ISSN 0375-1511

*Rec. zool. Surv. India* : **112**(Part-3) : 101-112, 2012

# OBSERVATIONS ON THE STATUS AND DIVERSITY OF BUTTERFLIES IN THE FRAGILE ECOSYSTEM OF LADAKH (J & K)

**AVTAR KAUR SIDHU, KAILASH CHANDRA* AND JAFER PALOT****

*High Altitude Regional Centre, Zoological Survey of India, Solan, H.P.*

** Zoological Survey of India,M-Block, New Alipore, Kolkata 700 053.*

***Western Ghats Regional Centre, Zoological Survey of India, Calicut, Kerala*

## INTRODUCTION

As one of the more inaccessible parts of the Himalayan Ranges, the cold deserts of India are resource poor regions. These could be considered as an important study area because of their extremely fragile ecosystem. The regions on the north flank of the Himalayas experience heavy snowfall and these remains virtually cut off from the rest of the country for several months in the year. Summers are short. The proportion of oxygen is less than in many other places at a comparable altitude because of lack of vegetation. There is little moisture to temper the effects of rarefied air. The people of these areas depend predominantly on agriculture and animal husbandry.

Ladakh is the highest altitude plateau region in India, situated in the state Jammu and Kashmir between Karakoram mountain range in the north and the main Great Himalayas in the south. It has an area of 45,110 km. Ladakh borders Tibet to the east, the Lahaul and Spiti to the south, the Valley of Kashmir, Jammu and Pakistan to the west and Afganistan and China in the north.

Bounded by two of the world's mightiest mountain ranges, the Karakoram in the north and the Great Himalaya in the south, Ladakh is traversed by two other parallel chains, the Ladakh Range and the Zanskar Range. Ladakh range and Zansker range running in the east and west side respectively through Ladakh, divides it into three main valleys i.e., Zansker valley, Indus valley and Nubra valley. The Zansker valley lies west to Zansker range, the Indus valley sandwiched between Zansker and Ladakh ranges and Nubra valley on the east side of Ladakh range crossing the Khardungla pass. The river Indus is the backbone of Ladakh.

As a distinct biome, this cold desert need specially focused research and a concerted effort in terms of natural resource management, especially in the light of their vulnerable ecosystems and highly deficient natural resource status. Ecology and biodiversity of the Ladakh is under severe stress due to severe pressures. Ladakh and Kargil districts have been greatly disturbed since 1962 because of extensive military activities. Since 1992, tourists and others have been allowed to visit some pristine areas. There has been tremendous increase in human and livestock populations. Increased agricultural and developmental activities have further contributed to the loss of wildlife in the area. The situation is critical, as almost all the large mammals in this zone are on the endangered list.

The floral and faunal elements of this area are unique and have high level of endemism which need to be protected. They have direct bearing on sustaining the ecosystem as well as the life of people. Insects form a predominant group and have a vital role in the equilibrium of the cold desert. But as compared to other vertebrate groups, this group has received little attention from researchers.

Butterflies are the most important component of our biodiversity. Apart from being aesthetically attractive, they act as indicators to depict the health

of a habitat. The larvae of butterflies are associated with plants but cause only little damage to the hosts. The adults act as incidental, wild pollinators and help in pollination of many native plants. The larvae as well as adults are food for many predators like lizards and birds. The butterfly diversity in an ecosystem tells how much healthy it is, as butterflies are very sensitive to any change in the environment. But in the present day scenario, many butterfly species are under a real threat due to depletion of the natural cover for various developmental activities. This is truer in case of high altitude areas. In Ladakh, some species of Apollo butterflies are of great interest because of their high money value in insect trade. During the survey by Zoological Survey of India in Ladakh in July 2009 to September, 2009, about 20 species of butterflies have been identified from Ladakh. Some of them are also available in lower altitudinal ranges of Himalayas but certain species such as The Mountain Blue, the Small Jewel White, The Lofty Bath White, The Lesser Bath White, The Common Red Apollo, The Mountain Satyr and The high Brown Silverspot are confined to high altitude only. Of these, two species i. e. The Common Red Apollo and The high Brown Silverspot are also included in Indian Wildlife (Protection) Act. The area from south Pullu to Khardungla is quite rich in common red Apollo, but due to traffic and tourism this habitat of Apollo butterflies is being destroyed and need to be conserved.

