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Study of the tribe Pipizini (Diptera: Syrphidae) in Saqqez region- Iran

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Abstract

The studied specimens of the tribe Pipizini (Diptera: Syrphidae) were collected using standard entomological sweep nets during 2012-2013, from Saqqez region, located in the northern west of Iran. In a total four species were identified of which *Heringia* (*Neocnemodon*) *fulvimanus* (ZETTERESTEDT 1843), *Pipizella curvitibia* (STACHELBERG 1960) and *Pipizella divicoi* (GOELDLIN DE TIEFENAU 1974) are reported as new to the Iranian insect fauna. Diagnostic characters and distribution for the studied species are given. An adopted key to the studied species with their supplementary photos is provided.

Key words: Syrphidae, Pipizini, Fauna, New records, Iran.

Zusammenfassung

Vorliegende Arbeit behandelt Aufsammlungen an Pipizini (Diptera: Syrphidae) aus den Jahren 2012-2013 aus der Region Saqqez im Nordwesten des Irans. Von den vier nachgewiesenen Arten sind *Heringia* (*Neocnemodon*) *fulvimanus* (ZETTERESTEDT 1843), *Pipizella curvitibia* (STACHELBERG 1960) und *Pipizella divicoi* (GOELDLIN DE TIEFENAU 1974) neu für die Fauna des Irans.

Introduction

Syrphidae (Diptera: Cyclorrhapha) are commonly called as syrphid flies, hover flies or flower flies, comprise about 6000 described species and is a specious family of Diptera (THOMPSON 2006). The syrphid flies are distributed worldwide, with the greatest species diversity in the New World tropics (MASETTI et al. 2006). Three subfamilies, Microdontinae, Milesiinae and Syrphinae, and 14 tribes are currently recognized in this family (THOMPSON & ROTHERAY 1998).

Pipizini is a small tribe of the subfamily Milesiinae that is characterized by flat face (with no trace of a knob) which is covered by long drooping hairs (STUBBS & FALK 2002); postpronotal lobe with setae; angle between outer cross vein and vein R_{4+5} sharp, not more than 90° ; vein r-m ending before the middle of the discal cell; thorax, scutellum and abdomen black, some species with yellow markings. However, the presence of a post-anal hood (not present in *Pipiza*: THOMPSON 1972), the evenly rounded oral margin, the short and broad (medially shorter than wide) horseshoe shaped clypeus (HIPPA & STAHL 2005) are characteristic for the tribe. Larvae are aphid feeders living on wax-secreting aphids (families Thexalidae, Pemphigidae and Adelgidae) and feed on aphids that live in galls or roots, with morphological structures of typical predatory types (STUBBS & FALK 1983). Based on phylogenetic analysis, CHENG et al. (2000) found that the phylogenetic relationship between Pipizini and the predatory groups within the family Syrphidae is stronger than Pipizini and saprophagous groups, so the tribe Pipizini was transferred from Milesiinae to Syrphinae based on the larval habits. Therefore, it should be put in Syrphinae, but its adults have the basic features of non-predatory groups, with hair on humeri. STAHL et al. (2003) revised the whole family Syrphidae based on combined analysis of molecular as well as morphological characters and replaced the tribe Pipizini as the sister-group to the subfamily Syrphinae.

The tribe Pipizini divided into five genera (*Heringia*, *Pipiza*, *Pipizella*, *Trichopsomyia* and *Triglyphus*) and more than 75 species from the Palaearctic region in recent literature (PECK 1988; CLAUSSEN 1991; KASSEBEER 1995; VERLINDEN 1999, VUJIC et al. 2008; VAN STEENIS & LUCAS 2011; SPEIGHT 2012). *Heringia* RONDANI 1856 are small and black hoverflies (VAN VEEN 2004). Based on the structure of their aedeagus, CLAUSSEN et al. (1994) recognized two subgenera of the genus *Heringia* *Heringia* (RONDANI 1856) (aedeagus simple) and *Neocnemodon* (GOFFE 1944) (aedeagus two-segmented). Only one species [*Heringia* (*Heringia*) *heringi* ZETTERSTEDT 1843] has been reported from Iran so far (AHMADIAN & PASHAEIRAD 2010). The genus *Pipiza* (FALLÉN 1810) comprises more than 40 species, of which 17 species occur in the Palaearctic region including Europe (12 species) (VUJIC et al. 2008). The species of the genus *Pipiza* are medium-sized, blackish, with similar wing venation and steeply inclined upper outer cross-vein (VUJIC et al. 2008). KAZERANI et al. (2012) recorded one species of *Pipiza* for the first time from Iran. The genus *Pipizella* (RONDANI 1856) consists of about 40 described species in the Palaearctic region (VAN STEENIS & LUCAS, 2011). Four species of this genus has been recorded from Iran (DOUSTI & HAYAT 2006; KHAGHANINIA & SHAKERYARI 2012). *Trichopsomyia* (WILLISTON 1888) is characterized by terga 2-4 well developed and subequal in length (SPEIGHT 2008). Two species of *Trichopsomyia* have been reported by KHAGHANINIA et al. (2012) from Iran.

