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BUTTERFLIES OF GARHWAL, UTTARAKHAND, WESTERN HIMALAYA, INDIA

Arun P. Singh¹ & Sanjay Sondhi²

¹ Forest Entomology Division, Forest Research Institute, P.O. New Forest, Dehradun, Uttarakhand 248006, India
² Titli Trust, 49 Rajpur Road Enclave, Dhoran Khas, Near IT Park, P.O. Gujrada, Dehradun, Uttarakhand 248001, India
¹ singhap@icfre.org, ranoteaps@gmail.com (corresponding author), ² sanjay.sondhi1@gmail.com

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Abstract: Thirty percent of butterfly species that occur in India are found in the Garhwal region of the western Himalaya, which comprise six districts of Uttarakhand State with five major vegetation types lying between the catchments of the Ganga and Yamuna rivers. The annotated checklist compiled here for this region comprises 407 species and takes into account all the species recorded since 1899, when the first list of 323 species was prepared by Mackinnon & de Nicéville on the 'butterflies of Mussoorie and its adjacent areas'. Over a 20 year period (1986–1990; 2000–June 2015) the present authors maintained detailed notes and were able personally to record 349 species. This information is presented in a checklist, together with details of the month, year and site of each record, relative abundance, Indian Wildlife (Protection) Act, 1972 (IWPA) status, as well as references of earlier records made by other authors in Garhwal for those species that the authors were not able to record themselves. Forty-nine species recorded in the region have been placed under various schedules of IWPA; only one species, the Golden Emperor *Dilipa morgiana* Westwood, is listed in Schedule I Part IV, the others being mainly included under Schedule II Part II. The paper also discusses new range extensions and significant records (past and present), identifies major biotic factors that threaten butterfly diversity in Garhwal, and suggests the scope for butterfly ecotourism in the state as an option for long term conservation.

Keywords: Conservation planning, ecotourism, Lepidoptera, moist temperate forest, oaks, protected species, tropical moist deciduous forest, western Himalaya.

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Author Details: ARUN P. SINGH, is currently working as a scientist with the Forest Research Institute, Dehradun. His experience pertains to the conservation and ecology of butterflies and birds across the Himalaya, over the last two decades. SANJAY SONDHI, Founder Trustee Titli Trust, is a naturalist with an interest in Lepidoptera, herpetofauna and avifauna. He supports conservation research and action and conservation education programs in eastern and western Himalaya.

Author Contribution: APS carried out most of the sampling surveys, photography, identification, compilation of the data, literature review, paper writing along with preparation of the figures and appendix. SS added many valuable new records to the first author's list, added records and supplementary data from his sampling surveys, reviewed older literature, provided photographs, identified many sub-species and validated taxonomic names of the species/subspecies.

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INTRODUCTION

The first comprehensive records on butterflies of Garhwal were published by Mackinnon & de Nicéville (1899) on the butterflies of Mussoorie and neighbouring regions. They produced a detailed account of 323 species collected during a 11-year period by Mackinnon from the Mussoorie Hills, the adjoining valleys of the Algar river and Nag Tibba lying to its north, the entire Dehradun Valley lying to its south, as well as some butterflies brought by native collectors “from the highest valleys and hills right up to the frontier of Hundes or Thibet”, i.e., three species of *Parnassius* from the Nilung Pass (5400m). Later, Ollenbach (1930) listed 144 species from six collecting localities (forested areas) in and around Mussoorie town, the best period for collection being May–June. Shull (1958, 1962) also reported on the butterflies of Mussoorie. Much later, Baindur (1993) documented 27 species from Nanda Devi National Park, followed by a list of 35 species by Uniyal (2004) from the same area that includes three new records for Garhwal. Rose & Sidhu (1994) revisited some of the older study sites near Mussoorie for a comparison into declining butterfly diversity with time. Uniyal et al. (2013) also reported a few butterflies of the Gangotri landscape as part of a larger entomofaunal survey in that area.

MATERIAL AND METHODS

Study area

The Garhwal region of the Himalaya lies in northern India and includes six districts of the state of Uttarakhand (namely Dehradun, Tehri Garhwal, Garhwal (Pauri), Uttarkashi, Rudraprayag and Chamoli) (Fig. 1). To its east lies the Kumaon Himalayan region and to its west the state of Himachal Pradesh; to its north lies the Tibetan Plateau and in the south the Shiwalik mountain ranges form a boundary and separate the Garhwal region from the plains of India (Haridwar district of Uttarakhand and the state of Uttar Pradesh). Two important river systems drain the region: the Ganges, which flows through the middle of Garhwal; and the Yamuna, which flows along its western boundary, together with their tributaries. Five major vegetation types occur in Garhwal: (1) Tropical moist deciduous forest dominated by sal, *Shorea robusta*, in the lower reaches (400–900 m), mainly in Dehradun District (Dehradun Valley, including Rajaji National Park) and Pauri Garhwal District (Kotdwar, Sonanadi Sanctuary and Corbett Tiger Reserve), which gradually merges with the dry deciduous forests in the south of the Shiwaliks

and stretching into the plains of northern India; (2) The sub-tropical zone, with mainly mixed vegetation and Chir pine, *Pinus roxburghii*, between 1,000–1,600 m in all districts; (3) Moist temperate forest between 1,800–3,000 m, dominated by oaks (*Quercus leucotrichophora*, *Q. semicarpifolia* and *Q. dilatata*), rhododendrons (*Rhododendron arboreum*, *R. barbatum*), west Himalayan spruce, *Picea smithiana*, silver firs (*Abies pindrow* and *A. spectabilis*), Indian cedar or deodar (*Cedrus deodara*), blue pine (*Pinus wallichiana*), horse chestnut (*Aesculus indica*), and many others; (4) Sub-alpine vegetation with *Rhododendron campanulatum* shrubberies above 3,500m; (5) Alpine meadows with *R. anthopogon* between 3,500–4,000 m, above which is generally the snow line with sparse vegetation and rocks. The region of Garhwal also includes a number of protected areas (national parks, wildlife sanctuaries and conservation reserves), which are the last strongholds of biodiversity in the region: Rajaji National Park, Benog Wildlife Sanctuary, Mussoorie; Corbett National Park, Sonanadi Wildlife Sanctuary, Govind Pashu Vihar Wildlife Sanctuary and Govind National Park; Gangotri National Park; Kedarnath Wildlife Sanctuary; Nanda Devi National Park and Valley of Flowers National Park (which form the part of the Nanda Devi Biosphere Reserve); Asan Conservation Reserve and Jhilmil Jheel Conservation Reserve). These, and other study sites of the current paper, are listed and described further in Table 1, and their locations shown in Fig. 1.

Identification of butterflies was undertaken with the help of field guides (Marshal & de Nicéville 1882; Moore 1874, 1890–1992, 1893–1896, 1896–1899, 1899–1900, 1901–1903, 1903–1905; Swinhoe 1905–1910, 1910–1911, 1911–1912 & 1912–1913; Bingham 1905; Talbot 1939, 1947; Evans 1932; Wynter-Blyth 1957; D’Abrera 1982, 1985, 1986; Haribal 1992; Smith 1989, 2006; Kehimkar 2008; Singh 2011; Sondhi et al. 2013; Sondhi & Kunte 2014; Smetacek 2015) and web resources (<http://www.ifoundbutterflies.org/>; <http://flutters.org/> and <http://yutaka.it-n.jp/>). Photographs and some specimens that were difficult to identify were compared with specimens in the National Forest Insect Collection (NFIC) at the Forest Research Institute, Dehradun, India.

How to use Appendix 1.

The annotated checklist (Appendix 1) also includes all records of earlier authors that the authors of the present paper were not able to verify in the study area. Random sampling surveys were carried out covering all the months/seasons of the year from 1986–2015.

1. Relative abundance for our observations: The

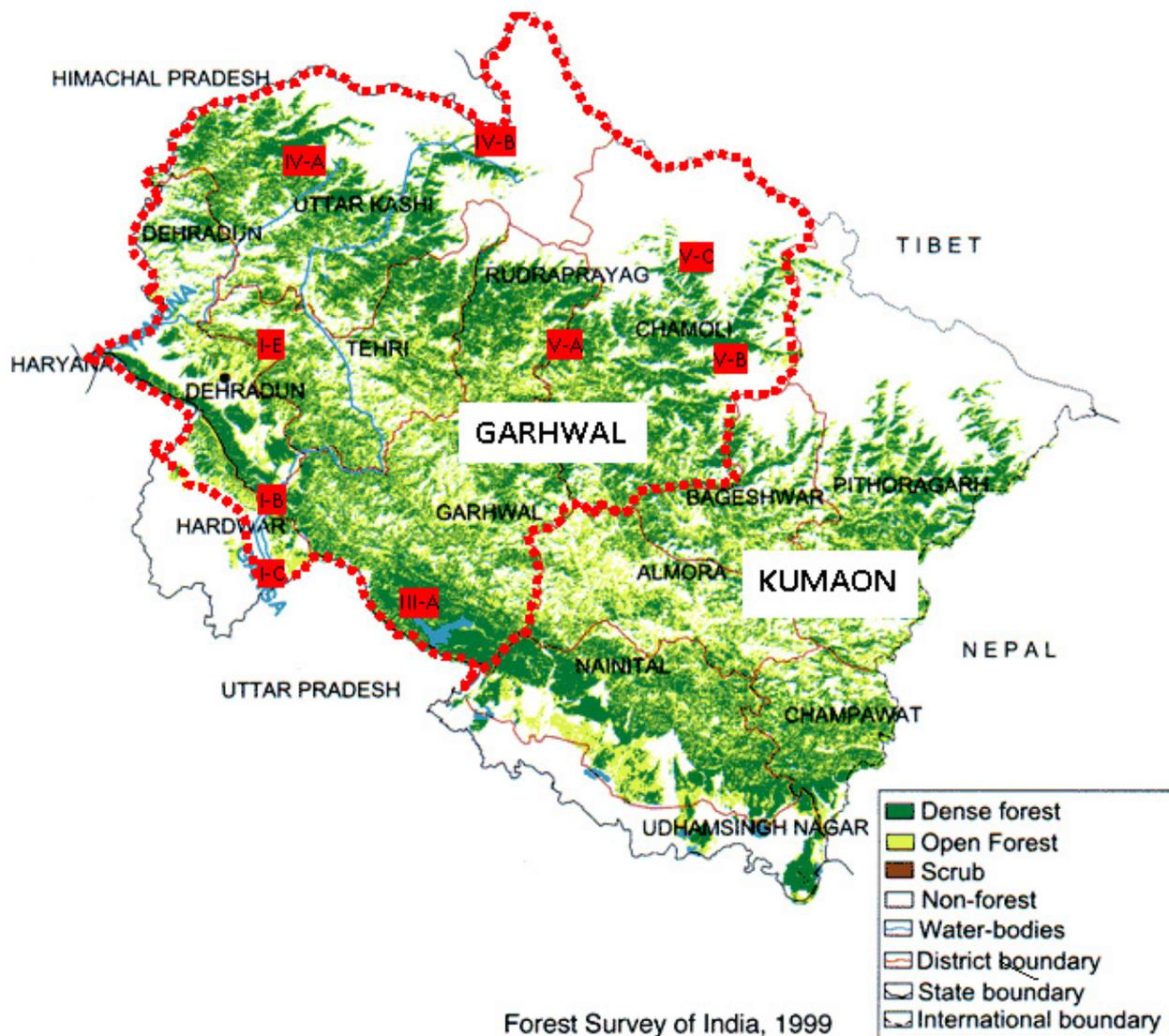


Figure 1. Map of Garhwal (encircled in red dots) showing the seven districts and locations of the protected areas as given in Table 1.

relative abundance of species was arrived upon largely using qualitative data and the following rationale. The relative abundances of species were divided into six categories. (1) Very Rare: only one record; (2) Rare: 2–3 records; (3) Uncommon: 4–10 records; (4) Common: species recorded at multiple locations across many samplings in moderate numbers or between 11–49 individuals; (5) Very common: species recorded in large numbers across multiple habitats in many samplings or greater than 50 individuals; and (6) Locally Common: species recorded in large numbers at a particular location at a particular time of the year.

2. Months and sites of collection: months are given against each site of record. Table 1 provides additional details of the sites.

3. References: Species recorded by earlier authors

/ historical records are given in brackets along with the author and year of publication.

RESULTS AND DISCUSSION

During the course of his study on the ‘Butterflies of Garhwal’, the first author has been recording butterflies in the region since 1986 and has since published several papers (Singh 1999, 2003a,b,c, 2005a,b, 2006a,b, 2007, 2009, 2011a,b, 2013; Bhardwaj et al. 2012). The second author started work on the butterflies of Garhwal in 2008. However, there has been no comprehensive review of the butterflies of Garhwal since that of Mackinnon & de Nicéville (1899). Many species that were present or rare then are no longer recorded in Garhwal, while some

Table 1. Study sites in Garhwal

	Study sites	Habitat	Altitudinal range
I.	Dehradun District	Tropical moist deciduous sal forest, dry deciduous mixed forest, sub-tropical pine, moist temperate forest	400–2,900 m
A.	Dehradun Valley	Tropical moist deciduous sal forest zone	400–900 m
1	Jhajra	Reserved forest; mainly sal, pure and mixed stands	560m
2	Karvapani	Reserved forest; mainly sal, pure and mixed stands	600m
3	Thano	Reserved forest; mainly sal, pure and mixed	750m
4	Timli	Reserved forest; mainly sal, pure and mixed	537m
5	Kalusidh	Reserved forest; swamp with mainly <i>Trewia nudiflora</i> ; mixed sal	550m
6	Khattapani, Lachhiwala	Reserved forest; mixed sal	515m
7	Kalsi RF	Reserved forest; pure degraded sal; nursery	560m
8	Baarwala RF	Reserved forest; degraded sal; orchards; pure and mixed	550m
9	Laxman Sidh	Reserved forest; pure and mixed sal	650m
10	Maldeota	Reserved forest; scrub; riverine	750m
11	Hathibarkala	Mixed deciduous; non sal	700m
12	Rikhauli	Reserve forest, hill sal	960m
13	Bijapur Dam	Canal; river; scrub	760m
14	New Forest	Mixed moist deciduous; pine and teak plantations; open fields; orchards; gardens; arboreta, bamboo thickets.	670m
15	Chowki Dhoulas	Reserved forest; mainly sal in pure and mixed patches with rivulets	750m
16	Langha	Reserved forest; mixed sal; nullahs	825m
17	Sulphur Springs, Sahastradhara	Riverine; scrub	830m
18	Asan River - Rampur Mandi	Wetland; agriculture; riverine	400m
19	Herbertpur	Agriculture; agroforestry	440m
20	Vasant Vihar	Urban gardens	650m
21	Doon School	Mixed plantations and gardens	658m
22	Vikas Nagar	Agriculture and tea garden	470m
23	Malsi RF	Reserved forest	822m
24	Dhoran Khas	Urban gardens; scrub	800m
25	Barkot RF	Sal forest	560m
26	Teenpani	resh water swamp inside moist deciduous forest	600m
27	Shikhar Falls	Scrub; nullahs	1100m
B.	RNP - Rajaji National Park & surrounds (Dehradun & Haridwar districts) (30°00'25"N & 78°03'26"E)	Tropical moist deciduous sal forest on north face; dry deciduous mixed forest on south face.	400–975 m
1	Kansrao-Satyanarian track	Mixed sal forest with water; swamps with <i>Trewia nudiflora</i>	400m
2	Phanduwala	Pure and mixed sal forest	655m
3	Ramgarh	Sal forest	630m
4	Motichur	Sal forest; riverine; grassland	424m
5	Shiwaliks	Moist deciduous on north face and dry mixed deciduous with <i>Terminalia</i> , <i>Bauhinia</i> spp. and <i>Zizyphus</i> spp. on south face and sub-tropical chir pine <i>Pinus roxburghii</i> on the ridges	400–1,000 m
C.	Jhilmil Conservation Reserve	Wetland and swamp; tropical moist deciduous sal forest	200–250 m
D.	Mussoorie Hills (Dehradun District)	Moist temperate forest-mainly Ban Oak <i>Quercus leucotrichophora</i> and Deodar <i>Cedrus deodara</i>	(1,800–2,300 m)
1	Woodstock School-Pump house	Mainly Ban Oak and <i>Rhododendron arboreum</i> in dense mixed patches with some chir pine	1,500–2,000 m
2	Bataghat to Koti Kimoi village	Mixed dense patches with and without Ban Oak and <i>Persia odoratissima</i>	1,800–2,135 m
3	Landour-Lal Tibba	Mixed patches of Ban Oak with deodar	2,200–2,400 m
4	Jharipani	Rocky scrub with Ban Oak in open patches	1,600m

5	Jabberkhet	Mainly Ban Oak and <i>Rhododendron arboreum</i> in dense mixed patches along with some chir pine	2,100m
E.	Benog WS - Benog Wildlife Sanctuary (Dehradun District) -West of Mussoorie (30°46'22"N & 78°00'27"E)	Moist temperate Ban Oak forest with Deodar and Blue Pine <i>Pinus wallichiana</i> , <i>Aesculus indica</i> , <i>Rhododendron arboreum</i> , Ringal Bamboo <i>Thamocalamus</i> sp., etc.	1,800–2,300 m
F.	Chakarata RF - (Dehradun District)	Moist temperate ban oak forest with deodar and blue pine, <i>Aesculus indica</i> , etc.	2,000–2,300 m
1	Cantonment Forest	Moist temperate ban oak forest with deodar and blue pine, <i>Aesculus indica</i> , etc.	2,200m
2	Tiger falls (near Chakarata)	Open scrub with agriculture, waterfall	1,700m
3	Deoban RF (Dehradun District)	Mainly moru oak, <i>Quercus semicarpifolia</i> and kharsu oak, <i>Q. dilatata</i> oak with West Himalayan fir <i>Abies pindrow</i> ; spruce <i>Picea smithiana</i> and blue pine	2,300–3,000m
II	Tehri Garhwal District	Moist temperate zone	1,500–2400m
1.	Burans Khanda and Dhanaulty	Mixed and pure patches of ban and moru oaks with deodar and <i>Rhododendron arboreum</i> and silver fir at higher elevations	2,250–2350m
2.	Nag Tibba RF	Mainly ban oak and deodar in degraded and dense patches along with agriculture in lower areas	2,900m
3.	Devalsari RF	Mosuo temperate–ban oak with rhododendron and deodar; riverine	1,700m
4.	Teva	Scrub	1,560m
5.	Kunain	Dry rocky scrub and agriculture along the river	1,000m
6.	Ghoraghati–Lakha Mandal	Dense ban oak forest without water courses; agriculture.	2,000m+
7.	Magra RF	Oak, rhododendron, chir pine, riverine	1,700m
III.	Garhwal District (Pauri)	Moist Temperate zone; Sub-tropical Zone	1,000–2,400m
A.	Sonanadi Wildlife Sanctuary (29°35'15.24"N & 78°38'31.21"E)	Mixed deciduous forest with sal, ban oak and wild bananas	300–850m
1.	Saneh RF	Reserve forest; mixed sal forest	322–400 m
2.	Dugadda	Mixed forest with <i>Shorea robusta</i>	805m
3.	Mundiapani	Sal, ban oak and banana	550m
4.	Rathuwa Dab	Tropical mixed moist deciduous	706m
B.	Thalisain	Sub-tropical pine forest; scrub; agriculture	1,670m
C.	Chori Khal	Ban oak; silver fir in mixed patches	2,280m
D.	Adwani RF	Pure dense ban oak patches	1,950m
E.	Kandolyia	Ban oak and deodar	1,770m
F.	Pabo	Scrub and agriculture along a stream	1,000m
G.	Khirsu	Ban oak, <i>Rhododendron arboreum</i> and deodar	1,800–2,200 m
H.	Lansdowne	Ban oak and rhododendron	1,700m
IV.	Uttarkashi District	Sub-tropical Pine; Moist Temperate Forest & Sub-Alpine zone	1,200–3,500 m
A.	GWS - Govind Pashu Vihar Wildlife Sanctuary (31°08'7.53"N & 78°25'36.45"E)	Moist temperate forest-deodar, sub-tropical pine; agriculture; apple orchards; degraded ban and moru oak patches	1,200–2,700 m
1.	Naitwar-Dangan Village	Sub-tropical pine; agriculture; apple orchards; degraded ban and moru oak patches	1,400–2,000 m
2.	Sankri	Deodar; scrub; ban oak; rhododendron; chir and blue pine	1,713m
3.	Taluka	Mixed moist temperate forest with oak, rhododendron, deodar and blue pine	2,100m
4.	Gangarh	Mainly deodar forest	2,392m
5.	Osla	Moru oak; scrub; agriculture; grassland	2,700m
6.	Dhaura	Blue pine; ban and moru oaks; ringal bamboo	1,631m
7.	Sewa village	Agriculture, ban oak	1,927m
8.	Istragad	Dense moru oak forest	2,100m
C.	GNP - Gangotri National Park (31°03'38"N & 78°87'38"E)	Alpine; Himalayan dry and moist temperate; deodar	2,000–3,500 m
1.	Bharon Ghati	Mainly deodar forest	2,800m
2.	Gangotri	Dry temperate forest	3,200m
3.	Nilung Pass	Alpine, cold desert, rocky	3,800m

