

STATUS AND DISTRIBUTION OF SATYRID (LEPIDOPTERA: NYMPHALIDAE: SATYRINAE) IN THE INDIAN HIMALAYAN STATES AND UNION TERRITORIES

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KEY WORDS

Dry and wet-season

Himalaya

Lepidoptera

Nymphalidae

Satyrids

ABSTRACT: A total of 179 species/subspecies belonging to 32 genera of subfamily *Satyrinae* (*Lepidoptera: Nymphalidae*) were found in the Indian Himalayan States and Union Territories, that is, four states, namely, Himachal Pradesh, Uttarakhand, Sikkim, West Bengal (Darjeeling and surrounding area), Arunachal Pradesh and 2 Union Territories, Jammu and Kashmir, and Ladakh. State wise analysis of satyrids showed maximum number of 97 species/subspecies (19 genera) in Arunachal Pradesh, followed by Sikkim with 81 species/subspecies (18 Genera), Uttarakhand with 71 species/subspecies (17 genera), Himachal Pradesh with 66 species/subspecies (18 genera), Jammu and Kashmir with 38 species/subspecies (14 genera), West Bengal with 26 species/subspecies (8 genera), and minimum number of subspecies/species were found in Ladakh Union Territory, that is, 15 species/subspecies under 6 genera. Observations on relative abundance of satyrid diversity revealed that out of 179 species/subspecies, 30 species/subspecies (17%), were found to be common, 120 species/subspecies (67%) uncommon, and remaining 29 species/subspecies (16%) less common. A total of 65 species/subspecies were included in the Wildlife (Protection) Act, 1972. Three scheduled species, that is, *Callerebia annada annada* (Moore), *Neorina patria westwoodi* Moore, and *Maniola devendra devendra* (Moore) were common in Indian Himalaya. Dry and wet-season forms were found in ten species/subspecies of genus *Ypthima* huebneri, 16 species/subspecies of *Mycalsis* huebneri, and four species/subspecies of genus *Melentis* Fabricius.

INTRODUCTION

Satyrids are mostly inconspicuous, dull brown or blackish butterflies of moderate size with usually short and broad wings, marked above and below with eye-like spots (called as ocelli in butterfly taxonomy).

Certain Satyrid genera have dry and wet-season forms (WSF). The dry-season forms (DSF) are characterized by the more angulate wings, the cryptic pattern of the underside and the reduced submarginal ocelli, whereas, in WSF, the submarginal ocelli on the underside wings

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are well developed. The differences between the seasonal forms of butterflies are not genetical, but solely due to environmental factors of temperature and humidity, which affect the internal chemical physiology in their immature stages. Such non-genetic variation is termed as polyphenism. Because of this, in monsoon areas, the DSF have more angulate wings, cryptic patterns on underside and reduced marginal ocelli, than WSF satyrid butterflies.

The seasonal forms in some genera, the Evening Browns, the Bush Browns, and the Rings in particular are very prominent and are difficult to identify on the basis of their morphological characters. The species are not easy to identify/separate due to lot of variations in size, cryptic colorations on underside, and number of ocelli on both side of the wings and as such a stumbling block for the taxonomists. These species can be authentically identified with the help of their characteristic forms of male and female genitalia. Satyrids like the Walls and Rings feed on flower nectar, but the majority prefers animal droppings, damp soil, tree sap, and over-ripe fruit. The larvae feed on monocotyledons, such as Gramineae and Palmaceae and come out at night to feed. Males usually have scent scales as long brands on the upper side forewing.

There are 18768 species of butterflies known from the world, out of which 1646 species occur in India (Varshney, 2006) which is about 8.7% of the total species of butterflies in the world. A total of 1013 species belonging to five families are known from the Indian Himalaya, out of which 179 species/subspecies under 32 genera of the subfamily *Satyrinae* belong to Indian Himalayan region.

