

# Checklist of arthropod predators of the cotton aphid, *Aphis (Aphis) gossypii* Glover, 1877 (Insecta: Hemiptera: Aphididae), and their distribution in India

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Received 10 July 2024 | Accepted 30 August 2024 | Published 05 September 2024

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## Abstract

In this article, arthropod predators of *Aphis (Aphis) gossypii* Glover, 1877 (cotton aphid, melon aphid, brinjal aphid etc.) are catalogued along with the host plants of the prey distributed in different states and union territories of India. Predatory arthropods of cotton aphid mostly belong to four orders of class Insecta: Coleoptera (Anthribidae, Coccinellidae, Nitidulidae, Staphylinidae), Diptera (Calliphoridae, Chamaemyiidae, Cecidomyiidae, Syrphidae), Hemiptera (Anthocoridae, Geocoridae, Miridae, Pentatomidae) and Neuroptera (Chrysopidae, Hemerobiidae); and one order of class Arachnida, the order Araneae (spiders) (10 families). Among the Coleoptera, the Coccinellidae (ladybird beetles) is the largest family having 92 species feeding on this aphid infesting 107 species of host plants distributed in 27 states and union territories of India. A maximum of 52 species of these ladybird beetles' prey on the aphids on brinjal (*Solanum melongena*) followed by cotton, *Gossypium hirsutum* (20 species), and okra, *Abelmoschus esculentus* (18 species). Among the Diptera, the hover flies (Syrphidae) are the most common predators having 24 species feeding on *Aphis gossypii* infesting 36 species of host plants distributed in 16 states and union territory of India. Among the Hemiptera, four species of anthocorid bugs are reported to prey on the cotton aphid. In Neuroptera, only two families, Chrysopidae (9 species) and Hemerobiidae (3 species) are recorded to prey on it in India. Among the Araneae, 29 species of spiders were reported belonging to 10 families, that prey on *Aphis gossypii* in six states of India. Indeed, very limited research works have been made to record these aphidophagous arthropods in India feeding on the cotton aphid and most of the regions are still unexplored and need an intensive and extensive survey plan to record them in those areas.

**Key words:** Aphid, aphidophagous, biocontrol, checklist, aphid predators, Coccinellidae, ladybirds, Syrphidae, hover flies, predatory bugs, spiders.

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# 1. Introduction

*Aphis (Aphis) gossypii* Glover, 1877 (Insecta: Hemiptera: Aphididae) is commonly known as cotton aphid, melon aphid or brinjal aphid. It is a cosmopolitan and polyphagous species widely distributed in the tropics, subtropics, and temperate regions of the world. It is a serious pest of field and glasshouse crops, especially cotton, okra, gourd, melon, chilli, brinjal and several ornamental plants such as chrysanthemums, roses, etc. (Singh et al., 2023a). The aphid varies in colour and may be light green, dark green, pale yellow or almost white (Singh et al., 2014). It feeds by sucking sap from their host plants. The undersides of leaves are preferred, other leaf surfaces and flower buds are its next choice, but the entire host plant may be covered when populations are very large. Infested leaves often become cupped downwards and may appear wrinkled. Heavy infestations on some plants may result in wilting. Young plants may have reduced or stunted growth. *Aphis gossypii* reduces flower production and yield (Singh et al., 2014). Like other aphids, the cotton aphid also produces copious amounts of honeydew, a sweet and watery excrement that serves as a medium on which sooty mould grows that blackens the leaf and decreases photosynthetic activity of the plants. When found on the fruits, honeydew and sooty mould reduces their marketability. Growers respond by washing fruit before marketing them. However, unfortunately, fruits often become unmarketable or of a lower grade because the fungus is difficult to wash off. Tinted cotton highly reduces the obtained market price. Honeydew is also fed on by bees, wasps, ants and other insects, which may provide protection for the aphids from their natural enemies (Singh et al., 2014). Both apterous and alate morphs vector many plant diseases which cause substantially greater losses than damage caused by direct feeding injury. Out of 620 plant viruses known in the bioscience, about one-third are arthropod-borne and more than 80 per cent are transmitted by aphids (Singh & Singh, 2021a; Ghosh et al., 2017a) and the cotton aphid alone transmits at least 80 plant viruses (Singh & Singh, 2016). The diversity of its host range in India includes plants belonging to more than 550 species belonging to about 100 plant families. Plants belonging to following families are highly infested: Asteraceae, Cucurbitaceae, Fabaceae, Lamiaceae, Malvaceae, Polygonaceae, Rosaceae and Solanaceae (Singh et al., 2014; Singh et al., 2023a).

Among the arthropod predators of insects, ladybird beetles (Coccinellidae: Coleoptera: Insecta) stand first due to their species diversity and by having high foraging and predatory efficiency (Pervez et al., 2020a; Kumar & Omkar, 2023). They feed on soft insects such as aphids, bugs, thrips, scale insects, whiteflies etc. (Omkar & Pervez, 2004; Ahmad et al., 2024). Other aphidophagous arthropods are the larvae of syrphid flies (Syrphidae: Diptera: Insecta) (Joshi & Ballal, 2013; Joshi et al., 2023; Ahmad & Kumari, 2024), chrysopids (Chrysopidae: Neuroptera: Insecta) (Bakthavatsalam & Varshney, 2023; Singh et al., 2024a), hemerobiids (Neuroptera: Insecta) (Singh et al., 2024a), spiders (Singh et al., 2024b), some predatory bugs (Ballal et al., 2023) and few carabid beetles (Sreedevi et al., 2023).

The anthropogenic activities have significantly reduced the global biodiversity. Therefore, one of the most significant confront facing our earth today is the conservation of biodiversity, which includes collections of species and families, and the spectrum of their ecosystems along with their genetic diversity. The natural enemies (parasitoids and predators) of insect pests have an essential role in maintaining the balance in the ecosystem. The anthropogenic activities have created threats to their existence and the ecosystems (Prodanova et al., 2023). The importance of conserving the natural enemies of insect pests is globally emphasized as these insects not only act as bioagents in controlling the pest population naturally but are also used in classical and conservation biocontrol programmes (Singh, 2024). The main objective of this compilation is to explore the biodiversity of natural enemies of the cotton aphid and their food plant associations across the country that may help in their natural conservation aiming to reduce the pest population and to protect the crops infested by them. Most of the predators of the cotton aphid are polyphagous and generalist predators of several species of

aphids. Some of these predators have been recommended for the biological control of this species, particularly, on cotton crops. These records indicate that most of the regions of India are still unexplored for arthropod predators of the cotton aphid that act as natural beneficial agents for its control where its host plants are cultivated.

## 2. Materials and methods

The present checklist is based on the primary data of published literature on aphidophagous arthropods, e.g. books, book chapters, journals, proceedings of conferences, Records and Fauna Series of the Zoological Survey of India, Kolkata, and a few authentic theses available on Shodhganga (<https://shodhganga.inflibnet.ac.in>) up to July 15, 2024. The records of aphidophagous arthropods without giving the name of their specific prey species are excluded from this checklist. In most of the recent past literature, there are several errors in the scientific names of the insects both predators as well as their preys (aphids) and food plants because of their modified status and other nomenclatural decisions and clarification. The names of aphids, as well as plants that were misspelt in the original records have been corrected where we logically ascertain the intended species. In the present checklist, attempts have been made to provide the valid scientific names of the predators following GBIF (2024), WSC (2024), aphids following Favret (2024), and of the plants, following (WFO, 2024). For detail synonymy of the valid species, above references should be consulted.

## 3. Results and Discussion

Predatory arthropods of *Aphis gossypii* mostly belong to four orders of class Insecta: Coleoptera (Anthribidae, Coccinellidae, Nitidulidae, Staphylinidae), Diptera (Calliphoridae, Chamaemyiidae, Cecidomyiidae, Syrphidae), Hemiptera (Anthcoridae, Geocoridae, Miridae, Pentatomidae) and Neuroptera (Chrysopidae, Hemerobiidae); and one order of class Arachnida, the order Araneae (spiders) (10 families). A total of 179 species of predators belonging to different taxa were observed to feed this aphid on 106 food plant species distributed in 27 states/union territories of India. Maximum number of predators belong to the families Coccinellidae (92 species) and Syrphidae (23 species) (Table 1).

### Checklist of aphidophagous arthropods along with their prey aphid species infesting food plants in different states of India:

#### A. Class: Arachnida

##### I. Order: Araneae

The order Araneae includes spiders which are an exceedingly valuable element of the earth's ecosystem being predatory consuming mostly insects keeping their population under control and hardly pose any danger to humans (Nyffeler & Birkhofer, 2017). But, unlike insect predators, their potential as biocontrol agents is less exploited to its fullest. Recently, Singh et al. (2024b) reported a total of 77 species of aphidophagous spiders in India preying on 53 species of aphids infesting 58 species of plants. Herewith, 30 species of spiders are listed belonging to 10 families that prey on the cotton aphid in 15 states of India. Indeed, very limited attempts have been made to record these aphidophagous spiders in India and need an intensive and extensive survey plan to record them in unexplored areas.

**1. Family: Araneidae:** Araneidae, commonly known as the orb-weaver spiders, are globally distributed. They are typically nocturnal and most active during evening hours and hide themselves in the middle of the webs hanging upside down during the daytime (Singh & Singh, 2021b). In India, 10 species of orb-weaver spiders are recorded preying on *Aphis gossypii* feeding on eight food plants in eight states as mentioned below.

#### 1. *Araneus* sp.

*Benincasa hispida* Cogn. – Chhattisgarh (Bisen et al., 2017)

*Capsicum frutescens* L. – Sikkim (Raychaudhuri et al., 1978)

2. ***Argiope catenulata* (Doleschall, 1859)**  
*Gossypium hirsutum* L. – Tamil Nadu (Mathirajan & Reghupathy, 2003)
3. ***Argiope luzona* (Walckenaer, 1841)**  
*Solanum melongena* L. – Tamil Nadu (Sankari & Thiyagesan, 2010)  
*Trichosanthes cucumerina* L. – Tamil Nadu (Sankari & Thiyagesan, 2010)
4. ***Argiope minuta* Karsch, 1879**  
*Gossypium hirsutum* L. – Tamil Nadu (Kannan et al., 2004)
5. ***Argiope pulchella* Thorell, 1881**  
*Gossypium hirsutum* L. – Tamil Nadu (Vanitha et al., 2009)
6. ***Cyrtophora cicatrosa* (Stoliczka, 1869)**  
*Solanum melongena* L. – Tamil Nadu (Sankari & Thiyagesan, 2010)  
*Trichosanthes cucumerina* L. – Tamil Nadu (Sankari & Thiyagesan, 2010)
7. ***Eriovixia* sp.**  
*Abelmoschus esculentus* Moench – Maharashtra (Kale et al., 2020)  
*Gossypium hirsutum* L. – Maharashtra (Kale et al., 2020)  
*Helianthus annuus* L. – Maharashtra (Kale et al., 2020)
8. ***Leucauge celebesiana* (Walckenaer, 1841)**  
*Galinsoga parviflora* Cav. – West Bengal (Raychaudhuri et al., 1979; Debnath, 2020)
9. ***Neoscona mukeerjei* Tikader, 1980**  
*Abelmoschus esculentus* Moench – Kerala (Manu, 2005)
10. ***Neoscona theisi* (Walckenaer, 1841)**  
*Benincasa hispida* Cogn. – Chhattisgarh (Bisen et al., 2017)  
*Gossypium hirsutum* L. – Maharashtra (Nagrare et al., 2015); – Tamil Nadu (Kannan et al., 2004); – Telangana (Malleth & Sravanthy, 2021)
11. ***Neoscona* spp.**  
*Abelmoschus esculentus* Moench – Maharashtra (Kale et al., 2020)  
*Gossypium hirsutum* L. – Andhra Pradesh (Dhillon & Sharma, 2013); – Maharashtra (Kale et al., 2020)  
*Helianthus annuus* L. – Maharashtra (Kale et al., 2020)

**2. Family: Clubionidae:** The spiders of the family Clubionidae, commonly known as sac spiders, construct flattened tubular dense retreats usually made on rolled leaves. These sac spiders are one of the common predators of insect pests in the crop fields and gardens (Singh et al., 2020). In India, only one species of the genus *Clubiona* was observed as aphidophagous on *Aphis gossypii* feeding in cotton agroecosystem of Gujarat.

1. ***Clubiona drassodes* O. Pickard – Cambridge, 1874**  
*Gossypium hirsutum* L. – Tamil Nadu (Vanitha et al., 2009)
2. ***Clubiona* spp.**  
*Gossypium hirsutum* L. – Andhra Pradesh (Dhillon & Sharma, 2013); – Maharashtra (Kale et al., 2020)  
*Helianthus annuus* L. – Maharashtra (Kale et al., 2020)  
Unknown plant – Himachal Pradesh (Das & Raychaudhuri, 1983)

Table 1. Number of species of predators belonging to different taxa preying on *Aphis (Aphis) gossypii* Glover infesting different number of host plants in number of states/union territories of India; (?) indicates doubtful records.

Class	Order	Families of predators	Number of predator species	Number of host plant species	Number of predator - prey - host - plant associations	Number of states/union territories
Arachnida	Araneae	1. Araneidae	10	8	19	8
		2. Clubionidae	1	2	3	4
		3. Corinnidae	1	1	1	1
		4. Lycosidae	2	3	5	3
		5. Oxyopidae	8	6	15	7
		6. Salticidae	2	1	2	2
		7. Tetragnathidae	3	2	3	2
		8. Theridiidae	1	3	3	2
		9. Thomisidae	1	2	2	1
		10. Uloboridae	1	2	2	2
		11. Unknown	6	2	2	6
		<b>Sub total</b>	<b>30</b>	<b>11</b>	<b>57</b>	<b>15</b>
Insecta	Mantodea	1. Mantidae (?)	1	1	1	1
	Coleoptera	1. Anthribidae (?)	1	2	2	1
		2. Coccinellidae	92	107	517	27
		3. Nitidulidae (?)	1	1	1	1
		4. Staphylinidae	2	3	3	5
		<b>Sub total</b>	<b>99</b>	<b>110</b>	<b>520</b>	<b>27</b>
	Diptera	1. Asilidae (?)	1	1	1	1
		2. Calliphoridae (?)	1	1	1	1
		3. Chamaemyiidae	1	5	5	3
		4. Cecidomyiidae	2	4	5	3
		5. Syrphidae	24	36	115	16
			<b>Sub total</b>	<b>28</b>	<b>29</b>	<b>125</b>
	Hemiptera	1. Anthocoridae	4	2	5	4
		2. Geocoridae	2	2	3	2
		3. Miridae	1	1	1	1
		4. Pentatomidae	1	1	1	1
		<b>Sub total</b>	<b>8</b>	<b>5</b>	<b>10</b>	<b>6</b>
	Neuroptera	1. Chrysopidae	9	21	42	19
		2. Hemerobiidae	3	5	9	5
			<b>Sub total</b>	<b>12</b>	<b>23</b>	<b>51</b>
	Odonata	1. Calopterygidae	1	1	1	1
		2. Libellulidae	1	1	1	1
		<b>Sub total</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>
	<b>Total</b>	<b>179</b>	<b>107</b>	<b>712</b>	<b>27</b>	

**3. Family: Corinnidae:** These spiders are called as corinnid sac spiders. They are hunter and build silken retreats, or sacs, usually on plant terminals, between leaves, under bark or under rocks (Singh et al., 2021a). In India, only an unidentified species of the genus *Castianeira* was recorded to feed the cotton aphid in Gujarat.

