

Fauna of PIN VALLEY NATIONAL PARK (Himachal Pradesh)



ZOOLOGICAL SURVEY OF INDIA

Conservation Area Series, 34

**FAUNA OF
PIN VALLEY NATIONAL PARK
(Himachal Pradesh)**

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



**Zoological Survey of India
Kolkata**

CITATION

Editor–Director, 2008. *Fauna of Pin Valley National Park, Conservation Area Series, 34* : 1-147
(Published by the Director, *Zool. Surv. India, Kolkata*)

Published January, 2008.

ISBN 978-81-8171-183-0

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PRICE

India Rs. 350.00

Foreign \$ 25; £ 20

Published at the Publication Division by the Director, Zoological Survey of India, 234/4, AJC Bose Road, 2nd MSO Building, (13th Floor), Nizam Palace, Kolkata-700 020 and printed at Calcutta Repro Graphics, Kolkata-700 006.

CONSERVATION AREA SERIES
FAUNA OF PIN VALLEY NATIONAL PARK

No. 34

2008

1-147

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PIN VALLEY NATIONAL PARK : AN OVERVIEW

R.M. SHARMA

Zoological Survey of India, Central Regional Station, Jabalpur-482002

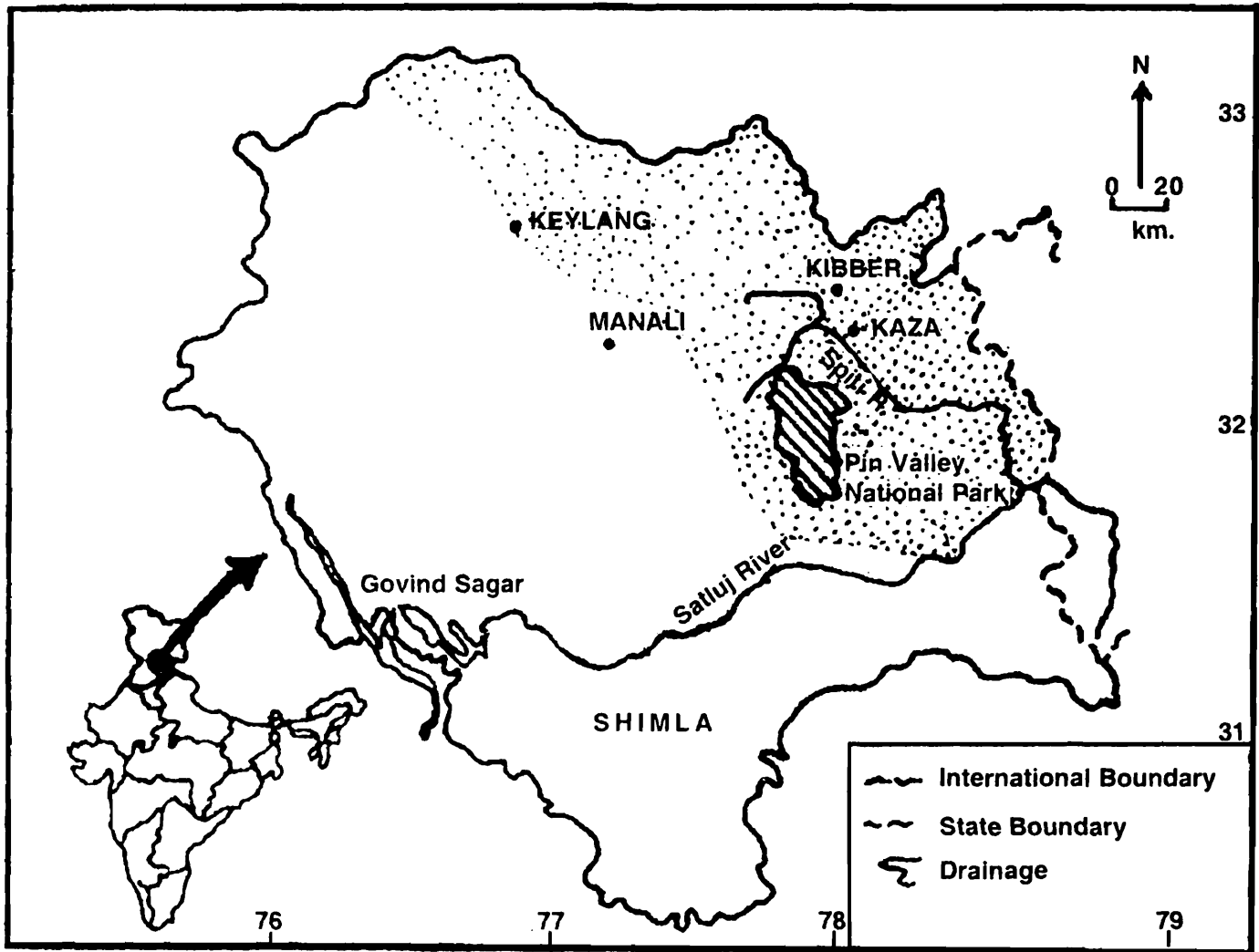
INTRODUCTION

The Indian Himalayan region occupies a special place in the mountain ecosystems of the world not only from the standpoint of climate and a life provider (giving water to a large part of the Indian subcontinent) but also as rich depository of variety of flora and fauna (Singh, 2006). Himalayan Mountain in India stretches for over 2000 km from Arid Mediterranean 'Areas' in the west to wet Chinese-Malayan 'Areas' in the east. Biographers classify the area from Kashmir to the Satluj in Himachal Pradesh as North-West Himalaya, which is characterized by a more Mediterranean climate and with more western taxa e.g. *Ibex* (Rodgers and Panwar, 1988).

Himachal Pradesh has a geographic area of 5.57 million ha. of which the recorded forest area is 3.54 million ha. This constitutes 63.60% of the geographic area. By legal status Reserved Forest constitutes 5.35%, Protected Forest 88.89% and Unclassed Forest 5.76%. The Protected Area Network (PAN) comprises of two National Parks and 32 Wildlife Sanctuaries, covering an area of 0.14 million ha and 0.57 million ha respectively. The total protected area is 0.71 million ha constituting 12.87% of the geographic area of the state (State of Forest Report, 1999).

Survey and inventorisation of faunal resources is the first and foremost requirement to generate baseline data on genetic, species and their macro and microhabitat in ecosystem diversity. Keeping this in view the inventorisation of the faunal resources of one such isolated, fragile and vulnerable ecosystem that is Pin Valley National Park was undertaken by the scientists of High Altitude Zoology Field Station, Zoological Survey of India, Solan, during the period 2000-2002.

The regional database thus generated helps in developing a national database on biodiversity, which in turn facilitate compilation of information on distributional pattern of faunal wealth. Further, it also lends hand in developing models for conservation strategies of endemic and threatened fauna.



Map 1. Location of Pin Valley National Park, Himachal Pradesh, India

Since conservation of the entire range of species is neither practical nor possible, such preliminary studies help in identifying the keystone and umbrella species. The protection and conservation of such species ensures the survival of all the species as well in the area.

1. STUDY AREA

Location & Topography : The Trans-Himalayan region of Himachal Pradesh runs through the north and north-eastern part of the state, and includes almost the entire Lahaul & Spiti district besides parts of Kinnaur, Kullu and Chamba Districts. It shares its state boundary with the Ladakh area of Jammu & Kashmir, and an international boundary with Tibet (China). Tethyan formations of Himachal Pradesh are best developed in the Spiti area. The Spiti valley lies between the Great Himalayan and the Zaskar ranges. The Spiti river which has its source at the base of the Kunzam range, flows through the 130 km long Spiti valley and continues into Kinnaur until it joins the Sutluj river at Khab.

The Pin Valley National park is situated between 31°6'40" to 32°2'2" N latitude and 77°4'21" to 78°6'19" E longitude and falls in the Spiti Sub-Division of Lahaul–Spiti district of Himachal Pradesh. The Pin Valley lies in the rain shadow of the Pir Panjal range and is classified under the Trans–Himalayan Zone-1 (biotic province B), whose precipitation, vegetation and terrain are influenced by the Greater Himalaya (Map-I).

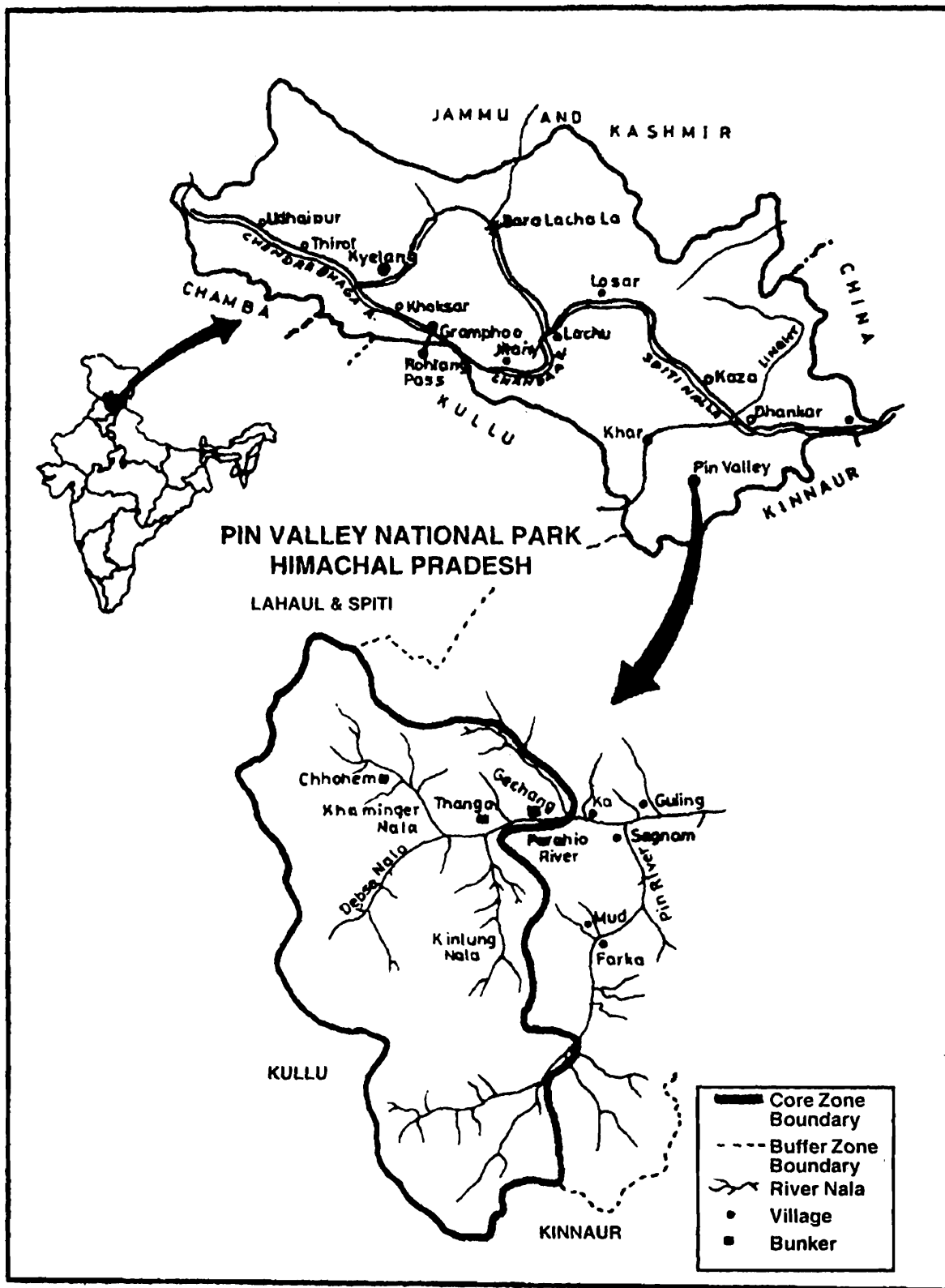
It is a rain-deficient area, as the moisture laden south west monsoon winds are blocked by the Greater Himalayan range, coupled with its location in the temperate latitudes, the region is termed as “cold desert” Pin valley N.P. is the only National Park situated in cold desert of the state and recognized as an important stronghold for the conservation of the Snow leopard and Himalayan ibex (*Capra siberica*) in India (Bagchi *et al.*, 2002). The altitudes in the area are over 3000m mean sea level and lie above the tree line.

The Pin valley is one of the major areas of the Spiti sub-division of the Lahaul & Spiti district (Map-II). The Pin River constitutes the most important Right Bank tributary of the Spiti River. It is 50 km long, originating in the Srikhand range in the Greater Himalaya and joins the Spiti River at Sushuna, near Dankhar. The Pin River flows in a general northerly direction until it reaches Sagnam, where it is joined by one of the major tributaries, the Parahio River. From here, the river flows eastwards, until it joins the Spiti River.

The Pin Valley National Park was established in 1987 *vide* H.P. Govt. Notification No. Fts. (B) F (7) 31/86 dt. 9.1.1987. The National Park encompasses the total area of 1825 sq km, of which 675 sq km. is Core Zone and 1150 sq km is Buffer Zone. The whole of National Park encompasses the watershed of the Parahio and Pin rivers. The Pin River itself flows mostly through the park's buffer zone whereas Parahio flows through the core zone. Altitudes within the park, range between 3650 m and 6632 m above mean sea level. The Parahio river valley is, on an average 250 m wide, with steep mountains on either side. The average slope is 35-40°.

Geomorphology : The left bank of Pin River is main PVNP area except for the habitation and pastures of Mud and Sagnam villages. In fact, the Pin River outskirts the PVNP area (it is about 50 km in length). The catchments of Parahio River, a tributary of Pin River covers the major part of this NP. A high ridge with Larang Pass (6375) divides the catchments of Parahio and Pin rivers in the Southeastern parts of NP. The Parahio River meets Pin outside the NP area near Sagnam village. There are three passes on the southern boundary of PVNP. The Tri Khango (4865 m), Nimish Khango (4890 m) and Shakarog Khango (5100 m) all connect the Rupi-Bhaba Sanctuary of Kinnaur district. The Pin–Parvati Pass (5319 m) is on the western boundary of the National Park and opens in to Kullu district. The Bara Shigri glacier (highest peak 6632 m) starts on the northwestern boundary of this NP and adjoins Lahaul.

Boundaries : Pin Valley National Park's northern boundary begins at the Bara Shigri glacier, follows the Hundungma ridge up to the top of the Ratang River, and continues along the ridge separating Khaminagar and Kidul Chu watersheds. The Park's eastern



Map 2. Map of District Lahaul and Spiti

PLATE-I. Topography of Pin Valley National park



Confluence of Pin of Parahio river



A view of buffer zone

PLATE-II. Topography of Pin Valley National park



View of Lower Pin Valley National Park



Farming in Buffer Zone

PLATE-III. Topography of Pin Valley National park



Salix sp. Plantation in Buffer Zone



A typical view of cold desert

PLATE-IV



A typical cold desert plant *Rosa* sp.



Insect Pollinators

PLATE-V. Insect Pollinators



PLATE-VI. Insect Pollinators



PLATE-VII



PLATE-VIII



A herd of Ibex in core zone



A Citrine Wagtail in buffer zone



Hill pigeon in buffer zone

boundary begins at the top of Kidul Chu and follows the river until it joins the Parahio. It continues along the Parahio River for short distance westwards, and then follows the ridge separating the Pin and Killung watersheds up to Larang La. From Larang La it follows the watershed flowing in to the Pin River, then along the Pin River upstream to Tari Khango. The southern boundary follows the district boundaries of Lahaul & Spiti, with Kinnaur and Kullu, up to Shakarang Khango. From here, the western boundary continues along the Kullu district boundary through the Pin Parvati Pass up to the Bara Shigri glacier (Map-III). The road head for this National Park is extended up to Mud (it was possible due to the construction of a bridge near Sagnam.) earlier the road head was up to Mikkim only, about 34 km from the sub-divisional head quarters at Kaza.

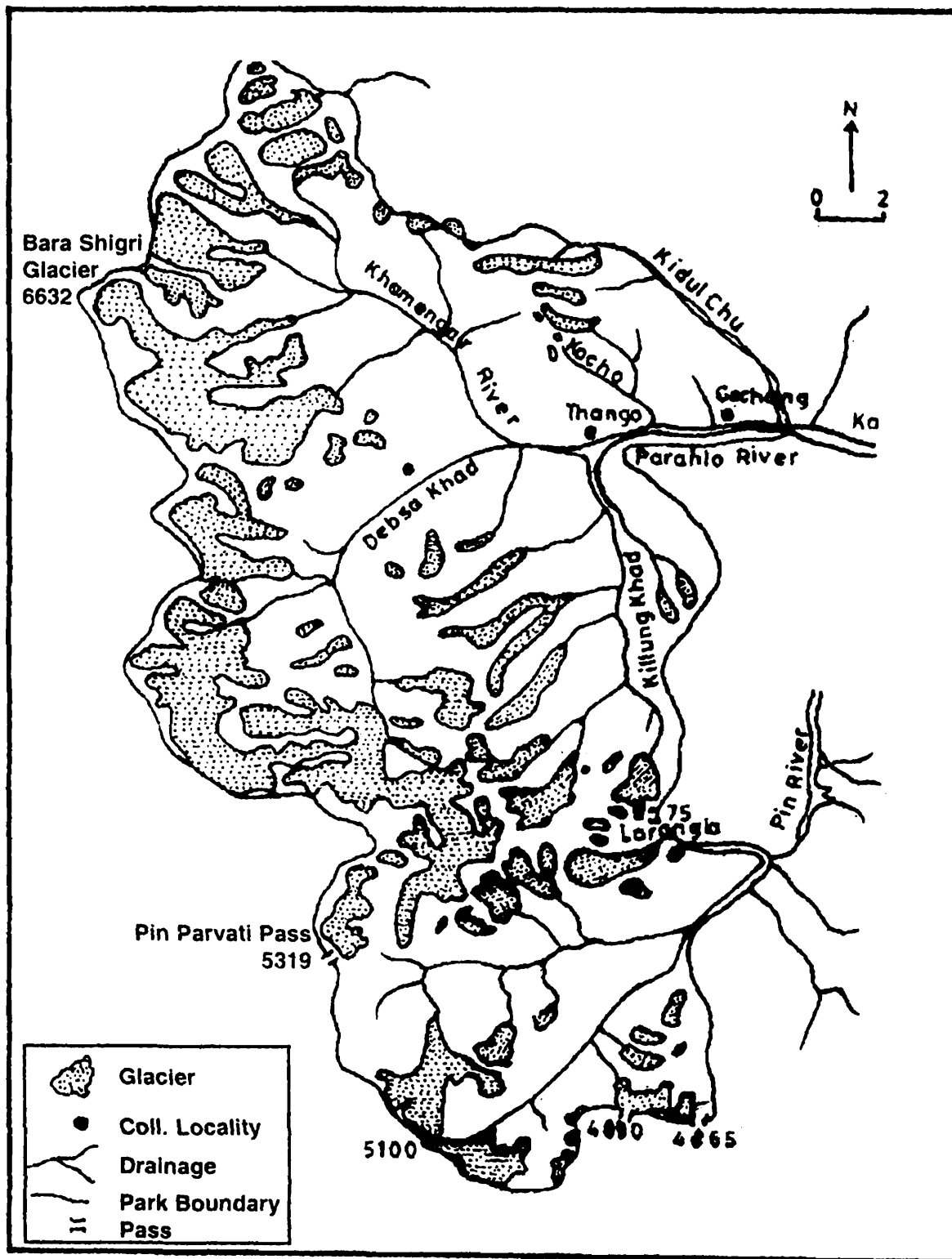
Geology & Soil : The geology of Spiti is very interesting owing to the almost complete sequence of exposed sediments from the Pre-Cambrian era to the Cretaceous period. The area is characterized by sharp change in a combination of quartzite, shales, limestones and conglomerates. Most of the area is rich in fossils, mainly branchiopods, trilobites, bivalves, gastropods, cephalopods, ammonites, echinoderms and also certain corals and algae, indicating its Tethyan past. Evidences of several advances and retreat of glaciers have been recorded in the PVNP area.

The high altitude desert soil is predominantly sandy and shallow, derived mainly by mechanical disintegration due to marked diurnal and seasonal fluctuations of temperature. Avalanches and streams deposit large amounts of soil in the lower valleys and alluvial fans, allowing particularly rich plant cover. The soil is mostly silty loam to silty-clay loam in texture with a slightly alkaline pH; poor organic matter and water holding capacity. It is low in available nitrogen, phosphorous, potassium and carbon, but well supplied with calcium.

No information is available on *Natural Salt Licks* however; it is believed that there are salt beds that were formed during the last Ice Age of geological times.

2. CLIMATE AND SEASONS

The temperature range is more than 60° C over the period of a year varying between ca. 30° in summer and ca-40° C in winter. The daily minimum temperature remains subzero for more than seven months (October to May) in the year and even the daily maximum temperature stays below freezing in January and February. These variations result in stark seasonality. The area experiences severe winters with heavy snowfall from December to April. The area receives an average annual rainfall for ca. 17 cm. The rest of the precipitation in the form of snow averages 300 cm per year. The area is extremely prone to avalanches, which are very severe during the snowmelt in March/April every year. Spring is characterized by patchy snowmelt and sprouting between April and June. The peak vegetation pulse coincides with the peak summer from July to September. Pin valley has more moist summer and winter as compared to other parts of Spiti. With the onset of autumn, the temperatures steadily decline and senescence of most plants sets in.



Map 3. Pin Valley National Park showing Boundaries

3. VEGETATION

The vegetation in most of the Trans-Himalayan region is classified as Dry Alpine Scrub and Dwarf Juniper Scrub (Champion and Seth, 1968). More or less same type of vegetation exists in the National Park; however, the vegetation of the park can be divided into three zones viz., Dry temperate, Alpine and Zone of Perpetual snow. The Dry temperate zone (3275-4000 m) is characterized by a variety of scattered herbs such as *Acuilegia* spp., *Caltha* spp., *Ranunculus* spp., *Trifolium* spp., *Potentilla* spp., and *Primula* spp. The main shrubs are wild roses, *Hippophae rhamnoides*, *Juniperous recurba*, *Ephedra*, *Lonicera*, *Carangana* sp. and *Artemisia* spp. The Alpine zone (4000-5000m) is characterized by the absence of trees and the presence of the *Juniperous* spp., and *Rhododendron* spp., in the tufted forms. The common grasses of rich nutritive value are *Poa* spp., and *Agropyron* spp. The zone of perpetual snow has two distinct belts, the glacier and the tundra. The former is a glaciated ice sheet enveloping the high lands, devoid of vegetation, while the later, is a narrow belt below the glacial zone with some lichens, mosses and a few grasses.

4. PEOPLE AND THEIR SUSTENANCE

The people of Spiti sub-division are Bhotis who are culturally similar to the Tibetans. Buddhism is the main religion and traditionally they are agro-pastorals, leading a subsistence-based life style. They cultivate barley (*Hordeum vulgare*), peas (*Pisum sativum*), and potatoes (*Solanum tuberosum*). Livestock consisting of Yaks, dzos (Yak-cow hybrids), sheep and goats are raised for milk and meat, whereas donkeys are used as beasts of burden. The local breed of 'Chumurti' horses are bred for sale in Ladakh. Since religion prohibits killing of animals, the locals do not poach the wild animals. Therefore, Ibex (*Capra ibex sibirica*) population in the area is considered to be relatively tame and easily observable. Locals even do not catch fish from the rivers & streams for themselves and do not allow others to catch or collect, thus the fish fauna is not much represented in our collections.

Although the human population density in the area is relatively low, changes in the social system, and a subsequent increase in the number of households, likely to affect resource use in the future.

There are about 17 villages in the buffer zone or community zone of the park, of which Sagnam with about 400 populations is the biggest settlement and located at the junction of the Parahio and Pin rivers. In core zone there are four "dogharies" (summer settlements), one just inside the eastern park boundary (Gechang), another at the confluence of the Killung and Parahio river (Thango), the third (Shaktan) between Gechang and Thango, and fourth (Dewa Ringmo) near Shaktan. They depend on the national park area for agriculture, fuel wood, and for grazing their livestock.

The inhabitants of Sagnam collect most of the fuel wood from the Core Zone since there are no trees in the park except for some *Salix* sp. plantations. The people uproot and

dry the shrubby vegetation viz. *Lonicera* spp; *Rosa* spp. *Salix* spp. and *Ephedra gerardiana* are some of the preferred fuel wood species. Green vegetation especially *Cicer microphyllum* and *Saussurea* sp. are collected as fodder and stored for stall feeding of livestock in winter. Livestock dung is also used for fuel. Sometime back State Forest Department had established Willow and Wild rose plantations within the park for use as fuel wood. However, the patches of such plantations are still visible around villages like Mikkim consisting of *Populus* sp. and *Salix* sp. (Locally called 'Changma').

5. FAUNAL EXPLORATIONS

Except the extensive study on the Himalayan or Asiatic Ibex (*Capra ibex sibirica*), one of the abundant ungulates in the park and important prey species of the endangered apex predator of the alpine region, the snow leopard, by Johnsingh *et al* (1999), practically nothing is known about the fauna of the Pin Valley National Park. This was one of the primary reasons for initiating faunal explorations in the park by the Zoological Survey of India.

In order to draw a faunal profile of the park five faunistic surveys were undertaken in the buffer and core zones of the park between 2000 & 2002. Based on the taxonomic studies carried out on the faunal samples collected and animals observed at various places in the park, the information emanated is given in Table-1.

Altogether, 183 species of various faunal groups have been documented.

Table-1. Faunal Profile of the Pin Valley National Park

Sl. No.	Faunal Group	No. of Genera	No. of Species
1	Oligochaeta	5	7
2	Mollusca	3	3
3	Crustacea	1	1
4	Scorpionida	2	3
5	Arachnida (Spiders)	17	17
6	Scolopendromorpha	2	3
7	Orthoptera	5	5
8	Dermaptera	1	1
9	Lepidoptera (Rhopalocera)	11	14
10	Coleoptera	15	18
11	Diptera	10	11
12	Hymenoptera (Ants)	5	7
13	Hymenoptera (Aculeata)	5	7

Table-1. Contd.

Sl. No.	Faunal Group	No. of Genera	No. of Species
14	Pisces	2	3
15	Herpetofauna	2	2
16	Aves	53	72
17	Mammalia	8	9
Total		147	183

The faunal explorations made so far in the Pin Valley National Park can not be claimed as exhaustive and may constitute a small portion of its rich faunal wealth as far as invertebrate fauna is concerned. It is evident from recently described new species of a phalangid, *Euphalangium martensi* Das and Bastawade (2006) from the vicinity of the park (Kaza, Spiti) and a new species *Amaurobius sharmai* described from the park area proper and included in the present document. Majority of the species documented are new records for the area and quite a few are being recorded for the first time from the State. Many species of lower invertebrates and insects remain as indeterminate and show Palaearctic elements.

Due to extreme nature of the environment in the park area vertebrate diversity in general is not very high although some species have adapted themselves to such conditions. A skink, *Asymblepharus ladacensis* (Günther, 1864) believed to be endemic to Ladakh has been reported for the first time from Himachal Pradesh. Recent mitochondrial DNA analysis revealed that wolves from Spiti valley in Himachal Pradesh are ancient and entirely of different lineage. Molecular analysis also revealed that the Spiti wolf has diverged from the rest of the world wolf population more than 800000 years ago (Sharma *et al.* 2004).

ACKNOWLEDGEMENTS

It is my great pleasure to gratefully acknowledge the support, encouragement and facilities received to execute this study from Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata. I am equally thankful to Dr. H.S. Mehta, Joint Director and the then Officer-in-Charge for initiating the project during his tenure. The necessary permission accorded by the State Forest Department to undertake faunistic surveys and collect the fauna for scientific studies from National Park is gratefully acknowledged. My thanks are also due to all those scientists and experts who have contributed their chapters to this document, without their unreserved cooperation this task would not have been completed. Last, but not the least am thankful to Dr. P.C. Tak, Scientist C of Zoological Survey of India, Dehra Dun and Dr. D.K. Sharma, Scientist B of this station for various courtesies and scientific staff for their painstaking efforts to collect the fauna from the difficult areas of the park. With pleasure, I place on record the strenuous efforts put in by Shri Rati Ram Verma, Publication Production Officer to bring out this document.

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ANNELIDA : OLIGOCHAETA

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INTRODUCTION

The famous Greek philosopher Aristotle described earthworms as “the intestine of earth” Charles Darwin in 1881 created an immense interest on earthworms throughout the world through his pioneering work “the formation of vegetable mould through the action of worms” Since then earthworms have been recognized to play significant role in enhancing soil fertility. They consume soil organic matter and convert it into humus. It has been assessed that the wormcasts contain higher amount of nitrate nitrogen and other nutrients than the parent soil (Edwards & lofty, 1977). Earthworms constitute a major component of the invertebrate biomass (> 80%) in most terrestrial ecosystems of the world (Senapati and Dash, 1982).

Oligochaetes occur in all types of aquatic and terrestrial habitats with sufficient moisture and food. On the basis of body size and habitat, oligochaetes are separated into two convenient groups : Microdrili (small, mainly aquatic worms including the terrestrial family Enchytraeidae), and Megadrili (larger, mostly terrestrial worms and their aquatic representatives). The Megadrili consists of the earthworms and corresponds to order Moniligastrida and Haplotaxida including suborder Tubificina.

Earlier, the earthworms of Lahaul Valley of district Lahaul & Spiti, were studied by Julka (1981). He reported six species from the valley with altitude ranging from 2700m to 3600m. Subsequently, Paliwal (1994), during his comprehensive studies on the taxonomy and ecology of earthworms of Western Himalaya, added one more species to the list raising the number to seven, distributed in the Lahaul valley. However, Pin Valley National Park (PVNP), which falls, in the Spiti region contiguous to Lahaul valley has remained unexplored so far, probably due to its difficult terrain and extreme cold climatic conditions.

This article deals with the comprehensive earthworm diversity of Lahaul & Spiti district including Pin Valley National Park, consisting seven species belonging to five genera spread over two families. A set of three figures united with dashes before locality under the *Material examined* indicates the number of juvenile, aclitellate and clitellate specimens respectively.

**Key to the earthworms of Pin Valley National Park and adjacent areas
(Lahaul & Spiti)**

1. Setae 8 per segment (lumbricine) 2
 Setae more than 8 per segment (perichaetine) *Amyntas corticis*
2. Setae closely paired 3
 Setae widely paired 6
3. Spermathecal pores and tubercula pubertatis absent *Allolobophora parva*
 Spermathecal pores and tubercula pubertatis present 4
4. Spermathecal pores near mid-dorsal line (absent in athecal morphs); tubercula pubertatis not extending beyond segment 31 *Aporrectodea r. rosea*
 Spermathecal pores at or close to *cd*; tubercula pubertatis on segments 31-33
 5 (*Aporrectodea trapezoids* species complex)
5. Pigmented; body dorsoventrally flattened posteriorly to form rectangular cross section with setal pairs at corners; tubercula pubertatis longitudinal elliptical bands
 *Aporrectodea caliginosa trapezoides*
 Unpigmented; body cylindrical; tubercula pubertatis longitudinal bands with a median concavity of ventral margin in segment 32 *Aporrectodea caliginosa caliginosa*
6. Clitellum 30-35; tubercula pubertatis 31-34; nephridiopores obvious
 *Octolasion tyrtaeum*
 Clitellum usually 26-31, sometimes extending to 25 and 32; tubercula pubertatis 28-30; nephridiopores inconspicuous *Dendrodrilus rubidus*

SYSTEMATIC ACCOUNT

- Phylum ANNELIDA
 Class OLIGOCHAETA
 Order HAPLOTAXIDA
 Suborder LUMBRICINA
 Superfamily LUMBRICOIDEA
 Family LUMBRICIDAE

1. *Allolobophora parva* Eisen, 1874

1874. *Allolobophora parva* Eisen, *Ofvers. K. Vetensk Acad. Forh. Stockh.*, **31** : 46.

1972. *Bimastos parvus*, Gates, *Trans. Am. phil. Soc.*, **62** : 87.

1983. *Allolobophora parva*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 475.

Length 25–52 mm, diameter 1.5–2.5 mm, 95–104 segments. Colour reddish on dorsum, venter yellowish. Body cylindrical. Prostomial epilobic, tongue open. First dorsal pore 5/6. Clitellum saddle-shaped, 24–30, rarely extending to 31; tubercula pubertatis absent. Setae lumbricine, closely paired, $aa = 3.18-3.67$ $ab = 1.09-1.14$ $bc = 2.92-5.0$ $cd = 0.31-0.41$ dd on 12, $aa = 2.67-3.82$ $ab = 1.14-1.31$ $bc = 5.0-6.0$ $cd = 0.31-0.47$ dd on 36; genital tumescences lacking. Nephridiopores inconspicuous. Male pores minute, paired, at the base of small transverse clefts, located on somewhat circular whitish tumescences, confined to 15, extending laterally to mid bc . Female pores paired, tiny, shortly above b , on setal arc of 14. Spermathecal pores and tubercula pubertatis absent.

Pigmented, pigment red. Septa 5/6-12/13 slightly muscular. Typhlosole simple, lamelliform. Nephridial vesicles J-shaped in 14 and anterior segments with curved part directed caudad; U-shaped in 15 and posterior segments with curved parts directed cephalad; lateral ends of vesicles closed. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, small, in 11 and 12. Spermathecae absent. Atrial glands well developed, reaching above longitudinal muscle layer, extending into 14 and 16; sometimes atrial glands rudimentary.

Type locality : Mount Lebanon, New York–New England, U.S.A.

Material examined : Coll. K.K. Mahajan : 0-0-31 Keylong, 31 July 1970, 0-0-7 Keylong, 14, 16, 18 Aug 1971, 0-0-2 Shansha, 2 Sept 1971; coll. J.M. Julka : 0-0-1 Thiroit, 17 Aug 1981; coll. R. Paliwal : 0-0-1 Madgram nr. Udaipur, 18 July 1989.

Distribution : India : Jammu & Kashmir, Himachal Pradesh, Punjab, Uttaranchal, Uttar Pradesh, Bihar, West Bengal, Rajasthan, Tamil Nadu.

Elsewhere : Pakistan, Burma, Malaya, Indonesia, Tibet, China, Korea, Central Asia, Russia, Kazakstan, Japan, Afghanistan, Tahiti, Hawaii, Australia, Mauritius, St. Paul, South Africa, South West Africa, Iceland, Denmark, Germany, England, Wales, Portugal, Spain, Switzerland, Italy, Corsica, Rhodes, Hungary, Romania, Bulgaria, St. Helena, U.S.A., Mexico, Guatemala, Costa Rica, Brazil, Argentina.

Aporrectodea trapezoides species-complex

1972. *Allolobophora trapezoides* species group, Gates, *Bull. Tall Timbers Res. Sta.*, no. 12 : 1.

1980. *Aporrectodea trapezoides* species-complex, Easton, *Bull. Br. Mus. nat. Hist. (Zool.)*, 40 : 41.

Setae lumbricine, closely paired. Body cylindrical, or flattened posteriorly to form rectangular cross section with setal pairs at corners. First dorsal pore in a furrow between 6/7 and 13/14. Clitellum on segments 27, 28, 29-33, 34, 35; tubercula pubertatis on segments 31-33. Spermathecal pores in furrows 9/10/11 in c lines.

Distribution : India : Jammu & Kashmir, Himachal Pradesh, Punjab, Uttaranchal, Sikkim, Rajasthan, Tamil Nadu.

Elsewhere : Pakistan, China, Korea, Japan, Hawaii Islands, Australia, Tasmania, New Zealand, Afghanistan, Iran, Lebanon, Rhodes Island, Egypt, Algeria, South Africa, Norway, Sweden, Finland, Scotland, England, Ireland, Denmark, Netherlands, Poland, Germany, France, Switzerland, Austria, Italy, Yugoslavia, Greece, Channel Islands, Azores, Madeira, Canary Islands, St. Helena, Greenland, Canada, U.S.A., Mexico, Chile, Argentina.

2. *Aporrectodea caliginosa caliginosa* (Savigny, 1826)

1826. *Enterion caliginosum* Savigny, *Mem. Acad. Sci. Inst. Fr. (Hist.)*, 5 : 180.

1958. *Allolobophora caliginosa*, Gates, *Breviora*, no. 91 : 2.

1972. *Allolobophora tuberculata*, Gates, *Trans. Am. phil. Soc.*, 62 : 79.

