodgsonii</i> Franklin's Prinia	1	A	RB,1	S
150.	1519-1523	<i>Prinia sylvatica</i> Jungle Prinia		A	RB,2	S
150.	1515-1518	<i>Prinia socialis</i> Ashy Prinia	2	A	RB,2	S
152.	1556	<i>Acrocephalus dumetorum</i> Blyth's Reed-Warbler	1			
153.	1535-1539	<i>Orthotomus sutorius</i> Common Tailorbird	1	A	RB,2	M,S
154.	1577	<i>Phylloscopus neglectus</i> Plain Leaf-Warbler		W	M,2	M,S
155.	1597-1599	<i>Phylloscopus maculipennis</i> Grey-faced Leaf-Warbler	1			

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
156.	1594-1596	<i>Phylloscopus chloronotus</i> *Lemon-rumped Warbler	2	W	M,2	M,S
157.	1590-1591	<i>Phylloscopus humei</i> *Hume's Warbler	2	W	M,1	M,S
158.	1602-1605	<i>Phylloscopus trochiloides</i> Greenish Leaf-Warbler	2	W	M,2	M,S
159.	1578	<i>Phylloscopus tytleri</i> Tytler's Leaf-Warbler		W	M,2	M,S
160.	1606	<i>Phylloscopus occipitalis</i> *Western Crowned Warbler	2			
161.	1615	<i>Seicercus burkii</i> *Gold-spectacled Flycatcher-Warbler	1			
162.	1614	<i>Seicercus whistleri</i> *Whistler's Flycatcher-Warbler	2			
163.	1616-1619	<i>Seicercus xanthoschistos</i> Grey-headed Flycatcher-Warbler	1, 2	W	M,1	M,S
164.	1567-1568	<i>Sylvia curruca</i> *Common Lesser Whitethroat Subfamily Muscicapinae	2			
165.	1405-1406	<i>Muscicapa sibirica</i> Sooty Flycatcher	2			
166.	1414	<i>Ficedula strophciata</i> Orange-gorgeted Flycatcher	2	W	R,1	BW,M,S
167.	1411-1412	<i>Ficedula parva</i> Red-throated Flycatcher	1, 2			
168.	1417	<i>Ficedula hyperythra</i> Rufous-breasted Blue Flycatcher	2			
169.	1421-1422	<i>Ficedula superciliaris</i> Ultramarine Flycatcher		A	R,1	M,S

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
170.	1423-1425	<i>Ficedula tricolor</i> Slaty-blue Flycatcher	2	A	R,1	M,S
171.	1445	<i>Eumyias thalassina</i> Verditer Flycatcher	2			
172.	1429-1430	<i>Niltava macgrigoriae</i> Small Niltava	1, 2			
173.	1431-1432	<i>Niltava sundara</i> Rufous-bellied Niltava	1, 2			
174.	1440	<i>Cyornis rubeculoides</i> Blue-throated Flycatcher	1	A	R,1	M,S
175.	1442-1443	<i>Cyornis tickelliae</i> Tickell's Blue-Flycatcher	1, 2	S	R,1	M,S
176.	1448-1449	<i>Culicicapa ceylonensis</i> Grey-headed Flycatcher Subfamily MONARCHINAE	1, 2	W	R,1	M,S
177.	1460-1464	<i>Terpsiphone paradisi</i> Asian Paradise-Flycatcher Subfamily Rhipidurinae	1	S	M,1	M
178.	1450	<i>Rhipidura hypoxantha</i> Yellow-bellied Fantail-Flycatcher	1, 2	W	M,1	M
179.	1454-1459	<i>Rhipidura albicollis</i> White-throated Fantail-Flycatcher	1, 2	A	R,1	M,S
180.	1451-1453	<i>Rhipidura aureola</i> White-browed Fantail-Flycatcher 33. Family PARIDAE	1	A	R,1	M,S
181.	1790-1797	<i>Parus major</i> Great Tit 34. Family SITTIDAE	1, 2	A	R,2	D,HM,M,S
182.	1834-1835	<i>Sitta himalayensis</i> White-tailed Nuthatch	1			

SI. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
183.	1838	<i>Sitta frontalis</i> Velvet-fronted Nuthatch	2	S	R,1	M
184.	1839	<i>Tichodroma muraria</i> Wallcreeper	1, 2	W	M,1	R,WL
35. Family CERTHIIDAE						
185.	1845-1848	<i>Certhia himalayana</i> Bar-tailed Tree-Creeper	1, 2	A	R,1	M
36. Family DICAIDAE						
186.	1892-1894	<i>Dicaeum agile</i> Thick-billed Flowerpecker	1	A	R,1	M,S
187.	1901-1903	<i>Dicaeum concolor</i> Plain Flowerpecker	1			
37. Family NECTARINIIDAE						
188.	1916-1918	<i>Nectarinia asiatica</i> Purple Sunbird	1, 2	S	R,2	D,M,S
189.	1927-1929a	<i>Aethopyga siparaja</i> Crimson Sunbird	1, 2	W	R,1	M,S
38. Family ZOSTEROPIDAE						
190.	1933-1936	<i>Zosterops palpebrosus</i> Oriental White-eye	1, 2	A	R,2	D,HM,M,S
39. Family FRINGILLIDAE						
191.	2010-2013	<i>Carpodacus erythrinus</i> Common Rosefinch		W	M,1	M,S
40. Family ESTRILDIDAE						
192.	1974-1975	<i>Lonchura punctulata</i> Spotted Munia		A	RB,2	D,S
41. Family PASSERIDAE						
Subfamily PASSERINAE						
193.	1938-1939a	<i>Passer domesticus</i> House Sparrow	1, 2	A	RB,3	D,G,S,WL

