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Biodiversity and Systematic Checklist of Moth Caterpillars, Belonging to Family Crambidae, Erebidae and Tortricidae, Affecting Host Crops and Plant Species in Jammu & Kashmir State (India)

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ABSTRACT

In this paper, a total of 55 species of 43 genera of moth caterpillars, covering three super- families, including 3 families and 9 families, affecting more than 59 species of host crops and plant species, has been dealt with. The number of various species, under different families and sub-families of caterpillars are: Crambidae-Crambinae (2 spp.), Evergestinae (2 spp.), Glaphyriinae (1 sp.), Pyraustinae (6 spp.) and Spilomelinae (5 spp.); Erebidae- Aractiinae (10 spp.) and Lymantriinae (12 spp.); Tortricidae- Olethreutinae (8 spp.) and Tortricinae (9 spp.). The highest number of caterpillar species *i.e.*, 21, has been found to be affecting 28 spp. of medicinal/ aromatic plants. This is followed by 12 spp., damaging fruit trees / crops (berry, drupaceous, pome), with 10 spp. on apple trees / crops. 9 spp. of caterpillar are associated with mulberry plantations (*Morus*). It is followed by a total of 6 spp. each, damaging food crops, vegetable crops and animal fodder / forage. 3 spp. of caterpillars are known to damage wood / timber trees, 2 spp. each affect aquatic weed, oil seed crop and ornamental plants, 1 sp. feeding on dye-yielding plant. An up-to- date systematic checklist of moth caterpillar species associated with crops and plant species, has been provided. Apart from this, species diversity of moth caterpillars on host / food plants, has been given.

Introduction

The adult moths lay eggs on the host / food plant crop species on which the larval stages, known as caterpillars feed. In Jammu & Kashmir State, the caterpillars of moth species affecting host plants and crops belong to families and subfamilies are: Crambidae (Crambinae, Evergestinae, Glaphyriinae, Pyraustinae, Spilomelinae); Erebidae (Aractiinae, formerly known as Aractiidae and Lymantriinae, formerly called Lymantriidae); Tortricidae (Olethreutinae, Tortricinae). Previously, Bhagat (2018), has dealt with moth caterpillars, belonging to six sub-families of Noctuidae and their biodiversity, damaging diverse host crops and plant species in J & K State.

The habits and morphology of Crambid caterpillars are greatly variable and diverse, feed on living host plants as leaf-roller, leaf-webbers (subfamily Spilomelinae, Pyraustinae), leaf-miners, borers, root and seed-feeders, and sometimes in combinations. The caterpillars of Crambinae, such as *Chilo*, are of great economic importance, damaging maize and *Sorghum* in J & K State. The members of Evergestinae and Glaphyriinae feed on plants of family Brassicaceae, including Brassicas vegetables or cole crops in this region.

The caterpillars of subfamily Aractiinae are often quite hairy, sometimes referred to as 'woolly bears'. These feed on wide range of grasses, crops, shrubs and trees. The Lymentriine caterpillars are characterized by the presence of 'tooth brush' or tuft of hairs or tussocks or clump of bristles on their back. These caterpillars are voracious defoliators, like gypsy moth as serious pest of forestry and horticultural importance in this region.

The majority of Tortricid moth caterpillars are leaf-rollers and feed on between rolled or folded leaves (Tortriciinae). However, the Olethreutrine caterpillars (codling moth and oriental fruit moth) bore into plants, shoots, stem, etc. including important pests of valuable fruit crops, such as apple, pear, quince, peach and walnut in this region.

Materials and methods

The database incorporated in this paper pertains to 55 species of moth caterpillars damaging more than 59 species of host crops and plant species of Jammu and Kashmir State. The J & K State is situated in the northern part of Indian sub-continent, in vicinity of Karakoram and Western Himalayan ranges. This State is divided into three geographically and climatically different Provinces, *viz*. Jammu (sub-tropical), Kashmir (temperate) and Ladakh (cold desert). J & K State is of great zoo-geographical importance as well as rich in biodiversity. In this paper, an attempt has been made for the first time to consolidate vast scattered data on moth caterpillars, under families as Crambidae, Erebidae and Tortricidae of J & K State, feeding on diverse host / food plants species, occurring in vast areas and localities.