MATERIALS AND METHODS

The collections and observations were made in all the four states, that is, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, West Bengal (Darjeeling and surrounding area) and 2 union territories (Jammu and Kashmir and Ladakh) of Indian Himalaya for the

past 15 years by the first author and different survey teams of Scientists of Zoological Survey of India. The collection of the satyrid diversity has been made during pre-monsoon, monsoon, and post-monsoon seasons in different habitats such as forest areas, grasslands, and vegetation along water bodies. Butterflies were collected with the help of a specified butterfly net. The adults were killed inside the net by pressing the thorax and transferred to insect folders. The insect folders brought to laboratory were relaxed in desiccator and stretched as per procedure. The old collections made by earlier workers housed at different Entomological Museums of Regional Centers and Headquarter of Zoological Survey of India were also identified and included in the systematic list of Satyrids of Indian Himalaya. The satyrid species which could not be collected/observed and reported by other workers from Indian Himalayan States and Union Territories are also included in the systematic list. Later, these were deposited as National Zoological Collections in the different Regional Centres and Headquarter of Zoological Survey of India. For the identification of satyrids, procedures of Bingham (1905, 1907) Evans (1932), Talbot (1939, 1947), Wynter-Blyth (1957), Haribal (1992), Shirozu and Shima (1979), Rose and Sharma (1999), etc., were followed. The identity of the cryptic species/variable species/seasonal forms was confirmed on the basis of their external male and female genitalia.

RESULTS AND DISCUSSION

A total of 179 species/subspecies belonging to 32 genera of subfamily *Satyrinae* were found in the Indian Himalayan States and Union Territories, that is, four states, namely, Himachal Pradesh, Uttarakhand, Sikkim, West Bengal (Darjeeling and surrounding area), Arunachal Pradesh and 2 Union Territories, Jammu and Kashmir, and Ladakh. State-wise analysis of satyrids shows that Arunachal Pradesh having the maximum number of 97 species/subspecies (19 genera) followed by Sikkim with

81 species/subspecies (18 Genera), Uttarakhand with 71 species/subspecies (17 genera), Himachal Pradesh with 66 species/subspecies (18 genera), Jammu and Kashmir with 38 species/subspecies (14 genera), West Bengal with 26 species/subspecies (8 genera), and minimum number of subspecies/species are found in Ladakh Union Territory, that is, 15 species/subspecies under 6 genera [Table 1 and Figure 1]. The 2 Union Territories (Ladakh and Jammu and Kashmir) and the state of Himachal Pradesh are in North-Western Himalaya; the state of Uttarakhand comes in Western Himalayan range; the states of Sikkim and West Bengal (Darjeeling and surrounding area) are in Central Himalayan region and the state of Arunachal Pradesh is from Eastern Himalaya. There is a gradual increase in the satyrid diversity from North-Western Himalaya to Eastern Himalaya. This gradual increase of number of species/subspecies from North-Western Himalaya to Eastern Himalaya is due to the reason of Indian Himalayan faunal components that are characterized by Palearctic affinities of North and North West part, while Southern and Eastern is influenced by Oriental elements. Most of the satyrid species/subspecies which are found in North-Western Himalaya and Western Himalaya (Uttarakhand) do not occur in Central and Eastern Himalaya. Only six species, namely, *Lethe rohria rohria* (Fab.), *Lethe confusa confusa* Aurivillius, *Melanitis leda ismene* (Cramer), *Aulocera swaha swaha* (Kollar), *Ypthima huebneri huebneri* Kirby, and *Ypthima lisandra* (Cramer) were found widely distributed throughout the Indian Himalaya. Out of

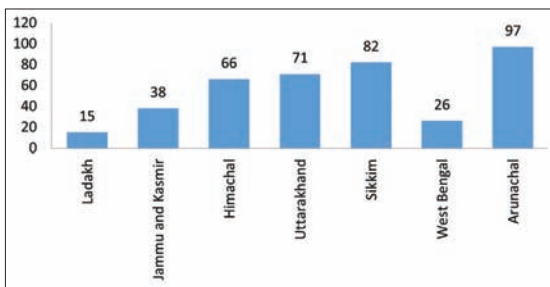


Figure 1: Distribution of satyrids in different Himalayan states and union territories.

