

Chapter 28

Biodiversity of Butterflies (Lepidoptera: Rhopalocera) of Jammu and Kashmir State



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Abstract The chapter reports butterfly fauna occurring in Jammu and Kashmir State. A total of 408 species belonging to 129 genera distributed under 25 subfamilies in 5 families are known to occur in the three distinct biogeographic regions of the State (Jammu, Kashmir, and Ladakh); these species account for ca. 27% of the India's butterfly fauna. Ladakh region harbors the highest number of species (317) followed by Kashmir (274) and Jammu (192). The highest number of genera (52) is represented by family Nymphalidae followed by Lycaenidae (38), HesperIIDae (20), Pieridae (15), and Papilionidae (4); while the family with highest number of species is Nymphalidae (166) followed by Papilionidae (81), Lycaenidae (80), Pieridae (50), and HesperIIDae (31). Biogeographically, 150 species are common to all the three regions, while 17, 50, and 116 species exclusively occur in Jammu, Kashmir, and Ladakh. In addition, 38 species of butterflies from the State have been included in the Wildlife (Protection) Act of India (1972). The present effort in documenting the butterfly fauna will form the baseline for undertaking future research, conservation and management strategies on butterfly biodiversity of this Himalayan State.

Keywords Biodiversity · Butterfly Fauna · Lepidoptera: Rhopalocera · Conservation · Jammu and Kashmir State

28.1 Introduction

Butterflies along with moths belong to insect order Lepidoptera and are perhaps the most conspicuous and colorful of insects (Kunte 2006). They undergo 'complete metamorphosis' and have four distinct stages in their life cycle (the egg, the larva, the pupa and the adult), and each stage of development takes its own time. Usually

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the larval (caterpillar) stage is the longest, and the egg stage is the shortest. A number of factors, such as high species richness, occurrence across the world and variety of habitats (Kristensen et al. 2007), relatively easy to sample and identify with the help of field guides (Basset et al. 2011), highly sensitive to environmental changes (Spitzer et al. 1997), and above all being charismatic insects that attract the public attention, have made butterflies one of the most studied groups of organisms among the invertebrates (Varshney 1993; Spitzer et al. 1997) and qualified them to be considered as ideal candidates for indicator, umbrella and/or flagship species (New 1997; Spitzer et al. 1997; Fleishman et al. 2000; Maes and Van Dyck 2001; Kristensen et al. 2007). Besides being used in biogeography, evolution and plant–insect interaction research, they play an important role in ecosystem functioning, including nutrient cycling and pollination. For instance, the association of blue caterpillars with ants is an astonishing case of coevolution (Kunte 2006). The habitats of butterflies are strictly terrestrial, and virtually all butterflies are associated with plants, and their occurrence depends on the presence of plants (Kunte 2006).

The total number of known species of Lepidoptera which makes up about 10% of the animal Kingdom, approaches 200,000 (Holloway et al. 1987) to 2,55,000 (Heppner 1991), most of which are moths (Heterocera) and only about 15,000 to 18,000 are butterflies (Rhopalocera) (Holloway et al. 1987; Shields 1989). India is also rich in butterfly fauna, and about 1400–1500 species (Bingham 1905, 1907; Talbot 1939, 1947; Wynter-Blyth 1957; Gaonkar 1996; Haribal 1992; Kunte 2006; Kehimkar 2008; Varshney and Smetacek 2015) have already been reported from the Indian subcontinent. The Jammu and Kashmir (J&K) State has also a unique and diverse butterfly fauna with respect to other parts of India. However, the information on butterfly fauna of this vital Himalayan region remains vague, erratic, scattered and poorly explored and documented. The present work is an attempt to document the butterfly diversity of this Himalayan State, and it is hoped that it will prove a baseline data for further studying these beautiful lifeforms.

28.2 Materials and Methods

The inventory data of the butterfly fauna was obtained from a comprehensive literature review. For compilation of the checklist, all the relevant scientific literature available has been perused. The earlier workers, prior to 1947, who have contributed to the information on butterfly fauna of the State include Kollar 1844; Horsfield and Moore 1857; Lang 1868; Moore 1874; Marshal and de Niceville 1883, 1886, 1889; Bingham 1905, 1907; Evans 1932; Thomas-Glover 1936; Home 1938; and Talbot 1939, 1947. Although these works remain relevant sources for developing the baseline data of butterfly wealth of J&K, many of these works, besides including Kashmir and Ladakh at that time, were covering whole of Indian subcontinent. Post 1947, during the last 70 years, a huge body of scientific literature has contributed to the knowledge base on butterflies of this biodiversity-rich region (Wynter-Blyth 1957; Das et al. 1964; Das and Verma 1965; Malik et al. 1972; Eisner 1978; Vis and

Coene 1987; Eisner and Weiss 1990; Jamdar 1991, 1992; Haribal 1992; Varshney 1993, 1994, 1997; Tshikolovets 2005; Kehimkar 2008; Khan et al. 2011a, b; Qureshi et al. 2012a, b, c; 2013a, b, c, d, e; 2014 Bala et al. 2014; Qureshi and Bhagat 2013, 2015) and Sondhi et al. 2017. For the present study, the classification scheme as proposed by Kunte (2012) and Varshney and Smetacek (2015) has been followed. The common names mostly as given in Evans (1932), Wynter-Blyth (1957), Varshney (1983), and Varshney and Smetacek (2015) have been followed. No attempt has been made to change the taxonomic position of a species, but at the same time, every effort has been made to put the species as per their valid taxonomic status.

28.3 Results and Discussion

A total of 408 species belonging to 5 families and distributed under 129 genera, which account for about 27% of the India's butterfly diversity, is reported from the J&K State (Table 28.1). Overall Ladakh region is reported to have the highest number of species (317) followed by Kashmir (274) and Jammu (192) regions. Family Nymphalidae is having highest number of species (166 spp.) which accounts for about 41% of the total butterfly fauna of the State, followed by Papilionidae (81 spp., 20%), Lycaenidae (80 spp., 19%), Pieridae (51 spp., 12%), and Hesperidae (31 spp., 8%) (Table 28.1). Some of the most diverse genera in terms of number of species include *Parnassius* having 58 species followed by *Hyponephele* (14 spp.), *Karanasa* (12 spp.), *Papilio* (12 spp.), *Argynnis* (11 spp.), *Colias* (11 spp.), *Polyommatus* (10 spp.), and *Ypthima* (10 spp.) (Table 28.1). The most diverse sub-family having the highest number of species is Satyrinae (76 spp.) followed by Parnassinae (58 spp.), Polyommatinae (48 spp.), Nymphalinae (33 spp.), Pierinae (27 spp.), Coliadinae (23 spp.), Papilioninae (23 spp.), Heliconinae (19 spp.), Pyrginae (16 spp.), Theclinae (16 spp.), Limenitinae (14 spp.), Hesperinae (13 spp.), and Lycaeninae (10 spp.) (Table 28.1; Fig. 28.1).

Biogeographically, 150 species (37%) are common to all the three regions, while 17 (4%), 50 (12%), and 116 (28%) species exclusively occur in Jammu, Kashmir, and Ladakh; and 24 (6%), 01 (0.25%), and 50 (12%) species are common between J&K, Jammu and Ladakh, and Kashmir and Ladakh regions, respectively (Fig. 28.2). Furthermore, 38 species belonging to 4 families, Nymphalidae (20 spp.), Pieridae (9 spp.), Lycaenidae (6 spp.), and Papilionidae (3 spp.), which account for 9% of the butterfly fauna of J&K have been included in the Wildlife (Protection) Act (WPA) of India (1972). Out of these, 6 species have been listed in the Schedule I and 31 species in the Schedule II of the Wildlife (Protection) Act of India (1972) (WPA), respectively (Table 28.1).

Despite being an important resource for socioeconomic development, the biodiversity of this Himalayan State which also includes butterfly wealth has suffered greatly due to varied anthropogenic pressures, more so in recent past. According to an estimate, about 40% of the endemic plant species in Kashmir Himalaya are cur-