1972. *Allolobophora turgida*, Gates, *Trans. Am. phil. Soc.*, 62 : 84.

1972. *Allolobophora tuberculata*, Gates, *Bull. Tall Timbers Res. Sta.*, no. 12 : 43.

1972. *Allolobophora turgida*, Gates, *Bull. Tall Timbers Res. Sta.*, no. 12 : 89.

1982. *Allolobophora caliginosa caliginosa*, Zicsi, *Acta zool. hung.*, 28 : 425.

1983. *Aporrectodea caliginosa caliginosa*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 476.

Length 48-136 mm, diameter 2.5-4.5 mm, 120-174 segments. Colour whitish or greyish. Body cylindrical, hind end slightly depressed dorsoventrally. Prostomium epibolic, tongue usually closed. First dorsal pore 12/13, occasionally 10/11, rarely 9/10, 11/12, 13/14. Clitellum saddle-shaped, ½27, 27-34, 35; tubercula pubertatis 30, 31-33, median margin concave, maximum concavity at 32, bipartite in origin as indicated on immature specimens. Setae lumbricine, closely paired, *aa* = 4.36-6.17 *ab* = 1.30-1.61 *bc* = 6.0-8.33 *cd* = 0.26-0.38 *dd* on 12, *aa* = 7.17-7.89 *ab* = 1.38-2.15 *bc* = 9.67-12.29 *cd* = 0.28-0.43 *dd* on 36; genital tumescences incorporating setae *a*, *b* on 9-11, 30, 32-34, rarely on 25, 26, 27, 29, 31. Nephridiopores inconspicuous. Male pores minute, paired, on 15, at the base of large transverse clefts located on prominent whitish tumescences which extend laterally to *c* lines and slightly on segments 14 and 16. Female pores paired, tiny, slightly lateral to *b*, on setal arc of 14. Spermathecal pores minute, paired, in 9/10/11, at or close to *c* lines.

Unpigmented. Septa 5/6-9/10 muscular. Typhlosole 21-24 to 90-125. Nephridial vesicles J-shaped, closed and laterad, curved part caudad. Holandric; testes and male funnels free, in 10 and 11, funnels large and iridescent; seminal vesicles paired, in 9-12, slightly smaller in 9-10 than those in 11-12. Spermathecae paired, in 10 and 11, small, confined to parietes, adiverticulate. Glands of tubercula pubertatis, atrium and genital setae absent.

Type locality : Unknown.

Material examined : Coll. K.K. Mahajan : 0-0-12 Sissu, 31 Aug 1971, 0-0-1 Madgram, 10 Sept 1971; coll. R. Paliwal 1989 : 0-0-1 Sissu, 22 July.

Distribution : India : Himachal Pradesh, Tamil Nadu.

3. *Aporrectodea caliginosa trapezoides* (Dugès, 1828)

1828. *Lumbricus trapezoides* Duges, *Annl. Sci. nat.*, 15 : 289.

1958. *Allolobophora trapezoides*, Gates, *Breviora*, no. 91 : 2.

1972. *Allolobophora trapezoides*, Gates, *Trans. Am. phil. soc.*, 62 : 76.

1972. *Allolobophora trapezoides*, Gates, *Bull. Tall Timbers Res. Sta.*, no. 12 : 2.

1983. *Aporrectodea caliginosa trapezoides*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 477.

Length 57-142 mm, diameter 2.5-5 mm, 97-147 segments. Colour slate brown, brownish, reddish brown, occasionally almost reddish in front of clitellum, lighter behind the clitellum. Body rectangular (trapezoidal) posteriorly with setal couples at corners. Prostomium epilobic, tongue closed. First dorsal pore 9/10, occasionally 10/11, rarely 8/9, 11/12. Clitellum saddle-shaped, 27-34, sometimes extending to 25 and 1/235; tubercula pubertatis longitudinal elliptical bands, 31-32. Setae *aa* = 4.25-5.20 *ab* = 1.52-1.73 *bc* = 6.8-8.2 *cd* = 0.30-0.32 *dd* on 12, *aa* = 5.25-6.25 *ab* = 1.60-1.67 *bc* = 8.0-12.50 *cd* = 0.29-0.38 *dd* on 36; genital tumescences around seae *a*, *b* in 9-11, 30, 32, 33, occasionally 27, rarely 32 and 34. Nephridiopores inconspicuous. Male pores minute, on 15, at the base of large transverse clefts located on prominent whitish tumescences, extending laterally to *c*, reaching anteriorly and posteriorly to equators of 14 and 16 respectively. Female pores paired, tiny, slightly lateral to *b*, on setal arc of 14. Spermathecal pores minute, paired, in 9/10/11, close to *c* lines.

Pigmented, pigment slate brown to reddish brown. Septa 5/6-9/10 muscular. Typhlosole 21 to 90-99. Nephridial vesicles J-shaped, closed and laterad, curved part caudad. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, in 9-12. Spermathecae paired, small, confined to parietes, in 10 and 11, adiverticulate. Glands of tubercula pubertatis, atrium and genital setae absent.

Type locality : Unknown.

Material examined : Coll. K.K. Mahajan : 0-0-16 Sissu, 31 Aug 1971; coll. R. Paliwal 1989 : 0-0-13 Tholang, 9 July.

Distribution : India : Jammu & Kashmir, Himachal Pradesh and Uttaranchal (now Uttarakhand).

4. *Aporrectodea rosea rosea* (Savigny, 1826)

1826. *Enterion roseum* Savigny, *Mém. Acad. Sci. Inst. Fr. (Hist)*, 5 : 182.

1976. *Aporrectodea rosea*, Gates, *Megadrilogica*, 2(12) : 4.

1983. *Aporrectodea rosea rosea*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 477.

Length 35-105 mm, diameter 2-4 mm, 119-127 segments. Colour rosy or grayish with orange or red clitellum when alive. Body cylindrical, oval to almost squarish behind clitellum, setal couples at corners. Prostomium epilobic, tongue open. First dorsal pore 4/5. Clitellum saddle-shaped, slightly flared ventro-laterally; 25-32, extending occasionally to 24, 33; tubercula pubertatis uninterrupted longitudinal bands, 29-31, lateral to *b*. Setae lumbricine, closely paired, *aa* = 6.0-7.50 *ab* = 1.20-1.43 *bc* = 6.70-7.50 *cd* = 0.40-0.58 *dd* on 12, *aa* = 8.0-10.57 *ab* = 1.53-1.86 *bc* = 9.20-14.80 *cd* = 0.47-0.69 *dd* on 36; genital tumescences incorporating setae *a*, *b* in 26-32, setal couples *cd* or sometimes *ab* on 9-13. Nephridiopores inconspicuous. Male pores conspicuous, minute, on 15, at the base of transverse clefts located on prominent, whitish, somewhat round tumescences, confined to 15, extending laterally to mid *bc*. Female pores paired, tiny, slightly lateral to *b*, on setal arc of 14. Spermathecal pores minute, paired, in 9/10/11, near mid-dorsal line.

Unpigmented. Septa 5/6-9/10 muscular. Typhlosole 21-23 to 88-102. Nephridial vesicles J-shaped, closed and laterad, curved part caudad. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, in 9-12. Spermathecae paired, in 10 and 11, adiverticulate, ampullae spheroidal to ovoidal, duct slender, as long as ampulla. Glands of tubercula pubertatis, atrium and genital setae present.

Type locality : Paris, France.

Material examined : Coll. K.K. Mahajan 1971 : 9-4-18 Keylong, 16, 18, 21 Aug, 18-39-56 Sissu, 28-31 Aug; coll. R. Paliwal 1989 : 0-0-17 Kolang nr. Jispa, 6 July, 2-2-20 Jahlman, 8 July, 0-0-24 Tholang, 9 July, 11-0-4 Goushal nr. Tandi, 10 July, 0-0-11 Shansha, 11 July, 5-0-1 Mooring nr. Thiroth, 15 July, 0-1-4 Trilokinath, 17 July, 0-0-1 Sissu, 22 July, 12-4-15 Yangling nr. Sissu, 23 July.

Distribution : India : Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, West Bengal, Sikkim, Tamil Nadu.

Elsewhere : Pakistan, Manchuria, Korea, Japan, Hawaii, Australia, New Zealand, Afghanistan, Iran, Lebanon, Israel, Turkey, Siberia, Turkmeniya, Tajikistan, Turkestan, Kazakstan, Algeria, Tunisia, Morocco, Libya, Egypt, South Africa, Europe, Russia, Byelorussia, Ukraine, Moldavia, Latvia, Lithuania, Rhodes Island, Canary Islands, St. Helena, Azores, Tristan da Cunha, Greenland, Canada, U.S.A., Mexico, Colombia, Brazil, Peru, Chile, Uruguay, Argentina.

5. *Dendrodrilus rubidus* (Savigny, 1826)

1826. *Enterion rubidum* Savigny, *Mém. Acad. Sci. Inst. Fr. (Hist.)*, 5 : 182.

1972. *Dendrobaena rubida*, Gates, *Trans. Am. phil. Soc.*, 62 : 92.

1979. *Dendrodrilus rubidus*, Gates, *Megadrilogica*, 3 : 152.
1983. *Dendrodrilus rubidus rubidus*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 479.
1983. *Dendrodrilus rubidus norvegicus*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 479.
1983. *Dendrodrilus rubidus subrubicundus*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 479.
1983. *Dendrodrilus rubidus tenuis*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 480.

Length 33-67 mm, diameter 2-3.5 mm, 92-108 segments. Colour light to dark red. Body cylindrical. Prostomium epilobic, tongue open. First dorsal pore 5/6, occasionally 4/5, rarely 6/7. Clitellum saddle-shaped, 26-31, sometimes extending to 25 and 32; tubercula pubertatis 28-30, longitudinal bands just lateral to *b*, usually grooved longitudinally. Setae lumbricine, widely paired, *aa* = 1.87-2.35 *ab* = 0.98-1.17 *bc* = 1.33-1.69 *cd* = 0.31-0.37 *dd* on 12, *aa* = 2.0-2.65 *ab* = 0.90-1.20 *bc* = 1.29-2.26 *cd* = 0.33-0.42 *dd* on 36; genital tumescences incorporating setae *a*, *b* on 16, 26-31, rarely on 25, 32. Nephridiopores inconspicuous. Male pores minute, paired, on 15, at the base of transverse clefts, located on somewhat spherical tumescences confined to 15, extending from *b* to mid *bc*. Female pores paired, tiny, just lateral to *b*, on setal arc of 14. Spermathecal pores minute, paired, in 9/10/11, close to *c* lines.

Pigmented, pigment red. Septa 5/6-12/13 slightly muscular. Typhlosole 20 to 78-97, with a median longitudinal groove on the ventral face. Nephridial vesicles U-shaped like hair pins, lateral ends closed, curved parts directed cephalad. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, in 9, 11, 12. Spermathecae in 9, 10; ampulla medium sized, spheroidal to ovoidal, duct slender, much shorter than ampulla. Glands of tubercula pubertatis, atrium and genital setae present.

Type locality : Paris, France.

Material examined : Coll. K.K. Mahajan : 9-10-60 Keylong, 31 July 1970, 1-4-9 Keylong, 1 Aug 1970, 0-0-8 Patsyoo, 10 Aug 1970, 0-0-20 Sander Bridge, 12 Aug 1970, 0-0-10 Koksar, 22 Jul 1971, 0-3-25 Keylong, 14, 21 Aug 1971, 0-2-26 Jispa, 24, 25 Aug 1971, 8-5-24 Sissu, 28, 30 Aug 1971, 0-3-20 Shansha, 2 Sep 1971, 0-4-12 Rappe vill., 4 Sep 1971, 8-22-132 Udaipur, 7, 9-11 Sep 1971, 2-5-1 Koksar, 23 July 1971; coll. Mahesh Chandra : 0-0-1, 2 km E. of Gondla, 7 Aug 1975, 0-0-2, 2 km W. of Gondla, 8 Aug 1975, 0-0-1 Lote, c. 5 km E. of Kirting, 17 Sept 1985, 0-0-3, 4 km E. of Sissu, 24 Sept 1985, 0-0-2, 2 km E. of Sissu, 26 Sept 1985, 0-0-1 Gopanthang, c. 2 km W. of Sissu, 27 Sept 1985; coll. J.M. Julka 1981 : 0-0-1 Thirot, 17 Aug, 0-0-1 Kirting, 20 Aug; coll. R. Paliwal 1989 : 0-0-8 Kuth Bihar nr. Koksar, 30 June, 7-0-8 Gramphu nr. Koksar, 1 July, 0-0-22 Patsyoo, 4 July, 0-0-4 Kolang vill., 6 July, 2-0-21 Jahlman, 8 July, 0-0-3 Tholang, 9 July, 17-4-9 Bhayadi nr. Thirot, 13 July, 0-0-2 Trilokinath, 17 July, 0-0-3 Yangling nr. Sissu, 23 July.

Distribution : India : Jammu & Kashmir, Himachal Pradesh, Uttaranchal, West Bengal, Sikkim, Arunachal Pradesh, Tamil Nadu.

Elsewhere : Pakistan, Bhutan, Manchuria, Korea, Siberia, Kazakstan, Japan, Hawaii, Juan Fernandez Island, Australia, New Zealand, Kermadec Islands, Stewart Island, Turkey, Turkestan, South Africa, Southwest Africa, Madagascar, Reunion, St. Paul Island, Kerguelen Island, Europe, Russia, Ukraine, Moldavia, Byelorussia, Crimea, Estonia, Latvia, Lithuania, Channel Islands, Rhodes Island, Azores, Madeira, Canary Islands, Tristan da Cunha, Tierra del Fuego, Falkland Islands, Greenland, Canada, U.S.A., Mexico, Guatemala, Colombia, Ecuador, Brazil, Chile, Argentina, Uruguay.

6. *Octolasion tyrtaeum* (Savigny, 1826)

1826. *Enterion tyrtaeum* Savigny, *Mem. Acad. Sci. Inst. Fr. (Hist.)*, 5 : 180.

1972. *Octolasion tyrtaeum*, Gates, *Trans. Am. phil. Soc.*, 62 : 125.

1973. *Octolasion tyrtaeum*, Gates, *Bull. Tall Timbers Res. Sta.*, no.14 : 35.

1982. *Octolasion lacteum*, Zicsi, *Acta zool. hung.*, 28 : 432.

1982. *Octolasion ?tyrtaeum*, Zicsi, *Acta zool. hung.*, 28 : 440.

1983. *Octolasion lacteum*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 483.

1983. *Octolasion tyrtaeum*, Easton, In Satchell, J.E. *Earthworm Ecology from Darwin to Vermiculture* : 483.

Length 48-100 mm, diameter 2.5-4 mm, 116-128 segments. Colour white or greyish. Body cylindrical, slightly octagonal at caudal end. Prostomium epilobic, tongue open: First dorsal pore 11/12 or 12/13, sometimes on 10/11, 13/14. Clitellum saddle-shaped; 30-35; tubercula pubertatis uninterrupted longitudinal bands, 31-34, lateral to *b*. Setae lumbricine, widely paired or separate behind clitellum, $aa = 3.14-3.83$ $ab = 1.42-1.73$ $bc = 3.38-5.85$ $cd = 0.28-0.32$ dd on 12, $aa = 1.67-2.32$ $ab = 1.28-1.70$ $bc = 1.82-2.83$ $cd = 0.26-0.52$ dd on 36; genital tumescences when present incorporating setae *a* on 12. Nephridiopores obvious, on 3-6 above *d* lines, on 7 and posteriad segments slightly lateral to *b* lines. Male pores minute, paired, on 15, at lateral ends of deep equatorial clefts on markedly protuberant tumescences slightly encroaching upon 14 and 16, extending between *b* and *c* lines. Female pores paired, on setal arc of 14, slightly lateral to *b*. Spermathecal pores minute, paired, in 9/10/11 at *c* lines.

Unpigmented. Septa 5/6-12/13 slightly thickened. Typhlososle 20-24 to 96-109, bifid ventrally with lateral flaps curved upwards. Nephridial vesicles ocarina-shaped. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, in 9-12. Spermathecae paired, sessile, in 10 and 11, ducts confined to parietes. Atrial glands reaching into 14 and 16; glands of tubercula pubertatis and genital setae absent.

Type locality : Paris, France.

Material examined : Coll. K.K. Mahajan : 3-2-0 Shansha, 13 Sep 1971; coll. J.M. Julka 1981 : 0-0-5 Kirting, 20 Aug, 0-0-2 c. 1 km on Kirting-Tandi Road, 21 Aug; coll. Mahesh Chandra 1985 : 0-0-5 Kirting, 14 Sept, 0-0-1 Lote, 5 km E. of Kirting, 17 Sept; coll. R. Paliwal 1989 : 0-0-21 Tholang, 9 July, 0-0-24 Shansha, 11 July; coll. R. Paliwal : 14-2-5 Kalamurti, c. 2 km from Mikkim (PVNP), 9 Sep 2000.

Distribution : India : Jammu & Kashmir, Himachal Pradesh, Uttaranchal, West Bengal, Sikkim, Tamil Nadu.

Elsewhere : Pakistan, Manchuria, Siberia, Kazakstan, Australia, New Zealand, Turkestan, Iran, Algeria, South Africa, Europe, Russia, Byelorussia, Moldavia, Crimea, Ukraine, Latvia, Lithuania, Channel Islands, Azores, Madeira, Canary Islands, Canada, U.S.A., Mexico, Peru, Argentina, Uruguay.

Superfamily MEGASCOLECOIDEA

Family MEGASCOLECIDAE

7. *Amyntas corticis* (Kinberg, 1867)

1867. *Perichaeta corticis* Kinberg, *Ofvers. K. Vetensk Acad. Forh. Stockh.*, **23** : 102.

1972. *Amyntas diffringens*, Sims and Easton, *Biol. J. Linn. Soc.*, **4** : 235.

1972. *Pheretima diffringens*, Gates, *Trans. Am. phil. Soc.*, **62** : 177.

1972. *Pheretima diffringens*, Gates, *Bull. Tall Timbers Res. Sta.*, no. **13** : 18.

1980. *Amyntas corticis* (in part), Easton, *Bull. Br. Mus. nat. Hist. (Zool.)*, **40** : 49 (excluding *ijimae* Rosa).

1982. *Amyntas corticis*, Easton, *Aust. J. Zool.*, **30** : 726.

1984. *Amyntas corticis*, Easton, *N.Z. J. Zool.*, **11** : 118.

Length 88-183 mm, diameter 2.5-4.5 mm, 91-110 segments. Colour reddish brown on dorsum. Prostomium epilobic, tongue open. First dorsal pore in furrow 11/12, sometimes in 12/13. Clitellum annular, 14-16. Setae perichaetine, $aa = 1.11-1.43$ $ab = 1.40-2.22$ $bc = 1.43-2.40$ $yz = 0.91-1.33$ zz on 12, $aa = 1.11-1.80$ $ab = 0.90-1.80$ $bc = 0.90-1.80$ $yz = 0.45-0.82$ zz on 24; 23-27 on 2, 25-39 on 7, 44 on 12, 47-51 on 20; 9-14 on 8 between spermathecal pore lines, 12-15 on 18 between male pores. Combined male and prostatic pores paired, minute, superficial, on 18, 0.23-0.25 body circumference apart; each pore on a small, slightly protuberant, circular, disc-like porophore. Female pore single, median, presetal, on 14. Spermathecal pores paired, minute, superficial, in furrows 5/6/7/8/9, 0.25-0.28 body circumference apart. Genital markings small, circular discs; paired, presetal, slightly median to spermathecal pore lines, on 7-9; paired (one of the pair usually lacking), postsetal, just anterior to spermathecal pores on 7-8; occasionally one or more just lateral to each male porophore on 18.

Pigmented, pigment reddish brown. Septa 5/6-7/8 and 10/11/12 muscular, 8/9/10 absent. Gizzard large, between septa 7/8 and 10/11; intestine begins in 16; intestinal caeca simple, paired, in 27, extending forward to near 22; typhlosole lamelliform from 27 to 75-80. Last pair of hearts in 13. Holandric; testes and male funnels paired, in 10 and 11, enclosed in unpaired and ventral testis sacs; seminal vesicles paired, in 11 and 12; pseudovesicles in 13 and 14. Prostates paired in 18, large, extending from 16 to 20; prostatic ducts muscular, long and looped. Spermathecae paired, in 6-9, each with a slender, anterior diverticulum, arising from about middle of duct; diverticulum extends to about middle of ampulla and terminates in a small, oval seminal chamber; duct slender, ectal end narrowed. Genital marking glands stalked, coelomic, composite.

Type locality : Plas Machynlleth, North Wales.

Material examined : Coll. K.K. Mahajan : 0-0-1 Keylong, 31 July 1970.

Distribution : India : Jammu & Kashmir, Himachal Pradesh, Uttaranchal, West Bengal, Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Assam, Karnataka, Tamil Nadu,.

Elsewhere : Pakistan, Nepal, Bangla Desh, Sri Lanka, Burma, Vietnam, Indonesia, China, Hong Kong, Taiwan, Korea, Russia, Japan, Philippines, New Caledonia, Fiji, Hawaii, Kermadec Island, Australia, New Zealand, Egypt, Rhodesia, South Africa, Madagascar, Mauritius(?), Wales, England, Scotland, Holland, Sweden, Germany, Poland, Italy, France, Portugal, Greece, Azores, Anjouan, Cape Verde Islands, St. Thomas, St. Helena, Canary Islands, Madeira, Jamaica, West Indies, U.S.A., Mexico, Guatemala, Costa Rica, Salvador, Panama, San Domingo, Trinidad, Colombia, Peru, Brazil, Argentina, Venezuela.

DISCUSSION

The family Lumbricidae is endemic to Holarctic, from Vancouver Island to Japan (Blakemore, 2003). A total of fifteen species of earthworms belonging to the family Lumbricidae have so far been recorded from India (Gates, 1972; Julka, 1995; Paliwal & Julka, 2005). These species also occur in British Isles. All lumbricids found in India are believed to have been transported from British Isles to various parts of the world in ballast or in soil around roots of plants (Gates, 1958, 1972, 1976). These species have been able to thrive well in the hilly regions with temperate-like climate above 600m elevations (Julka, 1981). Occurrence of lumbricids in the Indo-Gangetic plains and Nicobar Islands is very rare, where they have not been able to colonize successfully, due to subtropical climatic conditions. According to Gates (1958) lumbricids have an inherent inability to survive in the less rigorous and more equable climate of the tropical lowlands.

The occurrence of six species of family Lumbricidae in the Pin Valley National Park and contiguous region of Lahaul Valley is also accredited to their accidental carrying around roots of exotic plants. Parthenogenetic mode of reproduction, ability to withstand extreme cold temperatures, and high degree of tolerance for human disturbances have favoured their successful colonization in the region.

Megascolecid earthworm *Amyntas corticis* is the most widely distributed amongst allochthonous species of the pheretimoid group, which has been recorded from both tropical and temperate regions throughout the world. In the tropical regions it is usually reported from higher altitudes. The indigenous range of the species is believed to be in east and southeast Asia (Blakemore, 2003). In India the species is distributed in Himalaya, northeast Hills, and hills of Tamil Nadu and Karnataka (Gates, 1972).

The distribution of *Amyntas corticis* in the Lahaul Valley is known by a single acitellate worm collected from Keylong in the year 1970. This may be a recent introduction of the species in the Valley.

Out of seven species known from the Lahaul & Spiti area only one *viz.*, *Octolasion tyrtaeum* has been collected from the Pin Valley National Park (PVNP) proper. However, the occurrence of remaining six species in the park can not be ruled out due to the introduction of exotic flora through recently practiced social forestry and changing agricultural pattern in Pin Valley National Park which may provide a basis for the colonization of other species distributed in the adjacent Lahaul Valley. Therefore, the account of all seven species recorded from the Lahaul & Spiti area has been included.

SUMMARY

Seven species of earthworms belonging to the families Lumbricidae (6 spp.) and Megascolecidae (1 sp.) are recorded from the Lahaul & Spiti area, which includes one species (*Octolasion tyrtaeum*) from the Pin Valley National Park proper. Occurrence of remaining six species in the Park is anticipated. A key and systematic account for all seven species is provided.

ACKNOWLEDGEMENTS

The author is thankful to Dr J.R.B. Alfred, Director, Zoological Survey of India, Kolkata and Dr. R.M. Sharma, Scientist-C and officer-in-Charge, High Altitude Zoology Field Station, ZSI, Solan for providing necessary facilities.

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CRUSTACEA : ISOPODA : ONISCIDAE

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INTRODUCTION

Isopoda is the largest order of crustacea next to Decapoda and Amphipoda. While most of the described species of this order are marine, a considerable number also live in freshwater and on land. Besides, there are also cave-dwelling and myrmecophilous forms. The terrestrial isopods belonging to the family Oniscidae are commonly referred to as wood-lice or pill-bug. They are regarded as one of the highly specialized group of crustacea which have successfully adapted to terrestrial mode of life. They are quite small, bug-like in appearance, hardly exceeding 20–25 mm in length and are usually found in humid environment or damp places on land under stones, logs, flower pots, barks, cow dung, amongst decaying vegetation etc. both in temperate and tropical regions. Nevertheless, there are also species which can thrive beneath stones in deserts (both hot and cold).

The family is represented by 33 species under 11 genera in India. A perusal of literature reveals the record of 6 species belonging to 4 genera from Himachal Pradesh (Ramakrishna, 1995) but no information is available from Pin Valley, cold desert area. A total of 194 exs. were examined and these have been found to belong to a single species.

SYSTEMATIC LIST

Family ONISCIDAE

Genus *Porcellionides* Miers, 1877

1. *Porcellionides pruinosus* (Brandt, 1833)

Material examined : 32 ex., 14. 9. 2000, Station 7, Tabo, Kaza, Dr. R. Paliwal, Reg. No. R 8858; 9 ex., 2.6.2002, Guling Village around Pin Valley, Pin Valley National Park, District Lahaul and Spiti, Dr. R. M. Sharma, Reg. No. 384; 3 ex., 31. 5. 2002, Station 9, Natari, 3 km from Sagnam, Kaza, T. R. Sharma, Reg. No. 9727; 35 ex. 30. 5. 2001, Chidang, Pin Valley, Kaza, T. R. Sharma, Reg. No. 9757; 21 ex., 25. 2. 2001, Station 1, Yansha near Sagnam Karya Kaza, T. R. Sharma, Reg. No. 9733; 7 ex., 9. 11. 2001, Station 4, Gulling, Pin

Valley, Kaza, T. R. Sharma, Reg. No. 9651; 7 ex., 11. 10. 2002, Station 3, near HPPWD-OH, Sagnam, District Lahaul and Spiti, Dr. H. S. Mehta, Reg. No.; 23 ex., 9. 10. 2002, Station 1, Mudh, 14 km NE HPWD-RM Sagnam, District Lahaul and Spiti, Dr. H. S. Mehta, Reg. No. ; 2 ex., 31. 6. 2002, Station 3, Mud and around Pin Valley, Pin Valley National Park, District Lahaul and Spiti, Dr. R. M. Sharma, Reg. No. 424; 12 ex., 1. 6. 2002, Station 1, Sagnam Village and around Pin Valley, Pin Valley National Park, District Lahaul and Spiti, Dr. R. M. Sharma, Reg. No. 398; 4 ex., 10. 9. 2000, Station 4, Near Kaza and Mikim, 30 km from Kaza, Dr. H. S. Mehta, Reg. No. 8827; 28 ex., 10. 9. 2000, 3 km from Sagnam towards Thosgcha, Mikim, Kaza, Dr. H. S. Mehta, Reg. No. 8844; 2 ex., 5. 6. 2002, Debsa Core Zone, Pin Valley, Pin Valley National Park, District Lahaul and Spiti, Dr. R. M. Sharma, Reg. No. 405; 3 ex., 27. 5. 2001, Station 2, Sagnam, Kaza, T. R. Sharma, Reg. No. 9746; 1 ex., 10.11.2001, Station 5, Kalamurti, Sagnam, Pin Valley, Kaza, T. R. Sharma, Reg. No. 9629; 1 ex., 8. 11. 2001, Station 2, Between Mikkim and Gulling, T. R. Sharma, Reg. No. 9646.

Diagnosis : Body oblong-oval, smooth but exhibiting fine granulation; head quadrangular. Abdomen narrower than thorax; telson sub-triangular, almost twice as broad as long at the base with bluntly pointed tip. Second antenna long and slender; flagellum made up of two articles, distal piece about half of its proximal one.

Distribution : India : Himachal Pradesh, Punjab, Haryana, Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, Assam and Andaman, Nicobar and Lakshadweep Islands.

Elsewhere : Europe, Africa, America, Madagascar, Pakistan and Indonesia.

Remarks : This species is a new record for Pin Valley where it occurs abundantly. The present study shows that it is adapted to both hot (Rajasthan) and cold (Pin Valley) deserts. Although cosmopolitan and known to be distributed in larger parts of North and Eastern states of India, interestingly the species is absent from Southern states.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata for laboratory facilities and to Dr. R.M. Sharma, Scientist C & Officer-in-Charge, Zoological Survey of India, Solan for placing the collection at my disposal.

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MOLLUSCA

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INTRODUCTION

The phylum Mollusca among invertebrates is important since it is the second largest group in animal kingdom. These soft-bodied animals occupy various habitats and are divided into marine, terrestrial and freshwater. Out of the seven classes of Mollusca, Gastropoda and Bivalvia are abundant in freshwater, besides land Gastropoda also adopt more quickly with the environment.

They are soft-bodied animals and a hard shell covers the body in many species. These fascinating organisms are very important because of its value in many things like they are edible, used in culture of pearls, for preparation of button, other decorative wares and poultry feeds. They harm to man and also his livestock, as some of them are intermediate hosts to trematode parasites.

Notable works on this group are "Fauna of British India Mollusca", by Blanford and Godwin Austin (1908), Gude (1914, 1921), Preston (1915) and Subba Rao (1989). Apart from these, there are published and unpublished works from Northwest Himalaya like Himachal Pradesh, Punjab. Mention must be made of the contributions of Surya Rao *et al.* (1997) on Delhi Fauna, Subba Rao and Mitra (1995) on fauna of Western Himalaya. Theses work of Khanna (1974), Singh (1987), Meenu Sharma (1993) on Punjab State Mollusca, Patil and Ramakrishna (2003) Shiwalik hills.

The present paper deals with a small collection of Mollusca from Pin Valley National Park. So far nothing is known about this group from the area. A total of three species of freshwater and land Molluscs have been reported for the first time.

Phylum MOLLUSCA
 Class GASTROPODA
 Order BASOMMATOPHORA
 Family LYMNAEDIAE
 Genus *Lymnaea* Lamarck

1. *Lymnaea (Galba) truncatula* (Mueller)

1774. *Buccinum truncatula* (Mueller) Verm. Terr. Fluw. Hist., 2 : 130. Type locality : Denmark.

1968. *Lymnaea truncatula* Rajgopal and Subba Rao, Proc. Symposium Mollusca, pt 1, P. 108.

Diagnosis : Shell thin, body whorl large, spire almost always exserted, collumella spirally twisted. Mud loving amphibious. Umbilical pore more prominent and not occluded by collumellar fold.

Material examined : 2 exs Guling, Romsjoran , Kaza, 10-09-2000, Station No. 4, Coll. H.S. Mehta and party, 2 ex. Mikkim, Pin Valley, Station No. 1, 7-11-2001, Coll. T.R. Sharma and Party; 8 exs. Mikkim, Kaza, 03-06-2002, Coll. H.S. Mehta and party.

Distribution : Pin Valley National Park, Himachal Pradesh, Kashmir, Leh, Chitral 9000 ft.

Elsewhere : This species is mainly a Palaearctic having distribution in Europe and the distribution extended up to Ethiopian region, North Western Africa and Egypt, East Africa and South Africa.

Habitat : Mud loving amphibious form.

Remarks : Closer to *L. andersonia* but umbilical pore more prominent. Spire longer to body whorl. Whorls slightly shouldered. Slightly differ in shape of aperture and collumellar fold.

Order STYLOMMATOPHORA

Family VALLONIIDAE

Genus *Vallonia* Risso

2. *Vallonia pulchella* (Mueller)

1774. *Helix pulchella* Mueller. Verm. Terr. Fluw. Hist. ii : 30.

1878. *Vallonia pulchella*, W.G. Binny Terr Moll. United State V; P 344 Pl 17, fig. 1.

1914. *Vallonia pulchella*. Gude, The Fauna of British India including Ceylon and Burma, Mollusca Pt. II (Trochomorphidae and Janellidae), London, Taylor and Francis : XII + 520 pp. 164 text figs.

Diagnosis : Moderately umbilicated, more widely for the last half whorl, convex and depressed conic above, straw coloured, transparent with fine all dense striae. Aperture moderately oblique and inclined, forming five sixth exit of a circle. Peristome abruptly averted with strong white lip.

Material examined : 1 ex. Mandong 2 kms from Sagnam Kaza H.P., Station No. 6, 29-

05-2001, Coll. T.R. Sharma and party; 1 ex; near Mikkim, Kaza (H.P.), Station No. 3 10-09-2002, Coll. H.S. Mehta.

Distribution : Mandong Pin valley National Park, H.P., Northern and Eastern Asia as far south as Kashmir, Northern Africa, Circumboreal Europe, greater part of North America.

Habitat : Damp soil, muddy area.

Remarks : Small in size and the more elevated spire with the deeper suture, the whorls are well rounded.

Family ARIOPHANTIDAE

Subfamily MACROCHLAMYDINAE

Genus *Macrochlamys* Benson

3. *Macrochlamys glauca* (Pfeiffer)

1846. *Macrochlamys glauca*, (Pfeiffer) BS MS; PLr (Helix) Symb. iii, P. 65; id (Helix Nanina) Mon Hel. I 1837, P. 48, H & T (Helix) C.I. 1876 pl. 63, fig. 10, Nevill (Nanina), Hand. 1. j, 1878, p. 25.

Diagnosis : Shell obliquely perforate or subperforate, conoidly subglobose, smooth, whitish horny spire low conoid. Major diameter 8-11 mm. Peristome thin, in one plane, collumellar margin vertical above and expanded, almost closing the perforations.

Material examined : 2. exs., Sagnam near Mikkim Kaza (H.P.) Station No.5, 11-09-2000, Coll. R. Paliwal and party; 2 exs. Between Mikkim and Gulling, Kaza H.P. Station No.2, 8-11-2001, Coll. T.R. Sharma and party; 1ex Mandang 2 km from Sagnam Kaza H.P. Station No.6, 29-05-2001, Coll. T.R. Sharma and Party; 1ex. Ka Village near Pin valley H.P. Station No.6, 06-06-2002, Coll. R.M. Sharma and party.

Distribution : H.P. : Pin valley National park, Kotgarh near Shimla; *Uttaranchal* : Almora, Nainital, Mussooree.

Habitat : High altitude species, generally found near rocky bottom.

SUMMARY

Three species of Molluscs have been recorded for the first time from Pin valley National Park, Himachal Pradesh of which, *Lymnaea (galba) truncatula* Mueller is mainly a Palearctic having distribution in Europe, extended up to Ethiopian region, North Western Africa and Egypt, East and South Africa. The other species, *Vallonia pulchella* extended its distribution in Northern and Eastern Asia as far as south Kashmir, Northern Africa, circumboreal Europe and greater part of America.

ACKNOWLEDGEMENTS

I am thankful to the Director, Zoological Survey of India, Kolkata and the Officer-in-Charge, Zoological Survey of India, Pune for permitting to undertake this study and

to Dr. R.M.Sharma, Scientist C & Officer-in-Charge, High Altitude Zoology Field Station, Solan for placing the collection at the disposal of the author.

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CHILOPODA : SCOLOPENDROMORPHA

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INTRODUCTION

Centipede Fauna of Himalayan Ecosystem, India has been adequately dealt by Khanna (2003), but while Khanna (2001) has check listed the Indian species of the centipedes of the order Scolopendromorpha, not much of the studies on the centipedes from Himachal Pradesh are available except for Khanna (2005) documenting an exhaustive list of the centipedes from Himachal Pradesh and Jammu and Kashmir. Khanna and Tripathi (1985,1986) have dealt with the inventory and records of the species under the genera *Rhysida* Wood and *Otostigmus* Porath, respectively, with description of new species, namely, *Rhysida longicarinulata* and *Otostigmus poonamae* from Himachal Pradesh.