Table 1: Distribution of satyrids (Lepidoptera: Nymphalidae: Satyrinae) in the Indian Himalayan states and union territories.

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
1	<i>Mycalasis adamsonii adamsonii</i> Watson						✓	✓	Uncommon	Schedule II Part II
2	<i>Mycalasis anaxias aemate</i> Fruhstorfer					✓		✓	Uncommon	Schedule II Part II
3	<i>Mycalasis annamitica watsoni</i> Evans							✓	Uncommon	
4	<i>Mycalasis evansii</i> Tytler							✓	Uncommon	



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
5	<i>Mycalasis francisca sanatana</i> Moore	✓			✓	✓	✓	✓	Less Common	
6	<i>Mycalasis gotama charaka</i> Moore							✓	Uncommon	Schedule II Part II
7	<i>Mycalasis heri</i> Moore				✓	✓	✓		Uncommon	Schedule II Part II
8	<i>Mycalasis intermedia</i> (Moore)							✓	Uncommon	
9	<i>Mycalasis lepcha lepcha</i> Moore	✓			✓				Less Common	
10	<i>Mycalasis lepcha kohimensis</i> Tytler							✓	Less Common	
11	<i>Mycalasis malsarida</i> Butler							✓	Uncommon	Schedule II Part II
12	<i>Mycalasis mestra vetus</i> Fruhstorfer					✓			Uncommon	Schedule II Part II
13	<i>Mycalasis mestra mestra</i> Hewitson							✓	Uncommon	Schedule II Part II
14	<i>Mycalasis mineus mineus</i> (Linnaeus)	✓			✓	✓	✓	✓	Common	
15	<i>Mycalasis nicotia</i> Westwood				✓	✓	✓	✓	Less Common	
16	<i>Mycalasis misenus</i> de Niceville					✓		✓	Uncommon	Schedule II Part II

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
17	<i>Mycalasis perseus blasius</i> (Fabricius)		✓		✓	✓	✓	✓	Common	
18	<i>Mycalasis suaveolens ranotei</i> Smetacek				✓				Uncommon	Schedule II Part II
19	<i>Mycalasis suaveolens tyleri</i> Talbat					✓		✓	Uncommon	Schedule II Part II
20	<i>Mycalasis visala visala</i> Moore				✓	✓	✓	✓	Less Common	
21	<i>Mycalasis malsara</i> Moore				✓	✓		✓	Uncommon	
22	<i>Lethe visrava</i> (Moore)					✓		✓	Uncommon	Schedule II Part II
23	<i>Lathe sidereal sidereal</i> Marshall				✓	✓	✓	✓	Uncommon	Schedule II Part II
24	<i>Lathe sidonis</i> (Hewitson)			✓	✓	✓	✓	✓	Less Common	
25	<i>Lethe dakwania</i> Tytler				✓			✓	Uncommon	
26	<i>Lethe nicetella</i> de Niceville					✓		✓	Uncommon	Schedule II Part II
27	<i>Lethe mairya mairya</i> de Niceville			✓	✓	✓			Uncommon	

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
28	<i>Lethe nicetas</i> (Hewitson)			✓	✓	✓	✓	✓	Uncommon	
29	<i>Lethe tristigmata</i> Elwes					✓			Uncommon	Schedule II Part II
30	<i>Lethe ocellata lyncus</i> (Poujade)					✓			Uncommon	Schedule I Part IV
31	<i>Lethe jalaurida jalaurida</i> (de Niceville)			✓	✓				Uncommon	Schedule II Part II
32	<i>Lethe jalaurida elwesi</i> (Moore)					✓			Uncommon	Schedule II Part II
33	<i>Lethe moelleri moelleri</i> (Elwes)					✓		✓	Uncommon	Schedule II Part II
34	<i>Lethe atkinsonia</i> (Hewitson)					✓			Uncommon	Schedule II Part II
35	<i>Lethe goalpara goalpara</i> (Moore)				✓				Uncommon	Schedule II Part II
36	<i>Lethe goalpara gana</i> Talbat					✓		✓	Uncommon	
37	<i>Lethe goalpara kabruensis</i> Tytler							✓	Uncommon	
38	<i>Lethe sura</i> (Doubleday)					✓		✓	Less Common	

