The Journal of Animal & Plant Sciences, 30(2): 2020, Page: 512-516
ISSN: 1018-7081

Short Communication

FIRST RECORD OF THE GENUS *GRAPTOMYZA* WIEDEMANN, 1830 (DIPTERA: SYRPHIDAE) FROM PAKISTAN

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ABSTRACT

The genus ***Graptomyza*** Wiedemann, 1820, is newly recorded from Pakistan. Two species of the genus are reported: ***Graptomyza flavonotata*** Brunetti, 1917 and ***Graptomyza brevirostris*** Wiedemann, 1820 for the first time from Pakistan. An identification key to these newly recorded species, their diagnostic characters, distribution, host plants and photographs are provided for the taxonomic study.

Key words: First record, *Graptomyza*, Syrphidae, Oriental region, Pakistan.

https://doi.org/10.36899/JAPS.2020.2.0059 *Published online March 02, 2020*

INTRODUCTION

The genus *Graptomyza* was erected by Wiedemann (1820) with *Graptomyza longirostris* Wiedemann, 1820 designated as the type species (Whittington, 1992). This genus belonged to subfamily Eristalinae and Volucellini tribe. Currently the tribe Volucellini comprises 4 genera viz; *Copestylum* Macquart, 1846, *Graptomyza* Wiedemann, 1820, *Ornidia* Lepeletier and Serville, 1828 and *Volucella* Geoffroy, 1762 (Whittington 1992). The genus *Graptomyza* has been placed in the tribe Volucellini because it shears some characters with other members of the tribe with recessive Ml vein, and series of strong setulae on basal position of r-m vein.

Genus *Graptomyza* comprises of 83 old world, 21 Afrotropical (Whittington 1992), 11 Palaearctic (Thompson and Rotheray, 1998), 6 from Japan (Shiraki, 1930, 1954, 1956 and 1968), 40 Oriental (Knutson *et al.,* 1975) and 3 species from India with a single species from Nepal (Ghorpadé, 2015). Little is known about the larval biology of *Graptomyza*, but some papers described the immature stages of some species (Whittington, 1994, Krivosheina and Krivosheina, 1996). However, some species are known to be saprophagous, developing in fruits and pods (Whittington, 1992).

Ghorpadé and Shehzad (2013) discussed about the geographical range of hover fly species in Pakistan. They thought that the species (*Graptomyza brevirostris* Wiedemann, 1820**)** reported from the Indian administered Jammu and Kashmir State should also be present in Azad Jammu and Kashmir. Recently, in the updated check-list on the Syrphidae of Pakistan by Shehzad *et al.* (2017), no species of the genus *Graptomyza* has been reported. Currently 80 species of Syrphidae under 42 genera are known from Pakistan (Shehzad *et al.,* 2017; Hassan *et al.,* 2018a, b, 2019).

The aim of the present study was to determine the occurrence of the genus *Graptomyzas* Wiedemann, 1820 from Pakistan.

MATERIALS AND METHODS

The adult specimens were collected by using a common entomological net from the flowers of *Parthenium hysterophorus* Linnaeus, 1753 and in onion (*Allium cepa*, L) filed with a few plants of coriander (*Coriandrum sativum*, L) in flowering stage. The specimens were killed by using potassium cyanide and pinned for detail examination up to species level under Olympus SZX7, Model SZ2-ILST stereo-microscope. Later, the pinned specimens were subjected for sun drying for at least 1 or 2 days to remove the internal body moisture and prevent from the attack of fungus. The dried specimens were transferred to wooden insect boxes for long term storage with label carrying information about localities, date, host and collector name for further taxonomic studies. The Napthalene bolls were used in the wooden box to observe the moisture and spray the cowpox powder to kill the small insects in the wooden box.

Photographs were prepared under a Nikon SMZ 1500 binocular microscope attached to a Nikon Digital Sight DS-Fi1 camera and identified by using the available literature (Brunetti, 1923). Body measurement was done by using ocular micrometer attached to a stereoscopic

microscope. The photographs were cleared by using Adobe Photoshop CS6 software. The examined specimens are deposited in the National Insect Museum Islamabad and in the Biosystematics Laboratory, Department of Entomology, Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Pakistan.

RESULTS

As a result of the present study two species, *Graptomyza flavonotata* Brunetti, 1917 and *Graptomyza brevirostris* Wiedemann, 1820 are recorded for the first time from Pakistan. The detail latitude, longitude and elevation along with the name of localities for these known species and distribution map are provided in Table 1 and Fig. 4 respectively.

