

A checklist of hover flies (Diptera, Syrphidae) of Kerala, India

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ABSTRACT: A checklist of the hover flies from Kerala belonging to two subfamilies is provided. Among the 59 species listed, the subfamily Syrphinae shares maximum number of species (34), followed by the subfamily Eristalinae (25). © 2024 Association for Advancement of Entomology

KEY WORDS: Flower flies, Syrphinae, Eristalinae, species

INTRODUCTION

The family Syrphidae, commonly called hover flies or flower flies is regarded as the most anthophilous flies in the order Diptera (Larson *et al.*, 2001). Hover flies have recently gained research interest because of their importance as both pollinators and biological control agents (Lucas *et al.*, 2018). They are significant pollinators as adults, while their larvae are effective predators of many pests (Mitra *et al.*, 2008). Most of the adults, mimic bees or wasps and are brightly coloured, may be striped, banded or spotted. India has 357 different species of hover flies (Ghorpadé, 2014; Mitra *et al.*, 2015), out of 6,107 species under 209 genera reported from the world (Evenhuis and Pape, 2023). The first elaborated work on Indian Syrphidae was done by Brunetti (1923). The south Indian fauna of Syrphidae became enriched by Fabricius (1805), Wiedemann (1819), Macruat (1842), Bigot (1883), Brunetti (1908, 1915, 1923), Knutson *et al.* (1975)

and Joseph and Parui (1986). Datta and Chakraborti (1986) reported 45 species of hover flies belonging to 21 genera based on the collections (1970-1981) accumulated in the Zoological Survey of India from south India.

Recent studies on Indian Syrphidae include the checklist prepared by Ghorpadé (2014) in which 357 species under 14 tribes of three subfamilies are reported. A review of the hover flies from India by Mitra *et al.* (2015) reported 357 species of Syrphidae from India. In the book, Faunal Diversity of Biogeographic Zones of India, Banerjee *et al.* (2020) published a book chapter on the Diptera fauna of the Western Ghats biogeographic area, which reported 35 species of Syrphidae from Kerala. Sankararaman *et al.* (2022) described two new species of Syrphidae with a review of the Indian species of *Monoceromyia* Shannon. The present work is the first attempt to provide a checklist of hover flies in Kerala.

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MATERIALS AND METHODS

For the preparation of the checklist, a thorough examination of published articles, books, catalogues, checklists, and other sources containing information on hover flies' distribution records was conducted. This checklist is wholly based on a literature review; no specimens were collected or studied for the same. All nomenclature and classification have been updated as per *Systema Diptorum* (Evenhuis and Pape, 2023).

RESULTS AND DISCUSSION

According to the current literature survey, 59 species of hover flies have been reported from Kerala to date. All species and their distribution within the state are provided with the reference.

Subfamily Eristalinae: The larvae of Eristalinae are mainly saprophagous and some are phytophagous. Eristalinae is the only polyphyletic subfamily under the family Syrphidae (Mengual *et al.*, 2015). Out of the 357 species reported from India, 197 belong to the subfamily Eristalinae (Sengupta *et al.*, 2016).

Tribe Ceriodini

Genus *Monoceromyia* Shannon, 1922

The members are wasp mimics and the genus can be distinguished by its scape that is at least as long as frontal prominence and with an incomplete post-metacoxal bridge. The petiole of the abdomen has short basal segments and is elliptical in shape. Antennae are elongated.

1. *Monoceromyia javana* (Wiedemann, 1824)
Source: Sankararaman *et al.* (2022)
Distribution: Pathanamthitta
2. *Monoceromyia tredecimpunctata* (Brunetti, 1923)
Source: Mitra *et al.* (2008)
Distribution: Kerala

Remarks: According to Mitra *et al.* (2008), *M. tredecimpunctata* is widely distributed in India

including the states of Assam, Karnataka, Kerala, Meghalaya, Sikkim, Tamil Nadu, Tripura, and West Bengal. But the subsequent Indian checklist by Ghorpadé (2014), Mitra *et al.* (2015), and Sengupta *et al.* (2016) supports that distribution of *M. tredecimpunctata* is restricted to north Indian states. So, the record from Kerala by Mitra *et al.* (2008) is suspicious.

Tribe Eristalini

Genus *Eristalinus* Rondani, 1845

Head is board as thorax. Wings with closed marginal cells and 3rd vein (R_{4+5}) evidently looped downward into the first posterior cell (R_5). Yellow to orange coloured abdomen and yellowish-brown scutellum.