The objective of this study was to determine the species of the tribe Pipizini in the Saqqez region of Iran.

Material & Methods

The specimens were collected using an entomological net from flower heads particularly of the families Asteraceae, Cyperaceae, Juncaceae, Ranunculaceae and Umbelliferae from the various regions of the Saqqez region in Kordestan province located in the northern west of Iran. After killing in a cyanide bottle, specimens were mounted on 00 and 0 size pins. The male genitalia were dissected and boiled in 10 % KOH solution for about 60 seconds. The genitalia were washed and then stored in 0.5-ml microvials of glycerine and examined under a binocular microscope (Nikon SMZ 1000). All specimens are deposited in the Insect Museum of Tabriz University (IMTU).

Results

In a total four species were collected and identified including: two species of the genus *Pipizella*, one species of the genus *Trichopsomyia* and one species of the genus *Heringia*. The subgenus and species of *Heringia* (*Neocnemodon*) *fulvimanus* (ZETTERSTEDT 1843) and the species *Pipizella curvittibia* (STACHELBERG 1960) and *Pipizella divicoi* (GOELDLIN DE TIEFENAU 1974) are recorded for the first time from Iran.

Key to the studied species of the tribe Pipizini of Saqqez region:

(adapted from STUBBS & FALK 2002; VAN STEENIS & LUCAS 2011)

- 1 Uper outer cross-vein with bend near center, hind trochanter with a long downwardly projecting spine from side view, Metatars 1 not broadened, tergite 2 with short hairs..... *Heringia* (*Neocnemodon*) *fulvimanus*
- Uper outer cross-vein with bend in lower third, cell r_5 is extended towards the wing tip 2
- 2 Hind tibia with long black hairs on anterior surface, Female with a pair of yellow spots on tergite 2, vein tm ends (almost) perpendicular to R_{4+5} , 3rd antennal segment long, Female: tergite 2 with 2 relatively small, roundspots.....*Trichopsomyia lavitarsis*
- Hind tibia with entirely pale hairs on anterior surface, female abdomen without spots 3
- 3 Lower gonocercus hook-shaped, Epandrium with shoulders, genitalia as in figs. 3, C & D; tergite IV very long, 2.0-2.3 times longer than tergite IV; tergite IV without modifications..... *Pipizella divicoi*
- Lower gonocercus otherwise, Lower gonocercus circular; hypandrium very wide, genitalia as in figs. 2, C & D; mid leg with club-like tibia and elongate basitarsus *Pipizella curvittibia*

The verified species are listed as follows

Genus *Heringia* RONDANI 1856

Heringia (Neocnemodon) fulvimanus (ZETTERSTEDT 1843)*

Material examined: Saqqez: 36°04.838' N, 46°58.838' E, 1886 m, (6♂♂), 8 Aug. 2012; Saqqez: 33°10.365' N, 46°04.061' E 1570 m, (3♂♂), 21 Jul. 2013; leg. C. Hosseini.

Distribution: Central Europe (van VEEN 2006), Sweden, Finland, Austria, Italy, Siberia to the Pacific (PECK 1988). **New record for Iran.**

Diagnostic characters: Body black, 4.5-5 mm (Fig 1A); face flat; 3rd segment of antennae round; coxa 2 and trochanter 3 with elongated protuberances (Fig. 1B), metatars 1 not broadened tibia 2 less broadened, Sternite 3 with a keel or prominence; wing: basal cells bm and br and anal cell bare at least on first 1 / 2 microtrichia often present along the veniaspuria; sternite 2 with short hairs (Fig. 1). Genitalia as in Fig. 1, C.

Genus *Pipizella* RONDANI 1856

Pipizella curvitibia (STACKELBERG 1960)*

Material examined: Saqqez: 36°10.365' N, 46°04.061' E, 1570 m, (2♂♂), 28 May. 2013; leg. C. Hosseini.

Distribution: North-east Turkey, Azerbaijan, Armenia (SPEIGHT 2012). **New record for Iran.**

Diagnostic characters: Body black, 7.4-8.9 mm (Fig 2A); face flat (Fig. 2B); setae on eyes light-brown and long, arista yellow on basal half; wing: first basal cell covered by microtrichia over 95%, basal wing veins yellow; legs: mid leg with club-like tibia and elongate basitarsus; extensively yellow: apical 1/5 of front and mid femur, front and mid tibia on basal 1/2-4/7 and apical 1/6 hind tibia, basitarsus of front tarsi, basitarsus of mid tarsi entirely covered with yellow bristles, femoral setae yellow; abdomen black, pregenital segment with yellow setae; hypandrium very wide, base at least as wide as entire length of hypandrium, Genitalia as in Figs. 2C, D.