Family Syrphidae Latreille, 1897
Subfamily Eristalinae Newman, 1834
Tribe **Volucellini (Goffe, 1952)**
Genus ***Graptomyza*** Wiedemann, 1820

Type Species: *Graptomyza longirostris* Wiedemann, 1820.

Diagnosis (Based on the known species from Pakistan): Eyes dichoptic in both sexes, head wider than thorax. Frons slightly depressed below antennae. Epistome produced anteroventrally. Face with conspicuous snout above epistome. Third antennal segment elongated, longer than wide. Wings with marginal cell open, spurious vein absent and an anterior cross vein at base of discal cell. Body usually short and stout. Abdomen rounded or shortly ovate. Body with distinct bristles, one or two on presutural, three on posterior calli and supra-alar, two on notopleural and a row of bristles on the side margin of scutellum (Brunetti, 1923; Whittington, 1992). The diagnostic character of *Graptomyza* is due to the presence of unique (well defined) depression in the scutellum (Whittington, 1992).

Key to the species of genus *Graptomyza* of Pakistan:

1. Wings with black markings; scutellum black with side margins yellow; 2nd and 3rd abdominal tergites with a black stripe on the hind margins with anterior edge extending forward in middle and towards side margins, forming three obtuse triangles (**Fig. 1: a-d**).....***brevirostris*** -. Wings clear; scutellum yellow; 2nd, 3rd and 4th abdominal tergites with distinct three black spots (**Fig. 2a-d**)……***flavonotata***

Graptomyza brevirostris Wiedemann, 1820 **(Fig. 1: a-d)**

Diagnosis: *Graptomyza brevirostris* Wiedemann, 1820 can be distinguished from other members of the genus *Graptomyza* by the following characters: Frons with large black median strip attached with an ocellular triangle by a narrow line, lateral sides of ocellular triangle largely and frons narrowly yellow, with yellowish pubescence. Face with shining black median strip, started from antennae to mouth, epistome with basal portion distinctly protruded, face with a central knob above epistom, lateral sides of face yellow with yellowish pubescence. Vertex black with yellowish pubescence. Eyes covered with yellowish pubescence. Antennae brownish black, ventral side of 3rd antennomere orange, arista yellow without hairs (Fig. 1: c). Scutum shining black, covered with yellowish hairs, postpronotal lobe, postalar callus, with a posterior half of notopleuron, lateral sides and posterior margin of scutum yellow. Scutellum black, posterior margin brownish, with median depression, sides with distinct black bristles (Fig. 1: a). Proepimeron and posterior half of posterior anepisternum yellow, posterior anepisternum little produced on at apical half on posterior side with a single black bristle. Posterior anepisternum and pteropleuron with yellowish hairs. Coxae, apical half of hind femora and hind tibia black, rest of the legs yellow. Hind tarsus brownish (Fig. 1: b). Sternum yellow except a large black square shape in the center of sternite 4. First abdominal tergite yellow with a black spot at lateral sides not reaching at the margins. Tergite 2 with black strip on the hind margins with anterior edge extending forward in middle and towards side margins, forming three obtuse triangles, the posterior sides of the lateral triangle fused on the side margin of abdomen. Lateral margins of tergite 3 and 4 largely black. Tergite 3 with lateral triangular and central square black shape, the central square shape posteriorly yellow, lateral spots not reached at side margins. Fourth abdominal tergite with three long black spots. Abdomen covered with yellowish hairs (Fig. 1: d). Wings with 3 black strips, base of stigma with dark spot attached with a black area in cell r1 forming a black strip, a large black strip from near tip of vein R1 to near end of lower marginal cross vein and 3rd strip starts near tip of vein R_{2+3} to near end of upper marginal cross vein (Fig. 1: a). Body length 6 mm.

Type Locality: Java.

Material Examined: 2♀. Islamabad: Shadra, 655 m, 7.xi.2016, leg. M.A. Hassan.

Host Plant: *Parthenium hysterophorus* Linnaeus, 1753 (Fig. 3: a).

Distribution: Burma, India, Nepal, Sri Lanka (Brunetti, 1923; Ghorpadé, 2015).

Comments: This species of genus *Graptomyza* Wiedemann, is recorded for the first time from Pakistan.