SI. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
194.	1948-1949	<i>Petronia xanthocollis</i> Yellowo-throated Sparrow 42. Family STURNIDAE	1	A	R,2	D,G,S,WL
195.	1002-1004	<i>Sturnus contra</i> Asian Pied Starling	2			
196.	1006-1007	<i>Acridotheres tristis</i> Common Myna 43. Family ORIOLIDAE	1, 2	A	R,2	D,G,S,WL
197.	952-953	<i>Oriolus oriolus</i> Eurasian Golden Oriole	1	S	M,1	HM,M
198.	958-960a	<i>Oriolus xanthornus</i> Black-headed Oriole	1, 2	A	R,2	HM,M
199.	961	<i>Oriolus traillii</i> Maroon Oriole 44. Family DICRURIDAE	2	S	M,1	M
200.	962-964	<i>Dicrurus macrocercus</i> *Black Drongo	1, 2	A	R,3	W,D,HM, M,S,WL
201.	965-966b	<i>Dicrurus leucophaeus</i> Ashy Drongo	2			
202.	967-969	<i>Dicrurus caerulescens</i> White-bellied Drongo	1, 2	A	R,2	HM,M,S
203.	971	<i>Dicrurus aeneus</i> Bronzed Drongo	2			
204.	972	<i>Dicrurus remifer</i> Lesser Racket-tailed Drongo	2			
205.	973	<i>Dicrurus hottentottus</i> Spangled Drongo 45. Family ARTAMIDAE	1, 2	A	R,2	D,HM,M, S,WL
206.	982	<i>Artamus fuscus</i> Ashy Woodswallow	2			

Sl. No.	HBI No.	Systematic List	Earlier Records	Season	Status	Habitat
46 Family CORVIDAE						
207.	1027-1028	<i>Urocissa erythrorhyncha</i> Red-billed Blue Magpie	1, 2	S	M,1	M
208.	1030a-1034	<i>Dendrocitta vagabunda</i> Indian Treepie	1, 2	A	R,2	D,HM, M,S,WL
209.	1037-1039	<i>Dendrocitta formosae</i> Grey Treepie	1	A	R,1	D,HM, M,S,WL
210.	1054-1057	<i>Corvus macrorhynchos</i> Jungle Crow	1, 2	A	R,2	D,GHM, M,S,WL

**Earlier records** 1 = Bhargav *et al.*, 2007  
2 = Ghosh *et al.*, 2007

S = Summer

W = Winter

A = Throughout the year

**Status**

R = Resident

M = Migratory

B = Breeding

1 = Less common

2 = Common

3 = Very Common

**Habitat**

A = Aquatic (Marshy areas & Wetland vegetation)

BW = Brushwood along Streams, rivers etc.

D = Disturbed (Human settlements and Cultivation)

G = Grasslands

HM = Steep hill slopes with mixed forests

M = Mixed Forests

R = Dry bed of seasonal river

S = Scrubland

WL = Wasteland

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## MAMMALIA

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### INTRODUCTION

Mammals constitute a significant portion of vertebrate diversity of Himachal Pradesh comprising 111 species (Chakraborty *et al.* 2005, Saikia *et al.*, 2004). Despite smaller geographical area, the state harbors about 27 percent of total mammalian species in India. Varied environmental setup in areas from lofty snowy peaks to hot plains coupled with good vegetation cover in the state provide ideal conditions for colonization by specialized mammalian species besides generalist one. Mammalian fauna of Himachal Pradesh is an admixture of Palearctic and Oriental elements since the state lies in the transition zone of the two biogeographical realms. Brown Bear, Lynx, Alpine Weasel, Mountain Noctule etc. are some of the Palearctic representative of the mammalian fauna of the state that probably came from Hindukush Mountains and Russian Uzbekistan (Roberts, 1977). Some of the representative Oriental fauna of the state include Leopard cat, Yellow throated Marten, Himalayan Palm Civet, Indian Pangolin, Grey Goral, Barking Deer, Bandicoot Rat, Bush Rat, Flying Fox, False Vampire, Fulvous leaf-nosed Bat, Musk Shrew etc. However, being a part of the Himalayan Range, no species level endemism is found in the state with respect to mammalian species (Chakraborty *et al.*, 2005).