Pipizella divicoi (GOELDLIN de TIEFENAU 1974)*

Material examined: Saqqez: 36°04.134' N, 46°15.221' E, 1639 m, (8♂♂), 20 May. 2012; 36°10.365' N, 46°04.061' E, 1570 m, (9♂♂), 28 May. 2013; leg. C. Hosseini.

Distribution: Netherland, Spain, Belgium, northern France, Italy, the former Yugoslavia, Turkey, European parts of Russia and on through Siberia, Mongolia (SPEIGHT 2012), former Czechoslovakia, Denmark (van STEENIS & LUCAS 2011). **New record for Iran.**

Diagnostic characters: Eye contiguity long, setae on eyes white and dark (Fig. 3B); arista yellow on basal 1/3; legs: predominantly black, yellow on knees, front and mid tibia on basal 1/3, front and mid basitarsus; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical; abdomen: tergite 4 very long, 2.0-2.3 times longer than sternite 4; with black and white setae, pregenital segment with white setae

(Fig. 3C); Epandrium in lateral view semicircular; surstylus small, triangular; cerci elongate, genitalia as in Figs 3C, D.

Genus *Trichopsomyia* WILLISTON 1888

***Trichopsomyia flavitarsis* (MEIGEN 1822)**

Material examined: Saqqez: 36°10.471' N, 46°20.290' E, 1603 m, (1 ♂ 1 ♀), 1 Jun. 2013; leg. C. Hosseini.

Distribution: Fennoscandia, Spain, Ireland, northern Europe and mountainous parts of central Europe into European parts of Russia to the Pacific coast, former Yugoslavia (SPEIGHT 2012), Iran (KHAGHANINIA & SHAKERYARI 2012).

Discussion

Among the species of the subfamily Milesiinae, only larva of tribe Pipizini feed on aphids and can be used in IPM programs. *Pipizella divicoi* (GOELDLIN de TIEFENAU 1974) has the highest frequency than the other studied species, so it can be concluded that this species can be dominant in the studied area.

According to conducted studies in Iran, the Iranian fauna of the tribe Pipizini is poorly known so more studies about this tribe should be developed in Iran.

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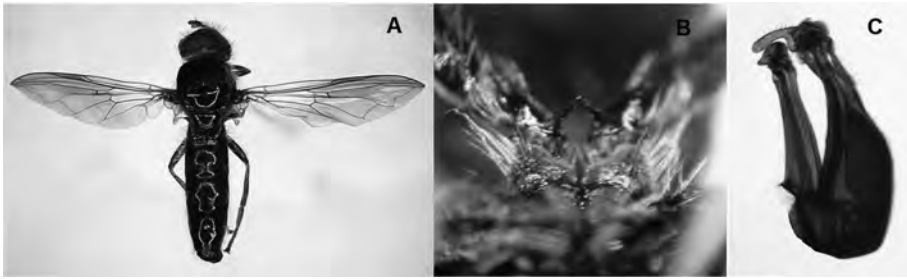


Fig. 1: *Heringia (Neocnemodon) fulvimanus*, (A) Dorsal view, (B) coxa 2 and with elongated protuberances, (C) Lateral view of genitalia.

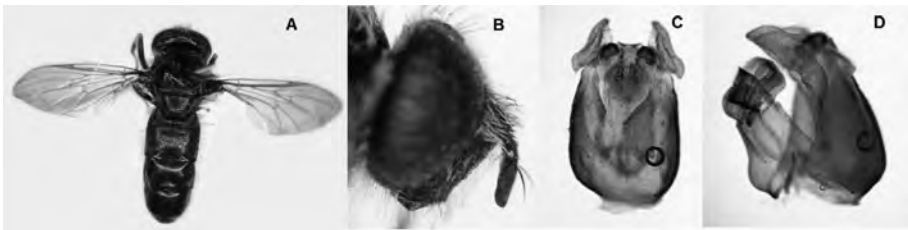


Fig. 2: *Pipizella curvitibia*, (A) Dorsal view, (B) Lateral view of head, (C) Dorsal view of genitalia, (D) Lateral view of genitalia.

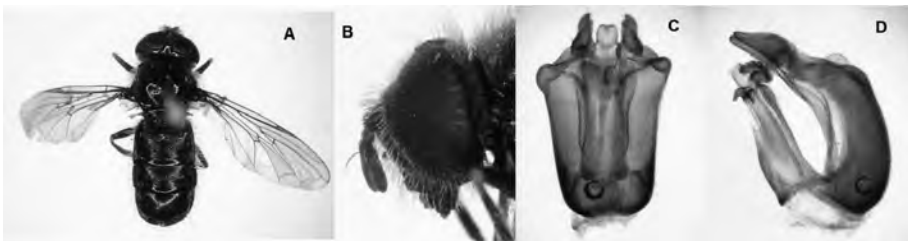


Fig. 3: *Pipizella divicoi*, (A) Dorsal view, (B) Lateral view of head, (C) Dorsal view of genitalia, (D) Lateral view of genitalia.

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