The present paper is based on a very small collection of Scolopendrid centipedes belonging to three species of two genera under two families from Pin Valley National Park, Lahaul Spiti, Himachal Pradesh, of which one *Cryptops doriae* is a new record from Himachal Pradesh and NW Himalaya.

SYSTEMATIC ACCOUNT

Class CHILOPODA

Order SCOLOPENDROMORPHA

Family 1 SCOLOPENDRIDAE

Subfamily OTOSTIGMINAE

Tribe Otostigmini

1. *Otostigmus amballae* Chamberlin, 1914

1913. *Otostigma amballae*, Chamberlin, *Ent. News*, Philad., 24 : 74.

1998. *Otostigmus amballae*, Khanna, *Panchhuli Multidimensional Expedition Scientific Report*, Sapper Adventure Foundation, Indian Army, p. 80.

Material Examined : INDIA : H.P. Lahaul Spiti, 2 exs, Guling Village, Kaza, 2.vi.2002, Coll. R.M. Sharma.

Diagnosis : 17-19 segmented antennae with 2-1/4 to 2-2/3 basal segment glabrous. Long antennae, when reflexed reaches back to the middle of the 5th tergal segment. Sparsely punctate, cephalic plate anteriorly bearing a short median groove. 1-8th pairs of walking legs with 2 spines to the 1st tarsal segment. Prefemur of the anal legs nearly four times longer than wide.

Remarks : Present record is an extension of range of distribution in H.P. and NW Himalaya.

Distribution : India : Haryana, Himachal Pradesh, Uttar Pradesh and Uttarakhand.

Elsewhere : Nepal.

2. *Otostigmus nudus* Pocock, 1890

1890. *Otostigma nudum*, Pocock, *Ann. Nat. Hist.*, Ser. 6(5) : 247.

1994. *Otostigmus nudus*, Khanna, *Rec. Zool. Surv. India*, 94(2-4) : 336, 464.

Material Examined : India : H.P. : Lahaul Spiti; 1 ex. Village Lara, ca 8 kms from Losar, Kaza, 13.ix.2001 Coll; Rahul Paliwal.

Diagnosis : 17-18 segmented antennae with 3 basal segments glabrous. All walking legs without tarsal spur.

Distribution : India : Himachal Pradesh, Meghalaya, Tamilnadu, Uttaranchal and Uttar Pradesh.

Remarks : Present record is an extension of range of distribution in H.P. and NW Himalaya.

Family 2 CRYPTOPIIDAE

Subfamily CRYPTOPIINAE

3. *Cryptops doriae* Pocock, 1891

1891. *Cryptops doriae*, Pocock, *Ann. Mus.*, Genova, 30 : 421

1997. *Cryptops doriae*, Khanna, *Fauna of Nanda Devi Biosphere Reserve, Fauna of Cons. Areas 9* : 105-106. *Zool. Surv. India*.

1999. *Cryptops doriae*, Lewis, *Senckenbergiana boil.*, 79(1) : 19-38.

Material Examined : India : Himachal Pradesh, Lahaul Spiti, 9 exs. Village Lara, ca 8 kms from Losar, Kaza, 13.ix.2001 Coll, Rahul Paliwal. 1 ex., Sagnam Village, 1.vi.2002, 1 ex., Guling Village and around, 2.vi.2002, 7 exs., Sagnam and near Mikkim, Coll. R.M. Sharma; 2 exs, Kalamurti near Bikim, Kaza, 9.ix.2000, 2 exs, Shimdong, Kaza, 11.ix.2002, Coll. H.S. Mehta.

Diagnosis : Ist tergal segment without any ring or longitudinal sulcus. Weakly punctate tergites with paramedian longitudinal furrows beginning from 3rd, 4th (5) to (19) 20 segments, also with a transverse sulcii. Both longitudinal and transverse sulcii equally developed. Prefemur, femur without terminal tooth.

Distribution : India : Maharashtra and Uttarakhand.

Elsewhere : Java, Myanmar, New Guinea, Nepal and Vietnam.

Remarks : Earlier known only from Satara (Maharashtra), in India, Khanna (1997) recorded the species for the first time from Malari-Girithi Road in Nanda Devi Biosphere Reserve, Uttarakhand. This is further extension of range of distribution of the species from Lahaul Spiti Valley, which is otherwise characterized by the predominant presence of the Palaearctic elements of the faunal diversity.

Discussion : While the record of *Otostigmus amballae* and *O. nudus* in Pin Valley National Park is merely an extension of the range of their distribution in the Himachal Pradesh and NW Himalaya, discovery of *Cryptops doriae* is however, new addition to the faunal diversity of HP and NWH.

SUMMARY

Three species of Scolopendrid centipedes belonging to two genera under two families have been recorded from Pin Valley National park, of which *Cryptops doriae* is a first record from Himachal Pradesh.

ACKNOWLEDGEMENTS

The author is thankful to the Director, Zoological Survey of India, Kolkata for his kind permission to undertake this study. He is also thankful to Dr. Arun Kumar, Additional Director, Northern Regional Station, Dehra Dun for facilities and to Dr. R.M. Sharma, Scientist C & Officer-in-Charge, High Altitude Zoology Field Station, Solan for placing the collection at the disposal of the author.

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SCORPIONIDA

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INTRODUCTION

Scorpion fauna of Himachal Pradesh is known by 14 species under 4 families out of 107 species and 5 families known from India Tikader and Bastawade (1983). The family Scorpiopsidae seems to be commonly occurring and widespread throughout the state. The district wise reports are scanty and await detailed explorations. This is the first report on Scorpion fauna of Pin Valley National Park, the cold desert area of the state. The present report includes 3 species belonging to 2 genera under 2 families.

SYSTEMATIC ACCOUNT

Order SCORPIONIDA

Family BUTHIDAE

Subfamily BUTHINAE

1. *Lychas (Distotrichus) nigristermis* (Pocock)

1899. *Lychas nigristermis* Pocock, J. Bombay Nat. Hist. Soc., 12 : 265.

1983. *Lychas (Distotrichus) nigristermis* : Tikader & Bastawade, Fauna of India, Arachn., 3 : 42-48.

Common Name : Small brown scorpion

Local Name : Bichhu (Hindi).

Diagnostic characters : Body size 36-42 mm in length, yellowish with black spots, ocular tubercles and interocular area black; mesosomal tergites with six black and five yellow spots; chelicerae blackish; pedipalps with spotted femora, entirely black patellae, yellowish on hands but darker on fingers; legs with spotted segments; entire body surface finely and coarsely granular; telson with elongated vesicles, sharp aculeus and a strong subaculear spine. Pedipalp fingers with 7 nonimbricated minute teeth on outer row; pectines well developed with 17/17 teeth; all tergites finely as well as coarsely granular and I - IV each

with a median carina; cauda slightly shorter than five times as carapacial length, almost all carinae evenly granular.

Locality : Pin valley, Lahaul & Spiti Dist., Himachal Pradesh.

Material examined : 1 young, 06.06.2002., Coll. R. M. Sharma & Party.

Distribution elsewhere : INDIA : Himachal Pradesh : Kinnaur, Bilaspur, Sirmour, Bhammary, Mandi, Bauly, Dhakong; Uttarakhand : Chamoli, Tehri, Uttarkasi, Nainital and Almora.

Habits and habitats : Occurs in fairly wooded countrysides as well as in thick-forested areas of North to Northwest Himalayan ranges and foothills. Normally hides under the smaller bark scales of large to medium sized trees. Rarely found under stones and rock crevices. Feeds on smaller insects. Female gives birth to 12–15 young ones.

Family SCORPIOPSIDAE

Subfamily SCORPIOPSINAE

2. *Scorpiops petersi* Pocock

1893. *Scorpiops petersii* Pocock, *Ann. Mag. nat. Hist.*, 12(6) : 323.

1900. *Scorpiops petersii* : Pocock, *Fauna Brit. India, Arachn.*, : 70.

1980. *Scorpiops (Scorpiops) petersi petersi* : Vachon, *Bull. Mus. nat. Hist. nat. Paris*, 4e Ser. A, (1) : 143.

Common Name : Brown rock scorpion.

Local Name : Bichhu (Hindi).

Diagnostic characters : Body size 40–45 mm in length, colour brownish and slightly darker on carapace and pedipalps, chelicerae pale yellow but brownish on fingers, legs paler than body, cauda brownish but slightly paler on telson, pectines poorly developed. Entire surface of carapace finely as well as coarsely granular, ocular tubercles also granular and extended posteriorly with few granules, median eyes situated anteriorly in the ratio 1 : 1.9; chelicerae normal with ventral inner margin of movable finger armed with five minute teeth; pedipalps dorsoventrally flat, femora shorter than carapace, patellae as long as femora and armed with two string, denticular tubercles, all digits carinated and under hand of manus slightly shorter than carapace, trichothridial pattern as in the genus but ventrals on patellae 6 in numbers; legs weakly granular on femora and patellae, spine formula on legs I–IV 8/8,8/8,10/10, 10/10; pectines weakly developed, 1.70 times than wide, pectinal teeth 5/5 in numbers; mesosomal tergites granular and more granular on posterior portions, tergites III–VI with median smooth obsolete carina and a pair of inconspicuous lateral carinae, sternite I–IV smooth, V weakly granular and two pairs of weakly granular carinae; cauda short and less than three and a half times as long as carapace, all segments carinated and dorsal carinae tuberculate to spiniform posteriorly,

telson more than as long as fifth caudal segment but shorter than carapace, vesicle shorter than fifth segment, smooth and aculeus half the length of vesicle.

Locality : Gechang core zone, Pin valley, Lahaul & Spiti Dist., Himachal Pradesh.

Material examined : 1♂, 06.06.2002. Coll. R. M. Sharma & Party.

3. *Scorpiops affinis* Kraepelin

1898. *Scorpiops affinis* Kraepelin, *Jb. hamb. wiss. Aust.*, 15 : 44.

1911. *Scorpiops austerus* : Hirst, *Ann. Mag. nat. Hist.*, 8(8) : 462.

1980. *Scorpiops (Scorpiops) austerus* : Vachon, *Bull. Mus. natn. Hist. nat. Paris, 4e Ser.*, 2 Sect. A, (1) : 143.

1983. *Scorpiops (Scorpiops) affinis* : Tikader & Bastawade, *Fauna of India, Scorpions*, 3 : 418–424.

Common Name : Blackish brown rock scorpion.

Local Name : Bichhu (Hindi).

Diagnostic characters : Body 37–42 mm in length, colour blackish brown to reddish, males less granular and smaller in size, chelicerae normal with ventral inner margin of movable finger with 5–6 teeth; pedipalps short, stout with much flattened manus, length of under hand shorter than carapace but as long as femora or patellae, trichobothridial pattern as in the genus but ventrals on patellae 7 in numbers; legs carinated on femora and patellae, all carinae granular, spine formula on I–IV 4/5, 5/5, 5/6.7/7; pectines weakly developed 1.75 times longer than wide, pectinal teeth 6/6; all tergites granular, more granular on lateral portions, tergites I–VI monocarinated, sternites I–IV smooth, V granular with two pairs of granular carinae; cauda four times as long as carapace, all segments carinated and granular, telson longer than carapace but vesicle longer than segment III but shorter than IV, entire surface finely granular, aculeus as long as half the vesicular length.

Locality : Kinnaur, Pin Valley, Lahaul & Spiti Dist. Himachal Pradesh, India.

Material examined : 2♀♀ and 1♂, 16.06.2002, Coll. B. Mitra.

Distribution elsewhere : INDIA : Himachal Pradesh : Kullu (Type locality), and Punjab.

Habits and habitats : Exactly not known and understood but appears to live in the cracks and crevices of soft rocks and road side out crops, feeds on smaller insects and invertebrates those intrude the crevices, female gives birth to 10–15 young ones. Developmental details not known. Toxicity also not reported.

SUMMARY

The present report includes 3 species belonging to 2 genera under 2 families and constitutes first record from Pin Valley National Park.

ACKNOWLEDGEMENTS

I am thankful to the Director, Zoological Survey of India, Kolkata and the Officer-in-Charge, Zoological Survey of India, Pune for permitting to undertake this study and to Dr. R.M.Sharma, Scientist C & Officer-in-Charge, High Altitude Zoology Field Station, Solan for placing the collection at the disposal of the author.

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ARACHNIDA : ARANEAE

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INTRODUCTION

The collection of spiders from Pin Valley National Park, Lahaul & Spiti District of Himachal Pradesh were made available by the Zoological Survey of India, High Altitude Zoology Field Station, Solan, collected through 8 surveys by various parties in different seasons of the respective year. It contained about 99 ♀♀ and 46 ♂♂ specimens of spiders in 27 lots. The collection identified up to species level and dealt in detail belongs to 4 families, 5 genera and 5 species. The specimens identified only up to generic level due to want of mature specimens, belong to 12 genera spread over six families have also been included in this account with a view to place on record of their existence in the district in general and Pin Valley National Park in particular. The studies of specimens belonging to the family Amaurobiidae are based on the information available from Platnick (2005, web page), Wang (2002) and for other families Tikader (1980-1982).

List of species recorded from Pin Valley National Park

1. Family GNAPHOSIDAE
 1. *Geodrassus simourensis* Tikader & Gajbe 1 ♀, 1 ♂
 2. *Drassodes parvidens* Caporiaco 4 ♀♀, 1 ♂
2. Family ARANEIDAE
 3. *Leucnuge fastigata* (Simon) 1 ♀
3. Family LYCOSIDAE
 4. *Pardosa minutus* Tikader & Malhotra 21 ♀♀, 24 ♂♂
4. Family AMAURBIIDAE
 5. *Amaurobius sharmai* sp. n 5 ♀♀, 5 ♂♂
1. Family LYCOSIDAE
 6. *Lycosa* sp. 1 ♀, 2 ♂♂ & 2 ♂♂

7. <i>Trochosa</i> sp.	8 ♀♀ & 7 ♂♂
2. Family GNAPHOSIDAE	
8. <i>Gnaphosa</i> sp.	20 ♀♀
9. <i>Zelotes</i> sp.	3 ♀♀ & 2 ♂♂
10. <i>Haplodrassus</i> sp.	2 ♀♀
11. <i>Scotopaeus</i> sp.	1 ♀
12. <i>Phaeocedus</i> sp.	1 ♀
3. Family ARANEIDAE	
13. <i>Argiope</i> sp.	2 ♀♀, 2 ♂♂
4. Family THOMISIDAE	
14. <i>Thomisus</i> sp.	1 ♀
15. <i>Xysticus</i> sp.	1 ♀
5. Family PISAURIDAE	
16. <i>Pisaurus</i> sp.	1 ♀
6. Family SALTICIDAE	
17. <i>Salticus</i> sp.	1 ♀

SYSTEMATIC ACCOUNT

Family GNAPHOSIDAE

Genus *Geodrassus* Chamberlin

1. *Geodrassus sirmourensis* Tikader & Gajbe

1977. *Geodrassus sirmourensis* Tikader & Gajbe, *Rec. zool. Surv., India*, 73(1-4) : 71.

1982. *Geodrassus sirmourensis* : Tikader & Gajbe, *Fauna of India, Araneae : Gnaphosidae*, 2(2) : 386-388.

Diagnostic characters : Body length ranges from 4.50 to 6.50 mm, body color reddish green on cephalothorax and legs but brown on abdomen; cephalothorax longer than wide broad in front, conspicuous longitudinal fovea on posterior median portion, eyes pearly white except anterior medians, both rows of eyes procured, posterior row longer than anterior, anterior medians smaller than the laterals and placed closer to laterals than each other, posterior medians oval, larger than laterals, much closer to each other than laterals; chelicerae moderately strong, inner and outer margins with 1 and 3 teeth respectively; legs formula 4123; abdomen longer than wide, almost elliptical, dorsum with 3 pairs of sigilla and U-shaped white marking at posterior end; epigyne with a pair of complexly coiled spermathecae.

Material examined : 1 ♀, 1 ♂, Loc. Mudh, NE of PWD RH, Sagnam, Lahaul-Spiti Dist., Himachal Pradesh, Coll. H. S. Mehta, 09.10.2002, Reg. No. 379.

Distribution : India : Himachal Pradesh (Renuka Lake).

2. *Drassodes parvidens* Caporiacco

1934. *Drassodes (Drassodes) parvidens* Caporiacco, *Memorie. Soc., ent. Ital.*, 13 : 126.

1982. *Drassodes parvidens* : Tikader, *Fauna of India, Araneae : Gnaphosidae*, 2(2) : 421-423.

Diagnostic characters : Body length ranges from 10.00 to 14.00 mm, yellowish brown on cephalothorax and legs, grayish brown on abdomen, cephalothorax longer than wide, blunt anteriorly, cephalic region distinctly raised than thoracic region, two rows of eyes almost straight, anterior medians smallest but laterals largest, posterior laterals smaller than anterior laterals, ocular quad longer than wide and wider behind, thoracic region with distinct median longitudinal furrow; chelicerae much stronger with a distinct boss at the base; abdomen longer than wide, dorsum with 2 pairs of sigilla and some irregular dark patches, epigyne very small, poorly sclerotised and internal genitalia with a pair of spherical spermathecae, opening in middle with short slightly bent ducts.

Material examined : 3 ♀♀, 1 ♂, 1 ♀y; Coll. T. R. Sharma, Betura, Mikkim, Pin-valley, Kaza, 08.11.2001, Reg. No. 9636.

Distribution : India : Himachal Pradesh, Kashmir (Deosai)

Family ARANEIDAE

Genus *Leucauge* White

3. *Leucauge fastigata* (Simon)

1877. *Meta fastigata* Simon, *Ann. Soc. Ent. Fr.*, 7(5) : 79.

1900. *Argyropeira fastigata* : Pocock, *Fauna Brit. India, Arachn.*, : 216.

1982. *Leucauge fastigata* : Tikader, *Fauna of India : Spiders, Araneae : Araneidae* 2(1) : 76-78.

Diagnostic characters : Body length ranges from 6.50 to 9.50 mm, body color pale yellowish on cephalothorax, light brownish on legs and silvery white with black and gray patches on abdomen; cephalothorax longer than wide, cephalic region slightly elevated with posterior trifold groove, ocular quad longer than wide and narrowed in front, both rows of eyes recurved, laterals placed close and on moderately prominent tubercles; chelicerae strong and stout with small boss; legs long and slender, femora IV with fringed with two rows of long hair on half of the proximal portion, tibiae I, II and IV densely clothed with long hair; abdomen strongly overlapping anteriorly on carapace and with a pair of broad blunt median shoulder hump, broad rounded posteriorly, epigyne plate like with a thin semicircular rim, internal genitalia complexly pouched spermathecae, opening in middle.

Material examined : 1 ♀, Tabo, Kaza, Himachal Pradesh, Coll. R. Paliwal, 14.09.2000, Reg. No. 8859.

Distribution : India : Kerala (Trichur, Cochin), Orissa (Ganjam), Uttaranchal (Hardwar, Saharanpur).

Elsewhere : Burma and Sri Lanka.

4. *Pardosa minutus* Tikader & Malhotra

1980. *Pardosa minutus* Tikader & Malhotra, *Fauna of India : Spiders, Araneae : Lycosidae*, 1(2) : 319-321.

Diagnostic characters : Body size ranges from 4-6 mm in length, color brownish yellow with few black stripes, cephalothorax longer than wide, convex, narrowed in front, cephalic region almost entirely occupied by posterior eyes, clypeus vertical, anterior row of eyes slightly procurved and shorter than the posterior, medians larger than the laterals, ocular quad longer than wide and narrowed in front; chelicerae moderately strong; legs long and thin; abdomen longer than wide, oval, mid-dorsally with a light reddish patch extending to the whole length, longitudinal black patch dorso-laterally; epigyne simple with a median plate, internal genitalia with a median plate forked posteriorly and with a pair of coiled spermathecae opening on posterior end..

Material examined : 21 ♀♀, 24 ♂♂. Yanasur, Sagmam, 25.05.2001, Reg. No. 9752; Sagnam & vicinity, 27.05.2001, Reg. No. 9754; Gulling, 28.05.2001, Reg. No. 9716; T.R. Sharma, Coll., Mud & around; Guling Vill. and around; 03.06.2002, Reg. No. 399, 393; Ka vill. & around 06.06.2002, R.M. Sharma & Party, Coll.

Distribution : India : Himachal Pradesh, (Banikhet, Chamba).

Family AMAUROBIIDAE

Genus *Amaurobius* C.L. Koch

5. *Amaurobius sharmai* sp. n.

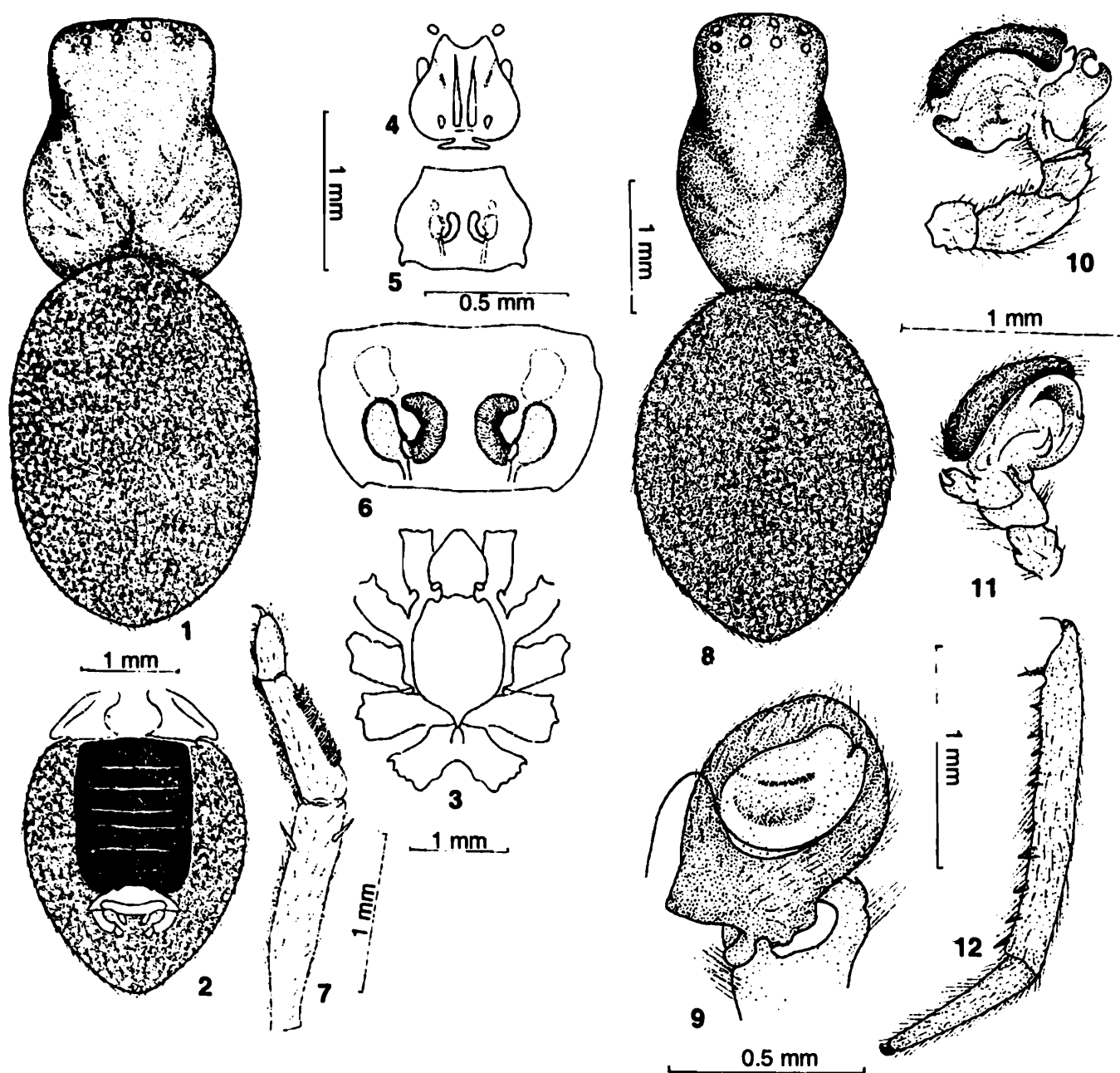
(Figs 1-12)

General : Body size smaller, ranging from 5.00-6.50 mm in length. Color brownish yellow on carapace and legs and blackish on abdomen. Legs thinner and longer in males.

Measurements (in mm) : ♀ *Holotype* : Total length 6.20. Carapace 2.70 long, 1.80 wide. Abdomen 3.50 long, 2.40 wide.

♂ *Paratype* : Total length 5.10. Carapace 2.30 long, 1.50 wide. Abdomen 2.80 long, 1.80 wide.

Cephalothorax : ♀ *Holotype* : Longer than wide, cephalic region smooth and elevated, eyes placed anteriorly in two rows, anterior row slightly procurved with laterals larger and placed on small tubercle. Posterior row slightly recurved and the laterals placed at the base of anterior lateral eyes. Ocular quad narrowed in front. Thoracic region low lined with deep median longitudinal fovea with a radiating lateral bands of darker color (Fig.1).



Figs. 1-12 : *Amaurobius sharmai* sp. n. Fig. 1. Dorsal aspects of female Holotype; Fig. 2. Ventral aspects of abdomen of female Holotype; Fig. 3. Ventral aspects of Sternum and Labium of female Holotype; Fig. 4. Ventral aspects of female Holotype Epigynum; Fig. 5. Dorsal aspects of female internal genitalia Holotype; Fig. 6. Enlarged dorsal aspects of female internal genitalia, Holotype; Fig. 7. Lateral aspects of walking leg IV of female Holotype; Fig. 8. Dorsal aspects of male Paratype; Fig. 9. Interior enlarged aspects of male palp Cymbium of male Paratype; Fig.10. Exterior (outer) aspects of male palp of male Paratype; Fig.11. Interior (inner) aspects of male palp of male Paratype; Fig.12. Lateral aspects of walking leg I of male Paratype.

Clypeus short. Cephalothoracic sternum broad, heart shaped and pointed posteriorly (Fig. 3). Chelicera narrowed anteriorly with distinct boss at the outer base, fang acutely curved and times as basal segment, fang groove armed with 1 large and 5–6 minute teeth on outer margin and 1 small tooth placed at the base of larger tooth. Legs not much stouter, clothed with a cluster of long setae on outer sub-latero-ventral surface of tarsus IV, a typical amaurobius calamistrum, metatarsus with a pair of inner basal spines (Fig. 7). Leg formula 1432.

Abdomen : Almost elliptical, Greyish black with reticulate design of short, yellow rod like structure weakly covered with short pubescence on dorsal and lateral portions. Ventrums with a median roughly rectangular soft non-sclerotized scutal patch with 4 transverse ridges and each ridge with a pair of small circular yellow depression (Fig. 2). Three pairs of spinnerets arranged in progressive length and size, proximal being shorter and distal longer. Cribellum placed next to the longer pair of spinnerets (Fig. 2). Epigynum simple, without any noticeable structure ventrally except a pair of median elongated denticles (?), a posterior median minute operculum and a pair of yellowish circular spots (Figs. 4–5). Internal genitalia with an elliptical pouched spermathecae/receptacles, each connected on inner portion with a convoluted duct, both dark black in color and each lateral pouch posteriorly opens with short duct (Fig. 6).

♂ Paratype : Smaller in body size (Fig. 8) and paler in color. Legs thinner and longer as compared with body size. Metatarsus IV with 1/3rd calamistrum on outer side and tibia with a pair of spines at distal end. Legs I with 6–7 smaller spines on ventral portion of tibia. Leg I with 6–7 minute spines on ventral surface of tarsus and II with 3–4 pairs of spines on ventral surface of tibia (Fig. 12). Male palp short with comparatively much robust palpal organ, globular cymbium with a long, thin and black thread like ejaculatory duct. Paracymbium short, roundish, not much sclerotized, haematodocha with a basal tibial clasped outer apophysis. Femur longer, bears a small sub-tuberculate central spine on pro-margin, patella almost half the femur (Figs. 9–11).

Table 1. Showing measurements of Legs I–IV of *Amaurobius sharmai* sp.n.

Female Holotype

Legs	Trochanter	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.30	2.00	0.70	1.40	1.40	0.90	6.69
II	0.30	1.60	0.60	1.00	1.00	0.70	5.20
III	0.30	1.70	0.80	1.00	1.00	0.70	5.49
IV	0.30	2.20	0.70	1.50	1.20	0.70	6.60

Leg Formula : 1432

Table 2. Showing measurements of Legs I-IV of *Amaurobius sharmai* sp.n.*Male Paratype*

Legs	Trochanter	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.30	2.00	0.80	1.80	1.60	0.80	7.30
II	0.30	1.60	0.60	1.30	1.10	0.60	5.55
III	0.30	1.50	0.50	1.00	1.00	0.70	5.00
IV	0.30	1.80	0.60	1.50	1.30	0.70	6.25

Leg Formula : 1423

Discussion : In India, the genus *Amaurobius* C.L. Koch is known by only 3 species viz. *A. andhracus* Patel & Reddy, *A. nathanbharii* Patel & Reddy and *A. indicus* Bastawade. The last has been transferred to the family Corinnidae in the light of Platnick (2005) and Bastawade (2006). The present new species does not show any similarity in any of the characters of the known Indian species, thus described as new. This is the first *Amaurobius* species described from remote locality of Himachal Pradesh in particular and Western Himalaya at large. This may be a Pale arctic element and needs to be extensively surveyed in other areas of the cold desert.

Type Data : *Holotype* : ♀ in 70% Alcohol, genitalia dissected and kept in separate microvial with specimen. *Paratype* : ♂ in 70% Alcohol, left palp detached and kept in microvial with specimen. *Holotype* and *Paratype* will be deposited in the National collection, Zoological Survey of India, New Alipore, Kolkata, West Bengal, India. *Para types* 4 ♀ ♀ and 5 ♂ ♂ all immature and sub-adults, kept with *Holotype*.

- Type locality :** 1. (7) : 1 ♀ *Holotype*, 1 ♂ *Paratype*, 1 ♂ *Paratype* ser. Immature, Sub-Adult. Locality : Thango, Pin Valley, Kaza, Himachal Pradesh, Coll. T. R. Sharma, Dt. 08.ix.2001, Reg. No. 9655.
2. (1) : 1 ♀ Broken, 1 ♂ Immature sub-adult *Paratype*. Locality : near, H. P. PWD, Rest House, Sagnam, Dt. 11.x.2002, Coll. H. S. Mehta, Reg. No. 9859.
3. : 1 ♂ Immature, Sub-adult. Locality : Sagnam and vicinity, Kaza, Himachal Pradesh, Coll. Rahul Paliwal, Dt. 11.ix.2000, Reg. No. 8823.
4. : 1 ♂ Immature, Sub-adult. Locality : 3 Kms. Sagnam, towards Thinache, Mikim, Kaza, Himachal Pradesh, Coll. H. S. Mehta, Dt. 10.ix. 2000, Reg. No. 8842.
5. : 1 ♂ Immature, Sub-adult, 2 ♀ ♀ young ones. Locality : Thango, Kaza, Lahaul Spiti District, Himachal Pradesh, Coll. T. R. Sharma, Dt. 26. v.2001, Reg. No. 0764.

6. : 1 ♀ sub-adult. Locality : Sagnam and vicinity, Kaza, Himachal Pradesh. Coll. T R. Sharma, Dt. 27.v.2001, Reg. No. 0754.
- 7 (2) : 1 ♂ Immature, Sub-adult. Locality 8 Kms from HP, PWD Rest House, Sagnam, Coll. H. S. Mehta, Dt. 10.x.2002, Reg. No. 9858.

Etymology : The species is named in honour of Dr. R.M. Sharma, Scientist C and Officer-In-Charge of High Altitude Zoology Field Station, Solan

SUMMARY

Five species belonging to five genera under four families have been reported and 12 genera have been assigned to six families collected from Pin Valley National Park, Himachal Pradesh. *Amaurobius sharmai* sp. n. (Family : Amaurobiidae) has been described and illustrated.

ACKNOWLEDGEMENTS

I am thankful to the Director, Zoological Survey of India, Kolkata and the Officer-in-Charge, Zoological Survey of India, Pune for permitting me to undertake this study and to R.M.Sharma, Scientist C & Officer-in-Charge, High Altitude Zoology Field Station, Solan for placing the collection at the disposal of the author.

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INSECTA : ORTHOPTERA

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INTRODUCTION

The members of the order Orthoptera are popularly known as grasshoppers, crickets, mole-crickets, pygmy mole crickets, Wetas and grouse-locusts. They may be winged, brachypterous or apterous. Mouth parts are biting and chewing type; prothorax large; hind legs usually enlarged and modified for leaping or jumping; fore wings, if present, elongate and more or less thickened with submarginal costal veins and almost usually modified as stridulatory organs; hind wings membranous with an extensive anal area; female generally with well developed ovipositor, not concealed by the 7th or 8th abdominal sternum; male external genital organs symmetrical, concealed at rest by the enlarged 9th abdominal sternum, which may or may not bear pair of styles; cerci usually short and almost invariably unsegmented; specialized auditory and stridulatory organs frequently developed.

Orthopteran insects of Himachal Pradesh are very little known except the stray records of Kirby (1914), Bolivar (1918), Uvarov (1921, 1925, 1927 and 1942), Bhowmik (1982, 1983, 1984 and 1985), Julka *et al.* (1982), Shishodia and Tandon (2000), Mehta *et al.* (2003) and Shishodia *et al.* (2003). They have reported 115 species of Orthoptera from the Himachal Pradesh (more than 20,000 from the world and 1000 from India). But none has studied the fauna of Pin Valley National Park, Lahaul & Spiti district of Himachal Pradesh. The present paper deals with 5 species (2 up to generic level) distributed under one family and 5 genera. All the species are newly recorded from the area. I believe that there shall be more species in the region, which could not be collected and reported so far. *Chorthippus* (Ch.) *indus* Uvarov, *Sphingonotus e. eurasius* Mistch. and *Diabolocatantops innotabilis* (Walker) are studied earlier from Lahaul & Spiti district. Male specimen of *Sphingonotus e. eurasius* Mistch. is deposited in National Collection Zoological Survey of India, Kolkata (Reg. No. 7704/H5) and rest are located at High Altitude Zoology Field Station Solan (HP).

SYSTEMATIC ACCOUNT

Class INSECTA

Order ORTHOPTERA

Family ACRIDIDAE

1. *Oedipoda himalayana* Uvarov

1925. *Oedipoda himalayana* Uvarov, *Mission Babault Prov. Centr. 1, Inde et 1 Himal. Orthot., Acrididae* : 22.

Diagnostics : Antennae longer than head and pronotum together; head rugose; median carina of pronotum raised throughout, scarcely lower in metazona, lateral carinae in the anterior part of the prozona not strongly raised and not tubercle-like; posterior part of prozona in front of transverse groove with 2 depressed oval pits on the sides of median carina; prosternal tubercle absent; apical half of tegmina transparent; wings rosy at the base, the dark band joined by all its base to the anterior arm and fully reaching the posterior margin of the wing behind; hind femora narrower than the tegmina; dorsal carina of hind femora in the apical part indented by a ledge or clearly lowered.

Material examined : 1 male, Pool, 10.vi. 2002, coll. S.K. Thakur; 12 males 3 females, 2 nymphs, Gechang, 8 km from PWD Rest House Sagnam, 10.x.2002, Coll. S.K. Thakur.

Distribution : India (Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh).

Habitat : Found at the altitude ranging from 1800 to 4500 m in the Himalayan region.

2. *Sphingonotus longipennis* Saussure

1884. *Sphingonotus longipennis* Saussure, *Prodr. Oedipod.*, 203.

1884. *Sphingonotus indus* Saussure, *Prodr. Oedipod.*, 204.

1925. *Sphingonotus longipennis*, Uvarov, *Mission Babault Prov. Centr. 1, Inde et 1 Himal. Orthot., Acrididae* : 17.

Diagnostics : Body large; prosternal tubercle absent; median carina of pronotum intersected by transverse grooves; tegmina well developed; hind wing base sky-blue-greenish; the dark band of the wing long, in the form of a quarter circle, nearly reaching the inner margin; hind tibiae with 2 dark bands; last abdominal sternite in female with a notch in the middle of posterior margin.

Material examined : 5 males, 10 females, Mudh, 14 km NE of Sagnam, 9.x.2002, Coll. S.K. Thakur.