V.	Chamoli & Rudra Prayag districts	Moist temperate broad leaved forest	1,200–3,900 m
A.	KMDR - Kedarnath Wildlife Sanctuary (30°33'23"N & 79°11'21"E)	Sub-tropical pine; Moist temperate; Sub-alpine; alpine.	1,200–4,000 m
1.	Anusuyia Devi	Ban and moru oak mixed broad leaved forest	2,110m
2.	Mandal-Garsari	Agriculture-ban oak mixed broad leaved temperate	1,200–1,760 m
3.	Kanchula Kharak	Maple, <i>Acer caesium</i> with silver fir and moru oak in higher reaches	2,700m
4.	Chopta	Kharsu oak with <i>Rhododendron arboreum</i> and <i>R.barbatum</i>	3,000m
5.	Makkumath	Ban oak broadleaved forest; agriculture	1,600m
6.	Tunganath-Chandrashila peak	Sub-alpine <i>Rhododendron campanulatum</i> and kharsu oak alpine forest with <i>R. anthopogon</i>	3,700m
7.	Tala Village	Forest edge and agriculture	1,893m
8.	Deoriya Taal	Kharsu oak with <i>Rhododendron arboreum</i>	2,380m
9.	Mohan Khal	Ban oak mixed patches	1,953m
B.	NDBR - Nanda Devi Biosphere Reserve (30°20'19"N & 79°57'30"E)	Alpine, sub-alpine, kharsu and moru oak	2,000–3,800 m
1.	Joshimath-Auli	Moist temperate, Mixed broad-leaved	2,000–3,000 m
2.	Malari	Dry temperate forest; rock and scree	3,100m
3.	Gorson	Sub-alpine and alpine	3,700m
4.	Kuwari Pass	Alpine meadows	3,800m
C.	VOFNP - Valley of Flower National Park (30°44'22"N & 79°37'31"E)	Alpine; sub-alpine and moist temperate	2,000m–3,300 m
1.	Ghangaria	Mixed moist temperate forest with silver fir and broad leaved species	3,120m
2.	Puspawati river/valley of Flowers	Alpine meadows, <i>Rhododendron lepidotum</i> , <i>Betula utilis</i>	3,400m

new range extensions have occurred into the region. The annotated list (Appendix 1) is a compilation of observations made by the first author from 1986–1990, in particular in the New Forest campus and surrounding areas, and then again from April 2000–March 2005 in the Dehradun Valley, and from 2005 to June 2013 in the Dehradun Valley and Garhwal Hills above 1500m and from 22 March 2016 to 17 April 2016 in Mussoorie Hills. The second author's observations in the list are mainly from the period 2008–2015. In all, 69 sites in the Garhwal Himalaya are mentioned in the text (Figs. 1 & 2, Table1).

A total of 407 species have been recorded so far from Garhwal (Appendix 1.). Both the authors were able to record 349 species in Garhwal themselves and the remainder have been reported by other authors. Mackinnon & de Nicéville (1899) reported 323 species from Mussoorie, Dehradun, Garhwal and adjacent areas. Of these, 28 species were only recorded by them (Appendix 1, species in brackets), which are mostly either rare occurrences, single or doubtful records. Of these, the Regal Apollo *Parnassus charltonius* and Keeled Apollo *P. jacquemontii* were caught by collectors from as far as the Nilung Pass near the Indo-China border and brought to Mackinnon & de Nicéville. Other

species reported by Mackinnon for which there are no recent published records from Uttarakhand include the Red Helen *Papilio helenus helenus* in April from Dehradun Valley (this species is common in eastern Himalaya and northeastern India but is rarely seen in Garhwal and Kumaon), Plains Blue Royal *Tajuria jehana*, Leopard Lacewing *Cethosia cyane* and Mountain Satyr *Paroeneis pumilus*. Some species are out of range, such as the Lesser Dart *Potanthus maesoides* which is found in Myanmar and the Andaman Islands (Wynter-Blyth 1957). Two other species (Pale Jezebel *Delias sanaca* and Orange Punch *Dodona egeon*) recorded by Ollenbach (1930) in Mussoorie were also not observed by the authors, the known range of the latter being from Kumaon eastwards (Evans 1932; Wynter-Blyth 1957). The Tibetan Satyr *Oeneis buddha garhwalica* and Plain Marbled Skipper *Carcharodus alceae gooraisa* were recorded only by Evans (1932) and the Ladakh Banded Apollo *Parnassius epahus epahus* only by Talbot (1939). The records of the Garhwal Woodbrown *Lethe dakwania* by Tytler (1939), the Sordid Emperor *Chitoria sordida* (male) collected by G.D. Bhasin in 1955 from Chakarata hills, the species being 'rare' having distribution from Sikkim to northern Burma (Evans 1932), two records by Wynter-Blyth (1957) of Hewitson's Dull Oakblue

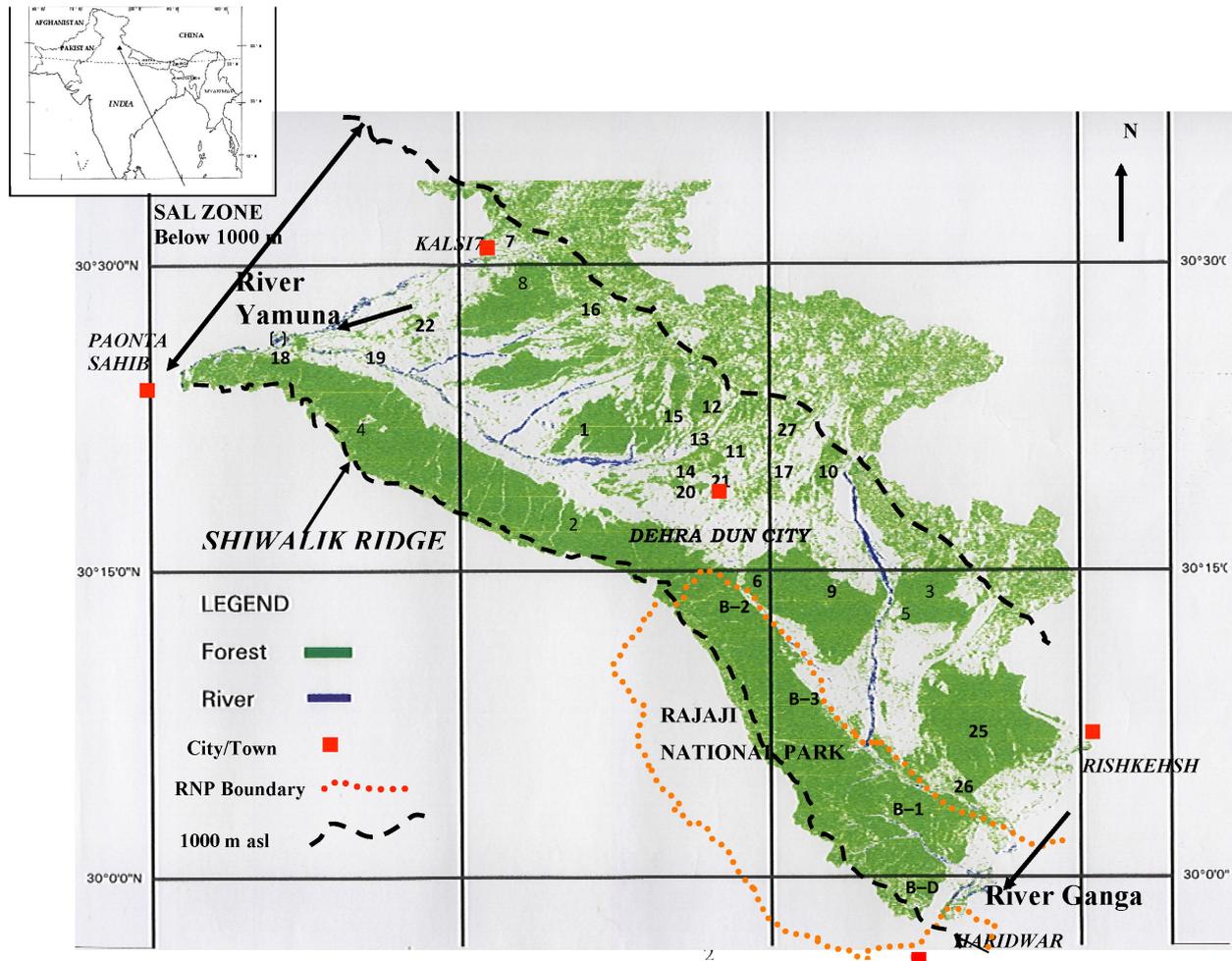


Figure 2. Map of Dehradun Valley depicting the extent of sal forest cover and butterfly sampling sites as mentioned in Table 1.

Arhopala oenea and the Yellow-disc Oakblue *Arhopala singla*, and one record of the Desert Bath White *Pontia glaconome iranica* in Mussoorie by Roonwal et al. (1963) are rare species in Garhwal or are the only records of the species that are worth mentioning.

Nine species reported by Uniyal (2004) and Bhardwaj & Uniyal (2013) from Nanda Devi National Park and Gangotri National Park were not recorded during the present study. Amongst these, the Lofty Bath White *Pontia callidice*; Small Cabbage White *Pieris rapae*; Western Silverstripe *Argynnis hyperbius hyperbius*; Highbrown Silverspot *Argynnis jainadeva jainadeva* Moore and Dark Green Silverspot *Speyeria aglaja* are all high altitude species with Palaearctic affinities. The Golden Sapphire *Heliophrous brahma* and Great Evening Brown *Melanitis zitenius*, with known distributions eastwards from Kumaon to Sikkim, and the Indian White Admiral *Limenitis trivena pallida* and Common Banded Owl *Hasora chromus chromus* are other species recorded

by Uniyal (2013) that have not been recorded by others. Many of the records published by Bhardwaj & Uniyal (2013), however, need to be validated due to either lack of specimens or photographic evidence to support them. Recently, Smetacek (2011) proposed a new subspecies, *Neptis clinia praedicta* with a distribution extending from Dehradun to Kumaon and later (Smetacek 2012) another new subspecies from Garhwal, Wood-Mason's Bushbrown *Mycalesis suaveolens ranotei*, based on a specimen collected by the first author at Mandal in KMDR.

Nine species have shown significant recent range extensions in their distributions in the Garhwal Himalaya. Four of these, the Figure-of-8-Swift *Baoris pagana* (Singh 1999), Common Gem *Poritia hewitsoni* (Singh 2003a), Spangled Plushblue *Flos asoka* (Singh 2006a) and Brown Gorgon *Meandrusa lachinus* (Singh 2006b) are from the Central Himalayas. Three more show significant range extensions into Garhwal from Peninsular India:

the Bush Hopper *Ampittia dioscorides* (Singh 2003b), Red Pierrot *Talicauda nyseus* (Singh 2005a) and Redspot *Zesius chrysomallus* (2005b). The Apefly *Spalgis epeus*, whose known range was from Kumaon eastwards, has also been recorded recently in Dehradun District by the second author. Finally, an unconfirmed record of Dark Branded Swift *Pelopidas agna* was reported by the second author.

SIGNIFICANT RECORDS

Papilionidae

1. Six-bar Swordtail *Graphium eurous caschmirensis*: Recorded in good numbers (10+) nectaring on *Rubus* sp. flowers in Kedarnath Musk Deer Reserve between 2100–2200 m on 30 April 2008 (Image 1a) and a single record on 2 April 2016 between Jharipani and Barlowganj (1800m) near Mussoorie. Two more individuals recorded nectaring on *Aesculus indica* blossoms near Lynndale estate, Mussoorie and third on nectaring on *Dianthus* flowers in a garden at Cloud's end estate, Benog WLS, both on 16 April 2016. At Woodstock nala, below Mussoorie (1700m), this species can be seen on the wing between mid April and first week of May (Image 1b). It frequents flowers of *Viburnum* spp. It has also been recorded in reasonable numbers at Devalsari in the Aglar Valley in early May (~1700m).

2. Tailed Redbreast *Papilio bootes janaka*: Recorded amongst rocks on 14 June 2012 between Makku village and the Sheep Farm, in Kedarnath Musk Deer Reserve (KMDR) (Image 2). The known distribution of this species is from Kumaon eastwards, hence this record extends its range westwards to Garhwal.

3. Brown Gorgon *Meandrusa lachinus lachinus*: A few individuals recorded during summer, on 14 May 2003 (2 females), 26–29 July 2006 (2 females and 1 male) and 26–30 September 2006 between 1800m and 2150m on northern facing slopes, from Mandal to Kanchula Kharak in KMDR. A female was noted ovipositing on saplings of *Machilus duthiei* (Lauraceae) along the road when one was caught on 28 July 2006 (Image 3). This species prefers to remain very close to the canopy (Singh 2006). This record in KMDR is 500km west of Kasi in Nepal, its previous known western limit in the Himalayas (Smith 1989; 2006).

4. Paris Peacock *Papilio paris paris*: Recorded in the New Forest campus (2 specimens caught on 5 October 2005 and 22 June 2006; Image 4) and from one specimen collected from Kalusidh Temple forest (20 February 2006) in Dehradun Valley. Numerous individuals were reported from Lacchiwala, Dehradun

District in October and November 2015. This represents a range extension to Garhwal, as the range reported in the literature is from Kumaon eastwards (Wynter-Blyth, 1957; Smetacek, 2015).

Pieridae

5. Lesser Brimstone *Gonepteryx mahaguru mahaguru*: A solitary male was observed on 23 March 2013 at the hill slope above Deoria Tal in the Kedarnath Musk Deer Wildlife Sanctuary. The individual was worn, and had possibly emerged after over-wintering, as the adults of this group are known to hibernate through the winter (Image 5).

6. One-spot Grass Yellow *Eurema andersoni jordani*: Recorded from Dehradun Valley in March (Singh & Bhandari 2003) and from the sal forest in the foothills below Chakarata on 5 October 2004. A recent record from New Forest Campus of a mating pair in July 2015. Earlier reported by Mackinnon & de Nicéville (1899) from Mussoorie (Image 6).

7. Striped Albatross *Appias libythea*: April–June 1991, observed in flight in the Botanical Garden of the New Forest campus, Dehradun.

8. Crimson Tip *Colotis etrida etrida*: Single record in March at Jhilmil Jheel Conservation Reserve. Mostly a plains species.

Lycaenidae

9. Water Hairstreak *Euaspa milionia*: Locally common during the dry season from May–June in oak forest along small streams/rivulets in shaded ravines. Sightings from Woodstock School Mussoorie on 30 May 2010, in Kedarnath Musk Deer Reserve on 15 June 2012 (Image 7) near the Sheep Farm on the road to Makku Village on 31 May 2015. The second author observed swarms of *E. milionia* along the Woodstock nala, Mussoorie, counting over 200 individuals in three hours on 31 May 2015.

10. White-spotted Hairstreak *Euaspa ziha*: Locally common in Benog Wildlife Sanctuary and Woodstock School in Mussoorie in the undergrowth of Ban oak trees between 1800–2200m in May–early June (Image 8). Otherwise rare in Garhwal.

11. Wonderful Hairstreak *Therzophyrus ataxus ataxus*: A single record of a pair on 16 June 2012 on rocky boulders amongst nettles and shrubs in a wet nullah near Chopta in Kedarnath Musk Deer Reserve (Images 9 a,b). The female of this species is rarely photographed.

12. Dull Green Hairstreak *Esakiozephyrus icana icana*: A single record of two individuals coming to dung on the stone path leading towards Deoban from



Image 1a. Six-bar Swordtail *Graphium euros cashmierensis*—Mussoorie



Image 1b. Six-bar Swordtail *Graphium euros cashmierensis*—Woodstock School, Mussoorie



Image 2. Tailed Redbreast *Papilio bootes janaka*—Kedarnath Musk Deer Reserve



Image 3. Brown Gorgon *Meandrusa lachinus lachinus*—Kedarnath Musk Deer Reserve



Image 4. Paris Peacock *Papilio paris paris*—New Forest campus, Dehradun Valley



Image 5. Lesser Brimstone *Gonepteryx mahaguru mahaguru*—Deoria Tal in Kedarnath Musk Deer Reserve



Image 6. One-spot Grass Yellow *Eurema andersoni jordani*—New Forest Campus, Dehradun



Image 7. Water Hairstreak *Euspa milionia*—Kedarnath Musk Deer Reserve



Image 8. White-Spotted Hairstreak *Euspa ziha*—Mussoorie



Image 9a. Wonderful Hairstreak *Thermozeephyrus ataxus ataxus* (female)—Kedarnath Musk Deer Reserve (Arun P.Singh)



Image 9b. Wonderful Hairstreak *Thermozeephyrus ataxus ataxus* (male)—Kedarnath Musk Deer Reserve



Image 10. Dull Green Hairstreak *Esakiozeephyrus icana icana*—Near Deoban, Chakarata

Chakarata on 19 July 2009 in Oak-fir forest (Image 10).

13. Walnut Blue *Chaetoprocta odata*: This west Himalayan endemic occurs around its food plant, *Juglans regia*, and has been recorded in flight from May–August in Mandal in KMDR and in May and June in Woodstock nala, Benog and Dhanaulty in Mussoorie hills, between 1800–2300m (Images 11,12). In early May, many *Juglans regia* trees are infested with caterpillars of this species.

14. Dusky Bushblue *Arhopala paraganesa paraganesa*: June seems to be the best month to observe this species in KMDR between Mandal and Kanchula karak (28 June 2007) in mixed patches of oak on creepers (Image 13).

15. Spangled Plushblue *Flos asoka*: Smetacek (2011) reported this species as a range extension to Uttarakhand, with its previous distribution having been reported from Nepal eastwards to eastern Himalaya (Wynter-Blyth 1957; Smith 1989). However, Singh & Bhandari (2006) had already reported this record from Dehradun Valley earlier (Images 14 a,b). This species was locally common especially in the sal forest (*Shorea robusta*) at Khattapani, Lachhiwala, where two individuals were recorded drinking from wet sand beside a seasonal jungle stream on 1 June 2004.

16. Redspot *Zesius chrysomallus*: Individuals were recorded from Hathibarkala area on Pomegranate trees (Images 15 a,b). Reported as a range extension to Garhwal, Uttarakhand by Singh (2005). Recent records from Pawalgarh Conservation Reserve, Kumaon by the second author confirm its status throughout Uttarakhand.