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
39	<i>Lethe dura ganniei</i> (Moore)					✓		✓	Uncommon	Schedule I Part IV
40	<i>Lethe baladeva aisa</i> Fruhstorfer			✓	✓				Uncommon	Schedule II Part II
41	<i>Lethe baladeva baladeva</i> (Moore)					✓			Uncommon	Schedule II Part II
42	<i>Lethe europa niladana</i> Fruhstorfer				✓	✓		✓	Less Common	
43	<i>Lethe rohria rohria</i> (Fab.)		✓		✓	✓	✓	✓	Common	
44	<i>Lethe confusa confusa</i> Aurivillius		✓	✓	✓	✓	✓	✓	Less Common	
45	<i>Lethe mekara mekara</i> (Moore)					✓			Uncommon	
46	<i>Lethe mekara zuchara</i> Fruhstorfer							✓	Uncommon	
47	<i>Lethe chandica chandica</i> (Moore)					✓		✓	Less Common	
48	<i>Lethe distans</i> Butler					✓		✓	Uncommon	Schedule I Part IV
49	<i>Lethe naga naga</i> Doherty							✓	Uncommon	Schedule II Part II
50	<i>Lethe margaritae</i> Elwes					✓	✓		Uncommon	Schedule I Part IV

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
51	<i>Lethe insana insana</i> (Kollar)	✓			✓				Uncommon	Schedule II Part II
52	<i>Lethe insane dinarbas</i> (Hewitson)					✓	✓	✓	Common	
53	<i>Lethe brisanda de Niceville</i>							✓	Uncommon	Schedule II Part II
54	<i>Lethe serbonis teesta</i> Talbat					✓		✓	Uncommon	
55	<i>Lethe serbonis serbonis</i> (Hewitson)					✓			Uncommon	Schedule II Part II
56	<i>Lethe serbonis bhutya</i> Talbot							✓	Uncommon	Schedule II Part II
57	<i>Lethe vindhya vindhya</i> (C. and R. Felder)					✓		✓	Uncommon	
58	<i>Lethe kansa</i> (Moore)				✓	✓		✓	Less Common	
59	<i>Lethe latiaris latiaris</i> (Hewitson)					✓		✓	Uncommon	Schedule II Part II
60	<i>Lethe gulnihal gulnihal</i> de Niceville							✓	Uncommon	Schedule I Part IV
61	<i>Lethe bhairava</i> (Moore)					✓		✓	common	

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
62	<i>Lethe verma verma</i> (Kollar)		✓	✓	✓				Less Common	
63	<i>Lethe verma sintica</i> Fruhstorfer					✓		✓	common	
64	<i>Lethe ramadeva</i> (de Niceville)					✓			Uncommon	Schedule I Part IV
65	<i>Lethe scanda</i> (Moore)					✓		✓	Uncommon	Schedule II Part II
66	<i>Lethe sinorix sinorix</i> (Hewitson)				✓	✓	✓	✓	Uncommon	Schedule II Part II
67	<i>Neope pulaha pandyia</i> Talbat		✓	✓	✓				Uncommon	Schedule II Part II
68	<i>Neope pulaha pulaha</i> (Moore)					✓		✓	Uncommon	Schedule II Part II
69	<i>Neope pulahoides pulahoides</i> (Moore)							✓	Uncommon	
70	<i>Neope pulahina</i> Evans					✓		✓	Uncommon	
71	<i>Neope armandii khasiana</i> Moore							✓	Uncommon	
72	<i>Neope bhadra</i> (Moore)					✓		✓	Uncommon	
73	<i>Neope yama buckleyi</i> Talbot			✓	✓				Uncommon	Schedule II Part II