Distribution : India (Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Punjab, Rajasthan, Uttar Pradesh and West Bengal); Afghanistan, Bangladesh, East Nepal, SE Tibet.

Habitat : Found on the surface of ground without dense vegetation and also on rocky or pebble banks of river, hill streams and sandy areas.

Remarks : Uvarov (1925 : 17) stated that the only differences between *S. longipennis* and *S. indus* of Saussure could be found in the colouration of hind wings, which are described as hvalinous and with a narrow fascia in *indus* and blue with a broad fascia in *longipennis*. He studied a series of specimens, which can be nothing else than *S. indus*. It shows that the wings are always blue, though the intensity of the colour varies individually as it does in some other species. As for the width of fascia, it is also subject to individual variations. Uvarov (1925) noticed that the area of distribution of both species is also the same.

3. *Paraconophyma scabra* (Walker)

1870. *Caloptenus scabra* Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 707.

1921. *Paraconophyma scabra*, Uvarov, *Ann. Mag. Nat. Hist.*, (9)7 : 501.

Diagnostics : Small in size; colour dark brown, with black markings; foveolae of vertex lateral; prosternal tubercle present; fastigium reclinate, sloping towards frontal ridge; median carina of pronotum crossed by 2-3 sulci; lateral carinae developed before the first sulcus only and clearly convergent behind; hind tibiae muddy green with a pale sub-basal ring; female anal segment with a median emargination; female ovipositor valves long, the upper pair shorter than the lower which is dentate basally.

Material examined : 1 female, Mudh, 14 km NE of Sagnam, 9.x.2002, Coll. S.K. Thakur.

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

4. *Dnopherula (Aulacobothrus)* sp.

1896. *Dnopherula* Karsch, *Stettin ent. Ztg.*, 57 : 259.

1902. *Aulacobothrus* Bolivar, *Annl. Soc. ent. Fr.*, 70 : (1901) : 597.

1971. *Dnopherula (Aulacobothrus)*, Jago, *Pro. Acad. nat. Sci. Philad.*, 123(8) : 245, 291.

Diagnostics : Antennae long and filiform; foveolae visible from above; fastigium with truncate apex; frontal ridge without lateral carinae; prosternal tubercle absent; tegmina and wings not long, narrow and pointed; stridulatory serrations present on inner side of hind femur.

Material examined : 1 male (nymph), Mudh, 14 km NE of Sagnam, 3.vi.2002, Coll. R.M. Sharma.

Distribution : The genus is distributed throughout the world.

Remarks : Ingrisch (1993 : 314) stated that the genus *Dnopherula* usually lives in anthropogenic disturbed habitats. Species of the genus usually occupy a vast range. Due

to variations of the ecological pre-requisites in large areas of distribution, individual variability is large. Developments under dry or wet seasonal conditions might further contribute to variations. Good characters for separating the species are possibly behavior and stridulation.

4. *Chorthippus* (*Chorthippus*) sp.

1852. *Chorthippus* Fiaber, *Keich Orthopt.* Oberschies, 1 : 1, 4.

1971. *Chorthippus* (*Chorthippus*), Jago, *Proc. Acad. nat. Sci. Philad.*, 123(8) : 259.

Diagnostics : Head short; foveolae long, narrow and lateral not visible from above; antennae slender, not thickened at apex; prosternal tubercle absent; pronotum with lateral carinae, which are straight or concave in the anterior part; tegmina and wings short; hind femora with rounded dorsal lobes.

Material examined : 1 male, 4 females (nymph), Mangthang near PWD Rest House, Saganam, 11.x.2002, Coll. H.S. Mehta.

Distribution : The genus is distributed in Europe, North Africa, Asia and North America.

SUMMARY

Diaboloocatantops innotabilis (Walker), *Chorthippus* (*Chorthippus*) *indus* Saussure and *Sphingonotus e. eurasius* Mistch. are studied from Lahaul & Spiti district of Himachal Pradesh somewhere else. Five species (2 up to generic level) are recorded for the first time from Pin Valley National Park, which is also located in the same district.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata and Dr. R.M. Sharma, Scientist C & Officer-in-Charge High Altitude Zoology Field Station, Solan for providing opportunity to workout the collection.

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INSECTA : DERMAPTERA

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INTRODUCTION

Dermaptera are commonly known as Earwigs. Which include hygrophilous and secretive insects. These are mainly characterized by three segmented tarsi and a pair of unsegmented, chitinous cerci or forceps at the hind end of body.

Earwigs are distributed almost all over the world right from oasis in desert to a high altitude up to 4500 m but attain their maximum development in terms of multiplicity of individual and diversity in tropical areas. They occur in a variety of habitats, such as dead and decaying matter, bamboo, and sugar cane stem sheaths, leaf axils, flowers, under the loose bark of trees and occasionally in birds and ants nests. A few species are termitophilous also. In nature they generally occur in small groups but solitary individuals are also found. Parental care is common in these insects.

Economically these insects are considered important as biological regulators. In Philippines *Euborellia* sp. has been used to control the population of Asian corn borer, *Lostrinia furnacalis* (Guene'e). Besides five other species of earwigs are effective predators of above corn borer. A few species have been observed to cause damage to tender shoots, leaves, and flowers. Groundnut crop is also destroyed sometimes by boring through the tender pods.

About 2000 species are known all over the world, of which, 320 are recorded from India and adjacent countries. A total of 20 species are found in high altitudes i.e. above 3000 m in Himalaya. *Anechura zubooskii* Semenov is recorded from the Pin Valley National Park for the first time. No other prior record exists. However, two species, namely *Isolaboides burri* (Borelli) and *Forficula schlagintweiti* (Burr) are known from Lahaul & Spiti district within which this National Park is situated.

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SYSTEMATIC ACCOUNT

Superfamily FORFICULOIDEA

Family FORFICULIDAE

Subfamily ANECHURINAE

1. *Anechura zubovskii* Semenov

1901. *Anechura zubovskii* Semenov, *Horae. Soc. Ent. Ross.*, **35** : 188
1955. *Anechura bipunctata pirpanjalae* Singh, *Agra Univ. J. Res., (Sci.)*, **4(1)** : 182
1966. *Anechura pirpanjalae* Kapoor, *Ann. Mag. nat. Hist.*, **13(9)** 391.
1975. *Anechura zubovskii*, Steinmann, *Fol. ent. hung.*, **28** : 162.

Diagnostics : General colour black to brownish, somewhat shining, sides of pronotum yellow, elytra and wings with a yellow spot. Pronotum transverse. In males pygidium transverse, rectangular, sloping backwards; ultimate tergite transverse, tumid above base of forceps, exterior angle with a sharp ridge and forceps with branches stout, undulated, armed at base above with a short conical tooth, often poorly developed, another small tooth at base ventrally on internal margin present.

Material examined : Debsa, Pin Valley National Park, L & S district, Himachal Pradesh, 4 males & 4 females, 05.vi.2002, Coll. R.M. Sharma.

Distribution : India (Himachal Pradesh, Kashmir, and Sikkim) and China (SW), Tibet.

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INSECTA : HYMENOPTERA : FORMICIDAE

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INTRODUCTION

Among all the wide diversity of insect life on earth, ants are one of the few forms universally recognized. This is because they are found in all terrestrial habitats such as seacoast, deserts, mountains, deep in the soil and tips of the trees. They occupy almost every habitat.

Ants have the most highly organized social life among all the insects. The major factor responsible for their ecological success is division of labour. They live in highly organized and well-established community with hundreds and thousands of individuals of distinct forms.

Bingham's (1903) fauna is the main source of knowledge on ants. Wroughton (1892) provided a good account of Formicidae mainly from Maharashtra. Chapman and Capco (1951) published a checklist of ants of Asia. Chhotani and Maiti (1977) worked on the Ants of Andaman islands. Pajni and Suri (1978) reported the Formicid fauna of Chandigarh. Bolton (1995) has dealt with the taxonomic and zoogeographical census of the extant ant taxa (Hymenoptera: Formicidae). Tiwari (1997) has worked out the ants of Delhi and Tiwari, Kundu, Roychoudhury and Ghosh (1998, 2003) have dealt with the ants of West Bengal and Sikkim. Mathew and Tiwari (2000) reported the Formicid fauna of Meghalaya, Bharati (2001, 2002) provided a checklist of ants of North India.

The present study is based on the material collected from cold desert area of Himachal Pradesh (Pin Valley National Park) by Scientists of High Altitude Zoology Field Station, Solan.

Abbreviations used

R. Paliwal	R.P
T. R. Sharma	T. R. S
R. M. Sharma	R. M. S
H. S. Mehta	H. S. M

The manuscript deals with seven ant species belonging to five genera under two subfamilies; Formicinae and Myrmicinae of family Formicidae of Order Hymenoptera. Out of seven species, one species (*Prenolepis indica*) is a new record from Himachal Pradesh.

List of Ant species recorded from Pin Valley National Park

Class INSECTA

Order HYMENOPTERA

Family FORMICIDAE

Subfamily FORMICINAE Lepeletier

Tribe **Camponotini** Forel

1. *Camponotus (Tanaemyrmex) invidus* Forel

Tribe **Prenolepidini** Forel

2. *Prenolepis indica* Forel

Tribe **Formicini** Forel

3. *Formica (Serviformica) fusca* Linnaeus
 4. *Formica (Serviformica) rubibarbis* Fabricius
 5. *Formica sanguinea* Latreille

Subfamily MYRMICINAE Lepeletier

Tribe **Myrmicini** Fred. Smith

6. *Myrmica rugosa* Mayr

Tribe **Pheidolini** Emery

7. *Aphaenogaster (Attomyrma) sagei* Forel

Ants have three distinct forms—the fertile female (♀), the fertile male (♂) and a worker (major or minor). The largest form of worker is a soldier.

Identification key is based on the worker caste of an ant.

Key to the sub-families of family FORMICIDAE

- A. Pedicel of the abdomen one jointed FORMICINAE
 B. Pedicel of the abdomen two jointed MYRMICINAE

Antennae 12 jointed, maxillary palpi 6 jointed Family Formicidae.

Key to the genera of family FORMICIDAE

- I Antennae inserted at a perceptible distance from the posterior margin of clypeus.
- (1) Thorax and node of pedicel neither dentate nor spinous nor with the angle markedly produced, basal two abdominal segments equal or subequal in length. Head not truncate anteriorly *Camponotus*
- II Antennae inserted immediately above posterior margin of clypeus almost touching it.
- (1) Antennal and clypeal hollow not distinct *Prenolepis*
- (2) Antennal and clypeal hollow not distinct *Formica*

Key to the genera of family MYRMICINAE

Antennae 12 jointed. Posterior margin of clypeus produced between bases of antennae. Pronotum not armed. Erect hairs on body simple. First node of pedicel not dentate posteriorly, flagellum of antennae scarcely thickened towards apex without distinct club.

- (1) Calcaria of posterior pair of leg pectinate *Myrmica*
- (2) Calcaria of posterior pair of leg not pectinate, simple *Aphaenogaster*

SYSTEMATIC ACCOUNT

Family FORMICIDAE

Subfamily FORMICINAE Lepeletier

Tribe Camponotini Forel

Genus *Camponotus* Mayr

1. *Camponotus (Tanaemyrmex) invidus* Forel

1892. *Camponotus indivus* Forel J. *Bombay nat. Hist. Soc.*, 7 : 225 & 224, W

1995. *Camponotus (Tanaemyrmex) invidus* Bolton. *A new Genl. Cat. Ants. World Harvard Univ. Press* : 105

Material Examined : Chindang–4 exs, 30.5.2001, TRS coll. Debsa–1 exs, 5.6 2002, RMS coll Gulling–10 exs, 28.5.2001 TRS coll. Gulling–2 exs, 2. 06 .2002, RMS coll. (4 exs retained).

Diagnosis : Head, thorax and abdomen pale yellow with very sparse erect yellowish pubescens. Head from in front more or less elongate, oval,, sides of the head straight, mandibles with 6 teeth minor and 7 teeth in major. Thorax convex anteriorly, strongly compressed laterally and posteriorly, with the pro, meso and metanotum more strongly curved. Node of the pedicel low, convex in front, flat posteriorly. Abdomen comparatively long and massive.

Distribution : India : Sikkim, Andaman and Nicobar Islands, Orissa, W. Bengal, Himachal Pradesh, Delhi.

Tribe **Prenolepidini** Forel

Genus *Prenolepis* Mayr

2. *Prenolepis indica* Forel

1894. *Prenolepis indica* Forel J. *Bombay nat. Hist. Soc.* Viii : 407, 408 and 409, ♀, ♂.

Material Examined : Chindang-3 exs, 30.5.2001. T.R.S coll. (1 ex. retained)

Diagnosis : Brownish yellow covered with abundant short thick erect hairs. Head quadrangular, broad posteriorly not polished. Clypeus very convex, rounded about as broad as long. Mandibles moderately broad, dentate (armed with 5 teeth), the scape of antennae extending beyond the top of the head by about one quarter of its length. Thorax-pro and mesonotum broad and convex, slightly constricted, deeply emarginated at the meso-metanotal suture. Node of pedicel low, flat, transverse above, fitting into a hollow in the front of the abdomen. Abdomen moderately broad.

Distribution : India : Bengal, Western and Central India, Maharashtra.

Elsewhere : Sri Lanka

Remarks : Recorded for the first time from Himachal Pradesh.

Ocelli present. Node of pedicel flat, 4th joint of maxillary palpi only a little larger than the Genus *Formica*

Key to the species of genus *Formica*

- I Anterior border of clypeus not emarginated.
1. Fuscous or brownish red, head darker than rest of the body. Abdomen opaque not shining *F. fusca*
 2. Head and thorax clear yellowish red, abdomen light fuscous brown *F. rufibarbis*
- II. Anterior border of clypeus emarginated.
1. Head, thorax and leg slightly fuscous, abdomen fuscous brown or black.
..... *F. sanguinea*

Tribe **Formicini** Forel

Genus *Formica* Linnaeus

3. *Formica (Serviformica) fusca* Linnaeus

1758. *Formica fusca* Linnaeus. *Syst. Nat. id.* 101 : 580 W

1995. *Formica fusca* Bolton. *A New Genl. Cat. Ants World Harvard Univ. Press* : 195.

Material Examined : Sagnam-3 exs, 11. 9. 2000, R. P. coll., Tabo-40 exs, 14. 9. 2000, R. P. coll. (10 exs retained), Gulling-22 exs, 28. 5. 2001, T.R.S coll., Mangdang-5 exs, 29. 5. 2001.T.R.S coll., Chingdang-16 exs, 30. 5. 2001 T.R.S coll., 3 Kms from Sagnam-45 exs, 31.5.2001, T.R.S coll. (30 exs retained), Debsa-14 exs, 5.6.2001 R. M. S. coll., Thango-3 exs, 26.6.2001 T.R.S coll. (1 ♀), Gulling-16 exs, 2.6.2002, R. M. S. coll., Sagnam R H along Parahio R.-11 exs, 5.6.2002, R.M.S coll., Muth-5 exs, 9.10.2002, H. S. M. coll.

Diagnosis : Head shorter, viewed from side strongly convex, mandibles triangular with a broad dentate masticatory margin, the apical tooth acute and curved. Clypeus very acutely medially carinate. Thorax a little narrower than the head, the pro and mesonotal suture well marked, the meso-metanotal sutures very deep. Node of pedicel somewhat thick, more convex in front, more or less flat posteriorly. Abdomen depressed and broad.

Distribution : India : Himachal Pradesh, Sikkim, Madhya Pradesh, Uttar Pradesh and Kashmir.

Elsewhere : Widely spread throughout Europe, North Africa, North America, Northern Asia.

Tribe Formicini Forel

4. *Formica (Serviformica) rufibarbis* Fabricius

1791. *Formica (Serviformica) rufibarbis* Fabricius *Ent. Syst.* 2, : 355, W

1995. *Formica (Serviformica) rufibarbis* Fabricius Bolton. *A New Genl. Cat. Ants World Harvard Univ. Press* : 202.

Material examined : Sagnam-12 exs, 11.9.2000, R. P. coll., Lara-2 exs, 13.9.2000, R. P. coll., Lara-11 exs, 13.9.2000, R. P. coll., Tabo-28 exs, 14.9.2000, R. P. coll. (10 exs retained), Gulling-5 exs, 28.5.2001 T. R. S coll., Gulling-17 exs, 28.5.2001 T. R. S coll., Mangdong-10 exs, 29.5.2001 T. R. S coll., Chingdang-13 exs, 30.5.2001 T. R. S coll., Debsa-13 exs, 30.6.2001 R. M. S coll. (5 exs retained), Thango-10 exs, 26.6.2001 T. R. S coll., Sagnam-8 exs, 1.6.2002 R. M. S coll., Gulling-13 exs, 2.6.2002 R. M. S coll., Muth-29 exs, 3.6.2002 R. M. S coll. (5 exs retained), Sagnam R H-13 exs, 5.6.2002 R. M. S coll., Gechang-40 exs, 6.6.2002 R. M. S. coll., Kaa vill.- 23 exs, 6.6.2002 R. M. S coll. (6 exs retained), Kaa vill.-12exs, 6.6.2002 R. M. S. coll., Muth-30 exs, 9.10.2002 H. S. M. coll. (9 exs retained).

Diagnosis : Head shorter, mandibles broad triangular, the scape of antennae extending well beyond the top of the head. The pro-mesonotal suture well marked. The constriction at the meso-metanotal suture well deep. Node of pedicel flat or slightly convex both anteriorly and posteriorly. Abdomen almost as broad as long.

Distribution : India : Himachal Pradesh (Dharamsala, Lahaul), Sikkim.

Elsewhere : Europe, North America.

Tribe **Formicini** Forel5. *Formica sanguinea* Latreille

1798. *Formica sanguinea* Latreille *Ess. Hist. Fourm* p. 37

1894. *Formica sanguinea* Forel, *J. Bombay nat. Hist. Soc.* Xii, p. 402,

Material examined : Muth-12 exs, 3.6.2002, R. M. S. coll. (5 exs retained), Sagnam-5exs, 11.9.2000, R. P. coll., Yashi nr Sagnam-43exs, 25.5.2001, T. R. S. coll. (15 exs retained), Gulling-1exs, 28.5.2001, T. R. S. coll., Gulling-9 exs, 28.5.2001, T. R. S. coll., Mangdong-20exs, 29.5.2001, T. R. S. coll. (8exs retained), 3 Kms from Sagnam-10exs, 31.5.2001, T. R. S. coll., Debsa-2exs, 5.6.2001, R. M. S. coll., Sagnam-6exs, 27.6.2001, T. R. S. coll., Sagnam - 6exs, 1.6.2002, R. M. S. coll., Gulling-7exs, 2.6.2002, R. M. S. coll., Muth-12exs, 3.6.2002, R. M. S. coll. (5 exs retained), 5 Kms Sagnam R H along Parahio-9exs, 5.6.2002, R. M. S. coll., Debsa-8exs, 5.6.2002, R. M. S. coll., Kaa vill.-2exs, 6.6.2002, R. M. S. coll., Gechang-3exs, 10.10.2002, H. S. M. coll.

Diagnosis : Head nearly square, posteriorly distinctly emarginated, mandibles strongly broad and clearly dentate, the scape of antennae extending well beyond the head. Thorax narrower than the head, the pro-mesonotal suture distinct, the meso-metanotal suture deep and broad. Node of the pedicel triangular, slightly biconvex very broad and transverse above, the lateral angle rounded, abdomen depressed as broad as long.

Distribution : India : Himachal Pradesh, Lahaul, frontier of Tibet.

Elsewhere : Northern Europe, Asia, America.

Subfamily MYRMICINAE Lepeletier

Tribe **Myrmicini** Fred. SmithGenus *Myrmica* Latreille6. *Myrmica rugosa* Mayr

1865. *Myrmica rugosa* Mayr, *Novara Reise, Zool Formicid*, 19 W

1983. *Myrmica rugosa* Datta and Raychaudhuri AKITTUN. Ser. 56 : 8

Material examined : Tabo-42 exs, 14.9.2000, R. P. coll. (11 exs retained), Gulling-10 exs, 28.5.2001, T. R. S. coll., Sagnam-1 exs, 27.6.2001, T. R. S. coll., Sagnam-2 exs, 1.6.2002, R. M. S. coll., Kaa vill.- 2 exs, 6.6.2002, R. M. S. coll., Muth-2 exs (?), 3.6.2002, R. M. S. coll., Lara-1 exs, 13.9.2002, R. P. coll.

Diagnosis : Brownish black ant. Head convex, longitudinally striate, mandibles longitudinally striate, the masticatory margin denticulate, the apical tooth very acute. The scape of antennae not passing beyond the top of the head. Thorax elongate, more or less longitudinally rugose, straight, impressed at the mesonotal suture, metanotal spines long, as long as basal face of metanotum pointing backwards. Pedicel the first node longer than broad, 2nd node quadrate. Abdomen oval.

Distribution : India : Sikkim, Himalayan states, N. W. India, Himachal Pradesh.

Tribe **Pheidolini** Emery

Genus *Aphaenogaster* Mayr

7. *Aphaenogaster (Attomyrma) sagei* Forel

1902. *Aphaenogaster (Attomyrma)sagei* Forel, *Rev. Suisse Zool.*, 10 : 221, F.M

1951. *Aphaenogaster (Attomyrma) sagei* Chapman and Capco, *Checklist of ants Asia*, 1 : 132

Material examined : Gulling–11 exs, 2.6.2002 R. M. S coll. (5 exs retained).

Diagnosis : A beautiful shining polished black ant. Head rectangular, longitudinally striate, the posterior lateral angles rounded. Mandibles broadly triangular. The scape of antennae passing beyond the top of the head by about one fourth of its length. Thorax irregularly longitudinally striate. Pronotum not constricted into a neck, pro and mesonotum forming one continuous convexity, the pro–mesonotal suture well marked, the meso–metanotal suture deep. Metanotum armed with two short spines which are thick at base, acute at apex. Pedicel the first joint with the node conical, rounded above, petiolate in front and posteriorly, 2nd joint longer than broad.

Distribution : India : Meghalaya, Himalayas, Haryana, Chandigarh (Punjab), Himachal Pradesh.

Elsewhere : Tibet

SUMMARY

The present paper deals with seven ant species belonging to five genera under two subfamilies (*Formicinae* and *Myrmicinae*) from Pin Valley National Park. Out of seven species one species (*Prenolepis indica*) is a new record from Himachal Pradesh.

ACKNOWLEDGEMENTS

We wish to express our deep sense of gratitude to Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata for support and facilities for our research work. We are also thankful to Dr. R.M. Sharma, Scientist C & Officer-in-Charge, High Altitude Zoology Field Station, Solan for providing us an opportunity to study the material sent by him.

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INSECTA : HYMENOPTERA : ACULEATA (VESPIDAE AND SPHECIDAE)

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INTRODUCTION

The first consolidated account of aculeate Hymenoptera (Wasps and Bees) of the Indian subcontinent was published by Bingham (1897). Some new species of wasps were described from Shimla by Cameron (1902). Subsequently, Das & Gupta (1983) catalogued families Stenogastridae and Vespidae from the Indian sub region and published a monographic account of Vespidae from India and adjacent countries in 1989.

Archer (1981), Williams (1983, 1988) recorded some species of the family Vespidae from different localities of Kashmir and Ladakh. Gupta (1997, 2004) published accounts of aculeate Hymenoptera from Nanda Devi Biosphere Reserve and Gobind Pashu Vihar, western Himalayas, based on the identifications of the material from these areas.

The present account is based on the identification of a part of the material of Hymenoptera collected from Pin Valley National Park, Himachal Pradesh. This account contains seven species belonging to the families Vespidae (four species) and Sphecidae (three species). Of the four species of Vespidae, three species (*Polistes associus*, *Dolichovespula asiatica* and *Vespula germanica*) are new records from Himachal Pradesh. The three species of family Sphecidae (*Bembix latitarsus* and two undetermined species of *Podalonia*) are also new records from Himachal Pradesh.

Family VESPIDAE

1. *Polistes (Polistes) nimpha* (Christ)

Material examined : INDIA : Himachal Pradesh : Lahaul & Spiti district., Attargu, Kaza, 2 W, 2♂, 12.ix.2000, Lara village, 8 km from Kaza, 3♂, 13.ix.2000, Tabo, Kaza, 1 W, 14.ix.2000. R. Paliwal & party; Kinnaur district, Yangthang, 1W, 13.x.2002, H.S. Mehta & party.

Distribution : INDIA : Himachal Pradesh, Jammu & Kashmir (Ladakh).

Elsewhere : Palaearctic Asia to Manchuria, central & southern Europe and North Africa.

Remarks : Das & Gupta (1983) recorded this species from India (Jammu & Kashmir : Risin Gorge in Kashmir, Drass in Ladakh; Himachal Pradesh : Solan, Kangra) for the first time.

2. *Polistes (Polistes) associus* Kohl

Material examined : INDIA : Himachal Pradesh : Kinnaur district, Yangthang, 1♂, 13.x.2002, H.S. Mehta & party.

Distribution : INDIA : Himachal Pradesh, Jammu & Kashmir.

Elsewhere : Europe.

Remarks : Das & Gupta (1983) recorded this species from India (Jammu & Kashmir : Risin Gorge, Srinagar) for the first time. This is a new record for Himachal Pradesh.

3. *Dolichovespula asiatica* Archer

Material examined : INDIA : Himachal Pradesh : Lahaul & Spiti district, Kalamurti village, ca 20 kms. from Kaza, 3 W, 9.ix.2000, Mudh village, 14 kms. N.E, P.W.D Rest House Sagnam, 1 W, 9.x.2002, H.S. Mehta & party.

Remarks : Archer (1981) included Gulmarg (Kashmir) as one of the localities during his description of this species. Subsequently, Williams (1983 & 1988) recorded it from different localities of Kashmir (Gulmarg, Apharwat, Daksum, Nigagar, Thajiwass Nar) and Ladakh (Drass, Samdo near Nartselang) in India This is a typically high altitude species with ranges from 2700–4120 m. in India and builds elaborate aerial nest. This is a new record for Himachal Pradesh.

Distribution : INDIA : Himachal Pradesh, Jammu & Kashmir (Ladakh & Kashmir).

Elsewhere : Afghanistan, China (Sinkiang) and Turkmenistan.

4. *Vespula germanica* (Fabricius)

Material examined : INDIA : Himachal Pradesh : Kinnaur district, Yangthang, 7 W, 13.x.2002, H.S. Mehta & party.

Distribution : INDIA : Himachal Pradesh, Jammu & Kashmir (Ladakh and Karakoram).

Elsewhere : China, Korea, Russia [southern Primore's (Lake Khauka), Zabaikal'e Altai]; widely distributed in Europe and introduced in eastern North America, absent from Japan and Taiwan.

Remarks : Yamane, Wagner & Yamane (1980) recorded this species from Shardu (sic for

Skardu) in Karakoram. Subsequently, Williams (1983, 1988) recorded it from different localities of Ladakh (Nimbu, Leh, Mulbekh, Khalsi), ranging in altitude from 3000–3500 m. This is a new record for Himachal Pradesh. This species has been considered a pest with records of attack on human beings.

Family SPHECIDAE

5. *Bembix latitarsus* Handlirsch

Material examined : INDIA : Himachal Pradesh; Lahaul & Spiti district Lara village, 8 kms from Kaza, 1 ♀, 13.ix.2000, R.Paliwal & party.

Distribution : INDIA : Himachal Pradesh, Uttarakhand (Mussoorie).

Elsewhere : Pakistan.

Remarks : Originally described from unknown locality of Himalayas, it has been recorded from Gilgit in Kashmir and Mussoorie in western Himalayas. This is a new record from Himachal Pradesh.

6. *Podalonia* sp. 1

Material examined : INDIA : Himachal Pradesh : Lahaul & Spiti district, Sagnam village, 1 ♀, 1.vi.2002. Mudh village, 2 ♀, 3.vi.2002, 5 kms. from Sagnam Rest House along Parahio River, 2 ♀, 5.vi.2002, Debsa (Core Zone), 4 ♀, 5.vi.2002, R.M. Sharma & Party.

Remarks : This species resembles *P. hirticeps* (Cameron) from Pakistan and *P. laeta* (Bingham) from Afghanistan, in having basal three or four abdominal segments red and rest of the integument black. This, however, differs in having pubescence and vestiture entirely black. *P. hirticeps* bears silvery pubescence on clypeus and front, while in *P. laeta* pubescence on median segment is yellowish white. The specific determination of this species requires direct comparison with other known Palaearctic species, since specific determination in *Podalonia* is considered to be difficult. The collection data suggests that this species is not uncommon in the area concerned. The species of the genus *Podalonia* are ectoparasitoids of lepidopterous larvae, mostly the nocturnal feeding caterpillars of the family Noctuidae.

7. *Podalonia* sp. 2

Material examined : INDIA : Himachal Pradesh; Lahaul & Spiti district, Lara village, 8 km from Kaza, 1 ♀, 13.ix.2000, R. Paliwal & party.

Remarks : The single female specimen is close to that of *P. laeta* Bingham of Afghanistan, in having three basal abdominal segments red and rest of the integument black. It can be differentiated by having propodeal dorsum finely and obliquely striated instead of being finely and closely punctuate.

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INSECTA : LEPIDOPTERA : RHOPALOCERA

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INTRODUCTION

Broadly speaking, the Himalayan butterflies fall into two major ecological groups, *viz.* (i) the forest species and (ii) the hypsobiont species. The forest forms are by and large confined to the more or less densely wooded mountain slopes of the lower and middle altitudes of Himalayan ranges and valleys, whereas the hypsobiont species are true inhabitants of high altitudes that never occur below the timberline (Mani, 1986). However, there are transitional forms between these two groups.

Himalayan butterflies are said to have been better studied than most other insect groups. Approximately, six hundred and ninety species are recorded from the entire Himalayan region (Haribal, 1992) of which, 288 species occur in Himachal Pradesh (Arora *et al.* 2005). In fact, there is no published account of butterflies from Pin Valley area (cold desert) in particular, however, based on old records and collections Arora *et al.* (2005) have enumerated 22 species from Lahaul & Spiti district (given as appendix at the end) in addition to the ones actually collected from the park. During the course of surveys as many as 14 species belonging to 11 genera spread over four families could be collected from the park area. Previous records and the present study make the number of species known from the district as 36 belonging to 24 genera. The nomenclature followed here is after Varshney (1993, 1994, & 1997).

SYSTEMATIC ARRANGEMENT OF BUTTERFLIES RECORDED FROM PIN VALLEY NATIONAL PARK

Family PAPILIONIDAE

Subfamily PAPILIONINAE

Tribe Papilionini

1. *Papilio demoleus* Linn.
2. *Papilio machaon* Linn.

Family PIERIDAE
 Subfamily PIERINAE
 Tribe **Pierini**

3. *Pieris canidia* Evans
4. *Pieris brassicae* Linn.
5. *Pontia daplidice* Linn.

Subfamily COLIADINAE

6. *Colias electo* Linn.
7. *Colias erate* (Esper.)

Family NYMPHALIDAE
 Subfamily BIBLIDINAE
 Tribe **Argynnini**

8. *Phalanta phalantha* Drury
9. *Issoria lathonia* (Linn.)

Subfamily NYMPHALINAE
 Tribe **Vanessidi**

10. *Cynthia cardui* (Linn.)
11. *Vanessa indica* Herbst.
12. *Aglais cashmirensis* Kollar

Family LYCAENIDAE
 Subfamily POLYOMMATINAE
 Tribe **Polyommagini**

13. *Pseudozizeeria maha* Kollar

Subfamily LYCAENINAE
 Tribe **Lycaenini**

14. *Heliophorus odo* Hewitson

SYSTEMATIC ACCOUNT

1. *Papilio demoleus* Linn. The Lime Butterfly

1758. *Papilio demoleus* Linnaeus, *Syst. Nat.* ed. 10 : 464
 1895. *Papilio demoleus* : Rothschild, *Nov. Zool.*, 2 : 279
 1907. *Papilio demoleus* : Bingham, *Fauna Brit. India Butterflies*, 2 : 39
 1939. *Papilio demoleus* : Talbot, *Fauna Brit. India Butterflies*, 1 : 187

1993. *Papilio demoleus* : Varshney, *Oriental Insects*, 27 : 352

Material examined : 1 ex., along river Parahio, 5.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 68-100 mm Male and female tail-less and look alike. Predominantly black with dusky black head and dark reddish brown antennae; fore wings black with yellow on basal half of cell and below it, forming more or less complete transverse dotted lines.

Distribution : This is one of the commonest butterflies in the Indian region with its distribution extending from northern Myanmar to Persia and Arabia.

2. *Papilio machaon* Linn. The Common Yellow Swallowtail

1758. *Papilio machaon* Linnaeus, *Syst. Nat. ed.* 10 : 464

1939. *Pieris canidia* : Talbot, *Fauna Brit. India Butterflies*, 1 : 192

1993. *Papilio machaon* : Varshney, *Oriental Ins.*, 27 : 352.

Material examined : 1 ex., along river Parahio, 5.6.2002, R. M. Sharma & Party.

Diagnostics : Wing expanse : 75-90 mm. Male and female tailed. Under parts of forewings with basal area black, dusted with yellow scales. Discal area yellow with black veins. Under parts of hindwing : basal half of wing yellow with black veins, outer half black with a series of obscure blue spots and a marginal series of yellow crescents. Blue-topped red spot at tornus.

Distribution : In Himalayas it is common to about 16,000 ft. descending to 2000 ft. in Kashmir but not below 4000 ft. in Himachal Pradesh or 8000 ft. in Sikkim.

3. *Pieris canidia* Sparrman The Indian Cabbage White

1768. *Pieris canidia* Sparrman, *Amaen. Acad.*, 7.

1939. *Pieris canidia* : Talbot, *Fauna Brit. India Butterflies*, 1 : 425

1957. *Pieris canidia* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 433

1993. *Pieris canidia* : Varshney, *Oriental Insects*, 27 : 357

Material examined : 2 exs., Sagnam & around, 4.6.2002, R.M.Sharma & Party.

Diagnostics : Wing expanse : 45-60 mm. The upperside of the forewing white, with a black apical area and a black outer margin, which is dentate inwardly. The underside of the forewing white. The underside of the hind wing uniform, dusted with grey.

Its flight is weak and it generally keeps close to the ground. It is often seen flying in the open places and frequently settles on flowers.

Distribution : In India Kashmir to Arunachal Pradesh extending to Pakistan and Myanmar. One of the most common pierid found throughout its range of distribution from about 1200 feet to 11000 feet in Himalaya.

**4. *Pieris brassicae* Linn.
The Large Cabbage White**

1939. *Pieris brassicae* : Talbot, *Fauna Brit. India Butterflies*, 1 : 426

1957. *Pieris brassicae* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, 434

1993. *Pieris brassicae* : Varshney, *Oriental Insects*, 27 : 357

Material examined : 3 exs., Mud and around, 6.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 65-75 mm. Male white with black apex forewing and apical spot hind wing. No discal spot on forewing. Underside of hind wing pale yellowish. Female similar with the addition of two discal spots.

Distribution : It is very abundant and one of the commonest of butterflies, ranging all over Europe, Baluchistan and the Himalayas, up to Assam and the plains near the foothills of the Himalayas.

**5. *Pontia daplidice* Linn.
The Bath White**

1758. *Papilio daplidice* Linn. *Systema Naturae*, ed. X.

1939. *Pontia daplidice* : Talbot, *Fauna of British India including Ceylon & Burma*, 1 : 430

1957. *Pontia daplidice* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 435

1993. *Pontia daplidice* : Varshney, *Oriental Insects*, 27 : 358

Material examined : 6 exs., Sagnam and around, 5.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 45-50 mm. Male white, forewing apex black with white spots and lines. Underside blotched with green. Female similar to male but upper side of forewing with discal spot in 1b. Underside with an obscure row of terminal and marginal spots.

Distribution : Common at high altitudes, Baluchistan, Chitral and Kashmir to Shipki. Peshawar.

**6. *Colias electo fieldi* Menetries
The Dark Clouded Yellow**

1855. *Colias fieldi* Menetries, *Enum. Corp. Anim. Mus. Petr.*, 1 : 79

1939. *Colias electo fieldi* : Talbot, *Fauna Brit., India including Ceylon & Burma*, 1 : 562

1957. *Colias electo* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 455
1992. *Colias fieldi* : Haribal, *Butterflies of Sikkim Himalaya*, : 90
1993. *Colias fieldi* : Varshney, *Oriental Insects*, 27 : 364

Material examined : 4 exs., Mikkim vill and around, 4.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 54-65 mm. Male above deep orange- yellow with broad unspotted black outer border. Female similar to male but borders spotted with ground colour, upper side of hind wing heavily dusted with black scaling.