The data pertaining to taxa has been updated in the light of latest nomenclatural / systematic changes. For the purpose of updating faunal taxa and their biodiversity, relevant published works (national, international), besides online information on taxonomic surveys and recent checklists of the world, have been consulted. For changes in the systematics of taxa, important and latest papers and online databases followed are: Robinson (1999), Robinson et al. (2001), Brown (2006), Lafontaine et al. (2006), Zahiri et al. (2011), Beccaloni et al. (2016), Anonymous (2017a, 2017b) and Ziegler (2017). The faunal records of valid caterpillar species, affecting different valid host plants species, are given in the annotated Systematic checklist. The synonymies of the taxa are given in the parentheses, below respective valid faunal species. This checklist also provides the references pertaining to authors recording / describing taxa from different regions and localities of Jammu and Kashmir State. These references are in the form of code numbers, cited at the end of the Checklist.

Results and discussion

Annotated systematic checklist of Crambid, Erebid and Tortricid moth caterpillars and their associated host crops / plant species

Super family: Noctuoidea

Family 1. Erebidae

Subfamily 1. Arctiinae (Tiger moths)

1. *Aloa lactinea* (Cramer) (Red Tiger Moth, Red hairy caterpillar)
   (= *Amsacta lactinea* Cramer) [5, 24, 56]
   Host / food plant: *Morus* spp. (Mulberry)
2. *Amata passalis* (Fabricius) [5, 24]
   Host / food plant: Mulberry plantations
3. *Argina cribraria* (Clerck) [52]
   Host / food plant: *Crotalaria madurensis*

4. *Callindra principalis principalis* (Kollar)
   (= *Panaxia principalis*) [43]
   (= *Euprepaia principalis* Kollar)
   (= *Callimorpha principalis ladakensis* Reich)
   (= *Callindra principalis ladakensis* Reich)
   Host / food plant: *Prunus cerasus* (Cherry)
5. *Pericellia ricini* (Fabricius) (Castor hairy caterpillar [13]
   Host / food plants: *Eichhornia crassipes* (Water hyacinth)
6. *Spilarctia luteum* (Hufnagel) (Buffish yellow moth)
   (= *Spilosoma lutea* Hufnagel) [6]
   Host / food plant: *Oryza sativa* (Paddy)
7. *Spilarcita obliqua* (Walker) [13]
   Host / food plant: *Eichhornia crassipes*
8. *Spilosoma obliqua* (Walker) (Jute hairy caterpillar, Bihar hairy caterpillar) [17, 45]
   (= *Diacrsia obliqua* Wlaker) [5, 24, 31, 52]
   Host / food plants: *Ablemoschus moschatus*, *Artremisia vulgaris*, *Cannabis sativa*, *Chenpodium ambrosiodes*, *Clerodendrum* sp., *Cheilocostus speciosus* (=*Costus speciosus*), *Cynoglossum lanceolatum* (= *Cynoglossum micranthum*), *Chrysanthemum indicum*, *Helianthus tuberosum*, Pulses (Kharif), Mulberry trees (*Morus* spp.), *Mentha arvensis*, *Plumbago indica*, *Ocimum*, *Pogostemon*, *Reinwardtia indica* (= *Reinwardtia trigyne*), *Withania somnifera.*
9. *Spilosoma? dalbergiae* Moore (Hairy caterpillar) [24]
   Host / food plants: Mulberry plantations
10. *Utetesia pulchella* (Linnaeus) (Crimson-speckled moth) [51, 52]
    Host / food plants: *Crotalaria madurensis*, *Crotalaria retusa*

Subfamily 2: Lymantriinae (Tussock Moths)

