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NEW HOST RECORDS OF POLYPHAGOUS LEPIDOPTERA ON BAN OAK *QUERCUS LEUCOTRICHOPHORA* A. CAMUS (FABACEAE) IN THE GARHWAL HIMALAYA, INDIA

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NEW HOST RECORDS OF POLYPHAGOUS LEPIDOPTERA ON BAN OAK *QUERCUS LEUCOTRICHOPHORA* A. CAMUS (FABACEAE) IN THE GARHWAL HIMALAYA, INDIA

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Abstract: The paper provides information on the life history stages of 12 species of Lepidoptera recorded for the first time feeding on Ban Oak *Quercus leucotrichophora* in Garhwal Himalaya, supported by images along with their distribution range and host plants recorded across the globe. A comprehensive list of all the Lepidoptera recorded so far feeding on *Q. leucotrichophora* is also provided.

Keywords: Arctiinae, Chakrata, Dehradun, Erebiidae, Geometridae, Lycaenidae, Pyralidae, Zygaenidae.

Mathur & Singh (1959) were the first to give a comprehensive list of 35 species of Lepidoptera feeding on Ban Oak *Quercus leucotrichophora* (Fabaceae), which occurs in the moist temperate forest zone from the western to the central Himalaya (Table 1). Recently, the life cycle of the Indian Gypsy Moth *Lymantria obfuscata* Walker, 1865 was studied on the host *Q. leucotrichophora* by Verma et al. (1979) and Thakur et al. (2015) in Himachal Pradesh, and two other species were later recorded as hosts on this oak (Smetacek & Smetacek 2011; Table 1) in the Kumaon region of Uttarakhand. Beeson (1941) had earlier recorded

Antheraea roylei Moore, 1858 (Saturniidae) feeding on *Q. leucotrichophora* along with seven other species of Lepidoptera, which were later reported by Mathur & Singh (1959). Besides these 39 species that belong to 16 families, there are no other records of Lepidoptera feeding on *Q. leucotrichophora* from the Himalayan region of India. The present study reports for the first time 12 new species of Lepidoptera feeding on *Q. leucotrichophora* from the Garhwal region of the Uttarakhand State of India. An account of each species is given below.

Common Onyx *Horaga onyx onyx* (Moore, [1857]) (Papilionoidea: Lycaenidae: Theclinae: Horagini) (Image 1)

A fifth instar larva (12mm; Image 1a) was collected on 14 September 2018 while feeding on the foliage of *Q. leuco trichophora* in the plantation in New Forest Campus of the Forest Research Institute (FRI), Dehradun. The larva was bred in the laboratory (Image 1b) FRI, Dehradun, on *Q. leucotrichophora* leaves. The mature larva (16mm) fed on the entire oak leaf leaving only the midrib. Pupation took place on 20 September 2018 (pupa:

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Image 1. Life history stages of the Common Onyx *Horaga onyx onyx* Moore, 1857: a - larva | b - feeding pattern | c - pupa | d - adult (female).

10mm) on the leaf stalk. The shape of the pupa, being oval and light green in colour with dark spots, resembled the eyes on a human face (Image 1c). The emergence of the butterfly (female; wingspan: 28mm; Image 1d) took place on 28 September 2018.

This species occurs throughout the Indian subcontinent up to 2,000m in hilly tracts (northern, northeastern, central, and southern India) with a flight period throughout the year (Wynter-blyth 1957), while the subspecies *O. h. onyx* occurs from Kangra in Himachal Pradesh up to Myanmar (Evans 1932). The larval food plant recorded for the subspecies is *Coriaria nepalensis* Wall. (Coriariaceae) in the Himalaya (Wynter-blyth 1957). The other subspecies *O. h. cingalensis* feeds on *Mangifera indica* L. (Nitin et al. 2018) in southern India and Sri Lanka. Other larval food plants for this species are *Durio zibethinus* L. (Malvaceae) in Thailand and *Glochidion rubrum* Blume, Bijdr. (1825) (Euphorbiaceae) in Taiwan (Robinson et al. 2010). The life cycle of the early stages of this species were photographed by Chandrasekharan (2018) in Kannur District of Kerala but was not described.