## OBSERVATIONS

The species collected from Ladakh have been identified consulting the works of Evans (1932), Wynter-Blyth (1957), Cantlie (1963) and Mani (1986). The following species of butterflies are being reported from Ladakh.

## SYSTEMATIC ACCOUNT

Order LEPIDOPTERA

Sub Division RHOPALOCERA

Super Family PAPILIONOIDEA

Family PAPILIONIDAE

Genus ***Parnassius*** Latrellie, 1804

1804. *Parnassius* Latreille, *Nouv. Dict. Hist. nat.* **24** (6): 185, 199.

Type-species : *Papilio apollo* Linnaeus

### 1. ***Parnassius epaphus*** Oberthur, 1879

1879 *Parnassius epaphus* Oberthur, *Etudes d'Ent.* **4**: 23

*Common Name :* Common Red Apollo

*Diagnostic features :* Male : Upperside of fore wing with crimson black-encircled spots reduced to a minute subcostal dot in the black mark beyond the cell; the subhyaline terminal margin much narrower, with dentate white spots in the interspaces along the actual margin; cilia white, markedly alternated with black at the apices of the veins. Hind wing: the dusky black along the dorsal margin comparatively much broader, its inner border more irregular, deeply bi-emarginated, the crimson centre to the black mark above the tornal angle entirely absent. In no specimens that I have seen are the crimson spots centered with white. Underside: on the fore wing the white dentate spots in the terminal row are larger, which give to the wing the appearance of having a subterminal as well as a post-discal transverse series of dusky-black lunules. On the hind wing the row of basal and the obliquely-placed pre-tornal spots are of a duller shade, while as in that form all the crimson spots are broadly centered with white. Female differs from the male in the dusky black markings on the upperside that are broader, especially the postdiscal series on the fore wing: this generally forms a diffuse band and so often restricts the lunules of the white ground-colour beyond it, blending as it does diffusely with the subhyaline terminal margin. Anal pouch of fertilized of the posterior high keel or carina absent.

*Matrerial examined* : Ladakh, Khardungla, 5 exs, 29.VII.2008, coll. A. K. Sidhu and party.

*Distribution* : Afghanistan, Pakistan, Tadzikistan, Northern India (Jammu & Kashmir and Sikkim), Nepal, Bhutan and China.

*Remarks* : All the species of genus *Parnassius* Latreille are Palaearctic, present above the tree line in isolated pockets. The species *Paranassius epaphus*, though has wide distribution but the subspecies *Parnassius epaphus hillensis* Bang-Haas is confined to Ladakh and Spiti areas of cold desert is included in Wildlife (Protection) Act of India (Schedule II, Part II). As per present survey this subspecies is commonly available in a small stretch of seven kilometers from South Pullu to Khardungla. But

due to rapidly expanding tourism this subspecies in Ladakh is under a real threat and this area is immediately needed to be conserved.

Genus ***Papilio*** Linnaeus, 1758

1758. *Papilio* Linnaeus, *Syst. Nat.* (Edn 10) **1**: 458.

*Type- species* : *Papilio machaon* Linnaeus

2. ***Papilio machaon*** Linnaeus, 1758

1758. *Papilio machaon* Linnaeus, *Syst. Nat.* (Edn 10) **1**: 462.

*Common name* : Common Yellow Swallowtail

*Diagnostic features* : Sexes similar; wings dorsally yellow with black markings, veins black; upperside of forewing with basal area black dusted with yellow scales; rest of the cell yellow with a black bar in cell and a black bar at end cell; marginal area black with a complete series of regular small yellow spots near termen. The hind wings have a pair of protruding tails, below each tail is a red eye spot.