11. *Daplasa irrorata* Moore [24]
    Host / food plants: Mulberry plantations
12. *Eublemma olivacea* Walker (Brinjal leafroller) [31]
    Host / food plant: *Solanum torvum*
13. *Euproctis (Euproctis) chrysorrhoea* (Donovan) (Brown tail tussock moth)
    (= *Nygmia phaeorrhoea* Donovan) [42]
    Host / food plants: *Malus domestica* (Apple), *Pyrus communis* (pear), *Prunus domestica* (plum)
14. *Euproctis fratena* Moore (Reddish brown hairy caterpillar) [52]
    Host / food plants: *Rosa damascene* (Damask rose), *Rosa centifolia* (Centifolia rose)
15. *Euproctis similis* (Fussli) (Gold-tailed moth) [11]
    (= *Prothesia bsimilis* Fussli) [42, 43]
    Host / food plants: Apple, *Rosa centifolia*, pear, plum
16. *Euproctis* sp. [8, 15]
    Host / food plants: *Brassica rapa* (Field mustard), *Solanum melongena* (Brinjal)
17. *Leucoma sericea* Moore [3, 10, 46]
    Host / food plants: *Juglans regia* (Walnut), *Parrotiopsis jacquemontiana*, *Populus* spp. (Poplars), *Salix* spp. (Willows).
18. *Lymantria obfuscata* Walker (Gypsy moth) [3, 14, 16, 19, 28, 29, 32, 37, 43, 44, 48, 50]
    Host / food plants: *Alnusnitida*, apple, *Prunus armeniaca* (apricot), Brassicas vegetable, *Prunus dulcis* (= *Prunus amgydalus*) (almond), *Prunus avium* (cherry), *Cydonia oblonga* (Quince), *Prunus persica* (peach), *Pyrus communis* (pear), *Prunus domestica* (plum), *Populus* spp. (poplars), *Quercus* spp.(oak), *Robinia pseudoacacia* (Black locust tree), willows and walnut.
19. *Orvasca irrorata* (Moore)
    (= *Euproctis irrorata* Moore) [5]
    Host / food plants: Mulberry plantations
20. *Porthesia xanthorrhoea* Kollar [35]
    (= *Euproctis* (*Prothesia*) *xanthorrhoea* Kollar) [49]
    Host / food plants: Paddy, *Glycine max* (Soybean)
21. *Somena scintillans* Walker (Yellow-tailed tussock moth) [20]
    (= *Euproctis scintillans* Walker) [19, 52, 56]
    (= *Porthesia scintillans* Walker) [5, 24]
    Host / food plants: Apple, Mulberry plantations, Damask rose and Centafolia rose
22. *Varmia indica* (Walker) [3]
    Host / food plant: Almond, walnut

Superfamily 2: Pyraloidea

Family: Crambidae

Subfamily: Crambinae

23. *Chilo partellus* (Swinhoe) (Maize stem borer, Spotted stalk/ stem borer) [2, 9]
    Host / food plants: *Zea mays* (Maize), *Sorghum* sp.
24. *Diatraea* sp. [43]
    Host / food plant: Apple

Subfamily 2. Evergestinae

25. *Crocidolomia parvonana* (Fabricius) (Cabbage cluster caterpillar)
    (= *Crocidolomia binotalis* Zeller) [26]
    Host / food plants: Brassicas vegetables
26. *Evergestis forficalis* (Linnaeus) [8]
    Host / food plants: Brassicas vegetables (*Brassica oleracea acephala*, *B. o. capitata*, *B. o. gonglyloides*), Field mustard.