Table 28.1 Checklist of butterflies of J&K State

S. No.	Taxa	Common/ English name	Distribution	References
	Family I: Hesperiidae			
	Subfamily: Coeliadinae			
1.	<i>Choaspes xanthopogon</i> (Kollar, [1844])	Similar awlking	K	Varshney and Smetacek (2015)
	Subfamily: Eudaminae			
2.	<i>Lobocla liliana</i> (Atkinson, 1871)	Marbled flat	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
	Subfamily: Hesperiinae			
3.	<i>Actinor radians</i> (Moore, 1878)	Veined dart	JKL	Varshney and Smetacek (2015)
4.	<i>Aeromachus stigmatus stigmatus</i> (Moore, 1878)	Veined scrub harper	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
5.	<i>Borbo bevani</i> (Moore, 1878)	Bevan's swift	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
6.	<i>Gegenes nostrodamus</i> (Fabricius, 1793)	Dingy swift	JKL	Varshney and Smetacek (2015)
7.	<i>Hesperia comma comma</i> (Linnaeus, 1758)	Chequered darter	JKL	Kehimkar (2008)
8.	<i>Hesperia comma dimila</i> (Moore, [1874])	Garhwal chequered darter	JKL	Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)
9.	<i>Notocryta feisthameli</i> (Boisduval, 1832)	Spotted demon	JKL	Kehimkar (2008)
10.	<i>Parnara bada</i> (Moore, 1878)	Ceylon swift	JKL	Varshney and Smetacek (2015)
11.	<i>Parnara guttatus mangala</i> (Moore, [1866])	Straight swift	JKL	Varshney and Smetacek (2015)
12.	<i>Potanthus dara</i> (Kollar, [1844])	Himalayan dart	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
13.	<i>Polytremis eltola</i> (Hewitson, 1869)	Yellow spot swift	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
14.	<i>Taractrocera danna</i> (Moore, 1865)	Himalayan grass dart	K	Dar et al. (2002), Varshney and Smetacek (2015) and Wynter- Blyth (1957)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
15.	<i>Taractrocera maevius sagara</i> (Moore [1866])	Common grass dart	JKL	Khan et al. (2011a, b), Varshney and Smetacek (2015)
	Subfamily: Pyrginae			
16.	<i>Calaenorrhinus leucocera</i> (Kollar, [1844])	Common spotted flat	JKL	Dar et al. (2002), Kehimkar (2008), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
17.	<i>Celaenorrhinus munda</i> (Moore, [1884])	Himalayan spotted flat	JKL	Varshney and Smetacek (2015)
18.	<i>Celaenorrhinus pulomaya</i> (Moore, [1866])	Multi-spotted flat	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
19.	<i>Carcharodus alceae</i> (Esper, 1780)	Plain marbled skipper	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
20.	<i>Carcharodus dravira</i> (Moore, [1875])	Tufted marbled skipper	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
21.	<i>Pelopidas agna agna</i> (Moore, [1866])	Obscure branded swift	JKL	Varshney and Smetacek (2015)
22.	<i>Pelopidas mathias</i> (Fabricius, 1798)	Variable swift	K	Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
23.	<i>Pelopidas thrax thrax</i> (Huebner, [1821])	Small branded swift	JKL	Varshney and Smetacek (2015)
24.	<i>Polytremis discrete</i> (Elwes and Edwards, 1897)	Himalyan swift	JKL	Varshney and Smetacek (2015)
25.	<i>Polytremis eltola</i> (Hewitson, 1869)	Yellow spot swift	JKL	Varshney and Smetacek (2015)
26.	<i>Pyrgus alpinus</i> (Erschoff, 1874)	Mountain skipper	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
27.	<i>Pyrgus cashmirensis cashmirensis</i> (Moore, 1874)	Kashmir skipper	JKL	Tshikolovets (2005) and Varshney and Smetacek (2015)
28.	<i>Pyrgus cashmirensis pseudoalpinus</i> (Alberti, 1952)	Kashmir skipper	JKL	Varshney and Smetacek (2015)
29.	<i>Seseria dohertyi</i> (Watson, 1893)	Himalayan white flat	JKL	Varshney and Smetacek (2015)
30.	<i>Spialia orbifer</i> (Huebner, 1823)	Brick skipper	JKL	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
31.	<i>Tagiades menaka</i> (Moore, [1866])	Spotted snow flat	JKL	Dar et al. (2002), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
	Family II: Lycaenidae			
	Subfamily: Aphaeinae			
32.	<i>Spindasis elima uniformis</i> (Moore, 1882)	Scarce Shot Silverline	K	Varshney and Smetacek (2015)
	Subfamily: Curetinae			
33.	<i>Curetis thetis</i> (Drury, [1773])	Indian Sunbeam	L	Varshney and Smetacek (2015)
	Subfamily: Lycaeninae			
34.	<i>Heliophorus androcles</i> (Westwood, 1851)	Green Sapphire	K	Evans (1932), Kehimkar (2008), Varshney (1994), Varshney and Smetacek (2015) and Wynter- Blyth (1957)
35.	<i>Heliophorus bakeri</i> (Evans, 1927)	Western Blue Sapphire	K	Varshney and Smetacek (2015)
36.	<i>Heliophorus moorei coruscans</i> (Moore, 1882)	Azure Sapphire	JKL	Varshney and Smetacek (2015)
37.	<i>Heliophorus sena</i> (Kollar, 1844)	Sorrel Sapphire	JKL	Kehimkar (2008)
38.	<i>Heliophorus tamu tamu</i> (Kollar, 1844)	Powdery Green Sapphire	JKL	Varshney and Smetacek (2015)
39.	<i>Lycaena panava</i> (Westwood, 1852)	White-Bordered Copper	JKL	Dar et al. (2002), Evans (1932), Khan et al. (2011a, b), Kehimkar (2008), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
40.	<i>Lycaena phlaeas baralacha</i> (Moore, 1884)	Common Copper	JKL	Varshney and Smetacek (2015) Qureshi et al. (2014)
41.	<i>Lycaena phlaeas phlaeas</i> (Linnaeus, 1761)	Common Copper	KL	Evans (1932), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e), Tshikolovets (2005), Qureshi and Bhagat (2015), Sondhi et al. (2017) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
42.	<i>Lycaena kasyapa</i> (Moore, 1865)	Green Copper	JKL	Khan et al. (2011b), Kehimkar (2008), Tshikolovets (2005) and Varshney and Smetacek (2015)
43.	<i>Thersamonia aditya</i> (Moore, [1875])	Ladakh Copper	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
	Subfamily: Polyommatinae			
44.	<i>Acytolepis puspa gisca</i> (Fruhstorfer, 1910)	Common Hedge Blue	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
45.	<i>Albulina chitralensis chitralensis</i> (Tytler, 1926)	Chitral Green Underwing	L	Varshney and Smetacek (2015)
46.	<i>Albulina chrysopis</i> (Grum-Grishmailo, 1888)	Golden Green Underwing	L	Varshney and Smetacek (2015)
47.	<i>Albulina galathea depreei</i> (Tytler, 1926)	Large Green Underwing	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
48.	<i>Albulina galathea galathea</i> (Blanchard, [1844])	Large Green Underwing	KL	Bingham (1907), Evans (1932), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
49.	<i>Albulina lehanus</i> (Moore, 1878)	Common Mountain Blue	KL	Bingham (1907), Khan et al. (2011b), Sondhi et al. (2017) and Varshney and Smetacek (2015)
50.	<i>Albulina metallica metallica</i> (C & R Felder, [1865]) ##	Small Green Underwing	JKL	Khan et al. (2011b), Kehimkar (2008), Tshikolovets (2005) and Sondhi et al. (2017)
51.	<i>Albulina omphisa</i> (Moore, [1875])	Dusky Green Underwing	KL	Evans (1932), Khan et al. (2011b), Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)
52.	<i>Alpherakya devanica devanica</i> (Moore, [1875])	Dusky Meadow Blue	KL	Bingham (1907), Evans (1932), Khan et al. (2011b), Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)
53.	<i>Alpherakya sarta gooraisica</i> (Tytler, 1927)	Brilliant Meadow Blue	KL	Varshney and Smetacek (2015)
54.	<i>Agriades jaloka jaloka</i> (Moore, [1875]) ##	Greenish Mountain Blue	KL	Bingham (1907), Evans (1932), Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
55.	<i>Agriades jaloka leela</i> (de Niceville, [1884])	Greenish Mountain Blue	L	Varshney and Smetacek (2015)
56.	<i>Agriades jaloka marlane</i> (Heming, 1934)	Greenish Mountain Blue	K	Varshney and Smetacek (2015)
57.	<i>Agriades pheretiades</i> (Eversmann, 1834)	Tien Shan Blue	L	Varshney and Smetacek (2015)
58.	<i>Aricia agestis nazira</i> (Moore, 1865)	Orange-Bordered Argus	JKL	Bingham (1907), Evans (1932), Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Tshikolovets (2005), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
59.	<i>Aricia artaxerxes artaxerxes</i> (Obratzov, 1935)	Northern Brown Argus	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
60.	<i>Aricia astorica</i> (Evans, 1925)	Astor Argus	L	Varshney and Smetacek (2015)
61.	<i>Celastrina argiolus kollari</i> Westwood, [1852])	Hill Hedge Blue	JKL	Kehimkar (2008), Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)
62.	<i>Celastrina gigas</i> Westwood, [1852])	Silvery Hedge Blue	JKL	Varshney and Smetacek (2015)
63.	<i>Celastrina huegelii huegelii</i> (Moore, 1882)	Large Hedge Blue	JKL	Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008), Tshikolovets (2005), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
64.	<i>Cupido alainus</i> (Staudinger, 1887)	Staudinger's Cupid	L	Varshney and Smetacek (2015)
65.	<i>Eumedonia eumedon</i> (Esper, 1780)	Streaked Argus	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
66.	<i>Everes argiades deporides</i> (Chapman, 1909)	Tailed/ Chapman's Cupid	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
67.	<i>Everes hugelii hugelii</i> (Gistel, 1857)	Dusky Blue Cupid	JKL	Varshney and Smetacek (2015)
68.	<i>Farsia ashretha</i> (Evans, 1925)	Evan's Argus Blue	L	Varshney and Smetacek (2015)
69.	<i>Farsia hanna</i> (Evans, 1932)	Jewel Argus Blue	L	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
70.	<i>Iolana gigantea</i> (Grum Grishimalio, 1885)	Gilgit Mountain Blue	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
71.	<i>Kretania beani</i> (Balint & Johnson, 1997)	Beans's Jewel Blue	L	Tshikolovets (2005) and Varshney and Smetacek (2015)
72.	<i>Lampides boeticus</i> (Linnaeus, 1767) ##	Pea Blue	KL	Khan et al. (2011a, b), Malik et al. (1972), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Sondhi et al. (2017) and Tshikolovets (2005)
73.	<i>Neopithecops zalmora zalmora</i> (Butler, [1881])	Quaker	KL	Varshney and Smetacek (2015)
74.	<i>Oreolyce vardhana vardhana</i> (Moore, [1875])	Dusky Hedge Blue	JKL	Evans (1932), Kehimkar (2008) and Wynter-Blyth (1957)
75.	<i>Polyommatus ariana</i> (Moore, 1865)	Lahaul Meadow Blue	KL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
76.	<i>Polyommatus drasula</i> (Swinhoe, 1910)	Ladakh Meadow Blue	L	Varshney and Smetacek (2015)
77.	<i>Polyommatus erigone</i> (Grum- Grshimailo, 1890)	Hunza Meadow Blue	L	Varshney and Smetacek (2015)
78.	<i>Polyommatus hunza</i> (Grum-Grshimailo, 1890)	Hunza Meadow Blue	L	Varshney and Smetacek (2015)
79.	<i>Polyommatus icadus</i> (Grum-Grshimailo, 1890)	Gilgit Meadow Blue	L	Varshney and Smetacek (2015)
80.	<i>Polyommatus janatae</i> (Evans, 1927)	Janet's Meadow Blue	L	Varshney and Smetacek (2015)
81.	<i>Polyommatus pulchellus</i> (Bernardi, 1951)	Bernardi's Meadow Blue	L	Varshney and Smetacek (2015)
82.	<i>Polyommatus pseuderos</i> (Moore, 1879)	Kashmir Meadow Blue	KL	Varshney and Smetacek (2015)
83.	<i>Polyommatus stoliczkanus stoliczkanus</i> (C. and R. Felder, [1865])	Stoliczka's Meadow Blue	KL	Bingham (1907), Khan et al. (2011b), Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
84.	<i>Plebejidea loewii loewii</i> (Evans, 1932)	Large Jewel Blue	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
85.	<i>Plebejus samudra</i> (Moore, [1875])	Ladakh Jewel Blue	KL	Khan et al. (2011b), Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)
86.	<i>Pseudozizeeria maha maha</i> (Kollar, [1844])	Pale Grass Blue	JKL	Varshney and Smetacek (2015)
87.	<i>Pseudophilotes vicrama vicrama</i> (Moore, 1865)	Chequered Blue	JKL	Khan et al. (2011b), Kehimkar (2008), Sondhi et al. (2017) and Tshikolovets (2005)
88.	<i>Pseudophilotes vicrama cashmirensis</i> (Moore, 1874)	Eastern Baton Blue	KL	Varshney and Smetacek (2015)
89.	<i>Tarucus hazara</i> (Evans, 1932)	Hazara Pierrot	K	Varshney and Smetacek (2015)
90.	<i>Tarucus venosus</i> (Moore, 1882)	Himalayan Pierrot	JKL	Varshney and Smetacek (2015)
91.	<i>Turanana chitrali</i> (Charmeux & Pages, 2004)	Chitral Argus Blue	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
	Subfamily: Riodininae			
92.	<i>Dodona durga</i> (Kollar, [1844])	Common Punch	JKL	Bingham (1905), Khan et al. (2011b), and Kehimkar (2008)
93.	<i>Dodona dipoea</i> (Hewitson, 1866) ##	Lesser Punch	JKL	Kehimkar (2008)
94.	<i>Dodona egeon</i> (Westwood, [1851]) ##	Orange Punch	K	Bingham (1905)
95.	<i>Dodona eugenes</i> (Bates, [1868])	Tailed Punch	JKL	Kehimkar (2008)
	Subfamily: Theclinae			
96.	<i>Arhopala atrax</i> (Hewitson, 1862)	Indian Oakblue	JKL	Varshney and Smetacek (2015)
97.	<i>Arhopala dodonea</i> (Moore, [1858])	Pale Himalayan Oakblue	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
98.	<i>Arhopala ganesa ganesa</i> (Moore, [1858])	Tailless Bushblue	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
99.	<i>Arhopala rama rama</i> (Kollar, [1844])	Dark Himalayan Oakblue	JKL	Evans (1932), Kehimkar (2008), Tshikolovets (2005), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
100.	<i>Chaetoprocta odata</i> <i>odata</i> (Hewitson, 1865)	Walnut Blue	JKL	Khan et al. (2011b), Kehimkar (2008) and Tshikolovets (2005)
101.	<i>Curetis thetis</i> (Drury, [1773])	Indian Sunbeam	L	Varshney and Smetacek (2015)
102.	<i>Deudorix epijarbus</i> (Moore, 1857)	Cornelian	JKL	Dar et al. (2002), Khan et al. (2011a, b) and Varshney and Smetacek (2015)
103.	<i>Euaspa milionia</i> (Hewitson, 1869)	Water Hairstreak	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
104.	<i>Euaspa ziha</i> (Hewitson, [1865])	White-spotted Hairstreak	JKL	Varshney and Smetacek (2015)
105.	<i>Inomataozephyrus</i> <i>syla</i> (Kollar, [1844])	Silver Hairstreak	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
106.	<i>Rapala iarbus sorya</i> (Kollar, [1884])	Common Red Flash	JKL	Khan et al. (2011b) and Varshney and Smetacek (2015)
107.	<i>Rapala nissa nissa</i> (Kollar, [1884])	Common Flash	JKL	Evans (1932), Haribal (1992), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d), Varshney and Smetacek (2015) and Wynter- Blyth (1957)
108.	<i>Rapala selira</i> (Moore, 1874)	Himalayan Red Flash	K	Varshney and Smetacek (2015)
109.	<i>Superflua deria</i> (Moore, 1865)	Moore's Hairstreak	K	Sondhi et al. (2017) and Varshney and Smetacek (2015)
110.	<i>Thermozephyrus</i> <i>ataxus</i> (Westwood, 1851) ##	Wonderful Hairstreak	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
111.	<i>Virachola isocrates</i> (Fabricius, 1793)	Common Guava Blue/Anar Butterfly	JK	Dar et al. (2002), Khan et al. (2011a, b) and Malik et al. (1972)
	Family III: Nymphalidae			
	Subfamily: Acraeinae			
112.	<i>Acraea violae</i> (Fabricius, 1793)	Tawny Coster	J	Viswanthan et al. (2004)
	Subfamily: Apaturinae			

