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Faunistic work on the Hover flies (Diptera: Syrphidae) of district Narowal, Pakistan

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Abstract

The present study was conducted to initiate the faunistic work on the family Syrphidae from District Narowal, Punjab. The specimens were collected from the different sites of study area during January to September 2016 and collections were done from the following host; grasses, flowers of *Raphanus sativus*, *Brassica campestris*, *Eruca sativa*, *Trifolium alexandrinum*, *Parthenium hysterophorus* and *Capsicum annum* by using common entomological net. Twenty species from 12 genera of two sub-families were identified and all of them are new records to the study area. *Mesembrius quadrivittatus* Wiedemann (1819) is recorded for the first time from Pakistan.

Keywords: Faunistic, Syrphidae, District Narowal, Pakistan

Introduction

Hover flies (Syrphidae: Diptera) are one of the most diverse and worldwide distributed group of true flies, comprising about 6107 species under 209 genera^[1, 2]. Hover flies (Diptera: Syrphidae) are popularly known as syrphid flies or flower flies. They can be found in a diverse habitat ranges from forest to residential areas^[3]. Due to its friendly behavior with human being and on our ecosystem both larvae and adults have an economic importance. Larvae of subfamily Syrphinae are zoophagous while subfamily Eristalinae has a diverse mode of feeding habitats^[4].

Various taxonomic studies have been conducted with time in order to explore the Syrphid fauna of Pakistan^[5-13]. Later, based on previous studied, Ghorpade and Shehzad,^[14] reported 84 species in the check-list on the Syrphidae of Pakistan. After that, Abdul Haq *et al.*,^[15]; Arif *et al.*^[16]; Irshad,^[17]; Khan *et al.*,^[18]; Turk *et al.*,^[19] and Turk *et al.*,^[20] contributed in the systematic and importance of this group.

Ghorpade,^[21] presented a great work on the Syrphidae of North-west Frontier of sub-continent, reporting 340 species under 96 genera in 15 tribes and 3 sub-families, and discuss briefly about the synonyms, taxonomic remarks and geographical distribution of all species. Khan and Hanif,^[22] worked on the faunal diversity of Syrphidae from Chakwal and reported sixteen species under 13 genera of two subfamilies. Subhan and Shah,^[23] worked on the taxonomy of genus *Sphaerophoria* Le Peletier et Serville, 1828 from the Northern Dry Mountains Region and reported 3 species viz; *S. bengalensis* Macquart, 1842, *S. Indiana* Bigot, 1884 and *S. scripta* (Linnaeus, 1758) along with their diagnostic characters, distribution, synonymy and male genitalia of the species are provided from Pakistan. Hassan *et al.*,^[24] studied the Syrphid fauna of Poonch District Azad Kashmir and reported 36 species under 18 genera of two subfamilies of Syrphidae with new country records.

Currently three subfamilies, Syrphinae, Eristalinae and Microdontinae and 14 tribes are included in this family^[25]. The present study was conducted to initiate the work on this important group from district Narowal, Pakistan.

Material and Method

The adult specimens were collected from the *Raphanus sativus*, *Brassica campestris*, *Trifolium alexandrinum*, *Eruca sativa*, *Parthenium hysterophorus*, *Capsicum annum* and from the grasses during the different timing of the year. The collections were done during the different months of the year 2015. The specimens were collected during 11:00 A.M to 1:00 P.M and 3:00 P.M to 4:00 P.M having an average temperature of 20-33 °C by using common entomological net.

The collection areas were selected from tehsil Shakargarh including; Shakargarh City, Dhudo Chak, Mangrai, Pindi Bohri, Essa, Noor Kot, Mir Poor, Sola, Sahgrta, etc. The specimens were killed in a killing jar and then placed in an envelope to reach at laboratory. The specimens were pinned and set according to the scientific way. The specimens were identified with the help of Brunetti, (1923) [8] and by the help of Dr. Kumar Ghorpade. The specimens have been deposited in the National Insect Museum, Islamabad Pakistan.

Result and Discussion

The current study yielded 20 species under 12 genera of two subfamilies of family Syrphidae, all of them are new record to the study area. *Mesembrius quadrivittatus* Wiedemann (1819) is new record to the Syrphid fauna of Pakistan. The rich biodiversity in the Punjab province of Pakistan are due to its surrounding areas as, Indian states of Punjab and Rajasthan in east, Azad Kashmir and Indian held Jammu and Kashmir in north-east, province of Sindh to the south, Balochistan province to southwest, province of Khyber Pakhtunkhwa to west and Capital Territory (Islamabad) in north. Tehsil Shakargarh lies in north-east of Narowal district of Punjab province. It is located at west bank of River Ravi and has coordinates of 32.2643° N, 75.1599° E.