17. Brown Onyx *Horaga viola*: One individual was collected from *Litchi chinensis* tree in an orchard in 11 Hill Road in New Forest Campus during 1989 (image 16).

18. Apefly *Spalgis epeus epeus*: A single individual recorded by SS from *Maldeota* in the outskirts of Dehradun on 13 November 2013 (image 17). This is the first record of this species from Garhwal, extending its known range by 250km westwards. Its previous known range was Kumaon eastwards (Evans 1932; Wynter-Blyth 1957).

Nymphalidae

19. Treble Silverstripe *Lethe baladeva aisa*: Recorded on 16 June 2012 near Chopta (2700m) and at 1800m near Makku in KMDR drinking water from wet sand amongst rocks in temperate oak forest (Image 18). The previously known distribution was from Kumaon eastwards (Evans 1932; Wynter-Blyth 1957).

20. Wood-Mason's Bushbrown *Mycalesis suaveolens ranotei*: A single female was collected near

Garsari in a thick oak-Alnus forest patch in KMDR at 1750m on 7 July 2007. The species was initially misidentified as *M. nicotia* Westwood, 1850 until corrected to *M. suaveolens*, and described as a new subspecies, *M. s. ranotei* (Smetacek 2012) (Images 19a,b).

21. Moore's Bushbrown *Mycalesis heri*: Recorded from Mandal in Kedarnath Musk Deer Reserve. First record from Garhwal; previous known range was Kumaon eastwards (Wynter-Blyth 1957).

22. Brown Argus *Ypthima (Dallacha) hyagriva hyagriva*: A little known species recorded from Magra and Devalsari in the Aglar Valley and Mandal in Kedarnath Musk Deer Reserve in September (Image 20).

23. Scarce Mountain Argus *Callerebia kalinda*: Locally common at 2200–2300m from Buranskhanda to Dhanaulty in Tehri Garhwal during May–June with over half a dozen sightings between 2006 and 2012 (Images 21a,b).

24. Medus Brown *Orsotriaena medus medus*: Recorded from Chakarata in September and October. Previously known from Garhwal by Mackinnon & de Nicéville (1899) who had not recorded it themselves, but reported a sighting by Butler.

25. Narrow-banded Satyr *Aulocera brahminus dokwana*: Prefers alpine habitats in the inner Himalaya above 3200m. A few individuals were recorded in the Valley of Flowers National Park amongst the shrubberies and near the Puspawati river on 12 September 2007 (Images 22a,b) and one record near Chandrashila Peak in KMDR in 2009.

26. Jewel Four-ring *Ypthima avanta*: Recorded from Devalsari in April 2010 (Image 23) and Chakarata in June 2010. No recent published records from Uttarakhand.

27. Indian Purple Emperor *Apatura ambica ambica*: Recorded in September in Gharsari and Mandal in Kedarnath Musk Deer Reserve (Image 24). Rare in the western part of its range.

28. Golden Emperor *Dilipa morgiana*: Two records from KMDR, first at Mandal Village on 11 March 2008 and then near the Sheep Farm towards Makku Village on 17 June 2012 (Image 25).

29. Siren *Hestina persimilis zella*: Recorded on 6 April 2010 and 12 June 2015 from Devalsari in the Aglar Valley, at forest streams in hot weather. One individual was caught in the Maldeota foothills along the river Song in Dehradun in October 2005 (Images 26,27).

30. Stately Nawab *Charaxes dolon dolon*: Recorded singly at moist patches and on large boulders near large forest streams on 19 May 2014 at Magra (Image 28) and on 5 May 2015 at Devalsari in the Aglar Valley and Kanchula Khark at Kedarnath Wildlife Sanctuary.



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Image 11. Walnut Blue *Chaetoprocta odata*—Woodstock School, Mussoorie



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Image 12. Walnut Blue *Chaetoprocta odata*—Mussoorie



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Image 13. Dusky Bushblue *Arhopala paraganesa paraganesa*—Kedarnath Musk Deer Reserve



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Image 14a&b. Spangled Plushblue *Flos asoka* female (Upper side) & (Underside)



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Image 15a&b. Redspot *Zesius chrysomallus* (Upper side) & (Underside)—Hathibarkala, Dehradun Valley



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Image 16a&b. Brown Onyx *Horaga viola* (Upperside) & (Underside)—New Forest Campus, Dehradun Valley.



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Image 17. Apefly *Spalgis epeus epeus*—Maldeota, Dehradun Valley



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Image 18. Treble Silverstripe *Lethe baladeva aisa*—Kedarnath Musk Deer Reserve



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Image 19 a & b. Wood-Mason's Bushbrown *Mycalesis suaveolens ranotei*—Kedarnath Musk Deer Reserve

31. Anomalous Nawab *Charaxes agrarius agrarius*: A single record on 9 October 2009 at noon from Kohlu Rau, Saneh in Lansdowne Reserved Forest (Image 29).

32. Eastern Comma *Polygonia c-album*: The best place to record this species was between Sankri to Taluka on the stone path below the giant *Aesculus indicia* trees in Govind National Park, where a few individuals were recorded on 3 and 4 March 2009 (Image 30). Also recorded at Ghangaria in Valley of Flowers National Park in September and KMDR near Chopta tower at 2700m on 13 September 2007.

33. Pale Green Sailer *Neptis zaida zaida*: Locally common around Mussoorie town in oak groves in Benog, Woodstock School, Dhanaulty in the dry summer (May–June) coming on to water percolating through rocks and in small rivulets (Image 31). Also recorded at Shikhar Falls, above Dehradun at 1300m on 15 May 2014.

34. Bluetail Jester *Symbrenthia niphanda hysudra*: Three individuals recorded along Bangsil nala at Devalsari Reserved Forest, Tehri Garhwal District on 4 and 5 May 2015 (Image 32). These are the only known records of this species from Garhwal in recent years.

35. Spotted Jester *Symbrenthia hypselis cotanda*: Not recorded by the authors during their survey in Garhwal. Bhardwaj et al. (2012) recorded this species in the upper catchment of the Tons Valley in Govind Pashu Vihar WLS and NP.

36. Extra Lascar, *Pantoporia sandaka davidsoni*: A single individual on 10 November 2013 near Maldeota bridge, flying amongst Common Lascars *P. hordonia*. A search for the species at the same spot a week later did not yield any further sightings (Image 33).

37. Grey Count *Tanaecia lepidea lepidea*: Recorded in October from the Dehradun Valley. Wynter-Blyth (1957) gave its distribution as Kumaon eastwards. However, this overlooks a specimen collected at Mussoorie by Mackinnon in the FRI collection (Roonwal et al., 1963). One unconfirmed record from Hathibarkala area during 2000.

Hesperiidae

38. Himalayan Yellow-banded Flat *Celaenorrhinus dhanada*: Recorded in September from Mandal and Kanchula Khark in Kedarnath WLS. Rare in Garhwal, more common from Kumaon eastwards (Image 34).

39. Mussoorie Bush Bob *Pedesta masuriensis masuriensis*: Recorded from Tiger Falls, Chakarata in June 2010 and from Cloud's End in Benog WLS in July 2004 (Image 35).

40. Garhwal Ace *Thoressa aina*: A single record of this small butterfly feeding on the flower of a herb on

the stone track from Cloud's end down towards Jawala Devi Temple in Benog Wildlife Sanctuary in October 2005.

41. Graham's Ace *Sovia grahami*: One specimen collected on 13 May 2003 from Mandal in KMDR.

42. Palm Redeye *Erionota torus*: A single specimen was collected at the FRI Director's residence (14 Hill Road) near Pine forest, New Forest campus, Dehradun on the evening on 12 October 1990 (Image 36).

43. Paintbrush Swift *Baoris farri*: Collected from a paddy field at 11 Hill Road in New Forest Campus, Dehradun on 27 August 1989. Also recorded from Saneh WLS in October 2008.

44. Conjoined Swift *Pelopidas conjuncta conjuncta*: Recorded during September 2000 from several locations in the valley at New Forest campus, Dehradun and in October 2005 nectaring on composite flowers in sal forests near Maldeota in Dehradun Valley (Image 37).

CONCLUSION

The present list of Garhwal includes about 84% of species found in the western Himalaya (Wynter-Blyth 1957) and 30% of India's total butterfly species list. Forty-nine species in the study area are listed under various schedules of the Indian Wildlife Protection Act, 1972 (Appendix 1). Only one species, the Golden Emperor (*Dilipa morgiana* Westwood) is listed in Schedule I, with 41 species in Schedule II and seven species in Schedule IV. New range extensions, past historic records and rare high altitude species are of conservation concern and need to be protected. Singh (2011) had earlier shortlisted 30 species of conservation priority in oak forests of Garhwal, according to their rarity, which are included in this list. It should be noted that 51 species have no recent records from Garhwal and/or Uttarakhand. While many of these species are from higher altitudes, some are also from lower altitudes and have not been seen for many years. In addition, there are 10 species for which records need further verification. The absence of reliable scientific information on 15% of the butterfly species recorded in the Garhwal Himalaya indicates that significantly more research is needed on this faunal group.

The long term conservation of butterflies in Garhwal calls for protection of the land remaining under native/natural forests of sal in the tropical moist deciduous zone and Oaks-Rhododendron forests in the Himalayan moist temperate zone, which hold most of the rare Himalayan butterfly species. Biotic pressure in the form of excessive lopping of fodder trees, grazing and browsing by cattle,



Image 20. Brown Argus *Ypthima (Dallacha) hyagriva hyagriva*—Magra RF, Tehri Garhwal



Image 23. Jewel Four-ring *Ypthima avanta*—Chakarata Hills



Image 26. Siren *Hestina persimilis zella* (Underside)—Devalsari



Image 27. Siren *Hestina persimilis zella* (Upperside)—Maldeota, Dehradun Valley



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Image 21a&b. Scarce Mountain Argus *Callerebia kalinda* (Upper side) & (Under side)—Dhanaulty, Tehri Garhwal



Image 24. Indian Purple Emperor *Apatura ambica ambica*—Kedarnath Musk Deer Reserve



Image 28. Stately Nawab *Charaxes dolon dolon*—Magra RF, Tehri Garhwal



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Image 22a&b. Narrow-banded Satyr *Aulocera brahminus dokwana* (Upperside & Underside)—Valley of Flowers National Park Chamoli District



Image 25. Golden Emperor *Dilipa morgiana*—Kedarnath Musk Deer Reserve



Image 29. Anomalous Nawab *Charaxes agrarius agrarius*—Saneh, Sonanandi Wildlife Sanctuary



Image 30. Eastern Comma *Polygonia c-album*—Sankri, Taluka, Govind Wildlife Sanctuary



Image 34. Himalayan Yellow-banded Flat *Celaenorrhinus dhanada*—Kedarnath Musk Deer Reserve



Image 35. Mussoorie Bush Bob *Pedesta masuriensis masuriensis*—Chakarata Hills



Image 38a. Eastern Blue Sapphire *Heliophorus oda* (male)—Suwakholi near Mussoorie



Image 31 a&b. Pale Green Sailer *Neptis zaida zaida* (Upper side & Under side)—Dhanaulty, Mussoorie

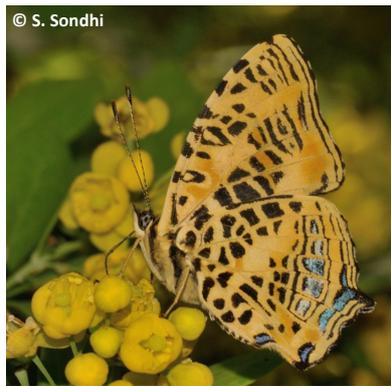


Image 32. Bluetail Jester *Symbrenthia niphanda hysudra*—Devalsari



Image 33. Extra Lascar, *Pantoporia sandaka davidsoni*—Maldeota, Dehradun Valley



Image 36. Palm Redeye *Erionota torus*—New Forest, Dehradun



Image 37. Conjoined Swift *Pelopidas conjuncta conjuncta*—New Forest Campus



Image 38b. Eastern Blue Sapphire *Heliophorus oda* (male upper side)—Suwakholi

ravaging summer fires, unchecked collection of non-food forest products by villagers, illegal encroachment of forest land, limestone mining, construction of new roads and landslides, impacts of mass tourism, and land use change due to rapid urbanization in the region that has led to habitat fragmentation, are all major threats to biodiversity across the landscape in the Garhwal region. Hence, any development in Garhwal should be concentrated away from forests to save its native diversity. Landuse planning should directly address issues linked to the people living around forests and directly dependent upon them for their livelihoods. Alternative means of employment should be encouraged in this region, such as “butterfly inclusive ecotourism”, to reduce human pressure on butterfly habitats, and butterfly rich sites and zones should be identified. This will also reduce the impacts of mass tourism on habitats and their associated biodiversity. The authors hope that this paper will form the basis for increased research on the butterfly fauna of the Garhwal Himalaya, to fill the information gaps that remain. It is hoped that the data we have generated will support habitat conservation efforts by helping establish butterfly inclusive ecotourism models and generating livelihood opportunities for the locals. In addition, we hope that the distribution patterns of individual species and their habitats that we have uncovered will also help in monitoring environmental changes.

REFERENCES

- Anonymous (2006).** *The Wildlife (Protection) Act 1972*. Natraj Publishers, Dehradun, 235pp.
- Atkinson, E.T. (1882).** *Gazetteer of the Himalayan Districts of the NW Provinces of India*. Volume 3, Chapter 2. Government Press, Allahabad, 87–266pp.
- Baindur, A. (1993).** The butterflies of Nanda Devi, pp. 35–43. In: Scientific and Ecological Expedition Nanda Devi, 2nd May to 22nd July 1993. (Army Corps of Engineers; W.I.I.; Salim Ali Centre for Ornithology & Natural History, WWF-India, G.B. Pant Institute of Himalayan Environment & Development, Botanical Survey of India) Army Headquarters, New Delhi.
- Bhardwaj, M., V.P. Uniyal, A.K. Sanyal & A.P. Singh (2012).** Butterfly communities along an elevation gradient in the Tons valley, Western Himalayas: Implications of rapid assessment of insect conservation. *Journal of Asia-Pacific Entomology* 15(1): 207–217.
- Bhardwaj, M. & V.P. Uniyal (2013).** High-altitude butterfly fauna of Gangotri National Park, Uttarakhand: Patterns in species abundance, composition and similarity. *ENVIS Bulletin on Wildlife and Protected Areas- Arthropods and their Conservation in India (Insects & Spiders)*, 38–48pp.
- Bingham, C.T. (1905).** *Fauna of British India. Butterflies Vol. I*. Taylor and Francis, London, 511pp.
- D’Abrera, B. (1982).** *Butterflies of the Oriental Region - Part I. Papilionidae, Pieridae & Danaidae*. Hill House, Victoria, Australia, 244pp.
- D’Abrera, B. (1985).** *Butterflies of the Oriental Region - Part II. Nymphalidae, Satyridae & Amathusiidae*. Hill House, Victoria, Australia, 534pp.
- D’Abrera, B. (1986).** *Butterflies of the Oriental Region - Part III. Lycaenidae & Riodinidae*. Hill House, Victoria, Australia, 672pp.
- Evans, W.H. (1932).** *The Identification of Indian Butterflies, 2nd Edition*. Bombay Natural History Society, Bombay, x+454pp+32pl.
- Forest Survey of India (2013).** *India State of Forest Report. Forest Survey of India*. Ministry of Environment and Forests, Government of India, Dehradun, 252pp.
- Gasse, P.V. (2013).** Annotated checklist of the Butterflies of the Indo-Burmese region; http://flutters.org/home/docs/Butterflies_Of_India_Paul_Van_Gasse.pdf
- Haribal, M. (1992).** *Butterflies of Sikkim Himalaya and their Natural History*. Sikkim Nature Conservation Foundation, Gangtok, Sikkim, India.
- Kehimkar, I. (2008).** *The Book of Indian Butterflies*. BNHS, Oxford University, Delhi Press, 497pp.
- Mackinnon, P.W. & L. de Nicéville (1899).** List of butterflies of Mussoorie in the Western Himalayas and neighbouring region. *Journal of the Bombay Natural History Society* 11: 205–221, 368–389, 585–605.
- Marshal, G.F.L. & L. de Nicéville (1882).** *Butterflies of India, Burma and Ceylon*. Vol. I., Calcutta Central Press, Calcutta, 321pp.
- Moore, F. (1890–1992).** *Lepidoptera Indica Part I. Rhopalocera - Nymphalidae*. Lovell, Reeve & Co. Ltd, London, 317pp + pls.1–94.
- Moore, F. (1893–1896).** *Lepidoptera Indica Part II. Rhopalocera - Nymphalidae*. Lovell, Reeve & Co. Ltd, London, 274pp + pls. 95–190.
- Moore, F. (1896–1899).** *Lepidoptera Indica Part III. Rhopalocera - Nymphalidae*. Lovell, Reeve & Co. Ltd, London, 254pp + pls. 191–286.
- Moore, F. (1899–1900).** *Lepidoptera Indica Part IV. Rhopalocera - Nymphalidae*. Lovell, Reeve & Co. Ltd, London, 260pp + pls. 287–378.
- Moore, F. (1901–1903).** *Lepidoptera Indica Parts V. Rhopalocera - Nymphalidae, Riodininae & Papilionidae*. Lovell, Reeve & Co. Ltd, London, 248pp + pls. 379–416.
- Moore, F. (1903–1905).** *Lepidoptera Indica Parts VI. Rhopalocera - Papilionidae & Pieridae*. Lovell, Reeve & Co. Ltd, London, 240pp + pls. 467–550.
- Moore, F. (1874).** *Description of New Asiatic Lepidoptera - Vol. I*. Proceedings of the Zoological Society London, Taylor and Francis, London, 680pp.
- Ollenbach, O.C. (1930).** Butterfly collection grounds at Mussoorie (U.P.). *Journal of the Bombay Natural History Society* 34: 836–840.
- Roonwal, M.L., R.N. Mathur, G.D. Bhasin, P.N. Chatterjee, P.K. Sen-Sarma, B. Singh, A. Chandra, R.S. Thapa & K. Kumar (1963).** A systematic catalogue of the main identified entomological collection at the Forest Research Institute, Dehra Dun, Indian Forest Leaflet, 121 (4) Ent., part 31 (Lepidoptera): 1295–1395.
- Rose, H.S. & A.K. Sidhu (1994).** Lycaenid butterfly diversity of Mussoorie (Uttar Pradesh) along with some comments on Wildlife (Protection) Act, 1972. *Cheetal* 33(3–4): 10–16.
- Seth, S.K. (1968)** *Forest Types of India*. Government of India Publication, Delhi. 404pp.
- Shull, E.M. (1958).** My highest catch of butterfly species in a single day (4th June, 1957) Mussoorie, India. *Journal of the Lepidopterists’ Society* 11: 167–168.
- Shull, E.M. (1962).** Over one hundred butterfly species caught in a single day (3rd June, 1961) at Mussoorie, India. *Journal of the Lepidopterists’ Society* 16 : 143–145.
- Singh, A.P. (1999).** New Forest, Dehradun, India: A unique man made habitat for butterflies in the lower western Himalayas. *Indian Forester* 125: 913–922.
- Singh, A.P. (2003).** New records on the distribution and ecology of Common Gem Butterfly, *Portia hewitsoni hewitsoni* Moore from the lower western Himalayas: lesser known taxa. *Journal of the Lepidopterists’ Society* 37(4): 295–298.
- Singh, A.P. (2003).** Distribution range extension of bush hopper butterfly, *Ampittia dioscorides* Fabricius (Lepidoptera: Hesperidae) into the lower western Himalayas. *Indian Forester* 129(8): 1046–