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
113.	<i>Apatura ambica ambica</i> (Kollar, [1844])	Indian Purple Emperor	JKL	Bingham (1905), Evans (1932), Khan et al. (2011b) and Kehimkar (2008)
114.	<i>Diagora nicevillei nicevillei</i> (Moore, [1895])#	Scarce Siren	KL	Varshney and Smetacek (2015)
115.	<i>Dilipa morgiana</i> (Westwood, [1850]) #	Golden Emperor	JKL	Dar et al. (2002), Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008), Varshney (1994) and Wynter-Blyth (1957)
116.	<i>Hestina persimilis zella</i> (Butler, 1869)	Siren	JKL	Varshney and Smetacek (2015)
117.	<i>Mimathyma chitralensis</i> (Evans, 1912)	Chitral Emperor	JKL	Varshney and Smetacek (2015)
118.	<i>Sephisa dichroa</i> (Kollar, [1844])	Western Courtier	JKL	Bingham (1905), Kehimkar (2008) and Varshney and Smetacek (2015)
	Subfamily: Biblidinae			Viswanthan et al. (2004)
119.	<i>Ariadne aridnae</i> (Linnaeus, 1763)	Angled Castor	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
120.	<i>Ariadne merione tapestrina</i> (Moore, 1884)	Common Castor	JK	Evans (1932), Khan et al. (2011b) and Varshney and Smetacek (2015)
	Subfamily: Calinaginae			
121.	<i>Calinga buddha buddha</i> (Moore, 1857)	Freak	JKL	Varshney and Smetacek (2015)
	Subfamily: Cyrestinae			
122.	<i>Cyrestis thyodamas ganesh</i> (Kollar, 1848)	Common Map	JKL	Dar et al. (2002), Evans (1932), Khan et al. (2011b), Kehimkar (2008), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
	Subfamily: Danainae			
123.	<i>Danaus chrysippus</i> (Linnaeus, 1758)	Plain Tiger	JK	Dar et al. (2002), Das and Verma (1965), Khan et al. (2011a, b), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015) and Wynter-Blyth (1957)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
124.	<i>Danaus genutia</i> (Cramer, [1779])	Common Tiger	JK	Das and Verma (1965), Khan et al. (2011a, b), Qureshi et al. (2012a) and Wynter-Blyth (1957)
125.	<i>Danaus liminiace</i> (Cramer, [1775])	Blue Tiger	J	Varshney and Smetacek (2015) and Viswanthan et al. (2004)
126.	<i>Danaus sita sita</i> (Kollar, [1884])	Chestnut Tiger	JKL	Bingham (1905), Dar et al. (2002), Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008), Talbot (1947), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
127.	<i>Euploea core core</i> (Cramer, [1780])	Indian Common Crow	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
128.	<i>Euploea mulciber mulciber</i> (Cramer, [1777])	Striped Blue Crow	JKL	Varshney and Smetacek (2015)
129.	<i>Euploea sylvester</i> (Fabricius, 1793)	Double-branded Crow	J	Viswanthan et al. (2004)
130.	<i>Parantica aglea aglea</i> (Stoll, [1782])	Glassy Tiger	JK	Bingham (1905), Dar et al. (2002), Evans (1932), Haribal (1992), Talbot (1947) and Wynter-Blyth 1957
131.	<i>Parantica aglea melanooides</i> (Moore, 1883)	Himalayan Glassy Tiger	K	Varshney and Smetacek (2015)
	Subfamily: Heliconinae			
132.	<i>Argynnis adippe pallida</i> (Moore) ##	Highbrown Silverstrip	JKL	Khan et al. (2011a) and Kehimkar (2008)
133.	<i>Argynnis aglaja vitatha</i> (Moore, [1875])	Dark-green Silverspot	JKL	Evans (1932), Khan et al. (2011b), Kehimkar (2008) and Varshney and Smetacek (2015)
134.	<i>Argynnis andora pasargades</i> (Fruhstorfer, 1908)	Cardinal	L	Varshney and Smetacek (2015)
135.	<i>Argynnis childreni childreni</i> (Gray, 1831)	Large Silverstripe	JKL	Bingham (1905), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, c, 2013c, d, e) and Qureshi and Bhagat (2015)
136.	<i>Argynnis childreni sakontala</i> (Kollar, 1848)	Large Silverstripe	JKL	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
137.	<i>Argynnis hyperbius hyperbius</i> (Linnaeus, 1763)	Indian Fritillary	JKL	Khan et al. (2003), Khan et al. (2004), Khan et al. (2011a, b), Kehimkar (2008), Marshal and de Niceville (1886), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015) and Varshney and Smetacek (2015)
138.	<i>Argynnis jainadeva jainadeva</i> (Moore, 1864)	Highbrown Silverspot	JKL	Varshney and Smetacek (2015)
139.	<i>Argynnis jainadeva persephone</i> Hemming, 1934	Highbrown Silverspot	L	Khan et al. (2011b), Sondhi et al. (2017) and Varshney and Smetacek (2015)
140.	<i>Argynnis kamala</i> (Moore, 1857)	Common Silverstrip	JKL	Bingham (1905), Khan et al. (2011b), Kehimkar (2008) and Varshney and Smetacek (2015)
141.	<i>Argynnis pales sipora</i> (Moore, [1875])	Straightwing Silverspot	KL	Bingham (1905), Evans (1932) and Khan et al. (2011b)
142.	<i>Argynnis pandora pasargades</i> (Fruhstorfer, 1908)	Cardinal	L	Kehimkar (2008) and Varshney and Smetacek (2015)
143.	<i>Boloria erubescens</i> (Staudinger, 1901)	Whitespot Fritillary	L	Varshney and Smetacek (2015)
144.	<i>Boloria generator</i> (Staudinger, 1901)	Hunza Fritillary	L	Varshney and Smetacek (2015)
145.	<i>Boloria jerdoni jerdoni</i> (Lang, 1868)	Jerdon's Silverspot	KL	Bingham (1905), Dar et al. (2002), Evans (1932), Khan et al. (2011b) and Wynter-Blyth, 1957
146.	<i>Issoria gemmata gemmata</i> (Butler, 1881)	Gem Silverspot	K	Qureshi et al. (2012a, 2013c, d)
147.	<i>Issoria isaea</i> (Gray, 1846)	Himalayan Queen Fritillary	L	Sondhi et al. (2017)
148.	<i>Issoria lathonia isaea</i> (Gray, 1846)	Queen of Spain Fritillary	JKL	Varshney and Smetacek (2015)
149.	<i>Issoria lathonia lathonia</i> (Linnaeus, 1758)	Queen of Spain Fritillary	JKL	Das and Verma (1965), Das et al. (1964), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015) and Marshal and de Niceville (1886)
150.	<i>Phalanta phalanta</i> (Drury, [1773])	Common Leopard	JK	Khan et al. (2011a, b) and Qureshi et al. (2012a, 2013c, d)