*Material examined* : Tsomoriri, 1 exs, 26.VII.2008, coll. A. K. Sidhu and party.

*Distribution* : Throughout the Palearctic region in Europe and Asia; across North America.

*Remarks* : This species though widely distributed and moderately available in hilly areas of north-west India but in Ladakh as per present surveys, it is quite rare and mainly present near brackish water lakes. In Ladakh the tail of this species is shorter as compared to the other specimens available in Himachal Pradesh.

Family PIERIDAE

Genus ***Pontia*** Fabricius, 1807

1807. *Pontia* Fabricius, *Magazin f. Insektenk.* (Illiger) **6**: 283.

*Type- species* : *Papilio daplidice* Linnaeus

3. ***Pontia callidice*** (Hubner, 1799)

1799. *Papilio callidice* Hubner, *Samml. eur. Schmett.* [1] : pl. 81 (1799-1800), f. 408-409.

*Common name :* Lofty Bath White

*Diagnostic features* : Male :Upperside of wings white; Forewing:with black at extreme base; discocellulars marked with a quadrate black spot; a discal curved series of inwardly dentate spots; Hindwing with uniformly white, the pattern of the underside visible through transparency; base densely irrorated with black scales. Underside of forewing white, basal half of costal margin and quadrate spot on discocellulars dull black. Hindwing green, an elongate oval yellowish-white spot in cell, followed beyond by complete curved series of discal and terminal yellowish-white, inwardly lanceolate spots. Female Upperside of wings similar to that of the male, the black scaling at the base of the wings more extended, especially on the hind wing where it stretches broadly down the dorsal half of the wing and occupies also the apex of the cell.

*Material examined* : Ladakh, Khardungla, 2 exs, 29.VII.2008, coll. A. K. Sidhu and party.

*Distribution* : North-west Himalayas above 12,000 feet from Chitral to Mussoorie. Occurs in the higher mountains of Europe; in Asia from the Altai to the Himalayas.

*Remarks* : This species is typically Palaearctic present above tree line. As per present surveys, it shares common habitat with *Parnassius epaphus* and is available in a small stretch of seven kilometers from South Pulla to Khardungla and need to be conserved.

4. ***Pontia chloridice*** (Hubner, 1808-1813)

*Papilio chloridice* Hübner, 1808-1813, *Samml. eur. Schmett.* [1] : pl. 141.

*Common name* : Lesser Bath White.

*Diagnostic characters* : Male : Upperside ground colour white, forewing with discocellulars edged broadly with black on each side ; a short broad transverse pre apical black bar present and another similar short bar further outwards; hindwing uniform, unmarked. Underside : white; fore wing markings as on the upperside, but those at apex green and with a few scattered superposed black scales on the upper preapical bar; hind wing with basal area green, an oval white spot in middle of cell. Female Upperside on fore wing the black edging to the discocellulars broader; a curved, postdiscal, irregular, macular, black band, the upper three and lowest spot that compose it large; hind wing with an anterior, postdiscal, short, curved, macular, black band, followed by a more or less complete terminal series of spots at the apices of the veins.

*Material examined* : Nubra Valley, Panamic, 1ex, 08.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Chitral and Ladakh in India and Pakistan.

*Remarks* : *Papilio chloridice* a typically Palaearctic species, has very restricted distribution. During present surveys it has been found to confine to Nubra valley and is quite rare in this area.

5. ***Pontia daplidice*** (Linnaeus, 1758)

1758. *Papilio daplidice* Linnaeus, *Syst. Nat.* (Ed. 10) **1**: 468.

*Common name* : Bath White

*Diagnostic characters* : Male with wings white; upperside of forewing with apex black studded with white spots and lines, end cell with black spot; underside of hindwing blotched with green colour. Female similar to male except upperside of forewing with a discal spot and upperside of hindwing with an obscure row of terminal and marginal spots.