Subfamily 3. Glaphyriinae

27. *Hellula undalis* (Fabricius) [26]
    Host / food plant: Brassicas vegetables, cabbage and cole crop

Subfamily 4. Pyraustinae

28. *Cnaphalocrocis medinalis* (Guence) (Rice leaf-roller/ leaf-folder) [4]
    Host / food plant: Rice (Paddy)
29. *Glyphodes pyloalis* Walker [5, 24, 34, 41]
    Host/ Food plants: Mulberry plantations
30. *Glyphodes vertumnalis* (Guence) [52]
    Host /food plant: *Rauwolfia serpentina*
31. *Leucinodes orbonalis* (Guence) (Brinjal fruit / shoot borer) [1, 8, 12, 21, 26, 31]
    Host / food plants: *Solanum melongena* (Brinjal), *Potato tuberosum* (potato) and *Solanum ferox.*
32. *Pleuroptya* sp. (Mother of Pearl moth) [6]
    Host / food plant: Paddy
33. *Pyrausta inornatalis* (Fernald) (Pyrusta or small pink moth) [31]
    Host / food plant: *Pergularia daemia*

Subfamily 5: Spilomelinae

34. *Dichocrosis punctiferalis* (Guence) (Yellow peach moth/ Castor capsule Borer) [22, 31, 53]
    Host / food plants: *Abrus precatorius, Psidium guajava* (Guava)
35. *Margaronia pyloalis* Walker [47]
    (= *Diaphania pyloalis* Walker)
    Host / food plants: Mulberry plantations
36. *Maruca testulalis* (Geyer) [26]
    Host / food plant: Vegetables (unknown)
37. *Spoladea recurvalis* (Fabricius) (But webworm moth) [26]
    Host / food plants: *Amaranthus, Spinacia oleracea* (Spinach)
38. *Sylepta derogata* (Fabricius) (Common leaf-roller) [26, 31]
    Host / food plants: *Abelmoschus esculentus* (okra) and other Malvaceous plants.

Superfamily 3: Tortricoidea

Family: Tortricidae

Subfamily: Olethreutinae

39. *Cryptophlebia illepida* (Butler) [22]
    Host / food plant: Guava
40. *Cydia pomonella* (Linnaeus) (Codling moth) [38, 40, 54, 55]
    (= *Laspeyresia pomonella* L) [30]
    (= *Corpocaspa pomonella* L) [43]
    Host / food plants: Apple, pear, quince and walnut
41. *Eucosma glaciata* Meyrick (Poplar shoot borer) [50]
    Host / food plants: *Populus* spp. (Poplars)
42. *Eucosma zelota* Meyrick [3]
    Hosts / food plants: Pear, rose
43. *Grapholitha molesta* (Busch) (Oriental Fruit moth) [43]
    [= *Carpocaspa molesta* (Busch)]
    [= *Lasperesia molesta* (Busch)]
    Hosts / food plants: Apple, *Prunus persica*

(peach), pear, quince

44. *Olethrutes* nr. *cellifora* (Meyrick) [33, 36]
    Host / food plant: *Punica granatum* (Pomegranate)
45. *Olethreutes* sp. [11, 36]
    Host / food plant: Pomegranate
46. *Rhopobota naevana* Hubner (Holly tortrix moth) [3]
    Host / food plant: Rose

Subfamily 2: Tortricinae

47. *Acleris* nr. *hastiana* (Linnaeus) [3]
    Hosts / food plants: *Crataegus* sp., Rose
48. *Archips argyrospilus* (Walker) (Fruit- tree leaf-roller moth) [43]
    Hosts / food plants: Apple, apricot, pear) and walnut
49. *Archips micaceana* (Walker) [3, 52]
    Hosts / food plants: *Atropa belladonna*, Cherry, *Crataegus*, *Vitis vinifera* (grapes), plum, rose, quince, willow.
50. *Archips podana* (Scopoli) (Large fruit tree tortrix) [3]
    Hosts / food plants: Rose, willow.
51. *Archips pomivora* Meyrick (Apple leaf-roller) [7, 23, 27]
    Host / food plant: Apple
52. *Archips subsidiaria* (Meyrich) [3, 36]
    Hosts / food plants: Cherry, *Crataegus*, grapes, plum, quince, rose, willow.
53. *Argyrotaenia franciscana* (Walsingham) (Orange tortrix / apple skin worm)
    (= *Tortix franciscana* Walsingham) [43]
    Hosts / food plant: Apple
54. *Pandemis dryoxesta* (Mayrick) [3]
    Hosts / food plants: Cherry, *Crataegus*, grapes, rose, quince.
55. *Tortrix* sp. [32]
    Host / food plant: Walnut