Simbalbara Wildlife Sanctuary, a dry deciduous forest patch (Dry Siwalik Sal forest, Type 5B/C1a, Champion & Seth, 1968) situated on the northernmost limit of Sal forest provides suitable habitats for herbivores like Barking Deer, Sambar, Cheetal, Wild Boar etc which in turn provide prey base for large carnivores. The Sanctuary is adjoining to Kalesar National Park in neighboring Haryana from which elephants occasionally cross over to Simbalbara. Incidentally, the sanctuary is the only conservation area in Himachal Pradesh where the occurrence of Tiger and Elephant has been reported. The present account deals with the mammalian species occurring in the Sanctuary which were recorded during field surveys from 2004-2006. The inventory comprises 21 species in 19 genera and 9 orders. Except for four species (marked with asterisk), all reported species were sighted in the field by the authors.

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Those four species have been reported on the basis of secondary information. Abundance status mentioned here is based on the frequency of sightings in the field and other inferences. Classification and scientific names followed here is as per Corbet & Hill (1992) and Wilson & Reeder (1993).

## SYSTEMATIC ACCOUNT

Order INSECTIVORA

Family ERINACEIDAE

Genus *Suncus* Ehrenberg, 1832

1. *Suncus murinus* (Linnaeus, 1766)

1766. *Sorex murinus* Linnaeus, *Syst Nat.* 12<sup>th</sup> ed. 1 : 74.

*Common Name* : House shrew.

*Diagnostic features* : A typical and large shrew with small black eyes, long pointed snout and profuse soft vibrissae. Typical coloration is dark brown dorsum and blackish grey venter without clear demarcation between the two. The ear is sparsely haired and has a distinctive fold on the conch. Tail is thickened at the base and tapers to a fine point at the end and bears long white hairs. The upper tooth row consists of an incisor, four palatal premolars and four molars. Closely resembling *Crocidura* species can be distinguished from this species by the presence of three premolars in the former. House shrew can also be differentiated from Pygmy shrew *Suncus etruscus* (which also occurs in Himachal Pradesh) by much larger size and lighter coloration.

*Specimen examined* : (I-6) 1, Near forest rest house, SWLS, Coll. U. Saikia, 12.VI.05. External and cranial measurements (in mm) : HB-110, T-half cut, HF-19, E-13, GTL-32.

*Distribution* : *India* : Widely distributed all over country.

*Elsewhere* : Afganistan, Pakistan, Nepal, China, Bhutan, Myanmar, Sri Lanka, Continental and peninsular Indo-malayan region (Alferd *et al.*, 2002). Introduced into the island of Guam, Maldive, Mauritius, Madagascar etc.

*Abundance Status* : Common around human settlement.

*Conservation Status* : CAMP, 2005 : LC.

*Observation* : The house shrew is better adapted for a commensal existence than any other species in the genus and hence usually not encountered in the wild. The species was observed near the forest rest house and a single specimen was trapped.

It was kept in a cage with a live house mouse for a night and the following morning, the mouse was found dead half eaten by the shrew. House shrew normally eats insects, and also reported to attack and eat Bull frog (*Rana tigrina*) and even snake (*Natrix atollata*) (Dharmakumarsinghi, 1937, Behura, 1958) but earlier report of killing and eating mouse is unknown to us.

Order CHIROPTERA

Family VESPERTILIONIDAE

Genus *Pipistrellus* Kaup, 1892

2. *Pipistrellus tenuis* (Temminck, 1840)

1840. *Vespertilo tenuis* Temminck, *Monographies de mammologie* 2.

*Common Name* : Indian Pygmy Pipistrelle.

*Diagnostic features* : It is the smallest pipistrelle found in Indian subcontinent. Average forearm length measures 27.7 mm (Bates and Harrison, 1997). Dorsum uniform brown, venter paler. The ears and patagium is dark without hairs. The skull has an average condylo-canine length of 10.2 mm which is characteristically smaller than any other species in the genus.

*Specimen examined* : (CW-41), 1, near forest rest house, SWLS, Coll. U. Saikia, 10.VI. 05. *Colouration* : dark brown dorsally, belly slightly lighter, patagium blackish.

*External measurements* (in mm) : HB-37, TL-29, HF-5.5, E-8, FA-35.2, TR-4, *Cranial measurements*: CBL-11, CCL-10.5, CM<sup>3</sup>-3.8, CM<sub>3</sub>-4, M<sup>3</sup>-M<sup>3</sup>-4.7, BB-5.8, PC-3.2, ZB-7.4, C<sup>1</sup>-C<sup>1</sup>-3.4, M-8.

*Distribution* : *India* : Himachal Pradesh, Haryana, Rajasthan, Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Orissa, Uttar Pradesh, Bihar, West Bengal, Assam, Meghalaya, Nagaland, Tripura (Bates & Harrison, 1997).

*Elsewhere* : Afganistan, Pakistan, Nepal, Bhutan, Myanmar, Thailand, Vietnam, Srilanka.

*Conservation Status* : CAMP, 2002 : LC.

*Abundance Status* : Commonest among the all observed bat species in the Sanctuary.