***Eterusia aedea aedea* (Clerck, 1759) (Zygaenoidea: Zygaenidae: Chalcosiinae) (Image 2)**

A dark reddish-brown larva (42mm; Image 2a,b) was

recorded feeding on the foliage of *Q. leucotrichophora* plantation and was collected on 12 April 2018 from the New Forest Campus of FRI, Dehradun. Pupa (30mm) formed on 16 April 2018, inside an arch-shaped pale coloured cocoon (Image 2c,d) with one end flat and the rest of the curved surface shaped like a purse; it was stuck to the surface of a half-curved oak leaf. The moth (wing-span: 62mm; Image 2e,f,g) emerged on 14 May 2018 from the mouth of the cocoon which was covered with a lid-like structure (Image 2d) in the laboratory at FRI, Dehradun.

The larvae of *E.a. aedea* were recorded feeding on a wide range of plants, including *Bischofia javanica* Blume, *Aporosa lindleyana* (Wright) Baill., *A. villosa* (Lindl.) Baill., *Cornus florida* L., *Lagerstroemia* sp., *Melastoma candidum* D. Don, *Myrica rubra* Siebold & Zucc., *Sloanea formosana* Li., *Rhododendron* sp., *Symplocos glauca* (Thunb) Koidz, *Camellia* spp. (including *C. japonica* L., *C. sasanqua* Thunb., *C. sinensis* (L.) Kuntze, *C.abel*, and *C. oleifera*), *Eurya japonica* Thunb., *E. septata* Wu, Hsu & Tsou, *Cleyera japonica* Thunb. and *Buddleja* sp. The *Eterusia aedeas* spp. *aedea*, *sinica*, *formosana*, *cingala*, and *virescens* were reported as pests on tea (Yen 2004; Robinson et al. 2010). The species is found in Sri Lanka, India, Taiwan, Japan, and China.



Image 2. Life history stages of *Eterusia aedea aedea* (Clerck, 1759): a - second instar larva | b - fifth instar larva | c - cocoon | d - cocoon with operculum | e - upper side of adult | f - underside of adult | g - upper side of adult.

The subspecies *E. a. aedea* occurs in the northeastern regions of India including Sikkim, Assam, Nagaland, Manipur, and Meghalaya during the months of April, May, July, August, and October (Hampson 1892; Shubhalaxmi et al. 2011; Anonymous 2018a).

***Artena dotata* (Fabricius, 1794) (Noctuoidea: Erebiidae: Erebinae: Ophiuini) (Image 3)**

The larvae (2.3–2.5 mm; Image 3a) of this moth were collected from the terminal tips of new shoots of *Q. leucotrichophora* plantation on 11 October 2017 from the New Forest Campus of FRI, Dehradun. Dark brownish pupa (26–28 mm; Image 3b) formed on 29 October 2017 and the moth (wingspan: 50mm; Image 3b,c) emerged on 9 November 2017 in the laboratory at FRI, Dehradun.

Artena dotata occurs from the Indian subregion to Sri

Lanka, Taiwan, Japan, Sumatra, and Borneo. Habitat preference is for lowland forest areas, including those with much secondary vegetation after logging. The pupa is typically ophiuine in form while the larva has a series of thin white lines running longitudinally along the body and was described by Bell (Holloway 2005). The flight period recorded is from April to June and August to December in Borneo. It was recorded in the Himalayan region from Himachal Pradesh, Uttarakhand, and Arunachal Pradesh and in northeastern India from Manipur and Nagaland (Hampson 1894a; Sondhi & Sondhi 2016; Anonymous 2018b). Larval food plants recorded are *Combretum latifolium* Bl., *Getonia floribunda* Roxb., *Quisqualis indica* L., *Terminalia bellirica* (Gaertn.) Roxb., *T. paniculata* Roth., and *T. tomentosa* (Roxb.) Wight &



Image 3. Life history stages of *Artena dotata* (Fabricius, 1794): a, b - mature larvae | c - upper side of moth | d - pupa and moth.