Key to the numericals in long brackets [ ] in the above listed taxa:

1 = Abrol and Singh (2003); 2 = Ahad et al. (2008); 3 = Ahmad and Bhat (1987); 4 = Ahmad et al. (2006); 5 = Anon (1997); 6 = Bahaar and Bhat (2011); 7 = Bhagat et al. (1994); 8 = Bhat et al. (2011); 9 = Bhat (1987); 10 = Bhat (1989); 11 = Bhat (1991); 12 = Bhagat et al. (2005); 13= Bhatia and Sharma (2008); 14 = Chandra and Sidhu (2009); 15 = Chauhan (2016); 16 = Dharmadhikari et al. (1985); 17 = Gupta and Narendran (2007); 18 = Gupta and Tara (2013); 19 = Gupta and Tara (2014); 20 = Gupta et al. (2015); 21 = Ishar et al. (2007); 22 = Kaul and Kesar (2003); 23 = Koul et al. (1999); 24 = Khan et al. (2004); 25 = Khan and Manobrullah (2003); 26 = Kumar et al. (2013); 27 = Malik et al. (1972); 28 = Msoodi (1991); 29 = Masoodi (1992); 30 = Masoodi et al. (1987); 31 = Mathur and Srivastava (1967); 32 = Mir and Wani (2005); 33 = Mir et al. (2012); 34 = Mittal et al. (2011); 35 = Munshi et al. (1970); 36 = Parry and Pawar (1988); 37 = Pandey and Dewivedi (2005); 38 = Pawar and Parry (1989); 39 = Pawar et al. (1980); 40 = Pawar et al. (1982); 41 = Ramegowda et al. (2012); 42 = Rishi (1966); 43 = Rishi (1968); 44 = Roonwal (1977); 45 = Sadhotra and Tripathi (2008); 46 = Salim (1991); 47 = Sharma and Tara (1985); 48 = Sheikh (1975); 49 = Singh and Gangrade (1976); 50 = Singh and Singh (1986); 51 = Srivastava (1977); 52 = Srivastava (1982); 53 = Tara and Sharma (2009); 54 = Tuhan et al. (1981) ; 55 = Zaki (1999); 56 = Zeya et al. (2000).

The above systematic checklist revealed that a total of 55 species, under 43 genera of moth caterpillas, belonging to family Crambidae (Superfamily Pyraloidea), Erebidae (Noctuoidea) and Tortricidae (Tortricoidea), is prevalent in vast areas and localities of Jammu & Kashmir State. The various caterpillar species, belonging to these families and Superfamilies, covered as many as 9 subfamilies. The total number of species, under various families found as: 12 spp. (Lymantriidae), 10 spp. (Arctiinae), 9 spp. (Tortriinae), 8 spp. (Olethreutinae), 6 spp. (Pyraustinae), 5 spp. (Spilomelinae), 2 spp. (Crambinae), 2 spp. (Evergestinae) and 1 sp. (Glaphyrinae).

The diverse 55 caterpillar species have been found to be feeding on more than 59 species of host plant species, including agricultural crops and other economically important plants. These include

valuable agricultural crops (food, fruits, vegetables and oil seed), medicinal/ aromatic plants, ornamental / flowering plants, animal fodder / forage, mulberry plantation, dye-yielding plant and aquatic weed.