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Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
	Subfamily: Libytheinae			
151.	<i>Libythea celtis</i> (Laicharting, 1782)	European Beak	JKL	Khan et al. (2011a, b) and Kehimkar (2008)
152.	<i>Libythea lepita lepita</i> (Moore, [1858]) ##	Common Beak	JKL	Bingham (1905), Dar et al. (2002), Haribal (1992), Kehimkar (2008), Marshal and de Niceville (1886), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
153.	<i>Libythea lepita lepitoidea</i> (Moore, 1901)	Common Beak	J	Viswanthan et al. (2004)
154.	<i>Libythea myrha</i> (Godart, 1819)	Club Beak	K	Haribal (1992)
	Subfamily: Limenitinidae			
155.	<i>Athyma opalina opalina</i> (Kollar, [1844])	Himalayan Sergeant	K	Dar et al. (2002), Evans (1932), Khan et al. (2011b), Kehimkar (2008) and Wynter-Blyth (1957)
156.	<i>Euthalia aconthea</i> (Cramer, [1777])	Common Baron	J	Viswanthan et al. (2004)
157.	<i>Euthalia patala patala</i> (Kollar, [1844])	Grand Duchess	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
158.	<i>Limenitis lepechini gilgitica</i> (Tytler, 1926)	Chitral White Admiral	L	Varshney and Smetacek (2015)
159.	<i>Limenitis trivena hydaspes</i> (Moore, 1874)	Indian White Admiral	JKL	Varshney and Smetacek (2015)
160.	<i>Limenitis trivena ligyes</i> (Hewitson, 1864)	Indian White Admiral	K	Khan et al. (2011b) and Varshney and Smetacek (2015)
161.	<i>Limenitis trivena trivena</i> (Moore, 1864)	Indian White Admiral	JKL	Bingham (1905), Evans (1932), Kehimkar (2008), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
162.	<i>Neptis hylas</i> (Linnaeus, 1758)	Common Sailor	K	Bingham (1905), Haribal (1992), Khan et al. (2003), Khan et al. (2004), Khan et al. (2011a, b), Qureshi et al. (2012a, 2013c, d, e)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
163.	<i>Neptis mahendra mahendra</i> (Moore, 1872)	Himalayan Sailor	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
164.	<i>Neptis sappho</i> (Pallas, 1771)	Pallas Sailor	K	Qureshi and Bhagat (2015), Qureshi et al. (2014) and Varshney and Smetacek (2015)
165.	<i>Neptis sankara sankara</i> Kollar, [1844]	Broad-Banded Sailor	JKL	Dar et al. (2002), Khan et al. (2011a, b), Kehimkar (2008) and Varshney and Smetacek (2015)
166.	<i>Neptis soma soma</i> (Moore, 1858) ##	Creamy Sailor	JKL	Evans (1932), Haribal (1992), Khan et al. (2011a, b), Kehimkar (2008) and Wynter-Blyth (1957)
167.	<i>Neptis yerburii yerburii</i> (Butler, 1886) ##	Yurburi's Sailor	JKL	Bingham (1905), Evans (1932), Haribal (1992), Kehimkar (2008) and Wynter-Blyth (1957)
168.	<i>Neptis zaida zaida</i> (Doubleday, [1848])	Pale Green Sailer	JKL	Varshney and Smetacek (2015)
	Subfamily: Nymphalinae			
169.	<i>Aglais cashmirensis aesis</i> (Frusstorfer, 1912)	Indian Tortoiseshell	K	Khan et al. (2011a, b) and Kehimkar (2008)
170.	<i>Aglais cashmirensis cashmirensis</i> (Kollar, [1844])	Indian Tortoiseshell	JKL	Bingham (1905), Dar et al. (2002), Evans (1932), Qureshi et al. (2012a, 2013b, c, d, e, 2014), Qureshi and Bhagat (2015), Malik et al. (1972), Sondhi et al. (2017), Varshney (1994) and Wynter-Blyth (1957)
171.	<i>Aglais ladakensis</i> (Moore, 1878) ##	Ladakh Tortoiseshell	L	Varshney and Smetacek (2015)
172.	<i>Aglais rizana</i> (Moore, 1872)	Mountain Tortoiseshell	JKL	Bingham (1905), Varshney (1994), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
173.	<i>Cynthia cardui</i> (Linnaeus, 1758)	Painted Lady	K	Khan et al. (2003, 2004, 2011a, b), Qureshi et al. (2012a, b, 2013a, c, d, e, 2014), Qureshi and Bhagat (2015), Sondhi et al. (2017) and Wynter-Blyth, 1957
174.	<i>Hypolimnasia misippus</i> (Linnaeus, 1764) ##	Danaid Eggfly	K	Evans (1932), Khan et al. (2011a, b), Qureshi et al. (2012a, c, d, e, 2014), Qureshi and Bhagat (2015) Varshney (1994) and Wynter-Blyth (1957)
175.	<i>Junonia almana</i> (Linnaeus, 1758)	Peacock Pansy	JK	Khan et al. (2011a, b) and Qureshi et al. (2012a)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
176.	<i>Junonia atlites</i> (Linnaeus, 1763)	Grey Pansy	JKL	Khan et al. (2011b)
177.	<i>Junonia hierta</i> (Fabricius, 1798)	Yellow Pansy	JK	Khan et al. (2003) and Mathur and Srivastava (1967)
178.	<i>Junonia iphita</i> (Cramer, [1779])	Chocolate Pansy	K	Marshal and de Niceville (1886), Qureshi et al. (2012a, 2013c, e, 2014), Qureshi and Bhagat (2015) and Wynter-Blyth, 1957
179.	<i>Junonia lemonias persicaria</i> (Fruhstorfer, 1912)	Lemon Pansy	JK	Dar et al. (2002), Evans (1932), Khan et al. (2011a, b) and Wynter-Blyth (1957)
180.	<i>Junonia orithya</i> (Linnaeus, 1758)	Blue Pansy	JK	Khan et al. (2003), (2011a, b), Qureshi et al. (2013c, d, e) and Qureshi and Bhagat (2015)
181.	<i>Kallima inachus huegeli</i> (Kollar, [1844])	Orange Oakleaf	K	Varshney and Smetacek (2015)
182.	<i>Kallima inachus inachus</i> (Boisduval, 1846)	Orange Oakleaf	JKL	Bingham (1905), Dar et al. (2002), Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008) and Wynter-Blyth (1957)
183.	<i>Kaniska canace canace</i> (Linnaeus, 1763)	Blue Admiral	JKL	Bingham (1905), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015) and Varshney and Smetacek (2015)
184.	<i>Melitaea arcesia amoenula</i> (C. & R. Felder, [1867])	Black Vein Fritillary	L	Khan et al. (2011b) and Sondhi et al. (2017)
185.	<i>Melitaea arcesia sindura</i> (Moore, 1865)	Black Vein Fritillary	KL	Dar et al. (2002) and Khan et al. (2011b)
186.	<i>Melitaea arcesia balbita</i> (Moore, 1874)	Kashmir Fritillary	KL	Varshney and Smetacek (2015)
187.	<i>Melitaea balbina</i> (Tytler, 1926)	Pamir Fritillary	L	Varshney and Smetacek (2015)
188.	<i>Melitaea fergana</i> (Staudinger, 1882)	Uzbek Fritillary	L	Varshney and Smetacek (2015)
189.	<i>Melitaea nadezhdae</i> (Sheljuzhko, 1912)	Sheljuzhko's Fritillary	L	Varshney and Smetacek (2015)
190.	<i>Melitaea shandura</i> (Evans, 1924)	Shandur Fritillary	L	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
191.	<i>Nymphalis xanthomelas fervescens</i> (Stichel, [1908])	Large Tortoiseshell	JKL	Bingham (1905), Khan et al. (2011b), Kehimkar (2008) and Varshney and Smetacek (2015)
192.	<i>Polygonia c-album agnicula</i> (Moore, 1872)	Comma	L	Varshney and Smetacek (2015)
193.	<i>Polygonia c-album cognata</i> (Moore, 1899)	Comma	K	Varshney and Smetacek (2015)
194.	<i>Polygonia c-album kashmira</i> (Evans, 1932)	Comma	KL	Varshney and Smetacek (2015)
195.	<i>Polygonia l-album</i> (Esper, 1781) ##	False Comma	KL	Varshney and Smetacek (2015)
196.	<i>Polygonia undina</i> (Grum-Grshimailo, 1890)	Pamir Comma	L	Varshney and Smetacek (2015)
197.	<i>Symbrenthia brabirasivokana</i> (Moore, 1899)	Himalayan Jester	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)
198.	<i>Symbrenthia hypselis cotanda</i> (Moore, [1875])	Spotted Jester	JKL	Bingham (1905), Dar et al. (2002), Evans (1932), Haribal (1992) and Wynter-Blyth (1957)
199.	<i>Symbrenthia niphanda hysudra</i> (Moore, 1874)	Blue-Tail Jester	K	Varshney and Smetacek (2015)
200.	<i>Symbrenthia niphanda niphanda</i> (Moore, 1872) ##	Blue-Tail Jester	JKL	Evans (1932), Dar et al. (2002), Kehimkar (2008) and Wynter-Blyth (1957)
201.	<i>Vanessa indica indica</i> (Herbst, 1794)	Indian Red Admiral	JKL	Dar et al. (2002), Haribal (1992), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Sondhi et al. (2017) and Wynter-Blyth (1957)
	Subfamily: Satyrinae			
202.	<i>Aulocera brahminus brahminus</i> (Blanchard, 1844) ##	Narrow-Banded Satyr	KL	Bingham (1905), Dar et al. (2002), Haribal (1992), Khan et al. (2011b), Qureshi et al. (2012a, 2013c, e), Varshney (1994), Sondhi et al. (2017) and Wynter-Blyth (1957)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
203.	<i>Aulocera brahminus tsukadai</i> (Sakai, 1978)	Narrow-Banded Satyr	JKL	Varshney and Smetacek (2015)
204.	<i>Aulocera padma padma</i> (Kollar, [1844])	Great Satyr	JKL	Evans (1932), Dar et al. (2002), Haribal (1992), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, e), Talbot (1947) and Varshney (1994)
205.	<i>Aulocera saraswati</i> (Kollar, [1844])	Straited Satyr	JKL	Bingham (1905), Khan et al. (2011b), Kehimkar (2008) and Varshney (1994)
206.	<i>Aulocera swaha garuna</i> (Fruhstosfer, 1911)	Common Satyr	L	Khan et al. (2011b), Sondhi et al. (2017), Tshikolovets (2005) and Varshney and Smetacek (2015)
207.	<i>Aulocera swaha gilgitica</i> (Tytler, 1926)	Common Satyr	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
208.	<i>Aulocera swaha swaha</i> (Kollar, 1848)	Common Satyr	JKL	Bingham (1905), Evans (1932), Kehimkar (2008), Talbot (1947) and Wynter-Blyth (1957)
209.	<i>Aulocera swaha tytleri</i> (Sakai, Aoki & Yamaguchi, 2001)	Common Satyr	L	Varshney and Smetacek (2015)
210.	<i>Callerebia annada</i> (Moore, [1858]) ##	Ringed Argus	JKL	Bingham (1905), Dar et al. (2002), Evans (1932), Khan et al. (2011b), Kehimkar (2008), Talbot (1947) and Varshney (1994)
211.	<i>Callerebia nirmala daksha</i> (Moore, 1874)	Common Argus	JKL	Dar et al. (2002), Khan et al. (2011a, b), Kehimkar (2008), Qureshi and Bhagat (2015) and Varshney and Smetacek (2015)
212.	<i>Callerebia scanda scanda</i> (Kollar, [1844])	Pallid Argus	JKL	Dar et al. (2002) and Kehimkar (2008)
213.	<i>Cepora nerissa</i> (Fabricius, 1775)	Common Gull	JKL	Bala et al. (2014), Khan et al. (2011a, b) and Varshney and Smetacek (2015)
214.	<i>Enmenis heydenreichi shandura</i> (Marshall, 1882) ##	Shandur Rockbrown	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
215.	<i>Hipparchia parisatis</i> <i>paris</i> (Le Cerf, 1913)	White-Edged Rockbrown	L	Khan et al. (2011a, b) and Kehimkar (2008)
216.	<i>Hipparchia parisatis</i> <i>shiva</i> (Le Cerf, 1913)	White-Edged Rockbrown	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
217.	<i>Hyponephele</i> <i>brevistigma</i> (Moore, 1893)	Short-branded Meadowbrown	L	Khan et al. (2011b), Sondhi et al. (2017) and Varshney and Smetacek (2015)
218.	<i>Hyponephele</i> <i>carbonelli</i> (Lukhtanov, 1995)	Baltistan Meadow brown	L	Varshney and Smetacek (2015)
219.	<i>Hyponephele cheena</i> <i>baltistana</i> (Eckweiler and Bozano, 2011)	Branded Meadowbrown	L	Varshney and Smetacek (2015)
220.	<i>Hyponephele cheena</i> <i>cheena</i> (Moore, 1865)	Branded Meadowbrown	L	Varshney and Smetacek (2015)
221.	<i>Hyponephele cheena</i> <i>kashmirica</i> (Moore, 1892)	Branded Meadowbrown	K	Khan et al. (2011b) and Varshney and Smetacek (2015)
222.	<i>Hyponephele</i> <i>coenonympha</i> (C. and R. Felder, 1867)	Spotted Meadowbrown	KL	Khan et al. (2011b) and Varshney and Smetacek (2015)
223.	<i>Hyponephele</i> <i>davendra</i> (Moore, 1865) ##	White-ringed Meadowbrown	L	Khan et al. (2011b),
224.	<i>Hyponephele</i> <i>pulchella</i> (C and R Felder, [1867])	Tawny Meadowbrown	JKL	Dar et al. (2002), Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, e) and Sondhi et al. (2017)
225.	<i>Hyponephele</i> <i>pulchra astorica</i> (Tytler, 1976)	Dusky Meadowbrown	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
226.	<i>Hyponephele</i> <i>pulchra baroghila</i> (Tytler, 1926)	Dusky Meadowbrown	L	Varshney and Smetacek (2015)
227.	<i>Hyponephele</i> <i>pulchra neoza</i> (Lang, 1868)	Dusky Meadowbrown	KL	Varshney and Smetacek (2015)
228.	<i>Hyponephele</i> <i>pulchra pulchra</i> (C. and R. Felder, [1867])	Dusky Meadowbrown	KL	Dar et al. (2002) and Khan et al. (2011a, b)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
229.	<i>Hyponephele pulchra sylvia</i> (Hemming, 1933)	Dusky Meadowbrown	L	Varshney and Smetacek (2015)
230.	<i>Hyponephele tenuistigma laspura</i> (Evans, 1932)	Lesser White-ringed Meadowbrown	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