*Material examined* : Leh, Neyoma, 2exs, 18.VII. 2008, coll. A. K. Sidhu and party; Chilling, 2 exs, 15.VII. 2008, coll. H. S. Mehta and party.

*Distribution* : Central and Southern Europe, Baluchistan, Peshawar, Chitral, Kashmir and along the Himalayas right across the Central Himalayas up to Darjeeling.

*Remarks* : This species is widely distributed from plains of India to cold desert of Ladakh. As per present surveys, it is commonly available in Agricultural fields of Ladakh adjoining Leh.

Genus ***Colias*** Fabricius, 1807

1807. *Colias* Fabricius, *Magazin f. Insektenk.* (Illiger) **6**: 284.

*Type-species* : *Papilio hyale* Linnaeus

6. ***Colias erate*** (Esper, 1805)

1805. *Papilio erate* Esper, *Ausl. Schmett.* **1** (2): 13, pl. 119, f. 3.

*Common name* : Pale Clouded yellow

*Diagnostic features* : Male with wings dorsally lemon yellow with broad unspotted black outer border, a prominent black spot present in cell of forewing. Female as in male but borders spotted with ground colour; upperside of hindwing heavily dusted with black scales.

*Material examined* : Ladakh, Leh, Ganglas, 1 exs, 29.VII.2008, coll. A. K. Sidhu and party; Leh, Horze, 1 exs, 11.VII.2008, coll. H. S. Mehta and party; Leh, Nyeoma, 7 exs, 05.VII.2008, coll. H. S. Mehta and party; Hemis, 2 exs, 04.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Himalayas from Chital to Kumaon; hills of south India.

*Remarks* : As per present surveys, *Colias erate* is commonly available in agriculture fields of Ladakh adjoining Leh. Otherwise this species in moderately available in Northwest India from plains to high altitude areas.

***Genus Pieris*** Schrank, 1801

1801. *Pieris* Schrank, *Fauna Boica* **2** (1): 152, 161.

*Type -species* : *Papilio brassicae* Linnaeus

7. ***Pieris brassicae*** (Linnaeus, 1758)

1758. *Papilio brassicae* Linnaeus, *Syst. Nat.* (Ed. 10) **1**: 467.

*Common name* : Large cabbage White

*Daignostic features* : Male with wings dorsally white with black apex of forewing and apical spot on hindwing; no discal spot present in forewing; underside if hindwing pale yellow. Female similar with two additional discal spots on upperside of forewing.

*Material Examined* : Leh, Ganglas, 2 exs, 11.VII.2008, coll. H. S. Mehta and party; Chilling, 1 ex, 15.VII.2008, coll. H. S. Mehta and party; Chishul, 2 exs, 25.VII.2008, coll. A. K. Sidhu and party; Chumathan, Skidmang, 7 exs, 13.VII.2008, coll. H. S. Mehta and party; Chilling, Sumdhoo, 1 ex, 15.VII.2008, coll. H. S. Mehta and party; Nubra Valley, Khardung, 1ex, 15.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Throughout Europe, North Africa and Asia to the Himalayas.

*Remarks* : This species is very common in agricultural fields of Ladakh and is widely distributed. In India it is available from plains to high altitude areas.

8. ***Pieris canidia*** (Linnaeus, 1768)

1768. *Papilio canidia* Linnaeus, in Sparrman, *Amoenit. acad.*, **7** (150): 504.

*Common name* : Indian Cabbage White.

*Diagnostic charaters* : Male upperside of wings white; upperside of forewing with apex black, inwardly dentate black outer margin and with a black discal spot; upperside of hindwing with apical spot and terminal spots. Female similar to male with an additional discal spot on upperside of hindwing.

*Material examined* : Leh, Ganglas, 3exs, 11.VII. 2008, coll. H. S. Mehta and party.