Appendix 1. Systematic list of butterflies (Rhopalocera) recorded from Garhwal Himalaya (1986–1990; April 2000 to June 2015)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
A. Superfamily: Papilionoidea				
I Family: Papilionidae (Swallowtails)				
a. Subfamily: Parnassinae				
1	<i>Parnassius hardwickei hardwickei</i> Gray	Common Blue Apollo	Uncommon	Feb–May; Jul–Sept (Gangarh-Osla-GWLS & Chopta-Tunganath-Chandrashila-KMDR)
2	[<i>Parnassius charltonius</i> Gray IWPA1972, Sch. II	Regal Apollo	Rare	above 4200m; Jul–Aug, Hills north of Mussoorie below snow (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
3	[<i>Parnassius jacquemontii jacquemontii</i> Boisduval IWPA1972, Sch. II	Keeled Apollo	Uncommon	July–August; 3600–4500m; Nila valley, Nila pass & Nilung pass (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
4	[<i>Parnassius epaphus epaphus</i> Oberthür IWPA1972, Sch. II	Red Apollo	Not rare	(Wynter-Blyth, 1957); GNP (Uniyal et al. 2013); Istragad, Kedarkanta in Govind Pashu Vihar (Bhardwaj, et. al. 2012)
5	[<i>Parnassius stoliczkanus florencae</i> Tytler	Ladakh Banded Apollo	Very rare	Garhwal (Phup, Hundes, north of Tehri in June) Talbot (1939). No recent published records from Garhwal.
b. Subfamily: Papilioninae				
6	<i>Graphium nomius nomius</i> Esper	Spot Swordtail	Common	March–May (Chandrabani, Jhajra; Karvapani; RNP-Dehradun); May (Mundiapani-SWS)
7	<i>Graphium eurous caschmirensis</i> Rothschild	Six–bar Swordtail	Locally common	April–May (Mussoorie; Devalsari-Aglar Valley; Kanchula Karak-KMDR)
8	<i>Graphium mandarinus garhwalica</i> Katayama	Spectacle Swordtail	Uncommon	(Katayama, 1986)
9	<i>Graphium cloanthus cloanthus</i> Westwood	Glassy Bluebottle	Common	Mar–June; Sept–Dec (Sahastradhara-Dehradun; Devalsari-Aglar Valley; Mussoorie; Naitwar-GWLS; Mandal, Anusuya Devi; Makku-KMDR; Chakarata RF; Chauri Khal-Pauri Garhwal) May (Mundiapani-SWS)
10	<i>Graphium sarpedon sarpedon</i> Linnaeus	Common Bluebottle	Very common	Feb–May (Dehradun Valley, Magra, Devalsari-Aglar Valley); Oct (Chakarata RF)
11	<i>Graphium agamemnon agamemnon</i> Linnaeus	Tailed Jay	Very common	March–Oct (Dehradun Valley); Oct (Chakarata RF)
12	<i>Graphium doson axion</i> C. & R. Felder	Common Jay	Uncommon	Mar–Oct (Vasant Vihar, Dehradun Valley); Mar & Aug Dhoran Khas; Oct (Chakarata RF);
13	<i>Byasa polyeuctes letincius</i> Fruhstorfer	Common Windmill	Uncommon	April–Sept (Mussoorie; Mandal, Anusuya Devi KMDR; Thalain & Chaurikhal-Pauri Garhwal)
14	<i>Byasa latreillei latreillei</i> Donovan	Rose Windmill	Uncommon	June–July (Mandal KMDR; Chauri Khal-Pauri Garhwal)
15	<i>Byasa dasarada ravana</i> Moore	Great Windmill	Uncommon	April–May (Mandal-KMDR)
16	<i>Atrophaneura aidoneus</i> Doubleday	Lesser Batwing	Rare	April–May (Mandal-KMDR)
17	<i>Atrophaneura varuna astorion</i> White	Common Batwing	Uncommon	Oct (Chakarata RF)
18	<i>Pachliopta aristolochiae aristolochiae</i> Fabricius	Common Rose	Uncommon	March–Nov (New Forest, Maldeota-Dehradun, Kansrao, Sukhrao, Cheela-RNP); Oct (Chakarata); Mar(KDMR); Oct (Saneh-Lansdowne)
19	<i>Troides aeacus aeacus</i> Felder & Felder	Golden Birdwing	Uncommon	April–June (Mussoorie; Duggal Bitta, Makku, Mandal-KMDR; Bharoghathi-Gangotri NP; ChauriKhal-Pauri Garhwal)
20	<i>Papilio agester govindra</i> Moore	Tawny Mime	Uncommon	April–May (Jharipani, Mussoorie)
21	<i>Papilio clytia clytia</i> Linnaeus	Common Mime	Common	June, Aug, Nov (Dehradun Valley); Apr (Devalsari-Aglar Valley); Oct (Chakarata Hills); GNP (Uniyal et al. 2013)
22	<i>Papilio machaon asiaticus</i> Ménétrés	Common Yellow Swallowtail	Uncommon	Feb–April; Sept–Nov (Mussoorie; Devalsari-Aglar Valley; Chakarata; Deoriya Taal, Mandal-KMDR); July (Istragad-GWLS); Feb (New Forest-Dehradun Valley), Valley of Flowers (Chaturvedi 1981)
23	<i>Papilio demoleus demoleus</i> Linnaeus	Lime Butterfly	Very Common	All year (Dehradun Valley, Maldevata, Shikar Falls, Sahastradhara); Oct (Chakarata RF hills); Oct (Saneh)
24	<i>Papilio bootes janaka</i> Moore IWPA1972, Sch. II	Tailed Redbreast	Rare	March (Mandal-KMDR)
25	<i>Papilio alcmenor alcmenor</i> C. & R. Felder	Redbreast	Rare	May (Bharoghathi-Gangotri NP); Oct (Chakarata)

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26	<i>Papilio protenor protenor</i> Cramer	Spangle	Common	May–Sep (Dehradun Valley & Mussoorie; Aglar Valley-Magra, Jogiyada, Devalsari); March–Oct (Anusuya Devi-KMDR; Chakarata RF-Hills)
27	<i>Papilio polytes romulus</i> Cramer	Common Mormon	Very Common	Feb–Dec (Dehradun Valley); May–Aug (Aglar Valley); Oct (Chakarata RF hills); Oct (Saneh-Lansdowne)
28	[<i>Papilio helenus helenus</i> Linnaeus	Red Helen	Rare	[Single record in April from Dehradun Valley (Mackinnon & de Nicéville 1899).
29	<i>Papilio paris paris</i> Linnaeus	Paris Peacock	Common	Feb–Nov (New Forest; Kalusidh-Dehradun Valley; Chakarata Hills)
30	<i>Papilio bianor polyctor</i> Boisduval	Common Peacock	Very Common	April–Oct (Mussoorie; Devalsari-Aglar Valley; Chakarata; Kunain-Tehri Garhwal; Naitwar-GWLS; Mandal, Anusuya Devi-KMDR; all over mid-elevation hills)
31	<i>Papilio arcturus arius</i> Rothschild	Blue Peacock	Uncommon	Nov (Thano; Sulphur Springs Dehradun Valley)
32	<i>Meandrusa lachinus lachinus</i> Fruhstorfer IWPA1972, Sch. II	Brown Gorgon	Rare	May–July (b/w Mandal-Kanchula Kharak-KMDR)
II Family: Pieridae (White and Yellows)				
a. Subfamily: Pierinae				
33.	[<i>Aporia nabellica nabellica</i> Boisduval IWPA1972, Sch. II	Dusky Blackvein	Rare	(Talbot 1939); 3,600–3,900m in Baspa valley & Borinda Pass; July–Aug (Mackinnon & de Nicéville 1899), Bingham 1907. [No recent records from Uttarakhand].
34	<i>Aporia leucodice soracta</i> Moore	Himalayan Blackvein	Very Common	April–June (Benog-Mussoorie); GNP (Uniyal et al. 2013)
35	<i>Aporia agathon caphusa</i> Moore	Great Blackvein	Uncommon	May (Papri Dhar, Joshimath-NDBR-Chamolli District)
36	<i>Aporia agathon phryxe</i> Boisduval	Great Blackvein	Very Common	April–July (Mussoorie; Chakarata; Kandolyia-Chauri Khal–Pauri Garhwal; Mandal-KMDR)
37	<i>Pieris melete ajaka</i> Moore	Green–veined White	Uncommon	June–Sept (Mandal-Chopta-KMDR; Chakarta RF); GNP (Uniyal et al. 2013)
38	<i>Pieris canidia indica</i> Evans	Indian Cabbage White	Very Common	Feb–May; Aug–Dec (Dehradun Valley); May (Bharoghathi-Gangotri NP); March–Oct (Chakarata-Hills); Feb–Nov (Mandal-KMDR).
39	<i>Pieris brassicae nepalensis</i> Doubleday	Large Cabbage White	Very Common	Feb–May; Oct–Dec (Dehradun Valley); March–July, Oct (Muss.; Chakarata); May (Bharoghathi-Gangotri NP); May (Magra RF-Aglar Valley); Mar (Deolsari-KMDR)
40	<i>Pieris rapae rapae</i> Linnaeus	Small Cabbage White	Record needs verification	Har–ki–dun GNP (Uniyal et al. 2013). Only published record from Uttarakhand. Known range is Kashmir westwards (Wynter-Blyth 1957).
41	<i>Pieris dapidice moorei</i> Röber	Bath White	Common	April–May (Anusuyadevi-KMDR); August (Istragad-GWLS); April (Asan River; New Forest-Dehradun Valley, Dhoran Khas); May–June (Devalsari RF, Magra RF-Aglar Valley); May–Jun (Woodstock nala, Dhanauly-Mussoorie)
42	[<i>Pontia callidice kalora</i> Moore	Lofty Bath White		May; Sept in Nanda Devi National Park (Uniyal 2004)
43	[<i>Pontia glauconome iranica</i> Bienert	Desert Bath White		Single record from Mussoorie (Roonwal et al. 1956). No recent published records from Garhwal.
44	<i>Belenois aurota aurota</i> Fabricius	Pioneer	Very Common	April–December.(New Forest-Dehradun Valley & Shivaliks; Shikhar Falls, Sahastradhara, Maldeota); Apr (Mussoorie); July–Oct (Chakarata RF)
45	<i>Cepora nerissa phryne</i> Fabricius	Common Gull	Very Common	March–August; Oct–Dec (Dehradun Valley & Shivaliks)
46	<i>Ixias pyrene kausala</i> Moore	Yellow Orange Tip	Uncommon	March (Timli; New Forest-Dehradun Valley); July (Kunain-Tehri Garhwal)
47	<i>Ixias marianne</i> Cramer	White Orange Tip	Uncommon	May; Oct (New Forest; Timli-Dehradun Valley; Jhilmil Jheel CR)
48	[<i>Delias sanaca sanaca</i> Moore	Pale Jezebel		June onwards in Mussoorie (Ollenbach 1930). Record needs verification.
49	<i>Delias eucharis</i> Drury	Common Jezebel	Very Common	Mar–Nov (Dehradun Valley); Oct (Chakarata-Hills); Oct (Saneh-Lansdowne)
50	<i>Delias belladonna horsfieldii</i> Gray	Hill Jezebel	Common	May–Oct (Mussoorie; Chakarata); Mar; Sept–Nov. (Mandal-KMDR; Govindghat-VFNP); May (Bharoghathi-Gangotri NP); March; Apr; Aug; Oct; Nov (New Forest; Karvapani-Dehradun Valley; Sahastradhara, Malsi, Dhoran Khas); Magra & Devalsari-Aglar Valley; GNP (Uniyal et al. 2013)

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52	<i>Appias lalage lalage</i> Doubleday	Spot Puffin	Uncommon	April–May (Mussoorie hills)
53	<i>Appias libythea</i> Fabricius IWPA1972, Sch. II	Striped Albatross	Rare	April–June (New Forest)
54	<i>Leptosia nina nina</i> Fabricius	Psyche	Very Common	Feb–Dec (Dehradun Valley), (Phandowala-RNP; Oct (Chakarata-Hills), Mar (KDMR); Oct (Saneh-Lansdowne)
55	<i>Colotis etrida etrida</i> Boisduval	Small Orange Tip	Rare	Mar (Jhilmil Jheel CR)
56	<i>Pareronia valeria</i> Cramer (+ form <i>philomela</i>)	Common Wanderer	Very Common	Feb–Dec (New Forest; Thano-Dehradun Valley; Maldeota, Sahastradhara, Dhoran Khas, Shikhar Falls; Kaduapani); Chilla, Sukhrau-RNP; Oct (Chakarata-Hills) (form <i>philomela</i> in New Forest & Kadua Pani); Oct (Saneh-Lansdowne)
b. Subfamily: Coliadinae				
57	<i>Catopsilia pomona pomona</i> Fabricius	Common Emigrant	Very Common	Feb–Dec (Dehradun Valley; Hills; Dhoran Khas, Maldeota, Shikhar Falls, Sahastradhara); Motichur, Chilla-RNP; Oct (Saneh-Lansdowne)
58	<i>Catopsilia pyranthe pyranthe</i> Linnaeus	Mottled Emigrant	Common	Feb–Dec (Kalsi; New Forest-Dehradun Valley; Chakarata RF-Hills); Chilla-RNP, Dec (Mussoorie)
59	<i>Gonepteryx rhamni nepalensis</i> Doubleday	Common Brimstone	Very Common	Feb–May (New Forest, Asan River-Dehradun Valley; Sahastradhara, Maldeota, Malsi, Shikhar Falls); Feb–Dec (Mussoorie; Chakarata; Nag Tibba; KMDR; GWLS; NDBR; Pauri Garhwal; Aglar Valley).
60	<i>Gonepteryx mahaguru mahaguru</i> Gistel	Lesser Brimstone	Rare	March (Deolsari-KMDR)
61	<i>Eurema brigitta rubella</i> Wallace	Small Grass Yellow	Common	March–April; Oct–Nov (New Forest; Timli-Dehradun Valley; Sept–Oct (Mandal; Tala-KMDR; Oct (Chakarata-Hills), Sept (Devalsari-Aglar Valley); Oct (Saneh-Lansdowne)
62	<i>Eurema andersonii jordani</i> Corbet & Pendlebury	One Spot Grass Yellow	Uncommon	March, July (Dehradun Valley); Oct (Chakarata-Hills).
63	<i>Eurema hecabe hecabe</i> Linnaeus	Common Grass Yellow	Common	Feb–Dec (Dehradun Valley); Oct (Chakarata-hills). Oct (Saneh-Lansdowne)
64	<i>Eurema blanda silhetana</i> Wallace	Three Spot Grass Yellow	Common	March–May; July; Aug, Nov, Dec (New Forest; Rikhauli-Dehradun Valley, Maldeota, Malsi RF); Sept–Oct (Mandal; Anusuya Devi-KMDR; Chakarata RF).
65	<i>Eurema laeta laeta</i> Boisduval	Spotless Grass Yellow	Common	May–Dec (Benog-Mussoorie); April, Oct, Dec (Thano-Dehradun Valley); Feb–Mar; Oct–Dec (Naitwar-GWLS; Makkumath-KMDR; Chakarata; Chauri Khal–Pauri Garhwal-Hills); Aug–Sep (Jogiyada, Devalsari-Aglar Valley); Oct (Saneh-Lansdowne)
66	<i>Colias eogene eogene</i> Felder & Felder	Fiery Clouded Yellow		Talbot (1939). No recent published records from Uttarakhand.
67	<i>Colias fieldii fieldii</i> Ménétriés	Dark Clouded Yellow	Common	Jan–May, Oct–Dec (Deolsari; Chopta; Tunganath-KMDR; Chakarata; Mussoorie); May (Bharoghati–Gangotri NP); July (Naitwar-GWLS); March–May, Dec (New Forest; Asan River-Dehradun Valley; Jhajra; Sahastradhara; Dhoran Khas); May–June, Sep–Oct (Magra RF, Devalsari RF-Aglar Valley); July (Khirsu)
68	<i>Colias erate</i> Esper	Pale Clouded Yellow	Uncommon	Feb; April (New Forest; Timli, Rampur mandi–Asan river; Dhoran Khas-Dehradun Valley); March–April (Chakarata); Mussoorie Apr–June (Devalsari-Aglar Valley)
69	<i>Colias ladakensis</i> C. & R. Felder	Ladakh Clouded Yellow	Rare on Nilung Pass,	Gangotri in July (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
III Family: Lycaenidae				
a. Subfamily: Poritiinae				
70	<i>Poritia hewitsoni hewitsoni</i> Moore IWPA1972, Sch. II	Common Gem	Uncommon	Feb–Dec (New Forest; Karvapani; Malsi RF; Thano-Dehradun Valley & Shiwaliks)
b. Subfamily: Curetinae				
71	<i>Curetis bulis</i> Westwood	Bright Sunbeam	Uncommon	June–July; Sept (Mandal; Makku-KMDR); July (Istragad–GWLS)
72	<i>Curetis dentata denata</i> Moore	Angled Sunbeam	Common	April–Aug; Nov (Dehradun Valley & Shiwaliks; Maldeota); Mar (KDMR)
c. Subfamily: Theclinae				
73	<i>Euaspa milionia milionia</i> Hewitson	Water Hairstreak	Locally common	May–June (oak forest below Woodstock school; Benog WLS-Mussoorie)