*Observation* : A female specimen was captured in mist net around 5.30 pm in June, 2005. It was captured little above ground near a seasonal pool of water confirming the observation of Bhattacharyya (1985) that the species frequently hunts near ground.

Based on external characteristics, *P. tenuis* is very difficult to distinguish from smaller specimens of *P. coromandra*. Hence, the collected specimen was preserved and

identified in the laboratory using cranial characters. It would be pertinent to mention that at least two other species of microchiropteran bats were observed in the sanctuary but because of the inability to capture any individual; their identity could not be ascertained.

*Remarks* : The Indian specimens are referred to the subspecies *P. t. mimus* (Sinha, 1980, Bates & Harrison, 1997).

## Order RODENTIA

### Family MURIDAE

#### Genus *Mus* Linnaeus, 1758

#### 3. *Mus musculus homourus* Hodgson, 1845

1845. *Mus homourus* Hodgson, *Ann. Mag. nat. Hist.*, 1(15) : 268.

*Common Name* : House mouse.

*Diagnostic features* : An outdoor subspecies of house mouse measuring up to 94 mm (Agrawal, 2002). Body colour tawny or cinnamon dorsally, venter grayish white. Tail is a little longer than head and body length. Length of diastema less than one-fourth of occipitonasal length.

*Specimen examined* : RW- 16 1, Kaludev RF, Coll. U. Saikia, 12.VI.05. *Colouration* : Dorsum dark brown, venter grayish white, hindfoot brownish white. *External measurements* (in mm) : HB-71, TL: 74, HF-15, E-8, *Cranial measurements* : ON-22.3, CBL-21.5, N-20.4, PL-10.5, MTR-3.2, BL-3.3, APF-4.5, ZB-11.2, IW-3.1, D-5.4, M-13.6.

*Distribution* : *India* : From J&K to West Bengal, North East (Agrawal, 2000).

*Elsewhere* : Nepal, Myanmar, Thailand, Laos, Vietnam, and South China.

*Abundance Status* : Uncertain, only one specimen was observed or collected.

*Conservation Status* : IWPA, 1972 : Schedule V, CAMP, 2005 : LC.

*Observation* : Being an outdoor subspecies, was observed and collected in forest away from human habitation. The gut content of the captured individual consisted of partly digested insect matter and seeds of unknown origin.

*Remarks* : The collected specimen could be attributed to the subspecies *M. musculus homourus* Hodgson on account of pelage colour and outdoor habit. Individuals of house mouse were also seen in an around the forest rest house. But for want of specimen, it could not be determined whether they belong to the same subspecies or not.

#### 4. *Mus booduga* (Gray, 1837)

1837. *Leggada booduga* Gray, *Charlesworth's Mag. Nat. Hist.* 1 : 586.

*Common Name* : Common Indian Field Mouse.

*Diagnostic features* : Similar in appearance to house mouse except for smaller size. Tail length equal or shorter than head and body. Dorsum varies from light to dark reddish brown, belly pure white or greyish white. Skull small, diastema length more than one fourth of occipitonasal length.

*Specimen examined* : (RW-12) 1, Kaludev RF, Coll: U. Saikia, 3.IV.06. *Colouration* : Rusty brown dorsally, venter greyish white, tail dark above and paler below. *External measurements* (in mm) : HB- 58, TL-62, HF-14, E-10. *Cranial measurements* (in mm) : ONL- 19.3, PL-10.1, MTR-3.2, APF-4.1 D-5.2.

*Distribution: India*: The present form with greyish white undersurface is distributed in Himachal Pradesh, Uttarakhand, Bihar, Orissa, Andhra Pradesh and West Bengal (Agrawal, 2000).

*Elsewhere* : Bangladesh, Nepal, Pakistan.

*Abundance Status* : Uncertain, only one specimen was observed or collected.

*Conservation Status* : IWPA, 1972 : Schedule V, CAMP, 2005 : LC.

*Observation* A female individual was trapped around a rubbish heap in June. Thorough searching of the area revealed a small rounded nest beneath a fallen log. The nest was made of dry leaves and contained five newborn pups, eyes still closed.

#### Genus *Tatera* Lataste, 1882

#### 5. *Tatera indica indica* Hardwicke, 1807

1807. *Dipus indicus* Hardwicke, *Trans. Linn. Soc. London*, 8 : 279.

*Common Name* Antelope rat or Indian Gerbil.

*Diagnostic features* : A large rodent of house rat size but with a longer tail. Fur is long and silky, reddish brown dorsally and white ventrally. Ears are relatively large, naked and distinguish it from other gerbils in the field. The long tail has black hairs on the distal portion and ending in a tuft which is very distinctive of the species.

*Specimen examined* : (RW-10) 1, Kaludev RF, Coll. U. Saikia, 11 VI.05. *Colouration* : Fur colour brownish with golden brown tinge on head, neck, shoulder, venter and hindfeet pure white. *External measurements* (in mm) : HB-155, T-187, HF-35, E-23. *Cranial measurements* (in mm) : ON-43.8, CB-41.5, PL-22.5, N-19, MTR-6, BL-11 APF-7.8, ML-22.