*Distribution* : North-west India, Himalayas, Assam, Burma, Nilgiris, Palnis, Travancore, Cochin, Tibet, West China.

*Remarks* : As per present surveys, this species is moderately available in agricultural fields of Leh and surrounding areas.

9. ***Pieris rapae*** (Linnaeus, 1758)

1758. *Papilio rapae* Linnaeus, *Syst. Nat.* (Ed. 10) **1**: 468.

*Common name* : Small Cabbage White.

*Diagnostic characters* : Male wings dorsally white, very small apical black area on forewing, one discal spot on forewing and apical spot on hindwing. Female similar to male but with additional discal spot on upperside of forewing.

*Material examined* : Diskit, 1ex, 07.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Australia. NewZealand, Palaearctic area, in India Ladakh, Kashmir, North-West India.

*Remarks* : The species *Pieris rapae* is distributed only in high altitude areas of India and in present surveys it has been found to be rare.

Family LYCAENIDAE

Genus ***Celastrina*** Tutt, 1906

1906. *Celastrina* Tutt, *Ent. Rec.* **18**: 131.

*Type-species* : *Papilio argiolus* Linnaeus

10. ***Celastrina argiolus*** (Linnaeus, 1758)

1758. *Papilio argiolus* Linnaeus, *Syst. Nat.* (Edn 10) **1**: 483.

*Common name* : Hill Hedge Blue.

*Diagnostic features* : Male with wings dorsally blue with broad dark border on forewing, increasing to apex, female with very broad dark borders and discal area pale blue. Wing below grey coloured in both sexes.

*Material examined* : Nubra, Diskit, 1 ex, 15.VII.2008, coll. H. S. Mehta and party; Chilling, Sumdhoo, 2 exs, 15.VII.2008, coll. H. S. Mehta and party; Leh, Nyeom, 5 exs, 05.VII.2008, coll. H. S. Mehta and party, 4 exs, 18.VII. 2008, A. K. Sidhu and party; Leh, Stock, 1ex, 10.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Eurasia and South Asia, Chitral to Kumaon.

*Remarks* : This species is commonly availble in hilly areas of north-west India and as per present surveys, it is commonly present in wild vegetation and in agricultural fields of Ladakh.

Genus ***Albulina*** Tutt, 1909

1909. *Albulina* Tutt, *Nat. Hist. Brit. Butts* **3** (6): 154.

*Type-species*: *Papilio orbitulus* Prunner

11. ***Albulina omphisa*** (Moore, 1875)

1875. *Polyommatus omphisa* Moore, *Proc. zool. Soc. Lond.* **1874** (4): 573, pl. 66, f. 2.

*Common name* : Dusky Green Under Wing.

*Diagnostic features* : Male with wings dorsally dusky violet blue with broad dark border; on hind wing the blue colouration confined to base; female plain brown; underside of hindwing green upto margins with faint white spots.

*Material examined* : Leh, Ganglas, 3exs, 11.VII. 2008, coll. H. S. Mehta and party.

*Distribution* : In India in the Himalayas (Chitral, Ladakh, Lahul) and north China.

*Remarks* : It is an high altitude species. It is moderately available in wild vegetation of Leh and surrounding areas, as per the present surveys.

12. ***Albulina pheretes*** (Hoffmansegg, 1804).

1804. *Papilio pheretes* Hoffmansegg, *Mag. f. Insektenk. (Illiger)***3**: 187.

*Common name :* Mountain Blue.

*Diagnostic features :* Male with upperside of wings purple blue; underside of forewing with spots black or white; underside of hindwing all greenish white or all brown or centrall grren metallic, highly variable, with spots large in size. Female is brown.

*Material examined* : Nubra Valley, Khardung, 1ex, 09.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Chitral to Kumaon; Sikkim.

*Remarks* : The species *Albulina pheretes* is a high altitude and Palearctic species. As per present surveys it is quite rare and confined to Nubra Valley.