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74	<i>Euaspa ziha</i> Hewitson IWPA1972, Sch. II	White-spotted Hairstreak	Uncommon	May–June (Makku-KMDR; Benog, Woodstock nala-Mussoorie)
75	[<i>Esakiozephyrus mandara dohertyi</i> de Nicéville IWPA1972, Sch. II	Indian Purple Hairstreak		May–July (Nagtibba; Pabur and Nila valleys in Jaunsaur (Mackinnon & de Nicéville, 1899), no recent records.
76	<i>Esakiozephyrus icana icana</i> Moore	Dull Green Hairstreak	Rare	July (Deoban–Chakarata RF)
77	<i>Thermozephyrus ataxus ataxus</i> Westwood IWPA1972, Sch. II	Wonderful Hairstreak	Very Rare	June (Nr Chopta-KMDR)
78	<i>Chrysozephyrus syla syla</i> Kollar	Silver Hairstreak	Common	July–Sept. (Kanchula Kharak-KMDR; Deoban–Chakarata); Oct (Jakhol; Istragad–GPVNP)
79	<i>Chrysozephyrus birupa</i> Moore	Fawn Hairstreak	Common	May–June (Woodstock school; Benog-Mussoorie); Jul, Sept–Oct (Makku-Duggal Bitta-KMDR; Adwani; Khirsu-Pauri Garhwal, Devalsari-Aglar Valley)
80	<i>Chaetoprocta odata peilei</i> Forster	Walnut Blue	Uncommon	May–Aug (Mandal-KMDR; Woodstock School -Mussoorie)
81	<i>Strymonidias assanides</i> Kollar	White–line Hairstreak	Not rare in inner valleys (Wynter-Blyth 1957)	Recorded from Garhwal by Mackinnon & de Nicéville (1899) (Jul–Aug, Nila Valley, 2,400 m). No recent published records from Garhwal.
82	<i>Iraota timoleon timoleon</i> Stoll	Silverstreak Blue	Uncommon	May; Oct–Nov (New Forest; Doon school; Jhajra; Laxmansidh-Dehradun Valley)
83	<i>Arhopala rama rama</i> Kollar	Dark Himalayan Oakblue	Common	June–July; Sept–Nov. (Mandal-Kanchula Kharak-KMDR); Apr (Devalsari-Aglar Valley)
84	<i>Arhopala dodonaea</i> Moore	Pale Himalayan Oakblue	Common	Mar–Jul; Oct–Nov. (Mussoorie; Aglar Valley; Pangarana–Buddha Kedar-Tehri Garhwal; Khirsu, Pauri Garhwal)
85	<i>Arhopala paraganesa paraganesa</i> de Nicéville	Dusky Bushblue	Rare	Dec (Koti Kimoi-Mussoorie); June (Mandal-KMDR)
86	<i>Arhopala ganesa ganesa</i> Moore	Tailless Bushblue	Very Common	Mar–Jul; Aug, Oct (Adwani; Khirsu-Pauri Garhwal; Woodstock School, Benog, Nali, Jabberkhet-Mussoorie); Apr, Sept (Devalsari RF)
87	<i>Arhopala amantes amantes</i> Hewitson	Large Oakblue	Very Common	Mar–Dec (Sal forests: Dehradun Valley & Shiwaliks). Malsi, Danda Lokhand, Dhoran Khas; Devalsari RF
88	<i>Arhopala atrax</i> Hewitson	Indian Oakblue	Very Common	Mar–Dec (Sal forests: Dehradun Valley & Shiwaliks; Benog, Woodstock nala-Mussoorie)
89	<i>Arhopala centaurus pirthous</i> Moore	Western Centaur Oakblue	Rare	May (Woodstock School-Mussoorie)
90	[<i>Arhopala oenea</i> Hewitson	Hewitson's Dull Oakblue	Very Rare	Mussoorie (Evans 1957). No recent published records from Garhwal.
91	[<i>Arhopala singla</i> de Nicéville	Yellow–disc Oakblue	Very Rare	Mussoorie (Evans 1957). No recent published records from Garhwal.
93	<i>Flos asoka</i> de Nicéville	Spangled Plushblue	Rare	June (Khattapani, Lacchiwala-Dehradun Valley)
94	<i>Surendra vivarna</i> Moore	Common Acacia Blue	Common	June–Aug; Nov–Dec (Dehradun Valley & Shiwaliks; Malsi; Sahastradhara, Dhoran Khas)
95	<i>Loxura atymnus continentalis</i> Fruhstorfer	Yamfly	Common	Feb–April; June–Oct (New Forest; Jhajra; Karvapani; Dhoran Khas; Malsi; Sahastradhara-Dehradun Valley & Shiwaliks)
96	<i>Spindasis vulcanus vulcanus</i> Fabricius	Common Silverline	Common	June–July; Oct–Nov (Barawala, Kalsi, New Forest, Thano -Dehradun Valley; Saneh-Lansdowne)
97	<i>Spindasis ictis</i> Hewitson	Common Shot Silverline	Uncommon	Mar, May–June (Thano; Barawala, Kalsi, Sahastradhara-Dehradun Valley)
98	<i>Spindasis nipalicus</i> Moore IWPA1972, Sch. II	Silver Grey Silverline	Common	Mar–May (Thano; Laxman sidh -Dehradun Valley; Woodstock nala-Mussoorie)
99	<i>Spindasis lohita</i> Horsfield IWPA1972, Sch. II	Long–banded Silverline	Uncommon	May–June (Kansrao-Shiwaliks)
100	<i>Spindasis elima uniformis</i> Moore IWPA1972, Sch. II	Scarce Shot Silverline	Uncommon	Mar–April (Thano-Dehradun Valley)
101	<i>Rapala selira</i> Moore	Himalayan Red Flash	Common	April–May (Mandal; Makku-KMDR; Benog WLS; Koti Kimoi-Mussoorie)
102	<i>Rapala nissa nissa</i> Kollar	Common Flash	Common	Mar; May–Oct (Mussoorie; Devalsari; Chakarata; Taluka-GWLS; Khirsu-Pauri Garhwal; KDMR); Jan (Dhoran Khas-Dehradun)