*Distribution* : India : Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Uttar Pradesh, Bihar, West Bengal (Agrawal, 2000).

*Elsewhere* : Sri Lanka, Pakistan, Saudi Arabia, Iran, Iraq, Syria.

*Abundance Status* : Very commonly observed especially in the summer season.

*Conservation Status* : IWPA, 1972 : Schedule V, CAMP, 2005 : LC.

*Observations* : Gregarious rodent. Active colonies are observed abundantly only during summer (May–June). Holes are dug up in the sand along the dry riverbed amidst bushes of *Lantana* near *Zyzyphus* shrubs, the ripen fruits of which serve as a convenient source of food. Each colony has 4-5 entrances opening at approximately 45° angle to the ground.

*Remarks* : Based on the length of the hind foot, *T. indica* has been divided into two subspecies, *T. indica. indica* (HF < 41 mm) and *T. indica. cuvieri* (HF > 41mm) (Agrawal & Chakravorty, 1981). The North Indian specimens are referred to the nominate subspecies i.e. *T. i. indica* Hardwicke (Agrawal, 2000).

#### Family HYSTRICIDAE

Genus *Hystrix* Linnaeus, 1758

6. *Hystrix indica* Kerr, 1792\*

1792. *Hystrix indica* Kerr. In Linnaeus, *Anim. Kingdom*, p. 213.

*Common Name* : Indian crested porcupine.

*Diagnostic features* : A massively built rodent, with head and body length in excess of 600 mm (Agrawal, 2000) and a short tail. A prominent crest of long bristles present on the head and neck which distinguishes it from Himalayan crestless porcupine (*H. brachyura*). Long quills have alternating bands of brown and white.

*Distribution* : Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, West Bengal (Agrawal, 2000).

*Abundance Status* : Very common.

*Conservation Status* : IWPA, 1972 : Schedule IV, CAMP-2005 : LC.

*Observation* : Because of nocturnal nature, no individual was observed. But extensive presence of quills (which are periodically shed) and live burrows in all parts of the sanctuary indicates its common occurrence in the area. Bones of animals were

also seen in a few burrow mouths and it is a well documented habit of porcupines to gnaw bones, probably a means of getting minerals for growing quills (Roberts, 1977).

Order LAGOMORPHA

Family LEPORIDAE

Genus *Lepus* Linnaeus, 1758

7. *Lepus nigricollis ruficaudatus* Geoffroy, 1826

1823. *Lepus nigricollis* Cuvier, *Dict Sci. Nat.*, 26 : 307.

*Common Name* : Indian hare

*Diagnostic features* : A medium sized lagomorph with long broad ears and long, slender hind limbs. The overall colour is buff with ochraceous tinge on lower limbs. The short tail is covered with long white hairs. Eyes are very large, placed high up and far back in the skull., The North Indian sub species has rufous tail and whitish underparts (Menon, 2003).

*Distribution : India* : Widely distributed throughout the country except mangroves and high altitude (Menon, 2003).

*Elsewhere* : Indonesia, Bangladesh, Bhutan, Pakistan, Sri Lanka.

*Abundance Status* : Commonly seen in the Sanctuary.

*Conservation Status* : IWLA, 1972 : Schedule IV, CAMP-2005 : LC.

*Remarks* : Ellerman and Morrison Scott (1965) recognized 9 subspecies of *L. nigricollis*. The North Indian form is referred to subspecies *L. n. ruficaudatus*.

Order CARNIVORA

Family HERPESTIDAE

Genus *Herpestes* Illiger, 1811

8. *Herpestes edwardsii* (E. Geoffroy Saint-Hilaire, 1818)\*

1818. *Ichneumon edwardsii* E. Geoffroy Saint-Hilaire, *Descrip de L'Egypte*, 2 : 139.

*Common Name* : Indian grey mongoose.

*Diagnostic features* : Considerably larger than Small Indian Mongoose, grey mongoose has longer fur that forms a cape along the flanks and hind quarters (Roberts, 1977). Fur is rather stiff and coarse with individual hairs being annulated with light and dark colour. Ventral fur is short, brownish and upper part of feet and limb reddish brown. The head is characteristically conical.

*Distribution* : India : Throughout.

*Elsewhere* : Indonesia, Malaysia, Japan, Sri Lanka, Nepal, Pakistan, Afghanistan, Saudi Arabia, Kuwait, Bahrain.

*Abundance Status* : Although a common species elsewhere, not observed live in the Sanctuary. Included on the basis of a skull collected from the sanctuary area.

*Conservation Status* : IWPA, Schedule II.

*Remarks* : Ellerman and Morrison-Scott (1965) recognized three subspecies from India i.e. *H.e. edwardsi* Geoffroy, *H. e. nyula*, Hodgson and *H.e. ferrugineus*, Blandford. The subspecies occurring in the area is not certain.