**1. *Castianeira* sp.**

*Gossypium hirsutum* L. - Gujarat (Dhulia & Yadav, 1991)

**4. Family: Lycosidae:** The members of this family are commonly called as wolf spiders. Mostly, they are diurnal and hunt the prey actively (Singh, 2021a). In India, only two species are known to prey on *Aphis gossypii* infesting three food plants as follows.

1. ***Hippasa pantherina* Pocock, 1899**

*Solanum melongena* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

*Trichosanthes cucumerina* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

2. ***Pardosa pseudoannulata* (Bösenberg & Strand, 1906) [syn. *Lycosa pseudoannulata* (Bösenberg & Strand, 1906)]**

*Gossypium hirsutum* L. - Tamil Nadu (Kannan et al., 2004)

*Solanum melongena* L. - Assam (Borkakati & Saikia, 2020); - Tamil Nadu (Sankari & Thiyagesan, 2010); - West Bengal (Satpathi, 1999)

*Trichosanthes cucumerina* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

3. ***Pardosa* sp.**

*Solanum melongena* L. - West Bengal (Satpathi, 1999)

5. **Family: Oxyopidae:** Oxyopids or lynx spiders have mostly cryptic colour to blend in with the vegetation and actively search for prey, stalk and often leap from branch to leaf and finally jumping on its prey or leaping a few centimeters into the air to catch flying insects (Singh, 2021b). At present, eight species are recorded preying on *Aphis gossypii* infesting six species of host plants in seven states in India as mentioned below.

1. ***Oxyopes birmanicus* Thorell, 1887**

*Gossypium hirsutum* L. - Tamil Nadu (Jeyaparvathi et al., 2013)

2. ***Oxyopes hindostanicus* Pocock, 1901 [syn. *Oxyopes pankaji* Gajbe & Gajbe, 2000]**

*Gossypium hirsutum* L. - Maharashtra (Nagrare et al., 2015; Kale et al., 2020)

3. ***Oxyopes javanus* Thorell, 1887**

*Abelmoschus esculentus* Moench - Kerala (Manu, 2005)

*Gossypium hirsutum* L. - Tamil Nadu (Kannan et al., 2004; Vanitha et al., 2009)

*Solanum melongena* L. - Assam (Borkakati & Saikia, 2020); - Tamil Nadu (Sankari & Thiyagesan, 2010)

*Trichosanthes cucumerina* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

4. ***Oxyopes lineatipes* (C.L. Koch, 1847)**

*Solanum melongena* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

*Trichosanthes cucumerina* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

5. ***Oxyopes pandae* Tikader, 1969**

*Arachis hypogaea* L. - Punjab (Sadana & Goel, 1996)

6. ***Oxyopes salticus* Hentz, 1845**

*Gossypium hirsutum* L. - Tamil Nadu (Jeyaparvathi et al., 2013)

7. ***Oxyopes* spp.**

*Benincasa hispida* Cogn. - Chhattisgarh (Bisen et al., 2017)

*Solanum melongena* L. - Assam (Borkakati et al., 2019; Das & Ahmed, 2021)

8. ***Peucetia latikae* Tikader, 1970**

*Gossypium hirsutum* L. - Tamil Nadu (Jeyaparvathi et al., 2013)

9. ***Peucetia viridana* (Stoliczka, 1869)**

*Gossypium hirsutum* L. - Tamil Nadu (Kannan et al., 2004; Jeyaparvathi et al., 2013); - Telangana (Malleth & Sravanthy, 2021)

*Solanum melongena* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

*Trichosanthes cucumerina* L. - Tamil Nadu (Sankari & Thiyagesan, 2010)

**6. Family: Salticidae:** Salticidae includes jumping spiders and is the largest family of the order Araneae. In general, they are master hunters, with the ability to jump vast distances feeding a large variety of preys (Singh et al., 2021b). At present, only two species of Salticidae are known from India to feed *Aphis gossypii* infesting cotton in Tamil Nadu and Telangana as mentioned below.

1. *Rhene* sp.

*Gossypium hirsutum* L. – Telangana (Malleth & Sravanthy, 2021)

2. *Salticus* sp.

*Gossypium hirsutum* L. – Tamil Nadu (Vanitha et al., 2009)

**7. Family: Tetragnathidae:** Tetragnathids are known as longed- jawed orb weavers, long- jawed spiders, stretch spiders or stilt spiders and spin more or less horizontal orb webs which are loosely woven with an open hub with few wide- set radii and spiral with no signal line or retreat. These spiders are often found in vegetation near water (Singh, 2021c). At present, only three species are known to prey on *Aphis gossypii* from India infesting okra in Kerala and on cotton in Tamil Nadu as mentioned below.

1. *Leucauge decorata* (Blackwall, 1864)

*Gossypium hirsutum* L. – Tamil Nadu (Vanitha et al., 2009)

2. *Tetragnatha javana* (Thorell, 1890)

*Gossypium hirsutum* L. – Tamil Nadu (Kannan et al., 2004)

3. *Tetragnatha mandibulata* Walckenaer, 1841

*Abelmoschus esculentus* Moench – Kerala (Manu, 2005)

**8. Family: Theridiidae:** These spiders are commonly known as the cobweb spiders, tangle- web spiders and comb- footed spiders and have a comb of serrated bristles on the tarsus of the fourth leg which is used to throw sticky silk over the prey to wrap them (Singh, 2021d). At present, two identified species are known to feed *Aphis gossypii* as mentioned below.

1. *Meotipa argyroformis* (Yaginuma, 1952)

*Solanum melongena* L. – Tamil Nadu (Sankari & Thiyagesan, 2010)

*Trichosanthes cucumerina* L. – Tamil Nadu (Sankari & Thiyagesan, 2010)

2. *Theridion* sp.

*Zinnia* sp. – Himachal Pradesh (Agarwala et al., 1981)

**9. Family: Thomisidae:** Thomisids are commonly known as the crab spiders, flower spiders or flower crab spiders because of crab- like appearance. They do not construct web, rather capture the prey by ambushing and sometimes by active pursuit. They are not active hunters but are sit- and- wait predators that hunt in flowers, foliage, or leaf litter (Singh & Singh, 2021c). At present, only one species is known to prey on *Aphis gossypii* in India.

1. *Thomisus spectabilis* Doleschall, 1859

*Gossypium hirsutum* L. – Maharashtra (Nagrare et al., 2015)

2. *Thomisus* sp.

*Abelmoschus esculentus* Moench – Maharashtra (Kale et al., 2020)

**10. Family: Uloboridae:** These spiders commonly called as the hackled- band orb- weavers and sometimes live in group with individual webs loosely connected. They lack poison glands and encase their prey thoroughly in silk covering and regurgitated digestive juice in it, and

then ingest the liquified body (Singh & Singh, 2021d). In India, only one species is recorded aphidophagous as follows.

1. *Uloborus khasiensis* Tikader, 1969

*Gossypium hirsutum* L. - Gujarat (Dhulia & Yadav, 1991)

2. *Uloborus* sp.

*Tagetes erecta* L. (syn. *Tagetes patula* L.) - West Bengal (Raychaudhuri et al., 1979 (Debnath, 2020)

11. Unidentified families:

*Abelmoschus esculentus* Moench - Maharashtra (Bisen et al., 2020); - Odisha (Mohapatra et al., 2022); - Tamil Nadu (Shanthi et al., 2020); - Uttarakhand (Bhatt & Karnatak, 2018)

*Gossypium hirsutum* L. - Andhra Pradesh (Rajasekhar & Durga Prasad, 2018); - Haryana (Kumar et al., 2016a)

**B. Class: Insecta**

**I. Order: Coleoptera**

Among the Coleoptera, the aphidophagous ladybird beetles are distributed throughout the world and have a long history of importation in classical biocontrol (Kumar & Omkar, 2023) and indeed are a gift of nature to the farmers as they protect several crops by reducing the aphid population (Pervez et al., 2020b). Members of four families of Coleoptera are recorded as predators of *Aphis gossypii* in India: Anthribidae, Coccinellidae, Nitidulidae and Staphylinidae out of which records of two families Anthribidae and Nitidulidae are doubtful and details of these families are given separately. Among these, the Coccinellidae is the largest family having 92 species feeding on *Aphis gossypii* infesting 107 species of host plants distributed in 27 states/union territories of India with 517 predator- prey- food plant associations (triplets) (Table 1). The representation of other three families is very poor, only 1 - 2 species prey on the aphid infesting 1-5 species of plants. The detail food plant associations of these beetles are given below.

**1. Family: Coccinellidae:** These are commonly called as ladybird beetles. Though several species of this family are major agricultural pests, at least 260 species are insectivorous feeding on soft insects like aphids, scale insects, mealy bugs, whiteflies etc. in India (Omkar & Pervez, 2004). In this checklist, 92 species of coccinellids infesting 107 species of plants are reported feeding on *Aphis gossypii* in 27 states/union territories of India. Most of the tritrophic associations (triplets, predators-preys-host plants) of these ladybird beetles are reported from Kerala (119 triplets) followed by Uttar Pradesh (116 triplets), Manipur (102 triplet), West Bengal (71 triplets), Bihar (42 triplets) and other less than 40 triplets (Figure 1). Almost 55 % species of these ladybird beetles prey on the cotton aphid on brinjal (*Solanum melongena*) followed by cotton (20 species), and okra (18 species). Following is the checklist of aphidophagous ladybird beetles along with their prey aphid species infesting food plants in different states of India.

1. *Adalia bipunctata* (Linnaeus, 1758)

*Solanum melongena* L. - Assam (Borkakati et al., 2019)

2. *Adalia tetraspilota* (Hope, 1831)

*Cucumis sativus* L. - Jammu & Kashmir (Bhat, 2017)

*Lagenaria siceraria* (Molino) Standl. - Jammu & Kashmir (Bhat, 2017)

*Solanum melongena* L. - Jammu & Kashmir (Bhat, 2017); - West Bengal (Satpathi & Mandal, 2006)

*Zinnia elegans* L. - Jammu & Kashmir (Bhagat & Lone, 1984)

3. *Aiolocaria hexaspilota* (Hope, 1831)

*Lagenaria siceraria* (Molino) Standl. - Uttarakhand (Pervez et al., 2020c)

4. *Alloneda dodecaspilota* (Hope, 1831) [syn. *Aiolocaria dodecaspilota* (Hope, 1831)]

*Cucumis sativus* L. - Uttarakhand (Pervez et al., 2020c)

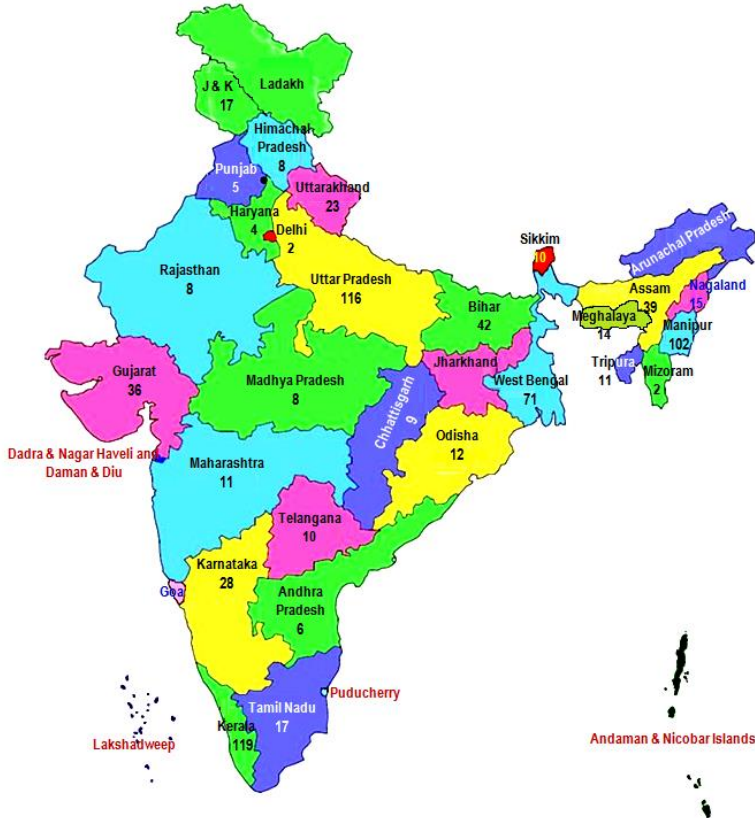


Figure 1. Map showing the number of tritrophic association of aphidophagous ladybird beetles preying on *Aphis (Aphis) gossypii* Glover in different states and union territories of India.