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103	<i>Rapala varuna grisea</i> Moore IWPA1972, Sch. II	Indigo Flash	Common	Mar; Sept–Dec (Maldeota; Kalusidh; New Forest, Karvapani, Sahastradhara; Phanduwala Rau-Dehradun Valley and Shiwaliks); May (Woodstock nala-Mussoorie); GNP (Uniyal et al. 2013)
104	<i>Rapala manea schistacea</i> Moore	Slate Flash	Common	Mar–July; Oct–Nov. (Kalsi; New Forest, Thano; Karvapani; Kansrao; Sahastradhara, Dhoran Khas, Sukh Rau (Rajaji)-Dehradun Valley and Shiwaliks); Devalsari RF.
105	<i>Rapala iarbus airbus</i> Fabricius	Indian Red Flash	Uncommon	April–June (Karvapani; Thano-Dehradun Valley & Shiwaliks); GNP (Uniyal et al. 2013)
106	<i>Zesius chrysomallus</i> Hübner	Redspot	Rare	Mar–May (Barawala, Kalsi, Hathibarkala -Dehradun Valley)
107	<i>Deudorix epijarbus epijarbus</i> Moore	Cornelian	Uncommon	April; Sept–Nov (Mandal -KMDR; ChakarataRF; Dhoran Khas-Dehradun; Phandowala–Rajaji; Devalsari-Aglar Valley)
108	[<i>Catapaecilma major major</i> Druce	Common Tinsel	Rare	March–May; July–Aug (Mussoorie) & Aug–Sept (Dehradun) (Mackinnon & de Nicéville, 1899). No recent records from Uttarakhand.
109	<i>Hypolycaena othona othona</i> Hewitson	Orchid Tit	Common	Mar–May; June–Nov (Jhajra; Karvapani; Kansrao; Thano; Timli; New Forest; Danada Lokhand, Sahastradhara-Dehradun Valley & Shiwaliks)
110	<i>Chliaria kina kina</i> Hewitson IWPA1972, Sch. II	Blue Tit	Uncommon	June–Oct (Makku; Mandal- KMDR; Mussoorie; Chakarata; Pauri); GNP (Uniyal et al. 2013)
111	<i>Ancema ctesia ctesia</i> Hewitson	Bi-spot Royal	Uncommon	July; Oct (Mandal; Tala-KMDR)
112	[<i>Tajuria yajna yajna</i> Doherty IWPA1972, Sch. II	Chestnut & Black Royal		Single record-Mussoorie (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
113	<i>Tajuria cippus cippus</i> Fabricius IWPA1972, Sch. II	Peacock Royal	Uncommon	March; May (Baarwala-Dehradun Valley; Chauki Dhaulas); Oct (Chakarata)
114	[<i>Tajuria jehana</i> Moore	Plains Blue Royal	Not rare	May–Sept Mussoorie and Dehradun (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
115	<i>Tajuria diaeus diaeus</i> Hewitson IWPA1972, Sch. II	Straightline Royal	Uncommon	Nov–Dec (Makku; Mandal-KMDR)
116	<i>Pratapa deva lila</i> Moore IWPA1972, Sch. II	White Tufted Royal	Rare	Nov (New Forest -Dehradun Valley)
117	<i>Pratapa icetas icetas</i> Hewitson IWPA1972, Sch. II	Dark Blue Royal	Rare	Sept (Makku-KMDR); Oct (Govind Pashu Vihar)
118	[<i>Tajuria illurgis</i> Hewitson IWPA1972, Sch. II	White Royal		April–June (Mussoorie; Nagtibba); Aug (Dehradun) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
119	[<i>Creon cleobis cleobis</i> Godart	Broadtail Royal		July, Sept Mussoorie & Feb, April, Aug-Dehradun (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
120	<i>Sinthus chandrana chandrana</i> Moore IWPA1972, Sch. II	Broad Spark	Rare	Nov (New Forest -Dehradun Valley); April Mandal- Anusuiya Devi– KMDR); June (Dhanaulty-Mussoorie).
121	[<i>Sinthus nasaka pallidor</i> Fruhstorfer IWPA1972, Sch. II	Narrow Spark		June–Aug (Mussoorie); July–Sept (Dehradun) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
122	<i>Virachola isocrates</i> Fabricius	Common Guava Blue	Uncommon	June (New Forest-Dehradun Valley); Aug (Jardhargaon-Tehri Garhwal)
123	<i>Virachola perse perse</i> Hewitson	Large Guava Blue	Uncommon	June; Oct–Nov (Kalsi; Chowki, Hathibarkala-Dehradun Valley)
124	<i>Horaga onyx onyx</i> Moore IWPA1972, Sch. II	Common Onyx	Uncommon	Oct–Nov (New Forest-Dehradun Valley; Asan CR); Apr (Woodstock nala-Mussoorie; Jardhargaon-Tehri Garhwal)
125	<i>Horaga viola</i> Moore IWPA1972, Sch. II	Brown Onyx	Rare	Oct–Nov (New Forest-Dehradun Valley)
d. Subfamily: Lycaeninae				
126	<i>Lycaena pavana</i> Kollar	White-bordered Copper	Very Common	April–Dec (Dhanaulty; Mussoorie; Devalsari; Chakarata; Kanchula Kharak– KMDR; Chauri Khal– Pauri Garhwal)
127	<i>Lycaena phlaeas baralacha</i> Moore	Common Copper	Common	April–Dec (Dhanaulty; Mussoorie; Devalsari; Chakarata, KMDR; Govind Pashu Vihar); May (Bharoghati–Gangotri NP)
128	[<i>Lycaena kasyapa</i> Moore	Green Copper	Rare	Govind Pashu Vihar (Uniyal et al 2013). Record needs verification.
129	<i>Heliophorus tamu tamu</i> Kollar	Powdery Green Sapphire	Common	March–Nov (Mussoorie; Mandal; Kanchula Kharak-KMDR; Chakarata)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
130	<i>Heliophorus moorei coruscans</i> Moore	Green Sapphire (=Azure Sapphire)	Common	July–Aug (Dangan-GWLSanctuary, Uttarkashi); Oct–Nov (Chakarata)
131	<i>Heliophorus sena</i> Kollar	Sorrel Sapphire	Very Common	Feb–Dec (Chaurikhal Pauri Garhwal; Maldeota; Kalsi; Chakarata; Mussoorie; Naitwar; Deoriya Taal–KDMR, Jardhagaon-Foothills and Himalayas; Saneh-Lansdowne)
132	[<i>Heliophorus brahma brahma</i> Moore	Golden Sapphire		Aug; Sept in broad leaved forest in Nanda Devi National Park (Uniyal, 2004) (Istragad–Govind Pashu Vihar (Bhardwaj et al. 2012) Record needs verification.
e. Subfamily: Polyommatinae				
133	<i>Chilades pandava pandava</i> Horsfield	Plains Cupid	Common	April–May; Aug–Dec (Thano, Maldeota, New Forest-Dehradun Valley; Sahastradhara; Shikar Falls); March–Oct (Chakarata; Saneh–Lansdowne)
134	<i>Chilades parrhasius parrhasius</i> Fabricius	Indian Cupid	Common	April (Thano, New Forest-Dehradun Valley)
135	<i>Chilades lajus lajus</i> Stoll	Lime Blue	Uncommon	Oct–Nov (New Forest-Dehradun Valley; Chakarata; Saneh-Lansdowne)
136	<i>Everes (argiades) indica</i> Evans	Tailed Cupid	Uncommon	March; May–June (Baarwala; Thano-Dehradun Valley; Magra, Devalsari RF-Aglar Valley); Oct (Saneh-Lansdowne)
137	<i>Everes lacturnus assamica</i> Tytler	Indian Cupid	Uncommon	Mar–April (Chauki Dhaulas; Devalsari)
138	<i>Everes huegeli dipora</i> Moore	Dusky Blue Cupid	Uncommon	Oct (Saneh-Lansdowne)
139	<i>Everes argiades diporides</i> Chapman	Chapman's Cupid	Common	Feb–May; Oct–Nov (Benog-Mussoorie; Chakarata; Devalsari)
140	<i>Acytolepis puspa gisca</i> Fruhstorfer	Common Hedge Blue	Very Common	May–Dec (Langha, Kansrao, Jhajra; New Forest; Sahastradhara, Maldeota, Shikar Falls, Sukh Rau, Rajaji-Dehradun Valley; Mandal-KMDR); Oct Saneh-Lansdowne
141	<i>Oreolyce vardhana vardhana</i> Moore	Dusky Hedge Blue	Uncommon	June; Oct–Nov (Chakarata), June (Dhanaulty)
142	<i>Udara dilecta dilecta</i> Moore	Pale Hedge Blue	Common	July–Sept. (Kanchula Kharak-KMDR); Nov–Dec (Dhoran Khas, Sahastradhara-Dehradun)
143	<i>Udara albocerulea albocerulea</i> Moore	Albocerulean	Locally common	April–Dec (Mandal; Makku-KMDR; Chakarata); New Forest, Maldeota, Sahastradhara-Dehradun Valley; Woodstock nala-Mussoorie, Devalsari; Magra RF-Aglar Valley)
144	<i>Celastrina lavendularis limbata</i> Moore	Plain Hedge Blue	Very Common	June; Oct (Dhanaulty-Tehri Garhwal; Chakarata)
145	<i>Celastrina gigas</i> Hemming	Silvery Hedge Blue	Common	April–Dec (Mandal, Kanchula Kharak-KMDR; Woodstock nala-Mussoorie; Magra, Devalsari-Aglar Valley)
146	<i>Celastrina argiolus kollari</i> Linnaeus	Hill Hedge Blue	Uncommon	May (Mandal- KMDR)
147	<i>Celastrina huegeli huegeli</i> Moore	Large Hedge Blue	Common	March–Oct (Govind Ghat-VOFNP; Anusuya Devi; Mandal; Makku-KMDR; Dhanaulty-Tehri Garhwal)
148	<i>Celatoxia marginata marginata</i> de Nicéville	Margined Hedge Blue	Common	May–June; Oct (Woodstock nala-Mussoorie; Dhanaulty-Tehri Garhwal; Makku; Anusuya Devi-KMDR; Chakarata); Dec (New Forest; Jhajra; Sahastradhara-Dehradun Valley)
149	<i>Zizeeria karsandra</i> Moore	Dark Grass Blue	Common	May–June (Mussoorie; New Forest; Timli-Dehradun Valley, Sahastradhara; Dhoran Khas; Maldeota; Shivaliks); Sept–Nov (Anusuya Devi; Chakarata)
150	<i>Pseudozizeeria maha maha</i> Kollar	Pale Grass Blue	Very Common	July; Nov (Jhajra, Maldeota-Dehradun Valley); Sept–Oct (Anusuya Devi; Chakarata); Oct (Saneh-Lansdowne)
151	<i>Zizeeria oits oits</i> Fabricius	Lesser Grass Blue	Common	Jan–June (New Forest; Barawala; Thano-Dehradun Valley; Sahastradhara; Deoriya Taal–KDMR)
152	<i>Zizula hylax hylax</i> Fabricius	Tiny Grass Blue	Common	Oct–Dec (Sahastradhara; Maldeota-Dehradun; Tiger Falls, nr. Chakarata)
153	<i>Catochrysops strabo</i> Fabricius	Forget-me-not Blue	Common	May; Oct–Nov (Barawala, Jhajra, Karvapani, New Forest; Maldeota; Sahastradhara; Chowki Daulas; Phandowala Rau-Dehradun Valley and Shivaliks; Saneh-Lansdowne)
154	<i>Lampides boeticus</i> Linnaeus IWPA1972, Sch. II	Pea Blue	Common	March–Oct (Bharoghathi–Gangotri NP; Sanki–Taluka– GWLS; Chakarata; Mussoorie; Magra RF); Mar–May; Oct–Nov (New Forest; Sahastradhara; Dhoran Khas; Kaduapani; Shikar Falls; Chauki Daulas-Dehradun Valley)
155	<i>Azanius ubaldus</i> Stoll	Bright Babul Blue	Uncommon	April–May (Thano-Dehradun Valley)
156	<i>Leptotes plinius plinius</i> Fabricius	Zebra Blue	Very Common	Feb–Dec (Thano, New Forest, Kasli; Maldeota; Sahastradhara; Shikar Falls-Dehradun Valley; Tiger Falls-Chakarata)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
157	<i>Euchrysops cnejus cnejus</i> Fabricius IWPA1972, Sch. II	Gram Blue	Very Common	June (Karvapani-Dehradun Valley); Oct (Chakarata)
158	<i>Jamides bochus bochus</i> Stoll	Dark Cerulean	Common	Jan, Sept–Dec (Maldeota; Dhoran Khas; Kalusidh; New Forest; Dhoran Khas-Dehradun Valley); May (Woodstock nala-Mussoorie); June (Devalsari-Aglar valley)
159	<i>Jamides celeno celeno</i> Cramer	Common Cerulean	Very Common	July–Dec (Karvapani; Timli; New Forest; Jhajra; Malsi; Sahastradhara; Maldeota; Dhoran Khas-Dehradun Valley; Tiger Falls-Chakarata; Saneh-Lansdowne)
160	<i>Prosotas nora ardates</i> Moore	Common Lineblue	Very Common	April–May; Aug–Dec (Sahastradhara; Shikar Falls; Maldeota; Phandowala & Sukh Rau–Rajaji Jhajra, New Forest-Dehradun Valley; Chakarata RF; Saneh-Lansdowne)
161	<i>Prosotas dubiosa indica</i> Evans	Tailless Lineblue	Common	May; Sept–Oct Jhajra; Maldeota; Sahastradhara; Thano-Dehradun Valley)
162	[<i>Prosotas noreia hamptonii</i> de Nicéville	White-tipped Lineblue	Rare	Rare in Doon; May, Aug, Nov (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
163	<i>Tarucus balkanicus nigra</i> Bethune–Baker	Black-spotted Pierrot	Rare	Unconfirmed record by SS. Aug (Maldeota, Dehradun)
164	<i>Tarucus indica</i> Evans	Pointed Pierrot	Uncommon	Aug (Karvapani-Dehradun Valley)
165	[<i>Tarucus nara</i> Kollar	Striped Pierrot	Not rare	Mussoorie (Wynter-Blyth 1957).
166	<i>Tarucus venosus</i> Moore	Himalayan Pierrot	Common	May–Aug, Nov (Maldeota; Danda Lokhand; Dhoran Khas, Asan)
167	<i>Castalius rosimon rosimon</i> Fabricius	Common Pierrot	Very Common	Mar; June–Oct (Jhajra; New Forest; Motichur at Rajaji-Dehradun Valley; KDMR); Oct (Saneh-Lansdowne)
168	<i>Talicauda nyseus nyseus</i> Guérin–Méneville	Red Pierrot	Common	Jan–Dec (New Forest; Kalsi; Vasant Vihar; Dhoran Khas; Shikar Falls; Motichur (Rajaji)-Dehradun Valley; Woodstock nala-Mussoorie; Kotdwar); Oct (Chakarata-Hills).
169	<i>Freyeria putli</i> Kollar	Least Grass Jewel	Common	June, Nov (Jhajra, New Forest-Dehradun Valley); Dec (Chilla–RNP; Dhoran Khas); Aug (Jardhgaon)
170	<i>Freyeria trochylus trochylus</i> Freyer	Grass Jewel	Common	May–Aug, Nov–Dec (Jhajra, Thano, New Forest; Dhoran Khas; Malsi RF-Dehradun Valley; Sukh Rau; Chilla–Rajaji; Devalsari); Oct (Tiger Falls-Chakarata)
171	<i>Neopithecops zalmora zalmora</i> Butler	Common Quaker	Uncommon	July (Kansrao; Motichur-RNP-Shiwali); Oct (Sahastradhara-Dehradun; Chakarata; Saneh-Lansdowne)
172	<i>Megisba malaya sikkima</i> Moore	Malayan	Common	July–Dec (Thano, Kalusidh, Timli, New Forest, Maldeota, Kaduapani, Sahastradhara, Dhoran Khas, Dehradun Valley; Motichur, Chilla, Phandowala–RNP); Oct (Chakarata)
173	<i>Aricia agestis nazira</i> Moore	Orange-bordered Argus	Uncommon	Feb–Apr (Asan Barrage-Dehradun Valley); Jun, Oct–Nov (Chakarata, Makku-KMDR); Apr, Jun, Sept (Devalsari-Aglar Valley); June (Dhanualty-Mussoorie)
174	[<i>Polyommatus eros</i> Ochsenheimer	Common Meadow Blue	Very Rare	Very common at Nila and Baspa Valley, 3,650m in Jul–Sept (Mackinnon & de Nicéville, 1899); Uniyal et al 2013 (Gangotri). Record needs verification.
175	[<i>Albulina lehanus lehanus</i> Moore	Common Mountain Blue	Very Rare	Rare at Nilung Pass in Jun–Jul (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
176	[<i>Albulina galathea galathea</i> Blanchard	Large Green Underwing	Very Rare	Reportedly very common at Nila and Baspa Valley near snowline in Jul–Sept (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
f. Subfamily :Miletinae				
177	<i>Spalgis epeus epeus</i> Westwood	Apefly	Very Rare	Nov (Maldeota). Record extends range to Garhwal.
IV. Family : Riodinidae				
178	<i>Dodona eugenes eugenes</i> Bates	Tailed Punch	Very Common	Mar–July; Sep–Oct. (Anusuya Devi-KMDR; Dhanualty-Tehri Garhwal; Benog; Woodstock nala; Nali-Mussoorie; Chakarata)
179	<i>Dodona dipoea nostia</i> Fruhstorfer IWPA1972, Sch. II	Lesser Punch	Common	May; Sept–Oct (Woodstock nala, Benog-Mussoorie; Mandal, Makku-KMDR; Chakarata)
180	<i>Dodona durga durga</i> Kollar	Common Punch	Very Common	March–Nov (KMDR; GWLS; Mussoorie; Chakarata; Pauri Garhwal)
181	<i>Dodona ouida phlegra</i> Fruhstorfer	Mixed Punch	Rare	May–June (Woodstock school; Benog WLS– Mussoorie)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
182	<i>[Dodona egeon egeon]</i> Westwood IWPA1972, Sch. II	Orange Punch		May–June in Mussoorie (Ollenbach, 1930). No recent published records from Garhwal.
183	<i>Abisara fylla</i> Westwood	Dark Judy	Uncommon	Mar; Nov (Chowki; Sahastradhara-Dehradun foothills); Mar; May–Oct (Mandal- KMDR)
184	<i>Abisara bifasciata suffusa</i> Moore	Double–banded Judy	Very Common	Mar–Dec (Karvapani, Timli, Kansrao; Hajra; New Forest; Thano, Chowki, Dhoran Khas; Malsi; Sukh Rau, Rajaji-Dehradun Valley & Shiwaliks); Oct (Chakarata)
185	<i>Zemeros flegyas flegyas</i> Cramer	Punchinello	Uncommon	Mar–April; Nov–Dec (Chowki; Dhoran Khas; Langha-Dehradun foothills; Nali-Mussoorie; KDMR); Oct (Saneh-Lansdowne)
V Family: Nymphalidae				
a. Subfamily: Satyrinae				
186	<i>Elymnias hypermnestra undularis</i> Linnaeus	Common Palmfly	Common	March–May; Oct–Dec (New Forest; Karvapani; Sahastradhara; Maldeota-Dehradun Valley)
187	<i>Melanitis leda leda</i> Linnaeus	Common Evening Brown	Very Common	Feb.–May; Sept–Dec (New Forest; Vikas nagar; Hajra; Karvapani; Sahastradhara; Malsi; Maldeota; Motichur; Phandowala-Dehradun Valley & Shiwaliks); Sept–Oct. (Mussoorie; Chakarata); Oct (Saneh-Lansdowne)
188	<i>Melanitis phedima bela</i> Cramer	Dark Evening Brown	Uncommon	Mar–April; Oct–Nov (Timli; Karvapani; New Forest; Malsi; Phandowala Rau-Dehradun Valley & Shiwaliks; Woodstock nala-Mussoorie)
189	<i>[Melanitis zitenius zitenius]</i> Herbst	Great Evening Brown	Very Rare	Govind Pashu Vihar (Uniyal et al. 2013). First record from Garhwal. Earlier known from E. Kumaon. Record needs verification.
190	<i>Lethe europa niladana</i> Fruhstorfer	Bamboo Treebrown	Common	April–Oct (New Forest, Karvapani-Dehradun & Shiwaliks valley); Oct (Chakarata)
191	<i>Lethe rohria rohria</i> Fabricius	Common Treebrown	Common	Mar–May; Oct–Nov (Rikhauli, Maldeota; New Forest; Malsi; Sahastradhara-Dehradun Valley & foothills; Woodstock nala-Mussoorie; Jadhargaon-Tehri Garhwal); July–Oct (Dangan village-GWLS; Chakarata)
192	<i>Lethe confusa confusa</i> Aurivillius	Banded Treebrown	Common	May, Sept–Nov (Sahastradhara-Dehradun; Rikhauli-Foothills); Woodstock nala; Benog-Mussoorie; Chakarata; KMDR; GWLS); Oct (Saneh-Lansdowne)
193	<i>Lethe verma verma</i> Kollar	Straight–banded Treebrown	Common	May–June, Aug–Oct (Rikhauli-Foothills; Woodstock nala; Benog-Mussoorie; Magra RF-Aglar Valley; Mandal, Makkumath-KMDR; Chakarata; Adwani-Pauri Garhwal)
194	<i>[Lethe dakwania]</i> Tytler, 1939	Garhwal Woodbrown	Rare	A series collected from Dakwani, 2740 m, E. Garhwal (Tytler, 1939). No recent published records from Garhwal.
195	<i>Lethe sidonis</i> Doherty	Common Woodbrown	Common	July–Oct (Benog-Mussoorie; Magra RF-Aglar Valley; Chakarata; Mandal; Kanchula Kharak-KMDR)
196	<i>Lethe maitrya maitrya</i> de Nicéville	Barred Woodbrown	Uncommon	June–July (Mandal; Kanchula Kharak-KMDR)
197	<i>[Lethe nicetas]</i> Hewitson	Yellow Woodbrown	Rare	Tehri Garhwal, northeast of Mussoorie (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal. Recent records from E. Kumaon.
198	<i>Lethe siderea</i> Marshall	Scarce Woodbrown	Rare	June–July (Mandal; Kanchula Kharak; KMDR)
199	<i>Lethe insana insana</i> Kollar IWPA1972, Sch. II	Common Forester	Uncommon	May–Sept (Benog-Mussoorie; Naitwar-GWLS; Makkumath-KMDR)
200	<i>[Lethe jalaurida jalaurida]</i> de Nicéville	Small Silverfork	Rare	July–Aug (Baspa = Sangla valley, Har–ki–doon area, Govind Pashu Vihar) (Mackinnon, & de Nicéville, 1899). No recent published records from Garhwal.
201	<i>Lethe baladeva aisa</i> Fruhstorfer IWPA1972, Sch. II	Treble Silverstripe	Rare	June (Makku-KMDR). Extends range to Garhwal.
202	<i>Lethe goalpara goalpara</i> Fruhstorfer	Large Goldenfork	Rare	Sept (Mandal-Kanchula Kharak-KMDR)
203	<i>Mycalesis nicotia</i> Westwood	Brighteye Bushbrown	Rare	June–July (Mandal-KMDR)
204	<i>Mycalesis mineus mineus</i> Linnaeus	Darkbrand Bushbrown	Common	Mar–Dec (Dehradun Valley & Shiwaliks); Oct (Saneh-Lansdowne)
205	<i>Mycalesis visala visala</i> Moore	Longbrand Bushbrown	Uncommon	Oct–Nov (Langha-Foothills; New Forest-Dehradun Valley); Oct (Chakarata RF)
206	<i>Mycalesis perseus blasius</i> Fabricius	Common Bushbrown	Common	Jan–Nov (Dehradun Valley and Shiwaliks); Sept (Adwani-Pauri Garhwal); Oct (Saneh-Lansdowne)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
207	<i>Mycalesis francisca sanatanana</i> Moore	Lilacine Bushbrown	Locally common	April–July; Sept (Benog; Woodstock school-Mussoorie; Ghorghati; Devalsari-Tehri Garhwal)
208	<i>Mycalesis lepcha lepcha</i> Moore	Lepcha Bushbrown	Uncommon	Mar–Oct (Benog; Woodstock nala-Mussoorie; Sahastradhara-Dehradun; Mandal-KMDR)
209	<i>Mycalesis heri</i> Moore IWPA1972, Sch. II	Moore's Bushbrown	Rare	July–August (Mandal -KMDR). Extends range to Garhwal.
210	<i>Mycalesis suaveolens ranotei</i> Smetacek	Wood–Mason's Bushbrown	Very Rare	July (Mandal-KMDR). Extends range to Garhwal.
211	<i>Orsotriaena medus medus</i> Fabricius	Nigger (Medus Brown)	Rare	Sept–Oct (Chakarata)
212	<i>Orinoma damaris damaris</i> Gray	Tigerbrown	Uncommon	July–Nov (Mandal & Kanchula Kharak-KMDR)
213	<i>Neope yama buckleyi</i> Talbot	Dusky Labyrinth	Uncommon	May–Sept (Mussoorie–BWLS; Mandal-Kanchula Kharak-KMDR; Jhitad–Tiuni)
214	<i>Neope pulaha pandyia</i> Talbot	Veined Labyrinth	Uncommon	March–Sept (Mandal, Gopeshwar-KMDR; Govindghat–Chamoli; Taluka–Gangarh-GWLS)
215	<i>Ypthima (Dallacha) hyagriva hyagriva</i> Moore	Brown Argus	Rare	Sept (Magra, Devalsari-Aglar Valley; Mandal-KMDR)
216	<i>Callerebia annada caeca</i> Watkins	Ringed Argus	Common	May–Nov (Benog; Woodstock nala-Mussoorie; Mandal-KMDR; Maldeota; Sahastradhara-Dehradun; Devalsari-Aglar Valley; Naitwar-GWLS; Chakarata)
217	<i>Callerebia hybrida</i> Butler	Hybrid Argus	Common	May–July; Sept–Oct (Benog; Woodstock nala; Jharipani-Mussoorie; Mandal-KMDR; Chakarata)
218	<i>Callerebia kalinda kalinda</i> Moore	Scarce Mountain Argus	Very Rare	May–June (Dhanaulti-Tehri Garhwal)
219	<i>Callerebia nirmala nirmala</i> Moore	Common Argus	Very Common	May–Oct (Chakarata; Dhanaulti; Jabberkhet; Woodstock nala-Mussoorie; Mandal-KMDR); Jan (New Forest-Dehradun)
220	<i>Callerebia shallada</i> Lang	Mountain Argus	Very Rare	May–Jul (NagTibba-Mussoorie) (Mackinnon & de Nicéville, 1899). No recent records from Uttarakhand.
221	<i>Callerebia scanda scanda</i> Kollar	Pallid Argus	Common	July–Oct (Benog; Jabberket-Mussoorie; Mandal; Makkumath-KMDR; Istragad-GWLS; Chakarata)
222	<i>Ypthima avanta</i> Moore	Jewel Fourring	Rare	April (Devalsari-Aglar Valley); Jun (Chakrata)
223	<i>Ypthima asterope mahratia</i> Moore	Common Threering	Uncommon	June (Kandoliya–Pauri Garhwal); Aug (Jardhagaon-Tehri Garhwal)
224	<i>Ypthima nareda nareda</i> Kollar	Large Threering	Uncommon	May–Nov (Mandal-KMDR; Sahastradhara-Dehradun; Mussoorie; Jhitad–Tuni; Chakarata)
225	<i>Ypthima inica</i> Hewitson	Lesser Threering	Very Common	July (Dhanaulti-Tehri Garhwal)
226	<i>Ypthima huebneri</i> Kirby	Common Fourring	Common	Feb–April; July–Oct (Dehradun Valley); Oct (Chakarata); Oct (Saneh-Lansdowne)
227	<i>Ypthima baldus baldus</i> Fabricius	Common Fivering	Very Common	Mar–April; Sept–Nov (Dehradun Valley & Shiwaliks); Oct (Chakarata); Oct (Saneh-Lansdowne)
228	<i>Ypthima indecora</i> Moore	Western Fivering	Uncommon	Mar–April; Sept–Oct (Mandal-Chopta-KMDR; Naitwar-GWLS)
229	<i>Ypthima nikaia</i> Moore	Himalayan Fivering	Very Common	May–Oct. (Bataghat; Jabberkhet; Benog-Mussoorie; Magra-Aglar Valley; Dangan-GWLS; Chakarata)
230	<i>Ypthima kedarnathensis</i> Singh	Garhwal Sixring	Common	April–July; Sept–Oct (Mandal); Anusuiya Devi-KMDR; Benog WLS-Mussoorie)
231	<i>Ypthima newara newara</i> Moore	Newar Threering	Very Rare	Single specimen from Dehradun in FRI Collection. Only record from Uttarakhand.
232	<i>Lasiommata schakra schakra</i> Kollar	Common Wall	Very Common	Mar–May; June–Oct (Dhanaulti-TehriGarhwal; Benog, Bata Ghat; Nali-Mussoorie; Magra-Aglar Valley; Maldeota-Dehradun; Chakarata; Mandal-KMDR)
233	<i>Rhaphicera moorei moorei</i> Butler	Small Tawny Wall	Uncommon	July–Oct (Kanchula Kharak-KMDR; Sankri–Govind Pashu Vihar; Suwakholi–Buraskhanda-Tehri Garhwal; Bhundar–Govindghat–Chamoli)
234	<i>Aulocera swaha swaha</i> Kollar	Common Satyr	Common	April–Sept (hills of Garhwal between 1400–3000m)
235	<i>Aulocera saraswati saraswati</i> Kollar	Striated Satyr	Common	July–Oct (Suwakholi-Mussoorie; Chakarata RF)
236	<i>Aulocera brahminus dokwana</i> Evans	Narrow–banded Satyr	Rare	Sept (Valley of Flowers–VOFNP; Tunganath-KMDR)
237	<i>Aulocera padma padma</i> Kollar	Great Satyr	Uncommon	July–Sept. (Kanchula Kharak-KMDR)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
238	<i>Paralasa mani</i> de Nicéville	Yellow Argus	Uncommon	Gangotri National Park (Bhardwaj and Uniyal, 2013). Record needs verification.
239	[<i>Hipparchia parisatis shiva</i> Kollar	White-edged Rockbrown	Rare	July Mussoorie (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
240	[<i>Hyponephele lupina</i> Costa	Branded Meadowbrown	Rare	3,300–3,600 m, Jul–Aug (Baspa Valley, Har–ki–dun, Govind Pashu Vihar) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
241	[<i>Hyponephele pulchra</i> C. & R. Felder	Dusky Meadowbrown		Jul–Sept (common in higher valleys) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
242	[<i>Oeneis buddha garhwalica</i> Tytler	Tibetan Satyr		N. Garhwal (Evans, 1932). No recent published records from Uttarakhand
b. Subfamily: Apaturinae				
243	<i>Apatura ambica ambica</i> Kollar IWPA1972, Sch. II	Indian Purple Emperor	Rare	Sept (Gharsari–Mandal KMDR)
244	<i>Dilipa morgiana</i> Westwood IWPA1972, Sch. I	Golden Emperor	Rare	Mar & June (Mandal and Makku-KMDR)
245	<i>Chitoria sordida</i> Moore IWPA, 1972, Sch. II	Sordid Emperor	Very Rare	Single record of a male collected from Dawarka Nath in Chakarata Hills in June 1955 by G.D. Bhasin, in National Forest Insect Collection at the Forest Research Institute, Dehradun, Uttarakhand, India.
246	<i>Euripus consimilis consimilis</i> Westwood	Painted Courtesan	Uncommon	Oct–Nov (Kalsi; New Forest; Maldeota-Dehradun Valley); June (Pabo–Pauri Garhwal)
247	<i>Sephisa dichroa</i> Kollar	Western Courtier	Common	April–Oct (Benog; Woodstock School; Bata Ghat-Mussoorie; Magra RF-Aglar Valley; Chakarata; Mandal-KMDR; Chauri Khal; Khirsu-Pauri Garhwal)
248	<i>Hestinalis nama nama</i> Doubleday	Circe	Uncommon	May, Oct–Dec (Woodstock School-Mussoorie; Shikhar Falls; Maldeota; Sahastradhara-Dehradun; Chakarata)
249	<i>Hestina nicévillei</i> Moore	Scarce Siren	Very Rare	Single record from Garhwal (Wynter-Blyth, 1957). No recent published records.
250	<i>Hestina persimilis zella</i> Butler	Siren	Rare	Oct–Nov (Maldeota foothills in Tehri Garhwal -Dehradun Valley); Apr, June (Devalsari-Aglar Valley)
c. Subfamily: Pseudergolinae				
251	[<i>Dichorragia nesimachus nesimachus</i> Boisduval	Constable		Single record, April, Mussoorie (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
252	<i>Stibochiona nicea nicea</i> Gray	Popinjay	Uncommon	April–Sept (Mandal-Kanchula Kharak-KMDR; Dhaura-GWLS; Chakarata); Mar, May (Chauki Dholas; Dhoran Khas & foothills-Dehradun; Woodstock nala-Mussoorie); May (Aglar Valley)
253	<i>Pseudergalis wedah wedah</i> Kollar	Tabby	Common	April–July; Aug–Dec (Mandal-KMDR; Jharipani, Benog; Woodstock nala-Mussoorie; Sahastradhara; Maldeota; Shikhar Falls-Dehradun; Magra; Devalsari-Aglar Valley; Taluka-GWLS; Chakarata RF)
d. Subfamily: Charaxinae				
254	<i>Charaxes solon solon</i> Fabricius	Black Rajah	Uncommon	Mar–June (Asan Barrage; Sahastradhara-Dehradun Valley)
255	[<i>Charaxes bernardus hierax</i> Fabricius	Tawny Rajah		Sept (Mussoorie) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
256	<i>Charaxes athmas athamas</i> Drury	Common Nawab	Uncommon	April–Dec (Chakarata, Mussoorie, Dhoran Khas; Sahastradhara; Maldeota; Shikhar Falls; Dehradun Valley and Shiwaliks; Lansdowne)
257	<i>Charaxes dolon dolon</i> Westwood	Stately Nawab	Rare	May (Kanchula Kharak-KMDR; Magra & Devalsari-Aglar Valley)
258	[<i>Charaxes arja</i> C. & R. Felder	Pallid Nawab		Landour-Mussoorie. Identity doubtful (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
259	<i>Charaxes agrarius agrarius</i> Swinhoe	Anomalous Nawab	Rare	Oct (Saneh-Lansdowne)
e. Subfamily: Calinaginae				
260	[<i>Calinaga buddha</i> Moore	Freak	Very Rare	Single individual in FRI Collection from Mussoorie collected in May 1904 (Bingham, 1905). No recent published records from Garhwal.
f. Subfamily: Biblidinae				
261	<i>Ariadne ariadne pallidior</i> Fruhstorfer	Angled Castor	Uncommon	Sept (New Forest-Dehradun Valley); Oct (Chakarata)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
262	<i>Ariadne merione tapestrina</i> Moore	Common Castor	Very Common	Jan; Mar; May; Aug–Dec (Foothills; Dehradun Valley & Shiwaliks); Oct (Chakarata); Oct (Saneh-Lansdowne)
g. Subfamily: Heliconiinae				
263	<i>Cupha erymanthis lotis</i> Sulzer	Rustic	Very Common	July–Oct (Mandal-KMDR; Chakarata); April–Oct (Chauki Dholas-Foothills; New Forest; Jhajra; Thano -Dehradun Valley and Timli, Karvapani-Shiwaliks; Shikhar Falls); Oct (Saneh-Lansdowne)
264	<i>Phalanta phalantha phalantha</i> Drury	Common Leopard	Very Common	Sept–Oct (Mandal-KMDR; Chakarata); April–May; Aug–Dec (Foothills; New Forest; Herbertpur; Thano; Sahastradhara; Maldeota; Shikhar Falls-Dehradun Valley; Timli, Karvapani; Sukha Rau-Shiwaliks; Magra-Aglar Valley); Oct (Saneh-Lansdowne)
265	<i>Vagrans egista sinha</i> Kollar	Vagrant	Common	May; Sept–Dec (New Forest; Sahastradhara; Dhoran Khas; Shikhar Falls; Maldeota-Dehradun Valley; Karvapani-Shiwaliks; Lansdowne)
266	<i>Argynnis hyperbius hyperbius</i> Linnaeus	Indian Fritillary	Uncommon	Mar–April; Oct–Dec (New Forest-Dehradun Valley; Maldeota April; Oct (Chakarata; Mussoorie; Mandal-KMDR)
267	<i>[Argynnis pandora pasargades</i> Fruhstorfer	Western Silverstripe	Very Rare	Govind Pashu Vihar (Uniyal et al. 2013). Record needs verification.
268	<i>Argynnis kamala</i> Moore	Common Silverstripe	Uncommon	Sept (Naitwar-GWLS)
269	<i>[Argynnis jainadeva jainadeva</i> Moore	Highbrown Silverspot	Very Rare	Jun–Aug; Upper Ganga Valley (Mackinnon & de Nicéville, 1899); Govind Pashu Vihar (Uniyal et al. 2013).
270	<i>Argynnis childreni sakontala</i> Kollar	Large Silverstripe	Common	Oct–Nov (Rikhauli-Foothills; Sahastradhara; Maldeota-Dehradun Valley); Sept (Duggalbitta-KMDR; Mussoorie; Chakarata)
271	<i>Speyeria clara clara</i> Blanchard	Silverstreak	Rare	Aug–Sept (Nila Valley; Upper Ganga), numerous in 1889, Baspa Valley-Har-kidun) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
272	<i>[Speyeria aglaja</i> Linnaeus	Dark Green Silverspot	Very Rare	Govind Pashu Vihar (Uniyal et al. 2013). Record needs verification.
273	<i>Boloria sipora sipora</i> Moore	Straightwing Silverspot	Very rare	A specimen in the FRI collection from Tehri (Roonwal et. al, 1963). No recent published records from Garhwal.
274	<i>Issoria (lathonia) isaea</i> Doubleday	Queen of Spain Fritillary	Common	Feb–Dec (Woodstock nala; Dhanaulty-Mussoorie; Magra & Devalsari-Aglar Valley; Chakaraka; Deoriya Tal; Chopta-KMDR; Auli-NDBR; Taluka-GWLS; Gangotri NP)
275	<i>[Cethosia cyane cyane</i> Drury	Leopard Lacewing		Unconfirmed record by Mackinnon & de Nicéville (1899) from Garhwal. No recent published records from Garhwal.
276	<i>Acraea issoria issoria</i> Hübner	Yellow Coster	Locally Common	Sept–Oct (Benog-Mussoorie; Anusuyia Devi-KMDR Jharipani; Chakarata-hills; Chowki Dhauas; Malsi-Foothills & New Forest & Lacchiwala-Dehradun Valley); May–Jun (Woodstock School and surrounds, Dhanaulty-Mussoorie; Devalsari-Aglar Valley; Sahastradhara, Shikhar Falls-Dehradun)
277	<i>Acraea violae</i> Fabricius	Tawny Coster	Common	Mar–Dec (New Forest; Sahastradhara; Dhoran Khas-Dehradun Valley; Timli-Shiwaliks)
h. Subfamily: Nymphalinae				
278	<i>Junonia iphita iphita</i> Cramer	Chocolate Soldier	Very Common	Mar–Dec (Foothills; Dehradun Valley & Shiwaliks); Mar–Sept (Chakarata; Mussoorie; Adwani-Pauri Garhwal)
279	<i>Junonia orithya ocyale</i> Hübner	Blue Pansy	Common	Mar–Dec (Dehradun Valley & Shiwaliks); Oct (Chakarata): Oct (Saneh-Lansdowne)
280	<i>Junonia hierta hierta</i> Fabricius	Yellow Pansy	Common	Feb–Dec (Foothills; Dehradun Valley & Shiwaliks); Feb–Oct (Chakarata; Pauri Garhwal); Oct (Saneh-Lansdowne)
281	<i>Junonia lemonias lemonias</i> Linnaeus	Lemon Pansy	Very Common	Mar–Dec (Foothills; Dehradun Valley & Shiwaliks); Oct (Saneh-Lansdowne)
282	<i>Junonia atlites atlites</i> Linnaeus	Grey Pansy	Common	Mar–Dec (Jhajra, New Forest-Dehradun Valley & Karvapani-Shiwaliks); Oct (Chakarata); Oct (Saneh-Lansdowne)
283	<i>Junonia almana almana</i> Linnaeus	Peacock Pansy	Very Common	Mar–Dec (Foothills; Dehradun Valley & Shiwaliks); Mar (Benog), Oct (Chakarata); Oct (Saneh-Lansdowne)
284	<i>Kaniska canace canace</i> Evans	Blue Admiral	Common	Mar–Nov (Hills–Chakarata; Taluka–Osla-GWLS; Mandal-Kanchula Kharak; Khirsu; Mussoorie–Benog, Woodstock Nala, Dhanaulty; all over forested areas in foothills; Dehradun Valley and Shiwaliks)
285	<i>Vanessa indica indica</i> Herbst	Indian Red Admiral	Common	Mar–Dec (Ubiquitous– Hills; foothills; Dehradun Valley & Shiwaliks; Mussoorie; Magra; Deoriya Tal–KMDR); Oct (Saneh-Lansdowne)