Genus ***Plebejus*** Kluk, 1780

1780. *Plebejus* Kluk, *Hist. nat. pocz. gospod.* 4: 89.

*Type-species* : *Papilio argus* Linnaeus

13. ***Plebejus christophi*** (Staudinger, 1874)

1874. *Lycaena christophi* Staudinger, *Stett. ent. Ztg.* **35**: 87.

*Common name :* Small Jewel Blue.

*Diagnostic features :* Male: Wings dorsally dull violet blue; forewing with narrow dark border; ventrally wings without prominent red marginal spots, hindwing with small metallic spots along entire margin; marginal spots of both wings faintly orange crowned.

Female : wings dorsally brown, bases blue scaled; otherwise similar to male.

*Material examined* : Leh, Nyeoma, 4exs, 05.VII. 2008, coll. H. S. Mehta and party; Pangong Tso, 1 ex, 24.VII. 2008, A. K. Sidhu and party.

*Distribution* : North Iran, Caucasus, Kurdistan, Turkestan, Chitral, North Afghanistan, Ladakh, Kashmir.

*Remarks :* It is a high altitude species commonly available in Ladakh.

Genus ***Pseudophilotes*** Beuret, 1958

1958. *Pseudophilotes* Beuret, *Mitt. ent. Ges. Basel* (n.f.) **8** (6): 100.

*Type-species* : *Papilio baton* Bergtrasser

14. ***Pseudiphilotes vicrama*** (Moore, 1865)

1865. *Polyommatus vicrama* Moore, *Proc. zool. Soc. Lond.* **1865** (2): 505

*Common name :* Chequered Blue.

*Diagnostic features :* Male with wings dorsally dusky blue; female dark brown; wings with fringe prominently chequered; ventrally wing creamish in colour with black spots, marginal spots orange crowned.

*Material examined* : Nubra valley, Huder, 1ex, 07.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Baluchistan, Chitral to Shipki.

*Remarks* : It is an high altitude species. It is moderately available in wild vegetation of Ladakh, as per the present surveys.

Family NYMPHALIDAE

Genus ***Fabriciana*** Reuss, 1920

1920. *Fabriciana* Reuss, *Ent. Mitt.* **9**: 92 nota.

*Type-species* : *Papilio niobe* Linnaeus

15. ***Fabriciana adippe*** (Schiffermuller, 1775)

1775. *Papilio adippe* Schiffermuller, *Ankündung eines systematischen Werkes von den Schmetterlingen der Wienergegend*: 176.

*Common name* : High Brown Silver Spot.

*Diagnostic features* : Sexes similar; wings dorsally tawny with black spots; underside with three upper discal silver spots at right angles to the costa not in line with the fourth spot; two small solver spots inside the upper two; three basal silver spots

*Material examined* : Leh, Horzey, 1ex, 11.VII.2008, coll. H. S. Mehta and party; Tsomoriri, 1ex, 26.VII. 2008, coll. A. K. Sidhu and party.

*Distribution* : Chitral to Kumaon; Ladakh.

*Remarks* : This species though commonly available in hilly areas of north-west India but in Ladakh as per surveys conducted presently, it is quite rare. In Ladakh it is ditributed near the brackish water lakes.

Genus ***Vanessa*** Fabricius, 1807

1807. *Vanessa* Fabricius, *Magazin f. Insektenk.* (Illiger) **6**: 281.

*Type-species*: *Papilio atalanta* Linnaeus

16. ***Vanessa cardui*** (Linnaeus, 1758)

1758. *Papilio cardui* Linnaeus, *Syst. Nat.* (Edn 10) **1**: 475.

*Common name :* Painted Lady.

*Diagnostic features :* Sexes similar; wings dorsally pinkish red with black markings; forewing slightly concave below apex; hindwing slightly wavy but otherwise evenly rounded; upperside of forewing with apex black bearing inner three conjoined and four separate marginal white spots.