5. *Anegleis cardoni* (Weise, 1892) [syn. *Micraspis cardoni* (Weise, 1892)]

*Abelmoschus esculentus* (L.) Moench- Uttar Pradesh (Tiwari et al., 2024)

*Cajanus cajan* (L.) Millsp. - Uttar Pradesh (Tiwari et al., 2024)

*Campsis radicans* (L.) Bureau - Uttar Pradesh (Tiwari et al., 2024)

*Capsicum annuum* L. - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Maji et al., 2023)

*Capsicum frutescens* L. - West Bengal (Gurung et al., 2019)

*Lagenaria siceraria* (Molino) Standl. - Uttar Pradesh (Omkar et al., 2009)

*Malus domestica* (Suckow) Borkh. - Manipur (Chakrabarti et al., 2012)

- Solanum melongena* L. - Uttar Pradesh (Afroze, 2000; Tiwari et al., 2024); - West Bengal (Satpathi & Mandal, 2006)
6. ***Axinoscymnus puttarudriahi* Kapur & Munshi, 1965**  
*Capsicum frutescens* L. - Kerala (Vidya & Bhaskar, 2017)
7. ***Brumoides suturalis* (Fabricius, 1798) [syn. *Brumus suturalis* (Fabricius, 1798)]**  
*Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009); - Odisha (Mohapatra et al., 2022); - Tamil Nadu (Rekha et al., 2009); - West Bengal (Gurung et al., 2019; Maji et al., 2023)  
*Cajanus cajan* (L.) Millsp. - Uttar Pradesh (Chaudhary & Singh, 2012; Tiwari et al., 2024)  
*Capsicum annuum* L. - Karnataka (Asma & Hanumantharaya, 2015); - Kerala (Thamilvel, 2009); - Uttar Pradesh (Tiwari et al., 2024)  
*Capsicum chinense* Jacq. - Assam (Begam et al., 2016; Thangjam et al., 2020)  
- *Capsicum frutescens* L. - Tamil Nadu (Rekha et al., 2009); - Uttar Pradesh (Tiwari et al., 2024)  
*Commelina benghalensis* L. - Kerala (Thamilvel, 2009)  
*Duranta erecta* L. - Sikkim (Chakrabarti et al., 2012)  
*Gossypium hirsutum* L. - Gujarat (Chakraborty, 2012); - Rajasthan (Dhaka, 2013); - Telangana (Mallesh & Sravanthy, 2021)  
*Lagenaria siceraria* (Molino) Standl. - Uttar Pradesh (Bista et al., 2012)  
*Plantago ovata* Forssk. - Rajasthan (Ola et al., 2024)  
*Portulaca oleraceae* L. - Kerala (Thamilvel, 2009)  
*Solanum lycopersicum* L. - Haryana (Khokhar & Rolania, 2021)  
*Solanum melongena* L. - Assam (Kalita et al., 1998; Borah & Saikia, 2017); - Kerala (Gokul et al., 2024); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Gurung et al., 2019)  
*Solanum tuberosum* L. - Uttar Pradesh (Raj, 1989)  
Unknown plant - Uttarakhand (Sharma & Joshi, 2010)
8. ***Brumoides* sp.**  
*Solanum melongena* L. - Assam (Borkakati et al., 2019; Das & Ahmed, 2021)
9. ***Brumus* sp.**  
*Abelmoschus esculentus* (L.) Moench - Chhattisgarh (Chaturvedani et al., 2023)
10. ***Cheilomenes propinqua* (Mulsant, 1850)**  
*Solanum melongena* L. - Assam (Borkakati et al., 2019); - Meghalaya (Boruah & Pathak, 2023); Uttar Pradesh (Singh, 2023)
11. ***Cheilomenes sexmaculata* (Fabricius, 1781) [syn. *Menochilus sexmaculatus* (Fabricius, 1781)]**  
*Abelmoschus esculentus* (L.) Moench - Assam (Das et al., 2021); - Bihar (Prabhakar & Roy, 2010; Ahmad et al., 2020); - Chhattisgarh (Chaturvedani et al., 2023); - Gujarat (Chakraborty, 2012); - Kerala (Thamilvel, 2009); - Maharashtra (Kale et al., 2020); - Tamil Nadu (Rajamohan & Jayaraj, 1973; Rekha et al., 2009); - Uttarakhand (Bhatt et al., 2018); - West Bengal (Gurung et al., 2019)  
*Acalypha indica* L. - Kerala (Thamilvel, 2009)  
*Ageratum conyzoides* L. - Kerala (Thamilvel, 2009); - Tripura (Ghosh et al., 2017b)  
*Amaranthus tricolor* L. - Kerala (Thamilvel, 2009)  
*Anethum graveolens* L. - Jammu & Kashmir (Butani & Kapadia, 2000a)  
*Arachis hypogaea* L. - Andhra Pradesh (Vasista et al., 2021)  
*Artocarpus integer* (Thumb.) Merr. - Manipur (Devi & Singh, 1987)  
*Barleria prionitis* L. - Kerala (Thamilvel, 2009)  
*Benincasa hispida* Cogn. - Chhattisgarh (Bisen et al., 2017)  
*Boerhavia repens* L. - Kerala (Thamilvel, 2009)

- Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)
- Cajanus cajan* (L.) Millsp. - Bihar (Ahmad et al., 2020)
- Capsicum annuum* L. - Chhattisgarh (Kumar et al., 2020); - Karnataka (Asma & Hanumantharaya, 2015); - Kerala (Thamilvel, 2009); - Madhya Pradesh (Chintkuntlawar et al., 2015); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Priyadarshini, 2018; Maji et al., 2023)
- Capsicum chinense* Jacq. - Assam (Begam et al., 2016; Thangjam et al., 2020)
- Capsicum frutescens* L. - Bihar (Ahmad et al., 2020); - Kerala (Thamilvel, 2009); - Tamil Nadu (Rekha et al., 2009); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Gurung et al., 2019)
- Cardiospermum halicacabum* L. - Kerala (Thamilvel, 2009)
- Catharanthus pusillus* (Murray) G. Don - Kerala (Thamilvel, 2009)
- Catharanthus roseus* (L.) G. Don - Bihar (Ahmad et al., 2020); - Kerala (Thamilvel, 2009)
- Centella asiatica* (L.) Urb. - Kerala (Thamilvel, 2009)
- Chromolaena odorata* (L.) R.M. King & H. Rob. - Manipur (Shantibala, 1989)
- Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)
- Colocasia esculenta* (L.) Schott - West Bengal (Bhattacharyya & Mandal, 2004)
- Commelina benghalensis* L. - Kerala (Thamilvel, 2009)
- Coriandrum sativum* L. - Gujarat (Butani & Kapadia, 2000a)
- Cucumis sativus* L. - Kerala (Thamilvel, 2009); - Manipur (Shantibala, 1989); - Tamil Nadu (Veeravel & Baskaran, 1997)
- Cucurbita maxima* Duchesne - Tripura (Ghosh et al., 2017b); - Uttar Pradesh (Tiwari et al., 2024)
- Cuminum cyminum* L. - Gujarat (Vadher et al., 2023)
- Cyanthillium cinereum* (L.) H. Rob. - Kerala (Thamilvel, 2009)
- Foeniculum vulgare* Mill. - Bihar (Ahmad et al., 2020)
- Gloriosa superba* L. - Kerala (Thamilvel, 2009)
- Gossypium arboreum* L. - West Bengal (Agarwala & Saha, 1986)
- Gossypium herbaceum* L. - Gujarat (Butani & Kapadia, 2000b)
- Gossypium hirsutum* L. - Andhra Pradesh (Dhillon et al., 2012); - Delhi (Pandi et al., 2012; Venkanna et al., 2020); - Gujarat (Chakraborty, 2012; Patel, 2015); - Karnataka (Jalali & Singh, 1994; Joshi et al., 1999a; Megha et al., 2015); - Maharashtra (Vennila et al., 2007; Kale et al., 2020); - Odisha (Mohapatra, 2004; Bhattacharyya et al., 2019); - Rajasthan (Dhaka, 2013); - Tamil Nadu (Kamman et al., 2004); - Telangana (Mallesh & Sravanthy, 2021); - Uttarakhand (Joshi & Sharma, 2008); - West Bengal (Maji et al., 2023)
- Helianthus annuus* L. - Maharashtra (Kale et al., 2020)
- Hibiscus rosa-sinensis* L. - Bihar (Ahmad et al., 2020)
- Lagenaria siceraria* (Molino) Standl. - Bihar (Kumar et al., 2016b; Ahmad et al., 2020); - Jammu & Kashmir (Bhat, 2017); - Uttar Pradesh (Omkar & Bind, 1998); - West Bengal (Saha et al., 2016)
- Luffa aegyptiaca* Mill. - Bihar (Ahmad et al., 2020)
- Luffa acutangula* (L.) Roxb. - Uttar Pradesh (Tiwari et al., 2024)
- Magnolia champaka* (L.) Baill. ex Pierre - Manipur (Shantibala, 1989)
- Malus domestica* (Suckow) Borkh. - Manipur (Devi & Singh, 1987); - West Bengal (Chakrabarti et al., 2012)
- Momordica charantia* L. - Bihar (Ahmad et al., 2020); - Kerala (Jose, 2003; Thamilvel, 2009)
- Ocimum tenuiflorum* L. - West Bengal (Maji et al., 2023)
- Plantago ovata* Forssk. - Rajasthan (Ola et al., 2024)

*Psidium guajava* L. - Karnataka (Mani & Krishnamoorthy, 1989); - Manipur (Devi & Singh, 1987)

*Sieruela rutidosperma* var. *burmanni* (Wight & Arn.) Roalson & J.C.Hall - Kerala (Thamilvel, 2009)

*Solanum lycopersicum* L. - Haryana (Khokhar & Rolania, 2021); - Kerala (Jose, 2003; Thamilvel, 2009); - Tamil Nadu (Rekha et al., 2009)

*Solanum melongena* L. - Andhra Pradesh (Rao et al., 1997); - Assam (Borkakati et al., 2019; Das & Ahmed, 2021); - Bihar (Ahmad et al., 2020); - Delhi (Anand, 1984); - Jammu & Kashmir (Bhat, 2017); - Karnataka (Prashanth et al., 2024); - Kerala (Gokul et al., 2024); - Madhya Pradesh (Verma et al., 1983); - Manipur (Lokeshwari et al., 2006; Shah et al., 2013); - Meghalaya (Boruah & Pathak, 2023); - Odisha (Singh et al., 2023b); - Rajasthan (Sharma, 1973); - Tamil Nadu (Veeravel & Baskaran, 1995; Rekha et al., 2009); - Uttar Pradesh (Afroze, 2001; Chaudhary & Singh, 2012); - West Bengal (Satpathi, 1999; Satpathi & Mandal, 2006; Gurung et al., 2019)

*Solanum nigrum* L. - Manipur (Shantibala, 1989)

*Solanum tuberosum* L. - Manipur (Nonita et al., 2002); - Uttar Pradesh (Raj, 1989)

*Solanum* sp. - Manipur (Shantibala, 1989)

*Stachytarpheta jamaicensis* (L.) Vahl - Kerala (Thamilvel, 2009)

*Trachyspermum ammi* Sprague - Gujarat (Butani & Kapadia, 2000a)

*Trichosanthes cucumerina* L. - Kerala (Thamilvel, 2009)

*Tridax procumbens* L. - Telangana (Shanker et al., 2018)

Unknown plant - Odisha (Basu & Patro, 2007); - Tripura (Agarwala et al., 1987a)

**12. *Chilocorus circumdatus* (Gyllenhal, 1808)**

*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)

**13. *Chilocorus nigrinus* (Fabricius, 1798)**

*Psidium guajava* L. - Karnataka (Mani & Krishnamoorthy, 1989)

*Solanum lycopersicum* L. - Tamil Nadu (Rekha et al., 2009)

**14. *Chilocorus politus* Mulsant 1850**

*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)

**15. *Chilocorus rubidus* Hope, 1831**

*Solanum melongena* L. - Manipur (Nonita et al., 2006)

**16. *Coccinella novemnotata* Herbst, 1793**

*Solanum melongena* L. - Madhya Pradesh (Lal et al., 2019)

**17. *Coccinella repanda* Thunberg, 1781**

*Gossypium hirsutum* L. - Punjab (Srivastava et al., 1982); - Uttar Pradesh (Tiwari et al., 2024)

**18. *Coccinella septempunctata* Linnaeus, 1758**

*Abelmoschus esculentus* (L.) Moench - Assam (Das et al., 2021); - Bihar (Prabhakar & Roy, 2010; Ahmad et al., 2020); - Chhattisgarh (Chaturvedani et al., 2023); - Gujarat (Patel et al., 2012); - Kerala (Thamilvel, 2009); - Madhya Pradesh (Singh et al., 2013); - Maharashtra (Ghugre et al., 2020); - Uttar Pradesh (Tiwari et al., 2024); - Uttarakhand (Bhatt et al., 2018)

- Ageratum conyzoides* L. - Kerala (Thamilvel, 2009); - Sikkim (Ghosh & Raychaudhuri. 1982; Chakrabarti et al., 2012); - West Bengal (Ghosh & Raychaudhuri. 1982; Debnath, 2020)
- Amaranthus tricolor* L. - Kerala (Thamilvel, 2009)
- Anethum graveolens* L. - Jammu & Kashmir (Butani & Kapadia, 2000a)
- Benincasa hispida* Cogn. - Chhattisgarh (Bisen et al., 2017)
- Bidens pilosa* L. - Sikkim (Raychaudhuri et al., 1979; Ghosh & Raychaudhuri. 1982); - West Bengal (Debnath, 2020)
- Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)
- Cajanus cajan* (L.) Millsp. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Chaudhary & Singh, 2012; Tiwari et al., 2024)
- Capsicum annuum* L. - Chhattisgarh (Kumar et al., 2020); - Karnataka (Asma & Hanumantharaya, 2015); - Kerala (Thamilvel, 2009); - Madhya Pradesh (Chintkuntlawar et al., 2015; Khadse et al., 2023); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Priyadarshini, 2018; Maji et al., 2023)
- Capsicum chinense* Jacq. - Assam (Begam et al., 2016; Thangjam et al., 2020)
- Capsicum frutescens* L. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Gurung et al., 2019; Debnath, 2020)
- Carthamus tinctorius* L. - Andhra Pradesh (Rao et al., 2007); - Karnataka (Hanumantharaya et al., 2008)
- Cassia* sp. - Manipur (Shantibala, 1989)
- Chromolaena odorata* (L.) R.M.King & H.Rob. - Kerala (Thamilvel, 2009); - Manipur (Shantibala, 1989)
- Clerodendrum infortunatum* L. - Kerala (Thamilvel, 2009)
- Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)
- Colocasia esculenta* (L.) Schott - Meghalaya (Thakur & Barwal, 1987); - Uttar Pradesh (Tiwari et al., 2024)
- Coriandrum sativum* L. - Gujarat (Butani & Kapadia, 2000a); - Uttar Pradesh (Tiwari et al., 2024)
- Cucumis sativus* L. - Kerala (Thamilvel, 2009); - Tripura (Agarwala et al., 1987b)
- Cucurbita maxima* Duchesne - Uttar Pradesh (Tiwari et al., 2024)
- Cucurbita pepo* L. - Assam (Bhattacharjee et al., 2023)
- Cuminum cyminum* L. - Gujarat (Vadher et al., 2023)
- Duranta erecta* L. - Sikkim (Raychaudhuri et al., 1979)
- Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)
- Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)
- Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)
- Gossypium herbaceum* L. - Gujarat (Butani & Kapadia, 2000b)
- Gossypium hirsutum* L. - Haryana (Kumar et al., 2016a); - Karnataka (Joshi et al., 1999a); - Maharashtra (Vennila et al., 2007); - Rajasthan (Dhaka, 2013); - Tamil Nadu (Kannan et al., 2004); - Uttar Pradesh (Tiwari et al., 2024); - Uttarakhand (Pushpendra & Joshi, 2010)
- Gynura bicolor* DC. - Manipur (Shantibala, 1989); - Nagaland (Shantibala, 1989)
- Lablab purpureus* (L.) Sweet - Uttar Pradesh (Tiwari et al., 2024)
- Lagenaria siceraria* (Molino) Standl. - Uttar Pradesh (Omkar & Srivastava, 2003)
- Luffa acutangula* (L.) Roxb. - Uttar Pradesh (Tiwari et al., 2024)
- Momordica charantia* L. - Bihar (Ahmad et al., 2020)
- Plantago ovata* Forssk. - Gujarat (Prajapati et al., 2020); - Rajasthan (Ola et al., 2024)
- Psidium guajava* L. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Tiwari et al., 2024)
- Solanum betaceum* Cav. - Meghalaya (Thakur & Barwal, 1987)