#### Family FELIDAE

Genus *Felis* Linnaeus, 1758

#### 9. *Felis chaus* Schreber, 1777

1777. *Felis chaus* Schreber. *Die Säugethiere*, 2(13) : pl. 1101B (1777); text, 3(24) : 414 (1777).

*Common Name* : Jungle cat

*Diagnostic features* : A small cat similar to domestic cat but with long straight ears and relatively short tail. Coat colour is uniform reddish buff or tawny grey although variable with season. The distal portion of the tail bears two to three black rings terminating in a solid black tip. The inside of the fore legs bears two prominent black rings (Roberts, 1977).

*Distribution* : India : Jammu and Kashmir, Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Bengal, North-East, South of Krishna river in South India.

*Elsewhere* : Vietnam, Thailand, South West China, Pakistan, Sri Lanka, West to Egypt and much of Soviet Turkestan (Corbett & Hill, 1992).

*Abundance Status* : Occasionally seen in the area.

*Conservation Status* : IWPA, 1972 : Schedule II.

Genus *Panthera* Oken, 1816

#### 10. *Panthera pardus* (Linnaeus, 1758)\*

1758. *Felis pardus* Linnaeus, *Syst. Nat.*, 10<sup>th</sup> ed, 1 : 41.

*Common Name* : Leopard.

*Diagnostic features* : A large but slim cat standing up to 66 cm at the shoulder (Roberts, 1977). Tail is long and averages about two third of head and body length. Body colour varies from golden orange to paler grayish fawn marked all over with black rosettes made of 4-5 concentric spots. Forehead and tail patterned with small spots.

*Distribution* : *India* : throughout in suitable pockets up to 3000 m (Menon, 2003). Widely distributed in Asia and Africa, CIS countries.

*Abundance Status* : A few resident individuals present in the Sanctuary, pugmarks are commonly seen.

*Conservation Status* : IWPA, 1972 : Schedule I.

### 11 *Panthera tigris tigris* (Linnaeus, 1758)\*

1758. *Felis tigris* Linnaeus, *Syst. Nat.* 10<sup>th</sup> ed. 1 : 41.

*Common Name* : Royal Bengal Tiger

*Diagnostic features* : The biggest amongst all cats, an adult may weigh up to 230 kg (Menon, 2003). Indian tiger is an unmistakable animal in orange coat patterned with vertical black stripes. Ears are blackish with white spots on the back. Long tail is banded with black.

*Distribution* : *India* Throughout the country in suitable habitat except desert region.

*Abundance Status* : Occasional visitor to the Sanctuary.

*Conservation Status* : IWPA, 1972 : Schedule I.

*Observations* : Tiger is a sporadic visitor to the sanctuary probably from adjacent Kalesar National Park. During the survey period, fresh pugmarks and scats were observed in two instances (19/12/05, 12/6/06). One scat sample collected was composed of pure soil with abundant undigested ants. Another scat sample comprised of digested bones in the form of powdery calcarious substance along with undigested hairs. Although Simbalbara supports a good prey base for large carnivores, its smaller size is not suitable for a tiger to reside permanently. Instead, the Sanctuary is probably a part of the much extensive home range of one or two of these big cats.

### Family CANIDAE

Genus *Canis* Linnaeus, 1758

### 12. *Canis aureus* Linnaeus, 1758

1758. *Canis aureus* Linnaeus, *Syst. Nat.*, 10<sup>th</sup> ed. 1 : 40.

*Common Name* : Asiatic Jackal.

*Diagnostic features* : Smaller version of wolf with shorter legs and smaller muzzle. Upright, pointed ears are comparatively smaller than many other canids. Body fur is sandy buff, venter creamy white, mid dorsal region blackish and tail tip black. Jackals of Northern India are larger and heavier than their peninsular counterpart (Menon, 2003).

*Distribution : India* : Almost throughout the country (Alfred *et al.* 2002)

*Elsewhere* : Afghanistan, Pakistan, Sri Lanka, Central, South western and South Asia, North and East Africa, South eastern Europe etc.

*Abundance Status* : Common.

*Conservation Status* : IWPA, 1972 : Schedule II.

#### Order PHOLIDOTA

#### Family MANIDAE

#### Genus *Manis* Linnaeus 1758

#### 13. *Manis crassicaudata* Gray, 1827\*

1827. *Manis crassicaudata* Gray, In Griffith *et al.*, *Anim. Kingdom*, 5 : 282.

*Common Name* : Indian Pangolin.

*Diagnostic features* : A rather unusual looking animal with a small head, hump backed body and thick tapering tail. Body is covered with large overlapping horny scales. Scales are dirty yellowish color. Unlike the other species of pangolin (*M. pentadactyla*) which has a naked glandular area at the tip of the tail, the tail tip of *M. crassicaudata* bears a terminal scale (Roberts and Viellard, 1971).

*Distribution : India* Himachal Pradesh, Delhi, Gujarat, Rajasthan, Maharashtra, Madhya Pradesh, Karnataka, Kerala, Tamil Nadu, Orissa, West Bengal, Bihar, Uttar Pradesh.