Graptomyza flavonotata Brunetti, 1917 **(Fig. 2: a-d)**

Diagnosis: This species can be differentiated from *Graptomyza brevirostris* Wiedemann, 1820 by following characters: Frons and face completely yellow with yellowish pubescence. Ocellar triangle black, lunule brownish, face with a distinct central knob above

epistome which is brownish, having distinct black bristles. Gena and occiput yellow. Eyes covered with yellowish pubescence. Antennae brownish black, ventral side of 3rd flagellomere largely orange, arista yellow without hairs. Vertex black with yellowish pubescence (Fig. 2: c). Scutum shining black, lateral margins yellowish, posterior margin with two circular yellow spots covered with yellowish hairs. Scutellum yellow with yellowish hairs, with median depression, sides margins with distinct black bristles. Wings clear, halteres yellow. Proepimeron and posterior half of posterior anepisternum yellow. Sternopleuron dorsocental yellow spot connecting with lower side of posterior anepisternum. Meron with dorsal oval yellow spot. Legs yellow, hind coxa brownish, apical 1/3rd of hind femora, hind tibia and tarsus black. Legs yellowish hairs except the black area with black bristles mixed with yellowish hairs (Fig. 2: b). Abdomen yellowish brown with yellow hairs, abdominal tergite 1 yellow, tergite 2 with three distinct black spots on the hind margin, the lateral nearly oval in shape, the middle is pointed on anterior side, tergite 3 with two similar oval spots on lateral side, the middle is near anterior margin, tergite 4 with similar spots on tergite 3 but smaller in size, tergite 5 yellow (Fig. 2: d). Body length 3 mm.

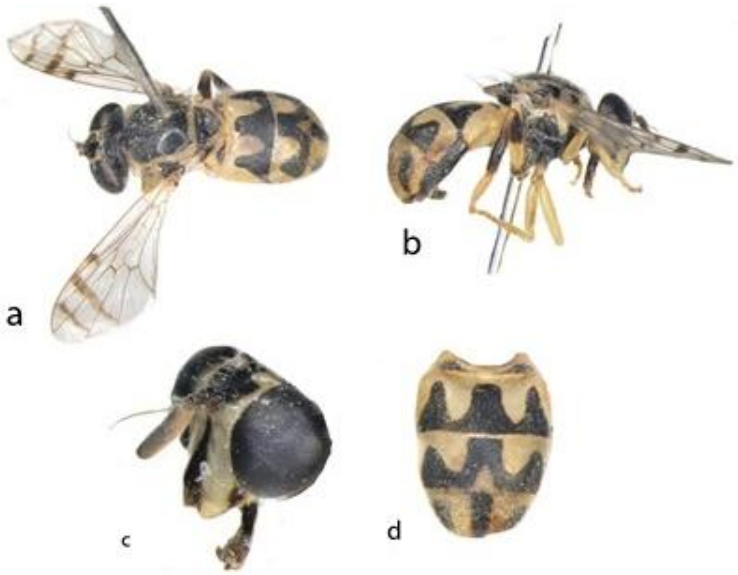

Fig. 1. A-D. *Graptomyza brevirostris* Wiedemann, 1820. Female: A, Dorsal view, B, Lateral view; C, Frontal view, D, Abdominal view.

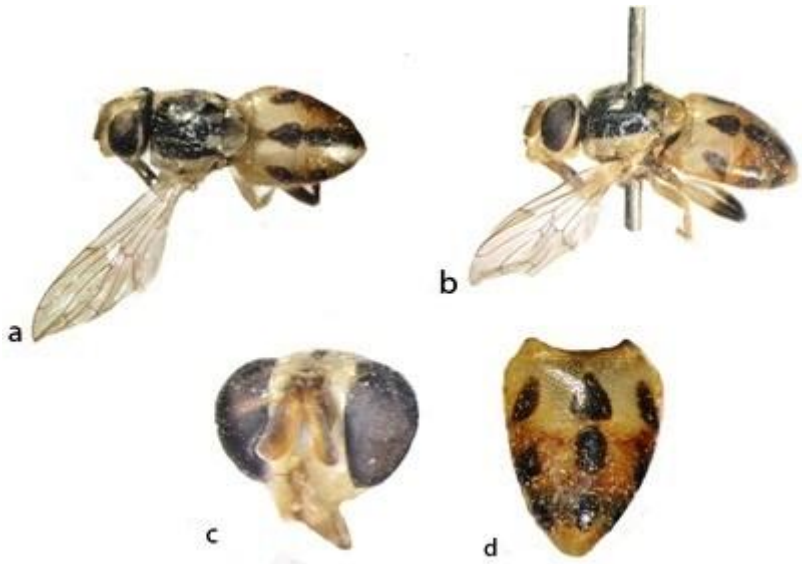

Fig. 2. A-D. *Graptomyza flavonotata* Brunetti, 1917. Male: A, Dorsal view, B, Lateral view; C, Frontal view, D, Abdominal view.