Image 4. Life history stages of *Artaxa guttata* Walker, 1855: a - dorsal view of larva | b - ventral view of larva | c - cocoon | d - moth | e - upper side of adult.



Image 5. Life history stages of *Orgyia postica* (Walker, 1855): a - larva | b - apteroous female with pupa | c - upperside of winged male.

Arn.in India and *Vitis* sp. in Korea (Robinson et al. 2010).

Yellow Tussock Moth *Artaxa guttata* Walker, 1855 (Noctuoidea: Erebidae: Lymantriinae: Nygmiini) (Image 4)

A fourth instar larva (10mm; Image 4a,b) was collected on 24 August 2018 while feeding on the foliage of *Q. leucotrichophora* in the plantation in the New Forest Campus of FRI, Dehradun. The larva underwent one moulting into final instar on 26 August 2018 (11–27 mm). Pupation (pupa: 18mm; Image 4c) on the surface of an oak leaf took place on 04 September 2018. The emergence of the moth (wingspan: 42mm; Image 4d) took place on 13 September 2018 in the laboratory at FRI, Dehradun. Another larva of the same moth collected on 16 May 2018 from the same location on the oak emerged from its pupa on 18 May 2018 in the laboratory.

This species is found in northern India (Sondhi & Sondhi 2016). The known host plants of this species are *Ricinus communis* L., *Jasminum* sp., *Lantana camara* L., *Mangifera indica* L., *Terminalia* spp., *Ziziphus mauritiana* Lam., *Shorea robusta* Roth., *Maesa lanceolata* Forssk., *Mallotus philippensis* (Lam.) Muell. Arg., *Anogeissus acuminata* (Roxb. Ex. Candolle) Guillemin et al., *Barringtonia acutangula* (L.) Gaertn., *Carissa carandas* L., and *Lagerstroemia indica* (L.) Pers. It occurs in India, Bangladesh, Nepal, and Sri Lanka (Robinson et al. 2010).

***Orgyia postica* (Walker, 1855) (Noctuoidea: Erebiidae: Lymantriinae: Orgyiini) (Image 5)**

One larva was collected on 29 October 2017 (15mm) while feeding on the foliage of *Q. leucotrichophora* in the plantation in the New Forest Campus of FRI, Dehradun. The larva was bred in the laboratory at FRI and pupated on 28 September 2017, with the moth (male; wingspan: 22mm) emerging on 6 October 2017 (Image 5a). Larvae were again collected on 15 and 22 October 2018 and 8 and 20 November 2018 from the Ban Oak foliage in the

same locality. The length of the larvae (Image 5b) just before pupation in October and November varied from 24mm to 40mm and the pupal length varied from 24mm to 38mm (Image 5c). Emergence of one apterous female took place on 24 October 2018 (Image 5d) and one male on 10 November 2018, while two pupae remained under hibernation until January 2019.

This species commonly occurs from the Oriental tropics east to New Guinea and the larvae are known to feed on *Buchanania*, *Mangifera*, *Durio*, *Ochroma*, *Casuarina*, *Terminalia*, *Shorea*, *Hevea*, *Ricinus*, *Pelargonium*, *Cinnamomum*, *Acacia*, *Albizia*, *Caesalpinia*, *Cajanus*, *Cassia*, *Dalbergia*, *Erythrina*, *Pithecellobium*, *Pterocarpus*, *Sesbania*, *Xylia*, *Lagerstroemia*, *Eucalyptus*, *Tristania*, *Zizyphus*, *Malus*, *Coffea*, *Citrus*, *Santalum*, *Dimocarpus*, *Litchi*, *Nephelium*, *Theobroma*, *Camellia*, *Grewia*, and *Tectona* (Holloway, 1999) species and also *Populus deltoides* W. Bartram ex. Marshall (Singh 1991).