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
74	<i>Neope yama yama</i> (Moore)					✓		✓	Uncommon	Schedule II Part II
75	<i>Lasiommata schakra schakra</i> (Kollar)		✓	✓	✓				Common	
76	<i>Lasiommata menava menava</i> Moore		✓	✓					Less Common	
77	<i>Lasiommata menava maeroides</i> C and R Felder	✓							Less Common	
78	<i>Lasiommata maerula maerula</i> (C and R Felder)		✓	✓	✓				Uncommon	Schedule I Part IV
79	<i>Pararge eversmanni cashmirensis</i> (Moore)		✓	✓					Uncommon	Schedule II Part II
80	<i>Neorina hilda</i> Westwood					✓		✓	Uncommon	Schedule II Part II
81	<i>Neorina patria westwoodi</i> Moore							✓	Common	Schedule II Part II
82	<i>Chonala masoni</i> (Elwes)					✓			Uncommon	
83	<i>Raphicera satricus satricus</i> (Doubleday)					✓		✓	Uncommon	

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
84	<i>Raphicera moorei moorei</i> Butler			✓	✓		✓		Uncommon	
85	<i>Raphicera moorei mantra</i> Talbot					✓		✓	Common	
86	<i>Orinoma damaris</i> Gray			✓	✓	✓		✓	Uncommon	
87	<i>Maniola pulchella</i> (C and R Felder)	✓	✓	✓	✓				Less Common	
88	<i>Maniola pulchra neoza</i> (Lang)	✓	✓	✓					Less Common	
89	<i>Maniola pulchra pulchra</i> (C and R Felder)			✓	✓				Less Common	
90	<i>Maniola pulchra astorica</i> Tytler	✓							Uncommon	
91	<i>Maniola coenonympha</i> (C and R Felder)	✓	✓						Uncommon	
92	<i>Maniola lupinus cheena</i> (Moore)			✓	✓				Uncommon	
93	<i>Maniola lupinus kashmirica</i> (Moore)		✓						Uncommon	
94	<i>Maniola devendra devendra</i> (Moore)			✓	✓				Common	Schedule II Part II

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
95	<i>Maniola devendra brevistigma</i> Moore	✓							Uncommon	
96	<i>Hipparchia parisatis shiva</i> (Le Cerf)		✓	✓	✓				Common	
97	<i>Pseudochazara miszechii lehana</i> Moore	✓							Uncommon	
98	<i>Pseudochazara baldivanni szechii</i> Moore			✓					Uncommon	
99	<i>Ragadia crisilda crito</i> de Niceville							✓	Uncommon	Schedule II Part II
100	<i>Satyrus pimpla pimpla</i> (C and R Felder)	✓							Uncommon	
101	<i>Karanasa huebneri</i> (C and R Felder)	✓		✓					Uncommon	
102	<i>Karanasa modesta modesta</i> Moore	✓							Uncommon	
103	<i>Karanasa modesta gemina</i> Avinoff and Sweader	✓		✓					Uncommon	
104	<i>Karanasa astorica balti</i> Tytler	✓							Uncommon	

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
105	<i>Karanasa astorica</i> Tytler	✓							Uncommon	
106	<i>Karanasa rohntanga</i> Avinoff and Sweadher		✓						Uncommon	
107	<i>Oeneis buddha garhwalia</i> Tytler			✓	✓				Uncommon	Schedule II Part II
108	<i>Orsotriaena medus medus</i> (Fabricius)			✓	✓	✓		✓	Common	
109	<i>Zipaetis cylax</i> Hewitson							✓	Uncommon	
110	<i>Dallacha hyagriva hyagriva</i> (Moore)		✓	✓	✓				Uncommon	Schedule II Part II
111	<i>Callerebia annada annada</i> (Moore)					✓	✓	✓	Common	Schedule I Part IV
112	<i>Callerebia annada caeca</i> (Watkins)		✓	✓	✓				Common	
113	<i>Callerebia nirmala daksha</i> Moore		✓						Common	
114	<i>Callerebia nirmala scandina</i> Fruhstorfer			✓					Common	
115	<i>Callerebia nirmala nirmala</i> (Moore)			✓	✓				Common	