Fig. 3. Host Plants: A; *Parthenium hysterophorus*, B; *Allium cepa*.

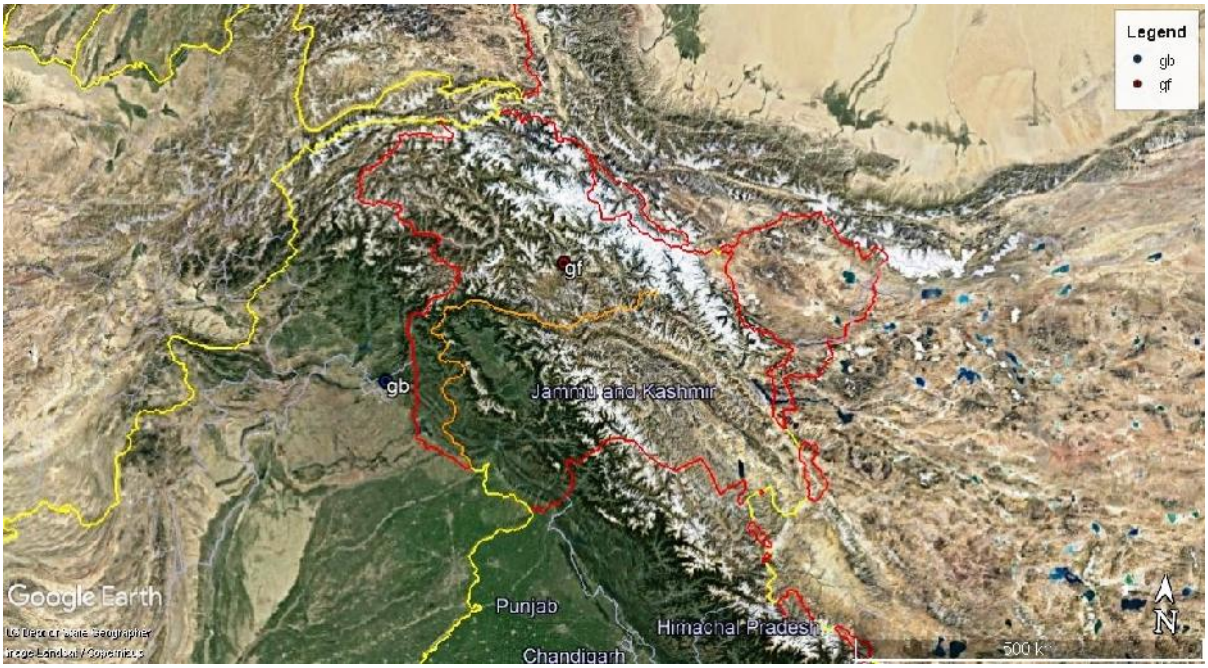

Fig. 4. Geographical distribution of the species: gb (*Graptomyza brevirostris*) and gf (*Graptomyza flavonotata*).

Table 1. Distributional records of known species under the genus *Graptomyza* Wiedemann, 1820 for Pakistan along with their latitude, longitude and elevation.

Species name	Localities	District	Latitude	Longitude	Elevation
Graptomyza brevirostris	Shahdara	Rawalpindi	33°45'59.18" N	73°10'27.58" E	655 m
Graptomyza flavonotata	Kresmathang	Skardu	35°18'57.36" N	75°51'51.65" E	2650 m

Material Examined: 1♂: Skardu, 2650 m, 1♀, 17.viii.2016, leg. M.A. Hassan.

Type Locality: Simla District.

Distribution: India (Ghorpadé, 2014), new to Pakistan.

Host Plant: Specimens were collected on *Allium cepa* L., near the field of *Coriandrum sativum* L. (Fig. 3: b).

Comments: This species of genus *Graptomyza* Wiedemann, is also recorded for the first time from Pakistan.

Acknowledgements: We kindly thank Valentin Nidergas for critically reviewing and suggesting edits to improve the language of this manuscript.

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