231.	<i>Kanetisa digna</i> (Marshall, 1883)	Chitrali Satyr	KL	Varshney and Smetacek (2015)
232.	<i>Karanasa alpherakyi</i> (Avinoff, 1910)	Avinoff's Satyr	L	Varshney and Smetacek (2015)
233.	<i>Karanasa bolorica</i> (Grum-Grshimailo, 1888)	Turkestan Stayr	L	Varshney and Smetacek (2015)
234.	<i>Karanasa cadesia</i> (Moore, [1875])	Moore's Satyr	L	Varshney and Smetacek (2015)
235.	<i>Karanasa huebneri astorica</i> (Tytler, 1926)	Tawny Satyr	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
236.	<i>Karanasa huebneri balti</i> (Tytler, 1926)	Tawny Satyr	L	Varshney and Smetacek (2015)
237.	<i>Karanasa huebneri expressa</i> (Avinoff and Sweadner, 1951)	Tawny Satyr	L	Varshney and Smetacek (2015)
238.	<i>Karanasa huebneri huebneri</i> (C. and R. Felder, [1867])	Tawny Satyr	KL	Sondhi et al. (2017) and Varshney and Smetacek (2015)
239.	<i>Karanasa leechi hunza</i> (Avinoff and Sweadner, 1951)	Leech's Satyr	L	Varshney and Smetacek (2015)
240.	<i>Karanasa modesta gemina</i> (Avinoff and Sweadner, 1951)	Small Satyr	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
241.	<i>Karanasa modesta modesta</i> (Moore, 1893)	Small Satyr	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
242.	<i>Karanasa moorei dubia</i> (Avinoff and Sweadner, 1951)	Shandur Satyr	L	Varshney and Smetacek (2015)
243.	<i>Karanasa moorei gilgitica</i> (Tytler, 1926)	Shandur Satyr	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
244.	<i>Lasiomata menava menava</i> (Moore, 1865)	Dark Wall	JKL	Dar et al. (2002), Khan et al. (2011b) and Kehimkar (2008)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
245.	<i>Lasiomata menava maeroides</i> (C. and R. Felder, 1868)	Dark Wall	L	Khan et al. (2011b) and Varshney and Smetacek (2015)
246.	<i>Lasiomata maerula maerula</i> (C. and R. Felder, [1867]) ##	Scarce Wall	JKL	Khan et al. (2011b), Kehimkar (2008) and Varshney and Smetacek (2015)
247.	<i>Lasiomata schakra schakra</i> (Kollar, [1844])	Common Wall	JKL	Dar et al. (2002), Khan et al. (2011a, b) and Kehimkar (2008)
248.	<i>Lethe confusa</i> (Aurivillus, 1898)	Banded Treebrown	JK	Kehimkar (2008)
249.	<i>Lethe rohria rohria</i> (Fabricius, 1787)	Common Treebrown	JKL	Dar et al. (2002), Khan et al. (2011b) and Kehimkar (2008)
250.	<i>Lethe verma verma</i> (Kollar, [1844])	Straight-Banded Treebrown	JKL	Dar et al. (2002), Khan et al. (2011b) and Kehimkar (2008)
251.	<i>Melanitis phedima galkissa</i> (Fruhstorfer, 1911)	Dark Evening Brown	JKL	Dar et al. (2002), Khan et al. (2011b), Kehimkar (2008) and Qureshi et al. (2012a, 2013c, e)
252.	<i>Melanitis phedima varaha</i> (Moore, 1856)	Dark Evening Brown	J	Viswanthan et al. (2004)
253.	<i>Mycalesis mineus</i> (Linnaeus, 1785) ##	Dark-branded Bushbrown	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
254.	<i>Oeneis buddha garhwalia</i> (Tytler, 1926)	Tibetan Satyr	JKL	Varshney and Smetacek (2015)
255.	<i>Paralasa chitralicayasina</i> (Tytler, 1936)	Chitral Argus	L	Varshney and Smetacek (2015)
256.	<i>Paralasa kalinda kalinda</i> (Moore, 1865) ##	Scarce Mountain Argus	KL	Khan et al. (2011b) and Sondhi et al. (2017)
257.	<i>Paralasa kalinda kamriana</i> (Tytler, 1926)	Scarce Mountain Argus	K	Varshney and Smetacek (2015)
258.	<i>Paralasa mani lorimeri</i> (Tytler, 1926)	Yellow Argus	L	Varshney and Smetacek (2015)
259.	<i>Paralasa mani mani</i> (de Niceville, 1881) ##	Yellow Argus	KL	Kehimkar (2008), Qureshi et al. (2013c, e) and Sondhi et al. (2017)
260.	<i>Paralasa shallada shallada</i> (Lang, 1881)	Mountain Argus	JKL	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
261.	<i>Paroeneis pumilus bicolor</i> (Seitz, [1909])	Mountain Satyr	K	Kehimkar (2008)
262.	<i>Paroeneis pumilus pumilus</i> (C and R Felder, [1867])	Mountain Satyr	JKL	Khan et al. (2011b), Kehimkar (2008), Tshikolovets (2005) and Varshney and Smetacek (2015)
263.	<i>Pararge everesmanni cashmirensis</i> (Eversmann, 1847) ##	Yellow Wall	JKL	Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, e, 2014), and Qureshi and Bhagat (2015)
264.	<i>Pseudochazara baldiva gilgitica</i> (Tytler, 1926)	Kashmir Rockbrown	L	Varshney and Smetacek (2015)
265.	<i>Pseudochazara baldiva baltistana</i> (Holik, 1949)	Kashmir Rockbrown	L	Varshney and Smetacek (2015)
266.	<i>Pseudochazara baldiva lehana</i> (Moore, 1878)	Kashmir Rockbrown	L	Varshney and Smetacek (2015)
267.	<i>Pseudochazara droshica</i> (Tytler, 1926)	Tytler's Rockbrown	L	Varshney and Smetacek (2015)
268.	<i>Satyrus pimpla pimpla</i> (C. and R. Felder, [1867])	Black Stayr	KL	Varshney and Smetacek (2015)
269.	<i>Ypthima avanta avanta</i> (Moore, [1875])	Jewel Fourring	JKL	Dar et al. (2002) and Kehimkar (2008)
270.	<i>Ypthima bolanica</i> (Marshall, 1882) ##	Desert Fourring	K	Varshney and Smetacek (2015)
271.	<i>Ypthima ceylonica</i> (Hewitson, 1865)	Four Fourring	JK	Varshney and Smetacek (2015)
272.	<i>Ypthima huebneri</i> (Kirby, 1871)	Common Fourring	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
273.	<i>Ypthima indecora</i> (Moore, 1882)	Western Fivering	K	Dar et al. (2002)
274.	<i>Ypthima kasmira</i> (Moore, 1884)	Kashmir Fourring	JKL	Varshney and Smetacek (2015)
275.	<i>Ypthima nareda</i> (Kollar, [1844])	Large Threewing	JKL	Dar et al. (2002), Kehimkar (2008) and Varshney and Smetacek (2015)
276.	<i>Ypthima nikaia</i> (Moore, [1875])	Moore's Fivering	JKL	Varshney and Smetacek (2015)
277.	<i>Ypthima sakra sakra</i> (Moore, 1857)	Himalayan Fivering	JKL	Kehimkar (2008) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
	Family IV: Papilionidae			
	Subfamily: Papilioninae			
278.	<i>Atrophaneura dasarada dasarda</i> (Moore, 1858)	Great Windmill	K	Dar et al. (2002), Haribal (1992), Khan et al. (2011b) and Kehimkar (2008)
279.	<i>Atrophaneura dasarada ravana</i> (Moore, 1858)	Great Windmill	K	Bingham (1907), Evans (1932), Haribal (1992), Talbot (1939), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
280.	<i>Atrophaneura latreillei latreillei</i> (Donovan, 1826)	Rose Windmill	JK	Varshney and Smetacek (2015)
281.	<i>Atrophaneura polyeuctes letincius</i> (Fruhstorfer, 1908)	Common Windmill	KL	Varshney and Smetacek (2015)
282.	<i>Atrophaneura polyeuctes polyeuctes</i> (Doubleday, 1842)	Common Windmill	K	Bingham (1907), Dar et al. (2002), Evans (1932), Haribal (1992), Kehimkar (2008) Talbot (1939) and Wynter-Blyth (1957)
283.	<i>Graphium cloanthus cloanthus</i> (Westwood, 1841)	Glassy Bluebottle	JK	Bingham (1907), Dar et al. (2002), Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008), Talbot (1939), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
284.	<i>Graphium dososn</i> (C. and R. Felder, 1864)	Common Jay	JKL	Varshney and Smetacek (2015)
285.	<i>Graphium eurous caschmirensis</i> (Rothschild, 1895)	Sixbar Swordtail	K	Dar et al. (2002), Evans (1932), Khan et al. (2011b), Kehimkar (2008), Talbot (1939) and Varshney and Smetacek (2015)
286.	<i>Graphium eurous sikkimica</i> (Heron, 1899)	Sixbar Swordtail	JKL	Evans (1932), Haribal (1992) and Wynter-Blyth (1957)
287.	<i>Graphium sarpedon sarpedon</i> (Linnaeus, 1758)	Common Bluebottle	K	Evans (1932), Haribal (1992), Khan et al. (2011b), Talbot (1939), Wynter-Blyth (1957), Dar et al. (2002) and Kehimkar (2008)
288.	<i>Graphium sarpedon sirkari</i> (Page and Treadaway, 2013)	Common Bluebottle	KL	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
289.	<i>Papilio agestor agestor</i> (Gray, 1831)	Tawny Mime	K	Dar et al. (2002), Haribal (1992), Khan et al. (2011b) and Kehimkar (2008)
290.	<i>Papilio agestor govindra</i> (Moore, 1864)	Tawny Mime	K	Bingham (1907), Evans (1932), Varshney and Smetacek (2015)
291.	<i>Papilio arcturus arius</i> (Rothschild, 1908)	Blue Peacock	JK	Dar et al. (2002), Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2012a, 2013c) and Marshall and De Niceville (1886)
292.	<i>Papilio demoleus</i> (Linnaeus, 1758)	Lime Butterfly	JK	Bingham (1907) and Khan et al. (2011a, b),
293.	<i>Papilio helenus</i> (Linnaeus, 1758)	Red Helen	JK	Khan et al. (2011a, b)
294.	<i>Papilio machaon asiatica</i> (Menetries, 1855)	Common Yellow Swallowtail	KL	Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e), Qureshi and Bhagat (2015), Talbot (1939), Tshikolovets (2005), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
295.	<i>Papilio machaon ladakensis</i> (Moore, 1884)	Common Yellow Swallowtail	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
296.	<i>Papilio machaon centralis</i> (Staudinger, 1886)	Common Yellow Swallowtail	L	Khan et al. (2011b) and Tshikolovets (2005)
297.	<i>Papilio paris</i> (Linnaeus, 1758)	Paris Peacock	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
298.	<i>Papilio polyctor</i> (Boisduval, 1836)	Common Peacock	JK	Kehimkar (2008)
299.	<i>Papilio polytes romulus</i> (Cramer, [1775])	Common Mormon	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
300.	<i>Papilio protenor euprotenor</i> (Fruhstorfer, 1908)	Spangle	K	Dar et al. (2002), Haribal (1992), Khan et al. (2011b) and Kehimkar (2008)
	Subfamily: Parnassinae			
301.	<i>Parnassius acco acco</i> (gray, [1853])	Varnished Apollo	L	Khan et al. (2011b), Kehimkar (2008) and Tshikolovets (2005)
302.	<i>Parnassius acco baltorana</i> (Bang-Haas, 1937)	Varnished Apollo	JL	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
303.	<i>Parnassius acco hamponi</i> (Avinoff, 1916)	Varnished Apollo	JK	Varshney and Smetacek (2015)
304.	<i>Parnassius acco tanglangi</i> (Bang-Hass, 1927)	Varnished Apollo	L	Varshney and Smetacek (2015)
305.	<i>Parnassius acco transhimalayensis</i> (Eisner, 1938)	Varnished Apollo	L	Varshney and Smetacek (2015)
306.	<i>Parnassius acdestis ladakensis</i> (Avinoff, 1916)	Dusky Apollo	L	Varshney and Smetacek (2015)
307.	<i>Parnassius acdestis rupshuana</i> (Avinoff, 1916)	Dusky Apollo	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
308.	<i>Parnassius acdestis takedai</i> (Mikami and Sakaibara, 1988)	Dusky Apollo	L	Varshney and Smetacek (2015)
309.	<i>Parnassius actius actius</i> (Eversmann, 1843)	Scarce Red Apollo	JKL	Khan et al. (2011b), Talbot (1939) and Tshikolovets (2005)
310.	<i>Parnassius actius yelyangi</i> (Bang-Hass, 1934)	Scarce Red Apollo	K	Varshney and Smetacek (2015)
311.	<i>Parnassius charltonius charltonius</i> (Gray, [1853]) ##	Regal Apollo	K	Eisner and Weiss (1990), Khan et al. (2011a, b), Kehimkar (2008), Talbot (1939) and Varshney and Smetacek (2015)
312.	<i>Parnassius charltonius corporaali</i> (Bryk, 1935)	Regal Apollo	L	Varshney and Smetacek (2015)
313.	<i>Parnassius charltonius deckerti</i> (Verity, 1927)	Regal Apollo	KL	Tshikolovets (2005) and Varshney and Smetacek (2015)
314.	<i>Parnassius charltonius eisnerianus</i> (Bryk, 1931)	Regal Apollo	L	Varshney and Smetacek (2015)
315.	<i>Parnassius charltonius ella</i> (Bryk, 1931)	Regal Apollo	L	Varshney and Smetacek (2015)
316.	<i>Parnassius charltonius otto</i> (Bryk and Eisner, 1932)	Regal Apollo	L	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
317.	<i>Parnassius charltonius sakai</i> (Eisner, 1978)	Regal Apollo	L	Varshney and Smetacek (2015)
318.	<i>Parnassius charltonius serenissimus</i> (Bryk, 1932)	Regal Apollo	KL	Tshikolovets (2005) and Varshney and Smetacek (2015)
319.	<i>Parnassius epaphus epaphus</i> (Oberthur 1879)	Common Red Apollo	L	Khan et al. (2011b), Talbot (1939) and Tshikolovets (2005)
320.	<i>Parnassius epaphus gyaella</i> (Eisner, 1932)	Common Red Apollo	L	Varshney and Smetacek (2015)
321.	<i>Parnassius epaphus puella</i> (Bryk, 1935)	Common Red Apollo	L	Varshney and Smetacek (2015)