Family Syrphidae

Subfamily Eristalinae

Tribe Eristalini

Genus *Eristalis* Latreille, 1804

1. *Eristalis tenax* (Linnaeus, 1758)

Material Examined (27 ex.): Shakargarh, 800 ft, 8.i.2016, 1♀, 9.i.2016, 7♂ 6♀, 18.i.2016, 3♂ 2♀, 19.i.2016, 2♂ 1♀, 6.ii.2016, 1♂, 5.iii.2016, 3♂ 1♀, leg. K. Nazir. Host: Collected from *Brassica campestris* and *Eruca sativa*. Distribution: Azad Kashmir: Alisojal, Banjosa, Datoot, Hajira, Hussainkot, Jandali, Khaigala, Paniola, Rawalakot, Singola, Topa [16, 24]. Pakistan: Haripur [13], Chakwal [26], Peshawar [27], Multan, Muzafargarh, Khanewal [28]. World Distribution: Afghanistan, India, Nepal [29, 30, 21]. Remarks: Hassan *et al.*, [24] reported this species from flowers of Berberidaceae, Brassicaceae, *Coriandrum sativum*, Lamiaceae and grassy fields from Azad Kashmir. Khan *et al.*, [26] collected this species from the flowers of *Launaea procumbens* and *Parkinsonia aculeate*. Sajjad and Saeed, [28] reported from eight different flowering plants. Genus *Eristalinus* Rondani, 1845

2. *Eristalinus taeniops* (Wiedemann, 1818)

Material Examined (7 ex.): Shakargarh, 800 ft, 9.i.2016, 1♂, 11.i.2016, 2♀, 6.ii.2016, 3♀, 14.iii.2016, 1♀, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa*, *Brassica campestris* and weeds. Distribution: Azad Kashmir: Banjosa, Hajira, Jandali, Rawalakot, Singola [24]. Pakistan: Chakwal [28], Multan [31]. World Distribution: Afghanistan, India, Nepal [29, 30, 21]. Remarks: Hassan *et al.*, [24] collected this species from the flowers of Berberidaceae, *Helianthus orgyalis* [7] and from the nine flowering plants at Multan [28].

3. *Eristalinus tarsalis* (Macquart, 1855)

Material Examined (2 ex.): Shakargarh, 800 ft, 26.vi.2016, 2♂, leg. K. Nazir. Host: Collected from *Parthenium hysterophorus* flowers. Distribution: Azad Kashmir: Banjosa, Hajira, Rawalakot [24]. Remarks: Hassan *et al.*, [24] recorded this species from Azad

Kashmir as a new country record. They gave the diagnostic characters of both male and female specimens of this species and mostly collected from flowers of Brassicaceae, Lamiaceae, *Coriandrum sativum* and grassy fields. World Distribution: Nepal, India [30, 21].

4. *Eristalinus arvorum* (Fabricius, 1787)

Material Examined (23 ex.): Shakargarh, 800 ft, 9.i.2016, 5♀, 11.i.2016, 5♀, leg. K. Nazir; Noor Kot, 11.vii.2016, 5♀, Dhudo Chak (Shakargarh), 12.vii.2016, 8♀, leg. M.A. Hassan. Host: Collected from *Eruca sativa*, *Brassica campestris*, *Parthenium hysterophorus*, *Capsicum annum* and weeds. Distribution: Azad Kashmir: Banjosa, Rawalakot [24]. Pakistan: Haripur [13], Chakwal [26], Multan [30]. World Distribution: India, Nepal [21, 30]. Remarks: Ghorpadé and Shehzad, [14] reported this species from Pakistan. Hassan *et al.*, [24] collected this species from Berberidaceae, Brassicaceae, Lamiaceae and wild flowers. Khan *et al.*, [25] reported from *Spergula arvensis*, *Cleome viscosa*, *Pulicaria crispa* and *Conyza bonariensis*. Sajjad and Saeed, [27] observed eleven host plants for this species.

5. *Eristalinus aeneus* (Scopoli, 1763)

Material Examined (2 ex.): Shakargarh, 800 ft, 9.i.2016, 2♂, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa* and *Brassica campestris*. Distribution: Azad Kashmir: Banjosa [26]. Pakistan: Baluchistan [9], Chakwal [26], Peshawar [27], Multan [30]. World Distribution: Afghanistan, India, Nepal [29, 30, 21]. Remarks: Ghorpadé and Shehzad, [14] reported this species from Pakistan. Hassan *et al.*, [24] found this species from the mint flowers and Arif, [7] found from the forest plantation. Sajjad and Saeed, [28] observed thirty seven host plant for this species. Ali *et al.*, [32] reported this species from the canola flowers at Multan.

