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## A preliminary list of hover flies (Diptera: Syrphidae) with a new locality records from swat, Khyber Pakhtunkhwa, Northern Pakistan

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#### Abstract

The current study was conducted to provide a preliminary check-list of Syrphidae for district Swat (Miandam), Khyber Pakhtunkhwa. A list of 23 hoverfly species under 19 genera is given here as a result of extensive survey from the study area during 2015-16. Of these 10 species viz.; *Eoseristalis arbustorum*, *Eoseristalis cerealis*, *Eristalis tenax*, *Eristalodes taeniops*, *Lathyrophthalmus arvorum*, *Eupeodes bucculatus*, *Platycheirus albimanus*, *Sphaerophoria bengalensis*, *Syrpitta pipiens*, and *Syrphus torvus* has been recorded for the first time from Swat Valley, KPK, Northern-Pakistan.

**Keywords:** Preliminary, syrphidae, swat, locality records, Khyber Pakhtunkhwa, Northern-Pakistan

#### Introduction

Rice Diptera is the 2<sup>nd</sup> largest and most diverse group of class Insecta comprising at about 150,000 species belonging to 158 families have been reported from all over the world except Antarctica <sup>[1, 2]</sup>. Currently, more than 6000 species under 199 genera of hover flies belong to 3 subfamilies namely Syrphinae, Eristalinae and Microdontinae are known worldwide <sup>[3]</sup>.

The adult hover flies generally feed on nectar and pollen from the flowering plants and are considered as a good pollinators <sup>[4]</sup>. Some larvae of subfamily Syrphinae are zoophagous while subfamily Eristalinae has a diverse mode of feeding habitats <sup>[5]</sup>. During the last 10 years, hover flies were focused mainly due to their role as biocontrol agents and pollinators in Pakistan <sup>[6-11]</sup>. Ghorpadé and Shehzad <sup>[12]</sup> reviewed the work on Syrphidae of Pakistan and listed more than 84 species under 42 genera, which included four *nomina nuda*. Ghorpadé <sup>[13]</sup> also gave an updated syrphid check list of the subcontinent's Syrphidae and then presented a detailed list of 340 species in 96 genera from the Northwest Frontier of the Indian subcontinent <sup>[14]</sup>.

Known records of Syrphidae of Pakistan documented by Shehzad *et al.* (2017) results 71 species of 40 genera from Pakistan. Of these, 11 species viz., *Paramixogaster contractus* (Brunetti, 1923) *Eoseristalis albibasis* (Bigot, 1880), *Mesembrius quadrivittatus* (Wiedemann, 1819), *Eumerus nepalensis* Brunetti, 1908, *E. sexvittatus* Brunetti, 1915, *Psilota cyanea* Hill, 1921, *Volucella peleterii* Macquart, 1834 *V. ruficauda* Brunetti, 1907, *Chrysotoxum antiquum* Walker, 1852, *Syrphus vitripennis* Meigen, 1822 and *Xanthogramma pedisequum* (Harris, 1776), are first records for Pakistan <sup>[15]</sup>.

The level of anthropisation of the Swat district is high, with an important agricultural pressure. The place is famous for his medicinal plants, but potatoes, peaches, plums, apples and apricots are also produced in very large amount. 113 000 tons of fruit are produced every year in the Swat Valley, constituting 30% of the fruits supplied to the national market. For these reasons, the local richness of the entomofauna is not very high, and that could be attributed to both the deforestation and the use of many pesticides on the 35 000 acre land under fruit cultivation <sup>[16]</sup>. With respect to past studies and status about the hoverflies, current study was conducted to investigate and presented the check-list of hoverflies fauna of Miandam Swat Valley, Khyber Pakhtunkhwa, Pakistan. Yet district Swat remained less explored and badly neglected due to uncertain ground conditions of the area.

#### Materials and Methods

The present study was conducted to explore the hover fly fauna of Miandam Swat Valley, Khyber Pakhtunkhwa, Pakistan.

The adult specimens were collected from the different wild flowers and grasses by using the common entomological net, during the different months of year 2015-2016. The timing for the collection of adult hoverflies was selected between 9 AM to 4 PM, because in these time the adult shows there maximum activities in their respective habitats. The specimens were killed by using Potassium Cyanide bottle, Ethylacetate and Acetone. After killing the specimens, they were set properly and tagging was also done for the identification. The collected specimens were identified under the stereoscope by following the different systematic and taxonomic keys [17].

## Result and Discussions

During the present study twenty three hover fly species under 19 genera of two subfamilies are provided, with some ten species has been recorded for the first time from Swat. Many authors sampled the hoverflies from the different localities of Swat Valley because of attractive mountainous region, located among the foothills of Hindukush mountain range. Yet the areas are least surveyed and badly ignored due to uncertain ground conditions of the area. Keeping in view the lapses of previous works, it was decided to thoroughly survey areas of Swat (Miandam) KPK to fulfill the gabs and provide a preliminary check-list of hover flies for Swat Valley.