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
116	<i>Callerebia scanda scanda</i> (Kollar)		✓	✓	✓				Uncommon	
117	<i>Callerebia scanda opima</i> (Watkins)					✓		✓	Uncommon	Schedule II Part II
118	<i>Callerebia hybrida</i> (Butler)			✓	✓				Less Common	
119	<i>Callerebia baileyi</i> (South)							✓	Uncommon	
120	<i>Callerebia dibangensis</i> Roy							✓	Common	
121	<i>Loxerebia narasingha narasingha</i> (Moore)					✓		✓	Uncommon	Schedule I Part IV
122	<i>Paralasa kalinda kalinda</i> Moore		✓	✓	✓				Uncommon	Schedule II Part II
123	<i>Paralasa shallada shallada</i> (Lang)		✓	✓	✓				Uncommon	
124	<i>Paralasa mani mani</i> (de Niceville)	✓	✓						Uncommon	Schedule II Part II
125	<i>Elymnias hypermnestra undularis</i> (Drury)			✓	✓	✓	✓	✓	Common	
126	<i>Elymnias peali</i> Wood-Mason							✓	Uncommon	Schedule I Part IV

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
127	<i>Elymnias nesaea timandra</i> Wallace					✓		✓	Uncommon	
128	<i>Elymnias malelas nilamba</i> Fruhstorfer				✓				Uncommon	Schedule II Part II
129	<i>Elymnias malelas malelas</i> (Hewitson)					✓		✓	Uncommon	
130	<i>Elymnias patna patna</i> (Westwood)				✓	✓	✓	✓	Uncommon	
131	<i>Elymnias vasudeva deva</i> Moore							✓	Uncommon	
132	<i>Ethope himachala</i> (Moore)					✓		✓	Common	
133	<i>Melanitis leda ismene</i> (Cramer)		✓	✓	✓	✓	✓	✓	Common	
134	<i>Melanitis phedima galkissa</i> Fruhstorfer		✓	✓	✓				Uncommon	
135	<i>Melanitis phedima bela</i> Moore			✓	✓	✓	✓	✓	Uncommon	
136	<i>Melanitis zitenus zitenus</i> (Herbst)			✓	✓	✓	✓	✓	Uncommon	Schedule II Part II
137	<i>Aulocera brahminus brahminus</i> (Blanchard)		✓	✓	✓				Uncommon	Schedule II Part II

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
138	<i>Aulocera brahminus dokwana</i> Evans				✓				Uncommon	
139	<i>Aulocera brahminus brahminoides</i> Moore					✓		✓	Uncommon	
140	<i>Aulocera padma fulva</i> Evans							✓	Uncommon	
141	<i>Aulocera padma padma</i> (Kollar)		✓	✓	✓	✓			Common	
142	<i>Aulocera padma chumbica</i> Moore							✓	Common	
143	<i>Aulocera swaha swaha</i> (Kollar)		✓	✓	✓	✓	✓	✓	Common	
144	<i>Aulocera swaha garuna</i> Fruhstofer		✓	✓					Common	
145	<i>Aulocera saraswati saraswati</i> (Kollar)		✓	✓	✓				common	
146	<i>Aulocera saraswati vishnu</i> Gross					✓		✓	uncommon	
147	<i>Aulocera loha loha</i> (Doherty)				✓	✓		✓	uncommon	
148	<i>Chazara heydenreichi shandura</i> (Marshall)		✓						Uncommon	Schedule II Part II