*Material examined* : Diskit, 1ex, 07.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Europe, Africa, Asia, Australia, New Zealand, Hawaii.

*Remarks* : This species is commonly available in North-west India including cold desert areas of Ladakh.

17. ***Vanessa cashmiriensis*** Kollar, 1844

1844. *Vanessa caschmirensis* Kollar, in Hügel, *Kaschmir und das Reich der Siek*, **4** (2): 442.

*Common name* : Indian Tortoise Shell.

*Diagnostic features* : Sexes similar; forewing narrower, more produced and cut off at apex; termen slightly concave; hindwing toothed at vein 4; wings dorsally tawny; forewing with one black patch in cell, one at end cell and one beyond the cell; upperside of hindwing blue submarginal spots inwardly bordered brownish.

*Material examined* : Tsomoriri, 1ex, 26.VII.2008, coll. A. K. Sidhu and party.

*Distribution* : Himalayas, Pamir.

*Remarks* : This species is quite common in hilly areas of North-west India including cold desert areas of Ladakh.

Family SATYRIDAE

Genus ***Aulocera*** Butler, 1867

1867. *Aulocera* Butler, *Ent. mon. Mag.* **4**: 121.

*Type-species* : *Satyrus brahminus* Blanchard

18. ***Aulocera swaha*** (Kollar, 1844)

1844. *Satyrus swaha* Kollar, in Hügel, *Kaschmir und das Reich der Siek*, **4** (2): 444.

*Common name* : Common Satyr.

*Diagnostic features* : Male and female with wings dorsally dark brown; discal band varying from white to bright yellow in colour, narrows towards dorsum on hindwing; wings below pale in colour.

*Material examined* : Leh, 1ex, 28.VII.2008, coll. A. K. Sidhu and party.

*Distribution* : Himalayas.

*Remarks* : The species *Aulocera swaha* is a high altitude butterfly. As per present surveys it is moderately available in Ladakh.

Genus ***Hyponephele*** Muschamp, 1915

1915. *Hyponephele* Muschamp, *Ent. Rec.* **27**: 156.

*Type-species* : *Papilio lycaon* Rottemburg

19. ***Hyponephele davendra*** (Moore, 1865)

1865. *Maniola davendra* (Moore,) *Proc. Zool. Soc. Lond.* **1865**: 502.

*Common name* : White ringed meadow brown.

*Diagnostic features* : Sexes similar; upperside of forewing tawny with a prominent black ocellus towards apex; underside of hindwing with ocelli; discal line dark, outwardly white margined.

*Material examined* : Leh, Ganglas, 1ex, 11.VII.2008, coll. H. S. Mehta and party.

*Distribution* : Iran - Afghanistan, Himalayas, Tibet, Middle Asia, Baluchistan - Kumaon, North West India

*Remarks* : This species is also a high altitude butterfly. As per recent surveys, it is less available in Ladakh.

Genus ***Paroeneis*** Moore, 1893

1893. *Paroeneis* Moore, *Lepidoptera Indica* **2** : 36.

*Type-species* : *Chionobas pumilus* C. & R. Felder

20. ***Paroeneis pumilus*** (C. & R. Felder, 1867)

1867. *Chionobas pumilus* C. & R. Felder, *Reise Fregatte Novara, Lep. Rhop.* (3): 490.