6. *Eristalinus megacephalus* (Rossi, 1794)

Material Examined (11 ex.): Shakargarh, 800 ft, 08.i.2016, 1♂, 9.i.2016, 4♂, 11.i.2016, 1♂, leg. K. Nazir; Noor Kot, 11.vii.2016, 2♂, Dhudo Chak (Shakargarh), 12.vii.2016, 3♂, leg. M.A. Hassan. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa*, *Brassica campestris* and weeds. Distribution: Azad Kashmir: Banjosa, Rawalakot [24]. Pakistan [14]. World Distribution: Afghanistan, India [29, 21]. Remarks: This species was found from the following hosts as *Brassica campestris*, Berberidaceae, Lamiaceae, wildflowers [24], *Ageratum conyzoides*, *Convolvulus arvensis*, *Daucus carota*, and *Launaea procumbens* [26].

7. *Eristalinus obliquus* (Wiedemann, 1824)

Material Examined (5 ex.): Shakargarh, 800 ft, 09.i.2016, 1♂ 1♀, 11.i.2016, 3♂, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa*, *Brassica campestris*, *Parthenium hysterophorus* and weeds. Distribution: Azad Kashmir: Banjosa, Rawalakot [24]. World Distribution: Nepal, India [30, 21]. Remarks: Hassan *et al.*, [24] found this species from the flowers of family Berberidaceae, Lamiaceae and other wildflowers and recorded this species as a new country record from Azad Kashmir. Genus *Mesembrius* Rondani, 1857

8. *Mesembrius quadrivittatus* (Wiedemann, 1819)

Material Examined (1 ex.): Shakargarh, 800 ft, 23.iii.2016, 1♂, leg. K. Nazir. Host: Collected from the flowers of *Raphanus sativus*. Distribution: New country record. World Distribution: India [21].

Tribe MilesiiniGenus *Syritta* Lepeletier and Serville, 1828**9. *Syritta orientalis*** Macquart, 1842

Material Examined (1 ex.): Shakargarh, 800 ft, 13.iv.2016, 1♂, leg. K. Nazir. Host: Collected from grasses.

Distribution: Punjab^[14]. World Distribution: India^[21].Remarks: Hassan *et al.*,^[24] found this species from the flowers of *Brassica campestris*, *Coriandrum sativum*, mint (Lamiaceae), and grasses.**10. *Syritta pipiens*** (Linnaeus, 1758) Material Examined (3

ex.): Shakargarh, 800 ft, 13.iv.2016, 3♂, leg. K. Nazir.

Host: Collected from grasses.

Distribution: Azad Kashmir: Banjosa, Hajira, Rawalakot^[24]. Pakistan: Khyber Pakhtunkhwa, Punjab, Multan, Muzafargarh, Khanewal^[28, 14]. World Distribution: Afghanistan, India, Nepal^[29, 30, 21]. Remarks: This species mostly preferred the grassy fields and Hassan *et al.*,^[24] collected this species from Azad Kashmir flies from the following host plants mint (Lamiaceae), *Brassica campestris* and *Coriandrum sativum*. Sajjad and Saeed,^[27] observed the same species from the four host plants.**Subfamily Syrphinae****Tribe Bacchini**Genus *Melanostoma* Schiner, 1860**11. *Melanostoma* sp.?**

Material Examined (4ex.): Shakargarh, 800 ft, 8.i.2016, 1♂ 2♀, 6.ii.2016, 1♀, leg. K. Nazir.

Host: Collected from grasses.