***Rhyptoses drepanioides* Kishida, 1995 (Noctuoidea: Erebiidae: Lymantriinae: Nygmiini) (Image 6)**

The larvae (15mm) were collected on 11 October 2017 while feeding on the foliage of *Q. leucotrichophora* in the plantation in the New Forest Campus of FRI, Dehradun. Dark coloured pupa (18mm) formed on 15 October 2017 and the emergence of the moth (wingspan: 30mm; Image 6a,b) took place on 09 November 2017 in the laboratory at FRI, Dehradun.

The moth is not so rare in nature. It is not attracted to light and traps as frequently as other moths. The distribution of *Rhyptoses drepanioides* Kishida, 1995 is extended westwards upto the Kumaon Himalaya, in India with larval food plant recorded as *Quercus floribunda* Lindl. ex A. Camus (Smetacek & Smetacek 1995, 2011).

***Thyas juno* (Dalman, 1823) (Noctuoidea: Erebiidae: Erebiinae: Ophiuini) (Image 7)**

Fifth instar larva (65mm; Image 7a) was collected



Image 6. Moth of *Rhyptoses drepanioides* Kishida, 1995: a - dorsal view | b - ventral view.

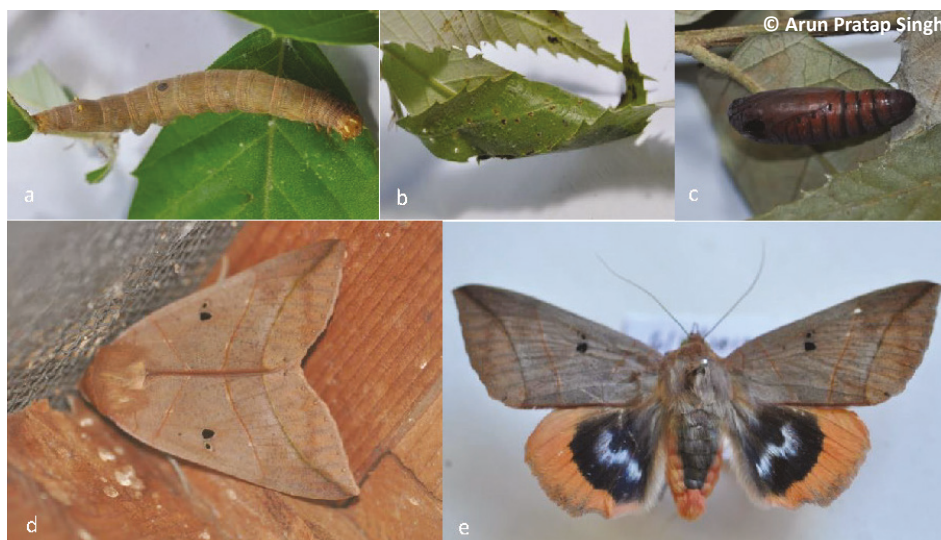


Image 7. Life history stages of *Thyas juno* (Dalman, 1823): a - mature larva | b - cocoon in folded leaves | c - pupa | d - moth in rearing cage | e - upper side of adult.



Image 8. Life history stages of *Cyana coccinea* (Moore, 1878): a - larva | b - pre-pupa | c - pupa inside cocoon | d - lateral view of moth.

on 7 October 2018 while feeding on leaves of *Q. leucotrichophora* in the plantation in New Forest Campus in FRI, Dehradun. The mature larva (70mm; Image 7b) underwent pre-pupation on 12 October 2018 by the formation of a hairy mass of body hairs by twining together three leaves and finally formed a pupa (38mm; Image 7c) on 15 June 2018. The emergence of the moth (wing-span: 90mm; Image 7d,e) took place on 5 November 2018 in the laboratory at FRI, Dehradun.