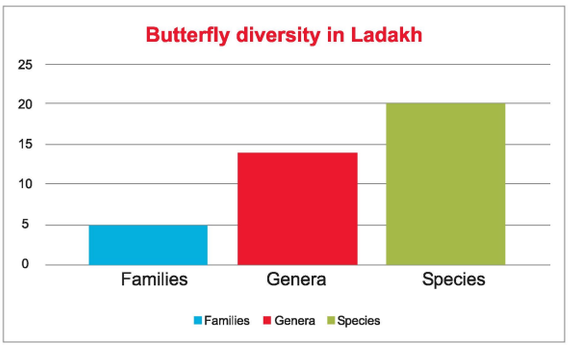
*Common name* : Mountain Satyr

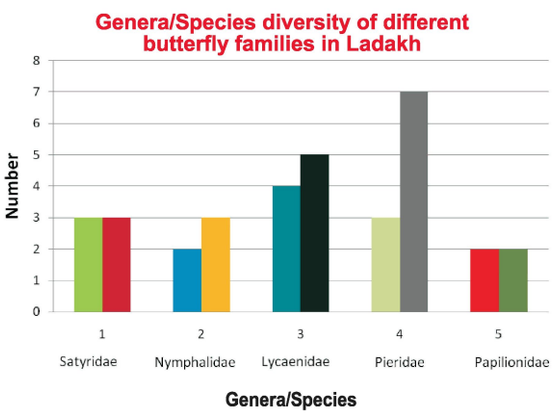
*Diagnostic features* : Sexes similar; wings dorsally mostly tawny except for dark border; with a tawny discal band, the latter ill defined, diffused inwards;

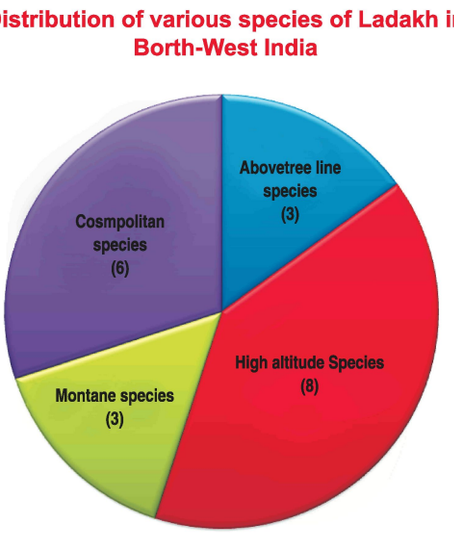
*Material examined* : Nyoma, 1ex, 23.VII.2008, coll. A. K. Sidhu and party.

*Distribution* : Himalayas, Kashmir, Tibet.

*Remarks* : It is typically a high altitude species. According to the present surveys, it is less available in Ladakh.




## ACKNOWLEDGEMENTS

The authors are thankful to Dr. Ramakrishna, Director, Zoological Survey of India, Kolkata for giving us opportunity for Ladak survey and for providing facilities for under taking the present studies.

## REFERENCES

**CANTLIE, K.** 1963. The Lycaenidae portion (except the *Arhopala* group) of Brigadier Evans' the identification of Indian Butterflies 1932 (India, Pakistan, Ceylon and Burma). *Bombay nat. Hist. Soc. Bombay* : vi + 156 pp.

**EVANS, W. H.** 1932. The identification of Indian Butterflies. Second edition revised. *Madras, Bombay nat. Hist. Soc.* : x + 454pp., 32pls., 9 figs.

**MANI, M. S.** 1986. Butterflies of Himalaya. *Oxford & IBH publishing Co., new Delhi,* x + 181 pp + 25 pls.

**WYNTER-BLYTH, M. A.** 1957. Butterflies of the Indian region. Today and Tomorrow's Printers and Publications, New Delhi : 523pp.

Manuscript Received : 30 August, 2010; Accepted : 21 August, 2012

## PLATE-I

*Parnassius epaphus*

*Papilio machaon*

*Pontia callidice*

*Pontia chloridice*

*Colias erate*

*Pieris brassicae*

## PLATE-II

*Pieris canidia*

*celastrina argiolus*

*Hyponephele davendra*

*Argynnis adippe pallida*

*Vanessa cardui*

*Plebejus christophi*

## PLATE-III

*Albulina omphisa*

*Aulocera swaha*

*Vanessa cashmiriensis*

*Pseudophilotes vicrama*

*Albulina pheretes*

*Paroeneis pumilus*

## PLATE-IV

Ladakh-A fragile ecosystem

A habitat of Apollos near Khardungla