*Solanum lycopersicum* L. - Assam (Harshita et al., 2019); - Bihar (Ahmad et al., 2020); - Haryana (Khokhar & Rolania, 2021); - Uttar Pradesh (Tiwari et al., 2024)

*Solanum melongena* L. - Assam (Kalita et al., 1998; Borah & Saikia, 2017); - Jammu & Kashmir (Bhat, 2008); - Madhya Pradesh (Lal et al., 2019); - Manipur (Nonita et al., 2006; Shah et al., 2013); - Meghalaya (Boruah & Pathak, 2023); - Odisha (Singh et al., 2023b); - Punjab (Srivastava et al., 1978); - Uttar Pradesh (Afroze, 2001; Sardana et al., 2008); - Uttarakhand (Bisht et al., 2001); - West Bengal (Satpathi & Mandal, 2006; Gurung et al., 2019)

*Solanum tuberosum* L. - Manipur (Nonita et al., 2002); - Uttar Pradesh (Raj, 1989; Tiwari et al., 2024)

*Solanum* sp. - Nagaland (Shantibala, 1989)

*Tagetes erecta* L. - Manipur (Shantibala, 1989)

*Trachyspermum ammi* Sprague - Gujarat (Butani & Kapadia, 2000a)

Unknown - Odisha (Basu & Patro, 2007)

#### 19. *Coccinella transversalis* Fabricius, 1781

*Abelmoschus esculentus* (L.) Moench - Bihar (Prabhakar & Roy, 2010; Ahmad et al., 2020); - Kerala (Gokul et al., 2024); - Madhya Pradesh (Singh et al., 2013); - Odisha (Mohapatra et al., 2022); - Tamil Nadu (Rekha et al., 2009); - Uttar Pradesh (Tiwari et al., 2024); - Uttarakhand (Bhatt et al., 2018); - West Bengal (Gurung et al., 2019; Maji et al., 2023)

*Ageratum conyzoides* L. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Tiwari et al., 2024)

*Amaranthus tricolor* L. - Kerala (Thamilvel, 2009)

*Arachis hypogaea* L. - Andhra Pradesh (Vasista et al., 2021)

*Artocarpus integer* (Thumb.) Merr. - Manipur (Devi & Singh, 1987)

*Bidens pilosa* L. - Manipur (Shantibala, 1989)

*Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)

*Cajanus cajan* (L.) Millsp. - Uttar Pradesh (Tiwari et al., 2024)

*Capsicum annuum* L. - Chhattisgarh (Kumar et al., 2020); - Karnataka (Asma & Hanumantharaya, 2015); - Kerala (Thamilvel, 2009); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Priyadarshini, 2018; Maji et al., 2023)

*Capsicum chinense* Jacq. - Assam (Begam et al., 2016; Thangjam et al., 2020)

*Capsicum frutescens* L. - Kerala (Gokul et al., 2024); - Manipur (Shantibala, 1989); - Tamil Nadu (Rekha et al., 2009); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Gurung et al., 2019)

*Catharanthus pusillus* (Murray) G. Don - Kerala (Thamilvel, 2009)

*Catharanthus roseus* (L.) G. Don - Kerala (Thamilvel, 2009)

*Centella asiatica* (L.) Urb. - Kerala (Thamilvel, 2009)

*Cestrum nocturnum* L. - Uttar Pradesh (Tiwari et al., 2024)

*Chromolaena odorata* (L.) R.M.King & H.Rob. - Manipur (Shantibala, 1989)

*Coccinia grandis* (L.) Voigt - Bihar (Ahmad et al., 2020); - Kerala (Thamilvel, 2009)

*Colocasia esculenta* (L.) Schott - West Bengal (Bhattacharyya & Mandal, 2004)

*Commelina benghalensis* L. - Kerala (Thamilvel, 2009)

*Coriandrum sativum* L. - Uttar Pradesh (Tiwari et al., 2024)

*Cucumis sativus* L. - Kerala (Thamilvel, 2009); - Tamil Nadu (Veeravel & Baskaran, 1997)

*Cucurbita maxima* Duchesne - Uttar Pradesh (Tiwari et al., 2024)

*Cucurbita pepo* L. - Assam (Bhattacharjee et al., 2023)

*Cuminum cyminum* L. - Gujarat (Vadher et al., 2023)

*Ficus carica* L. - Manipur (Shantibala, 1989)

- Glebionis carinata* (Schousb.) Tzvelev – West Bengal (Maji et al., 2023)  
*Gossypium herbaceum* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Gossypium hirsutum* L. – Gujarat (Chakraborty, 2012); – Karnataka (Joshi et al., 1999a); – Maharashtra (Kale et al., 2020); – Telangana (Malleth & Sravanthy, 2021); – West Bengal (Agarwala & Saha, 1986)  
*Gynura bicolor* DC. – Manipur (Shantibala, 1989)  
*Hibiscus rosa-sinensis* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Lagenaria siceraria* (Molino) Standl. – Uttar Pradesh (Omkar & James, 2004; Tiwari et al., 2024); – Uttarakhand (Kumari et al., 2022); – West Bengal (Saha et al., 2016)  
*Luffa aegyptiaca* Mill. – Uttar Pradesh (Tiwari et al., 2024)  
*Malus domestica* (Suckow) Borkh. – Manipur (Devi & Singh, 1987)  
*Momordica charantia* L. – Bihar (Ahmad et al., 2020); – Kerala (Jose, 2003; Gokul et al., 2024); – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Maji et al., 2023)  
*Moringa oleifera* Lam – Kerala (Thamilvel, 2009)  
*Parthenium hysterophorus* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Psidium guajava* L. – Manipur (Devi & Singh, 1987; Chakrabarti et al., 2012); – Uttar Pradesh (Tiwari et al., 2024)  
*Psophocarpus tetragonolobus* (L.) DC. – Kerala (Thamilvel, 2009)  
*Ranunculus sceleratus* L. – Uttarakhand (Kumari et al., 2022)  
*Rosa indica* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Sieruela rutidosperma* var. *burmanni* (Wight & Arn.) Roalson & J.C.Hall – Kerala (Thamilvel, 2009)  
*Solanum lycopersicum* L. – Assam (Harshita et al., 2019); – Kerala (Thamilvel, 2009); – Tamil Nadu (Rekha et al., 2009)  
*Solanum melongena* L. – Assam (Kalita et al., 1998; Borkakati et al., 2019); – Kerala (Gokul et al., 2024); – Manipur (Nonita et al., 2006; Shah et al., 2013); – Madhya Pradesh (Chandan, 2018); – Odisha (Singh et al., 2023b); – Tamil Nadu (Veeravel & Baskaran, 1995; Rekha et al., 2009); – Uttar Pradesh (Afroze, 2001; Chaudhary & Singh, 2012); – West Bengal (Satpathi & Mandal, 2006; Gurung et al., 2019)  
*Solanum tuberosum* L. – Manipur (Nonita et al., 2002); – Uttar Pradesh (Raj, 1989; Tiwari et al., 2024)  
*Trichosanthes cucumerina* L. – Kerala (Thamilvel, 2009)  
*Tridax procumbens* L. – Kerala (Thamilvel, 2009); – Telangana (Shanker et al., 2018)  
Unknown – Tripura (Agarwala et al., 1987a)  
*Vicia faba* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Vigna unguiculata* (L.) Walp. – Maharashtra (Udtewar et al., 2022)

## 20. *Coccinella undecimpunctata* Linnaeus, 1758

- Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Cucurbita maxima* Duchesne – Uttar Pradesh (Tiwari et al., 2024)  
*Dahlia pinnata* Cav. – Uttar Pradesh (Tiwari et al., 2024)  
*Fagopyrum esculentum* Moench – Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi – Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. – Gujarat (Bhat et al., 1986)  
*Gossypium hirsutum* L. – Punjab (Rahman, 1940)  
*Luffa aegyptiaca* Mill. – Uttar Pradesh (Tiwari et al., 2024)  
*Solanum melongena* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Solanum tuberosum* L. – Uttar Pradesh (Chaudhary & Singh, 2012; Tiwari et al., 2024)

## 21. *Coccinella* sp.

- Solanum melongena* L. – Uttarakhand (Bisht et al., 2001)

## 22. *Coelophora biplagiata* (Swartz, 1808)

*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)

23. ***Coelophora bissellata* Mulsant, 1850 [*Lemnia (Spilocaria) bissellata* [Mulsant, 1850]**

*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)

*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024)

*Gossypium* sp. – India (Dastur et al., 1960)

*Solanum melongena* L. – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Satpathi & Mandal, 2006)

*Ageratum conyzoides* L. – Manipur (Shantibala, 1989)

*Chromolaena odorata* (L.) R.M.King & H.Rob. – Manipur (Shantibala, 1989)

*Gynura bicolor* DC. – Manipur (Shantibala, 1989)

*Phragmites karka* (Retz.) Trin. ex Steud. – Nagaland (Shantibala, 1989)

*Solanum melongena* L. – Assam (Kalita et al., 2008); – Manipur (Nonita et al., 2006; Shah et al., 2013); – Meghalaya (Boruah & Pathak, 2023)

*Solanum tuberosum* L. – Manipur (Nonita et al., 2002)

24. ***Coelophora saucia* (Mulsant, 18 0) [syn. *Lemnia saucia* Mulsant, 18 0]**

*Ageratum conyzoides* L. – Manipur (Shantibala, 1989)

*Brassica oleracea* L. – Manipur (Singh et al., 2002)

*Colocasia esculenta* (L.) Schott – Manipur (Shantibala, 1989)

*Colocasia esculenta* (L.) Schott – Nagaland (Shantibala, 1989)

*Cucumis sativus* L. – Manipur (Shantibala, 1989)

*Gynura bicolor* DC. – Nagaland (Shantibala, 1989)

*Luffa aegyptiaca* Mill. – Manipur (Chakrabarti et al., 2012)

*Solanum* sp. – Manipur (Shantibala, 1989)

25. ***Coelophora* sp.**

*Galinsoga parviflora* Cav. – Sikkim (Ghosh & Raychaudhuri, 1982; Chakrabarti et al., 2012); – West Bengal (Debnath, 2020)

26. ***Cryptogonus ariasi* (Mulsant, 1853)**

*Malus domestica* (Suckow) Borkh. – Manipur (Chakrabarti et al., 2012)

27. ***Cryptogonus bimaculatus* (Kapur, 1948)**

*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)

28. ***Cryptogonus himalayensis* Kapur, 1948**

*Solanum melongena* L. – Uttar Pradesh (Omkar & Pervez, 2002)

29. ***Cryptogonus nitidus* Kapur, 1948**

*Gynura* sp. – Manipur (Chakrabarti et al., 2012)

30. ***Cryptogonus orbiculus* (Gyllenhal, 1808)**

*Abelmoschus esculentus* (L.) Moench – Kerala (Thamilvel, 2009)

*Capsicum annuum* L. – Kerala (Thamilvel, 2009)

*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)

31. ***Cryptogonus quadriguttatus* (Weise, 1895)**

*Abelmoschus esculentus* (L.) Moench – Manipur (Chakrabarti et al., 2012)

*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)

*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)

32. ***Cryptogonus* sp.**

*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)

*Chromolaena odorata* (L.) R.M.King & H.Rob. – Manipur (Chakrabarti et al., 2012)

33. ***Cryptolaemus montroussieri* Mulsant, 1853**

- Gossypium hirsutum* L. – Assam (Saikia & Balasubramanian, 2000); – Maharashtra (Surwase et al., 2020)  
*Psidium guajava* L. – Karnataka (Mani & Krishnamoorthy, 1989)  
*Vigna unguiculata* (L.) Walp. – Assam (Saikia & Balasubramanian, 2000)  
*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)
34. ***Exochomus uropygialis* Mulsant, 1853**  
*Fagopyrum esculentum* Moench – Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi – Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. – Gujarat (Bhat et al., 1986)
35. ***Harmonia axyridis* (Pallas, 1773)**  
*Hibiscus syriacus* L. – Tripura (Agarwala, 2004)
36. ***Harmonia dimidiata* (Fabricius, 1781)**  
*Cajanus cajan* (L.) Millsp. – Manipur (Shantibala, 1989)  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)  
*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Cucumis sativus* L. – Himachal Pradesh (Sharma et al., 2017)  
*Sesamum indicum* L. – Manipur (Chakrabarti et al., 2012)  
*Solanum melongena* L. – Assam (Borkakati et al., 2019); – Uttar Pradesh (Chaudhary & Singh, 2012; Tiwari et al., 2024); – West Bengal (Satpathi & Mandal, 2006; Gurung et al., 2019)
37. ***Harmonia eucharis* (Mulsant, 1853)**  
*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Colocasia esculenta* (L.) Schott – Meghalaya (Thakur & Barwal, 1987); – Nagaland (Shantibala, 1989)  
*Colocasia* sp. – Nagaland (Shantibala, 1989)  
*Duranta erecta* L. – Nagaland (Shantibala, 1989)  
*Solanum betaceum* Cav. – Meghalaya (Thakur & Barwal, 1987)  
*Solanum melongena* L. – Uttar Pradesh (Tiwari et al., 2024); – Uttarakhand (Bisht et al., 2001)
38. ***Harmonia octomaculata* (Fabricius, 1787) [syn. *Coccinella arcuata* Fabricius, 1787; *Harmonia arcuata* (Fabricius, 1787)]**  
*Abelmoschus esculentus* (L.) Moench – Kerala (Thamilvel, 2009)  
*Amaranthus tricolor* L. – Kerala (Thamilvel, 2009)  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)  
*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Colocasia esculenta* (L.) Schott – West Bengal (Bhattacharyya & Mandal, 2004)  
*Gossypium hirsutum* L. – Gujarat (Chakraborty, 2012); – Telangana (Mallesht & Sravanthy, 2021)  
*Luffa aegyptiaca* Mill. – Manipur (Chakrabarti et al., 2012)  
*Solanum melongena* L. – Uttar Pradesh (Tiwari et al., 2024)
39. ***Harmonia sedecimnotata* (Fabricius, 1801) [syn. *Callineda sedecimnotata* (Fabricius, 1801)]**  
*Abelmoschus esculentus* (L.) Moench – Mizoram (Boopathi et al., 2020)  
*Lagenaria siceraria* (Molino) Standl. – Uttarakhand (Pervez et al., 2020c)  
*Solanum melongena* L. – Mizoram (Boopathi et al., 2020)
40. ***Hippodamia variegata* (Goeze, 1777) [syn. *Adonia variegata* (Goeze, 1777)]**  
*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Colocasia esculenta* (L.) Schott – Uttar Pradesh (Tiwari et al., 2024)