The moth is known to occur in the Indian sub-region, China, Japan, Korea, Thailand, Borneo, Java, Sulawesi, and on southern Maluku. The larvae feed on *Castanea*, *Quercus*, *Juglans*, and *Pterocarya* species (Holloway 2005). The oak species infested are *Quercus acutissima* Carruth., *Q. phillyraeoides* A. Gray, *Q. serrata* Murray, and *Q. variabilis* Blume in Japan (Robinson et al. 2001). The adult is a fruit-piercer in Thailand (Kuroko & Lewvanich 1993). There are, however, no reports of

it infesting the genus *Quercus* in India. The species is known to be in flight in April and August–September in Mussoorie, Uttarakhand, and Eaglenest Wildlife Sanctuary in Arunachal Pradesh in the Himalaya (Anonymous 2018c).

***Cyana coccinea* (Moore, 1878) (Noctuidae: Arctiidae: Lithosiinae: Nudariini) (Image 8)**

The fifth instar larva (30mm; Image 8a) was collected on 19 June 2018 while feeding on leaves of *Q. leucotrichophora* plantation in the New Forest Campus of FRI, Dehradun. The larva underwent pre-pupal stage (20mm; Image 8b) on 20 June 2018 by the formation of a hairy dome (40mm) from the mass of body hairs on the upper surface of a leaf and finally formed a pupa (20mm; Image 8c) on 21 June 2018. The emergence of the moth

(female; wingspan: 30mm; Image 8d) took place on 28 June 2018 in the laboratory at FRI, Dehradun.

The species is distributed in India from the Himalaya (Uttarakhand, Nepal, and Sikkim) to northeastern India (Sikkim, Assam, West Garo Hills in Meghalaya, and Nagaland) and the Andaman in October–November (Anonymous 2018d). It also occurs in China, Thailand, Malaysia, Vietnam, Laos (Hampson 1894b; Strand 1922; Ghosh & Chaudhury 1998; Chaudhury 2003; Tangmitcharoen et al. 2006; Sondhi & Sondhi 2016). Host plants recorded for this species are *Dimocarpus* sp. (Kuroko & Lewvanich 1993), *Camellia sinensis* (L.) Kuntze (Theaceae), *Dalbergia sissoo* Roxb. (Leguminosae), *Shorea robusta* Roth. (Dipterocarpaceae), *Tectona grandis* (Verbenaceae), *Mangifera indica* L. (Anacardiaceae), and *Dimocarpus longan* Lour. (Sapindaceae) (Robinson et al. 2010). San-



Image 9. Life history stages of *Hyposidra talaca* (Walker, 1860): a - second stage larva | b - fifth instar larva | c - pre-pupa | d - pupa | e - live moth | f - upper side of pinned moth.



Image 10. Life history stages of *Hypomecis infixaria* (Walker, 1860): a, b - second instar larva | c, d - fifth instar larva | e - upper side of live moth | f - underside of live moth | g - upper side of pinned moth.

yal et al. (2013) studied the life history of this moth on *S. robusta* in Dehradun and reported its outbreak in Rajaji National Park in Uttarakhand, India.

***Hyposidra talaca* (Walker, 1860) (Geometroidea: Geometridae: Ennominae: Boarmiini) (Image 9)**

A second instar larva (12mm; Image 9a) was collected on 20 June 2018 while feeding on leaves of *Q. leucotrichophora* plantation in the New Forest Campus of FRI, Dehradun. Moulting into the fifth instar larva took place on 25 June 2018 (30–43 mm; Image 9b); pre-pupa (Image 9c) was formed on 2 July 2018, finally turning into a dark brown pupa (18mm; Image 9d) on 4 July 2018. The emergence of the moth (female; wingspan: 32mm; Image 9e,f) took place on 10 July 2018 in the laboratory at FRI, Dehradun.