3. *Eristalinus arvorum* (Fabricius, 1787)
Subgenus: *Eristalinus*
Source: Joseph and Parui (1986), Mathew (2004)
Distribution: Silent Valley National Park (Palakkad)
4. *Eristalinus aurulans* (Wiedemann, 1824)
Subgenus: *Eristalinus*
Source: Brunetti (1915) Ghorpadé (2014, 2019) Mitra *et al.* (2015)
Sengupta *et al.* (2016)
Distribution: Travancore
5. *Eristalinus megacephalus* (Rossi, 1794)
Subgenus: *Eristalinus*
Source: Datta and Chakraborti (1986), Shah *et al.* (2014), (Ghorpadé, 2019)
Distribution: Chalakudy (Thrissur), Parambikulam (Palakkad)
6. *Eristalinus obliquus* (Wiedemann, 1824)
Subgenus: *Eristalinus*
Source: Ghorpadé (2019)
Distribution: Kerala
7. *Eristalinus quinquestriatus* (Fabricius 1794)

Subgenus: *Eristalinus*

Source: Datta and Chakraborti (1986), Mukherjee et al. (2006), Mitra et al. (2008), Shah et al. (2014), Sengupta et al. (2016)

Distribution: Kumily (Idukki)

8. *Eristalinus tristriatus* (Meijere, 1911)

Subgenus: *Eristalinus*

Source: Datta and Chakraborti (1986), Mitra et al. (2008, 2015), Ghorpadé (2014, 2019)

Distribution: Konnakuzhy, Chalakudy (Thrissur)

Genus *Phytomia* Guerin-Meneville, 1833

Eyes are bare, with comparatively shorter antennae. Densely pubescent and thick obconical abdomen. Loop of third vein with short appendix, comparatively shorter and weak legs.

9. *Phytomia argyrocephala* (Macquart, 1842)

Subgenus: *Phytomia*

Source: Brunetti (1923), Ghorpadé (2014, 2019), Mitra et al. (2015) Sengupta et al. (2016)

Distribution: Travancore, Nilgiri hills

10. *Phytomia crassa* (Fabricius, 1787)

Subgenus: *Dolichomerus*

Source: Datta and Chakraborti (1986), Joseph and Parui (1986), Brunetti (1923), Mathew (2004), Mitra et al. (2008), Ghorpadé (2014, 2019), Shah et al. (2014)

Distribution: Idamalayar (Ernakulum), Silent Valley National Park, Parambikulam (Palakkad), Madathara (Kollam)

11. *Phytomia errans* (Fabricius, 1787)

Subgenus: *Phytomia*

Source: Brunetti (1915, 1923), Datta and Chakraborti (1986), Mathew (2004) Mukherjee et al. (2006), Mitra et al. (2008, 2015), Ghorpadé (2014, 2019), Shah et al. (2014)

Distribution: Idamalayar (Ernakulum),

Parambikulam (Palakkad), Kumily (Idukki), Thiruvananthapuram

12. *Phytomia zonata* (Fabricius, 1787)

Subgenus: *Phytomia*

Source: Brunetti (1923) Datta and Chakraborti (1986), Mukherjee et al. (2006), Mitra et al. (2008, 2015), Ghorpadé (2014, 2019)

Distribution: Valiyaparathodu (Palakkad), Nilgiri hills

Tribe Merodontini

Genus *Eumerus* Meigen, 1822

The head is broader than the thorax. Slightly arched and sub quadrate thorax. Wings with widely opened marginal cells and closed 1st posterior cell. Long abdomen, nearly always having three pairs of pale lunules.

13. *Eumerus figurans* Walker, 1859

Source: Sandhya et al. (2016), Ghorpadé (2019)

Distribution: Thrissur, Palakkad

14. *Eumerus nicobarensis* Schiner, 1868

Source: Brunetti (1923)

Distribution: Palode (Thiruvananthapuram)

Genus *Psilota* Meigen, 1822

The head with pilose eyes and face without tubercles. Slightly concave or straight face with an anteriorly projecting lower facial margin. The wings have a straight R₄₊₅ vein and an oblique M₁ vein.