Distribution : Baluchistan to North Punjab, Sikkim, Assam and North Myanmar

7. *Colias erate* (Esper.) The Pale Clouded Yellow

1805. *Papilio erate* Esper, p 13, pl. cxix, fig. 3.
1880. *Colias erate* : Butler, p. 409
1939. *Colias erate* : Talbot, *Fauna British India, including Ceylon & Burma*, 1 : 552
1957. *Colias erate* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 454

Material examined : 1 ex., Sagnam vill & around, R.M. Sharma & Party.

Diagnostics : Wing expanse : 45-55 mm. Male above lemon-yellow. The base of both the wings and the posterior half of the hind wing dusted with black scaling. The forewing bears a small, oval, discocellular black spot. The hind wing bears a fairly large bright orange yellow discocellular spot .The under side is lemon yellow.

Distribution : Himalayas from Chitral to Kumaon. Hills of South India.

8. *Phalanta phalantha* (Drury) The Common Leopard

1770. *Papilio phalantha* Drury, *Exot. Inst.*, 1 : 41
1932. *Atella phalantha* : Evans, *Identification of Indian Butterflies* : 187
1980. *Phalanta phalantha* : Varshney et al. *Rec. Zool. Surv. India, Occ. Paper No.*, 31 : 18.
1994. *Phalanta phalantha* : Varshney, *Oriental Insects*, 28 : 171

Material examined : 1 ex., Ka vill & around, 5.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 50-60 mm. Male and female above, tawny with rows of black spots, no silver markings below as in Fritillaries.

Distribution : Throughout India.

Elsewhere : Myanmar, Nepal and Sri Lanka.

**9. *Issoria lathonia* (Linn.)
The Queen of Spain Fritillary**

1761. *Papilio lathonia* Linn. *Fauna Suec.*, : 282.
1957. *Argynnis lathonia* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 222
1994. *Issoria lathonia* : Varshney, *Oriental Insects*, **28** : 169.

Material examined : 1 ex., Mikkim, Buffer zone, 10.ix.2000, H.S. Mehta and Party.

Diagnostics : Wing expanse : 50-60 mm. In male and female both wings pale reddish brown, fore wings produced; under parts of hind wings yellowish brown with very large silvery spots. Unmistakable, easily distinguished from all other Fritillaries by the very large silver spots on the underside.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Sikkim.

Elsewhere : Bhutan Nepal, Myanmar (Chin Hills) and Pakistan.

**10. *Cynthia cardui* (Linn.)
The Painted Lady**

1758. *Papilio cardui* Linnaeus, *Syst. Nat. ed. 10* : 475
1932. *Vanessa cardui* : Evans, *Identification of Indian Butterflies* : 177
1957. *Vanessa cardui* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 210
1971. *Cynthia cardui* : Field, *Smithson. Contrib. Zool.*, **84** : 37
1994. *Cynthia cardui* : Varshney, *Oriental Insects*, **28** : 175

Material examined : 1 ex., Attargu, 3.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 55-70 mm. Male and female above, pinkish red with black markings. Hind wings with deeper shade of ochreous and brown; an oval spot across middle of cell and the row of medial spots as on upper side.

Distribution : Cosmopolitan probably due to wide range of food plants and migratory habit. In India it is widely distributed from higher hills down to sea level.

Elsewhere : Myanmar and Sri Lanka.

**11. *Vanessa indica* Herbst.
The Indian Red Admiral**

1794. *Papilio indica* Herbst, *Nat. Schmett*, **7** : 171
1957. *Vanessa indica* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 212
1994. *Vanessa indica* : Varshney, *Oriental Insects*, **28** : 175

Material examined : 1 ex., Attargu, 3.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 55-65 mm. Male and female : above, dark brown with red central band. Fore wing divided on the inside by large black spots. Hind wing with black spotted red terminal band.

Distribution : Sri Lanka, Hills of South India, Himalayas as far west as Kashmir.

**12. *Aglais cashmiriensis* Kollar
The Indian Tortoiseshell**

1848. *Vanessa cashmiriensis* Kollar, *In Hugel's Kaschmir und das Reich der Sier*, 4(2) : 442.

1957. *Vanessa cashmiriensis* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, 214

1994. *Aglais cashmiriensis* : Varshney, *Oriental Insects*, 28 : 174.

Material examined : 1 ex., Ka vill. Buffer zone, 6.vi.2002, R.M. Sharma and Party.

Diagnostics : Wing expanse : 55-65 mm. Fore wings chestnut- red, narrower and more produced, cut off at tip and produced at vein 6. Hind wing toothed at vein 4; under parts of hind wing with blue spots inwardly bordered brownish.

Distribution : This is one of the commonest butterflies in the NW Himalayas and found round the year. Found in the Northern hills from Waziristan to Sikkim. The range is from low elevations to about 15,000 ft.

**13. *Pseudozizeeria maha* (Kollar)
The Pale Grass Blue**

1848. *Lycaena maha* Kollar, *in Hugel's Kaschmir und das Reich der Sier*, 4(2) : 422

1907. *Zizeeria maha* : Bingham, *Fauna Brit. India Butterflies*, 2 : 355

1957. *Zizeeria maha* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 284

1997. *Pseudozizeeria maha* : Varshney, *Oriental Insects*, 31 : 96

Material examined : 2 exs., Sagnam & around, 4.6.2002, R.M. Sharma & Party.

Diagnostics : Wing expanse : 26-30 mm. Head, thorax and abdomen bluish above, paler beneath; antennae with white rings. Upperside of both wings in male pale greenish-blue; underside spots encircled with white. Fore wings with a black spot in cell as well as a bar at end of cell; hind wings with three spots across the sub basal area; a curved series of black spots before outer margin; a broad outer border with some small black spots. Female dark brown to fuscous above, with blue scaling. Distinct markings on underside.

Distribution : Throughout India.

**14. *Heliophorus oda* Hewitson
The Eastern Blue Sapphire**

1865. *Ilerda oda* Hewitson, *Ill. Diurn. Lep.* No. 3, 58.

1890. *Ilerda oda* : deNiceville, *Butterflies of India Burma & Ceylon*, 3 : 326

1957. *Heliophorus oda* : Wynter-Blyth, *Bombay Nat. Hist. Soc.*, : 304.

1997. *Heliophorus oda* : Varshney, *Oriental Insects*, 31 : 109

Material examined : 1 ex., Mikkim vill & around, R.M. Sharma & Party.

Diagnostics : Wing expanse : 32-36 mm. No tail only a tooth at v. 2; male deep rich non-metallic silky blue above. Discal lines on underside of forewing straight and prominent; disc flushed with orange. Upperside of hind wing always with red tornal crescents. In female orange patches less extensive. Hind wing less rounded.

Distribution : These are true hill insects and in India they are confined to the Himalayas and the hills of northeast between 2000 and 12000 feet.

SUMMARY

Altogether 14 species of butterflies belonging to 11 genera under four families have been collected and enumerated from cold desert area of Himachal Pradesh encompassing Pin Valley National Park. In addition, a list of 22 species belonging to 13 genera is appended which occur in Lahaul & Spiti district. Out of these, some species might be occurring in the park area.

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APPENDIX

Systematic arrangement of butterflies recorded from Lahaul & Spiti district (as per Arora *et al.* 2005)

Family PAPILIONIDAE
Subfamily PAPILIONINAE
Tribe **Parnassini**

1. *Parnassius hardwickei* Gray
2. *Parnassius stoliczkanus* C & R Felder
3. *Parnassius delphius* Eversmann
4. *Parnassius charltonius* Gray

Family PIERIDAE
Subfamily PIERINAE
Tribe **Pierini**

5. *Baltia butleri* (Moore)
6. *Synchloe callidice* Huebner

Subfamily COLIADINAE

7. *Gonepteryx rhamni* Linn.
8. *Colias eogene* C & R Felder

Family SATYRIDAE
Subfamily SATYRINAE
Tribe **Satyriini**

9. *Aulocera brahminus* Blanchard
10. *Aulocera swaha* Kollar
11. *Aulocera saraswati* Kollar

Tribe **Ypthimini**

12. *Callerebia shallada* Marshall & de Niceville

Tribe **Lethini**

13. *Lasiommata maerula* Felder

Tribe **Maniolini**

14. *Maniola pulchella* Felder & Felder
15. *Maniola pulchra* Felder & Felder
16. *Maniola pulchella* Felder & Felder

17. *Maniola devendra* (Moore)

Subfamily CALINAGINAE

Tribe **Calinagini**18. *Calinaga buddha* Moore

Family NYMPHALIDAE

Subfamily BIBLIDINAE

Tribe **Melitaeini**19. *Melitaea arcesia* Bremer

Subfamily LIMENITIDINAE

Tribe **Limenitidini**20. *Limenitis trivena* Moore

Family LYCAENIDAE

Subfamily LYCAENINAE

Tribe **Lycaenini**21. *Lycaena kasyapa* Moore

Subfamily THECLINAE

Tribe **Eumaeini**22. *Strymon sassanides* Kollar

INSECTA : DIPTERA

BULGANIN MITRA, P. PARUI, M. MUKHERJEE AND R.M. SHARMA*

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INTRODUCTION

Flies, gnats, midges, mosquitoes, keds, etc. are all common names applied to the members of the order Diptera. This tiny group of insects is a major component of virtually all non-marine ecosystems and also spread over to icy continent like Antarctica. The economic importance of the group is immense. We mostly know them as vectors of deadly diseases like malaria, encephalitis, kala azar, dengue etc. Flies also destroy our food especially grains and fruits. Outside their obviously essential roles in maintaining our ecosystem, flies are of little direct benefit to man. They are model organisms for comparative research in genomic development, neurobiology and behaviour (e.g., fruit flies, mosquitoes, house flies), some are biological control agents of weeds and other insects and some act as pollinators of various agricultural crops and wild plants.

With an estimated 1, 50,000 described species in the world, dipterans or true flies, are one of the most diverse groups. The order probably arose in the Permian, and the main lineages of flies were present in the Triassic. Flies are minute to medium size, rarely large, usually with good flight abilities. Adults are free-living, rarely parasites, larvae terrestrial or aquatic, sometimes parasitic, concealed in various organic substrates, food habits of both highly variable.

Studies on Diptera of Himachal Pradesh dates back to Brunetti (1917). There after Datta (1985, 1992) and Parui *et al* (1999) have contributed but nothing specific has been reported from Pin Valley National Park barring recent reports by Mitra *et al* (2003a & b) wherein 4 species of flower flies are reported from this National park of which one species *Paragus bicolor* (Fabricius) was reported for the first time from India.

Efforts to collect the dipteran fauna of the cold desert area resulted in the enumeration of 11 species under 10 genera of 6 families from this high altitude national park of

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Himachal Pradesh. All the species are reported for the first time from this national park except 4 species of the family Syrphidae (Mitra *et al.*, 2003b).

Family TIPULIDAE

Tipulidae (Crane flies) is one of the largest families of infraorder Tipulomorpha under the suborder Nematocera. Over 14000 described species are so far known from the world. The insects are characterized by elongated body; absence of ocelli; antennae long, 6-10 segmented, legs always long and slender, V-shaped mesonotal suture is characteristic in most of the crane flies. The representatives of the family are mostly associated with moist, temperate habitats, though some occur in open meadows and deserts. The larvae are hemicephalous, the head being deeply embedded in the prothorax and incomplete posteriorly. Larvae are widely distributed in freshwater habitats; intertidal zones; wet soil or decomposing vegetation, mostly saprophagous, utilizing decaying organic matter, some herbivores, some leaf miners, some predaceous.

Genus *Limonia* Meigen

1803. *Limonia* Meigen, *Magazine Insektdke*, 2 : 262. Type- species: *Tipula tripunctata* Fabricius.

1973. *Limonia* Meigen, *A Catalog of Diptera of the Oriental Region*, 1 : 81.

Diagnosis : Eyes large, proboscis shorter than head, palpi large, stout; antennae fourteen jointed, last joint often with a cylindrical prolongation, each joint elongate towards the tip, verticels of hair long; anterior part of thorax prolonged into a inconspicuous neck; wings short and broad, one submarginal cell, four posterior, discal cell always closed, auxiliary vein ends beyond the origin of second longitudinal vein; legs stout, long, tibiae without terminal spurs, empodia indistinct or absent, ungues with several teeth below; abdomen normal, moderate in size, robust; second joint of male claspers form a horney hook.

1. *Limonia* sp.

Material examined : 1 ♀; Mudh, N.E of Sagnam Rest House, 9. x.2002, coll. H.S. Mehta & Party.

Distribution : Himachal Pradesh, Uttaranchal (now Uttarakhand).

Family BIBIONIDAE

The large & diverse infraorder Bibiniomorpha includes four major families of which the March flies (Family Bibionidae, 700 species in the world) are robust, hairy flies of medium to small size with shorter legs and wings. Antennae 8-16 segmented, usually shorter than thorax, the segments usually bead-like and closely apposed. In males the eyes often occupy nearly the whole of the head and the upper facets are much larger than lower, they are in two series. They are frequently found in meadows, grassy hillsides or

decaying vegetation and often appear in great numbers. Larvae terrestrial, peripneustic, feed gregariously at the roots of grasses, cereals, hops and in leaf mould.

Genus *Bibio* Geoffroy

1762. *Bibio* Geoffroy, *Hist. abreg Ins. Paris* 2 : 568, Type-species : *Tipula hortulana* Linnaeus.

Diagnosis : Eyes in male densely pubescent, bare in female; ocelli situated on a distinct protuberance; palpi 4-5 segmented, third often thickened; antennae stout with 9-10 segments; thorax elevated with dense pubescence; scutellum semicircular; legs robust, hind pair generally longer, fore femora thickened, tibiae bear a curved spine at apex in both sexes, hind femora and tibiae incrassate distally; second longitudinal vein absent, fifth longitudinal vein forked, seventh vein absent; abdomen elongate, conical, male terminalia bears two jointed claspers.

2. *Bibio tenebrosus* Coquillett

1898. *Bibio tenebrosus* Coquillett, *Proc. U.S. natn. Mus.*, 21 : 307.

1973. *Bibio tenebrosus* Coquillett, *A Catalog of Diptera of the Oriental Region*, 1 : 436.

Diagnosis : In ♂ vertex prominent, shining; thorax shining black with dark brown hairs, anterior corner reddish brown; wings brownish grey, anterior portion dark, stigma elongate, oval, black; basal part of 3rd vein much longer than anterior cross-vein; legs shining black, the bases and tips of the tarsi reddish brown, spines of fore tibia dull carmine coloured; abdomen black with blackish brown hair.

Material examined : 1 ♂, Mudh, N.E. of Rest house Sagnam, 9 x .2002, coll. H.S. Mehta & Party.

Distribution : Himachal Pradesh, West Bengal.

Family ASILIDAE

The 12 families in this very large infraorder Asilomorpha fall into three well-defined super families, Asiloidea, Bombylioidea, and Empidoidea. About 80% of the asiloids belong to the cosmopolitan family Asilidae (Robber flies), which with about 5000 species is among the largest of the orthorrhaphous Brachycera. The Asilids are moderate to very large sized flies. Usually, elongated and bristly, with a horny proboscis adopted for piercing. The adults are predacious, their powerful legs being adapted for grasping the prey. The larvae live in soil, sand, wood or in leaf-mould and are either predacious or scavengers.

Genus *Machimus* Loew

1849. *Machimus* Loew, *Linn. Ent.*, 4 : 1. Type-species : *Asilus chrysitis* Meigen

Diagnosis : Head with prominent gibbous densely covered with bristles; mesonotum

high, covered with long setae, metanotal callosity with a dense tuft of bristly pile; all femora and tibiae with stout bristles, long piles; marginal cell and fourth posterior cells closed and petiolate; abdomen robust, male genitalia with eighth sternite in some species highly produced, female ovipositor comprises of moderately long and compressed eighth and ninth segments and the long free dorsal proctiger.

3. *Machimus bicolor* Joseph & Parui

1984. *Machimus bicolor* Joseph & Parui, *Oriental Ins.*, 18 : 63.

1986. *Machimus bicolor* Joseph and Parui, *Rec. Zool. Surv. India; Occ. Paper No.*, 96 : 12.

Diagnosis : Mystax black with some pale yellow bristles below; antennae black except pedicel black and yellowish brown mixed; mesonotum with a black medio-longitudinal stripe divided by a grey stripe; scutellum with sparse pale yellow hairs on disc and two black marginal bristles; fore and mid femora black dorsally and anteriorly, rest yellowish brown, hind femora more extensively black, tibiae yellowish brown basally and black distally; wing apically infuscated, basally hyaline; abdomen black, male genitalia yellowish brown and black with pale yellow and black hairs.

Material examined : 2♂, Debsa, Core zone, Dist Lahaul & Spiti, 5.vi.2002, Coll. R.M. Sharma & Party.

Distribution : Himachal Pradesh and Arunachal Pradesh.

Family THEREVIDAE

The members of this family (500 species in the world) are more or less elongated, densely pubescent with slender, non-prehensile legs. They exhibit resemblance to some Asilidae, but the weaker legs and the non-protuberant eyes enable them to be readily separated. In habits, these flies are commonly stated to be predacious but very few direct observations appear to have been made. The larvae of several species are known to be predacious upon those of other insects, especially of beetle larvae and earthworms. They live in soil, among leaf-moulds, in fungi, decaying wood etc. Adults frequent on vegetation and grass meadows near water and feed on nectar. Larvae inhabit the soil in leaf-mould, fungi, decaying wood etc. and are carnivorous.

Genus *Thereva* Latreille

1796. *Thereva* Latreille, *Precis caract. gen. Ins.* : 167. Type-species : *Musca plebeja* Linnaeus.

Diagnosis : Frons densely pubescence and produced towards antennae; antennae approximate at base, 1st and 2nd joint bristly and pubescent; thorax oval with distinct presuturals, supra alars, prescutellars present; scutellum semicircular with four marginal bristles; legs moderately long, bristles present on coxae and anterior femora, tibiae with rows of small spines and a circlet of spines at tip; fourth posterior cell closed or narrowly open; abdomen with seven or eight segments.

4. *Thereva bilineata* Brunetti

1917. *Thereva bilineata* Brunetti, *Rec. Indian Mus.*, 13 : 78.

1975. *Thereva bilineata* Brunetti, *A Catalog of Diptera of the Oriental Region*, 1 : 93.

Diagnosis : Frons with scattered black hairs of moderate length, face with long whitish grey hairs, mouth surrounded by some black hairs; antennae black, first two joints bear strong black bristles, 3rd as long as 1st; thorax dark brown with two distinct well separated yellowish-white stripes with yellowish pubescence, humerus with a row of fine spines behind; scutellum ash-grey with a brown spot at base; wings pale grey; femora black with whitish pubescence, a row of bristles in middle of underside, fore tibiae with three and hind pair with four rows of spines; abdomen black, 1st segment grey, segments with distinct ash grey hind border, 7th segment shining chestnut brown.

Material examined : 1 ♀, Guling, 25. v.2000, coll. T. R. Sharma & Party.

Distribution : Himachal Pradesh.

Family SYRPHIDAE

The members of the family are commonly referred as 'Flower flies' or 'Hover flies'. Usually moderate to large sized flies almost always bristle less, very brightly coloured and may be striped, spotted or banded yellow on a blue, black or metallic ground-colour. Mostly all members of this family are attracted to flowers and may frequently be observed poised in air, their wings vibrating with extreme rapidity, hence the name hover-flies. The venaspuria is one of their most characteristic features and is rarely found in other dipterans. It is a vein-like thickening of the wing membrane and may be distinguished from the veins in being fainter and terminating without association with other veins. The larval habits of syrphids are extremely varied. They may be phytophagous, carnivorous, saprophagous, scavengers and are natural enemies of aphids, scale insects etc. These flies are pollinators of major significance. In some agroecosystems, such as orchards, they outperform native bees in pollinating the fruits. The family is divided into 3 subfamilies and 15 tribes and contains more than 5,500 described species in the world.

Genus *Episyrphus* Matsumura & Adachi

1917. *Episyrphus* Matsumura and Adachi, *Ent. Mag. Kyoto*, 2 : 134. Type-species : *Musca balteata* De Geer.

5. *Episyrphus balteatus* (De Geer)

1776. *Musca balteata* De Geer, *Mem. pour surv. Hist. Ins.*, 6 : 116.

1775. *Episyrphus balteatus* (De Geer) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 314.

Diagnosis : Eyes bare; face orange with orange hairs; base of antenna with a black dot above; mesonotum black, with a narrow and 2 lateral greyish stripes; posterior margin of wing with a series of sclerotized dots; abdomen linear, orange, tergites 3 and 4 mostly yellow with narrow sub-basal and broad apical black bands, surstylus in male terminalia straight, not more than twice as long as broad; superior lobe stout, with neutro-laterally directed tooth apically; distal portion of aedeagus not expanded apically.

Material examined : 1 ♀; near Rajgaund Mikkim, Kaza, 10.ix .2002, coll. H.S. Mehta & Party; 1 ♀ Mikkim and around, Pin Valley, 4.vi 2002 coll. R. M. Sharma & Party; 1 ♀, Pin Valley, 2.vi.2002, Coll. B. Mitra.

Distribution: Himachal Pradesh, Arunachal Pradesh, Assam, Bihar, J&K, Kerala, Meghalaya, Orissa, Sikkim and West Bengal.

Genus *Metasyrphus* Matsumura

1917. *Metasyrphus* Matsumura, *Ent. Mag. Kyoto*, 2 : 147. Type-species : *Scaeva corollae* F.

Diagnosis : Face hollowed below frontal prominence and usually with a central knob; ocelli situated near vertex, eyes sparsely hairy; metasternum hairy; hypopleuron bare below metathoracic spiracle and in front of its lower end; hind coxa without tuft of hairs at posteromedian apical angle; wing clear; abdomen broadly oval.

Subgenus *Metasyrphus* Matsumura

Diagnosis : Wing with vein R_{4+5} straight or nearly so; sternite I in male terminalia without lateral and dorsolateral grooves.

6. *Metasyrphus (Metasyrphus) corollae* (Fabricius.)

1794. *Scaeva corollae* Fabricius, *Ent. Syst.*, 4 : 306.

1975. *Metasyrphus (Metasyrphus) corollae* (Fabricius) : Knutson, Thompson and Vockeröth, *A catalog of Diptera of the Oriental Region*, 2 : 317.

Diagnosis : Eyes bare; scutellum yellow-haired; abdomen with 3 pairs of spots passing over lateral margins; surstylus in male terminalia slender and curved, sharply forward near apex with distinct anterior flange.

Material examined : 1 ♀; near Rajgaund Mikkim, Kaza, H.P., 10.ix .2002, coll. H.S. Mehta & Party; 1 ♀, Mikkim and around, Pin Valley N.P., 4.vi. 2002; coll. R.M. Sharma & Party.

Distribution : Himachal Pradesh, Meghalaya and West Bengal; other Asian countries including Taiwan; North Africa and Palaearctic region.

Genus *Scaeva* Fabricius

1805. *Scaeva* Fabricius, *Syst. Antliat* : 248. Type-species : *Musca pyrastris* Linnaeus.

Diagnosis : Eyes with long hairs on anterior half, in male, eyes with large facets above and smaller below; metasternum bare, mesopleuron with microscopic pubescent on its anterior flat portion; wing clear with little stigmal darkening, surface with sparse microtrichia.

7. *Scaeva selenitica* (Meigen)

1822. *Syrphius seleniticus* Meigen, *Syst. Bschr. Europ. zweifl. Insekt.*, 3 : 304.

1975. *Scaeva selenitica* (Meigen) : Knutson, Thompson and Vockeroth, *A catalog of Diptera of the Oriental Region*. 2 : 318.

Diagnosis : Eyes densely haired, sparser posteriorly; antennae black except yellowish segment 1 and base of 3; mesonotum shining black with dense yellowish brown hairs, wing clear; legs predominantly bright yellow; hind tibia with a dark brown ring; abdomen black, tergites 2-4 each with a pair of bright yellow spots being lumulate on 3-4.

Material examined : 1 ♀; Pin Valley National Park, 2.vi.2002, Coll. B. Mitra.

Distribution : Himachal Pradesh, Delhi, Meghalaya, Sikkim and Uttar Pradesh.

Elsewhere : Cambodia, China, Laos and Vietnam; Europe.

8. *Scaeva latimaculata* (Brunetti)

1923. *Lasiopticus latimaculata* Brunetti, *Fauna Brit. India, Dipt.*, 3 : 68.

1975. *Scaeva latimaculata* (Brunetti) : Knutson, Thompson and Vockeroth, *A catalog of Diptera of the Oriental Region*, 2 : 318.

Diagnosis : Vertex narrowly deep black with very short black pubescence; upper part of frons with brown pubescence, brownish around base of antennae; mesonotum aeneous black with brownish grey pubescence on pleurae and yellowish on side margins; wings clear; legs orange yellow, basal half of anterior femora and more than basal half of hind pair black, upper side of tarsi brownish; abdomen shining black with three pairs of subequal orange spots.

Material examined : 1 ♀; Pin Valley National Park, H.P., 2.vi.2002; coll. B. Mitra.

Distribution : Himachal Pradesh, Punjab, Rajasthan and Uttar Pradesh.

Genus *Melanostoma* Schiner

1860. *Melanostoma* Schiner, *Wien. Ent. Mschr.*, 4 : 213. Type-species : *Musca mellina* L.

Diagnosis : Flies with elongate-oblong abdomen and intermediate tergites usually with pairs of bright yellow spots; in male, fore tarsus normal and not dilated; surstylus in male terminalia usually not bifid; superior lobe normally triangular.

9. *Melanostoma orientale* (Wiedemann)

1824. *Syrphus orientale* Wiedemann, *Analecta Ent.*, : 36.

1975. *Melanostoma orientale* (Wiedemann) : Knutson, Thompson and Vockeroth, *A Catalog of Diptera of the Oriental Region*, 2 : 325.

Diagnosis : Eyes bare; face with two distinct bumps; arista hairy; abdomen shining black, with large quadrate or oblong orange spots anteriorly or at least terga 3 and 4 laterally leaving a broad median space; surstylus in males narrow and curved at base.

Material examined : 1 ♀, 1 ♂, Debsa core zone, Pin Valley N.P., 5.vi.2002, coll. R. M. Sharma & Party.

Distribution : Himachal Pradesh, Arunachal Pradesh, Assam, Jammu & Kashmir, Karnataka, Meghalaya, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal.

Elsewhere : Bhutan, Nepal, Pakistan, Sri Lanka and other parts of the Oriental Region; Palaearctic region.

Genus *Paragus* Latreille

1804. *Paragus* Latreille, *Nouv. Dict. Hist. nat.*, 24 : 94. Type-species : *Syrphus bicolor* Fabricius.

Diagnosis : Head slightly flattened and broader than thorax; eyes pilose; face produced to a large central bump; arista bare; thorax quadrate and arched, mesonotum striped; wing with veins $M_1 + 2$ and $M_3 + Cu_1$ undulating apically and cross-vein r-m distinctly before middle of discal cell; abdomen as wide as thorax, nearly parallel sided; aedeagus in male terminalia undivided, simple and tubular medially with a complex lateral lobe at base on either side.

10. *Paragus bicolor* (Fabricius)

1794. *Syrphus bicolor* Fabricius, *Ent. Syst.*, 4 : 297.

1862. *Paragus bicolor* Schiner, *Fauna Austr. Dipt.*, 1 : 259.

1901. *Paragus bicolor* Verral, *Brit. Flies. Syrph* : 152.

Diagnosis : Face yellow, with narrowly black mouth edge indistinctly extended up to middle of the face; eyes with conspicuous whitish pubescence, more or less like stripes; antennae long, 3rd joint pointed narrow about five times as long as broad; thorax aeneous with two faint stripes in front; scutellum orange; legs orange; wings clear; abdomen varying in colour from wholly black with reddish isolated spots on 2nd and 3rd segments to entirely reddish except base and tip dark

Material examined : 1 ♀; Pin Valley National Park, 2. vi. 2002, coll. B. Mitra.

Distribution : Himachal Pradesh.

Family CONOPIDAE

The family Conopidae or the thick-headed flies are moderate, more or less elongated and almost bare mimicking the families Vespidae (Hymenoptera) & Syrphidae (Diptera). Well-developed ptilinum; proboscis very long and often conspicuously jointed. Palps reduced. Most species are brightly marked with yellow and black and visit flowers; usually slow fliers. These are endoparasitic flies on aculeate Hymenoptera, cockroaches & calyptrate Diptera. Oviposit in adult host while in flight; egg deposition rapid and inserted into the abdomen of host. Larvae swollen in posterior half; strongly narrowed and tapering in the anterior half, integument smooth, metapneustic.

Genus *Zodion* Latreille

1796. *Zodion* Latreille, *Precis caract. Gen. Ins.*, : 162. Type-species : *sumbaensis* Camras.

Diagnosis : Eyes bare; epistome receding; ocelli present; antennae porrect, short, first joint short, second and third subequal, third oval with style-like dorsal arista; scutellum semicircular; legs long and stout, femora slightly thickened; wing with first posterior cell closed at margin or slightly petiolate; abdomen long and arched above.

11. *Zodion griseum* Brunetti

1923. *Zodion griseum* Brunetti, *Fauna Br. India, Dipt.*, 3 : 375.

1975. *Zodion griseum* Brunetti, *A catalog of Diptera of the Oriental Region*, 2 : 385.

Diagnosis : Frons bright mahogany-brown; ocellar tubercle, a small spot on each side near the vertex and contiguous to the eye and sometimes an indistinct black stripe above each antennae; head orange yellow with whitish reflections; antenna wholly black; thorax dark ash-grey, with short black hairs, a pair of median well separated narrow blackish stripes, three intermediate very narrow darker lines, an indefinite spot on each side on the inner side of the humerous; wings pale grey; yellowish at base, 3rd vein nearly straight from anterior cross-vein to tip; legs dark ash-grey hairy, hind femora wholly black, under side of femora on apical half, knees and base of tibiae orange; abdomen ash grey with soft black hairs which are longest towards sides of the segment.

Material examined : 1 ♂; Guling vill. & around (Buffer Zone), Pin Valley, 2.vi.2002, coll. R.M. Sharma & Party.

Distribution : Himachal Pradesh, J & K and Uttar Pradesh.

SUMMARY

11 species under 10 genera of 6 families have been reported from Pin Valley National Park, Himachal Pradesh.

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INSECTA : COLEOPTERA

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INTRODUCTION

If the insects account for more than three fourths of all forms of life on earth, just one of the 30 insect orders, the Coleoptera, includes more species than all other animal life put together and makes up about 40% of all insects. About, 3, 50,000 species known from the world makes it to be the largest order of insects. The known Indian coleopteran fauna runs up to 15,000 species, which comes to 4.42% of the world fauna. It is estimated that if all the habitats were extensively explored for this group, the existing figures would be doubled.

Although, beetles are predominant insects of the present epoch, they are not seen as frequently as members of the other orders because of their more concealed habits. Beetles show exceptionally diverse adaptations to wide range of environmental conditions and habits. Aside from the polar caps and oceans, they are to be found in every corner of the world. Out of all the available insect orders in India, only fourteen have colonized the zones above timberline and can be called typical nival insects. Of these, Coleoptera, stand foremost among the dominant nival insects, representing about one half of the total high altitude insect species. Among the different families of the order, Carabidae and Staphylinidae form the bulk of the species in the nival zone together accounting for more than 2/3 of the nival Coleoptera (Mani, 1962, 1973). This is evident from the collections made in the Pin Valley National Park located in Lahaul & Spiti district of Himachal Pradesh, a cold desert.

A small collection of beetles and weevils from Pin Valley National Park, Lahaul & Spiti district of Himachal Pradesh together with past records from the district (marked with asterisk) revealed the presence of eight families. Actual collection representing five families contains ten genera. Specimens belonging to families *viz* Elateridae and Anthicidae could not be assigned to even generic level. Most of the collections could not be placed

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beyond generic level for want of enough specimens and relevant literature. However, they are recorded here, with a view to place on record the presence of those genera and families in the vicinity of the National Park, which might help in assessing faunal diversity of the Park in future.

SYSTEMATIC ACCOUNT

Order COLEOPTERA

Suborder ADEPHAGA

Family TENEBRIONIDAE

1. Genus *Blaps* sp.

Material examined : 1 ex Lara vill. Near Kaza, 13.ix.2000, R. Paliwal, (Reg. No. 8683). 4 exs. Thango, 26.v.2001, T.R. Sharma, (Reg. No. 9092); 4 exs. Thango, 26.v.2001, T.R. Sharma, (Reg. No. 9114). 2 exs. Sagnam vill. & around, 1.vi. 2002, R.M. Sharma, (Reg. No. 292), 1ex Mudh, 3.vi.2002, R.M. Sharma, (Reg. No. 297).

2. Genus *Platynotus* sp.

Material examined : 7 exs. Sagnam vill. & around, 1.vi. 2002, R.M. Sharma, (Reg. No. 289), 5 exs Mudh, 3.vi.2002, R.M. Sharma, (Reg. No. 297).

3. Genus *Cyphogenia* sp.

Material examined : 1 ex Mudh, 3.vi.2002, R.M. Sharma, (Reg. No. 297); 1 ex. Thango, 26.v.2001, T.R. Sharma, (Reg. No. 9114).

Family CARABIDAE

*4. *Calosoma maderae auropunctatum* F.

Distribution : Past record. Recorded from Sumdeo, Patseo, Keylong, Cimur, Lahaul (H.P). (Andrewes, 1929).

*5. *Calosoma maderae kashmirensis* Breun

Distribution : Past record. Recorded from Lahaul (H.P). (Andrewes, 1929).

*6. *Calosoma maderae indicum* Hope

Distribution : Past record. Recorded from Spiti (H.P). (Andrewes, 1929).

*7. *Caralius boysi* Tatum

Distribution : Past record. Recorded from Spiti (H.P). (Andrewes, 1929).

*8. *Nebria limbiger* Solsky

Distribution : Past record. Recorded from Zing Zingbar, Lahaul (H.P). (Andrewes, 1929).

*9. *Scarites sulcatus* Oliv.

Distribution : Past record. Recorded from Spiti (H.P). (Andrewes, 1929).

*10. *Scarites praedator* Chaud.

Distribution : Past record. Recorded from Spiti (H.P) (Andrewes, 1929).

11. *Tachys* sp.

Material examined : 2 exs Guling vill. 2.vi.2002, R.M. Sharma, (Reg. No.319).

12. *Chlaenicus* sp.

Material examined : 4 exs, Lara vill. Near Kaza, 13.ix.2000, R. Paliwal, (Reg. No. 8683).

13. *Gnathaphanus* sp.

Material examined : 4 exs Debsa, Core Zone, 5.vi.2002, R.M. Sharma, (Reg. No. 268).

14. *Bembidion* sp.

Material examined : 1 ex Sagnam vill. & around, 11.ix.2000, R. Paliwal; 1 ex Lara vill. Near Kaza, 13.ix.2000, R. Paliwal, (Reg. No. 8683); 5 exs Kiamo, Losar, Kaza, 16.ix.2000, R. Paliwal, (Reg. No. 8669); 5 exs Sagnam vill. & around, 1.vi.2002, R.M. Sharma (Reg. No. 291); 1 ex Mudh, 2.vi.2002, R.M. Sharma, (Reg. No: 298).

Family CHRYSOMELIDAE

*15. *Longitarsus cyanipensis* Bryant

Distribution : Past record. Recorded from Lahaul (Type locality) (H.P). (Maulik, 1926).

Family COCCINELLIDAE

16. *Adonia veriegata* (Goeze)

Material examined : 10 exs, Kalamurti, 20 km from Kaza, Spiti, 9.ix.2000, H.S. Mehta (Reg. No. 8696).

Family MELOIDAE

17. *Meloe* sp.

Material examined : 2 exs, Sagnam vill. & around, 1.vi.2002, R.M. Sharma, (Reg. Nos 283 & 293); 1 ex Debsa, Core Zone, 5.vi.2002., R.M. Sharma, (Reg. No. 268).