The above given annotated systematic checklist shows very diverse nature of a total of 55 species of moth caterpillars belonging to 43 genera, under 3 super-families and 3 families, *viz.* Noctulidea-Erebidae, Pyraloidea-Crambidae and Tortricoidea-Tortricidae. These species have been found to be distributed over as many as 9 sub-families, under these families and super-families. The caterpillar taxa are known to have wide range of host / plant species, including agricultural crops and other economically important plant species. The 55 species of moth caterpillars feed on more than 59 species of host plants crops. These are: agricultural cops (food, fruits, vegetables, oil seed); medicinal / aromatic plants, ornamental / flowering plants; animal fodder / forage, dye-yielding plant; wood / timber trees; mulberry plantations and aquatic weed.

Species diversity of caterpillars, affecting host crops / plant species:

(1) Affecting agricultural and horticultural crops

A total of 6 species of moth caterpillars under sub-families – Aractiinae (2 spp.), Pyraustinae (2 spp.), Crambinae (1 sp.) and Lymantriinae (1 sp.), severely affecting the food crops of this region. These include 2 species of caterpillars associated with paddy and 1 species each devouring pulses, maize, potato and soybean. The vegetable crops of this region such as brassicas / cole crops, okra and brinjal, are found to be attacked by 4 spp., 1 sp. and 2 spp. of caterpillars respectively. These species belong to the sub-families, *viz.* Spilomelinae (2 spp.), Lymantriinae (2 spp.), Pyraustinae (1sp.) and Glaphyriinae (1 sp.). *Brassica rapa* (field mustard) or oil seed crop serves food for 2 spp. of caterpillars as *Euproctis* sp. (Lymantriinae) and *Evergestis* sp. (Evergestinae) (*see* Checklist and Table 1).

As many as 12 species of fruit trees / crops have been found to be devoured by 19 spp. of moth caterpillars, under sub-families like Lymantriinae (6 spp.), Olethreutinae (6 spp.), Tortricinae (6 spp.) and Crambinae (1 sp.) In J & K State the apple trees/ crops are affected by highest number of caterpillar species i.e 10. This followed by pear, quince and walnut, affected by 6 spp. each of moth caterpillar species (lymantriines, crambines, olethreutines and tortricines).

The plum and cherry tree / crop, are damaged by 5 species each of caterpillars, belonging to sub-families, *viz.* Lymantriinae, Aractiinae and Tortricinae. 3 spp. of tortricine caterpillars, have been found to be damaging grape fruit trees in this region. The fruit tree / crops as almond, apricot, guava, peach and pomegranate, have been found to be damaged by 2 spp. each of caterpillars, pertaining to sub-families- Lymantriinae, Olethreutinae, Spilomelinae and Tortricinae (see Table 1).

(2) Affecting medicinal / aromatic plants

Twenty eight species of medicinal / aromatic plants are affected by 21 spp. of moth caterpillar species, belonging to family Erebidae (9 spp.), Crambidae (5 spp.) and Tortricidae (7 spp.) (Table 1).

Rosa spp. are affected by 7 tortricid species, besides these, damasak rose and centifolia rose are damaged by 2 spp. each of caterpillars, belonging to sub-family Aractiinae and Lymantriinae. After *Rosa* spp., the highest number of caterpillar species as 4 each known to be damaging medicinal plants like *Crataegu*s spp. and willows. These caterpillar species belong to sub-family Lymantriinae and Tortricinae. Medicinal plants, *viz. Ablemoschus moschatus* and *Crotalaria madurensis*, are affected by 2 spp. each of caterpillars, belonging to subfamily Spilomelinae, Aractiinae. Rest of the 21 species of medicinal / aromatic plants, listed in Table 1, show each host / plant species affected by single species of caterpillar, under various sub-families of family Crambdae, Erebidae and Tortricidae.

Table 1. Species Diversity of Erebid, Cambid and Tortricid Moth caterpillars, under different Sub-families, affecting various host /food plants, including agricultural crops and economically important plant species in Jammu and Kashmir State (AR= Aractiinae; CR= Crambinae; EV= Evergestinae; GL= Glaphyriinae; LY= Lymentriinae; OL= Olethrentinae; PY= Pyraustinae; SP= Spilomelinae; TO= Tortricinae).