15. *Psilota shewelli* Thompson, 2012

Source: Thompson (2012)

Distribution: Vellayani (Thiruvananthapuram)

Tribe Milesiini

Genus *Milesia* Latreille, 1804

Milesia is one of the diverse genera of hover flies. More than eighty species in this genus mimic social wasps. They have a hairy post-pronotal lobe, and

their eyes and arista are bare. Wings with straight third vein and oblique cross vein within apical half of discal cell. Presence of pale pubescence on the abdomen.

16. *Milesia caesarea* Hippra, 1990

Source: Hippra (1990), Ghorpadé (2014, 2019), Mitra *et al.* (2015)

Distribution: Ponmudi range (Thiruvananthapuram), Anamalai hills

17. *Milesia cinnamomea* Hippra, 1990

Source: Hippra (1990), Ghorpadé (2014, 2019), Mitra *et al.* (2015)

Distribution: Chembra peak (Wayanad), Ponmudi range (Thiruvananthapuram)

18. *Milesia mima* Hippra, 1990

Source: Hippra (1990), Ghorpadé (2014, 2019), Mitra *et al.* (2015)

Distribution: Ponmudi range (Thiruvananthapuram), Anamalai hills

19. *Milesia sexmaculata* Brunetti, 1915

Source: Brunetti (1915, 1923), Hippra (1990) Mathew (2004), Ghorpadé (2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Thiruvananthapuram

Genus *Syritta* Le Peletier and Audinet-Serville, 1828

Pale triangular spots present behind the head. Metasternum without hairs and patch of fine hairs on metepisternum. Separate dorsal and ventral hair patches are present on Katepisternum. Greatly enlarged hind femur and apical third with an anteroventral spinose ridge.

20. *Syritta indica* (Wiedemann, 1824)

Source: Datta and Chakraborti (1986), Van Steenis (2010), Ghorpadé (2014, 2019), Shah *et al.* (2014), Mitra *et al.* (2015)

Distribution: Chalakudy (Thrissur), Ponmudi range (Thiruvananthapuram)

21. *Syritta orientalis* Macquart, 1842

Source: Mathew *et al.* (1987), Mathew (2004),

Distribution: Nilambur (Malappuram), Peechi (Thrissur)

22. *Syritta proximata* Lyneborg and Barkemeyer, 2005

Source: Ghorpadé (2014, 2019)

Distribution: Anamalai hills

23. *Syritta stylata* Lyneborg and Barkemeyer, 2005

Source: Ghorpadé (2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Chembra peak (Wayanad)

Genus *Xylota* Meigen, 1822

Head elliptical in anterior view and marginally wider than thorax. Elongate abdomen. Wings with anterior cross vein situated beyond middle of discal cell. Hind femur thickened and serrated below.

24. *Xylota bistriata* Brunetti, 1915

Source: Brunetti (1915, 1923), Mathew (2004), (Ghorpadé, 2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Parambikulam (Palakkad)

Tribe Volucellini

Genus *Graptomyza* Wiedemann, 1820

Graptomyza is the only genus of Syrphidae having wings without the “Spurious vein.” The head is broader than the thorax. Mouth having elongated and thin proboscis. Antennae have short 1st and 2nd segments, whereas the 3rd joint is very elongated.

25. *Graptomyza brevis* Wiedemann, 1820

Source: Brunetti (1923), Ghorpadé, (2019)

Distribution: Thaliparamba (Kannur), Erattupetta (Kottayam)

Subfamily Syrphinae

The larvae of the subfamily Syrphinae are mainly predacious that prey on soft-bodied insects, mostly Hemiptera (Rojo *et al.*, 2003). The group contains more than 1,600 species worldwide (Evenhuis and

Pape, 2023) and is monophyletic (Mengual *et al.*, 2015). Out of the 357 species reported from India, 143 belong to the subfamily Syrphinae (Sengupta *et al.*, 2016).

Tribe Bacchini

Genus *Melanostoma* Schiner, 1860

Face and Scutellum completely black in background colour. Microscopic pubescence present on anterior anepisternum. Un-margined abdomen with bare eyes and metasternum. Slender legs without bristles, hair tufts, or modified hair in males.