The species is distributed from India to Indo-Chi-

na, Sundaland, Sulawesi, the Philippines, Sri Lanka, the Solomon Islands, Thailand, Taiwan, New Guinea, and Australia (Queensland). It is a major defoliating pest in tea plantations. In India, the species was reported from Assam, Meghalaya, Himachal Pradesh, Uttarakhand, Goa, Madhya Pradesh, and Karnataka with flight throughout the year. The flight period in the western Himalaya is during the monsoons (July–September; Sondhi & Sondhi 2016; Singh 2018). Host plants include *Anacardium*, *Bombax*, *Terminalia*, *Chromolaena*, *Gynura*, *Mikania*, *Cupressus*, *Aleurites*, *Aporosa*, *Bischofia*, *Breynia*, *Glochidion*, *Hevea*, *Manihot*, *Ficus*, *Morus*, *Psidium*, *Polygonum*, *Rubus*, *Cinchona*, *Coffea*, *Mussaenda*, *Citrus*, *Schleichera*, *Theobroma*, *Perilla-frutescens* (L.) Britton, *Camellia*, and *Tectona* (Holloway, 1993a). The larva was described by Singh (1953).



Image 11. Life history stages of *Hypomecis transcissa* (Walker, 1860). a, b - mature larva | c - pupa shell and moth.

***Hypomecis infixaria* (Walker, 1860) (Geometridae: Ennominae: Boarmiini) (Image 10)**

A second instar larva (Image 10a,b; 8mm) was collected on 5 July 2018 from the leaves of *Q. leucotrichophora* from the plantation in the New Forest Campus of FRI, Dehradun. A fifth instar larva (36mm) was formed on 18 July 2018 (Image 10c,d), while a dark brown pupa (16mm) was formed on 31 July 2018. The emergence of the moth (male; wingspan: 30mm; Image 10e,f) took place on 6 August 2018 in the laboratory at FRI, Dehradun.

Host plants in India include *Bauhinia divaricate* L., *Carissa spinarum* L., *Dalbergia sissoo* Roxb., *Derris scandens* Roxb. (Benth.), *Planchonia careya* (F. Muell.) R. Knuth, *Platycladus orientalis* (L.) Franco, *Schleichera*

oleosa (Lour) Oken, *Shorea robusta* Roth, *Xylia xylocarpa* Roxb. Taub., and *Tectona grandis* L.f. (Robinson et al. 2010). Another species of the same genus, *Hypomecis punctinalis* (Scopoli, 1763), is known to feed on the family Fagaceae and the genus *Quercus*, in Japan and British Isles (Robinson et al. 2010).

***Hypomecis transcissa* (Walker, 1860) (Geometridae: Ennominae: Boarmiini) (Image 11)**

A fifth instar larva (38–40 mm; Image 11a,b), dark brown and black, was collected on 24 August 2018 feeding on the foliage of *Q. leucotrichophora* in the plantation in the New Forest Campus of FRI, Dehradun. Pupation took place (pupa: 17mm; dark brown; Image 11c) between two oak leaves on 30 August 2018 and the



Image 12. Life history stages of *Ephestiodes* sp. (Pyralidae: Phycitinae). a - feeding pattern of skeletonizing the oak leaf | b, c - larva | d - mass of cocoons | e - pupa inside cocoon | f - moth | g, h - upperside of moth | i - lateral view of moth.

moth (wingspan: 42mm; Image 11d) emerged on 6 September 2018 in the laboratory at FRI, Dehradun.