Family CURCULIONIDAE

18. *Ptochus* sp.

Material examined : 9 exs, Sagnam and vicinity, 11.ix.2000, R. Paliwal (Reg. No. 8688); 1 ex, Sagnam vill. & around, 1.vi.2002, R.M. Sharma (Reg. No. 291); 2 exs, Mudh, 3.vi.2002, R.M. Sharma (Reg. No. 298); 4 exs, Debsa, Core Zone, 5.vi.2002, R. M. Sharma (Reg. No. 272); 6 exs, 5 km from Sagnam Rest House, 5.vi.2002, R.M. Sharma (Reg. No. 304).

Family ELATERIDAE

Eight examples collected from the Park belonging to two different species could not be assigned to any of the genera for want of literature, but placed on record to show the existence of the family in the Park. (Reg. Nos. 8669,319 and 291).

Family ANTHICIDAE

Two examples collected from the Park belonging to single species could not be assigned to any of the genera for want of literature, but placed on record to show the existence of the family in the Park (Reg. No. 319).

SUMMARY

A small collection (ninty-four examples) of Coleoptera from Pin Valley National Park, Dist. Lahaul & Spiti, together with past records from the district revealed the presence of eight families (seven from the collections and one from past record) in the district. A total of 18 species belonging to 15 genera are listed in the paper of which, 10 species are represented in the collection and remaining eight are past records.

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PISCES

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INTRODUCTION

Himachal Pradesh is a hill state with varied topography and natural resources. The state has innumerable lakes, several man-made reservoirs and rivers. The rivers Satluj, Beas, Ravi, Chandra Bhaga and their tributaries criss-cross various climatic zones of the Himalaya.

The Ichthyofauna of Indian Region is represented by 2500 species of which 930 are freshwater fishes (Jayaram, 1999). About 73 species are cold-water inhabitants (Anon, 1992-1993; Das, 1994). A perusal of literature revealed that the fish fauna from the different ecological regions of the state of Himachal Pradesh has been compiled by various workers (McClelland, 1842; Steindachner, 1867; Fowler, 1924; Hora, 1950; Menon, 1962; Tilak and Husain, 1977; Johal, 1998; Dhanze and Dhanze, 2004). Recently, Mehta and Uniyal (2005) check listed 104 species inhabiting the waters of Himachal Pradesh which comes to 11.18% of the total freshwater fauna recorded from India.

Pin Valley is one of the main valleys located on both sides of the river Pin in district Lahaul-Spiti (H.P.) in the Trans Himalayan zone. The fish fauna of the Indian Trans-Himalaya is mainly represented by the species belonging to the subfamilies Schizothoracinae and Noemacheilinae (Stream loaches). The Noemacheilin genus *Triplophysa* (Steindachner) is known by ten species in the Indian continent (Menon, 1987) of which, seven species are known from Ladakh and one from Spiti valley of Lahaul & Spiti district of Himachal Pradesh (Mehta and Julka, 2002).

Based on the collections present in the holdings of ZSI, Solan, from Pin Valley National Park, which falls in the Trans-Himalayan cold desert, shows the occurrence of two species belonging to subfamily Noemacheilinae. Mehta and Uniyal (2005) added one more species from district Lahaul Spiti viz. *Diptus maculatus*. Thus, with the present communication the total number of species, known from Himachal Pradesh goes to 105 and that of Lahaul-Spiti to three.

SYSTEMATIC ACCOUNT

Class PISCES

Order CYPRINIFORMES

Suborder CYPRONOIDEI

Family HOMALOPTERIDAE

Subfamily NOEMACHEILINAE

1. *Triplophysa microps* (Steindachner)

1866. *Cobitis microps* Steindachner, *Verh. Zool-bot. Gest. Wien*, 16 : 794 pl. 12 fig. 3 (Type locality : Leh).
1878. *Nemachilus microps*, *Day Sci. Res. 2nd Yarkand Miss. Ichthyology*, p. 17.
1922. *Nemachilus microps*, *Hora, Rec. Indian Mus.*, 24 : 80 (Mecma from Yarkand Mission collection of Dr. Stoliczka).
1936. *Nemachilus microps*, *Hora, Mem. Conn. Acad.*, 10 : 310. (Tso-Mpriri Lake).
1987. *Triplophysa microps*, *Menon, Fauna of India, Pisces*, 4 : 210, pl. 8, fig.4.
1991. *Triplophysa microps*, *Talwar & Jhingran, Inland Fishes*, 1 : 513, fig. 166.

Diagnostic Characters : Body elongate slender; caudal peduncle long and narrow, whip like. Dorsal profile of the body slightly arched. Eyes small. Nostrils close to each other and situated closer to eyes than snout. Lips thick and furrowed. Barbels short and thick. Belly rounded. Seven branched dorsal fin rays, Dorsal fin nearer to base of caudal fin than to tip of the snout, runs almost parallel to pelvic fin. Caudal fin truncate, slightly shorter than the head. Lateral line incomplete, Scales absent.

Colour : The colour of the body is brownish-yellow and with various dark narrow transverse stripes (13-15).

Size : The specimens examined measure 27-41mm of Standard Length.

Meristic Characters : Pre-dorsal distance 52.69-54.14 (M=52.62) percent, Pre-pelvic distance 40.92-43.7(M=41.86) percent, Pectoral 15.18-21 (M=15.43) percent, Pelvic 14.24-17.4(15.96) percent, Caudal peduncle length 17.40-21.21 (M=18.68) percent, Distance from pelvic to anal insertion 16.48-20.73 (M=17.99) percent, Depth of the body 11.5-14.8 (M= 11.95) percent, Length of head 20.73-24.07 (M=22.27) percent, Length of snout 7.27-8.8 (M=7.99) percent of the standard length, Eye diameter 11.76-18.64 (M=16.10) percent of head length.

Material Examined : 5 exs., Station 4, Near Rajganio, Mikim, 30 km from Kaza (H.P.), 10.9.2000, Coll. H.S. Mehta.

Distribution : Himachal Pradesh: Lahaul Spiti (Kaza, Pin Valley National Park). Jammu and Kashmir : Ladakh, Drass nala, and Suran river, Kargil.

Elsewhere : Pakistan.

Status : Endemic to Ladakh (J. & K.) and Lahaul Spiti (H.P.)

2. *Triplophysa stoliczkae* (Steindachner)

1866. *Cobitis stoliczkae* steindachner, *Verh. Zool-bot. Gest. Wien*, 16 : 793 pl. 14 fig. 2 (Type locality : Western Tibet).
1878. *Nemachilus stoliczkae*, Day (in part) *Fauna Brit. Ind. Fish.*1, p. 235, fig. 84. Fish.
1922. *Nemachilus stoliczkae*, Hora, *Rec. Indian Mus.*, 24 : 78.
1987. *Triplophysa stoliczkae*, Menon, *Fauna of India, Pisces*, 4 : 213, pl. 8, fig. 3.
1991. *Triplophysa stoliczkae*, Talwar & Jhingran, *Inland Fishes*, 1 : 514.

Diagnostic Characters : A long and slender species with compressed tail. Dorsal profile of the body is gently arched, lips thick and continuous. Eyes small. Nostrils nearer to eyes. Barbules short and stumpy. Belly slightly rounded. Dorsal fin nearer to base of the caudal fin, pectoral fin shorter than the head. pelvic fin slightly ahead of dorsal fin, shorter than the pectoral and reaches up to anal opening. Anal fin does not touch the base of the caudal fin. Caudal fin slightly emarginated and as long as head. Lateral line complete. Body naked.

Colour : Dark grey with irregular broad black transverse stripes. Dorsal and Caudal fin spotted.

Size : The specimens examined measure 47-82mm of Standard length.

Meristic Characters : Pre-dorsal distance 47-55.22 (M=52) percent, Pre-pelvic distance 41.66-45.63 (M=43.77) percent, Pectoral 15.33-19.2 (M=16.62) percent, Pelvic 13.33-15.95 (M=14.53) percent, Caudal peduncle length 17.53-22.42 (M=18.81) percent, Distance from pelvic to anal insertion 17.85-24.8 (M=20.88) percent, Depth of the body 8.5-16.5 (M=10.2) percent, Length of head 17.66-21.8 (M=19.42) percent, Length of snout 7.27-8.8 (M=7.99) percent of the standard length, Eye diameter 13.67-16.66 (M=15.49) percent of head length.

Material Examined : 10 exs. Station 8, Goechang Core Zone, Pin Valley, Dist. Lahaul Spiti (H.P.), 6.6.2002, Coll. R.M. Sharma.

Habit : These fishes feed on algae, which they scrape off from the boulders with the help of jaws (Menon, 1987).

Distribution : Himachal Pradesh: Lahaul Spiti (Pin Valley National Park). Jammu and Kashmir: Ladakh.

Elsewhere : China : Headwaters of the Tarim River (Karakush Valley) and Western Tibet.

Status : Endemic to Ladakh (J. & K.) and Lahaul Spiti (H.P.).

Remark : As the fishes are worshiped by the local Buddhist community in the region. They do not allow the catching of fish, thus reflected in the poor collection of fishes from the area.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India, Kolkata for providing necessary facilities. The second author is also thankful to Dr. R.M. Sharma, Scientist C & Officer-in-Charge, Zoological Survey of India, Solan, for placing the fish collection at her disposal and for his encouragement and valuable suggestions in preparing the manuscript.

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HERPETOFAUNA

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INTRODUCTION

The herpetofauna of India comprises of 216 species of Amphibia (Dutta, 1997) and 506 species of Reptilia (Das, 2003). They occur in varied ecological conditions from the plains to mountains, low to heavy rainfall areas and even in deserts, occupying every ecological niche available. In the state of Himachal Pradesh, the amphibian component of herpetofauna is represented by 17 species (Mehta, 2005), which is 7.8% of total Indian species. But, there is no up to date account of the reptilian fauna of Himachal Pradesh. However, an analysis of published literature (Agrawal, 1979, Prashad, 1914, Smith, 1935, 1943; Sharma, 2002, 2003; Tikader & Sharma, 1985, Whitaker & Captain, 2004, Saikia *et al* 2005 etc.) revealed the presence of a total of 44 species of Reptiles in the state. The Trans-Himalayan region of the state comprising the entire Lahaul & Spiti district and parts of Kinnaur district is a distinct biogeographic unit characterised by very harsh climatic conditions and is referred to as a cold desert (Roger & Panwar, 1988). By virtue of its extreme climatic conditions, faunal diversity in this region is not very high, but a few forms have adapted to survive in such a inhospitable terrain. Among vertebrates, the herpetofauna constitutes a prominent component of biodiversity. Although, the herpetofauna from the Trans-Himalayan region of the country especially Jammu and Kashmir has been documented to some extent by Boulenger (1890), Smith (1943), Gruber (1981), Sahi *et al* (1996) etc , but studies on this group from the Trans-Himalayan region of Himachal Pradesh is almost negligible.

The present paper deals with a small collection of herpetofauna from the Trans-Himalayan cold desert of Pin Valley National Park in the district of Lahaul & Spitti. The inventory and the systematic account presented here are based on the collections made during faunistic surveys by the HAZ Field Station, Z.S.I. Solan together with reference to the published literature.

SYSTEMATIC ACCOUNT

Class AMPHIBIA

Order ANURA

Family BUFONIDAE

1. *Bufo viridis* Laurenti, 1768

1768. *Bufo viridis* Laurenti, 176 : 27 Fig 1 (Type : Not designated, from Vienna, Austria)

1964. *Bufo calamita* (non Laurenti) Günther, Rept. Brit. Ind. Pp. 420.

Diagnosis : Crown without bony ridges; snout short rather blunt; inter orbital space narrower than upper orbit; tympanum distinct, about half the diameter of the eye. First finger extending a little beyond second, toes half or two third webbed, with single subarticular tubercles; two moderate metatarsal tubercle; a tarsal fold. The tibio-tarsal articulation usually reaches the eye. Upper parts with depressed, irregular, distinctly porous warts, parotoids vary in shape & size, generally kidney shaped. Olive or greenish, uniform or spotted or marbled with darker, beneath whitish, uniform or spotted with blackish. Male with a subgular vocal sac and black nuptial excrescences on the two inner fingers. Snout to vent 3.5 inches. (Boulenger, 1890)

Material examined : 5 exs, Guling, Kaza, Coll. T.R. Sharma, 28.V. 2001. 1ex, Gechang, Coll. H.S. Mehta, 10.X.2002. 1ex, Gechang, Coll. R.M. Sharma, 6.VI.2002.

Distribution : India : Himachal Pradesh: Kinnaur (Kalpa), Lahaul & Spitti (Pin Valley N.P.); Jammu and Kashmir: (Srinagar, Ladakh, Drass, Kargil); Gujarat; Punjab.

Elsewhere : North Africa, Western & Central Asia, Mongolia, Tibet, Europe, East to Kazakhstan and Altai mountains in Central Asia, extreme Western China.

Habits & Habitat : The specimens were collected at an altitude of 3600m msl in an around Gechang and obviously adapted to high altitude conditions. Possibly it is the only amphibian species that occurs at an altitude of 5000m (Mehta & Julka, 2002).

Status : Not definitely known.

Class REPTILIA

Order SQUAMATA

Suborder SAURIA

Family SCINCIDAE

1. *Asymblepharus* (= *Scincella*) *ladacensis* (Günther, 1864)

1864. *Eumeces ladacensis*, Günther, Repl. Brit. Ind., : 88, pl 10, Fig 1 (Type locality-Ladak, Kashmir)

1887. *Lygosoma ladacense*, Boulenger, Cat. Liz. Brit. Mus., 3 : 258, pl 17, fig 3

1966. *Leiopisma ladacense*, Smith, *Fauna Brit. Ind.*, 2 : 300
1966. *Scincella ladacense*, Minton, *Bull. Amer. Mus. Nat. Hist.*, 134 : 105
1980. *Asymblepharus ladacensis*, Eremchenko & Szczerbak, *Vestnik Zoologii, Kiev*, 4 : 10-15.

Diagnosis : The mid dorsal region of this skink is bronzy; there is a dark brown lateral stripe from eye to gorin, enclosing light brown spots, belly is bluish white. Prefrontals are not in contact, upper labials are 8 in number, scales at the middle of the body are 32-38 rows, 20-24 lamellae beneath the forth toe. Standard length 50-55 mm, tail length 54-59 mm. (Sharma, 2002).

Material examined : 6exs, Sagnam & vicinity, Coll. R. Paliwal, 11.v.2000; 8exs, Kalamurti, Kaza, Coll. H.S. Mehta, 09. ix. 2000; 3exs, Rajganw, Mikim, Coll. H.S. Mehta, 10.ix.2000; 3exs, Gulling, Coll. T.R. Sharma, 28.v.2001; 3exs, Sagnam, Kaza, Coll. T.R. Sharma, 25.v.2001; 1ex, Sagnam, Kaza, Coll. T.R. Sharma, 27.v.2001; 1ex, Mikim, Coll. T.R. Sharma, 07.xi.2000; 1ex, Kalamurti, Kaza, Coll. T.R. Sharma, 10.xi.2001; 1ex, Thango hill, Coll. H.S. Mehta, 11.xi.2001; 1ex, Sagnam, Coll. R.M. Sharma, 01.vi.2002; 3exs, Mu[†] and around, Coll. R.M. Sharma, 03.vi.2002; 1ex, Mikkim vill., Coll. R.M. Sharma, 04.vi.2002 3exs, Mud, Coll. H.S. Mehta, 09.x.2002.

Distribution : India : Himachal Pradesh: Kinnaur, Lahaul & Spitti (Pin Valley N.P.); Jammu & Kashmir (Ladakh).

Elsewhere : Nepal to Karakoram in the alpine region, Pakistan.

Habits and Habitat : It is a terrestrial species and has been found to be occurring upto an altitude of 3600m (present study). Insectivorous and diurnal.

Status : Very common (Sharma, 2002), commonly observed in Pin Valley N.P.

Remarks : This species appeared to be endemic to Ladakh. But the present record shows that it is not so. This is a first record from Himachal Pradesh.

SUMMARY

A small collection of Herpetofauna comprising one species each of Amphibia and Reptilia from Pin Valley National Park, Lahaul & Spitti district (H.P.) is reported. The skink is reported for the first time from Himachal Pradesh.

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AVES

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INTRODUCTION

A reconnoitre of the existing ornithological literature reveals that there is no comprehensive study on the avifauna of Pin Valley National Park, except a checklist of birds recorded in Parahio catchments of the park, which is appended in the report on Asiatic Ibex by Johnsingh *et al.* 1999 and a short note by Pandey, 1989. It is precisely with this point in mind that the authors started making bird observations while conducting faunistic surveys of the park during the period 2000-2002.

The present account on birds of the park is thus based on our own observations as well as the earlier records. In all, it incorporates 72 bird species belonging to 53 genera and 28 families. Some details on diagnostics, locality records, distribution, habitat and status for each bird species have been provided. A three-fold status terminology, *viz.*, residential, abundance and conservation, along with varying number of subcategories and sub-subcategories, has been used to highlight status of each bird species. The summary of which is as follows :

Sl. No.	Residential status	Species (Nos. only)
i	Resident (including resident with local &/or altitudinal movement/winter influx/part migratory population etc.)	54
ii	Altitudinal migrant (including those with winter influx)	9
iii	Winter migrant (including partly resident &/or partly passage migrant)	8
iv	Summer visitor/migrant	1
	Total	72

Abundance status

i	Very common	6
ii	Locally common	20
iii	Common	37
iv	Uncommon	8
v	Vagrant	1
		Total 72

Conservation status

i	Schedule I of the Wildlife (Protection) Act 1972*	1
ii	Schedule IV of the Wildlife (Protection) Act 1972*	54
iii	Schedule V of the Wildlife (Protection) Act 1972*	1
iv	Bird species/families that do not appear either in Schedule I (Part-III) or Schedule IV (No.11) of the Wildlife (Protection) Act 1972* but should be included in the future amendments * =(as amended upto 1993)	16
		Total 72

Of these 72 species, 28 species (including doubtful identification of four species as indicated by a question mark-? following asterisk) not observed during the present study have been taken from Johnsingh *et al.*, 1999 and are indicated by an asterisk (*) preceding serial number of the species.

METHODOLOGY

The authors first in September 2000 and the second in May 2002 carried out two field surveys, of ten days duration each. The birds were observed with the aid of 10x50 power prismatic field binocular and 1000mm 'Questar' telelens. Field identifications were carried out with the help of various field guides (Ali & Ripley 1983, Grimmett *et al.* 1999 and Kazmierczak 2000). The nomenclature followed is after Manakadan and Pittie, 2001. Number(s) within bracket, following the serial number, is that given in the *Handbook of the Birds of India and Pakistan* (Ali and Ripley, 1968-74),

The published information on diagnostics, distribution, habitat and status has been used from Grimmett *et al.*, 1998, 1999; Kazmierczak, 2000; Alfred *et al.*, 2002; Clements, 1981; Jhunjunwala *et al.*, 2001; BNHS, 2002; Wetland International, 2002.

SYSTEMATIC ACCOUNT

1. Family ARDEIDAE (Hérons, Egrets & Bitterns)

*1(35-36). *Ardea cinerea* Linnaeus, 1758**Grey Heron**1758. *Ardea cinerea* Linnaeus, *Syst. Nat.*, 10th ed., i : 143.2001. *Ardea cinerea*, Manakadan & Pittie, *Buceros*, 6(1) : 2.

Diagnosics : Size 90-98 cm. A long-legged and long-necked ashy-grey bird with yellow bill, whitish head and neck, long black occipital crest, black dotted line down the middle of the foreneck and elongated black streaked white feathers on breast. Sexes alike.

Locality : Parahio catchments.

Distribution : Throughout India, breeds up to 1750 m in Kashmir, recorded up to 4500 m in Ladakh.

Elsewhere : Pakistan; Nepal; Bangladesh; Bhutan; Sri Lanka; Maldives. Palearctic region, Africa.

Habitat : Almost all types of wetlands, from tiny streams to rivers, backwaters, marshes, swampy meadows and jheels.

Status : Resident as well as winter migrant; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number (*i.e.* 1% of its biogeographic population) is 1200 (Jhunjhunwala, *et al.* 2001).

2(42-42a). *Ardeola grayii* (Sykes, 1832).**Indian Pond-Heron**1832. *Ardea grayii* Sykes, *P. Z. S.*, London : 157.2001. *Ardeola grayii*, Manakadan & Pittie, *Buceros*, 6(1) : 2.

Diagnosics : Size 42-45 cm. A thickset and earthy-brown bird, has yellow bill, black at tip and bluish at base; white chin, throat and foreneck; horny-green legs and largely snow-white in flight. *Adult breeding* bird has long recumbent white or buff occipital crest of lanceolate plumes; ashy-brown upper breast; deep maroon and long decomposed feathers on back; white underparts. *Adult non-breeding* bird has dark brown head and neck with buff streaks of sides of neck prominent; brown mantles; white streaks on scapulars and white underparts. Sexes alike.

Locality : Pin (Sagnam) and Parahio catchments.

Distribution : Throughout India up to 2150 m in Himalayas.

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; Maldives. Persian Gulf to Malaysia.

Habitat : All types of shallow wetlands, both large and small, below 2150 m.

Status : Resident, subject to local movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number is 5000 (Jhunjunwala, *et al.* 2001).

2. Family ANATIDAE (Swans, Geese & Ducks)

*3(90). *Tadorna ferruginea* (Pallas, 1764)

Brahminy Shelduck

1764. *Anas ferruginea* Pallas, in *Vroeg, Cat. D'Ois., Adumber.*, : 5.

2001. *Tadorna ferruginea*, Manakadan & Pittie, *Buceros*, 6(1) : 3.

Diagnostics : Size 61-67 cm. A rusty-orange duck has pale buff head and neck; black beak, feet and tail; white wing coverts and a prominent metallic green speculum. *Breeding male* develops a narrow black collar on lower neck.

Locality : Parahio catchments.

Distribution : Mainly winter migrant all over India.

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka. Breeds over huge area from Morocco to C Siberia and N China, also around high-altitude lakes and swamps above 4000 m in Ladakh (*viz.*, Pangong Tso, Tsokar and Tso Moriri Lakes), Sikkim and Nepal. Mediterranean basin to east Asia.

Habitat : Large lakes and reservoirs, breeds in Himalayas.

Status : Winter visitor as well as resident, locally common.

Remarks : Popularly called as "*Surkhab*" Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number is 1000 (Jhunjunwala, *et al.* 2001).

*?4 (94). *Anas crecca* Linnaeus, 1758

Common Teal

1758. *Anas crecca* Linnaeus, *Syst. Nat.*, 10th ed., i : 125.

2001. *Anas crecca*, Manakadan & Pittie, *Buceros*, 6(1) : 3.

Diagnostics : Size 34-38 cm. A small duck has penciled grayish body, black bill, olive grey to deep slaty-blue legs, and a distinctive tricoloured (black, metallic green and buff) speculum-particularly conspicuous in flight. *Male* has broad metallic green band from eye

to nape on chestnut head, white stripe along scapulars and yellowish triangular patch at the side of the tail.

Locality : Parahio catchments.

Distribution : Occur throughout India, including A and N islands.

Elsewhere : Pakistan; Sri Lanka; Nepal. Europe, Africa, Asia, N America.

Habitat : Mainly freshwater lakes, jheels and marshes.

Status : Winter migrant, very common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number is 9000 (Jhunjhunwala, *et al.* 2001).

3. Family ACCIPITRIDAE (Eagles & Vultures)

5(188). *Gypaetus barbatus* (Linnaeus, 1758)

Bearded Vulture

1758. *Vultur barbatus* Linnaeus, *Syst. Nat.*, 10th ed. : 87.

2001. *Gypaetus barbatus*, Manakadan & Pittie, *Buceros*, 6(1) : 3.

Diagnostics : Size 100-115 cm. *Adult* has yellowish or white head with black mask and 'beard'; greyish-black upperparts, wings and tail. In flight, cream or rufous-orange underparts contrasting with black under wing-coverts; wedge-shaped tail and narrow pointed wings are an aid to identification. *Juvenile* has blackish head and neck with grey-brown underparts. Sexes alike.

Locality : Throughout the park.

Distribution : Frequents throughout Himalayas, usually between (300) 1200-4100m (7500).

Elsewhere : Mountains of S Europe to India, Tibet, E Africa.

Habitat : Mountains.

Status : Resident, subject to altitudinal movement; locally common.

Remarks : A purely northern mountain form. Listed in Schedule I of the Wildlife (Protection) Act, 1972 (BNHS 2002).

6(181). *Gyps himalayensis* Hume, 1869

Himalayan Griffon

1869. *Gyps himalayensis* Hume, *Rough Notes*, i, : 12.

2001. *Gyps himalayensis*, Manakadan & Pittie, *Buceros*, 6(1) : 3.

Diagnostics .. Size 115-125 cm. It is the largest of the *Gyps*, usually seen together with Eurasian Griffon, Long-billed or White-rumped Vulture. *Adult* is the palest *Gyps*, readily identified by being overall very pale sandy/creamy coloured (white on underwing-coverts) with contrastingly dark flight feathers and tail. *Juvenile* is dark brown overall with whitish head and neck; pale streaks especially obvious on upperwing-coverts and underparts; almost no contrast between the flight feathers and underwing-coverts. Sexes alike.

Locality : Throughout the park.

Distribution : Himalayas from N Pakistan east to W Arunachal Pradesh; India (above 600 m; (plains) 900-4000m (6100).

Elsewhere : Nepal; Bhutan; Mountains of Afghanistan and Turkestan, the Pamirs, Tibet, the Himalayas east to W China.

Habitat : Mountains, especially along routes well used by pack animals.

Status : Resident; common in Himalayas above 600 m, foraging to over 5000 m.

Remarks : A purely mountain bird. Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

7(166). *Aquila chrysaetos* (Linnaeus, 1758)
Golden Eagle

1758. *Aquila chrysaetos* Linnaeus, *Syst. Nat.*, 10th ed. i : 88.

2001. *Aquila chrysaetos*, Manakadan & Pittie, *Buceros*, 6(1) : 4.

Diagnostics : Size 75-88 cm. *Adult* distinguished from most other large eagles by overall dark plumage with golden hind-crown, nape and hind-neck. *Juvenile* is very distinct, with white base to tail and white patch at base of flight feathers. Sexes alike.

Locality : Pin (Guling) and Parahio catchments.

Distribution : Mainly N Baluchistan; Pakistan; Himalayas from N Pakistan east to Arunachal Pradesh; India (in desolate rocky mountainous country mainly above 1700 m).

Elsewhere : Nepal; Bhutan; Holarctic regions to N Africa, Himalayas, Mexico.

Habitat : High rugged mountain or above the tree line.

Status : Resident; uncommon.

4. Family FALCONIDAE (Falcons)

8(222-224). *Falco tinnunculus* Linnaeus, 1758
Common Kestrel

1758. *Falco tinnunculus* Linnaeus, *Syst. Nat.*, 10th ed. i : 90.

2001. *Falco tinnunculus*, Manakadan & Pittie, *Buceros*, 6(1) : 4.

Diagnostics : Size 32-35 cm. *Male* has greyish head with diffused dark moustachial stripe, rufous mantle, scapulars and wing-coverts which are heavily marked with black, buffish underparts with streaking, and grey tail with black subterminal band and whitish tip. In flight, rufous coverts contrast with blackish flight feathers. *Female* and *Juvenile* have rufous crown and nape streaked with black, diffused and narrow dark moustachial stripe, rufous upperparts which are heavily barred and spotted with black, and dark barring on rufous tail.

Locality : Throughout the park.

Distribution : Breeds in W Pakistan (N Bluchistan, NWF Province, Punjab) and India in the W Himalayas (Ladakh, Kashmir, Himachal Pradesh) between 700-3300 m, forages up to 5500 m.

Locality : Pakistan, Nepal; India (plains to highest peninsular hills); Sri Lanka; Maldives. Palaearctic, Ethiopian regions; Canary, Cape Verde, Azores.

Habitat : Open country, cultivation, grassland and semi-desert in hills and plains, and open subalpine and alpine slopes.

Status : Altitudinal migrants in Himalayas and Western Ghats, winter visitor to rest of the subcontinent; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

5. Family PHASIANIDAE (Partridges)

*9(232). *Tetraogallus himalayensis* G.R. Gray, 1843 Himalayan Snowcock

1843. *Tetraogallus himalayensis* Gray, P. Z. S., 1842 : 105.

2001. *Tetraogallus himalayensis*, Manakadan & Pittie, *Buceros*, 6 (1) : 4.

Diagnostics : Size 72 cm. Chestnut neck stripes, whitish breast contrasting with dark grey underparts, and chestnut flank stripes.

Locality : Parahio catchments.

Distribution : Himalayas from Afghanistan to Nepal, Tsinghai, Kansu.

Habitat : High-altitude rocky slopes and alpine meadows between 4000-5500 m (down to 2100 m in western Himalayas, in severe winters).

Status : Resident with altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

10(234-236). *Alectoris chukar* (J.E. Gray, 1830)**Chukor**

1830. *Perdix chukar* J. E. Gray, *Hardw. Ill. Ind. Zool.*, i, pl. 54.

2001. *Alectoris chukar*, Manakadan & Pittie, *Buceros*, 6(1) : 4.

Diagnostics : Size 38 cm. Black gorget encircling throat, barring on flanks, and red bill and legs are the diagnostics. Sexes alike.

Locality : Pin (Attargu) and Parahio (Mikkim, Kalamurti) catchments.

Distribution : Slopes with sparse scrub and adjacent cultivation; hills of Pakistan and Himalayas from N Pakistan east to EC Nepal; India between (1200) 2000-4000 m (5000). Balkan Peninsula to EC Nepal.

Habitat : Dry terraced cultivation and open rocky or grassy hills.

Status : Resident with some altitudinal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

6. Family RALLIDAE (Rails, Crakes, Moorhens, Coots)

*11(347-347a). *Gallinula chloropus* (Linnaeus, 1758)**Common Moorhen**

1758. *Gallinula chloropus* Linnaeus, *Syst. Nat.*, 10th ed. i : 152.

2001. *Gallinula chloropus*, Manakadan & Pittie, *Buceros*, 6(1) : 6.

Diagnostics : Size 32-35 cm. *Breeding adult* has red bill with yellow tip and red shield; dark grey head and neck; dark brown upperparts; slaty-grey underparts; white lateral under tail-coverts and usually white line along flanks. *Non-breeding adult* has duller bill and legs. *Juvenile* is mainly brown with dull green bill. Sexes alike.

Locality : Parahio catchments.

Distribution : Widely distributed all over India.

Elsewhere : Pakistan; Nepal; Bangladesh; Sri Lanka. SE Asia.

Habitat : Occurs in jheels and swamps, marshes, lakes, ponds, village tanks and ditches with emergent vegetation.

Status : Resident, also migrant in some areas; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number is 10000 (Jhunjhunwala, *et al.* 2001).

7. Family CHARADRIIDAE (Plovers, Dotterels, Lapwings)

*12(364). *Vanellus vanellus* (Linnaeus, 1758)
Northern Lapwing1758. *Tringa vanellus* Linnaeus, *Syst. Nat.*, 10th ed. i : 148.2001. *Vanellus vanellus*, Manakadan & Pittie, *Buceros*, 6(1) : 6.

Diagnosics : Size 28-31 cm. *Non-breeding adult* has black crest, white and black face pattern, black breast band, and dark green upperparts. *Breeding adult* has a very long black crest and strongly contrasting black and white face pattern. Chin and throat are all black on male and usually white on female. *Juvenile* Brown above, each feather fulvous edged; back slightly glossed with purple-bronze and wings with green; underparts like non-breeding adult. Sexes alike, but female has smaller crest.

Locality : Parahio catchments.

Distribution : Winter migrant to N and NW, rare in NE India.

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; S China and Japan. Breeds in Europe and N Asia east to Siberia, winters in S Europe, N Africa, SW Asia.

Habitat : Affects fallows, reaped and irrigated fields, riverbanks with pebbles, lake margins and marshlands.

Status : Winter visitor; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number is 650 (Jhunjhunwala, *et al.* 2001).

8. Family SCOLOPACIDAE (Sandpipers, Stints, Snipes)

*13(397). *Tringa ochropus* Linnaeus, 1758
Green Sandpiper1758. *Tringa ochropus* Linnaeus, *Syst. Nat.*, 10th ed. i : 149.2001. *Tringa ochropus*, Manakadan & Pittie, *Buceros*, 6(1) : 7.

Diagnosics : Size 21-24 cm. *Non-breeding adult* has ashy brown head and neck; brown remaining upperparts with green-bronze sheen; white tail with faint blackish terminal bars; white underparts with fine brown streaks on throat, breast and flanks. *Breeding adults* (summer) are darker and spotted lightly with white. Sexes alike.

Locality : Pin (near Sagnam) and Parahio catchments.

Distribution : Almost all over India, widespread up to 2000 m.

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka. Breeds in N Europe and Asia, north to Arctic Circle up to 68° N, winters in Britain, Mediterranean, S Africa, S and SE Asia.

Habitat : Generally favours small wetlands though affect lakes, village tanks, puddles, streams, marshes and paddy fields.

Status : Winter migrant as well as resident locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002). Its population threshold number is 2000 (Jhunjhunwala, *et al.* 2001).

9. Family COLUMBIDAE (Pigeons & Doves)

14(516-517). *Columba livia* Gmelin, 1789

Blue Rock Pigeon

1789. *Columba livia* Gmelin, *Syst. Nat.*, i, : 769.

2001. *Columba livia*, Manakadan & Pittie, *Buceros*, 6(1) : 8.

Diagnostics : Size 33 cm. *Adult* is chiefly greyish, with metallic green-and-purple sheen on neck, blackish terminal band on grey tail, and short, broad black bars across inner wing. *Juvenile* is browner, with less pronounced iridescence, and less developed black bar on greater coverts. Sexes alike.

Locality : Lower altitudes of the Pin and Parahio catchments.

Distribution : India (plains up to at least 3300 m).

Elsewhere : Pakistan; Nepal; Palaearctic, domesticated and distributed worldwide.

Habitat : Both feral and wild populations occur; the former inhabit villages, towns and cities while the latter frequent cliffs, gorges and ruins.

Status : Resident undertakes altitudinal movements; very common.

15(515). *Columba rupestris* Pallas, 1811

Hill Pigeon

1827. *Columba rupestris* Pallas, *Zoogr. Russo-Asiat.*, i, : 560.

2001. *Columba rupestris*, Manakadan & Pittie, *Buceros*, 6(1) : 8.

Diagnostics : Size 33 cm. *Adult* has pale grey plumage with metallic green-and-purple sheen on neck and breast; white band across dark tail; white back contrasting with grey rump. *Juvenile* is usually browner than the adult and lacks iridescence. Sexes alike.

Locality : Throughout Pin and Parahio catchments.

Distribution : Himalayas from N Pakistan east to Sikkim; Pakistan; Nepal and India (breeds between 3000-5500 m). Central, E Asia to China, Korea, the Himalayas.

Habitat : Rocky cliffs, gorges, villages, cultivation and *Carangana* scrub at high altitude, mainly in open trans-Himalayan country; 3000-5500m in summer and >1500 m in winter.

Status : Resident in Himalayas shows altitudinal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

16(513-514). *Columba leuconota* Vigors, 1831
Snow Pigeon

1832. *Columba leuconota* Vigors, P. Z. S. London : 16

2001. *Columba leuconota*, Manakadan & Pittie, *Buceros*, 6(1) : 8.

Diagnostics : Size 34 cm. *Adult* has slate-grey head, fawn brown mantle, white back contrasting with pale grey wing-coverts; creamy-white collar and underparts, and white band across blackish tail. *Juvenile* has greyish-buff wash to neck, breast and rest of underparts. Sexes alike.

Locality : Throughout Pjn and Parahio catchments.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh; India (locally common and breeds between 3000-5100 m).

Elsewhere : Pakistan; Nepal; Bhutan; Himalayas of Afghanistan to Tibet, Myanmar.

Habitat : Cliffs, gorges and slopes; 3000-5000m in summer and >1500m (750) in winter.

Status : Resident in Himalayas shows altitudinal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

17(530-533). *Streptopelia orientalis* (Latham, 1790)
Oriental Turtle-Dove

1790. *Columba orientalis* Latham, *Ind. Orn.*, ii, : 606.

2001. *Streptopelia orientalis*, Manakadan & Pittie, *Buceros*, 6(1) : 9.