*Elsewhere* : Bangladesh, Sri Lanka, China, Pakistan.

*Abundance Status* : Uncommon.

*Conservation Status* : IWPA, 1972 : Schedule I.

*Observation* : Termite mounds associated with Sal forest provide ideal condition for ant eaters like pangolin. But in Simbalbara, the population of pangolin appears very low and local villagers, forest staff also reported very few sightings. The species is recorded on the basis of scales of a dead animal collected on June 2005.

## Order ARTIODACTYLA

## Family SUIDAE

Genus *Sus* Linnaeus 175814. *Sus scrofa cristatus* Wanger, 1839

1758. *Sus scrofa* Linnaeus, *Syst. Nat.* 10<sup>th</sup> ed. 1 : 49.

*Common Name* : Indian Wild boar.

*Diagnostic features* : A rather bulky animal with thick dumpy neck short legs. Muzzle is elongated terminating in a flattened disc. Sparsely haired than its European counterpart, it has long black mane all along the back. Can be differentiated from Pygmy hog (*S. salvanius*) by much bigger size and presence of mane.

*Distribution* : *India* : Throughout the country (Alfred *et al.* 2002).

*Abundance Status* : Very common throughout the sanctuary.

*Conservation Status* : IWPA, 1972: Schedule III.

*Remarks* : On the basis of body size, Groves (2003) recognized two subspecies i.e. *S.s. cristatus* Wagner and *S. s. davidi* Groves from Indian subcontinent. The later subspecies is inhabitant of drier parts of northwestern India and Pakistan.

## Family CERVIDAE

15. *Axis axis* (Erxleben, 1777)

1777. *Cervus axis* Erxleben, *Syst. Regn. Anim.*, 1 : 312.

*Common Name* : Cheetal or Spotted Deer

*Diagnostic features* : Cheetal is the only predominantly spotted deer in India and is a strikingly beautiful animal. A medium sized ungulate, an adult may stand up to about 90 cm at shoulder, (Menon, 2003). Fur coat is rufous (varies geographically, becoming redder in Southern India) intensely spotted with white. Throat bears a white patch.

*Distribution* : *India* : Peninsular India, northward to Kumaon, Sikim, West Bengal, introduced in Andaman (Alfred *et al.* 2002)

*Elsewhere* : Nepal, Sri Lanka. Introduced in many countries.

*Abundance Status* : Commonly seen in certain areas of the Sanctuary.

*Conservation Status* : IWPA, 1972 : Schedule III.

Genus *Cervus* Linnaeus, 175816. *Cervus unicolor* Kerr, 1792

1792. *Cervus unicolor* Kerr., In Linnaeus, *Anim. Kingdom*, p. 300.

*Common Name* : Sambar

*Diagnostic features* : Sambar is the biggest of all deers in India. An adult individual may weigh up to 320kg and may attain a height of 150 cm (Menon, 2003). Coat texture is shaggy, dark brown. Stags bear very large branched antlers.

*Distribution: India*: Tamil Nadu, northward to Uttar Pradesh, East to NE states. *Elsewhere*: China, Taiwan, Indonesia, Malaysia, Myanmar, Sri Lanka, Australia (Alferd, et al., 2002).

*Abundance Status* : Common.

*Conservation Status* : IWPA, 1972 : Schedule III.

Genus *Muntiacus* Rafinesque, 181517. *Muntiacus muntjak* (Zimmermann, 1780)

1780. *Cervus muntiacus* Zimmermann, *Georg. Gesch. Mensch. Vierf. Thiere*, 2 : 131.

*Common Name* : Barking deer or Indian Muntjac

*Diagnostic features* : A small deer measuring 41-60 cm at shoulder (Roberts, 1977). Comparatively short and thin legs give the animal rather stocky appearance. Fur colour is glossy dark chestnut with throat, belly and inner side of the legs whitish. Males have two bony pedicles covered with skin on which short deciduous horns are grown. Two bony ridges come down from the base of pedicles beyond the level of the eye which has given rise to its another name rib faced deer.

*Distribution : India* : Throughout the country except Jammu and Kashmir and desert region (Alfred et al., 2002).

*Elsewhere* : Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, China, Indonesia, Malaysia.

*Abundance Status* : Commonly seen in the sanctuary.

*Conservation Status* : IWPA, 1972 : Schedule III.

*Remarks* : Groves (2003) used the name *Muntiacus vaginalis* (Boddaert, 1785) for Indian Muntjac. He is of the opinion that *M. muntjak* is Indonesian or Malaysian species and differs from *M. vaginalis* in chromosome number and coloration. Alfred et al. (2002) synonymised *muntjak* and *vaginalis*.

## Family BOVIDAE

Genus *Naemorhedus* H. Smith, 182718. *Naemorhedus goral goral* (Hardwicke, 1825)1825. *Antelope goral* Hardwicke, *Trans. Linn. Soc. London*, 14 : 518.*Common Name* : Grey goral

*Diagnostic features* : A small ungulate measuring 65-71 cm at shoulder and weighs around 25-28 kg (Lydekker, 1907). Body colour is dark grayish-blue, speckled when viewed close up. Comparatively long tail is covered with long black and grey hairs. Chest and belly pale grey with a prominent white patch on the upper throat (Roberts, 1977).