322.	<i>Parnassius epaphus rienki</i> (Eisner and Weiss, 1990)	Common Red Apollo	L	Varshney and Smetacek (2015)
323.	<i>Parnassius epaphus sculptor</i> (Bryk and Eisner, 1939)	Common Red Apollo	L	Varshney and Smetacek (2015)
324.	<i>Parnassius hardwickii hardwickii</i> (Gray, 1831)	Common Blue Apollo	KL	Khan et al. (2011b), Kehimkar (2008) and Tshikolovets (2005)
325.	<i>Parnassius hunza hunza</i> Grum-Grshimailo, 1888)	Karakoram Banded Apollo	L	Varshney and Smetacek (2015)
326.	<i>Parnassius hunza shigarensis</i> (Bang-Haas, 1935)	Karakoram Banded Apollo	L	Varshney and Smetacek (2015)
327.	<i>Parnassius jacquemontii jacquemontii</i> (Boisduval, 1836) ##	Keeled Apollo	KL	Bingham (1907), Evans (1932), Khan et al. (2011b), Talbot (1939) and Tshikolovets (2005)
328.	<i>Parnassius jacquemontii hunzaica</i> (Tytler, 1926)	Keeled Apollo	L	Varshney and Smetacek (2015)
329.	<i>Parnassius maharaja erici</i> (Hanus, Hanus and Manon, 1988)	Royal Apollo	L	Varshney and Smetacek (2015)
330.	<i>Parnassius maharaja maharaja</i> (Avinoff, 1916)	Royal Apollo	JKL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
331.	<i>Parnassius mamaievi affinis</i> (Peschke and Eisner, 1934)	Scarce Banded Apollo	L	Varshney and Smetacek (2015)
332.	<i>Parnassius mamaievi</i> (Bang-Haas, 1915)	Scarce Banded Apollo	L	Tshikolovets (2005) and Varshney and Smetacek (2015)
333.	<i>Parnassius mamaievi workman</i> (Avinoff, 1916)	Scarce Banded Apollo	L	Varshney and Smetacek (2015)
334.	<i>Parnassius simo chenrezi</i> (Wyatt, 1960)	Black-edged Apollo	KL	Varshney and Smetacek (2015)
335.	<i>Parnassius simo colosseus</i> (Bang-Haas, 1935)	Black-edged Apollo	L	Varshney and Smetacek (2015)
336.	<i>Parnassius simo ganymedes</i> (Bryk and Eisner, 1932)	Black-edged Apollo	L	Varshney and Smetacek (2015)
337.	<i>Parnassius simo kangruensis</i> (Eisner and Weiss, 1990)	Black-edged Apollo	L	Varshney and Smetacek (2015)
338.	<i>Parnassius simo lanaki</i> Bryk and (Eisner, 1932)	Black-edged Apollo	L	Varshney and Smetacek (2015)
339.	<i>Parnassius simo lorimeri</i> (Tytler, 1926)	Black-edged Apollo	L	Varshney and Smetacek (2015)
340.	<i>Parnassius simo saserensis</i> (Bang-Haas, 1937)	Black-edged Apollo	K	Talbot (1939) and Varshney and Smetacek (2015)
341.	<i>Parnassius simo simo</i> (Gray, [1853])	Black-edged Apollo	KL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
342.	<i>Parnassius simo zarraensis</i> (Bang-Haas, 1935)	Black-edged Apollo	K	Talbot (1939) and Varshney and Smetacek (2015)
343.	<i>Parnassius stenosemus atkinsoni</i> (Moore, [1902])	Greater Banded Apollo	L	Khan et al. (2011b) and Tshikolovets (2005)
344.	<i>Parnassius stenosemus divinus</i> (Bryk and Eisner, 1931)	Greater Banded Apollo	L	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
345.	<i>Parnassius stenosemus nadiae</i> (Weiss and Michel, 1992)	Greater Banded Apollo	L	Varshney and Smetacek (2015)
346.	<i>Parnassius stenosemus pensii</i> (Eisner and Weiss, 1990)	Greater Banded Apollo	L	Varshney and Smetacek (2015)
347.	<i>Parnassius stenosemus rileyi</i> (Tytler, 1926)	Greater Banded Apollo	L	Varshney and Smetacek (2015)
348.	<i>Parnassius stenosemus stenosemus</i> (Honrath, 1890)	Greater Banded Apollo	JKL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
349.	<i>Parnassius stoliczkanus atkinsoni</i> (Moore, 1902)	Lesser Banded Apollo	KL	Talbot (1939) and Varshney and Smetacek (2015)
350.	<i>Parnassius stoliczkanus beate</i> (Eisner, 1971)	Lesser Banded Apollo	L	Varshney and Smetacek (2015)
351.	<i>Parnassius stoliczkanus davidi</i> (Eisner, 1971)	Lesser Banded Apollo	L	Varshney and Smetacek (2015)
352.	<i>Parnassius stoliczkanus nicevillei</i> (Avinoff, 1916)	Lesser Banded Apollo	KL	Talbot (1939) and Varshney and Smetacek (2015)
353.	<i>Parnassius stoliczkanus stoliczkanus</i> (C. and R. Felder, 1865) #	Lesser Banded Apollo	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
354.	<i>Parnassius stoliczkanus tenuis</i> (Bryk and Eisner 1865)	Lesser Banded Apollo	KL	Varshney and Smetacek (2015)
355.	<i>Parnassius stoliczkanus thomas</i> (Eisner, 1939)	Lesser Banded Apollo	L	Varshney and Smetacek (2015)
356.	<i>Parnassius stoliczkanus zanskarica</i> (Bang-Haas, 1935)	Lesser Banded Apollo	L	Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
357.	<i>Parnassius stoliczkanus zogilaica</i> (Tytler, 1926)	Lesser Banded Apollo	KL	Talbot (1939) and Varshney and Smetacek (2015)
358.	<i>Parnassius tianschanica gilgitensis</i> (Bang-Haas, 1932)	Large Keeled Apollo	JKL	Varshney and Smetacek (2015)
Family V: Pieridae				
Subfamily: Coliadinae				
359.	<i>Belenois aurota</i> (Fabricius, 1793)	Pioneer	JK	Bala et al. (2014), Bingham (1907), Khan et al. (2011a, b) and Qureshi et al. (2012b)
360.	<i>Catopsilia crocale</i> (Cramer, 1775)	Lemon Emigrant	J	Khan et al. (2011a, b) and Viswanthan et al. (2004)
361.	<i>Catopsilia pomona</i> (Fabricius, 1775)	Common Emigrant	K	Bala et al. (2014), Khan et al. (2011a, b), Qureshi and Bhagat (2013) and Talbot (1939)
362.	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	Mottled Emigrant	JK	Das and Verma (1965), Das et al. (1964), Khan et al. (2011a, b), Qureshi et al. (2012a) and Qureshi and Bhagat (2013)
363.	<i>Colias cocandica cocandica</i> (Erschoff, 1874)	Pamir Clouded Yellow	L	Kehimkar (2008) and Tshikolovets (2005)
364.	<i>Colias eogene eogene</i> (C. and R. Felder, 1865) ##	Fiery Clouded Yellow	KL	Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2012b) and Talbot (1939)
365.	<i>Colias eogene francesca</i> (Watkins, 1927)	Fiery Clouded Yellow	K	Bingham (1907), Evans (1932) and Varshney and Smetacek (2015)
366.	<i>Colias fieldi</i> (Menetries, 1855)	Dark Clouded Yellow	KL	Dar et al. (2002), Das et al. (1964), Home (1938), Khan et al. (2011a, b), Qureshi et al. (2012a, 2013b c, d, e, 2014), Qureshi and Bhagat (2015), Thomas-Glover (1936), Tshikolovets (2005) and Varshney and Smetacek (2015)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
367.	<i>Colias erate</i> (Esper, 1805)	Pale Clouded Yellow	JKL	Bingham (1905), Dar et al. (2002), Das and Verma (1965), Das et al. (1964), Home (1938), Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2012a, 2013b, c, d, e, 2014), Qureshi and Bhagat (2015), Thomas-Glover (1936), Tshikolovets (2005) and Varshney and Smetacek (2015)
368.	<i>Colias ladakensis</i> (C. and R. Felder, 1865) ##	Ladakh Clouded Yellow	KL	Bingham (1907), Khan et al. (2011b), Qureshi et al. (2013b), Talbot (1939) and Tshikolovets (2005)
369.	<i>Colias leechi</i> (Grum-Grshimailo, 1893)	Glaucous Clouded Yellow	JKL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
370.	<i>Colias marcopolo</i> (Grum-Grshimailo, 1883)	Marcopolo's Clouded Yellow	JKL	Varshney and Smetacek (2015)
371.	<i>Colias stoliczkana stoliczkana</i> (Moore, 1878)	Orange Clouded Yellow	KL	Bingham (1907), Evans (1932), Khan et al. (2011b), Qureshi et al. (2013b), Talbot (1939) and Varshney (1993),
372.	<i>Colias thrasibulus thrasibulus</i> (Fruhstorfer, 1903) #	Lemon Clouded Yellow	L	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
373.	<i>Colias wiskotti</i> (Staudinger, 1882)	Broad-bordered Clouded Yellow	L	Varshney and Smetacek (2015)
374.	<i>Eurema andersoni</i> (Moore, 1866)	One Spot Grass Yellow	JKL	Khan et al. (2011b)
375.	<i>Eurema blanda</i> (Boisduval, 1836)	Three Spot Grass Yellow	J	Viswanthan et al. (2004)
376.	<i>Eurema brigitta</i> (Stoll, [1780])	Small Grass Yellow	JKL	Khan et al. (2011a, b)
377.	<i>Eurema hecabe</i> (Linnaeus, 1758)	Common Grass Yellow	JK	Bala et al. (2014), Khan et al. (2011a, b), Qureshi and Bhagat (2013) and Qureshi et al. (2012a, 2013c)
378.	<i>Eurema laeta</i> (Boisduval, 1836)	Spotless Grass Yellow	JKL	Khan et al. (2011a, b)
379.	<i>Gandaca harina</i> (Horsfield, [1829])	Tree Yellow	J	Viswanthan et al. (2004)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
380.	<i>Gonepteryx mahaguru mahaguru</i> (Gistel, 1857)	Lesser Brimstone	K	Dar et al. (2002), Evans (1932), Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2013b), Talbot (1939), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
381.	<i>Gonepteryx rhamni nepalensis</i> (Doubleday, [1847])	Common Brimstone	JKL	Bala et al. (2014), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Tshikolovets (2005), Varshney (1993) and Varshney and Smetacek (2015)
	Subfamily: Pierinae			
382.	<i>Aporia agathon phryxe</i> (Boisduval, [1836]) ##	Great Blackvein	K	Bingham (1907), Dar et al. (2002), Evans (1932), Haribal (1992), Khan et al. (2011b), Kehimkar (2008), Qureshi and Bhagat (2013), Talbot (1939) and Wynter-Blyth (1957)
383.	<i>Aporia leucodice</i> (Eversmann, 1843)	Baluchi Blackvein	K	Bala et al. (2014), Bingham (1907), Evans (1932), Dar et al. (2002), Khan et al. (2011b), Qureshi and Bhagat (2013), Qureshi et al. (2013c), Qureshi et al. (2013e), Talbot (1939) and Wynter-Blyth (1957)
384.	<i>Aporia nabellica nabellica</i> (Boisduval, [1836]) ##	Dusky Blackvein	KL	Bingham (1907), Dar et al. (2002), Evans (1932), Khan et al. (2011b), Talbot (1939), Tshikolovets (2005) and Wynter-Blyth (1957)
385.	<i>Aporia soracta soracta</i> (Moore, 1857)	Himalayan Blackvein	JKL	Khan et al. (2011b), Kehimkar (2008), Qureshi et al. (2014), Qureshi and Bhagat (2015), Tshikolovets (2005) and Varshney and Smetacek (2015)
386.	<i>Baltia butleri butleri</i> (Moore, 1882) ##	Butler's Dwarf	JKL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
387.	<i>Baltia shawii shawii</i> (Bates, 1873)	Shaw's Dwarf	JKL	Khan et al. (2011b), Tshikolovets (2005) and Varshney and Smetacek (2015)
388.	<i>Colotis etrida etrida</i> (Boisduval, 1876)	Little Orange Tip	JK	Bingham (1907) and Qureshi and Bhagat (2013)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
389.	<i>Delias sanaca</i> (Moore, 1857) #	Pale Jezabel	JKL	Kehimkar (2008), Qureshi and Bhagat (2013) and Wynter-Blyth (1957)
390.	<i>Delias eucharis</i> (Drury, 1773)	Common Hezebel	J	Viswanthan et al. (2004)
391.	<i>Delias belladonna horsfieldi</i> (Gray, 1831)	Hill Jezabel	K	Khan et al. (2011b) and Varshney and Smetacek (2015)
392.	<i>Euchloe daphalis</i> (Moore, 1865)	Little White	JKL	Tshikolovets (2005)
393.	<i>Hebomoia glaucippe</i> (Linnaeus, 1758)	Great Orange Tip	J	Viswanthan et al. (2004)
394.	<i>Ixias marianne</i> (Crammer, [1779])	White Orange Tip	JK	Bala et al. (2014) and Khan et al. (2011a, b)
395.	<i>Ixias pyrene</i> (Linnaeus, 1764)	Yellow Orange Tip	JKL	Khan et al. (2011a, b)
396.	<i>Pieris ajaka</i> (Moore, 1865)	Himalayan White	JKL	Varshney and Smetacek (2015)
397.	<i>Pieris brassicae nepalensis</i> (Gray, 1846)	Large Cabbage White	JKL	Bala et al. (2014), Bhat et al. (2010), Bhat et al. (2011), Dar et al. (2002), Das and Verma (1965), Home (1938), Jamdar (1991, 1992), Khan et al. (2003), Khan et al. (2011a, b), Kehimkar (2008), Malik et al. (1972), Qureshi and Bhagat (2013), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Thomas-Glover (1936), Tshikolovets (2005), Varshney and Smetacek (2015) and Wynter-Blyth (1957)
398.	<i>Pieris canidia indica</i> (Evans, 1926)	Indian Cabbage White	K	Bingham (1907), Khan et al. (2003), Khan et al. (2004), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a), Qureshi and Bhagat (2013), Qureshi et al. (2013c), Qureshi et al (2014), and Qureshi and Bhagat (2015)
399.	<i>Pieris canidia palaearctica</i> (Staudinger, 1886)	Indian Cabbage White	L	Khan et al. (2011b) and Tshikolovets (2005)
400.	<i>Pieris deota deota</i> (de Niceville, [1884]) ##	Kashmir White	KL	Talbot (1939) and Tshikolovets (2005)