26. *Melanostoma orientale* (Wiedemann, 1824)
 Source: Joseph and Parui (1986), Ghorpadé (2019)
 Distribution: Silent Valley National Park (Palakkad)

27. *Melanostoma univittatum* (Wiedemann, 1824)
 Source: Brunetti (1915, 1923), Datta and Chakraborti (1986), Joseph and Parui (1986), Mathew (2004) Mitra *et al.* (2008, 2015), Ghorpadé (2014, 2019), Shah *et al.* (2014)
 Distribution: Kumily (Idukki), Eluppara (Kottayam), Silent Valley National Park (Palakkad), Nedumangad (Thiruvananthapuram)

Tribe Paragini

Genus *Paragus* Latreille, 1804

They are small sized hover flies with length 7.5 mm or less. Distinctly haired eyes with vertical bands of contrasting colour. Unmarked wings except for stigmal darkening. Metasternum bare, well developed tergite I.

28. *Paragus crenulatus* Thomson, 1869
 Subgenus: *Paragus*
 Source: Thompson and Ghorpadé (1992) Ghorpadé (2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Chalakudy (Thrissur), Idamalayar (Ernakulum), Parambikulam, Walayar forest (Palakkad)

29. *Paragus politus* Wiedemann, 1830
 Subgenus: *Pandasyophthalmus*
 Source: Brunetti (1908, 1915, 1923), Datta and Chakraborti (1986), Mathew (2004), Shah *et al.* (2014)
 Distribution: Tenmalai (Kollam), Chalakudy (Thrissur)
30. *Paragus rufocinctus* (Brunetti, 1908)
 Subgenus: *Pandasyophthalmus*
 Source: Datta and Chakraborti, 1986), Thompson and Ghorpadé (1992) Ghorpadé (2014, 2019), Mitra *et al.* (2015)
 Distribution: Chalakudy (Thrissur), Meppadi (Wayanad), Kaikatty (Palakkad)
31. *Paragus serratus* (Fabricius, 1805)
 Subgenus: *Paragus*
 Source: Datta and Chakraborti (1986), Joseph and Parui (1986), Brunetti (1923), Mathew (2004), Mitra *et al.* (2008), Mukherjee *et al.* (2006), Shah *et al.* (2014), Sengupta *et al.* (2019)
 Distribution: Chalakudy (Thrissur), Parambikulam (Palakkad), Silent Valley National Park (Palakkad), Travancore, Ernakulum
32. *Paragus tibialis* (Fallén, 1817)
 Subgenus: *Pandasyophthalmus*
 Source: Mitra *et al.* (2008), Mukherjee *et al.* (2006), Shah *et al.* (2014)
 Distribution: Kerala
33. *Paragus yerburiensis* Stuckenberg, 1954
 Subgenus: *Paragus*
 Source: Thompson and Ghorpadé (1992), Ghorpadé (2014, 2019), Shah *et al.* (2014), Mitra *et al.* (2015), Sengupta *et al.* (2016)
 Distribution: Walayar forest (Palakkad)

Tribe Syrphini**Genus *Allobaccha* Curran, 1928**

Many species of this genus have an extended abdomen that mimics wasps. Head with bare eyes. Thorax with pilose post-pronotum and incomplete post-metacoxal bridge. Abdomen petiolate in shape.

34. *Allobaccha amphithoe* (Walker, 1849)

Subgenus: *Allobaccha*

Source: Ghorpadé (2014, 2019), Shah *et al.* (2014), Mitra *et al.* (2015), Sengupta *et al.* (2016), Sengupta *et al.* (2019)

Distribution: Kerala

35. *Allobaccha apicalis* (Loew, 1858)

Subgenus: *Allobaccha*

Source: Ghorpadé (2014, 2019), Shah *et al.* (2014), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Nilgiri hills

36. *Allobaccha oldroydi* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Nedumkayam (Malappuram)

Genus *Allograpta* Osten Sacken, 1875

The genus exhibits variations in morphological characters, including colour pattern and shape of the head. Yellow-faced head with or without a medial black vitta. Oval to slightly elongate baso-flagellomere. Thorax with at least partially yellow scutellum. Moderately dense and complete sub-scutellar fringe. Hypopleuron usually bare.

37. *Allograpta javana* (Wiedemann, 1824)

Subgenus: *Allograpta*

Source: Ghorpadé (2014, 2019), Shah *et al.* (2014), Mitra *et al.* (2015) Sengupta *et al.* (2016)

Distribution: Kerala

38. *Allograpta maculipleura* (Brunetti, 1913)

Subgenus: *Allograpta*

Source: Ghorpadé (2014, 2019), Mitra *et al.*

(2015), Sengupta *et al.* (2016)

Distribution: Munnar (Idukki)

Genus *Asarkina* Macquart, 1842

The humerus and latero-tergites are completely bare. A noticeable face bump is present. Abdomen flat and broader. Widened sub marginal cell at middle of the wing. Wings completely hyaline or differently, variably, darkened.