- Coriandrum sativum* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Cucurbita maxima* Duchesne - Jammu & Kashmir (Bhat, 2008); - Uttar Pradesh (Tiwari et al., 2024)  
*Cuminum cyminum* L. - Gujarat (Vadher et al., 2023)  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)  
*Gossypium hirsutum* L. - Gujarat (Chakraborty, 2012); - Rajasthan (Dhaka, 2013)  
*Lablab purpureus* (L.) Sweet - Uttar Pradesh (Tiwari et al., 2024)  
*Luffa acutangula* (L.) Roxb - Uttar Pradesh (Tiwari et al., 2024)  
*Solanum melongena* L. - Jammu & Kashmir (Bhat, 2008); - Uttar Pradesh (Raj, 1989; Tiwari et al., 2024); - Uttarakhand (Bisht et al., 2001)
41. ***Hippodamia variegata doubledeayi* (Mulsant, 1850)**  
*Chrysanthemum* sp., - Uttar Pradesh (Chaudhary & Singh, 2012)  
*Luffa aegyptiaca* Mill. - Manipur (Chakrabarti et al., 2012)
42. ***Hormiolius guimeti* (Mulsant, 1850) [syn. *Scymnus guimeti* Mulsant, 1850]**  
*Colocasia esculenta* (L.) Schott - Manipur (Chakrabarti et al., 2012)  
*Gossypium* sp. - India (Dastur et al., 1960)  
*Solanum tuberosum* L. - Karnataka (Puttarudriah & Channa Basavanna, 196)
43. ***Hyperaspis maindroni* Sicard, 1929**  
*Duranta erecta* L. - Manipur (Chakrabarti et al., 2012)  
*Gossypium hirsutum* L. - Karnataka (Puttarudriah & Channa Basavanna, 1956)
44. ***Hyperaspis marginaloides* Canepari, 1997**  
*Colocasia esculenta* (L.) Schott - Manipur (Chakrabarti et al., 2012)
45. ***Illeis cincta* (Fabricius, 1798)**  
*Acmella uliginosa* (Sw.) Cass. - Telangana (Shanker et al., 2018)  
*Gossypium hirsutum* L. - Karnataka (Megha et al., 2015)  
*Lagenaria siceraria* (Molino) Standl. - Uttarakhand (Pervez et al., 2020c)  
*Solanum melongena* L. - Uttar Pradesh (Tiwari et al., 2024)
46. ***Illeis confusa* Timberlake, 1943**  
*Cucumis sativus* L. - Uttarakhand (Pervez et al., 2020c)
47. ***Illeis indica* Timberlake, 1943**  
*Capsicum frutescens* L. - West Bengal (Gurung et al., 2019)  
*Solanum melongena* L. - West Bengal (Gurung et al., 2019)
48. ***Jauravia assamensis* Kapur, 1963**  
Unknown plant - Manipur (Chakrabarti et al., 2012)
49. ***Jauravia dorsalis* (Weise, 1908)**  
*Coccinia* sp. - Kerala (Jose, 2003)
50. ***Jauravia pallidula* Motschulsky, 1858**  
*Coccinia* sp. - Kerala (Jose, 2003)
51. ***Jauravia quadrinotata* (Kapur, 1946)**  
*Capsicum chinense* Jacq. - Assam (Thangjam et al., 2020)  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)
52. ***Megalocaria dilatata* (Fabricius, 1775) [syn. *Anisolemnia dilatata* (Fabricius, 1775)]**  
*Cucumis sativus* L. - Manipur (Shantibala, 1989)

**53. *Micraspis allardi* (Mulsant, 1866)**

*Chrysanthemum indicum* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Lagenaria siceraria* (Molino) Standl. – Uttar Pradesh (Omkar & Pervez, 1999)  
*Luffa aegyptiaca* Mill. – Uttar Pradesh (Chaudhary & Singh, 2012)  
*Mangifera indica* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Psidium guajava* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Solanum tuberosum* L. – Uttar Pradesh (Raj, 1989; Tiwari et al., 2024)  
Unknown plant – (Chakrabarti et al., 2012)

**54. *Micraspis crocea* (Mulsant)**

*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)

**55. *Micraspis discolor* (Fabricius, 1798) [syn. *Verania discolor* (Fabricius, 1798)]**

*Abelmoschus esculentus* (L.) Moench – Bihar (Prabhakar & Roy, 2010); – Kerala (Thamilvel, 2009); – Odisha (Mohapatra et al., 2022); – Tamil Nadu (Shanthi et al., 2020); – West Bengal (Gurung et al., 2019; Maji et al., 2023)  
*Acmella uliginosa* (Sw.) Cass. – Telangana (Shanker et al., 2018)  
*Ageratum conyzoides* L. – Manipur (Chakrabarti et al., 2012)  
*Amaranthus tricolor* L. – Kerala (Thamilvel, 2009)  
*Brassica oleracea* L. – Manipur (Singh et al., 2002)  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009); West Bengal (Priyadarshini, 2018)  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020); – Assam (Begam et al., 2016)  
*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Gurung et al., 2019)  
*Cucumis sativus* L. – Tripura (Agarwala et al., 1988)  
*Gossypium hirsutum* L. – West Bengal (Maji et al., 2023)  
*Lagenaria siceraria* (Molino) Standl. – West Bengal (Saha et al., 2016)  
*Momordica charantia* L. – West Bengal (Maji et al., 2023)  
*Solanum lycopersicum* L. – Assam (Harshita et al., 2019)  
*Solanum melongena* L. – Assam (Kalita et al., 1998; Borah & Saikia, 2017); – Meghalaya (Boruah & Pathak, 2023); – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Satpathi & Mandal, 2006; Gurung et al., 2019)  
*Solanum tuberosum* L. – Manipur (Nonita et al., 2002)

**56. *Micraspis univittata* (Hope, 1831)**

*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)

**57. *Micraspis vincta* (Gorham, 1895) [syn. *Verania vincta* Gorham, 1895]**

*Solanum melongena* L. – Andhra Pradesh (Rao et al., 1997); – Uttar Pradesh (Omkar & Pervez, 2000; Tiwari et al., 2024)

**58. *Micraspis yasumatsui* Sasaji, 1968**

*Capsicum frutescens* L. – West Bengal (Gurung et al., 2019)  
*Solanum melongena* L. – West Bengal (Gurung et al., 2019)

**59. *Micraspis* sp.**

*Abelmoschus esculentus* (L.) Moench – Chhattisgarh (Chaturvedani et al., 2023)  
*Cucurbita maxima* Duchesne – Tripura (Ghosh et al., 2017b)  
*Leucas aspera* (Willd.) Link – Tripura (Ghosh et al., 2017b)  
*Melastoma* sp. – Tripura (Ghosh et al., 2017b)  
*Solanum melongena* L. – Odisha (Singh et al., 2023b)

**60. *Nephus regularis* (Sicard, 1929)**

*Psidium guajava* L. – Manipur (Chakrabarti et al., 2012)  
*Solanum melongena* L. – Uttar Pradesh (Omkar & Pervez, 1999)

61. ***Nephus* sp.**  
*Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009)  
*Amaranthus tricolor* L. - Kerala (Thamilvel, 2009)  
*Capsicum annuum* L. - Kerala (Thamilvel, 2009)
62. ***Oenopia conglobata* (Linnaeus, 1758)**  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)  
*Solanum melongena* L. - Jammu & Kashmir (Bhat, 2008)
63. ***Oenopia kirbyi* Mulsant, 1850**  
*Boehmeria virgata* subsp. *macrophylla* (Hornem.) Friis & Wilmot-Dear - Manipur (Shantibala, 1989)  
*Bougainvillea spectabilis* Willd. - Manipur (Shantibala, 1989)  
*Chromolaena odorata* (L.) R.M.King & H.Rob. - Manipur (Shantibala, 1989)  
*Colocasia esculenta* (L.) Schott - Manipur (Shantibala, 1989); - Meghalaya (Thakur & Barwal, 1987); - Nagaland (Shantibala, 1989)  
*Cucumis sativus* L. - Himachal Pradesh (Sharma et al., 201); - West Bengal (Poorani, 2002)  
*Duranta erecta* L. - Manipur (Shantibala, 1989)  
*Hibiscus cannabinus* L. - Manipur (Shantibala, 1989)  
*Hibiscus rosa-sinensis* L. - Manipur (Shantibala, 1989)  
*Jasminum* sp. - Manipur (Shantibala, 1989)  
*Osbeckia chinensis* L. - Manipur (Shantibala, 1989)  
*Psidium guajava* L. - Manipur (Chakrabarti et al., 2012)  
*Solanum betaceum* Cav. - Meghalaya (Thakur & Barwal, 1987)  
*Solanum melongena* L. - Himachal Pradesh (Sharma et al., 2015); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Satpathi & Mandal, 2006)  
*Solanum* sp. - Manipur (Shantibala, 1989)  
 Unknown plant - Sikkim (Agarwala et al., 1981); - Uttarakhand (Sharma & Joshi, 2020)
64. ***Oenopia manipurensis* Devi, Singh & Singh, 1991**  
*Psidium guajava* L. - Manipur (Shantibala, 1989)
65. ***Oenopia quadripunctata* Kapur, 1963**  
*Artocarpus integer* (Thumb.) Merr. - Manipur (Devi & Singh, 1987)  
*Callicarpa macrophylla* Vahl - Manipur (Shantibala, 1989); - Nagaland (Shantibala, 1989)  
*Malus domestica* (Suckow) Borkh. - Manipur (Devi & Singh, 1987)  
*Psidium guajava* L. - Manipur (Devi & Singh, 1987; Chakrabarti et al., 2012); - Nagaland (Shantibala, 1989)  
*Solanum melongena* L. - Manipur (Nonita et al., 2006); - West Bengal (Satpathi & Mandal, 2006)
66. ***Oenopia sauzeti* Mulsant, 1866**  
*Colocasia esculenta* (L.) Schott - Manipur (Shantibala, 1989); - Nagaland (Shantibala, 1989)  
*Cucumis sativus* L. - Himachal Pradesh (Sharma et al., 2015)  
*Cucumis* sp. - Uttarakhand (Ghosh et al., 1991)  
*Helianthus annuus* L. - Manipur (Shantibala, 1989)  
*Malus domestica* (Suckow) Borkh. - Manipur (Chakrabarti et al., 2012)

- Rumex nepalensis* Spreng. – Himachal Pradesh (Agarwala et al., 1981); – Sikkim (Agarwala et al., 1981)  
*Solanum melongena* L. – Himachal Pradesh (Sharma et al., 2015)
67. ***Oenopia sexareata* (Mulsant, 1853) [syn. *Coelophora sexarcata* Mulsant, 1853]**  
*Ageratum conyzoides* L. – Manipur (Shantibala, 1989); – Nagaland (Shantibala, 1989)  
*Artocarpus heterophyllus* Lam. – Manipur (Chakrabarti et al., 2012)  
*Artocarpus integer* (Thumb.) Merr. – Manipur (Devi & Singh, 1987)  
*Chromolaena odorata* (L.) R.M.King & H.Rob. – Manipur (Shantibala, 1989)  
*Colocasia esculenta* (L.) Schott – Manipur (Shantibala, 1989); – Meghalaya (Thakur & Barwal, 1987); – Nagaland (Shantibala, 1989)  
*Cucumis sativus* L. – Himachal Pradesh (Sharma et al., 2015)  
*Ficus* sp. – Manipur (Shantibala, 1989)  
*Jasminum* sp. – Manipur (Shantibala, 1989)  
*Malus domestica* (Suckow) Borkh. – Manipur (Devi & Singh, 1987)  
*Psidium guajava* L. – Manipur (Devi & Singh, 1987)  
*Solanum betaceum* Cav. – Meghalaya (Thakur & Barwal, 1987)  
*Solanum melongena* L. – Himachal Pradesh (Sharma et al., 2015); – Meghalaya (Boruah & Pathak, 2023)
68. ***Pharoscymnus flexibilis* (Mulsant, 1853)**  
*Gossypium hirsutum* L. – Gujarat (Chakraborty, 2012)
69. ***Phrynocaria perrottei* (Mulsant, 1850)**  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)
70. ***Phrynocaria unicolor* (Fabricius, 1792) [syn. *Coelophora unicolor* (Fabricius, 1792)**  
*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)
71. ***Platynaspis kapuri* (Chakraborty & Biswas, 2000)**  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)
72. ***Platynaspis saundersii* Crotch, 1874**  
*Cucurbita* sp. – Uttarakhand (Debnath, 1991; Ghosh et al., 1991)
73. ***Platynaspis* sp.**  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)
74. ***Priscibrumus uropygialis* (Mulsant, 18 3)**  
*Lagenaria siceraria* (Molino) Standl. – Jammu & Kashmir (Bhat, 2017)  
*Malus domestica* (Suckow) Borkh. – Manipur (Chakrabarti et al., 2012)  
*Solanum melongena* L. – Jammu & Kashmir (Bhat, 2017)
75. ***Propylea dissecta* (Mulsant, 18 0)**  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2021)  
*Capsicum frutescens* L. – West Bengal (Gurung et al., 2019)  
*Chrysanthemum indicum* L. – Uttar Pradesh (Tiwari et al., 2024)  
*Gossypium hirsutum* L. – Gujarat (Chakraborty, 2012); – Telangana (Malleth & Sravanthy, 2021)  
*Lagenaria siceraria* (Molino) Standl. – Uttar Pradesh (Omkar & Richmond, 2004; Siddiqui et al., 2023)  
*Solanum melongena* L. – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Gurung et al., 2019)  
*Tridax procumbens* L. – Telangana (Shanker et al., 2018)  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2020)
76. ***Propylea japonica* (Thunberg, 1781)**

- Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009); - Uttar Pradesh (Tiwari et al., 2024)
- Amaranthus tricolor* L. - Kerala (Thamilvel, 2009)
- Capsicum annuum* L. - Kerala (Thamilvel, 2009)
- Capsicum frutescens* L. - Uttar Pradesh (Tiwari et al., 2024)
- Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)
- Cucumis sativus* L. - Kerala (Thamilvel, 2009)
- Duranta erecta* L. - Manipur (Chakrabarti et al., 2012)
- Psidium guajava* L. - Uttar Pradesh (Tiwari et al., 2024)
- Solanum melongena* L. - Kerala (Thamilvel, 2009); - Uttar Pradesh (Omkar & Pervez, 1999; Tiwari et al., 2024); - West Bengal (Gurung et al., 2019)
77. ***Propylea luteopustulata* (Mulsant, 1850) [syn. *Oenopia luteopustulata* Mulsant, 1850; *Pania luteopustulata* (Mulsant, 1850)]**
- Ageratum conyzoides* L. - Manipur (Shantibala, 1989)
- Colocasia esculenta* (L.) Schott - West Bengal (Bhattacharyya & Mandal, 2004)
- Cucumis sativus* L. - Uttarakhand (Pervez et al., 2020c)
- Hibiscus cannabinus* L. - Manipur (Shantibala, 1989); - Nagaland (Shantibala, 1989)
- Lagenaria siceraria* (Molino) Standl. - Jammu & Kashmir (Bhat, 2017)
- Solanum melongena* L. - Jammu & Kashmir (Bhat, 2017); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Satpathi & Mandal, 2006)
- Unknown plant - Sikkim (Agarwala et al., 1981; Chakrabarti et al., 2012)
78. ***Propylea quatuordecimpunctata* (Linnaeus, 1758)**
- Duranta erecta* L. - Manipur (Chakrabarti et al., 2012)
79. ***Propylea* sp.**
- Capsicum chinense* Jacq. - Assam (Thangjam et al., 2020)
80. ***Pseudaspidimerus flaviceps* (Walker, 1859)**
- Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009)
- Capsicum annuum* L. - Kerala (Thamilvel, 2009)
- Capsicum frutescens* L. - Uttar Pradesh (Tiwari et al., 2024)
- Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)
- Psidium guajava* L. - Karnataka (Poorani, 2001)
- Solanum melongena* L. - Uttar Pradesh (Omkar & Pervez, 2002; Tiwari et al., 2024)
81. ***Pseudaspidimerus trinotata* (Thunberg, 1781) [syn. *Aspidimerus circumflexa* (Motschulsky, 1858); *Pseudaspidimerus circumflexa* (Motschulsky, 1858)]**
- Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009)
- Capsicum annuum* L. - Kerala (Thamilvel, 2009)
- Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)
- Coccinia* sp. - Kerala (Jose, 2003)
- Gossypium* sp. - West Bengal (Poddar & Ghosh, 1984)
- Lablab purpureus* (L.) Sweet ssp. *purpureus* - West Bengal (Poddar & Ghosh, 1984)
- Momordica charantia* L. - Kerala (Jose, 2003)
- Psidium guajava* L. - Bihar (Ahmad et al., 2020); - Karnataka (Puttarudriah & Channa Basavanna, 1956; Mani & Krishnamoorthy, 1989); - West Bengal (Poddar & Ghosh, 1984)
- Solanum melongena* L. - Karnataka (Puttarudriah & Channa Basavanna, 1956); - Uttar Pradesh (Omkar & Pervez, 2000); - West Bengal (Satpathi & Mandal, 2006)
- Unknown plant - Odisha (Basu & Patro, 2007)
82. ***Scymnus (Neopullus) fuscatus* Boheman, 1859 [syn. *Scymnus brunnescens* Motschulsky]**

*Momordica charantia* L. - Uttar Pradesh (Tiwari et al., 2024)

*Solanum melongena* L. - Uttar Pradesh (Tiwari et al., 2024)

**83. *Scymnus (Pullus) castaneus* Sicard, 1929**

*Capsicum frutescens* L. - Manipur (Chakrabarti et al., 2012)

*Gossypium hirsutum* L. - Karnataka (Puttarudriah & Channa Basavanna, 1956)

*Psidium guajava* L. - Karnataka (Verghese & Devraj Urs, 1994)

**84. *Scymnus (Pullus) coccivora* Ayyar, 1925**

*Gossypium hirsutum* L. - Gujarat (Chakraborty, 2012)

*Solanum melongena* L. - Kerala (Vidya & Bhaskar, 2017)

**85. *Scymnus (Pullus) giganteus* Kamiya, 1961**

*Bidens pilosa* L. - Sikkim (Chakrabarti et al., 2012)

*Artocarpus heterophyllus* Lam. - Sikkim (Chakrabarti et al., 2012)

*Artocarpus integer* (Thunb.) Merr. - Manipur (Devi & Singh, 1987)

*Malus domestica* (Suckow) Borkh. - Manipur (Devi & Singh, 1987)

*Psidium guajava* L. - Manipur (Devi & Singh, 1987)

*Solanum melongena* L. - Uttar Pradesh (Afroze, 2001)

**86. *Scymnus (Pullus) hilaris* Motschulsky, 1858**

*Solanum melongena* L. - Uttar Pradesh (Tiwari et al., 2024)

**87. *Scymnus (Pullus) latemaculatus* Motschulsky, 1858]**

*Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009)

*Ageratum conyzoides* L. - Kerala (Thamilvel, 2009)

*Capsicum annuum* L. - Kerala (Thamilvel, 2009)

*Capsicum frutescens* L. - Kerala (Vidya & Bhaskar, 2017)

*Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)

*Colocasia* sp. - Kerala (Vidya & Bhaskar, 2017)

*Cucumis sativus* L. - Kerala (Thamilvel, 2009)

*Eupatorium* sp. - Kerala (Vidya & Bhaskar, 2017)

*Gloriosa superba* L. - Kerala (Thamilvel, 2009)

*Hibiscus rosa-sinensis* L. - Karnataka (Chinmu et al., 2023)

*Hibiscus* sp. - Kerala (Vidya & Bhaskar, 2017)

*Momordica charantia* L. - Kerala (Thamilvel, 2009)

*Psidium guajava* L. - Kerala (Vidya & Bhaskar, 2017)

*Ruellia tuberosa* L. - Kerala (Thamilvel, 2009)

*Solanum lycopersicum* L. - Kerala (Thamilvel, 2009); - Maharashtra (Bhandare, 2022)

*Solanum melongena* L. - Karnataka (Puttarudriah & Channa Basavanna, 1956) - Kerala

(Vidya & Bhaskar, 2017); - Maharashtra (Bhandare, 2022)

*Trichosanthes cucumerina* L. - Kerala (Thamilvel, 2009)

*Tridaxprocumbens* L. - Kerala (Thamilvel, 2009)

*Vernonia cinerea* (Linn.) Less - Kerala (Thamilvel, 2009)

*Vigna unguiculata* (L.) Walp. - Kerala (Vidya & Bhaskar, 2017)

*Withania somnifera* (L.) Dunal. - Kerala (Thamilvel, 2009)

**88. *Scymnus (Pullus) posticalis* Sicard, 1913**

*Hibiscus syriacus* L. - Tripura (Agarwala, 2004)

*Lagenaria siceraria* (Molino) Standl. - Uttarakhand (Pervez et al., 2020c)

**89. *Scymnus (Pullus) pyrocheilus* Mulsant, 1853**

*Abelmoschus esculentus* (L.) Moench - Bihar (Prabhakar & Roy, 2010; Ahmad et al., 2020)

*Ageratum conyzoides* L. - Bihar (Ahmad et al., 2020)

- Capsicum frutescens* L. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Tiwari et al., 2024)
- Catharanthus roseus* (L.) G. Don - Bihar (Ahmad et al., 2020)
- Colocasia* sp. - Bihar (Ahmad et al., 2020)
- Croton* sp. - Bihar (Ahmad et al., 2020)
- Duranta erecta* L. - Manipur (Chakrabarti et al., 2012)
- Eupatorium* sp. - Kerala (Vidya & Bhaskar, 2017)
- Helicteres isora* L. - Bihar (Ahmad et al., 2020)
- Hibiscus rosa-sinensis* L. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Tiwari et al., 2024)
- Hibiscus* sp. - Kerala (Vidya & Bhaskar, 2017)
- Lagenaria siceraria* (Molino) Standl. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Tiwari et al., 2024)
- Lawsonia inermis* L. - Bihar (Ahmad et al., 2020)
- Mikania* sp. - Kerala (Vidya & Bhaskar, 2017)
- Momordica charantia* L. - Bihar (Ahmad et al., 2020); - Kerala (Jose, 2003); - Uttar Pradesh (Tiwari et al., 2024)
- Ocimum tenuiflorum* L. - Bihar (Ahmad et al., 2020)
- Psidium guajava* L. - Bihar (Ahmad et al., 2020); - Kerala (Vidya & Bhaskar, 2017); - Manipur (Raychaudhuri et al., 1978); - Uttar Pradesh (Tiwari et al., 2024)
- Rosa* sp. - Bihar (Ahmad et al., 2020)
- Solanum lycopersicum* L. - Bihar (Ahmad et al., 2020)
- Solanum melongena* L. - Bihar (Ahmad et al., 2020); - Kerala (Vidya & Bhaskar, 2017)
- Solanum tuberosum* L. - Uttar Pradesh (Raj, 1989; Chaudhary & Singh, 2012)
- Tagetes* sp. - Bihar (Ahmad et al., 2020)
- Vigna unguiculata* (L.) Walp. - Kerala (Vidya & Bhaskar, 2017)
- Unknown plant - Odisha (Basu & Patro, 2007)
90. ***Scymnus (Pullus) quadrillum* Motschulsky, 1858**
- Gossypium hirsutum* L. - Karnataka (Puttarudriah & Channa Basavanna, 196)
- Lagenaria siceraria* (Molino) Standl. - Uttar Pradesh (Omkar & Bind, 1996)
- Luffa aegyptiaca* Mill. - Manipur (Chakrabarti et al., 2012)
- Solanum melongena* L. - Karnataka (Puttarudriah & Channa Basavanna, 196; Chinnu et al., 2023)
91. ***Scymnus (Pullus) xerampelinus* Canepari, 2003**
- Capsicum frutescens* L. - West Bengal (Chakrabarti et al., 2012)
- Gossypium hirsutum* L. - Karnataka (Puttarudriah & Channa Basavanna, 1953); - Punjab (Rahman, 1940)
92. ***Scymnus (Scymnus) nubilus* Mulsant, 1850**
- Abelmoschus esculentus* (L.) Moench - Manipur (Chakrabarti et al., 2012)
- Capsicum chinense* Jacq. - Assam (Thangjam et al., 2020)
- Gossypium hirsutum* L. - Karnataka (Puttarudriah & Channa Basavanna, 1953)
- Hibiscus cannabinus* L. - Uttar Pradesh (Tiwari et al., 2024)
- Momordica charantia* L. - Uttar Pradesh (Tiwari et al., 2024)
- Psidium guajava* L. - Uttar Pradesh (Tiwari et al., 2024)
93. ***Scymnus* spp.**
- Cucurbita* sp. - Uttarakhand (Ghosh et al., 1991)
- Gossypium hirsutum* L. - Maharashtra (Vennila et al., 2007)
- Abelmoschus esculentus* (L.) Moench - Tamil Nadu (Rekha et al., 2009)
- Capsicum frutescens* L. - Tamil Nadu (Rekha et al., 2009)

- Gossypium* sp. – India (Dastur et al., 1960)  
*Lagenaria siceraria* (Molino) Standl. – West Bengal (Saha et al., 2016)  
*Passiflora edulis* Sims – Kerala (Joy & Sherin, 2013)  
*Psidium guajava* L. – Karnataka (Mani & Krishnamoorthy, 1989)  
*Solanum melongena* L. – Jammu & Kashmir (Bhat, 2017); – Karnataka (Puttarudriah & Channa Basavanna, 1956); – Manipur (Nonita et al., 2006; Shah et al., 2013); – Uttar Pradesh (Omkar & Pervez, 1999); – West Bengal (Satpathi & Mandal, 2006; Satpathi, 1999)  
Unknown plant – Tamil Nadu (Rao, 1969); – West Bengal (Rao, 1969)
94. ***Serangium parcesetosum* Sicard, 1929**  
*Solanum melongena* L. – Assam (Borkakati & Saikia, 2020)
95. ***Stethorus gilvifrons* (Mulsant, 1850)**  
*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)
96. ***Stethorus punctillum* Weise, 1891**  
*Solanum melongena* L. – Punjab (Shankar & Tripathi, 2021)
97. ***Stethorus* sp.**  
*Solanum melongena* L. – Uttar Pradesh (Omkar & Pervez, 2000)
98. ***Sticholotis obscurella* Weise, 1908**  
*Abelmoschus esculentus* (L.) Moench – Kerala (Thamilvel, 2009)  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)  
*Solanum melongena* L. – Kerala (Thamilvel, 2009)
99. ***Sticholotis* sp.**  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)
100. ***Synona rougeti* (Mulsant, 1866)**  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)  
*Solanum melongena* L. – Kerala (Thamilvel, 2009)
101. ***Synonycha grandis* (Thunberg, 1781)**  
*Lablab purpureus* (L.) Sweet ssp. *purpureus* – West Bengal (Chakrabarti et al., 2012)
102. ***Telsimia* sp.**  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)

## 2. Family: Staphilinidae:

1. ***Paederus fuscipes* Curtis, 1826**  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2021)  
*Solanum melongena* L. – West Bengal (Satpathi, 1999; Satpathi & Mandal, 2006)
2. ***Paederus* spp.**  
*Gossypium hirsutum* L. – Telangana (Malleth & Sravanthy, 2021)  
*Solanum melongena* L. – Odisha (Singh et al., 2023b); – West Bengal (Satpathi, 1999; Satpathi & Mandal, 2006)
3. ***Oligota* sp.**  
*Solanum melongena* L. – Punjab (Shankar & Tripathi, 2021)

## Order: Diptera

Among the Diptera, the hover flies (Syrphidae) are most common aphid predators and are widely distributed in Nearctic, Neotropical and Palaearctic regions. Most of the Syrphidae

provide dual service in nature, as adult they help in crop pollination (Joshi et al., 2023) and as larvae they consume several soft-bodied insects such as aphids, scale insects, mealy bugs, whiteflies, thrips etc.; and thus form an integral part of natural control of these insects. Other than Syrphidae, four more families of Diptera are recorded as aphidophagous in India: Asilidae, Calliphoridae, Cecidomyiidae and Chamaemyiidae out of which the records of Asilidae and Calliphoridae are doubtful and their details are given separately. Syrphidae is the largest family having 24 aphidophagous species feeding on *Aphis gossypii* infesting 36 species of host plants distributed in 16 states/union territory of India. Maximum 16 species of these hover flies prey the aphids on brinjal (*Solanum melongena* L.). Most of the tritrophic associations (triplet, predators-prey-host plant) of these hoverflies are reported from Uttar Pradesh (27 triplets) followed by West Bengal (21 triplets), Gujarat (20 triplets), and others less than 20 triplets (Figure 2). The representation of other four families, Asilidae, Calliphoridae, Cecidomyiidae and Chamaemyiidae is very poor. The detail food plant associations of these flies are given below.