Host food / Plant species and Agricultural crops	Number of species (genus /genera) of moth caterpillars									Total number of Species (genus/genera)
	Carmbidae					Erebidae		Torticidae		
	CR	EV	GL	PY	SP	AR	LY	OL	TO	
Ablemoschus moschatus [MP/AP]	-	-	-	-	01 (01)	01 (01)	-	-	-	02 (02)
Abrus-precatorius [MP]	-	-	-	-	01 (01)	-	-	-	-	01(01)
Almond [FR]	-	-	-	-	-	-	02 (02)	-	-	02 (02)
Alnusnitida [OR]	-	-	-	-	-	-	01 (01)	-	-	01 (01)
Amaranthus [MP]	-	-	-	-	01 (01)	-	--	-	-	01 (01)
Apple [FR]	01 (01)	-	-	-	-	-	04 (03)	02 (02)	03 (02)	10 (08)
Apricot [FR]	-	-	-	-	-	-	01 (01)	-	01 (01)	02 (02)
Artemisia vulgaris [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Atropa belladonna [MP]	-	-	-	-	-	-	-	-	01 (01)	01(01)
Brinjal [VC]	-	-	-	01 (01)	-	-	01 (01)	-	-	02 (02)
Brassicas vegetables [VC]	-	02 (02)	01 (01)	-	-	-	01 (01)			04 (04)
Cannabis sativa [MP]	-	-	-	-	-	01 (01)	-	-	-	01(01)
Centifolia rose [MP/ AP]	-	-	-	-	-	01 (01)	01 (01)	-	-	02 (02)
Chenopodium ambroisides [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Cheilocostus speciosus [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Cherry [FR]	-	-	-	-	-	01 (01)	01 (01)	-	03 (02)	05 (04)
Chrysanthemum indicum [OR]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Clerodendrum [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Crataegus sp. [MP]	-	-	-	-	-	-	-	-	04 (03)	04 (03)
Crotalaria madurensis [MP]	-	-	-	-	-	02 (02	-	-	-	02 (02)
Crotalaria retusa [MP]						01 (01)	-	-	-	01 (01)
Cynoglossum- lanceolatum [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Damasak rose [MP / AP]	-	-	-	-	-	01 (01)	01 (01)	-	-	02 (02)
Grapes [FR]	-	-	-	-	-	-	-	-	03 (02)	03 (02)
Guava[FR]	-	-	-	-	01 (01)	-	-	01 (01)	-	02 (02)
Helianthus tuberosum [FC -/AF]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Maize [FC]	01 (01)	-	-	-	-	-	-	-	-	01(01)

Table 1. Contd…….