39. *Asarkina ayyari* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019) Mitra *et al.* (2015) Sengupta *et al.* (2016)

Distribution: Meppadi (Wayanad), Malabar

40. *Asarkina ericetorum* (Fabricius, 1781)

Subgenus: *Asarkina*

Source: Ghorpadé (2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016), Sengupta *et al.* (2019)

Distribution: Marayur (Idukki), Kaikatty (Palakkad), Pathanamthitta

41. *Asarkina hema* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019) Mitra *et al.* (2015) Sengupta *et al.* (2016)

Distribution: Thekkady (Idukki), Walayar forest (Palakkad)

42. *Asarkina pitambara* Ghorpadé, 1994

Source: Ghorpadé (2019)

Distribution: Taliparamba (Kannur)

Genus *Asiobaccha* Violovich, 1976

Head with bare eyes. Thorax with microtrichose anatergum, pilous anterior an-episternum, and meta-episternum. The post-metacoxal bridge is incomplete. Sclerotized black dots on the posterior wing margin. The petiolate abdomen without an abdominal margin.

43. *Asiobaccha nubilipennis* (Austen, 1893)

Source: Brunetti (1923), Mengual (2016), Mathew (2004), Ghorpadé (2014, 2019) Mitra *et al.* (2015) Sengupta *et al.* (2016)

Distribution: Thiruvananthapuram

Genus *Betasyrphus* Matsumura, 1917

Densely haired eyes. Densely and uniformly trichose wing membrane at least beyond level of end of false vein or spurious vein. Eyes of male without evident demarked area of larger facets above. Tergum 2 with narrow yellow or grey fascia which may be interrupted in centre in some specimens.

44. *Betasyrphus fletcheri* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019) Mitra et al. (2015) Sengupta et al. (2016)

Distribution: Mananthavady (Wayanad), Kaikatty (Palakkad), Munnar (Idukki)

45. *Betasyrphus linga* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019) Mitra et al. (2015) Sengupta et al. (2016)

Distribution: Kerala

Genus *Citrogramma* Vockeroth, 1969

Posteriorly joined sterno-pleural patches of hair. Bright yellow coloured lateral mesonotal margin. Presence of bright yellow areas within pleuron. Scutellum simple with dark sub-scutellar fringe. Pilose metasternum with some long hairs.

46. *Citrogramma chola* Ghorpadé, 1994

Source: Mengual (2012)

Distribution: Munnar (Idukki), Kaikatty (Palakkad)

47. *Citrogramma flavigena* Wyatt, 1991

Source: Ghorpadé (2014, 2019), Mitra et al. (2015), Sengupta et al. (2016)

Distribution: Munnar (Idukki)

Remarks: According to Ghorpadé (2019), *Citrogramma chola* is treated as a junior synonym of *Citrogramma flavigenum*. But following the classification scheme of Systema Dipterorum (Evenhuis and Pape, 2023) both are considered separate valid species.

Genus *Dasysyrphus* Enderlein, 1938

Partially bare wings. Eyes with yellow maculae.

Distinctly marginated abdomen. Tergum 2 black in colour with yellow spots. Entirely trichose wing membrane. Presence of undivided or medially divided yellow bands of tergites.

48. *Dasysyrphus rossi* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019), Mitra et al. (2015), Sengupta et al. (2016)

Distribution: Munnar (Idukki)

Genus *Dideopsis* Matsumura, 1917

This genus is distinguished by a unique banding pattern on the wing that is typically characterised by the presence of a dark median brown band. Apical third of wing is hyaline. Bare hypopleuron.

49. *Dideopsis aegrota* (Fabricius, 1805)

Source: Datta and Chakraborti (1986), Mukherjee et al. (2006), Ghorpadé (2014, 2019), Shah et al. (2014), Mitra et al. (2015), Sengupta et al. (2016)

Distribution: Idamalayar (Ernakulam), Konnakuzhi, Chalakudy (Thrissur)

Genus *Episyrphus* Matsumura and Adachi, 1917

Larvae are predators that often feed on aphids. Metasternum pilose and haired. Short stout tooth apically within the superior lobe of male genitalia. Abdomen petiolate to sub-oval shaped.