**1. Family: Cecidomyiidae:** The family Cecidomyiidae includes gall midges or gall gnats. Several species of these flies are notorious crop pests, but few are beneficial and prey on aphids, spider mites, jassids, scale insects etc. reducing the damage caused by them. In India, only two species are reported to feed on *Aphis gossypii* on four food plants as given below.

**1. *Aphidoletes aphidimyza* Rondani, 1848**

*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986); - Jammu & Kashmir (Bhagat, 2014)

*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986); - Jammu & Kashmir (Bhagat, 2014)

*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)

*Solanum melongena* L. - Punjab (Shankar & Tripathi, 2021)

**2. *Feltiella minuta* (Felt, 1907)**

*Solanum melongena* L. - Punjab (Shankar & Tripathi, 2021)

**2. Family: Chamaemyiidae:** It is a very small family having about 200 species. The larvae of these flies are predatory on soft-bodied insects, like aphids, scale insects, etc. and have been used in their biocontrol programmes. In India, only one species of this family is reported feeding on *Aphis gossypii* infesting as mentioned below.

**1. *Leucopis auraria* Tanasijtshuk, 1961 [syn. *Leucopis auraria marcida* Tanasijtshuk, 1961]**

*Gossypium hirsutum* L. - Gujarat (Butani & Kapadia, 2000c)

**2. *Leucopis* spp.**

*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)

*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)

*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)

*Hibiscus rosa-sinensis* L. - Karnataka (Chinnu et al., 2023)

Unknown plant - Odisha (Basu & Patro, 2007)



Figure 2. Map showing the number of tritrophic association of aphidophagous hoverflies (Syrphidae) preying on *Aphis (Aphis) gossypii* Glover in different states and union territories of India.

**3. Family: Syrphidae:** The Syrphidae is highly economically important family as the adult flies are pollinators and thus productive in nature while larvae of many species are protective by feeding and thus killing of several insect pests including aphids (Joshi et al., 2023). In India, 24 species are recorded preying on *Aphis gossypii* infesting 36 species of host plants in 16 states/union territories. Its tritrophic associations in different parts of India is illustrated in Figure 2.

1. ***Allograpta javana* (Wiedemann, 1824) [syn. *Sphaerophoria javana* Wiedemann, 1824; *Syrphus javana* Wiedemann, 1824]**  
*Gossypium* sp. – Assam (Agarwala et al., 1984); – Bihar (Bhatia & Saffi, 1932); – Karnataka (Rao, 1969); – Meghalaya (Agarwala et al., 1984); – Tamil Nadu (Agarwala et al., 1984)  
*Lagenaria siceraria* (Molino) Standl. – Bihar (Kumar et al., 2015; Ahmad et al., 2020); – Uttar Pradesh (Tiwari et al., 2024)
2. ***Asarkina belli* Ghorpadé, 1994**  
*Hibiscus rosa-sinensis* L. – Karnataka (Chinnu et al., 2023)
3. ***Asarkina ericetorum* (Fabricius, 1781)**  
*Lagenaria siceraria* (Molino) Standl. – Bihar (Kumar et al., 2015; Ahmad et al., 2020)
4. ***Betasyrphus serarius* (Wiedemann, 1830) [syn. *Syrphus serarius* Wiedemann, 1830]**  
*Brassica oleracea* L. – Bihar (Prakash & Rani, 2015); – Manipur (Devjani & Singh, 1998; Singh et al., 2002)  
*Capsicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Debnath, 2020)  
*Gossypium hirsutum* L. – Rajasthan (Dhaka, 2013)  
*Solanum melongena* L. – Uttar Pradesh (Chaudhary & Singh, 2012)

5. ***Dideopsis aegrota* (Fabricius, 1850) [syn. *Asarcina aegrota* (Fabricius, 1850)]**  
*Psidium guajava* L. - Tamil Nadu (Baskaran et al., 2009)  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)
6. ***Episyrphus balteatus* (De Geer, 1776) [syn. *Syrphus balteatus* De Geer, 1776]**  
*Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)  
*Cajanus cajan* (L.) Millsp. - Bihar (Ahmad et al., 2020); - Uttar Pradesh (Chaudhary & Singh, 2012)  
*Capsicum annuum* L. - Jammu & Kashmir (Bhat & Bhagat, 2017); - Uttarakhand (Bisht et al., 2006)  
*Chrysanthemum* sp. - Uttarakhand (Bisht et al., 2006)  
*Coccinia grandis* (L.) Voigt. - Uttar Pradesh (Tiwari et al., 2024)  
*Colocasia esculenta* (L.) Schott. - Uttar Pradesh (Tiwari et al., 2024)  
*Coriandrum sativum* L. - Uttarakhand (Bisht et al., 2006)  
*Cucumis sativus* L. - India (Agarwala et al., 1984); - Jammu & Kashmir (Bhat & Bhagat, 2017); - Sikkim (Agarwala et al., 1982); - Uttarakhand (Bisht et al., 2006); - West Bengal (Agarwala et al., 1982)  
*Cucurbita maxima* Duchesne - Jammu & Kashmir (Bhat, 2008; Bhat & Bhagat, 2017)  
*Datura metel* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum* sp. - Sikkim (Agarwala et al., 1982); - West Bengal (Agarwala et al., 1982)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)  
*Lagenaria siceraria* (Molino) Standl. - Jammu & Kashmir (Bhat & Bhagat, 2017)  
*Luffa aegyptiaca* Mill. - Uttar Pradesh (Tiwari et al., 2024)  
*Psidium guajava* L. - Tamil Nadu (Baskaran et al., 2009)  
*Solanum betaceum* Cav. - Sikkim (Agarwala et al., 1982); - West Bengal (Agarwala et al., 1982)  
*Solanum melongena* L. - Assam (Borkakati et al., 2019; Das & Ahmed, 2021); - Jammu & Kashmir (Bhat, 2008; Bhat & Bhagat, 2017); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Satpathi & Mandal, 2006)  
*Solanum tuberosum* L. - Manipur (Nonita et al., 2002); - Uttar Pradesh (Raj, 1989; Tiwari et al., 2024); - Uttarakhand (Bisht et al., 2006)  
Unknown plants - Odisha (Basu & Patro, 2007); - Tripura (Agarwala et al., 1987a)
7. ***Episyrphus viridaureus* (Wiedemann, 1824) [syn. *Episyrphus alternans* (Macquart, 1842)]**  
*Capsicum chinense* Jacq. - Assam (Thangjam et al., 2021)  
Unknown plant - Tripura (Agarwala et al., 1987a)
8. ***Eristalinus arvorum* (Fabricius, 1787) [syn. *Lathyrophthalmus arvorum* (Fabricius, 1787)]**  
*Capsicum chinense* Jacq. - Assam (Thangjam et al., 2021)
9. ***Eristalis tenax* (Linnaeus, 1758)**  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)
10. ***Eupeodes confrater* (Wiedemann, 1830) [syn. *Metasyrphus confrater* (Wiedemann, 1930)]**  
*Bidens pilosa* L. - West Bengal (Agarwala et al., 1982)  
*Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)

- Chrysanthemum* sp. - India (Agarwala et al., 1984); - Uttar Pradesh (Chaudhary & Singh, 2012)  
*Cucumis sativus* L. - Uttarakhand (Bisht et al., 2006)  
*Lagenaria siceraria* (Molino) Standl. - West Bengal (Saha et al., 2016)  
Unknown plant - Tripura (Agarwala et al., 1987a)
11. ***Eupeodes corollae* (Fabricius, 1794) [syn. *Metasyrphus corollae* (Fabricius, 1794); *Syrphus corollae* Fabricius, 1794]**  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)
12. ***Eupeodes frequens* (Matsumura, 1917)**  
*Hibiscus syriacus* L. - Tripura (Agarwala, 2004)
13. ***Ischiodon scutellaris* (Fabricius, 1805) [syn. *Xanthogramma scutellare* (Fabricius, 1805)]**  
*Abelmoschus esculentus* Moench - Karnataka (Udayakumar et al., 2023); - Maharashtra (Kale et al., 2020); - Uttar Pradesh (Tiwari et al., 2024)  
*Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)  
*Cajanus cajan* (L.) Millsp. - Uttar Pradesh (Chaudhary & Singh, 2012; Tiwari et al., 2024)  
*Capsicum annuum* L. - Uttarakhand (Bisht et al., 2006)  
*Capsicum chinense* Jacq. - Assam (Thangjam et al., 2021)  
*Chromolaena odorata* (L.) R.M.King and H.Rob. - Karnataka (Chinnu et al., 2023)  
*Chrysanthemum* sp. - Uttarakhand (Bisht et al., 2006)  
*Coccinia grandis* (L.) Voigt - Bihar (Ahmad et al., 2020)  
*Coriandrum sativum* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Cucumis sativus* L. - Karnataka (Chinnu et al., 2023)  
*Cucumis* sp. - Uttarakhand (Ghosh et al., 1985; Bisht et al., 2006)  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)  
*Foeniculum vulgare* Mill. - Uttar Pradesh (Tiwari et al., 2024)  
*Gossypium hirsutum* L. - Gujarat (Chouhan et al., 2011); - Karnataka (Joshi et al., 1999b; Udayakumar et al., 2023); - Maharashtra (Kale et al., 2020); - Odisha (Mohapatra, 2004)  
*Gossypium* sp. - India (Agarwala et al., 1984)  
*Hibiscus rosa-sinensis* L. - Bihar (Ahmad et al., 2020)  
*Lagenaria siceraria* (Molino) Standl. - Bihar (Ahmad et al., 2020); - West Bengal (Saha et al., 2016)  
*Luffa aegyptiaca* Mill. - Bihar (Ahmad et al., 2020)  
*Mangifera indica* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Momordica charantia* L. - Bihar (Ahmad et al., 2020)  
*Phaseolus vulgaris* L. - Uttarakhand (Bisht et al., 2006)  
*Plantago ovata* Forssk. - Gujarat (Prajapati et al., 2020)  
*Psidium guajava* L. - Karnataka (Mani & Krishnamoorthy, 1989); - Tamil Nadu (Baskaran et al., 2009); - Uttarakhand (Bisht et al., 2006)  
*Solanum melongena* L. - Manipur (Shah et al., 2013); - West Bengal (Agarwala et al., 1982; Satpathi & Mandal, 2006)  
*Solanum tuberosum* L. - Manipur (Nonita et al., 2002); - Uttar Pradesh (Raj, 1989)  
Unknown plant - Tripura (Agarwala et al., 1987a)
14. ***Melanostoma orientale* (Wiedemann, 1824)**  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)

15. ***Microdon bellus* Brunetti, 1923**  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)
16. ***Paragus crenulatus* Thomson, 1869 [syn. *Serratoparagus crenulatus* (Thomson, 1869)]**  
*Capsicum chinense* Jacq. - Assam (Thangjam et al., 2021)  
 Unknown - Tripura (Agarwala et al., 1987a)
17. ***Paragus politus* Wiedemann, 1830 [syn. *Pipizella indicus* Brunetti, 1908; *Paragus indicus* Brunetti, 1908]**  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)
18. ***Paragus serratus* (Fabricius, 1805)** [Some specimens identified as *Paragus serratus* may belong to *Paragus crenulatus* recorded from northeast India (Thompson & Ghorpadé, 1992)]  
*Ageratum conyzoides* L. - Bihar (Ahmad et al., 2020)  
*Brassica oleracea* L. - Manipur (Singh et al., 2002)  
*Cajanus cajan* (L.) Millsp. - Bihar (Ahmad et al., 2020)  
*Cucumis sativus* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Cucurbita maxima* Duchesne - Uttar Pradesh (Tiwari et al., 2024)  
*Gossypium herbaceum* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Gossypium hirsutum* L. - Karnataka (Joshi et al., 1999b)  
*Hibiscus rosa-sinensis* L. - Bihar (Ahmad et al., 2020)  
*Lagenaria siceraria* (Molino) Standl. - Bihar (Ahmad et al., 2020)  
*Medicago sativa* L. - Uttar Pradesh (Tiwari et al., 2024)  
*Psidium guajava* L. - Karnataka (Mani & Krishnamoorthy, 1989); - Tamil Nadu (Baskaran et al., 2009); - Uttar Pradesh (Tiwari et al., 2024)  
*Solanum melongena* L. - Manipur (Shah et al., 2013); - Uttar Pradesh (Chaudhary & Singh, 2012)  
 Unknown plants - Manipur (Nonita et al., 2002); - Odisha (Basu & Patro, 2007)
19. ***Paragus tibialis* (Fallén, 1817)**  
*Coccinia grandis* (L.) Voigt. - India (Agarwala et al., 1984)  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)  
*Gossypium* sp. - India (Agarwala et al., 1984)  
*Leucas aspera* (Willd.) Link - India (Agarwala et al., 1984)
20. ***Paragus yerburiensis* Stuckenberg, 1954**  
*Gossypium* sp. - Assam (Agarwala et al., 1984); - Tamil Nadu (Agarwala et al., 1984); - Uttar Pradesh (Agarwala et al., 1984); - West Bengal (Agarwala et al., 1984)  
*Solanum melongena* L. - West Bengal (Satpathi & Mandal, 2006)
21. ***Sphaerophoria bengalensis* Macqurt, 1842**  
*Fagopyrum esculentum* Moench - Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi - Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. - Gujarat (Bhat et al., 1986)
22. ***Sphaerophoria indiana* Bigot, 1884**  
*Brassica oleracea* L. - Bihar (Prakash & Rani, 2015); - Manipur (Devjani & Singh, 1998; Singh et al., 2002)  
*Solanum melongena* L. - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Satpathi & Mandal, 2006)
23. ***Sphaerophoria scripta* (Linnaeus, 1758)**  
*Capsicum annuum* L. - West Bengal (Agarwala et al., 1982)

*Capasicum frutescens* L. – Uttar Pradesh (Tiwari et al., 2024); – West Bengal (Agarwala et al., 1984)

*Cucurbita maxima* Duchesne – Jammu & Kashmir (Bhat, 2008)

*Fagopyrum esculentum* Moench – Gujarat (Bhat et al., 1986)

*Fagopyrum kashmirianum* Munshi – Gujarat (Bhat et al., 1986)

*Fagopyrum tataricum* (L.) Gaertn. – Gujarat (Bhat et al., 1986)

*Solanum melongena* L. – Jammu & Kashmir (Bhat, 2008); – Uttar Pradesh (Tiwari et al., 2024)

**24. *Sphaerophoria* sp.**

*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)

**25. *Syrphus* spp.**

*Abelmoschus esculentus* Moench – Uttarakhand (Bhatt et al., 2018)

*Chrysanthemum* sp. – Uttarakhand (Bisht et al., 2006)

*Solanum melongena* L. – West Bengal (Satpathi, 1999)

**Order: Hemiptera**

The order Hemiptera includes at least seven families of predatory bugs preying on aphids, scale insects, mealybugs, bugs, leaf hoppers, thrips, mites, caterpillars etc. (Chellappan & Ranjith, 2023). In India, eight species of predatory bugs belonging to four families are reported as predator of *Aphis gossypii* as mentioned below.