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
149	<i>Coelites nothis adamsoni</i> Moore							✓	Uncommon	Schedule I Part IV
150	<i>Cyllogenes sura deva</i> (Moore)					✓		✓	Uncommon	Schedule II Part II
151	<i>Cyllogenes janetae janetae</i> de Niceville					✓		✓	Uncommon	Schedule I Part IV
152	<i>Paroeneis pumilus bicolor</i> (Seitz)					✓			Uncommon	
153	<i>Paroeneis pumilus pumilus</i> (C and R Felder)	✓	✓						Uncommon	
154	<i>Paroeneis sikkimensis</i> (Staudinger)					✓			Uncommon	
155	<i>Panthea lisarda lisarda</i> (Doubleday)					✓		✓	Less Common	Schedule II Part II
156	<i>Ypthima affectata</i> Elwes and Edwards							✓	Uncommon	Schedule II Part II
157	<i>Ypthima baldus baldus</i> (Fabricius)			✓	✓	✓	✓	✓	Common	
158	<i>Ypthima bolanica</i> Marshall		✓						Uncommon	Schedule II Part II

(Contd...)



Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
159	<i>Ypthima hamnyngtoni hamnyngtoni</i> Eliot			✓	✓				Uncommon	
160	<i>Ypthima huebneri huebneri</i> Kirby		✓	✓	✓	✓	✓	✓	Common	
161	<i>Ypthima indecora</i> Moore		✓	✓	✓			✓	Less Common	
162	<i>Ypthima inica</i> Hewitson			✓	✓				Less Common	
163	<i>Ypthima lisandra</i> (Cramer)		✓	✓	✓	✓	✓	✓	Less Common	
164	<i>Ypthima lycus lycus</i> de Niceville							✓	Uncommon	Schedule II Part II
165	<i>Ypthima methora</i> Hewitson					✓		✓	Uncommon	
166	<i>Ypthima newara newara</i> Moore			✓	✓	✓		✓	Common	
167	<i>Ypthima nikaea</i> Moore			✓	✓				Less Common	
168	<i>Ypthima persimilis</i> Elwes and Edwards							✓	Uncommon	Schedule I Part IV
169	<i>Ypthima philomela peguana</i> Evans							✓	Uncommon	

(Contd...)

Table 1: (Continued).

Sl. No	Name of the Species	Ladakh (UT)	Jammu and Kashmir	Himachal	Uttarakhand	Sikkim	West Bengal	Arunachal Pradesh	Status	Wildlife Protection Act
170	<i>Ypthima sakra sakra</i> Moore			✓	✓	✓	✓		Common	
172	<i>Ypthima singala</i> Felder		✓	✓	✓				Less Common	
173	<i>Ypthima marshalli</i> Butler			✓					Uncommon	
174	<i>Ypthima sarkaghatensis</i> Rose and Sharma			✓	✓				Less Common	
175	<i>Ypthima uenurai</i> Rose and Sharma			✓					Less Common	
176	<i>Ypthima kasmira</i> Moore		✓	✓	✓				Uncommon	
177	<i>Ypthima asterope mahratta</i> Moore		✓	✓	✓			✓	Less Common	
178	<i>Ypthima nareda</i> (Kollar)		✓	✓	✓				Less Common	
179	<i>Ypthima kashmirensis</i> Sharma		✓						Less Common	

179 species/subspecies, 29 species/subspecies were limited to Arunachal Pradesh, 13 species/subspecies to Sikkim, 7 species/subspecies to Ladakh, 5 species/subspecies to Uttarakhand, 5 species/subspecies to Himachal Pradesh, and 5 species/subspecies to Jammu and Kashmir [Table 1]. Observations on relative abundance of satyrid diversity revealed that out of 179 species/subspecies, 30 species/subspecies (17%), were found to be common, 120 species/subspecies (67%) uncommon, and remaining 29 species/subspecies (16%) less common [Table 1 and Figure 2].

