

An updated checklist of blow fly fauna (Diptera: Calliphoridae) of Pakistan with new records for the country

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Abstract

An updated checklist of blow fly fauna of Pakistan is provided herewith. *Calliphora loewi* Enderlein, 1903, *Isomyia electa* (Villeneuve, 1927), *Lucilia calviceps* Bezzi, 1927, *Rhinia apicalis* (Wiedemann, 1830) and *Stomorphina xanthogaster* (Wiedemann, 1820) represent new records for the country. Now, the family Calliphoridae is represented by seven subfamilies, eighteen genera and fifty seven species from Pakistan.

Keywords: Calliphoridae, blow flies, check list, distribution, new records, Pakistan.

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Introduction

The members of family Calliphoridae (Diptera) represent cosmopolitan group of calyptrate flies, widely distributed in all of the zoogeographical regions of the world, encompassing 1450 described species clustered in 150 genera and 13 subfamilies (Tomberlin and Benbow, 2015). This heterogenous group of flies is of great significance in terms of medical, veterinary and economic concerns. Some of the species belonging to subfamily Calliphorinae, Chrysomyinae, Luciliinae and Toxotarsinae are well known for their potential to calculate post-mortem interval (PMI) in homicidal cases. On the other hand, few species of subfamily Bengaliinae, Ameniinae parasitize termites and ant nests, whereas species of *Protocalliphora*, *Trypocalliphora* and *Auchmeromyia* are hematophagous parasites of birds and mammals.

As per the earlier data, Senior-White *et al.* (1940) recorded 33 genera and 154 species from the British India (including Pakistan) and remainder of the Oriental region. Later, Nandi (2000, 2002), Bharti and Kurahashi (2010), Bharti (2011, 2012, 2014a & b, 2015, 2016), Bharti and Bunchu (2016)

and Bharti and Verves (2016) supplemented to the knowledge of Indian blow flies. However, for Pakistan, Kurahashi and Afzal (2002) reported forty eight species under eighteen genera. Of these, thirty seven species were new records for the country. Herein, we provide an updated checklist of Calliphorids of Pakistan including five new records.

Materials and Methods

For collection of blow flies, different regions of Pakistan were surveyed from 2015-2017. The adult specimens were collected from a variety of habitats (cow dung, horse manure, human excrements, garbage, trees, grasses, forest, wild flowers, animal meat and bones etc.) with the help of sweep nets. The specimens were killed with Potassium Cyanide fumes, subsequently pinned and kept in insect collection boxes. Taxonomic analysis was carried under Microscope CZM6 and images were captured on, Olympus SZX7. The identification was carried with the help of following literature: Senior-White *et al.*, 1940; Bharti and Kurahashi, 2010; Kurahashi and Bunchu, 2011; Bharti, 2014a, b; Setyaningrum and Al Dhafer, 2014; Yang *et*

al., 2014; Akbarzadeh *et al.*, 2015. Furthermore, some of the collected material was also compared with the reference collection housed in the laboratory of corresponding author at Department of Zoology and Environmental Sciences, Punjabi University Patiala, Punjab India. The identified specimens have been deposited at the Department of Entomology, Pir Mehr Ali Shah Arid Agricultural University, Rawalpindi, Pakistan.

Updated Checklist of Calliphoridae from Pakistan

Family: Calliphoridae

Subfamily: Ameniinae

Genus: *Catapicephala* Macquart, 1850

Catapicephala pattoni Senior-White, Aubertin *et Smart*, 1940

Subfamily: Calliphorinae

Genus: *Calliphora* Robineau-Desvoidy, 1830

Calliphora chinghaiensis Van *et Ma*, 1978

Calliphora himalayana Kurahashi, 1994

**Calliphora loewi* Enderlein, 1903 Figure (C)

Calliphora uralensis Villeneuve, 1922

Calliphora vicina Robineau-Desvoidy, 1830

Calliphora vomitoria (Linnaeus, 1758)

Material Examined: Kashmir (Pakistan): Banjosa, 6000 ft, 1♂, 16.iv.2016, leg. M.A. Hassan. **New Record**

Distribution: China, India, Japan, Mongolia, Nepal and Pakistan.

Genus: *Cynomya* Robineau-Desvoidy, 1830

Cynomya mortuorum (Linnaeus, 1761)

Genus: *Onesia* Robineau-Desvoidy, 1830

Onesia menechmoides (Chen, 1979)

Onesia pamirica Rohdendorf, 1962

Genus: *Melinda* Robineau-Desvoidy, 1830

Melinda sugiyamai Kurahashi *et Thapa*, 1994

Melinda scutellata (Senior-White, 1923)

Subfamily: Luciliinae

Genus: *Hemipyrellia* Townsend, 1917

Hemipyrellia ligurriens (Wiedemann, 1830)

Hemipyrellia pulchra (Wiedemann, 1830)

Genus: *Lucilia* Robineau-Desvoidy, 1830

Lucilia ampullacea Villeneuve, 1922

Lucilia andrewsi (Senior-White, 1940)

**Lucilia calviceps* Bezzi, 1927 Figure (E)

Material Examined: Pakistan: Rawalpindi, 1600 ft, 1♀, 13.vi.2016, leg. I. Bodlah. **New Record**

Distribution: India, Malaysia, New Caledonia, Pakistan, Papua New Guinea, Philippines, Vanuatu Loyalty Islands.