*Distribution* : *India* : Jammu & Kashmir, Punjab to Kumaon ( Ellerman and Morrison Scott, 1965). From Bhutan West to about Nainital (Grooves, 2003).

*Abundance Status* : Common.*Conservation Status* : IWPA, 1972 : Schedule III.

*Observation* : Small groups of 4-5 individuals are usually observed along the ridges of hillocks in Kaludeo and Danda Sukhsainpur beats of the Sanctuary. They can be seen grazing on scattered clumps of grasses especially in the late afternoon almost all the year round. During the day time, they conceal themselves in inaccessible areas and hard to spot unless approached very close.

## Order PROBOSCIDEA

## Family ELEPHANTIDAE

Genus *Elephas* Linnaeus, 175819. *Elephas maximus* Linnaeus, 17581758. *Elephas maximus* Linnaeus, *Syst. Nat.*, 10<sup>th</sup> ed., 1 : 33.*Common Name* : Asian elephant.

*Diagnostic features* : The largest of all land mammals in India, with the distinctive long prehensile trunk, large sail like ear, elephant is an unmistakable animal. An adult male measures up to 275cm at shoulder and weighs up to 3000 kg (Menon, 2003). However, Asian elephant is smaller compared to it's African counterpart *Loxodonta africana*.

*Distribution* : *India* : Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Orissa, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and NE states.

*Elsewhere* : Bangladesh, China, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam.

*Abundance Status* : Occasional visitor to the Sanctuary.

*Conservation Status* : IWPA, 1972, Schedule I.

*Observation* : A small family herd of 4-5 individuals (mother and siblings) occasionally enter the sanctuary from nearby Kalesar National Park, stays for few days before going back. Since grass is the major food item for Elephants (Santiapillai *et al.* 2003) and trees and shrubs makes up a small portion of their food (Buss, 1961), smaller size and deciduous vegetation of Simbalbara (without much grassland) cannot sustain an elephant herd for a longer period and hence the Sanctuary is not an attractive habitat for elephant.

*Remarks* : Ellerman and Morrison Scott (1965) recognized three subspecies of Asian elephant, *E. m. maximus* Linnaeus, *E. m. indicus* Cuvier and *E. m. ceylanicus* Blainville. The subspecies occurring in the mainland India is *E. m. indicus*.

## Order PRIMATES

### Family CERCOPITHECIDAE

#### Genus *Macaca* Lacepede, 1799

#### 20. *Macaca mulatta* (Zimmermann, 1780)

1780. *Ceropithecus mulatta* Zimmermann, *Georg Gesch. Mensch. Vierf. Thiere*, 2 : 195.

*Common Name* : Rhesus macaque.

*Diagnostic features* : Adult Rhesus macaques have almond brown coat with pink face and reddish rump which is a good field character to distinguish it from Assamese macaque in sympatric situations.

*Distribution* : *India* : Almost everywhere in Indian Peninsula (Tiwari & Mukherjee, 1992). The southern limit is marked by the river Godawari.

*Elsewhere*: Afganistan, Pakistan, Nepal, Myanmar, Bangladesh, China, Vietnam, Thailand, Cambodia and Laos

*Abundance Status* : Very common.

*Conservation Status* : IPWA, 1972 : Schedule II, CAMP, 1998 : LR1c.

#### Genus *Semnopithecus* Desmarest, 1822

#### 21. *Semnopithecus entellus* (Dufresne, 1797)

1797. *Simia entellus* Dufresne, *Bull. Sci. Soc. Philom. Paris*, ser. 1 : 7 : 49.

*Common Name* : Common Langur.

*Diagnostic features* : Distinctively langur like in appearance (Slim body with deep chest, long legs and tail) with naked black skin around eyes, cheeks and muzzle framed by a collar of radiating creamy white hairs. Rest of the body is covered by grayish fur. Tail fur is grayish ending in a tuft of long white hairs.

*Distribution* : *India* : Throughout India except NE India and western part of Gujarat.

*Elsewhere* : China, Nepal, Sri Lanka, Pakistan.

*Abundance Status* : Very common, on one day, eight troops comprising 10-12 individuals each were counted.

*Conservation Status* : IWPA, 1972 : Schedule II, CAMP, 1998 : LRlc.

*Abbreviations* : IWPA : Indian Wildlife (Protection) Act, 1972, CAMP-1998 : Conservation Assessment and Management Plan of Biodiversity Conservation Prioritization Project Workshop 1998, CAMP-2002 : Conservation Assessment and Management Plan for South Asian Chiroptera workshop 2002, CAMP-2005 : Conservation Assessment and Management Plan Workshop on status of South Asian Non-volant Small Mammals 2005, LC : Least Concerned, LRlc : Low risk least concerned.

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