**1. Family: Anthocoridae:** Anthocorid bugs, commonly known as minute pirate bugs or flower bugs are mostly predaceous and feed on small, soft-bodied arthropods naturally controlling especially sucking pests infesting orchards, row crops, forests, ornamental plants, greenhouses and granaries. In India, four species of these bugs are known to feed *Aphis gossypii* as follows.

**1. *Anthocoris* sp.**

*Solanum melongena* L. – Jammu & Kashmir (Bhat, 2008)

**2. *Blaptostethus pallescens* Poppius, 1909**

*Gossypium hirsutum* L. – Tamil Nadu (Nasreen et al., 2022)

**3. *Deraeocoris indicus* Poppius, 1915**

Unknown host plant – Karnataka (Rao, 1969)

**4. *Orius tantillus* (Motschulsky, 1863) [syn. *Triphleps tantilus* (Motschulsky, 1863)]**

*Gossypium hirsutum* L. – Punjab (Rahman, 1940)

**5. *Orius* sp.**

*Solanum melongena* L. – Punjab (Shankar & Tripathi, 2021)

**2. Family: Geocoridae:** Geocoridae, or big-eyed bugs, are widely distributed; generalist predators mostly feed on aphids and thrips (Varshney, 2023). Only two species of geocorid bugs are known to feed *Aphis gossypii* in India as follows.

**1. *Geocoris jucundus* (Fieber, 1861)**

*Solanum lycopersicum* L. – Rajasthan (Pal, 1974)

**2. *Geocoris ochropterus* (Fieber, 1844)**

Unknown plant – India (Bal & Biswas, 2013)

**3. *Geocoris* sp.**

*Abelmoschus esculentus* (L.) Moench – Karnataka (Aravinda et al., 2024)

**3. Family: Miridae:** Like Geocoridae, mirid bugs, are widely distributed, generalist predators of small arthropods. Only a single species of geocorid bug is known to feed on *Aphis gossypii* in India as follows.

1. ***Nesidiocoris caesar* (Ballard, 1927)**  
*Lagenaria siceraria* (Molino) Standl.) – Uttarakhand (Chakraborty & Chakrabarty, 1994)

**4. Family: Pentatomidae:** Only a single species is recorded predatory on *Aphis gossypii* from India.

1. ***Eocanthecona* sp.**  
*Abelmoschus esculentus* Moench – Uttarakhand (Bhatt & Karnatak, 2018)

#### IV. Order: Neuroptera

Neuroptera includes lacewings, mantisflies, antlions and their relatives and both adults and larvae are predatory. They are globally distributed and generalist predator of soft-bodied insects. Recently, Singh et al. (2024a) enlisted 32 species of aphidophagous neuropterans from India belonging to four families. However, members of only two families, Chrysopidae and Hemerobiidae are recorded to prey on *Aphis gossypii* in India.

**1. Family: Chrysopidae:** This is the largest family of the order, commonly known as green lacewings or aphid lions. In India, it comprises 24 aphidophagous species preying on 55 species of aphids infesting 84 species of food plants (Singh et al., 2024a). Among them, only nine species of lacewings prey on *Aphis gossypii* feeding on 21 species of food plants in 19 states/union territory as mentioned below.

1. ***Ankylopteryx octopunctata* (Fabricius, 1793)**  
*Abelmoschus esculentus* (L.) Moench – Kerala (Thamilvel, 2009)  
*Capsicum annuum* L. – Kerala (Thamilvel, 2009)  
*Solanum melongena* L. – Kerala (Thamilvel, 2009)
2. ***Brinckochrysa scelestes* (Banks, 1911) [syn. *Chrysopa scelestes* Banks, 1911; *Chrysoperla scelestes* Banks, 1911, sic]**  
*Abelmoschus esculentus* Moench – Gujarat (Patel et al., 2012)
3. ***Chrysopa pallens* (Rambur, 1838) [syn. *Chrysopa septempunctata* Wesmael, 1841]**  
Unknown plant – Himachal Pradesh (Das & Raychaudhuri, 1983)
4. ***Chrysopa virgestes* Banks, 1911**  
*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)
5. ***Chrysopa* sp.**  
*Gossypium hirsutum* L. – Andhra Pradesh (Dhillon et al., 2012); – Haryana (Butani, 1971); – Telangana (Malleh & Sravanthy, 2021)  
*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)
6. ***Chrysoperla orestes* (Banks, 1911) [syn. *Chrysopa orestes* Banks, 1911]**  
*Solanum melongena* L. – Jammu & Kashmir (Bhagat & Masoodi, 1985)

7. ***Chrysoperla zastrowi sillemi* (Esben – Petersen, 1935) [syn. *Chrysopa gujaratensis* Ghosh, 1976; *Chrysopa punensis* Ghosh, 1976; *Chrysopa sanandensis* Ghosh, 1977; *Chrysopa sillemi* Esben – Petersen, 1935]**  
*Abelmoschus esculentus* (L.) Moench – Kerala (Thamilvel, 2009); – Madhya Pradesh (Shukla, 2014); – Tamil Nadu (Saminathan et al., 2003); – Uttarakhand (Bhatt & Karnatak, 2018)  
*Capsicum annuum* L. – Karnataka (Jambagi et al., 2021); – Kerala (Thamilvel, 2009)  
*Capsicum chinense* Jacq. – Assam (Thangjam et al., 2021)  
*Carthamus tinctorius* L. – Andhra Pradesh (Rao et al., 2007); – Karnataka (Hanumantharaya et al., 2008)  
*Catharanthus roseus* (L.) G. Don – Kerala (Thamilvel, 2009)  
*Cucurbita maxima* Duchesne – Jammu & Kashmir (Bhat, 2008); – Uttar Pradesh (Tiware et al., 2024)  
*Fagopyrum esculentum* Moench – Gujarat (Bhat et al., 1986)  
*Fagopyrum kashmirianum* Munshi – Gujarat (Bhat et al., 1986)  
*Fagopyrum tataricum* (L.) Gaertn. – Gujarat (Bhat et al., 1986)  
*Gossypium herbaceum* L. – Gujarat (Butani & Kapadia, 2000b)  
*Gossypium hirsutum* L. – Gujarat (Chakraborty & Korat, 2010); – Haryana (Kumar et al., 2016a); – Karnataka (Manjumatha et al., 2018); – Maharashtra (Vemila et al., 2007; Mounika et al., 2021); – Odisha (Bhattacharyya et al., 2019); – Punjab (Kumar et al., 2019; Shankar & Tripathi, 2021); – Rajasthan (Dhaka, 2013; Naruka & Ameta, 2015); – Tamil Nadu (Saminathan et al., 2003; Kannan et al., 2004)  
*Gossypium hirsutum* L. – Telangana (Sheileja et al., 2022)  
*Luffa aegyptiaca* Mill. – Uttar Pradesh (Chaudhary & Singh, 2012)  
*Momordica charantia* L. – Kerala (Thamilvel, 2009)  
*Psidium guajava* L. – Tamil Nadu (Saminathan et al., 2003)  
*Solanum melongena* L. – Assam (Borkakati et al., 2019; Das & Ahmed, 2021); – Jammu & Kashmir (Bhat, 2008); – Karnataka (Chandrakumar et al., 2008); – Kerala (Thamilvel, 2009); – Madhya Pradesh (Kumar & Chandra, 2015); – Uttar Pradesh (Singh, 2023; Tiware et al., 2024)  
*Vicia faba* L. – Uttar Pradesh (Tiware et al., 2024)  
Unknown plant – Uttar Pradesh (Singh et al., 2024c)
8. ***Chrysoperla* sp.**  
9. *Capsicum annuum* L. – Karnataka (Asma & Hanumantharaya, 2015)  
*Gossypium hirsutum* L. – Maharashtra (Kale et al., 2020)  
*Tectona grandis* L.f. – Chhattisgarh (Harinkhere et al., 2013)
10. ***Mallada basalis* (Walker, 1853)**  
*Solanum melongena* L. – Punjab (Shankar & Tripathi, 2021)
11. ***Mallada desjardinsi* (Navás, 1911) [syn. *Anisochrysa boninensis* (Okamoto, 1914); *Mallada boninensis* (Okamoto, 1914)]**  
*Cucumis sativus* L. – Himachal Pradesh (Kumari et al., 2021)  
*Gossypium herbaceum* L. – Gujarat (Butani & Kapadia, 2000b)  
*Gossypium hirsutum* L. – Gujarat (Nehare et al., 2004)  
*Solanum melongena* L. – West Bengal (Satpathi & Mandal, 2006)  
*Solanum tuberosum* L. – Uttar Pradesh (Raj, 1989)  
Unknown plant – Maharashtra (Nagamallikadevi et al., 2013; George et al., 2016)
12. ***Mallada* sp.**  
*Gossypium hirsutum* L. – Maharashtra (Kale et al., 2020)
13. ***Pseudomallada astur* (Banks, 1937) [syn. *Mallada astur* (Banks, 1937)]**

*Gossypium hirsutum* L. - Karnataka (Jalali & Singh, 1994)

**2. Family: Hemerobiidae:** The hemerobiids are commonly known as brown lacewings and both adults and larvae are voracious predators on soft-bodied insects. In India, two genera *Hemerobius* and *Micromus* are recorded preying on 29 aphid species infesting 48 food plants (Singh et al., 2024a). Three species are recorded to prey on *Aphis gossypii* infesting five species of plants in India as given below.

1. ***Micromus australis* Hagen, 1858**  
*Gossypium hirsutum* L. - Karnataka (Mulimani et al., 2007)
2. ***Micromus igorotus* Banks, 1920**  
*Gossypium hirsutum* L. - Karnataka (Mulimani et al., 2007; Joshi et al., 2011)
3. ***Micromus timidus* Hagen, 1853 [syn. *Micromus sauteri* Esben - Petersen, 1912]**  
*Brassica oleracea* L. - Manipur (Singh et al., 2002)  
*Gossypium hirsutum* L. - Karnataka (Mulimani et al., 2008; Navi et al., 2010)  
*Lagenaria siceraria* (Molino) Standl. - West Bengal (Saha et al., 2016)  
*Solanum melongena* L. - Manipur (Shah et al., 2013); - Uttar Pradesh (Tiwari et al., 2024); - West Bengal (Satpathi, 1999; Satpathi & Mandal, 2006)  
Unknown plant - Odisha (Basu & Patro, 2007)
4. ***Micromus* spp.**  
*Cucumis* sp. - Uttarakhand (Debnath, 1991)  
*Abelmoschus esculentus* (L.) Moench - Kerala (Thamilvel, 2009)  
*Capsicum chinense* Jacq. - Assam (Thangjam et al., 2021)  
*Coccinia grandis* (L.) Voigt - Kerala (Thamilvel, 2009)  
*Ageratum conyzoides* L. - Kerala (Thamilvel, 2009)  
*Amaranthus tricolor* L. - Kerala (Thamilvel, 2009)  
*Capsicum annuum* L. - Kerala (Thamilvel, 2009)  
*Momordica charantia* L. - Kerala (Thamilvel, 2009)  
*Solanum melongena* L. - Kerala (Thamilvel, 2009)  
*Trichosanthes cucumerina* L. - Kerala (Thamilvel, 2009)

**V. Order: Odonata**

The Odonata comprises the dragonflies and damselflies. The larvae are aquatic and are also carnivorous, mostly insectivorous. Adult ones are aerial hunters and catch their prey in flight. Hence, the aphids will not serve a good source of food for them. Following records are doubtful; it seems that they simply are visitor and not predator.

**1. Family: Calopterygidae:**

1. ***Calopteryx splendens* (Harris, 1780)**  
*Gossypium hirsutum* L. - Telangana (Malleesh & Sravanthy, 2021)

**2. Family: Libellulidae:**

1. ***Libellula* sp.**  
*Gossypium hirsutum* L. - Telangana (Malleesh & Sravanthy, 2021)

**Doubtful records**

Records of at least 5 species of predators belonging to 5 families from different states are seemingly erroneous and doubtful as these predators are not repeatedly reported to prey aphids by other authors. These doubtful records are mentioned below.

## I. Order: Mantodea

**1. Family: Mantidae:** The preying mantids are well known predatory insects preying not only small insects, but also small vertebrates. The aphids are not preferred food for mantids, however, the well-known species, *Mantis religiosa* Linnaeus, 1758 was seen preying on *Aphis gossypii* on cotton in Telangana.

### 1. *Mantis religiosa* Linnaeus, 1758

*Gossypium hirsutum* L. - Telangana (Malleš & Sravanthy, 2021)

## II. Order: Coleoptera

**1. Family: Anthribidae:** Anthribidae, also known as fungus weevils, mostly feed upon fungi or decomposing plant litters. In India, only an unidentified species of *Illis* sp. was reported to feed on *Aphis gossypii* on okra and cotton in Maharashtra (Kale et al., 2020). However, its aphidophagous nature seems doubtful.

### 2. Family: Nitidulidae:

#### 1. *Glischrochilus* sp.

*Gossypium hirsutum* L. - Telangana (Malleš & Sravanthy, 2021)

## III. Order: Diptera

**1. Family: Asilidae:** These flies are commonly known as the robber fly or assassin flies. They are predatory and mostly are entomophagous. Usually, they feed on active prey and hence, aphids are not their choice as food. In India, only one species, *Machimus indianus* Ricardo, 1919 is reported to prey on *Aphis gossypii* in Uttarakhand on *Solanum melongena* L. (Bisht et al., 2001).

**2. Family: Calliphoridae:** These flies are commonly known as blow flies, carrion flies, bluebottles, or greenbottles. The adults are occasional pollinators, but their larvae are either scavengers of carrion and dung or predators of spiders, beetles, vertebrates etc. The record of one species, *Cochliomyia* sp. as a predator of *Aphis gossypii* on cotton by Malleš & Sravanthy (2021) in Telangana seems doubtful.

## Acknowledgements

I would like to thank the reviewers for their valuable comments and suggestions to improve paper quality

## Conflict of interests

The author declares that they have no competing interests.

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