Genus *Ceriana* Rafinesque, 1815

### 1. *Ceriana dimidiatipennis* (Brunetti, 1923)

Material Examined: Swat, 20.iv.2015, (2 ♀), 4.v.2016, (1 ♀), 22.v.2016, (1 ♂), leg. Fazlullah.

Distribution: Abbottabad, Azad Kashmir, Gilgit-Baltistan, Rawalakot, Hangu, Quetta, Swat [12, 15, 18].

Genus *Eoseristalis* Kanervo, 1939

### 2. *Eoseristalis arbustorum* (Linnaeus, 1758)

Material Examined: Swat, 20.v.2015, (1 ♂), 4.vi.2016, (3 ♂), 22.vi.2016, (2 ♀, 3 ♂), 22.v.2016, (3 ♂), leg. Fazlullah.

Distribution: New record for Swat. Balochistan, Gilgit-Baltistan, Azad Kashmir, Multan [7, 12, 15, 18].

### 3. *Eoseristalis cerealis* (Fabricius, 1805)

Material Examined: Swat, 20.vii.2015, (3 ♀, 2 ♂), 5.vi.2016, (2 ♀, 1 ♂), 22.v.2016, (2 ♂), 22.v.2016, (3 ♀), leg. Fazlullah.

Distribution: New record to Swat. Haripur, Azad Kashmir, Murree, Dir Upper, Meena Khor, Mansehra, Lawari tunnel [12, 15, 19, 20].

Genus *Eristalis* Latreille, 1804

### 4. *Eristalis tenax* (Linnaeus, 1758)

Material Examined: Swat, 12.v.2015, (5 ♀, 3 ♂), 18.vi.2015, (2 ♀, 1 ♂), 2.vii.2015, (1 ♀), 3.v.2016, (3 ♀), 21.v.2016, (3 ♀), leg. Fazlullah.

Distribution: New record for Swat. Balochistan, Gilgit-Baltistan, Punjab, Haripur, Hazara Division, Shakargarh, Azad Kashmir [12, 15, 19, 20, 21, 22, 23].

Genus *Eristalodes* Mik, 1897

### 5. *Eristalodes taeniops* (Wiedemann, 1818)

Material Examined: Swat, 20.v.2015, (1 ♂), 5.vi.2015, (1 ♀, 3 ♂), 12.vi.2016, (1 ♂, 1 ♀), 14.vi.2016, (2 ♂), 21.vi.2016, (1 ♂, 2 ♀), leg. Fazlullah.

Distribution: New record for Swat. Balochistan, Punjab, Azad Kashmir, Muzafargarh, Khyber Paktunkhwa, Multan, Shakargarh [7, 12, 15, 21, 23].

Genus *Lathyrophthalmus* Mik, 1897

### 6. *Lathyrophthalmus arvorum* (Fabricius, 1787)

Material Examined: Swat, 25.vi.2016, (1 ♂), leg. Fazlullah.

Distribution: New record for Swat. Islamabad, Sindh, Punjab, Sindh, Haripur, Multan, Shakargarh [7, 12, 15, 21, 23].

Genus *Pararctophila* Hervé-Bazin, 1914

### 7. *Pararctophila oberthueri* Hervé-Bazin, 1914

Distribution: Madian [24].

Genus *Criorhina* Meigen, 1822

### 8. *Criorhina interrupta* Brunetti, 1923

Distribution: Khaza Khel, Bahrain, Mingora, Kabbal (Swat) [15, 24].

Genus *Syritta* Lapeletier & Serville, 1828

### 9. *Syritta pipiens* (Linnaeus, 1758)

Material Examined: Swat, 22.v.2015, (2 ♂), 12.vi.2015, (2 ♀, 2 ♂), 22.vi.2016, (7 ♂, 5 ♀), 23.vii.2016, (2 ♂), leg. Fazlullah.

Distribution: New record for Swat. Khyber Pakhtunkhwa, Multan, Punjab, Shakargarh [12, 15, 21, 23].

Genus *Pandasyopthalmus* Stuckenberg, 1954

### 10. *Pandasyopthalmus politus* (Wiedemann, 1830)

Material Examined: Swat, 2.viii.2015, (2 ♀, 3 ♂), 22.viii.2015, (1 ♀), 7.ix.2016, (2 ♂, 2 ♀), leg. Fazlullah.

Distribution: Khyber Pakhtunkhwa, Swat, Punjab, Balochistan [12, 15].

Genus *Serratoparagus* Vujić & Radenković, 2008

### 11. *Serratoparagus serratus* (Fabricius, 1805)

Material Examined: Swat, 7.ix.2016, (2 ♀), leg. Fazlullah.

Distribution: Changananga, Punjab, Khyber Pakhtunkhwa, Multan, Swat, Federally Administered Tribal Areas, Sindh, Shakargarh [12, 15, 21, 23].

Genus *Chrysotoxum* Meigen 1803

### 12. *Chrysotoxum antiquum* Walker, 1852

Distribution: Swat [15].

### 13. *Chrysotoxum intermedium* Meigen, 1822

Distribution: Naran, Swat, Gilgit-Baltistan, Khyber Pakhtunkhwa [12, 15].