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286	<i>Vanessa cardui cardui</i> Linnaeus	Painted Lady	Common	Mar–Dec (Hills; Foothills; Dehradun Valley and Shivaliks); Mar–Oct (Gangotri NP; Deoriya Tal; Mandal-KMDR, Chakarata; Mussoorie)
287	<i>Aglais caschmirensis aesis</i> Fruhstorfer	Indian Tortoiseshell	Very Common	Jan–Dec (Ubiquitous-Hills; foothills); Winter-Dehradun Valley
288	<i>Nymphalis xanthomelas</i> <i>ferescens</i> Stichel	Large Tortoiseshell	Uncommon	Feb–May (Chopta–Tunganath-KMDR; Kunwari Pass–NDBR; Benog-Mussoorie; Gangotri NP)
289	<i>Aglais ladakensis</i> Moore	Ladakh Tortoiseshell		Nilang Pass (Mackinnon & de Nicéville, 1899). No recent records from Uttarakhand.
290	<i>Polygona c–album cognata</i> Moore IWPA1972, Sch. II	Eastern Comma	Uncommon /Very local	Mar–Sept (Sankri-Taluka-GWLS; Ghangaria VOFNP; Mandal- KMDR)
291	<i>Symbrenthia niphanda</i> <i>hysudra</i> Moore	Bluetail Jester	Rare	May (Devalsari)
290	<i>Symbrenthia hypselis cotanda</i> Moore	Spotted Jester	Very Rare	Recorded from GNP (Bhardwaj et al. 2012).
291	<i>Symbrenthia lillaea khasiana</i> Moore	Common Jester	Very Common	Mar–Dec (Hills–Chakarata; Mussoorie; Devalsari-Aglar Valley; Naitwar-GWLS; Mandal; Makku-KMDR; all over Dehradun Valley and Shivaliks)
292	<i>Symbrenthia brabira brabira</i> Moore	Himalayan Jester	Uncommon	April–Oct (Mandal; Makku-KMDR; Chakarata; Woodstock Nala-Mussoorie)
293	<i>Hypolimnas misippus</i> Linnaeus IWPA1972, Sch. II	Danaid Eggfly	Uncommon	Sept (Mandal-KMDR; Govind Ghat-Bhundar-NDBR); Feb, Aug–Nov (Asan Barrage-Dehradun Valley; Malsi; Maldeota; Sahastradhara); Oct (Saneh-Lansdowne)
294	<i>Hypolimnas bolina jacinta</i> Drury	Great Eggfly	Very Common	April–Dec (Hathipaon-Mussoorie; Chakarata; New Forest; Thano, Jhajra; Sahastradhara; Maldeota; all over Dehradun Valley; Timli, Karvapani-Shivaliks); Oct (Saneh-Lansdowne)
295	<i>Kallima inachus huegeli</i> Kollar	Orange Oakleaf	Common	Mar–Nov (Mussoorie; Chakarata; Mandal-Anusuya Devi- KMDR; Pauri Garhwal-Hills; Chawki Dholas– Foothills; New Forest, Jhajra, Dehradun Valley; Timli, Karvapani, Kansrao- Shivaliks); Oct (Saneh-Lansdowne)
i. Subfamily: Cyrestinae				
296	<i>Cyrestis thyodamas ganescha</i> Kollar	Common Map	Common	Mar–Dec (Khirsu; Mussoorie; Mandal-Anusuya Devi-KMDR; Chakarata; Dehradun Valley; Shivaliks)
j. Subfamily: Limenitidinae				
297	<i>Neptis ananta ananta</i> Moore	Yellow Sailer	Uncommon	May–Oct (Woodstock School; Benog-Mussoorie; Devalsari- Aglar Valley; Mandal-Anusuya Devi-KMDR; Kaddukhal– Dhanaulty-Tehri Garhwal–Pauri Garhwal-Hills)
273	<i>Boloria sipora sipora</i> Moore	Straightwing Silverspot	Very rare	A specimen in the FRI collection from Tehri (Roonwal et. al, 1963). No recent published records from Garhwal.
298	<i>Neptis nata yerburyii</i> Butler	Yerbury's Sailer/Burmese Sailer	Common	April (Mandal-KMDR); April–Oct (Karvapani; New Forest; Timli- Dehradun Valley)
299	<i>Neptis hylas varmona</i> Moore	Common Sailer	Common	Mar–Dec (Foothills; Dehradun Valley & Shivaliks; Mussoorie; Chakarata Hills); Oct (Saneh-Lansdowne)
300	<i>Neptis sappho astola</i> Moore	Pallas's Sailer	Very Common	April–July (Maldeota; Sahastradhara; Malsi-Dehradun; Woodstock Nala-Mussoorie Hills; Mandal-KMDR; Naitwar- GWLS)
301	<i>Neptis clinia praedicta</i> Smetacek	Clear Sailer	Common	April–Dec (Dehradun Valley & Shivaliks; Woodstock Nala- Mussoorie; Chakarata); Mar, Sept (Anusuya Devi-KMDR; Taluka-GWLS)
302	<i>Neptis mahendra mahendra</i> Moore	Himalayan Sailer	Uncommon	April–Nov (Hills: Mandal-Kanchula Kharak-KMDR; Naitwar– Taluka-GWLS; Chakarata Hills)
303	<i>Phaedyma columella ophiana</i> Cramer	Short–Banded Sailer	Uncommon	Mar–Nov (Dehradun Valley–New Forest; Foothills–Baarwala)
304	<i>Neptis sankara sankara</i> Kollar	Broad–Banded Sailer	Uncommon	April–Sept (Mussoorie; Mandal-Anusuyia Devi-KMDR; Kandolya–Pauri Garhwal; Chakarata); Dec (Chilla–Rajaji)
305	<i>Neptis narayana narayana</i> Moore IWPA1972, Sch. II	Broadstick Sailer	Uncommon; Very local	May–July (Hills; Woodstock School-Mussoorie; Khirsu; Devalsari-Aglar Valley)
306	<i>Neptis soma butleri</i> Moore IWPA1972, Sch. II	Sullied Sailer	Uncommon	Mar–Nov (Hills:Mandal-KMDR; Foothills& Dehradun Valley: Thano; Sahastradhara; Maldeota; Chakarata Hills)
307	<i>Neptis zaida zaida</i> Doubleday IWPA1972, Sch. II	Pale Green Sailor	Uncommon	April–June (Hills: Mussoorie–Woodstock School; Dhanaulty- Tehri Garhwal); Dehradun–Shikar Falls

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308	<i>Neptis cartica cartica</i> Moore	Plain Sailer		Mussoorie (Atkinson, 1882). Single brooded in May from 1200–1800m (Smetacek, 2011). No recent published records from Garhwal.
309	<i>Pantoporia hordonia hordonia</i> Stoll	Common Lascar	Very Common	Oct–Nov (Dehradun Valley–New Forest; Maldeota; Dhoran Khas; Thano & Shiwaliks; Tiger Falls–Chakarata; Lansdowne); Apr (Sahastradhara)
310	<i>Pantoporia sandaka davidsoni</i> Eliot	Anomalous or Extra Lascar	Uncommon	Oct–Nov (Maldeota; New Forest–Dehradun)
311	<i>Athya perius perius</i> Linnaeus	Common Sergeant	Common	April–Nov (foothills; Dehradun Valley & Shiwaliks; Malsi; Maldeota; Sahastradhara); Oct–Dec (Chakarata; Rudra Prayag; Lansdowne)
312	<i>Athya asura asura</i> Moore IWPA1972, Sch. II	Studded Sergeant	Uncommon	Sept–Oct (Dehradun–Shikhar Falls; Hills: Mandal & Makku-KMDR); Jun (Devalsari-Aglar Valley; Dhanauly-Mussoorie)
313	<i>Athya opalina opalina</i> Kollar	Himalayan Sergeant	Very Common	Jan, April–Dec (Hills–Bata Ghat, Woodstock Nala, Benog-Mussoorie; Magra; Devalsari; foothills; New Forest, Sahastradhara; Maldeota–Dehradun Valley; Chakarata)
314	<i>Athya selenophora selenophora</i> Kollar	Staff Sergeant	Common	Mar–Dec (Mandal-KMDR; Chakarata); Oct (foothills–Sahastradhara, Malsi); Oct (Dehradun Valley: New Forest) & Mar (Shiwaliks: Phanduwala)
315	<i>Athya cama cama</i> Moore	Orange Staff Sergeant	Uncommon	May (Chowki Dhaulas-Foothills); Aug (Shikhar Falls)
316	<i>Modusa procris procris</i> Cramer	Commander	Common	Oct–Dec (New Forest–Dehradun Valley; Timli-Shiwaliks; Danda Lokhand; Chowki Dhaulas; Sukh Rau–Rajaji-Foothills); Oct (Chakarata)
317	<i>Auzakia danava danava</i> Moore IWPA1972, Sch. II	Commodore	Common	Mar–May; Sept–Nov (Woodstock School; Benog-Mussoorie; Dhanauly; Makku-KMDR; Sahastradhara; Maldeota; Shikhar Falls–Dehradun Valley)
318	<i>[Limenitis trivena pallida</i> Tytler	Indian White Admiral	Rare	(Bhardwaj et al. 2012) in Govind Pashu Vihar NP. Record needs verification.
319	<i>Euthalia patala patala</i> Kollar	Grand Duchess	Locally Common	May–Sept (Ban oak forests–Benog, Woodstock School–Mussoorie; Chakarata; Mandal-Kanchula Kharak-KMDR; Khirsu; Devalsari-Aglar Valley).
320	<i>Euthalia lubentina lubentina</i> Cramer IWPA1972, Sch. IV	Gaudy Baron	Uncommon	Mar–April; Oct–Nov (New Forest; Thano; Maldeota, Chauki Daulas–Dehradun Valley; Timli-Shiwaliks)
321	<i>Euthalia aconthea garuda</i> Moore	Common Baron	Common	April–Nov (New Forest; Chauki Daulas; Rajpur Road–Dehradun Valley & Timli-Shiwaliks; Lansdowne)
322	<i>Symphaedra nais</i> Forster	Baronet	Uncommon	May (Baarwala-Foothills; Timli-Shiwaliks)
323	<i>Tanaecia lepidea lepidea</i> Butler	Grey Count	Rare	Oct (New Forest; Hathibarkala–Dehradun Valley).
k. Subfamily: Libytheinae				
324	<i>Libythea myrrha sanguinalis</i> Godart	Club Beak	Common	April–Nov (New Forest; Sahastradhara; Maldeota–Dehradun Valley; Timli–Sukh Rau–Rajaji-Shiwaliks; Lansdowne)
325	<i>Libythia lepita lepita</i> Moore IWPA1972, Sch. II	Common Beak	Common	Feb–Dec (Chakarata; Taluka-GWLS; Mandal–Chopta–KWLS; Mussoorie; Magra; Jhajra–Dehradun Valley)
I. Sub-family: Danainae				
326	<i>Danaus chrysippus chrysippus</i> Linnaeus	Plain Tiger	Common	April–Nov (Ubiquitous - all over Dehradun Valley)
327	<i>Danaus genutia genutia</i> Cramer	Common Tiger	Common	Mar–Dec (Ubiquitous - all over Dehradun Valley; Magra-Aglar Valley; Tiger Falls–Chakarata)
328	<i>Tirumala septentrionis septentrionis</i> Butler	Dark Blue Tiger	Common	Jan–Nov (Thano; New Forest; Sahastradhara–Dehradun Valley); Oct (Chakarata; Mussoorie)
329	<i>Tirumala limniace exotica</i> Gmélin	Blue Tiger	Common	May–Nov (Jhajra; New Forest; Maldeota; Shikhar Falls; Sahastradhara–Dehradun Valley; Karvapani - Shiwaliks; Mussoorie–Dhanauly)
330	<i>Parantica aglea melanoides</i> Moore	Glassy Tiger	Common	Jan–Dec (New Forest, Jhajra, Shikhar Falls, Maldeota, Sahastradhara–Dehradun Valley & Timli-Shiwaliks; Magra-Aglar Valley)
331	<i>Parantica sita sita</i> Kollar	Chestnut Tiger	Common	Jan; April; Aug–Dec (New Forest; Asan CR; Jhajra, Kalusidh; Malsi; Sahastradhara; Maldeota–Dehradun Valley); Nov (Kansrao-Shiwaliks); May–Oct (Chakarata; Mussoorie; Magra; Mandal; Makku-KMDR)
332	<i>Euploea mulciber mulciber</i> Cramer IWPA1972, Sch. IV	Striped Blue Crow	Common	Mar–Nov (New Forest; Maldeota; Sahastradhara; Malsi; Sukh Rau–Rajaji–Dehradun Valley; Chakarata; Mussoorie; Magra-Aglar Valley; Mandal -KMDR)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
333	<i>Euploea core core</i> Cramer	Common Indian Crow	Common	Mar–Dec (Dehradun Valley & Shwaliks); Oct (Chakarata)
B. Superfamily: Hesperioidea				
I Family: Hesperidae				
a. Subfamily: Coeliadinae				
334	<i>Burara oedipodea belesis</i> Mabille	Branded Orange Awlet	Uncommon	May–Oct (Jhajra; New Forest-Dehradun Valley & Karvapani-Shiwaliks)
335	<i>Burara jaina jaina</i> Moore	Orange Awlet	Uncommon	Aug–Oct (New Forest-Dehradun Valley & Maldeota-Foothills)
336	[<i>Burara anandi</i> de Nicéville	Plain Orange Awlet		Single record in May (Mussoorie) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
337	[<i>Hasora chromus chromus</i> Cramer	Common Banded Awl		Single record from Gangotri landscape (Uniyal et al 2013).
338	<i>Bibasis sena sena</i> Moore IWPA1972, Sch. II	Orange-tailed Awl	Uncommon	Oct (Jharipani – Sulphur springs below Mussoorie)
339	<i>Badamia exclamationis</i> Fabricius	Brown Awl	Uncommon	Nov (Chowki Dhaulas-Foothills); Oct (Mussoorie–Benog WLS)
340	<i>Choaspes benjaminii japonica</i> Guérin–Méneville	Indian Awlking	Uncommon	Mar–April; Sept (Mandal-Anusurya Devi-KMDR; Mussoorie–Benog WLS)
241	[<i>Choaspes xanthopogon</i>	Similar Awlking	Very rare	Kashmir to Kumaon (Evans, 1949). No recent published records from Garhwal.
b. Subfamily: Pyrginae				
342	<i>Lobocla liliana ignatius</i> Plötz	Marbled Flat	Uncommon	May–Sept (Dhanaulty, Mussoorie–Benog WLS; Tiger Falls-Chakarata; Devalsari-Aglar Valley; Chaurikhal–Pauri Garhwal; Makkumath-KMDR)
343	<i>Celaenorrhinus leucocera leucocera</i> Kollar	Common Spotted Flat	Common	May; Sept–Oct (Maldeota; Shikhar Falls; Rikhauli-Foothills; Bijapur dam–canal-Dehradun Valley; Anusuyia Devi; Makkumath-KMDR)
344	<i>Celaenorrhinus munda</i> Moore	Himalayan Spotted Flat	Uncommon	May–June (Mussoorie–Benog–Dhanaulty; Chauri Khal, Pauri Garhwal)
345	<i>Celaenorrhinus pulomaya</i> Moore	Multi-spotted Flat	Uncommon	Aug (Ghoraghati–Lakha Mandal)
346	<i>Celaenorrhinus pero pero</i> de Nicéville	Mussoorie Spotted Flat	Common	June–July (Mandal-KMDR; Mussoorie–Woodstock School)
347	<i>Celaenorrhinus dhanada</i> Moore	Himalayan Yellow-banded Flat	Rare	Sept (Mandal-Kanchula Kharak-KMDR)
348	[<i>Darpa hanria</i> Moore	Hairy Angle		May–Mussoorie (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
349	<i>Pseudocoladenia dan fatih</i> Kollar	Fulvous Pied Flat	Common	Mar–Oct (Chakarata RF; Mussoorie–Bataghat; Mandal; Anusuyia Devi-KMDR-Hills; Thano, Jhajra, New Forest; Maldeota; Shikhar Falls; Sahastradhara-Dehradun Valley; Timli-Shiwaliks)
350	<i>Coladenia indrani indrani</i> Moore	Tri-colour Pied Flat	Uncommon	May–Aug (New Forest-Dehradun Valley)
351	<i>Sarangesa purendra</i> Moore	Spotted Small Flat	Locally Common	April–June; Aug–Nov (Rikhauli-Foothills; Sahastradhara; Shikhar Falls; Woodstock Nala-Mussoorie; Tiger Falls-Chakarata)
352	<i>Sarangesa dasahara dasahara</i> Moore	Common Small Flat	Common	Mar–Dec (Dehradun Valley & Shiwaliks; Sahastradhara; Shikhar Falls; Maldeota); Oct (Chakarata RF) (Saneh)
353	<i>Seseria dohertyi dohertyi</i> Watson	Himalayan White Flat	Uncommon	April–May (Bataghat-Mussoorie)
354	<i>Tagiades menaka menaka</i> Moore	Spotted Snow Flat	Common	Mar, May; June, Aug–Nov (Jhajra; Sahastradhara; Dehradun Valley' Magra-Aglar Valley; Woodstock Nala-Mussoorie)
355	<i>Tagiades litigiosa litigiosa</i> Möschler	Water Snow Flat	Common	Mar–April; Sept–Oct (New Forest-Dehradun Valley; Chowki Dhaulas-Foothills); Oct (Tiger Falls- Chakarata RF)
356	<i>Tagiades japetus ravi</i> Moore	Common Snow Flat	Uncommon	June–Oct (Mussoorie)
357	<i>Caprona agama agama</i> Moore	Spotted Angle	Uncommon	Mar–Oct (Karvapani, Timli-Shiwaliks; Thano-Dehradun Valley)
358	<i>Caprona ransonnetti potiphora</i> Hewitson	Golden Angle	Uncommon	Aug–Oct (Chowki Dhaulas-Dehradun Foothills; Chakarata; Mussoorie)
359	<i>Caprona alida yerburyi</i> Evans	Yellow-spotted Angle	Very Rare	Collected from Dehradun (Evans 1949). No recent published records from Garhwal.