Host food / Plant species and Agricultural crops	Number of species (genus /genera) of moth caterpillars									Total number of Species (genus/genera)
	Carmbidae					Erebidae		Torticidae		
	CR	EV	GL	PY	SP	AR	LY	OL	TO	
Mentha arvensis [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Mulberry plantations [ML]	-	-	-	01 (01)	01 (01)	04 (03)	03 (03)	-	-	09 (8)
Mustard [OS]	-	01 (01)	-	-	-	-	01 (01)	-	-	02 (02)
Oak [WT / MP]	-	-	-	-	-	-	01 (01)	-	-	01 (01)
Ocimum [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Okara [VC]	-	-	-	-	01 (01)	-	-	-	-	01 (01)
Paddy / Rice [FC]	-	-	-	02 (02)	-	01 (01)	01 (01)	-	-	04 (04
Parrotiopsis jacquemontiana [FC]	-	-	-	-	-	-	01 (01)	-	-	01 (01)
Peach [FC]	-	-	-	-	-	-	01 (01)	01 (01)	-	02 (02)
Pear [FC]	-	-	-	-	-	-	03 (02)	02 (02)	01 (01)	06(05)
Pergularia daemia [MP]	-	-	-	01 (01)	-	-	-	-	-	01 (01)
Plum [FC]	-	-	-	-	-	-	03 (02)	-	02 (01)	05 (03)
Plumbago indica [MP /OR]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Pogostemon [AP/ MP]]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Pomegranate [FR]	-	-	-	-	-	-	02 (01)	-	-	02 (01)
Poplars [WT]	-	-	-	-	-	-	01 (01)	01 (01)	-	02 (02)
Potato [FC]	-	-	-	01 (01)	-	-	-	-	-	01 (01)
Pulses (Kharif) [FC]	-	-	-	-	-	01 (01)	-	-	-	01(01)
Quince [FR]	-	-	-	-	-	-	01 (01)	02 (02)	03 (02)	06 (05)
Rauvolfia sepentiana [MP]	-	-	-	01 (01)	-	-	-	-	-	01 (01)
Reinwardtia indica [DP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Robinia pseudoacacia [WT -/MP]	-	-	-	-	-	-	01 (01)	-	-	01 (01)
Rose [MP / AP]	-	-	-	-	-	-	-	02 (02)	05 (03)	07 (05)
Solanum ferox [MP]	-	-	-	01 (01)	-	-	-	-	-	01(01)
Solanum torvum [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)
Sorghum [AF]	01 (01)	-	-	-	-	-	-	-	-	01 (01)
Soybean [FC]	-	-	-	-	-	-	01 (01)	-	-	01 (01)

Table 1. Contd…….

Host food / Plant species and Agricultural crops	Number of species (genus /genera) of moth caterpillars									Total number of Species (genus/genera)
	Carmbidae					Erebidae		Torticidae		
	CR	EV	GL	PY	SP	AR	LY	OL	TO	
Spinach [VC]	-	-	-	-	01 (01)	-	-	-	-	01 (01)
Walnut [FR]	-	-	-	-	-	-	03 (03)	01 (01)	02 (02)	06 (06)
Water hyacinth [AW]	-	-	-	-	-	02 (02)	-	-	-	02 (02)
Willows [MP / AF]	-	-	-	-	-	-	01 (01)	-	03 (01)	04 (01)
Withhania somnifera [MP]	-	-	-	-	-	01 (01)	-	-	-	01 (01)

AF= Animal fodder/ forage; AP= Aromatic plant; AW= Aquatic weed; DP= Dye-yielding plant; FC= Food tree/ crop; FR= Fruit tree/ crop; ML=Mulberry plantations (*Morus* spp.); MP= Medicinal plant; OR= Ornamental / flowering plant; OS= Oil-seed yielding plant; VC= Vegetable plant; WT= Wood/ timber tree.

(3) Affecting animal fodder/ forage, dye-yielding plant, wood/ timber trees, mulberry plantations and aquatic weed

Six species of caterpillar affect animal fodder / forage crops (*Helianthus tuberosum*, *Salix* spp. and *Sorghum* sp.). *Salix* spp. are affected by 3 spp. of Tortricine (*Archips*) and 1 sp. of Lymantriine (*Lymantria*), besides Aractiine (*Spilosoma*) and Crambine (*Chilo*) damage *H. tuberosum* and *Sorghum* respectively. *Spilosoma obliqua* is responsible for damaging dye-yielding plant, *Reinwardtia indica* in this region. The important timber/ wood trees of this region, *viz*. oak and poplars, have been found to be attacked by *L. obfuscata* and *Eucosoma glaciata*, and *Parrotiopsis jacquemontiana* is affected by *Leucoma sericea.*

9 spp., under 8 genera of moth caterpillar, under sub-family Aractiinae (4 spp.), Lymantriinae (3spp.), Pyraustinae (1 sp.) and Spilomelinae (1 sp.), have been found to be damaging mulberry plantations (*Morus* spp.) in this region. 2 spp. of Aractiine, belonging to genus S*pilarctia*, are affecting aquatic weed, water hyacinth in this region.

Conflict of interest statement

Authors declare that they have no conflict of interest.

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