(continued)

Table 28.1 (continued)

S. No.	Taxa	Common/ English name	Distribution	References
401.	<i>Pieris krueperi devta</i> (de Niceville, [1884]) #	Kruepers's Small White/ Green Banded White	KL	Khan et al. (2011b), Kehimkar (2008), Talbot (1939) and Tshikolovets (2005)
402.	<i>Pieris rapae rapae</i> (Linnaeus, 1758)	Small Cabbage White	JKL	Bhat et al. (2011), Dar et al. (2002), Khan et al. (2011a, b), Kehimkar (2008), Tshikolovets (2005) and Varshney and Smetacek (2015)
403.	<i>Pontia callidice kalora</i> (Moore, 1865)	Lofty Bath White	JKL	Khan et al. (2011b), Kehimkar (2008), Tshikolovets (2005) and Varshney and Smetacek (2015)
404.	<i>Pontia chloridice alpina</i> (Verity, 1911) ##	Peak White/ Small Bath White/Lesser Bath White	L	Varshney and Smetacek (2015)
405.	<i>Pontia chloridice chloridice</i> (Hubner, [1813])	Peak White/ Small Bath White	JKL	Khan et al. (2003), Khan et al. (2011b), Kehimkar (2008) and Tshikolovets (2005)
406.	<i>Pontia daplidice daplidice</i> (Linnaeus, 1758)	Bath White	JKL	Bala et al. (2014), Bingham (1907), Bhat et al. (2011), Dar et al. (2002), Khan et al. (2003), Khan et al. (2011a, b), Kehimkar (2008), Qureshi et al. (2012a, 2013c, d, e, 2014), Qureshi and Bhagat (2015), Talbot (1939), Tshikolovets (2005) and Wynter-Blyth (1957)
407.	<i>Pontia daplidice moorei</i> (Roerber, [1907])	Bath White	JKL	Khan et al. (2011b) and Varshney and Smetacek (2015)
408.	<i>Pontia glauconome</i> (Klug, 1829)	Desert Bath White	K	Malik et al. (1972) and Qureshi and Bhagat (2013)