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
360	<i>Odontoptilum angulata angulata</i> Felder	Chestnut Angle	Uncommon	Mar–April (Chowki Daulas; Sahastradhara-Dehradun foothills)
361	<i>Spialia galba</i> Fabricius	Indian Skipper	Common	April–Dec (New Forest; Dhoran Khas; Thano-Dehradun Valley; Yamuna pul-Nain Bag-Tehri Garhwal; Timli, Karvapani-Shiwaliaks); Oct (below Chakarata)
262	[<i>Carcharodus alceae gooraisa</i> Evans	Plain Marbled Skipper		No recent records from Uttarakhand, Mussoorie (Evans 1949).
c. Subfamily: Hesperinae				
363	[<i>Actinor radians</i> Moore	Veined Dart		April (Dehradun) (Mackinnon & de Nicéville 1899).
364	<i>Ampittia dioscorides dioscorides</i> Fabricius	Bush Hopper	Locally Common	July–Oct (Karvapani; Herbertpur-Timli Dehradun Valley & Shiwaliaks); Oct (Chakarata RF-Hills)
365	<i>Pedesta masuriensis masuriensis</i> Moore	Mussoorie Bush Bob	Rare	May–June (Benog WLS-Mussoorie; Tiger Falls-Chakarata)
366	[<i>Halpe porus</i> Mabille	Moore's Ace		May, Dehradun (Mackinnon & de Nicéville 1899). No recent published records from Garhwal.
367	<i>Thoressa aina aina</i> de Nicéville	Garhwal Ace	Rare	Oct (Benog WLS-Mussoorie)
368	<i>Sovia grahami</i> Evans	Graham's Ace	Rare	May (Mandal-KMDR)
369	[<i>Thoressa gupta gupta</i> de Nicéville	Olive Ace		May, Tehri Garhwal (Mackinnon & de Nicéville 1899). No recent published records from Garhwal.
370	<i>Udaspes folus</i> Cramer	Grass Demon	Common	April; Sept–Oct (Jhajra; New Forest-Dehradun Valley & Timli, Karvapani-Shiwaliaks; Tiger Falls- Chakarata)
371	<i>Notocrypta curvifascia curvifascia</i> C. & R. Felder	Restricted Demon	Common	May–Oct (New Forest; Jhajra-Dehradun Valley; Lacchiwala; Kansrao; Karvapani-Shiwaliaks; Woodstock Nala-Mussoorie; Chakarata-hills)
372	<i>Notocrypta feisthamalli alysos</i> Moore	Spotted Demon	Common	April–June (Mussoorie; Chakarata)
373	<i>Suastus gremius gremius</i> Fabricius	Indian Palm Bob	Locally Common	May–Nov (New Forest; Dhoran Khas; Sahastradhara-Dehradun Valley; Rikhauli-Foothills)
374	<i>Iambrix salsala salsala</i> Moore	Chestnut Bob	Uncommon	Sept (Mandal; Anusuya Devi; Makkumath-KMDR)
375	<i>Hyarotis adrastus praba</i> Moore IWPA1972, Sch. IV	Tree Flitter	Common	May–Oct (New Forest; Sahastradhara; Shikhar Falls-Dehradun Valley)
376	<i>Erionota torus</i> Evans	Palm Red–Eye	Rare	Sept–Oct (New Forest-Dehradun Valley)
377	<i>Matapa aria</i> Moore	Common Red Eye	Common	April–Oct (New Forest; Dhoran Khas-Dehradun Valley; Karvapani, Timli-Shiwaliaks)
378	<i>Ochlodes brahma brahma</i> Moore	Himalayan Darter	Uncommon	May–June (Bataghat-Mussoorie–Dhanaulty)
379	[<i>Ochlodes siva siva</i> Moore	Assam Darter	Very Rare	A single specimen from from Mussoorie in NHM (Evans 1949). No recent published records from Garhwal.
380	<i>Hesperia comma dimila</i> Moore	Chequered Darter	No recent records from Uttarakhand	Jul–Aug, 4,800m, Nilang Pass (Mackinnon & de Nicéville 1899)
381	<i>Taractrocera danna</i> Moore	Himalayan Grass Dart	Uncommon	Oct (New Forest-Dehradun Valley)
382	<i>Taractrocera maevius</i> Fabricius	Common Grass Dart	Locally common	June–July (Mohankhal-KMDR)
383	<i>Oriens golooides</i> Moore	Common Dartlet	Very Common	July–Nov (Dehradun Valley and Shiwaliaks; Sahastradhara)
384	<i>Potanthus dara</i> Kollar	Himalayan Dart	Uncommon	July–Oct (Maldeota; Chowki Dhaulas-Foothills; New Forest-Dehradun Valley)
385	[<i>Potanthus maesoides</i> Butler	Lesser Dart		May, Aug–Sept (Mussoorie & Dehradun)(Mackinnon & de Nicéville, 1899 - Identity doubtful)
386	<i>Potanthus pseudomaesa</i> Moore	Common Dart	Common	Sept–Oct (Mandal-KMDR)
387	[<i>Potanthus pallida</i> Evans	Pale Dart		Simla to Kumaon (Evans, 1949). Unconfirmed record from Sahastradhara (SS).
388	[<i>Potanthus pavapava</i> Fruhstorfer	Yellow Dart		Mussoorie (Evans 1949). No recent published records from Garhwal.
389	<i>Telicota colon colon</i> Fabricius	Pale Palm Dart	Very Common	May; Aug–Nov (Herbertpur–Asan Barrage; New Forest-Dehradun Valley)
390	<i>Telicota bambusae bambusae</i> Moore	Dark Palm Dart	Common	Aug; Oct–Nov (New Forest; Sahastradhara; Shikhar Falls-Dehradun Valley; Chakarata RF)

	Species	Common name	Relative abundance	Month & Sites of collection/ observation & earlier references
391	<i>Aeromachus stigmata stigmata</i> Moore	Veined Scrub Hopper	Uncommon	Aug–Oct (Mussoorie–Benog WLS; Shikhar Falls–Dehradun; Jadhargaon–Tehri Garhwal; Magra–Aglar Valley; Tiger Falls–Chakarata)
392	<i>Aeromachus dubius dubius</i> Elwes & Edwards	Dingy Scrub Hopper	Uncommon	Aug–Sept (Naitwar–Dhaura–GWLS; Mandal–KMDR)
393	[<i>Gegenes nostradamus</i> Fabricius	Dingy Swift		Sept (Mussoorie); August (Dehradun) (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
394	<i>Parnara guttatus mangala</i> Moore	Straight Swift	Common	Sept–Nov (Mandal–Anusuiya Devi–KMDR; Chakarata–hills; Maldeota–Foothills; New Forest–Dehradun Valley)
395	<i>Borbo cinnara</i> Wallace	Rice Swift	Uncommon	Oct–Nov (New Forest, all over agricultural land, Dehradun Valley)
396	<i>Borbo bevani</i> Moore	Bevan’s Swift	Uncommon	Sept–Nov (Maldeota–Foothills; Sahastradhara; New Forest, Timli–Dehradun Valley; Tiger Falls–Chakarata; Saneh–Lansdowne)
397	<i>Pelopidas sinensis</i> Mabille IWPA1972, Sch. IV	Large Branded Swift	Uncommon	Jan, Mar, Sept–Oct; (New Forest–Dehradun Valley; Sahastradhara; Benog–Mussoorie)
398	<i>Pelopidas mathias mathias</i> Fabricius	Small Branded Swift	Common	May–Nov (New Forest; Vikas nagar; Herbertpur; Sahastradhara; Maldeota–Dehradun Valley; Timli–Shiwalik; Chakarata RF–Hills)
399	<i>Pelopidas conjuncta conjuncta</i> Herrich–Schäffer	Conjoined Swift	Rare	Sept–Oct (New Forest–Dehradun Valley; Chakarata RF–Hills)
400	<i>Pelopidas agna agna</i> Moore	Dark Branded Swift	Range extension to Uttarakhand	May (Magra–Aglar Valley). Unconfirmed sighting.
401	<i>Pelopidas assamensis</i> de Nicéville IWPA1972, Sch. IV	Great Swift	Uncommon	Aug–Nov (Maldeota; Shikhar Falls; Sahastradhara–Foothills; Ramgarh–RNP–Shiwalik; Sept (Mandal–KMDR; Chakarata RF–Hills)
402	<i>Polytremis discreta discreta</i> Elwes & Edwards IWPA1972, Sch. IV	Himalayan Swift	Uncommon	May, Jul–Aug, Oct–Nov (Maldeota–Dehradun; Magra–Aglar Valley; Jabberkhet–Mussoorie; Mandal–Kanchula Kharak–KMDR)
403	<i>Polytremis eltola</i> Hewitson	Yellowspot Swift	Very Common	May–June; Aug–Oct (New Forest; Sahastradhara; Shikhar Falls; Maldeota–Dehradun Valley; Magra; Devalsari–Aglar Valley; Mandal–KMDR; Naitwar–GWLS)
404	<i>Baoris pagana</i> de Nicéville	Figure–of–8–Swift	Rare	(New Forest–Dehradun Valley)
405	<i>Baoris farri</i> Moore IWPA1972, Sch. IV	Paintbrush Swift	Rare	Oct (Saneh–Lansdowne; New Forest–Dehradun Valley)
406	<i>Caltoris plebeia</i> de Nicéville	Tufted Swift		Single record in April from Dehradun (Mackinnon & de Nicéville, 1899). No recent published records from Garhwal.
407	<i>Heliophorus oda</i> Hewitson, 1865 (Family: Lycaenidae)	Eastern Blue Sapphire	Rare	A single male recorded by APS on 17 April 2016 on wet ground in a mixed oak–deodar forest along the road side between Suwakholi and Rotu–ki–Bela near Mussoorie at ~1900m (Image 38).

IWPA1972 - Indian Wildlife (Protection) Act, 1972.

1048.

Singh, A.P. & R.S. Bhandari (2003). Butterfly diversity in tropical moist deciduous sal (*Shorea robusta*) forests of Dehradun Valley: the lower western Himalayas. *Indian Forester* 129(10): 1257–1269.

Singh, A.P. & R. Pandey (2004). A model for estimating butterfly species richness of areas across the Indian subcontinent: species proportion of family Papilionidae as an indicator. *Journal of the Bombay Natural History Society* 101(1): 79–89.

Singh, A.P. (2005). Initial colonization of Red Pierrot butterfly, *Talicauda nyseus nyseus* Guerin (Lycaenidae) in the lower western Himalayas: An indicator of the changing environment. *Current Science* 89: 41–42.

Singh, A.P. (2005). Recent records on the distribution, seasonality and occurrence of Redspot butterfly, *Zesius chrysomallus* Hübner from the lower western Himalayas. *Journal Bombay Natural History Society* 102 (2): 238–239.

Singh, A.P. & R.S. Bhandari (2006). New additions to the butterflies of Dehradun Valley, the lower Western Himalayas. *Indian Forester* 132(6): 767–769.

Singh, A.P. (2006). Range extension of Brown Gorgon butterfly,

Meandrusa gyas gyas into Kedarnath Musk Deer Reserve, Western Himalayas : A lesser known species from north-east India. *Indian Forester* 132(12a): 187–189.

Singh, A.P. (2007). A new butterfly species of the genus *Ypthima* Hubner (Nymphalidae: Satyrinae) from Garhwal Himalaya, India. *Journal Bombay Natural History Society* 104(2): 191–194.

Singh, A.P. (2008). Butterflies of Renuka Wildlife Sanctuary, Sirmour district, Himachal Pradesh, India. *Indian Forester* 134(10): 1326–1338.

Singh, A.P. (2009). Butterflies of Kedarnath Musk Deer Reserve, Garhwal Himalayas, India. *Journal of Threatened Taxa* 1(1): 37–48; <http://dx.doi.org/10.11609/JoTT.01873.37-48>

Singh, A.P. (2011). *Butterflies of India*. OM Books International, 183pp.

Singh, A.P. (2011). Delineating habitats of conservation priority in a threatened tropical moist deciduous forest landscape in the lower western Himalayas using butterflies: Climate Change and Environment Management, pp. 183–185. In: *ICFRE Technologies: Forestry in Service of the Nation*. ICFRE Publication.

Singh, A.P. (2013). Rarity in Oak Forest Butterflies of Garhwal. ENVIS Bulletin on Wildlife and Protected Areas - Arthropods and their

- Conservation in India (Insects & Spiders), 140–146pp.
- Smetacek, P. (2011).** A review of west Himalayan *Neptini* (Nymphalidae). *Journal of Lepidopterists' Society* 65(3): 153–161.
- Smetacek, P. (2012).** A new sub-species of *Mycalesis suaveolens* Wood-Mason & de Niceville 1883 from the western Himalaya, India (Lepidoptera, Nymphalidae, Satyrinae). *Nachrichten Entomologischen Vereins Apollo* 32 (3/4): 105–108.
- Smetacek, P. (2015).** *The Papilionid Butterflies of the Indian Subcontinent*. Concise Edition, 120pp.
- Smith, C. (1989).** *Butterflies of Nepal (Central Himalaya)*. Tecpress Service L.P., Bangkok, 352pp.
- Smith, C. (2006).** *Illustrated Checklist of Nepal's Butterflies*. Craftman Press, Bangkok, 129pp.
- Sondhi, S., K. Kunte, G. Agavekar, R. Lovalekar & K. Tokekar (2013).** *Butterflies of the Garo Hills*. Samrakshan Trust (New Delhi), Titli Trust (Dehradun), and Indian Foundation for Butterflies (Bengaluru), xvi+200pp.
- Sondhi, S. & K. Kunte (2014).** *Butterflies and Moths of Pakke Tiger Reserve*. Titli Trust (Dehradun), and Indian Foundation for Butterflies (Bengaluru), vi+202pp.
- Swinhoe, C. (1905–1910).** *Lepidoptera Indica* Parts VII. Rhopalocera - Papilionidae & Lycaenidae. Lovell, Reeve & Co.Ltd, London, 286pp +pls. 551–639.
- Swinhoe, C. (1910–1911).** *Lepidoptera Indica* Parts VIII. Rhopalocera - Lycaenidae. Lovell, Reeve & Co. Ltd., London, 293pp + pls. 640–705.
- Swinhoe, C. (1911–1912).** *Lepidoptera Indica* Parts IX. Rhopalocera - Lycaenidae & Hesperidae. Lovell, Reeve & Co. Ltd., London, 278pp +pls. 706–756.
- Swinhoe, C. (1912–1913).** *Lepidoptera Indica* Parts X. Rhopalocera - Hesperidae. Lovell, Reeve & Co. Ltd., London, 364pp + pls. 757–835.
- Talbot, G. (1939).** *The Fauna of British India including Ceylon and Burma*. Butterflies. 2nd edition. Vol. I. Taylor & Francis, London, 600pp.
- Talbot, G. (1947).** *The Fauna of British India including Ceylon and Burma*. Butterflies. 2nd edition. Vol. II. Taylor & Francis, London, 506pp.
- Tytler, H.C. (1939).** Notes on some new and interesting butterflies chiefly from Burma (1 & 2). *Journal Bombay Natural History Society* 41 (2): 235–252, 42 (1): 109–123.
- Uniyal, V.P. (2004).** Butterflies of Nanda Devi National Park– a world heritage site. *Indian Forester* 130: 800–803.
- Uniyal, V.P., M. Bhardwaj & A.K. Sanyal (2013).** *An Assessment of Entomofauna for Management and Conservation of Biodiversity in the Gangotri Landscape*. Annual Progress Report, Wildlife Institute of India, Dehradun, 237pp.
- Varshney, R.K. (1997).** Index Rhopalocera Indica Part III. Genera of butterflies from India and neighbouring countries [Lepidoptera: (C) Lycaenidae. *Oriental Insects* 31: 83–138.
- Wynter-Blyth, M.A. (1957).** *Butterflies of the Indian Region*. Bombay Natural History Society, Bombay, xx+523pp+72pls.