The host plant recorded is *Aleurites* (Euphorbiaceae) species. The moth occurs in the Indian subregion, from Sri Lanka to Sundaland (Holloway 1993b). Its distribution is in India (Dharamsala, Sikkim, Assam, and Nilgiris), Bhutan, Sri Lanka, Burma, and Java (Hampson 1895). The species is also found in Malaysia and Hong Kong (Robinson 2010). Host plants recorded outside India are *Aleurites Montana* Lour., *Castanopsis fissa* (Champ. ex. Benth.) Rehd. & Wils., *Cinnamomum zylanicum* Blume, *Nephelium lappaceum* L., *Hevea* sp., *Theobroma cacao* L., and *Vernicia fordii* (Hemsl.) Airy Shaw (Robinson et al. 2010). Flight period is from August to December in Himachal Pradesh, Maharashtra, Assam, Tripura (Anonymous 2018d), and Uttarakhand (Sondhi & Sondhi 2016).

***Ephestiodes* (Ragonot, 1887) sp. (Pyraloidea: Pyralidae: Phycitinae) (Image 12)**

The larvae of this moth were recorded feeding on *Q. leucotrichophora* in Chakrata Forest Division, Ut-

tarakhand, on 22 May 2018. Feeding took place by scratching and skeletonizing the oak leaf surface (Image 12a). Two pale-coloured larvae (32mm; Image 12b,c) and a mass of 11 dark brown pupae (14–15 mm; Image 12d,e) within interwoven leaves were collected from the Chakrata Cantonment Forest (30.743°N & 77.871°E; 2,610m). Four moths (wingspan: 24–32 mm; Image 12f) emerged on 24 and 25 May 2018 in the laboratory at FRI, Dehradun. The moths (Image 12g,h,i) were slender with light brown forewings with yellowish shading in the basal third and darker reddish-brown in distal two-thirds. The hind wings were much wider than the forewings and were pale with a brown terminal line and having long pale fringe scales.

An allied species of the same genus, *Ephestiodes infimella* Ragonot, 1887, is native to North America (Wikipedia contributors, 2018, April 5) and feeds on wild cherry and *Ambrosia* sp. with adults on the wing from June to September (Stegmaier 1971), besides *Prunus* sp. and *Smilax rotundifolia* L. in the Nearctic region (Robinson et al. 2010).

Except for *H. o. onyx* and *Ephestiodes* sp., all other

Table 1. Past records of Lepidoptera feeding on Ban Oak *Quercus leucotrichophora* A. Camus in the western Himalaya.