50. *Episyrphus balteatus* (De Geer 1776)

Subgenus: *Episyrphus*

Source: Datta and Chakraborti, 1986), Mukherjee et al. (2006), Mitra et al. (2008), Shah et al. (2014)

Distribution: Vazhachal (Thrissur), Parambikulam (Palakkad), Anamalai Hills

51. *Episyrphus viridaureus* (Wiedemann, 1824)

Subgenus: *Episyrphus*

Source: Ghorpadé (2014, 2019), Shah et al. (2014), Mitra et al. (2015), Sengupta et al. (2016)

Distribution: Nelliampathy hills (Palakkad)

Genus *Eosphaerophoria* Frey, 1946

Small-sized hoverflies with lengths ranging from 4.9 mm to 6.8 mm. Head with bare eyes and slightly broadened face. The short antenna with a length less than the width of the head. Oval to slightly elongate baso-flagellomere. Thorax with black Scutum having narrow yellow postsutural stripe.

52. *Eosphaerophoria dentiscutellata* (Keiser, 1958)

Source: Mengual (2013)

Distribution: Anamalai hills

Genus *Ischiodon* Sack, 1913

A slender tooth is located on the underside of the hind trochanters in both sexes. Bright yellow lateral mesonotal margin and posteriorly separated sternopleural hair patches. The abdomen is dorsally slightly convex or flattened.

53. *Ischiodon scutellaris* (Fabricius, 1805)

Source: Mitra *et al.* (2008, 2015), Ghorpadé (2014, 2019), Shah *et al.* (2014) Sengupta *et al.* (2016), Sengupta *et al.* (2019)

Distribution: Kerala

Genus *Meliscaeva* Frey, 1946

Eyes, metasternum, and metaposternum are all bare, and the anterior anepisternum is usually pilose. Presence of minute series of closely spaced black maculae on the posterior wing margin. Oval to parallel sided abdomen. Terga pale yellow in colour.

54. *Meliscaeva mathisi* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019), Mitra *et al.* (2015)

Distribution: Kerala

Genus *Rhinobaccha* Meijere, 1908

The scutellum has a curved posterior margin and a normal subscutellum. No facial tubercle. Wings anal lobe reduced. Lower face is strongly produced into the snout.

55. *Rhinobaccha krishna* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019), Mitra *et al.*

(2015), Sengupta *et al.* (2016)

Distribution: Munnar (Idukki)

56. *Rhinobaccha peterseni* Ghorpadé, 1994

Source: Ghorpadé (2014), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Kerala

Genus *Sphaerophoria* Lepeletier and Serville, 1828

They are smaller but more slender species. Males have a 5-segmented abdomen plus the genitalia, while females have a seven- to 8-segmented abdomen. The anterior cross vein always appears before the middle of the discal cell, and the third longitudinal vein is usually straight.

57. *Sphaerophoria indiana* Bigot, 1884

Subgenus: *Sphaerophoria*

Source: Datta and Chakraborti (1986), Mukherjee *et al.* (2006), Mitra *et al.* (2008), Shah *et al.* (2014), Sengupta *et al.* (2018)

Distribution: Eluppara (Kottayam)

58. *Sphaerophoria knutsoni* Ghorpadé, 1994

Source: Ghorpadé (2014, 2019), Mitra *et al.* (2015)

Distribution: Nilgiri hills

59. *Sphaerophoria macrogaster* (Thomson, 1869)

Subgenus: *Sphaerophoria*

Source: Ghorpadé (2014, 2019), Mitra *et al.* (2015), Sengupta *et al.* (2016)

Distribution: Kerala

According to literature, 59 hover flies of the subfamilies Syrphinae and Eristalinae are reported from Kerala. The distributional records of the species within Kerala are biased because many of the reports come from single records. The literature survey also shows no extensive field surveys were conducted in Kerala exclusively for Syrphidae. Some hover flies are also reported from the field surveys at Shendurney Wildlife Sanctuary, Kollam (Mathew *et al.*, 2004a), Peechi-Vazhani Wildlife

Sanctuary, Thrissur (Mathew *et al.*, 2005) and Peppara Wildlife Sanctuary, Thiruvanthapuram (Mathew *et al.*, 2004b), but they are only identified up to family level. The unidentified Syrphidae reports also show the insufficiency of Syrphidae taxonomists in Kerala. Further extensive field surveys are needed to reveal a clearer picture of the distributional record of the reported species within the state.

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