species included in the Schedule-I of Wildlife (Protection) Act (1972), of India

species included in the Schedule-II of Wildlife (Protection) Act (1972), of India

rently threatened (Dar et al. 2002), and just like other floral and faunal elements, butterflies are facing survival risks with many species already listed in Red Data books. Some of the identified threats to butterfly diversity include (i) habitat destruction, degradation and fragmentation, (ii) illegal trade, (iii) grazing, (iv) biotic pressure, (v) climate change, (vi) fires, (vii) application of chemical pesticides and weedicides in agricultural and urban ecosystems, and (viii) administrative and legal loopholes. In India, some of the areas where considerable butterfly trading goes on are in the Himalaya and in northeastern India (Kunte 2006). Although J&K State forms an important region of the Himalaya, its bio-wealth including butterflies is scientifically poorly reported and documented. There is still lack of basic informa-

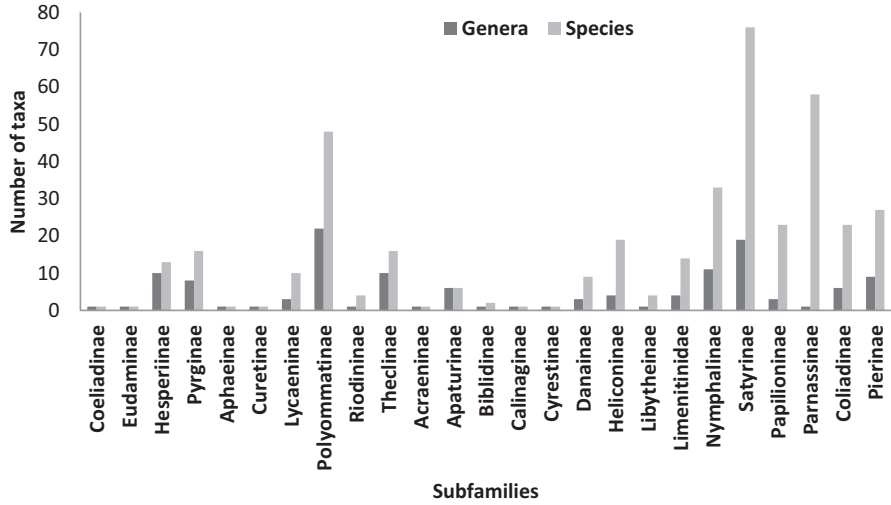


Fig. 28.1 Subfamily-wise diversity in butterfly fauna of J&K State

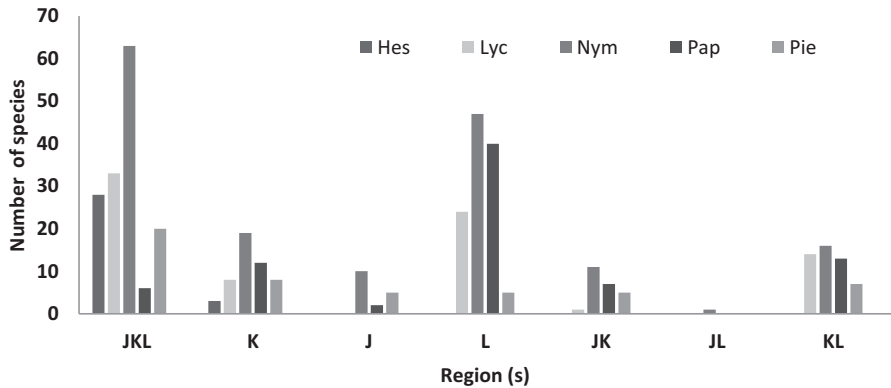


Fig. 28.2 Region-wise diversity of butterflies in J&K State. (Hes = Hesperidae; Lyc = Lycaenidae; Nym = Nymphalidae; Pap = Papilionidae; Pie = Pieridae)

tion on taxonomy, distributional records, status, biology, ecology, etc., for both widely distributed and endangered butterfly species (Plate 28.1).

28.4 Concluding Remarks

Butterflies are biological indicators of a healthy environment. In recent times, much emphasis is given to butterflies in the developed world and numerous and relatively small nature reserves have been set up to protect particular species or butterfly-rich



Plate 28.1 Butterflies:(A) *Pieris brassicae* (B) *Gonepteryx rhamni* (C) *Junonia orithya* (D) *Colias electo* (E) *Aulocera padma* (F) *Vanessa indica* ; (G) *Cynthia cardui* (H) *Pontia daplidice* (I) *Lebethya lepita* (J) *Aglias cashmirensis* (K) *Argynnis childreni* (L). *Aulocera brahminus*

habitats. These allow the butterflies to prosper in areas threatened by human activities. Such conservation measures need to be undertaken in the developing world as well. In the J&K State, inspite of having its separate J&K Wildlife (Protection) Act, 1978 (JKWPA), to date no butterfly species has been listed. Thus, there is an urgent need to include the threatened butterflies in JKWPA, which will provide legal protection at the regional level. An enormous amount of organized research using

new methodologies/technologies including molecular analysis (DNA barcoding), geospatial tools, information technology, etc., is required so that a reliable information base can be achieved for the conservation of butterfly and other biodiversity elements of J&K State. There is immense scope to popularize the concept of butterfly parks/gardens, which besides boosting ecotourism opportunities in the State shall pave way for the public awareness and participation in the conservation process. Further, there is need to promote research involving long-term monitoring, strict enforcement of laws, conservation education, citizen science among local communities, besides having a strong government support and political will for the overall documentation, conservation, and management of these beautiful creatures of nature. There are innumerable opportunities for entomologists, pollination biologists, policy makers, and other stakeholders to jointly put concerted efforts towards conservation of butterfly biodiversity of the State.

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