Dry and WSF included ten species/subspecies of genus *Ypthima* Huebner, that is, *Ypthima inica* Hewitson, *Ypthima asterope mahratta* Moore, *Ypthima huebneri huebneri* Kirby, *Ypthima bolanica* Marshall, *Y. lisandra* (Cramer), *Ypthima singala* Felder, *Ypthima indecora* Moore, *Ypthima baldus baldus* (Fabricius), *Ypthima methora* Hewitson, and *Ypthima marshalli* Butler; 16 species/subspecies of genus *Mycalesis* Huebner, namely, *Mycalesis anxias aemate* Fruhstorfer, *Mycalesis francisca sanatana* Moore, *Mycalesis gotama charaka* Moore, *Mycalesis mineus mineus* (Linnaeus), *Mycalesis perseus blasius* (Fabricius), *Mycalesis visala visala* Moore, *Mycalesis evansii* Tytler, *Mycalesis suavolens ranotei* Smetacek, *Mycalesis malsara* Moore, *Mycalesis lepcha lepcha* Moore, *Mycalesis malsarida* Butler, *Mycalesis nicotia* Westwood, *Mycalesis misenus* de Niceville, *Mycalesis suavolens tytleri* Talbot, *Mycalesis intermedia* (Moore), and *Mycalesis adamsoni adamsoni* Watson; and four species/subspecies of genus *Melanitis* Fabricius, that is, *Melanitis leda ismane* (Cramer), *Melanitis phedima galkissa* Fruhstorfer, *Melanitis phedima bela* Moore, and *Melanitis zitenus zitenus* (Herbst).

A total of 65 species/subspecies were included in the Wildlife (Protection), Act 1972; 13 species/subspecies in Schedule I, Part IV; and 52 species/subspecies in Schedule II Part II [Table 1]. Maximum number of scheduled species/subspecies, that is, 37 were found in Arunachal Pradesh followed by Sikkim (33 species/

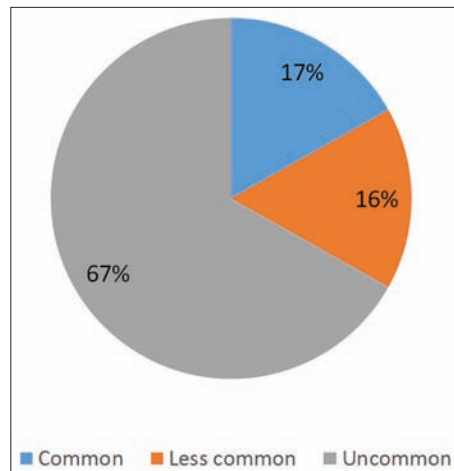


Figure 2: Relative abundance of satyrids in Indian Himalayan states and union territories.

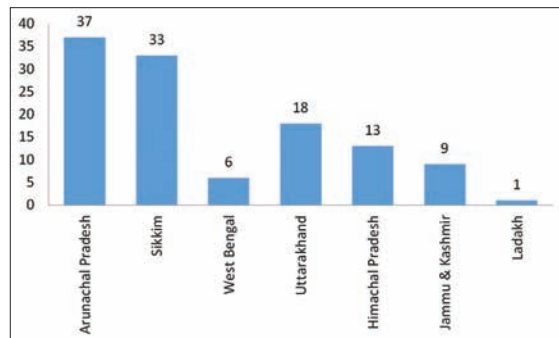


Figure 3: Distribution of scheduled species/subspecies in Indian Himalayan states and union territories.

subspecies), Uttarakhand (18 species/subspecies), Himachal Pradesh (13 species/subspecies), Jammu and Kashmir (9 species/subspecies), West Bengal (6 species/subspecies), and Ladakh (1 species) [Table 1, Figure 3]. Out of 65 scheduled species, 14 satyrids were found to be restricted in Arunachal Pradesh, 8 in Sikkim, 3 in Uttarakhand, and 2 species in Jammu and Kashmir [Table 1]. As per surveys, three scheduled species, that is, *Callerebia annad aannada* (Moore) (Schedule I Part IV), *Neorina patria westwoodi* Moore (Schedule II Part II), and *Maniola devendra devendra* (Moore) (Schedule II Part II) were common in Indian Himalaya and hence they should be removed from the Wildlife (Protection) Act, 1972.

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