Genus *Episyrphus* Matsumura & Adachi 1917

### 14. *Episyrphus balteatus* (De Geer, 1776)

Material Examined: Swat, 21.v.2015, (2 ♀, 4 ♂), 28.v.2015, (2 ♀, 2 ♂), 4.vi.2015, (1 ♀), 23.ix.2015, (2 ♀, 1 ♂), 20.v.2016, (2 ♂, 2 ♀), 12.ix.2016, (1 ♀), leg. Fazlullah.

Distribution: Haripur, Shakargarh, Azad Kashmir, Murree, Multan, Islamabad, Gilgit-Baltistan, Giszar, Sindh, Muzafarabad, Naran, Swat [12, 15, 19, 20, 21, 23].

Genus *Ischiodon* Sack 1913

### 15. *Ischiodon scutellaris* (Fabricius, 1805)

Material Examined: Swat, 7.v.2015, (2 ♂), leg. Fazlullah.

Distribution: Khyber Pakhtunkhwa, Punjab, Haripur, Islamabad, Shakargarh, Multan, Murree, Khanewal [12, 15, 20, 21, 23].

Previously recorded from Swat [15].

Genus *Eupeodes* Osten Sacken, 1877

### 16. *Eupeodes bucculatus* (Rondani, 1857)

Material Examined: Swat, 12.v.2016, (2 ♂), 22.vi.2016, (1 ♀), leg. Fazlullah.

Distribution: New record for Swat. Pakistan; Shakargarh [12,

Genus *Platycheirus* Lepeletier & Serville, 1828

**17. *Platycheirus albimanus*** (Fabricius, 1781)

Material Examined: Swat, 12.v.2016, (4♀, 2♂), 22.vi.2016, (2♀), leg. Fazlullah.

Distribution: New record for Swat. Khyber Pakhtunkhwa Peshawar), Hazara Division <sup>[12, 22]</sup>.

Genus *Scaeva* Fabricius 1805

**18. *Scaeva pyrastris*** (Linnaeus, 1758)

Material Examined: Swat, 18.vi.2016, (2♀, 1♂), leg. Fazlullah.

Distribution: Abbottabad, Chitral, Dargi, Hangu, Kohat, Lahore, Murree, Parachinar, Paras, Peshawar, Rawalpindi, Timurgarh, Swat, Thall and WahMurree, Haripur <sup>[12, 15, 20]</sup>.

Genus *Sphaerophoria* Lepeletier & Serville, 1828

**19. *Sphaerophoria indiana*** Bigot, 1884

Material Examined: Swat, 27.vi.2016, (1♀, 3♂), 12.vii.2016, (2♀, 1♂), 2.viii.2016, (1♂), leg. Fazlullah.

Remarks: This species was reported from Bahrain (Swat) and recorded the following host plants as; Ber (*Zizyphus jujuba*), Sorghum, rose (*Rosa indica*) and grasses <sup>[24]</sup>.

Distribution: Haripur, Khanpur, Havelian, Khala, Takht Nasarti, Peshawar, Bahrain, Darra Adam Khel, Buner, Chitral, Gilgit-Baltistan, Gokand, Skardu, Ghizer, Khaplu, Swat <sup>[15, 22, 24, 25]</sup>.

**20. *Sphaerophoria scripta*** (Linnaeus, 1758)

Material Examined: Swat, 12.vii.2015, (1♂), 22.vi.2016, (1♀ 3♂), 2.viii.2016, (2♂), leg. Fazlullah.

Remarks: Arif *et al.* <sup>[24]</sup> reported this species from ber (*Zizyphus jujuba*), tobacco (*Nicotiana tabacum* L.) and wild grasses. Hassan *et al.* <sup>[23]</sup> collected this species from *Brassica campestris*, *Coriandrum sativum* and wild flowers.

Distribution: Chokera, Darra Adam Khel, Hangu, Khaza Khel, Peshawar, Shakargarh, Takht Nasartim, Swat <sup>[12, 15, 23, 24]</sup>.

**21. *Sphaerophoria bengalensis*** Macquart, 1842

Material Examined: Swat, 12.vii.2015, (1♂), 22.vi.2016, (1♀), 2.viii.2016, (1♀), leg. Fazlullah.

Remarks: Subhan and Shah <sup>[25]</sup> gave the diagnostic characters of this species and gave a flower species visited by this species.

Distribution: Thal, Sheringal, Kalam, Timergara, Bajaur Agency, Damadola, Kohat, Multan, Khanewal, Muzaffargarh, Balochistan <sup>[12, 25]</sup>.

Genus *Syrphus* Fabricius 1775

**22. *Syrphus torvus*** Osten Sacken, 1875

Material Examined: Swat, 7.v.2015, (1♂), leg. Fazlullah.

Remarks: This species was collected from wild flowers, Brassica and oats <sup>[18, 24]</sup>.

Distribution: New record for Swat. Azad Kashmir, Rawalakot <sup>[18]</sup>, Makran <sup>[24]</sup>.

Genus *Xanthogramma* Schiner, 1860

**23. *Xanthogramma pedissequum*** (Harris), 1776

Distribution: Bumburiate, Chitral, Miandum, Swat <sup>[15]</sup>.

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