	Family/Species	Nature of damage	References
Family: Nolidae			
1	<i>Nola</i> sp.	Larva defoliates	Mathur & Singh (1959)
2	<i>Meganola nitida</i> (Hampson, 1894)	Larva defoliates	Mathur & Singh (1959)
3	<i>Garella ruficirra</i> (Hampson, 1905)	Larva defoliates	Mathur & Singh (1959)
4	<i>Nycteola revayana</i> (Scopuli, 1772)	Larva defoliates	Mathur & Singh (1959)
Family: Bombycidae			
5	<i>Mustilizans hepatica</i> (Moore, 1879)	Larva defoliates	Mathur & Singh (1959)
Family: Tortricidae			
6	<i>Enarmonia disperma</i> Meyrick, 1931	Larva defoliates	Beeson (1941); Mathur & Singh (1959)
Family: Gelechiidae			
7	<i>Dichomeris quercicola</i> Meyrick, 1921	Larva feeds on leaves	Beeson (1941); Mathur & Singh (1959)
8	<i>Telphusa tetragraptia</i> Meyrick, 1937	Larva defoliates	Mathur & Singh (1959)
Family: Geometridae			
9	<i>Mixochlora vittata</i> (Moore, [1868])	Larva defoliates	Mathur & Singh (1959)
Family: Lasiocampidae			
10	<i>Pyrosis undulosa</i> (Walker, 1855)	Larva defoliates	Mathur & Singh (1959)
11	<i>Euthrix inobtrusa</i> (Walker, 1862)	Larva defoliates	Mathur & Singh (1959)
12	<i>Malacosoma indica</i> Walker, 1855	Larva defoliates	Beeson (1941); Mathur & Singh (1959)
13	<i>Trabala vishnou</i> (Lefèbvre, 1827)	Larva defoliates	Beeson (1941); Mathur & Singh (1959)
Family: Lycaenidae			
14	<i>Arhopalado donaea</i> Moore, [1858]	Larva defoliates	Mathur & Singh (1959)
15	<i>A. ganesa</i> (Moore, [1858])	Larva defoliates	Mathur & Singh (1959)
16	<i>A. rama</i> (Kollar, [1844])	Larva defoliates	Mathur & Singh (1959)
17	<i>Acytolepis puspia gisca</i> (Fruhstorfer, 1910)	Larva defoliates	Smetacek & Smetacek (2011)
Family: Erebidae			
18	<i>Callitera grotei</i> (Moore, 1859)	Larva defoliates	Mathur & Singh (1959)
19	<i>C. strigata</i> (Moore, 1879)	Larva defoliates	Mathur & Singh (1959)
20	<i>C. varia</i> (Walker, 1855)	Larva defoliates	Mathur & Singh (1959)
21	<i>Somena scintillans</i> Walker, 1856	Larva defoliates	Mathur & Singh (1959)
22	<i>Euproctis varians</i> (Walker, 1855)	Larva defoliates	Mathur & Singh (1959)
23	<i>Lymantria concolor</i> Walker, 1855	Larva defoliates	Beeson (1941); Mathur & Singh (1959)
24	<i>L. mathura</i> Moore 1866	Larva defoliates	Beeson (1941); Mathur & Singh (1959)
25	<i>L. obfuscata</i> Walker, 1865	Larva defoliates	Verma et al. (1979); Thakur et al. (2015)
26	<i>Ophiura olistia</i> (Swinhoe, 1893)	Larva defoliates	Mathur & Singh (1959)
27	<i>Hypocala rostrata</i> Fabricius, 1794	Larva defoliates	Mathur & Singh (1959)
28	<i>H. subsatura</i> Guenée, 1852	Larva defoliates	Mathur & Singh (1959)
Family: Tineidae			
29	<i>Opogona iolychna</i> Meyrick, 1920	Larva feeds on dead bark	Mathur & Singh (1959)
Family: Pyralidae			
30	<i>Syllepta lunalis</i> (Guenée) [1970]	Larva defoliates	Beeson (1941); Mathur & Singh (1959)
31	<i>Heterocrasa expansalis</i> Warren, 1896	Larva defoliates	Smetacek & Smetacek (2011)
Family: Noctuidae			
32	<i>Goniocras pidumennomoides</i> Hampson, 1894	Larva defoliates	Mathur & Singh (1959)
Family: Nymphalidae			
33	<i>Euthalia patala</i> (Kollar, [1844])	Larva defoliates	Mathur & Singh (1959)
34	<i>Sephisa dichroa</i> (Kollar, [1844])	Larva defoliates	Mathur & Singh (1959)

	Family/Species	Nature of damage	References
Family: Elachistidae			
35	<i>Agonopterix taciturna</i> (Meyrick, 1910)	Larva bores into green shoots	Mathur & Singh (1959)
Family: Oecophoridae			
36	<i>Promalactis calathiscias</i> Meyrick, 1937	Larva feeds on dead bark	Mathur & Singh (1959)
Family: Saturniidae			
37	<i>Antheraea roylei</i> Moore, 1858	Larva defoliates	Beeson (1941)
Family: Sphingidae			
38	<i>Pergesa acteus</i> (Cramer, [1779])	Larva defoliates	Mathur & Singh (1959)
Family: Zygaenidae			
39	<i>Tasema bipars</i> Walker, 1856	Larva defoliates	Mathur & Singh (1959)

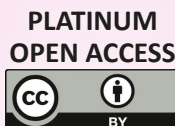
new Lepidoptera recorded feeding on *Q. leucotrichophora* are polyphagous in nature with these species occurring across either the entire Himalaya and/or the Indian sub-continent.

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