Diagnostics : Size 33 cm. *Adult* has rufous-scaled scapulars and wing-coverts, brownish-grey to dusky maroon-pink underparts, and black and bluish-grey barring on neck sides. *Juvenile* lacks neck barring. Sexes alike.

Locality : Lower altitudes of Pin and Parahio catchments.

Distribution : Resident and winter visitor to Himalayas, NE India, C & E peninsular India, south to N Karnataka. Winter visitor to much of N and W India south to S Maharashtra, except the arid northwest.

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; Maldives. Himalayas, C Asia to Indochina.

Habitat : Open forests, mainly broadleaved, sometimes coniferous, often near cultivation and orchards below 4000m.

Status : Resident and winter visitor, summer visitor to higher elevations; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*18(537-540). *Streptopelia chinensis* (Scopoli, 1786)
Spotted Dove

1786. *Columba chinensis* Scopoli, *Del. Flor. et Faun., Insubr.*, : 94.

2001. *Streptopelia chinensis*, Manakadan & Pittie, *Buceros*, 6(1) : 9.

Diagnostics : Size 30 cm. *Adult* has white spots on black hind-neck and spotted upperparts. *Juvenile* is paler and browner, and lacks white spots on hind-neck. Sexes alike.

Locality : Parahio catchments.

Distribution : Throughout much of the subcontinent, except most of the NW and N Himalayas; India (plains to 2400 m in Himalayas, to 1500 m in peninsular hill).

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; and Maldives. Pakistan to SE China.

Habitat : Around villages and towns, gardens, parks, open moist deciduous forest etc.

Status : Resident, shows local movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

19(534). *Streptopelia decaocto* (Frivaldszky, 1838)
Eurasian Collared-Dove

1838. *Columba risoria decaocto* Frivaldszky, *A. M. Tarsasag Evk.*, : 183.

2001. *Streptopelia decaocto*, Manakadan & Pittie, *Buceros*, 6(1) : 9.

Diagnostics : Size 32 cm. *Adult* sandy-brown with black half-collar, white sides to tail, and white undertail-coverts. *Juvenile* lacks neck-collar. Sexes alike.

Locality : Pin and Parahio catchments.

Distribution : Throughout much of the subcontinent, except W Pakistan, most of Himalayas and SW India.

Elsewhere : Nepal; Bhutan; Bangladesh; Sri Lanka. Europe, N Africa to Myanmar, China, Korea.

Habitat : Gardens, scrub and cultivation with scattered trees below 2400m (3000).

Status : Resident, subject to marked seasonal and altitudinal movements; locally very common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

10. Family PSITTACIDAE (Parakeets & Hanging-Parrots)

*20(549-550). *Psittacula krameri* (Scopoli, 1769)**Rose-ringed Parakeet**1769. *Psittacula krameri* Scopoli, *Annus I. Hist. Nat.*, : 31.2001. *Psittacula krameri*, Manakadan & Pittie, *Buceros*, 6(1) : 9.

Diagnostics : Size 42 cm. *Male* is distinguished by slim green body and black and rose collar, which is absent in female.

Locality : Parahio catchments.

Distribution : Throughout much of the subcontinent, except parts of the NW, NE and Himalayas; India.

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; Maldives. From N Africa to Myanmar.

Habitat : Vicinity of habitation, gardens, cultivation, open woodland, deciduous forest etc.

Status : Resident; very common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

11. Family STRIGIDAE (Owls)

21(661-662). *Strix aluco* Linnaeus, 1758**Tawny Wood-Owl**1758. *Strix aluco* Linnaeus, *Syst. Nat.*, 10th ed. i : 92.2001. *Strix aluco*, Manakadan & Pittie, *Buceros*, 6(1) : 3.

Diagnostics : Size 45-47 cm. A medium-sized Himalayan owl has heavily streaked underparts, white marking on scapulars, dark center to crown, and pale forecrown stripe.

Locality : Pin and Parahio catchments.

Distribution : N Baluchistan; Pakistan; and Himalayas from N Pakistan east to Arunachal Pradesh; NE India (widespread in Kashmir, 1800 m up to the tree line in Himalayas, 1200 m up to the tree line in NE hills).

Elsewhere : Nepal; Bhutan. Palaearctic region.

Habitat : Temperate oak, rhododendron, pine and fir forest (600) 1200-4250 m.

Status : Resident, subject to altitudinal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

12 Family APODIDAE (Swifts)

*22(683-684). *Collocalia brevirostris* (Horsfield, 1840)**Himalayan Swiftlet**1840. *Hirundo brevirostris* Horsfield, P. Z. S. London : 155.2001. *Collocalia brevirostris*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 14 cm. A brownish swiftlet has slight sheen on upperparts, greyish rump band, and pronounced indentation to tail.

Locality : Parahio catchments.

Distribution : Mainly in Himalayas from W Himachal Pradesh east to Arunachal Pradesh; NE India; Nepal; Bhutan; Bangladesh; Maldives. Himalayas to China.

Habitat : Often forages over forest; roosts in caves.

Status : Resident, subject to altitudinal movements; common.

Remarks : The family Apodidae does not appear either in Schedule- I (Part-III) or Schedule- IV (No.11) of the Wildlife (Protection) Act, 1972 but should be included in the future amendments (BNHS 2002).

*23(688). *Hirundapus caudacutus* (Latham, 1802)**White-throated Needletail-Swift**1801. *Hirundo caudacuta* Latham, *Ind. Orn., Suppl.*, : 57.2001. *Hirundapus caudacutus*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 20 cm. *Adult* has well-defined white throat, white patch on tertials, and prominent pale 'saddle' *Juvenile* has black streaking and spotting on white of hindflanks, and black fringes to white undertail-coverts.

Locality : Parahio catchments.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh; NE India; Pakistan; Nepal; Bhutan; Bangladesh; Maldives. E Palaearctic; winters to Australia and Tasmania.

Habitat : Ridges, cliffs, upland grassland and river valleys, 1250-4000 m.

Status : Summer visitor; uncommon.

Remarks : As that of serial number 22.

*24(693-695). *Tachymarptis melba* (Linnaeus, 1758)**Alpine Swift**1758. *Hirundo melba* Linnaeus, *Syst. Nat.*, 10th ed. i : 192.2001. *Tachymarptis melba*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 22 cm. Has brown plumage with white throat, brown breast-band, and white patch on belly.

Locality : Parahio catchments.

Distribution : NW Pakistan; Himalayas from N Pakistan east to Bhutan; from S Rajasthan to N Andhra Pradesh, and south to Kerala and Sri Lanka; mainly a summer visitor to Himalayas, but some winter in foothills; resident in Western Ghats, also recorded breeding in N Maharashtra and W Madhya Pradesh; winter visitor to the peninsula; passage migrant to the north; Bhutan; Bangladesh; Sri Lanka. Mediterranean basin to S Africa, east to India.

Habitat : Mainly hills and mountains with cliffs or old forts.

Status : Breeds in Himalayas and winters in southern India; locally common.

Remarks : As that of serial number 23.

25(696). *Apus apus* (Linnaeus, 1758)

Common Swift

1758. *Hirundo apus* Linnaeus, *Syst. Nat.*, 10th ed. i : 192.

2001. *Apus apus*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 17 cm. *Adult* has uniform dark brown plumage; deeply forked tail; long sickled wings; and diffused white throat visible at closer range. *Juvenile* has whiter forehead and more extensive throat, and extensive pale scaling on underparts.

Locality : Pin and Parahio catchments.

Distribution : India (locally common; 1500-3300 m (5700)).

Elsewhere : Baluchistan; Pakistan; and Himalayas from N Pakistan east to Nepal; Pakistan; Nepal; Palaearctic region; winters to S Africa.

Habitat : Rugged mountain.

Status : Breeds locally; very common.

Remarks : As that of serial number 24.

26(702-706). *Apus affinis* (J.E. Gray, 1830)

House Swift

1832. *Cypselus affinis* Gray, *Ill. Ind. Zool.*, i, pl. 35, Fig. 2.

2001. *Apus affinis*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 15 cm. A small, stout, and blackish swift has a distinctive white rump and throat; and either square-ended or shallow fork tail.

Locality : Pin and Parahio catchments.

Distribution : Throughout much of the subcontinent except parts of the northwest; Pakistan; Nepal; India (locally common, from February-November occurs in Himalayas, elsewhere resident, subject to local movements); Bhutan; Bangladesh; Sri Lanka; Maldives. Africa to Oriental region, including islands.

Habitat : Cities, towns, villages, cliffs, ruins and old forts etc. below 2000 m.

Status : Resident; very common.

Remarks : As that of serial number 25.

13. Family CORACIIDAE (Rollers)

27(755-757). *Coracias benghalensis* (Linnaeus, 1758) Indian Roller

1758. *Coracias benghalensis* Linnaeus, *Syst. Nat.*, 10th ed. i : 106.

2001. *Coracias benghalensis*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 33 cm. *Adult* has rufous-brown on nape and underparts; white streaking on ear-coverts and throat; greenish mantle; turquoise band across primaries; and dark blue terminal to tail. *Juvenile* is duller than adult.

Locality : Lower altitudes of Pin and Parahio catchments.

Distribution : Throughout much of the subcontinent, subject to poorly understood local seasonal movements; Pakistan; Nepal; India (common and very widespread); Bhutan; Bangladesh; Sri Lanka; Maldives. Persian Gulf to Indochina.

Habitat : Cultivation, gardens, groves near villages and open country with suitable perches <1500m (3700).

Status : Resident; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

14. Family UPUPIDAE(Hoopoes)

28(763-766). *Upupa epops* Linnaeus, 1758 Common Hoopoe

1758. *Upupa epops* Linnaeus, *Syst. Nat.*, 10th ed. i : 117.

2001. *Upupa epops*, Manakadan & Pittie, *Buceros*, 6(1) : 11.

Diagnostics : Size 31 cm. An unmistakable orange-buff bird has black-tipped fan-like crest and black-and-white wings and tail.

Locality : Throughout Pin and Parahio catchments.

Distribution : Summer visitor to far north; resident and winter visitor to much of rest of the subcontinent; Pakistan; Nepal; India; Bhutan; Bangladesh; Sri Lanka; Maldives. S Europe to S Africa and S Asia.

Habitat : Open country, lightly wooded areas, cultivation and villages below 4600 m (5000).

Status : Resident breeds locally (common summer visitor to Himalayas and common in the peninsula, especially in winter), subject to altitudinal movements; common.

Remarks : The family Upupidae does not appear either in Schedule-I (Part-III) or Schedule-IV (No.11) of the Wildlife (Protection) Act, 1972 but should be included in the future amendments (BNHS 2002).

15. Family PICIDAE (Woodpeckers)

29(796). *Jynx torquilla* Linnaeus, 1758 Eurasian Wryneck

1758. *Jynx torquilla* Linnaeus, *Syst. Nat.*, 10th ed. i : 112.

2001. *Jynx torquilla*, Manakadan & Pittie, *Buceros*, 6(1) : 12.

Diagnostics : Size 16-17 cm. A slim, silvery grey-brown bird with cryptic pattern; has dark stripe down nape and mantle; and a long, barred tail.

Locality : Near Attargu (3500 m) at the confluence of the rivers Pin with Spiti (the entry point to the Park).

Distribution : Breeds in NW Himalayas, from Pakistan east to Himachal Pradesh between 1500-3300 m; Pakistan; Nepal; India (in winter and on passage common in the north, rare in the south; a frequent breeding visitor to Kashmir); Bhutan; Bangladesh. Palearctic; Oriental mainland; Hainan; Taiwan.

Habitat : Winters in open scrub country, edges of cultivation, and semi-desert thorn forest; summers at edges of open forestland and orchards.

Status : Winter visitor, passage migrant; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

16. Family ALAUDIDAE (Larks)

*?30 (888a). *Calandrella rufescens* (Vieillot, 1820) Lesser Short-toed Lark

1819. *Alauda rufescens* Vieillot, *Nouv. Dict. d'Hist. Nat.* xxix : 516.

2001. *Calandrella rufescens*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 13 cm. Primaries extend beyond tertials; bill shorter and stouter; broad gorget of fine streaking on breast; streaked ear-coverts; whitish supercilia appear to join across bill.

Locality : Parahio catchments.

Distribution : Pakistan; India (status uncertain; one record from Haryana, and possibly from Desert National Park, Rajasthan).

Elsewhere : Arid regions of Europe, N Africa to India.

Habitat : Stony foothills.

Status : Winter migrant; vagrant.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

31(903-903a). *Alauda arvensis* Linnaeus, 1758

Eurasian Skylark

1758. *Alauda arvensis* Linnaeus, *Syst. Nat.*, 10th ed. i : 165.

2001. *Alauda arvensis*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 18 cm. Primaries extent beyond tertials; pronounced whitish trailing edge to secondaries; whiter outer tail feathers.

Locality : Pin (Sagnam) and Parahio (Mikkim and Guling) catchments.

Distribution : N India (from Punjab east to W Uttar Pradesh and south to E Rajasthan).

Elsewhere : Pakistan; Palaearctic region; introduced in Australasia, Vancouver.

Habitat : Grassland and cultivation (favouring young wheat, paddy stubbles and fallow fields); Plains-1500m (3000+).

Status : Winter migrant; uncommon.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

32(895-897). *Eremophila alpestris* (Linnaeus, 1758)

Horned Lark

1758. *Alauda alpestris* Linnaeus, *Syst. Nat.*, 10th ed. i : 166.

2001. *Eremophila alpestris*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 18 cm. *Adult male* has striking black-and-white head pattern, with black mask, 'horns' and band across crown; creamy-white underparts with black breast band; and sandy upperparts with vinous cast to upper mantle and/or nape. *Adult female* has black breast and diffuse dark mask, but crown and mantle are heavily streaked, and lacks pinkish cast to nape/mantle. *Juvenile* has suggestion of dark mask; extensively and diffusely spotted underparts.

Locality : Pin (Sagmam) and Parahio (Mikkim and Guling) catchments.

Distribution : Himalayas from N Pakistan east to Sikkim; India (common breeds from the treeline up to 5400 m, winters down to 3000 m).

Elsewhere : Pakistan; Nepal; Palaearctic, Nearctic regions.

Habitat : Barren steppes, grassy pastures, riverbanks; in summer 3500m-snowline, winters >1500m.

Status : Resident, subject to altitudinal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

17. Family HIRUNDINIDAE (Swallows & Martins)

33(913). *Hirundo rupestris* Scopoli, 1769 Eurasian Crag-Martin

1769. *Hirundo rupestris* Scopoli, *Ann. i. Hist. Nat.*, : 167.

2001. *Hirundo rupestris*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 15 cm. A stocky and broad-winged martin with white spots on tail which are apparent when tail is spread; has dark brown upperparts and underwing-coverts; dusky throat, dusky brown flanks and vent, and more distinct pale fringes to undertail-coverts.

Locality : Pin catchment.

Distribution : India (locally fairly common; breeds between 1200-4500 m, winters below 2000 m).

Elsewhere : Breeds in W & N Pakistan and Himalayas from Pakistan east to Bhutan, winters in Western Ghats; Pakistan; Nepal; Bhutan; S Europe to C Asia, N Africa.

Habitat : Mountain crags, cliffs, old hill forts etc.

Status : Resident, migrant (breeds in Himalayas and winters in Western Ghats); locally common.

Remarks : The family Hirundinidae does not appear either in Schedule- I (Part-III) or Schedule- IV (No.11) of the Wildlife (Protection) Act, 1972 but should be included in the future amendments (BNHS 2002).

34(916-918). *Hirundo rustica* Linnaeus, 1758 Common Swallow

1758. *Hirundo rustica* Linnaeus, *Syst. Nat.*, 10th ed. i : 191.

2001. *Hirundo rustica*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 18 cm. *Adult* has chestnut forehead and throat; bright blue sheen to upperparts and long tail-streamers; distinct blue-black breast-band. *Juvenile* is duller with browner breast-band and shorter tail-streamers.

Locality : Pin and Parahio catchments.

Distribution : From N Pakistan east to Arunachal Pradesh; NE India; widespread farther south in winter; Pakistan; Nepal; India (locally common, breeds from foothills up to 3000 m); Bhutan; Bangladesh; Sri Lanka; Maldives. Worldwide.

Habitat : Usually near water in winter, lakes, rivers, open country, cultivation, villages, towns, etc.

Status : Resident, migrant; locally common.

Remarks : As that of serial number 33.

35(931). *Delichon dasypus* (Bonaparte, 1850)
Asian House-Martin

2001. *Delichon dasypus*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 12 cm. *Adult* has dusky underparts; shallower fork to shorter tail; darker underwing; and dirty white rump patch. *Juvenile* has browner upperparts and stronger dusky wash to underparts.

Locality : Guling, Mikkim, Sagnam and Mud.

Distribution : From N Pakistan east to Arunachal Pradesh; winters mainly in foothills; Pakistan; Nepal; India (breeds 1800-4800 m, locally down to 1300 m in the west; winters at lower altitudes, rarely down to the plains); Bhutan; Bangladesh. E Asia, Japan to Malaysia.

Habitat : Grassy slopes with cliffs, and forest around mountain villages.

Status : Resident in Himalayas, subject to altitudinal movement; locally common.

Remarks : As that of serial number 33.

18. Family MOTACILLIDAE (Wagtails & Pipits)

36(1885-1890). *Motacilla alba* Linnaeus, 1758
White Wagtail

1758. *Motacilla alba* Linnaeus, *Syst. Nat.*, 10th ed. i : 185.

2001. *Motacilla alba*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 19 cm. The pied plumage of *Adult* separates this from other wagtails with exception of white-browed wagtail. The black-backed races are distinguished from the latter by their white foreheads, smaller size and different wing pattern. *Juveniles* of the two breeding races have grey head, mantle and breast with whitish supercilium.

Locality : Pin and Parahio catchments.

Distribution : Breeds in Himalayas from N Pakistan east to Arunachal Pradesh; winters in Himalayan foothills and south throughout most of the subcontinent except parts of Pakistan; Pakistan; Nepal; India (breeds between 1500-5000 m in Himalayas, winters in plains and hills); Bhutan; Bangladesh; Sri Lanka. Palearctic and Oriental regions; Alaska.

Habitat : Usually in open country, vicinity of water, streams, rivers, damp fields, short grassland; summers 800-5000 m and winters below 1800 m.

Status : Resident with altitudinal movements, and winter visitor; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*37(1891). *Motacilla maderaspatensis* Gmelin, 1789

Large Pied Wagtail

1789. *Motacilla maderaspatensis* Gmelin, *Syst. Nat.*, 1 : 961.

2001. *Motacilla maderaspatensis*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 21 cm. *Adult* is black and white. The black head, neck, mantle and white supercilium and largely white wing-coverts separate it from all races of White Wagtail. *Juvenile* has brownish-grey head, mantle and breast with white supercilium.

Locality : Parahio catchment.

Distribution : Locally throughout much of the subcontinent, except parts of the northwest, northeast, Himalayas and Sri Lanka; Pakistan; Nepal; India (widespread resident, locally common; up to 1500 m in Himalayas and up to 2200 m in the peninsula); Bhutan; Bangladesh; Sri Lanka.

Habitat : Vicinity of water, banks of rivers, lakes, canals, and around irrigation barrages.

Status : Resident; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

38(1881-1883). *Motacilla citreola* Pallas, 1776

Citrine Wagtail

1776. *Motacilla citreola* Pallas, *Reise Russ. Reich.*, iii, : 696.

2001. *Motacilla citreola*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 19 cm. *Adult breeding male* has entirely yellow head and underparts, and black or grey mantle. *Breeding female* and *adult non-breeding male* have broad yellow supercilium continuing around ear-coverts, grey upperparts, and mainly yellow underparts. *Juvenile* lacks yellow and has brownish crown, ear-coverts and mantle; buffish supercilium; and buffish-white underparts with gorget of black spotting across breast.

Locality : Pin and Parahio catchments.

Distribution : India (summers (1500) 3000-4600 m and winters mainly lowlands).

Elsewhere : Breeds in Baluchistan, Pakistan, and in Himalayas from N Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka. Russia and China; winters India and Myanmar.

Habitat : Marshes, wet margins of lakes and jheels, wet paddies.

Status : Resident in Himalayas, winters in plains; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

39(1884). *Motacilla cinerea* Tunstall, 1771

Grey Wagtail

1771. *Motacilla cinerea* Tunstall, *Orn. Brit.*, : 2.

2001. *Motacilla cinerea*, Manakadan & Pittie, *Buceros*, 6(1) : 13.

Diagnostics : Size 19 cm. *Adult* is longer-tailed than other wagtails and has white supercilium, grey upperparts, and yellow vent and undertail-coverts. *Breeding male* has black throat. *Non-breeding adult* has white throat and pale yellowish to buffish-white underparts, and yellow vent. *Juvenile* is with brownish cast to upperparts, buffish supercilium, and dark mottling on breast sides.

Locality : Pin and Parahio catchments.

Distribution : India (common in summer in Himalayas (1200) 1800-3900 m, winters in plains and foothills up to 1500m).

Elsewhere : Breeds in Baluchistan, Pakistan and in Himalayas from N Pakistan east to Bhutan; Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; Maldives. Palaearctic, Oriental region to New Guinea.

Habitat : Fast flowing, rocky mountain streams.

Status : Resident in Himalayas, winters in plains; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*?40 (1865). *Anthus roseatus* Blyth, 1847

Rosy Pipit

1847. *Anthus roseatus* Blyth, *Jour. Asiat. Soc.*, Bengal 16 : 437.

2001. *Anthus roseatus*, Manakadan & Pittie, *Buceros*, 6(1) : 14.

Diagnostics : Size 15 cm. *Breeding adult* is identified by bold dark streaking on olive crown and mantle; mauve-pink wash to underparts; pinkish to buff prominent supercilium; variable bold, irregular black spotting on breast and flanks, and olive-green edges to

greater coverts, secondaries and tertials. *Non-breeding* plumage with olive-green cast to upperparts and heavily streaked underparts.

Locality : Parahio catchment.

Distribution : India (common on breeding grounds from timberline up to 4200 m; winters in plains and foothills, up to 1500 m in Himalayas).

Elsewhere : Breeds in Himalayas from N Pakistan east to Arunachal Pradesh; winters mainly south to N Pakistan, E Rajasthan, S Nepal, Bhutan, Bangladesh and Assam; Pakistan; Nepal; Bhutan; Bangladesh. India to Tibet, Myanmar; Hainan.

Habitat : Summers on alpine meadows; grassy, grassy scrub-covered and boulder-strewn slopes; winters in marshes, cultivation, and damp grassy areas along streams.

Status : Resident with altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*41(1873). *Anthus sylvanus* (Blyth, 1845)

Upland Pipit

1845. *Heterura sylvana* Hodgson, in Blyth, *Jour. Asiat. Soc.*, Bengal 14 : 556.

2001. *Anthus sylvanus*, Manakadan & Pittie, *Buceros*, 6(1) : 14.

Diagnostics : Size 17 cm. *Adult* is heavily streaked dark brown above and finely streaked below with white supercilium and black malar. *Juvenile* has rounded and neatly fringed with rufous-buff dark brown centres to feathers of upperparts.

Locality : Parahio catchment.

Distribution : India (frequently breeds between 1200-3000 m).

Elsewhere : Pakistan; Nepal; Himalayas Afghanistan to Yunnan.

Habitat : Steep rocky and grassy hillsides, abandoned terraced cultivation with scattered trees and open pine forest.

Status : Resident with altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

19. Family LANIIDAE (Shrikes)

42(946-948). *Lanius schach* Linnaeus, 1758

Rufous-backed Shrike

1758. *Lanius schach* Linnaeus, *Syst. Nat.*, 10th ed. i : 94.

2001. *Lanius schach*, Manakadan & Pittie, *Buceros*, 6(1) : 15.

Diagnostics : Size 25 cm. *Adult* has rufous scapulars and upper back contrasting with paler grey mantle; more extensive black forehead; rufous sides to black and long tail; and more conspicuous white flash at base of primaries which may lack in some birds. *Juvenile* has rufous-brown scapulars, back and rump; dark greater coverts and tertials fringed rufous.

Locality : Pin catchment.

Distribution : India (widespread resident, locally common; breeds in the plains and Himalayas, from the base up to 3000 m; winters below 2200 m).

Elsewhere : Throughout much of the subcontinent, except parts of northwest and northeast; Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka. Transcaspians to SE Asia; winters New Guinea.

Habitat : Variety of open habitats such as bushes in cultivation, gardens, canalside and roadside tree plantations, orchards, open forest, and tall grassland with scattered trees. Avoids dry country.

Status : Resident with altitudinal and local movements; locally common.

Remarks : The family Laniidae does not appear either in Schedule- I (Part-III) or Schedule- IV (No.11) of the Wildlife (Protection) Act, 1972 but should be included in the future amendments (BNHS 2002).

*43(944-945). *Lanius tephronotus* (Vigors, 1831)

Grey-backed Shrike

1831. *Collurio tephronotus* Vigors, P. Z. S., London : 43.

2001. *Lanius tephronotus*, Manakadan & Pittie, *Buceros*, 6(1) : 15.

Diagnostics : Size 25 cm. *Adult* has dark grey upperparts with no rufous on scapulars and upper back and usually lacks white patch on primary. *Juvenile* has cold grey upperparts and brown ear-coverts.

Locality : Parahio catchment.

Distribution : From Ladakh east to Arunachal Pradesh; India (breeds 2700-3600 m in W Himalayas and 2700-4575 m in E Himalayas, and winters in foothills and adjoining plains).

Elsewhere : Nepal; Bhutan; Bangladesh. Tibet, S China and Thailand.

Habitat : Bushes in cultivation, scrub and secondary growth.

Status : Resident with altitudinal movements; locally common.

Remarks : As that of serial number 42.

20. Family CINCLIDAE (Dippers)

*44(1772-1774). *Cinclus cinclus* (Linnaeus, 1758)**White-throated Dipper**1758. *Sturnus cinclus* Linnaeus, *Syst. Nat.*, 10th ed. i : 290.2001. *Cinclus cinclus*, Manakadan & Pittie, *Buceros*, 6(1) : 15.

Diagnostics : Size 20 cm. *Adult* has white throat and breast contrasting with brown belly, head and nape; and blackish-slate mantle, wings and tail. However, a rare colour phase, with brown throat and breast, has been recorded in Ladakh. *Juvenile* has dark scaling on grey upperparts and grey scaling on whitish underparts.

Locality : Parahio catchment.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh replaces Brown Dipper at higher elevations, but altitudinal ranges overlap and both species may occur along the same stream.

Elsewhere : Pakistan; Nepal; India (common in Trans-Himalayas; breeds 3000-4800 m; winters at lower altitudes); Bhutan. Palearctic region.

Habitat : Torrential hill streams.

Status : Resident with altitudinal movements; uncommon.

Remarks : The family Cinclidae does not appear either in Schedule-I (Part-III) or Schedule-IV (No.11) of the Wildlife (Protection) Act, 1972 but should be included in the future amendments (BNHS 2002).

21. Family PRUNELLIDAE (Accentors)

*45(1781). *Prunella rubeculoides* (Moore, 1854)**Robin Accentor**1854. *Accentor rubeculoides* Moore, *P. Z. S.*, London : 118.2001. *Prunella rubeculoides*, Manakadan & Pittie, *Buceros*, 6(1) : 15.

Diagnostics : Size 16-17 cm. *Adult* has grey head, rusty-orange breast band, and whitish belly. *Juvenile* has dark streaking on crown, nape, breast, and diffusely streaked underparts

Locality : Parahio catchment.

Distribution : India (common; breeds 3600-5300 m; winters down to 2000 m).

Elsewhere : Himalayas from N Pakistan east to Bhutan; Pakistan; Nepal; Bhutan. Pakistan to Inner Mongolia.

Habitat : Summers in dwarf willows, *Carangana* and sedge tussocks around streams and lakes; winters on stony ground and around upland villages.

Status : Resident, subject to altitudinal movements; locally common.

Remarks :..The family Prunellidae does not appear either in Schedule- I (Part-III) or Schedule- IV (No.11) of the Wildlife (Protection) Act, 1972 but should be included in the future amendments (BNHS 2002).

*?46 (1784-1785). *Prunella fulvescens* (Severtzov, 1873)

Brown Accentor

1873. *Accentor fulvescens* Severtzov, *Turk. Jevotn.*, : 66.

2001. *Prunella fulvescens*, Manakadan & Pittie, *Buceros*, 6(1) : 15.

Diagnostics : Size 15 cm. *Adult* has black mask, prominent white supercilium, faintly streaked upperparts, and pale orange-buff underparts. *Juvenile* has more heavily streaked upperparts with rufous-buff cast, brown mottling on supercilium and crown, browner ear-coverts, and brown streaking across breast.

Locality : Parahio catchment.

Distribution : N Himalayas, breeds in N Pakistan, Ladakh and NW Nepal, winters mainly from N Pakistan east to WN Nepal; Pakistan; Nepal; India (locally common, 3300-5100 m in summer; winters down to 1500 m). Afghanistan to Yunnan.

Habitat : Occur on dry scrubby and rocky slopes during summer, and in winter around upland villeges.

Status : Resident, subject to altitudinal movements; locally common.

Remarks : As that of serial number 45.

22. Family MUSCICAPIDAE

Subfamily TURDINAE (Thrushes & Redstarts)

47(1725-1726). *Monticola solitarius* (Linnaeus, 1758)

Blue Rock-Thrush

2001. *Monticola solitarius*, Manakadan & Pittie, *Buceros*, 6(1) : 15.

Diagnostics : Size 20 cm. *Adult breeding male* is indigo-blue with blacker wings and tail. *Female* has bluish cast to slaty-brown upperparts, and buff scaling on underparts.

Locality : Pin and Parahio catchments.

Distribution : India (common in W Himalayas in summer, 1200-4500 m, winters in plains where it is locally common).

Elsewhere : Breeds in Himalayas from N Pakistan east to WC Nepal; Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka. Palaearctic and Oriental regions.

Habitat : Rocky country, ruins, villages.

Status : Altitudinal migrant; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

48(1671-1672). *Phoenicurus ochruros* (Gmelin, 1774)

Black Redstart

1774. *Motacilla ochrura* Gmelin, *Reis. Russl.*, iii, : 101.

2001. *Phoenicurus ochruros*, Manakadan & Pittie, *Buceros*, 6(1) : 16.

Diagnostics : Size 15 cm. *Adult* male has largely black or dark grey upperparts with browner wings, black throat and breast, and rufous-orange remaining underparts. *Female* has dusky brown underparts, with orange-buff wash to flanks and vent. *Juvenile* has diffuse dark scaling on upper-and-underparts.

Locality : Pin and Parahio catchments.

Distribution : India (2400-5100 m in west, 3300-5200 m in east; winters widely in plains and hills up to 1700 m).

Elsewhere : Breeds in Himalayas from N Pakistan east to Sikkim; Pakistan; Nepal; Bhutan; Bangladesh. Palaearctic region; winters in Oriental regions.

Habitat : Breeds in Tibetan meadows and scree above treeline, stony ground with *Carangana* scrub, dwarf juniper forest and subalpine scrub; winters in cultivation, gardens, plantations by roadsides and canals, and riverain forest.

Status : Altitudinal migrant; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*49(1678). *Phoenicurus erythrogaster* (Guldenstadt, 1775)

Guldenstadt's Redstart

1775. *Motacilla erythrogaster* Guldenstadt, *Nov. Com. Petrop.* xix : 469.

2001. *Phoenicurus erythrogaster*, Manakadan & Pittie, *Buceros*, 6(1) : 16.

Diagnostics : Size 18 cm. *Male* has large white patch on wing and white cap. *Female* has buff-brown upperparts and buffish underparts. *Juvenile* has brown head and body with diffuse buff spotting and brown scaling. *Juvenile male* has white wing patch.

Locality : Parahio catchment.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh; India (breeds in N Himalayas between 3600-5200 m, winters 2650-3965 m).

Elsewhere : Pakistan; Nepal; Bhutan. Afghanistan to Mongolia.

Habitat : Occur in dry scrubby alpine habitat.

Status : Altitudinal migrant; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

50(1716). *Chaimarrornis leucocephalus* (Vigors, 1831)

White-capped Redstart

1830. *Phoenicurus leucocephala* Vigors, P. Z. S., : 35.

2001. *Chaimarrornis leucocephalus*, Manakadan & Pittie, *Buceros*, 6(1) : 16.

Diagnostics : Size 19 cm. *Adult* has white cap contrasting with blue-black remaining head, mantle and breast, rufous belly and rump, and rufous tail with broad black terminal band. *Juvenile* has blackish fringes to white crown, brownish-black upperparts, and blackish underparts with rufous fringes.

Locality : Pin and Parahio catchments.

Distribution : India (breeds 1830-4880 m, common; winters from foothills up to 1500 m).

Elsewhere : Breeds in Himalayas from N Pakistan east to Arunachal, and NE Indian hills; winter south to Baluchistan, Pakistan, and Bangladesh. Pakistan; Nepal; Bhutan; Bangladesh. Turkestan to China; Hainan.

Habitat : Hilly rivers and streams; in winter along canals.

Status : Altitudinal migrant; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*51(1709-1710). *Oenanthe deserti* (Temminck, 1825)

Desert Wheatear

1825. *Oenanthe deserti* Temminck, *Pl. Col. Pl.* 359.

2001. *Oenanthe deserti*, Manakadan & Pittie, *Buceros*, 6(1) : 16.

Diagnostics : Size 15 cm. *Adult breeding male* has black face and throat, sandy-brown upperparts, and largely black tail contrasting with white rump. *Non-breeding male* has black face and throat partly obscured by white fringes. *Adult breeding female* lacks black throat of male, black on ear coverts and lower throat, and has colder grey-brown crown and mantle. *Adult Non-breeding female* has black of face and throat partly obscured by whitish fringes.

Locality : Parahio catchment.

Distribution : Breeds from Baluchistan east to NC Nepal; winters to Pakistan and NW India, south to Gujarat and east to W Madhya Pradesh; Pakistan; Nepal; India (3000-5100

m in west during summer, widespread in plains during winter); Bangladesh; Sri Lanka. S Palearctic region.

Habitat : Breeds on rocky or sandy plateau with scattered *Carangana* bushes; winters in barren semi-deserts with scattered scrub.

Status : Altitudinal migrant; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

Subfamily SYLVIINAE (Warblers)

52(1477-1478). *Cettia fortipes* (Horsfield, 1845)

Brown-flanked Bush-Warbler

1845. *Horornis fortipes* Hodgs., *P. Z. S.*, : 31.

2001. *Cettia fortipes*, Manakadan & Pittie, *Buceros*, 6(1) : 19.

Diagnostics : Size 12 cm. Pale buffish-brown upperparts with brown-olive flanks; small area of off-white on underparts; buffy supercilium; diffuse dark stripe through eye; brownish legs and feet.

Locality : Guling and Mikkim.

Distribution : India (common in the west, breeds 1800-3000 m, winter below 1800 m down to foothills; 2000-3300 m in the east; 1200-2000 m in NE hills).

Elsewhere : Himalayas from N Pakistan east to Arunachal Pradesh; NE Indian hills; Pakistan; Nepal; Himalayas to S China; Greater Sundas; Taiwan.

Habitat : Scrubby slopes, undergrowth.

Status : Altitudinal migrant; uncommon.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*53(1574-1575). *Phylloscopus collybita* (Vieillot, 1817)

***Common Chiffchaff**

1817. *Sylvia collybita* Vieillot, *Nouv. Dict. d'Hist. Nat. nouv. ed.* xi : 235.

2001. *Phylloscopus collybita*, Manakadan & Pittie, *Buceros*, 6(1) : 20.

Diagnostics : Size 11 cm. Brownish to greyish upperparts; olive-green edges to wing-coverts, remiges and rectrices; black bill and legs.

Locality : Pin and Parahio catchments.

Distribution : India (common and widespread in the north; up to 2100 m in Himalayas).

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh. Palearctic region.

Habitat : Forests, bushes, crops and reedbeds.

Status : Winter migrant; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*54(1581). *Phylloscopus griseolus* Blyth, 1847
Olivaceous Leaf-Warbler

1847. *Phylloscopus griseolus* Blyth, *Jour. Asiat. Soc.*, Bengal 16 : 443.

2001. *Phylloscopus griseolus*, Manakadan & Pittie, *Buceros*, 6(1) : 20.