Lucilia cuprina (Wiedemann 1830)

Lucilia fumicosta (Malloch, 1926)

Lucilia illustris (Meigen, 1826)

Lucilia papuensis Macquart, 1843

Lucilia porphyrina (Walker, 1856)

Lucilia sericata (Meigen, 1826)

Lucilia sinensis Aubertin, 1933

Subfamily: Polleniinae

Genus: *Pollenia* Robineau-Desvoidy, 1830

Pollenia dasypoda Portschinsky, 1881

Pollenia pediculata Macquart, 1834

Pollenia rudis (Fabricius, 1794)

Subfamily: Bengaliinae

Genus: *Bengalia* Robineau-Desvoidy, 1830

Bengalia bezzii Senior-White, 1923

Bengalia escheri Bezzi, 1913

Bengalia martinleakei Senior-White, 1930

Bengalia surcoufi Senior-White, 1923

Bengalia torosa (Wiedemann, 1819)

Bengalia unicolor Séguy, 1946

Subfamily: Chrysomyinae

Genus: *Chrysomya* Robineau-Desvoidy, 1830

Chrysomya albiceps (Wiedemann, 1819)

Chrysomya nigripes Aubertin, 1932

Chrysomya phaonis Séguy, 1928

Chrysomya megacephala (Fabricius, 1794)

Chrysomya regalis (Walker, 1858)

Chrysomya pinguis (Walker, 1858)

Chrysomya rufifacies (Macquart, 1843)

Genus: *Phormia* Robineau-Desvoidy, 1830

Phormia regina (Meigen, 1826)

Genus: *Protocalliphora* Hough, 1899

Protocalliphora azurea (Fallén, 1817)

Protocalliphora maruyamensis Kano *et*

Shinonaga, 1966

Protocalliphora terraenovae (Robineau-Desvoidy, 1830)

Subfamily: Rhiniinae

Genus: *Rhinia* Robineau-Desvoidy, 1830

**Rhinia apicalis* (Wiedemann, 1830) Figure (A)

An updated checklist of blow fly (Diptera: Calliphoridae) fauna of Pakistan

Material Examined: Kashmir (Pakistan): Hajira, 3200 ft, 1♂, 13.vii.2017; Banjosa, 6000 ft, 1♀, 14.iv.2016, leg. M.A. Hassan.

New Record

Distribution: India, Pakistan, Saudi Arabia, Thailand.



A. *Rhinia apicalis* (Wiedemann, 1830)



B. *Isomyia electa* (Villeneuve, 1927)



C. *Calliphora loewi* Enderlein, 1903



D. *Stomorhina xanthogaster* (Wiedemann, 1820)



E. *Lucilia calviceps* Bezzi, 1927

Genus: *Stomorhina* Rondani, 1861

Stomorhina cribrata (Bigot, 1874)
Stomorhina discolor (Fabricius, 1794)
Stomorhina lunata (Fabricius, 1805)
Stomorhina procula (Walker 1849)
**Stomorhina xanthogaster* (Wiedemann, 1820) Figure (D)

Material Examined: Kashmir (Pakistan): Hajira, 3200 ft, 2♂, 13.vii.2017, leg. M.A. Hassan. **New Record**

Distribution: China, India, Indonesia, Malaysia, Nepal, Pakistan, Sri Lanka.

Genus: *Cosmina* Robineau-Desvoidy, 1830

Cosmina prasina (Brauer et Bergenstamm, 1889)

Genus: *Isomyia* Walker, 1860

Isomyia aurifacies James, 1970
**Isomyia electa* (Villeneuve, 1927) Figure (B)

Material Examined: Kashmir (Pakistan): Rawalakot, 5500 ft, 1♀, 18.v.2016. Gilgit-Baltistan: Skardu, 8000 ft, 1♀, 22.v.2015, leg. M.A. Hassan. **New Record**

Distribution: India, Pakistan, Thailand.

Isomyia fulvicornis (Bigot, 1887)
Isomyia pseudoviridana (Peris, 1952)

Genus: *Rhyncomya* Robineau-Desvoidy, 1830

Rhyncomya townsendi James, 1977

Genus: *Onesia* Robineau-Desvoidy, 1830

Onesia kiyoshii Kurahashi, 2002

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