Diagnostics : Size 11 cm. Dark greyish to browner upperparts; bright yellow supercilium; and dusky yellow underparts washed with buff.

Locality : Parahio catchment.

Distribution : India (locally common, breeds 2400-4500 m, winters in plains and hills up to 1000 m, passage migrant in the northwest.

Elsewhere : Breeds in Himalayas from NW Pakistan east to C Nepal; Pakistan; Nepal; Baluchistan to outer Mongolia.

Habitat : Occur on stony slopes with scattered vegetation, juniper, and willows along riverbeds in summer; and in rocky areas and around old buildings in winter.

Status : Altitudinal migrant with winter influx; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

Subfamily MONARCHINAE (Paradise-Flycatchers)

55(1460-1464). *Terpsiphone paradisi* (Linnaeus, 1758)
Asian Paradise-Flycatcher

1758. *Corvus paradisi*, Linnaeus, *Syst. Nat.*, 10th ed. i : 107.

2001. *Terpsiphone paradisi*, Manakadan & Pittie, *Buceros*, 6(1) : 21.

Diagnostics : Size 20 cm. *Male* has black head and crest, with white or rufous upperparts and long tail streamers. *Female* lacks streamers and has reduced crest.

Locality : Near Attargu (3500 m) at the confluence of the rivers Pin with Spiti (the entry point to the Park).

Distribution : Himalayan foothills from N Pakistan east to Arunachal Pradesh and NE India, and south through much of the subcontinent except parts of N and NW India; Himalayan and N and C Indian bird winter farther south in the peninsula; Pakistan; Nepal; India; Bhutan; Bangladesh; Sri Lanka; Maldives. Oriental region, mainland and islands.

Habitat : Shady areas, often near water, in forest, plantations, groves and gardens, scrub jungles.

Status : Resident and partial migrant; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

23. Family EMBERIZIDAE (Buntings)

56(2051-2052). *Emberiza cia* Linnaeus, 1766

Rock Bunting

1766. *Emberiza cia* Linnaeus, *Syst. Nat.*, 12th ed. : 310.

2001. *Emberiza cia*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 16 cm. *Male* has grey head with black lateral crown-stripes and border to ear-coverts, and rufous underparts. *Female* is dull version of male with less striking head pattern.

Locality : Pin and Parahio catchments.

Distribution : India (common, breeds 2000-4200 m, winters up to 2100 m in hills, vagrant to plains).

Elsewhere : Breeds in Himalayas from NW Pakistan east to WC Nepal; Pakistan; Nepal; Palaearctic and Oriental region mainland.

Habitat : Breeds on dry and rocky slopes, winters in lowland fallow cultivation.

Status : Resident, altitudinal migrant; very common and widespread.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

24. Family FRINGILLIDAE (Finches)

57(1998). *Serinus pusillus* (Pallas, 1811)

Fire-fronted Serin

1811. *Passer pusillus* Pallas, *Zoogr. Rosso-Asiat.*, ii, : 28.

2001. *Serinus pusillus*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 12.5 cm. *Adult* has blackish head with scarlet forehead; mantle and belly/flanks are boldly streaked with black. *Juvenile* has cinnamon-brown head.

Locality : Pin and Parahio catchments.

Distribution : Himalayas from N Pakistan east to NC Nepal; Pakistan; Nepal; India (common, breeds 2400-4300 m, winters mainly 750-3300). Caucasus mountains to NC Nepal.

Habitat : Breeds in Tibetan steppe habitat; winters on stony and bushy slopes.

Status : Resident, subject to altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

58(1987-1989). *Carduelis carduelis* (Linnaeus, 1758)
Eurasian Goldfinch

1766. *Fringilla carduelis* Linnaeus, *Syst. Nat.*, 12th ed. i, : 318.

2001. *Carduelis carduelis*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 13-15.5 cm. *Adult* has red face; grey-brown crown, nape and mantle; black wings with yellow panel and white on tertials; white rump; and grey-brown breast and flanks. *Juvenile* lacks red face of adult.

Locality : Pin and Parahio catchments.

Distribution : India (common; breeds 2400-3900 m; winters in adjacent Indian plains).

Elsewhere : Himalayas from N Pakistan east NC Nepal; Pakistan; Nepal; Palaearctic region.

Habitat : Open coniferous forest, shrubberies above treeline, orchards, and cultivation.

Status : Resident, altitudinal migrant; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

59(1999-2000). *Leucosticte nemoricola* (Hodgson, 1836)
Hodgson's Mountain-Finch

1836. *Fringilla nemoricola* Hodgson, *As. Res.*, xix, : 158.

2001. *Leucosticte nemoricola*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 15 cm. *Adult* has boldly streaked mantle; faint supercilium; two thin pale wing-bars. *Juvenile* is warmer rufous-buff.

Locality : Pin and Parahio catchments.

Distribution : India (common; breeds above 3300 m in Kashmir, up to 5000 m in Ladakh and Spiti, and 4200-5300 m in the east; winters down to 1000 m).

Elsewhere : Himalayas from Pakistan east to W Arunachal Pradesh; Pakistan; Nepal; Bhutan. Himalayas of Afghanistan to NE Myanmar.

Habitat : Breeds on alpine slopes and winters in open forest and upland cultivation.

Status : Resident, altitudinal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

60(2010-2013). *Carpodacus erythrinus* (Pallas, 1770)
Common Rosefinch

1770. *Loxia erythrina* Pallas, *Nov. Comm. Petrop.*, xiv, : 587.

2001. *Carpodacus erythrinus*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 14-15 cm. *Male* has crimson head, breast and rump; brown upperparts tinged with red/pink; white belly and vent; and brownish eye-stripe. *Female* has streaked upperparts; two buffy/whitish wing-bars; boldly streaked underparts; and whitish belly and vent. *Juvenile* is very similar to female, but with more prominent streaking on upper-and-underparts.

Locality : Parahio catchment.

Distribution : India (common; summers (2700) 3900-4200 m in west; winters from 1500 m down to the foothills and plains).

Elsewhere : Breeds in N Baluchistan, Pakistan, and Himalayas from N Pakistan east to Arunachal Pradesh; winters throughout most of the subcontinent; Pakistan; Nepal; Bhutan; Bangladesh. Palearctic and Oriental regions mainland.

Habitat : Breeds in high altitudes shrubberies and open forest; winters in cultivation with bushes.

Status : Resident, altitudinal migrant; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

61(2027). *Carpodacus rubicilla* (Guldenstadt, 1775)
Common Great Rosefinch

1775. *Loxia rubicilla* Guldenstadt, *Nov. Comm. Petrop.*, xix, : 463.

2001. *Carpodacus rubicilla*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 19-20 cm. *Male* has pink head and underparts, and pale sandy-grey and lightly streaked upperparts. *Female* has paler, sandy-brown faintly streaked upperparts; less heavily streaked ear-coverts and underparts. In flight, both sexes show white edge to outer tail feathers.

Locality : Parahio catchment.

Distribution : India (uncommon; summers 3300-4800 m).

Elsewhere : N Himalayas from N Pakistan east to Sikkim; Pakistan; Nepal; Mountains of Asia Minor to Mongolia.

Habitat : High-altitude semi-desert.

Status : Resident, subject to small altitudinal movement; uncommon.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*62(2029-2031). *Carpodacus puniceus* (Blyth, 1845)
Red-fronted Rosefinch

1845 (1844). *P. (yrrhospiza) punicea* 'Hodgson' = Blyth, *Jour. Asiat. Soc., Bengal*, 13 : 953.

2001. *Carpodacus puniceus*, Manakadan & Pittie, *Buceros*, 6(1) : 23.

Diagnostics : Size 20 cm. *Male* has red forehead, lower ear-coverts, throat and breast; dark grey-brown eye-stripe; heavily streaked grey-brown upperparts; deep pink rump; light grey-brown belly, flanks and vent; and conical bill and short tail. *Female* is heavily streaked; lacks supercilium; and may show yellow-olive rump.

Locality : Parahio catchment.

Distribution : N Himalayas from N Pakistan east to Bhutan; Pakistan; Nepal; India (uncommon; breeds 3900-5200 m; winters (1500) 2700-4550 m); Bhutan; east to Szechwan.

Habitat : Steep rocky slopes.

Status : Resident, subject to some altitudinal movement; uncommon.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

25. Family PASSERIDAE (Sparrows & Snowfinches)

63(1938-1939a). *Passer domesticus* (Linnaeus, 1758)
House Sparrow

1758. *Fringilla domestica* Linnaeus, *Syst. Nat.*, 10th ed. i, : 183.

2001. *Passer domesticus*, Manakadan & Pittie, *Buceros*, 6(1) : 24.

Diagnostics : Size 15 cm. *Male* has grey crown, chestnut nape, black throat and upper breast; and brownish mantle. *Female* has pale buffy-brown supercilium and unstreaked greyish-white underparts. *Juvenile* has broader buff-brown fringes to upperparts.

Locality : Pin and Parahio catchments.

Distribution : India (widespread and common; plains and hills, breeds up to 4500 m in Ladakh; winters at lower altitudes).

Elsewhere : Throughout most of the subcontinent, except parts of the northwest and northeast; Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka. S Palaearctic; introduced worldwide.

Habitat : Breeds in human habitation, ranging from city centres to isolated houses in forest; during autumn and winter also occurs in cultivation, sometimes far from human habitation.

Status : Resident, subject to some local and seasonal movements; common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

64(1952). *Montifringilla adamsi* Adams, 1858
Tibetan Snowfinch

1858. *Montifringilla adamsi* Adams, *P. Z. S.*, : 482.

2001. *Montifringilla adamsi*, Manakadan & Pittie, *Buceros*, 6(1) : 24.

Diagnostics : Size 17 cm. *Adult* has whitish-tipped black throat, black bill, and largely white or buffish-white wing-coverts. *Juvenile* lacks black throat and has pale bill.

Locality : Pin catchments (Sagnam and Mud).

Distribution : N Himalayas in Ladakh, N Himachal Pradesh, N Sikkim and NW Nepal.

Habitat : Open stony ground, scree slopes, and fields.

Status : Resident, subject to poorly understood altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*65(1953). *Pyrgilauda taczanowskii* (Przevalski, 1876)
Mandelli's Snowfinch

1876. *Onychospiza taczanowskii* Przevalsky, *Mong. Sutrana Tangut.*, 2 : 81.

2001. *Pyrgilauda taczanowskii*, Manakadan & Pittie, *Buceros*, 6(1) : 24.

Diagnostics : Size 17 cm. *Adult* has grey head, black lores, white supercilium; and is the only snowfinch with white rump. *Juvenile* has warmer brown colouration to mantle and wings, and buffish breast and flanks.

Locality : Parahio catchment.

Distribution : N Himalayas in Ladakh, N Sikkim, NW Nepal, and N India; Nepal; India (rocky high-altitude semi-desert). Tibet, Sikiang, Tsinghai.

Habitat : Stony plateaux in Tibetan steppe country and among Pika colonies at the drier edges of marshes.

Status : Resident?, winter visitor; uncommon.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

26. Family Oriolidae (Orioles)

66(952-953). *Oriolus oriolus* (Linnaeus, 1758)
Eurasian Golden Oriole

1758. *Coracias oriolus* Linnaeus, *Syst. Nat.*, 10th ed. i, : 107.

2001. *Oriolus oriolus*, Manakadan & Pittie, *Buceros*, 6(1) : 25.

Diagnostics : Size 25 cm. *Male* is golden-yellow, with black mask and wings. *Female* and *juvenile* are variable, usually with streaking on underparts and yellowish-green upperparts.

Locality : Pin (Mikkim, Guling) and Parahio catchments.

Distribution : India (locally common; usually summers in the plains and up to 1800 m in Himalayas (4400 m); widespread in peninsula in winter in plains and up to 1800 m in hills).

Elsewhere : Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; Maldives. S Palaearctic region.

Habitat : Open deciduous woodland, groves, orchards, and trees at the edge of cultivation.

Status : Resident, migrant, and passage migrant (summer visitor to W Pakistan and Himalayas from Pakistan east to Nepal and N plains of subcontinent; resident from E Rajasthan and N Maharashtra east to West Bengal and south to Karnataka and N Tamil Nadu; winter visitor farther south; status in NE India uncertain); locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

27. Family DICRURIDAE (Drongos)

67(965-966b). *Dicrurus leucophaeus* Vieillot, 1817

Ashy Drongo

2001. *Dicrurus leucophaeus*, Manakadan & Pittie, *Buceros*, 6(1) : 3.

Diagnostics : Size 29 cm. *Adult* has dark grey underparts, slate-grey upperparts with blue-grey sheen, and bright red iris. *Juvenile* has uniform brownish-black upperparts and underparts that lack sheen and shorter tail.

Locality : Pin and Parahio catchments.

Distribution : Breeds in Himalayas from N Pakistan east to Arunachal Pradesh, NE Indian hills; winters in the plains from E Punjab and S Gujarat eastwards, and south through most of peninsula and Sri Lanka; Pakistan; Nepal; India (locally common; summers in Himalayas from foothills up to 3000 m; winters in the plains) Bangladesh; Bhutan; Sri Lanka. Afghanistan to China, Malaya; Andamans; Greater Sundas.

Habitat : Breeds in broadleaved and coniferous forest with preference for more open rather than dense forest; winters in well-wooded areas such as groves, plantation, secondary growth and wooded gardens.

Status : Resident, subject to altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

28. Family CORVIDAE (Choughs & Crows)

68(1046-1047). *Pyrrhonorax pyrrhonorax* (Linnaeus, 1758)**Red-billed Chough**1758. *Upupa pyrrhonorax* Linnaeus, *Syst. Nat.*, 10th ed. i, : 118.2001. *Pyrrhonorax pyrrhonorax*, Manakadan & Pittie, *Buceros*, 6(1) : 25.

Diagnostics : Size 36-40 cm. *Adult* has blackish plumage with metallic gloss, long downcurved red bill, and red legs. In flight, squarer tail with angular corners and broader wing tips or 'fingers' (pronounced fingered primaries) is the diagnostics. *Juvenile* lacks metallic gloss of adult, has pinkish-brown to orange-brown bill.

Locality : Pin (Guling, Mikkim, Sagnam, Mud) and Parahio catchments.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh; Pakistan; Nepal; India (locally very common; 3000-4500 m, foraging up to 6000 m in summer; winters down to 1800 m); Bhutan. S Palearctic region.

Habitat : High mountains, alpine pastures and cultivation.

Status : Resident, subject altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

69(1045). *Pyrrhonorax graculus* (Linnaeus, 1766)**Yellow-billed Chough**1766. *Corvus graculus* Linnaeus, *Syst. Nat.*, 12th ed. i, : 158.2001. *Pyrrhonorax graculus*, Manakadan & Pittie, *Buceros*, 6(1) : 25.

Diagnostics : Size 37-39 cm. *Adult* has blackish plumage with metallic gloss, almost straight yellow bill, and red legs. *Juvenile* lacks metallic gloss of adult, has brown or blackish (rather than red) legs and duller olive-yellow bill.

Locality : Pin (Guling, Mikkim, Sagnam, Mud) and Parahio catchments.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh; Pakistan; Nepal; India (locally very common; from treeline up to 8600 m; winters down to 1500 m); Bhutan. High mountains of S Europe, Morocco to Asia.

Habitat : High mountains, alpine pastures and cultivation.

Status : Resident, subject altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*70(1048-1051). *Corvus splendens* Vieillot, 1817**House Crow**1817. *Corvus splendens* Vieillot, *Nouv. Dict. d'Hist. Nat.*, viii : 44.

2001. *Corvus splendens*, Manakadan & Pittie, *Buceros*, 6(1) : 25.

Diagnostics : Size 40 cm. *Adult* has double-toned (black and grey) appearance. The nape, neck and breast being greyish (collar) while the remaining parts black with metallic gloss. *Juvenile* lacks gloss, and 'collar' is duskier and less defined.

Locality : Parahio catchment.

Distribution : Throughout much of the subcontinent, except parts of the northwest, northeast and Himalayas; Pakistan; Nepal; India (widespread and common; from plains to 2100 m); Bhutan; Bangladesh; Sri Lanka; Maldives. Iran, India to China, Myanmar, Thailand.

Habitat : Closely associated with human activity; occurs in villages, towns, cities, gardens and cultivation.

Status : Resident, subject to altitudinal and seasonal movements; locally common.

Remarks : Listed in Schedule V of the Wildlife (Protection) Act, 1972 (BNHS 2002).

71(1054-1057). *Corvus macrorhynchos* Wagler, 1827
Jungle Crow

1827. *Corvus macrorhynchos* Wagler, *Syst. Av.*, : 3.

2001. *Corvus macrorhynchos*, Manakadan & Pittie, *Buceros*, 6(1) : 25.

Diagnostics : Size 46-59 cm; has glossy black plumage, domed head, large bill with arched culmen, and wedge-shaped tail.

Locality : Pin (Guling, Mikkim, Sagnam, Mud) and Parahio catchments.

Distribution : N Baluchistan, Pakistan; Himalayas from N Pakistan east to Arunachal Pradesh; NE India, Bangladesh, peninsular India and Sri Lanka. Pakistan; Nepal; India (widespread and common; from plains up to 4500 m in Himalayas, to 2300 m in peninsular hills); Bhutan; Bangladesh; Sri Lanka. Oriental region.

Habitat : Forest, well-wooded compounds on the outskirts of towns and villages.

Status : Resident, subject to some altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

*72(1059-1060). *Corvus corax* Linnaeus, 1758
Common Raven

2001. *Corvus corax*, Manakadan & Pittie, *Buceros*, 6(1) : 25.

Diagnostics : Size 58-69 cm; has heavy bill, glossy black plumage, and shaggy throat feathers. In flight, markedly wedge-shaped tail, and longer and more angled wings with more pronounced fingered primaries are an aid to identification.

Locality : Parahio catchment.

Distribution : Himalayas from N Pakistan east to Arunachal Pradesh; Pakistan; Nepal; India (trans-Himalayas; 4000-5500 m, foraging to over 6000 m, winters down to 2500 m); Bhutan. Palaearctic, Nearctic regions.

Habitat : Dry stony Trans-Himalayan desert.

Status : Resident, subject to some altitudinal movements; locally common.

Remarks : Listed in Schedule IV of the Wildlife (Protection) Act, 1972 (BNHS 2002).

SUMMARY

A total 72 bird species belonging to 53 genera and 28 families have been recorded from Pin Valley National Park. Various aspects such as diagnostics, locality records, distribution, habitat and status of each bird species have been dealt with. A three-fold status terminology, viz., residential, abundance and conservation, along with varying number of sub and sub-subcategories, has been used to highlight status of each bird species.

ACKNOWLEDGEMENTS

We are thankful to the Director, Zoological Survey of India, Kolkata for permitting to undertake this study and to Dr. R.M.Sharma, Scientist C & Officer-in-Charge, Zoological Survey of India, Solan for facilities and encouragements.

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MAMMALIA

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INTRODUCTION

The mammalian fauna of India is represented by 397 species (Alfred *et al.* 2002). They are found in all possible habitats from snowy Himalayas to plains and display all sorts of adaptation. Knowledge about the diversity of Indian mammals has gained a momentum chiefly through the collections made between 1911 and 1928 by the Mammal Survey of India organized by the Bombay Natural History Society. After the inception of Zoological Survey of India in 1916, data generated by collections of Kemp (1924), Roonwal (1950), Kurup (1966), Agrawal (1973), Khajuria and Ghoshal (1981), Chakraborty (1983), Das *et al.* (1995) made significant contribution to the knowledge of mammalian fauna of India.

The state of Himachal Pradesh shares a good number of mammalian species comprising 3 insectivores, 24 chiropterans, 27 rodents, 2 lagomorphs, 20 carnivores, 11 ungulates and 2 primates totaling 89 species (about 22% of total Indian species). The district of Lahaul and Spiti and parts of Kinnaur fall under a distinct biogeographic zone, the Trans-Himalaya. This zone is characterized by extreme cold, low precipitation and absence of trees and is referred as cold desert. Due to extreme nature of the environment, mammalian diversity is not high although some species have adapted themselves to such conditions. In the past, a few attempts have been made to study the mammalian fauna of this region. Bhatnagar (1993) gave a general account of the wildlife of Pin Valley National Park. Studies on habitat utilization, feeding ecology and conservation of Asiatic Ibex, conflicts between pastoralism and wild herbivores and ecology of Snow leopard were also conducted in the park and other parts of Trans-Himalayan region in Himachal and Ladakh (Bhatnagar 1997, Chundawat 1994, Manjrekar 1997, Johnsingh *et al.* 1999, Mishra 2000).

The present paper aims to document the mammalian fauna of the Pin Valley National Park based on the actual sightings by ZSI survey party during many field visits to the park during the years 2000-2002. Except otherwise indicated, information on the species

mentioned here are taken from Alfred *et al.* (2002), Gurung and Singh (1996), Menon (2003), Pfister (2004), Prater (1971), Nowak (1983), Roberts (1977) and Sharma (1998). The present account deals with 9 species belonging to eight genera spread over three orders.

SYSTEMATIC ACCOUNT

Class MAMMALIA

Order CARNIVORA

Family FELIDAE

1. *Uncia uncia* (Schreber, 1775)

1775. *Felis uncia* Schreber, Die Säugethiere, 2(14) : pl. 100. (1775); text, 3(22) : 386-7 (1777)

2002. *Uncia uncia* Alfred, Sinha & Chakraborty, *Rec. zool. Surv. India. Occ. Paper No.*, 199 : 106

Common Name : Snow Leopard

Diagnostic characters : Head and body length is 100 to 130cm, tail length is 80 to 100 cm, shoulder height is about 60cm. The sexes are alike, but the male is larger weighing 40-45 kg, the female weighing 30-40 kg (Pfister, 2004). The body colour varies from pale gray to creamy smoke gray, and the underparts are whitish. On the head, neck and lower limbs are solid spots. On the back, sides and tail are large rings or rosettes that enclose some small spots. Other distinctive features include a short snout, high forehead, short legs and a long bushy tail.

Distribution : India : Kashmir, Himachal Pradesh, Uttaranchal and Arunachal Pradesh.

Elsewhere : Afghanistan, Bhutan, China, CIS countries, Mongolia, Nepal, Pakistan.

Habits and habitat : The snow leopard is found on the high mountains of Central Asia. During summer, it commonly occurs in alpine meadows and rocky areas within an altitude of 2700 to 6000 m. In the winter it may follow its prey down the mountain slopes. It is often active by day especially in the early morning and late afternoon. It is an agile animal and can leap upto a distance of 15m. Prey is either stalked or ambushed. Big cats can generally subdue prey weighing three times their own weight (Schaller 1972). Thus, most high - altitude wild ungulates except adult kiang, takin and yak represent potential prey. Ward (1923) included monal pheasant and chukor in its food item. In Spiti valleys, snow leopard is a major predator of livestock (Mishra, 1997). In Ladakh areas, dzo (a cross between yak and cow), donkey, sheep and dog are the major prey items (Nath. 1982).

Threats : Hunted for pelts. Sometimes local inhabitants also kill them to save their livestock.

Conservation status : IWPA : Schedule I, Part I; RDB : EN. ; CITES : Appendix I.

Order CARNIVORA

Family CANIDAE

2. *Canis lupus chanco* Gray, 1863

1758. *Canis lupus* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 39

1951. *Canis lupus chanco* Ellerman and Morrison- Scot. *Checklist of Palaearctic & Indian Mammals Brit. Mus. Nat. Hist.*, 219p

Common name : Tibetan wolf

Diagnostic characters : This is one of the largest members of the family Canidae. Head and body length is generally about 95-140cm, tail 35-40cm and shoulder height 75-80cm. In a given population, males are larger on average than the females. The sexes look alike and weighs between 30-40kg. The Tibetan wolf varies greatly in pelage colour from light to sandy brown, dark grey or even black. Black individuals are common in some populations especially those of Tibet, Ladakh and northern slopes of Himalayas. The face is pale and under parts are generally lighter coloured. It has got long legs and ears. The tail is bushy and tipped black.

Distribution : India : High altitude areas (above 3500m) of Kashmir, eastern Ladakh, Lahaul and Spiti district of Himachal Pradesh, Sikkim and Arunachal Pradesh.

Elsewhere : Tibet, China, Mongolia and Afghanistan.

Habits and habitat : Mostly live in a pack of 2-6 animals. In the barren uplands of Trans-Himalaya, they live as nomads coming down to valleys in winter, migrating with game and grazing flocks to the snow line in summer. Generally, they hunt during night but remain active during morning and evening hours of the day. According to Schaller (1977), Ibex, livestock and marmot constitute the major prey items in Chitral and Gilgit areas of Pakistan. Studies by Mishra (1997) showed that along with Snow leopard, wolf is the main predator of livestock in the Trans-Himalayan region.

Threats : Often comes in conflict with locals for killing their precious livestock. Persecuted locally by burning and blasting dens, killing pups capturing and killing adults in pitfall traps. Present status in the region is obscure.

Conservation status : IPWA : Schedule I, Part I; RDB : Vu.; CITES : appendix I.

Remarks : Recent mitochondrial DNA analysis revealed that wolves from Spiti valley in Himachal Pradesh are ancient and entirely of different lineage. Molecular analysis also revealed that the Spiti wolf has diverged from the rest of the world wolf population more than 800000 years ago (Sharma *et al.* 2004).

Order CARNIVORA

Family CANIDAE

3. *Vulpes vulpes montana* Pearson, 1836

1758. *Vulpes vulpes* Linnaeus, *Syst. Nat.* 10th ed., 1 : 39

1951. *Vulpes vulpes montana* Ellerman and Morrison -Scot, *Checklist of Palaearctic & Indian Mammals*, *Brit. Mus. Nat. Hist.*, 226p

Common name : Hill fox

Diagnostic characters : Head and body length 55 to 75cm, tail length 40 to 50cm, and weighs up to 5 kg. The typical coloration varies from pale yellowish red to deep reddish brown upper parts and pure white, grey or silvery underparts. The lower part of the leg is usually black, and the tail is bushy tipped with white, which distinguishes it from other Indian foxes. Body is well proportioned with slender limbs. The head rather pointed and narrow with pointed blackish ears.

Distribution : India : This subspecies is found throughout the Himalayas from Ladakh to Sikkim.

Elsewhere : Tibetan plateau, Pakistan and Afghanistan.

Habits and habitat : Usually encountered singly in semi arid open grasslands or dry boulder set slopes. Although nocturnal, it may be seen hunting by day in the winter (Roberts, 1977). The fox is monogamous and territorial. The diet is omnivorous consisting mostly of rodents, lagomorphs, insects and fruits.

Conservation status : IPWA : Schedule II, Part II; CITES : Appendix III.

Order CARNIVORA

Family MUSTELIDAE

4. *Martes foina intermedia* Severtzov, 1837

1777. *Mustela foina* Erxleben, *Syst Regni. Anim.*, 1 : 458

1951. *Martes foina intermedia* Ellerman and Morrison -Scot., *Checklist of Palaearctic & Indian Mammals*. *Brit. Mus. Nat. Hist.*, 246p

Common name : Stone Marten

Diagnostic characters : Head and body length 30-50 cm, tail length 18-25 cm and weight is about 1.1 to 2.3 kg. A slender marten with moderately long legs, tail about half as long as the head and body. The fur colour is chocolate brown with paler underparts. There is a prominent white patch from throat to chest which may be broken up by brown patches or may even be obliterated.

Distribution : In India : Himalayas from Kashmir, Ladakh, Himachal Pradesh to as far East as Sikkim.

Elsewhere : Southern Europe, Western and Southwestern Asia except Arabia.

Habits and habitats Stone martens inhabit the temperate and Alpine zones of the Himalayas and are rarely found below 1500m (Prater 1971). In Ladakh areas, they have been recorded up to 4000m (Pfister, 2004). They are often observed on the barren heights above the tree line, even on orchards and near human settlements. They are active both in the day and night preying on small mammals. In the higher levels of the Himalayas, prey largely consists of voles and pikas like *Ochotona* spp. They may prey on lizards and frogs (Prater, 1971). Stone marten is a solitary creature except during mating season or when they are very young.

Conservation status : IPWA : Schedule II, Part II; CITES : Appendix II

Order CARNIVORA

Family MUSTELIDAE

5. *Mustela sibirica* Pallas, 1773

1773. *Mustela sibirica* Pallas, *Reise. Prov. Russ. Reichs.* 2 : 701

2002. *Mustela sibirica* Alfred, Sinha & Chakraborty, *Rec. zool. Surv. India. Occ. Paper No.*, 199 : 119

Common name : Siberian weasel

Diagnostic characters : In males, head and body length is 28-39 cm, tail length 15 to 21cm and weighs approx. 800gm. Females are smaller with head and body length of 25 to 30 cm, tail length 13 to 16 cm and weight approx. 400gm. Colour varies from foxy red to dark chocolate, no sharp contrast between upper and underparts, which are but slightly paler. The colour of the muzzle is black in some forms, in others more or less white.

Distribution : Himalayas from Kashmir to Northeastern states. Elsewhere : Russia, Central and eastern Asia, upper Burma and Java.

Habits and habitat : In the Himalayas, this weasel lives in temperate and alpine forests and in the open grass and scrub above tree line at altitudes ranging from 1500-4800m. Elsewhere in its range, it shows remarkable adaptability to varied conditions, being found in dense forests, in dry sandy valleys, even in low lying swamps. They are nocturnal although may hunt in daytime also. Weasels hunt for rodents, pikas, birds and bird's eggs, sometimes reptiles and fish (Pfister, 2004). Except mating time and with young ones, it hunts alone.

Conservation status : IPWA : Schedule II, Part II; CITES : Appendix III.

Order CARNIVORA

Family MUSTELIDAE

6. *Mustela altaica temon* Hodgson, 1857

1881. *Mustela altaica* Pallas, *Zoogr. Rssso-Asiat.*, 1 : 98

1951. *Mustela altaica temon* Ellerman and Morrison Scot., *Checklist of Palaearctic & Indian Mammals. Brit. Mus. Nat. Hist.*, 259p

Common name : Mountain weasel

Diagnostic characters : In males, head and body length 22 to 29cm, tail length 11 to 15 cm and weight 220 to 350 gms. In female head and body length measures 22 to 25 cm, tail length 9 to 12 cm and weighs between 130 to 220gm. *M. altaica* resembles *M. siberica*; the latter is smaller and has shorter fur and a less luxuriant tail. The winter pelage is yellowish brown above and pale yellow below. In summer, the coat is gray to grayish brown. Paws, chin and upper lips are white.

Distribution : In India : Ladakh, higher reaches of Himachal Pradesh, Uttar Pradesh and Sikkim.

Elsewhere : China, CIS countries, Korea, Mongolia.

Habits and habitat : It is generally distributed in the upper levels of the Himalayas, between 2000 to 4000m (Prater, 1971). However, Pfister (2004) mentioned that in Ladakh areas, it was recorded up to 5100m or in rare occasions even higher. It nests among rock crevices and may occupy rodent burrows. It is chiefly nocturnal and crepuscular. It is believed to be exclusively carnivorous (Roberts, 1977). Food includes rodents like *Alticola* spp., Pikas (*Ochotona* spp.) small birds, etc.

Conservation status : IPWA : Schedule II, Part II; CITES : Appendix III.

Order ARTIODACTYLA

Family BOVIDAE

7. *Capra sibirica* (Pallas, 1776)

1776: *Ibex sibiricus* Pallas, *Spic. Zool.* 11 : 52

2002. *Capra sibirica* Alfred, Sinha & Chakraborty, *Rec. zool. Surv. India. Occ. Paper No.*, 199 : 164

Common name : Siberian Ibex

Diagnostic characters : Height of the male at the shoulder is 100cm; females smaller. Full grown horn of male measures 100 to 115 cm around the curve. A male in good condition may weigh upto 90 kg and females are smaller, weighing about 40 kg. It is a sturdy thickset goat, the male with a great beard and a coat of coarse brittle hairs. The colour is variable; winter coat is yellowish white, more or less tinged with brown or gray. In

summer the general hue is dark brown with irregular white patches. The female is yellowish brown and insignificant to look at.

Distribution : India : Himachal Pradesh, Jammu & Kashmir, and Uttaranchal (now Uttarakhand).

Elsewhere : Afghanistan, China, Mongolia, Pakistan, Former Russia.

Habits and habitat : The Asiatic Ibex uses rugged mountains of cold arid regions, between the tree line (2500-3000m) and the upper limit for vegetation (5000m) (Schaller 1977, Prater 1971). In the spring they are found below the snow line. They graze early in the morning and late in the afternoon. They are very watchful animals and at the slightest sign of danger, they will retreat to inaccessible cliffs and ridges. Ibex live in a herd of 40 to 50 individuals although larger groups may be seen. In the early spring and the summer, the old males are usually near the herd of young and females but later they retire to more inaccessible terrain where they live in small groups of 3 to 4.

Conservation status : IWPA : Schedule I, Part I : RDB : EN., CITES : Appendix II.

Remarks : Earlier included as a subspecies of *C. ibex* by Ellerman & Morrison- Scot (1951). However, Heptner *et al.* (1961) treated it as a distinct species.

Order ARTIODACTYLA

Family BOVIDAE

8. *Pseudois nayaur* (Hodgson, 1833)

1833. *Ovis nayaur* Hodgson, *Asiat. Res.*, 18(2) : 135

2002. *Pseudois nayaur* Alfred, Sinha & Chakraborty, *Rec. zool. Surv. India. Occ. Paper No.*, 199 : 168

Common name : Blue sheep

Diagnostic characters : It is a stocky built ungulate with short legs. Body length varies from 120-160cm and shoulder height up to 90cm. An adult male weighs up to 75 kg. Males possess wrinkled curved horns directed sidewise forming a semi-circle. Coat is short and thick. In the winter, coat colour is slaty blue offset by white legs and belly. There is a conspicuous blue-black stripe down the foreparts of the shanks and another horizontal stripe that divide the white belly from the grey flanks. In summer, the underwool is shed and the fur becomes reddish-grey in colour. Tail is short and black tipped.

Distribution : Ladakh, Himachal Pradesh and Sikkim.

Elsewhere : China, Mongolia, Nepal, Pakistan and Pamir range in Tajikistan.

Habits and Habitats : Found in high altitude pastures, rocky slopes in between 3500-5500m (Schaller, 1977). However, Roberts (1977) mentioned that in summer, it may occupy even a height up to 6500m. They are gregarious in habits and can be seen in a group of 5-40 individuals (Pfister, 2004). Alert and shy animal and will retreat to inaccessible cliffs when disturbed.

Conservation status : IPWA : Schedule I, RDB : VU, CAMP : Molur *et al* (2005) : LRlc (Nationally) DD (Globally).

Order LAGOMORPHA

Family OCHOTONIDAE

9. *Ochotona roylei* (Ogilby, 1839)

1839. *Lagomys roylei* Ogilby, *Royle's illus. Botany Himalaya*, Vol 2, 69, pl. 4

2002. *Ochotona roylei* Alfred, Sinha & Chakraborty, *Rec. zool. Surv. India. Occ. Paper No.*, 199 : 228.

Common name : Royle's Pika

Diagnostic characters : Approx. head and body length 15 to 20 cm. Somewhat like a guinea pig in built. It has a short muzzle, small rounded head, rounded ears and no tails. The hair is very fine, straight and glossy in texture. The typical form of the species has a reddish brown coat with a pale band over the nape. There is a considerable seasonal change in colour of these animals.

Distribution : India : Jammu & Kashmir (Gilgit, Nurh, Skardu, Ladakh), Uttaranchal (Nanda Devi NP) and Sikkim (Molur *et al.*2005).

Elsewhere : China, Central Asia, Himalayan mountains in Pakistan, Myanmar, Nepal, Tibet.

Habits and habitat : Himalayan mouse hare usually live on open rocky ground above the tree line ranging from 3000 to 4000 m. They do not make burrows in open ground but live under rocks and stone piles. Their food varies considerably with season. They feed on coarse grasses although captive specimens are known to take flowers, strawberry leaves, vegetables etc.

Conservation status : CAMP, Molur *et al* (2005); LRnt (Nationally), DD (Globally).

SUMMARY

The present paper provides an account of 9 species belonging to 8 genera of 3 orders from Pin Valley National Park.

ACKNOWLEDGEMENTS

We are thankful to Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata and Dr. R.M. Sharma, Scientist C & Officer-in-Charge, Zoological Survey of India, Solan for encouragement and facilities.

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