Remarks: Ali *et al.*,^[32] reported an unidentified species under this genus in canola crops from Multan.**Tribe Paragini**Genus *Paragus* Latreille, 1804**12. *Paragus (Serratoparagus) serratus*** (Fabricius, 1805)Material Examined (3 ex.): Shakargarh, 800 ft, 12.viii.2016, 3♂, leg. M.A. Hassan. Distribution: Pakistan: Khyber Pakhtunkhwa, Federally Administered Tribal Areas, Punjab, Sindh^[14]; India^[21]. Hosts: Collected from the flowers of *Raphanus sativus*. World Distribution: Afghanistan, India, Nepal^[29, 30, 21]. Remarks: Thompson and Ghorpadé,^[33] differentiated this species by the presence of serrate on posterior margin of scutellum, first abdominal tergite being medially reddish and hind femora yellow with narrow dark brownish annulus, mesonotal pile short, wing hyaline. Sajjad and Saeed,^[28] observed thirty eight host plants for this species.**Tribe Syrphini**Genus *Betasyrphus* Matsumura, 1917**13. *Betasyrphus isaaci*** (Bhatia, 1933)Material Examined (1 ex.): Shakargarh, 800 ft, 14.iii.2016, 1♂, leg. K. Nazir. Host: Collected from *Eruca sativa* and *Brassica campestris*. Distribution: Azad Kashmir: Banjosa^[24]. Pakistan^[14]. World Distribution: Nepal, India^[30, 21]. Remarks: Hassan *et al.*,^[24] recorded this species from the Brassica flowers. Genus *Episyrphus* Matsumura, in Matsumura & Adachi, 1917**14. *Episyrphus balteatus*** (De Geer, 1776)

Material Examined (20 ex.): Shakargarh, 800 ft, 8.i.2016, 6♀,

9.i.2016, 1♂, 11.i.2016, 1♂ 1♀, 6.ii.2016, 3♀, 26.ii.2016, 5♂ 3♀, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa*, *Brassica campestris* and weeds.Distribution: Azad Jammu: Ali Sojal, Banjosa, Datoot, Hajira, Jandali, Paniola, Rawalakot, Singola, Topa^[16]. Pakistan: Haripur^[13], Chakwal^[26], Peshawar^[27], Multan, Muzafargarh, Khanewal^[28]. World Distribution: Afghanistan, India, Nepal^[29, 30, 21]. Remarks: Sajjad and Saeed,^[28] observed thirty five host plants for this species. Ali *et al.*,^[32] reported this species from the canola flowers at Multan.**15. *Episyrphus viridaureus*** (Wiedemann, 1824)Material Examined (7 ex.): Shakargarh, 800 ft, 9.i.2016, 1♀, 11.i.2016, 1♂, 26.ii.2016, 1♂ 1♀, 5.iii.2016, 1♂ 2♀, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa*, *Brassica campestris* and weeds. Distribution: Azad Kashmir:^[24]. Pakistan^[14]. World Distribution: Nepal, India^[30, 21].Genus *Ischiodon* Sack, 1913**16. *Ischiodon scutellaris*** (Fabricius, 1805)Material Examined (6 ex.): Shakargarh, 800 ft, 14.iii.2016, 1♂ 5♀, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa* and *Brassica campestris*.Distribution: Azad Kashmir: Banjosa, Hajira, Jandali^[24]. Pakistan: Haripur^[13], Chakwal^[26], Multan, Muzafargarh, Khanewal^[28]. World Distribution: Afghanistan, India, Nepal^[29, 30, 21]. Remarks: Hassan *et al.*,^[24] collected this species from the flowers of *Brassica campestris*, grasses and wild flowers. Sajjad and Saeed,^[28] observed thirty seven host plants for this species. Ali *et al.*,^[32] reported this species from the canola flowers at Multan. Genus *Eupeodes* Osten Sacken, 1877**17. *Eupeodes bucculatus*** (Rondani, 1857)

Material Examined (14 ex.): Shakargarh, 800 ft, 6.ii.2016, 1♂ 5♀, 5.iii.2016, 4♂, 14.iii.2016, 2♂ 2♀, leg. K. Nazir.

Host: Collected from *Eruca sativa* and *Brassica campestris*.Distribution: Azad Kashmir: Banjosa, Hajira, Jandali, Singola^[24]. Pakistan^[14]. World Distribution: Afghanistan, India, Nepal^[29, 30, 21]. Remarks: Hassan *et al.*,^[24] reported this species from *Brassica campestris* flowers and hovering under pine trees (*Pinus wallichiana*).**18. *Eupeodes corolla*** (Fabricius, 1794)Material Examined (9 ex.): Shakargarh, 800 ft, 6.ii.2016, 2♂, 26.ii.2016, 2♂, 05.iii.2016, 1♂, 14.iii.2016, 2♂ 2♀, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa* and *Brassica campestris*. Distribution: Azad Kashmir: Rawalakot, Hajira^[24]. Pakistan: Punjab^[26], Multan, Muzafargarh, Khanewal^[28], Quetta^[19]. World Distribution: Afghanistan, India, Nepal^[29, 30, 21]. Remarks: Hassan *et al.*,^[24] reported this species from the flowers of *Brassica campestris*, *Coriandrum sativum*, wild flowers, grasses, and hovering under pine trees (*Pinus wallichiana*). Sajjad and Saeed,^[28] observed thirty twenty four host plant for this species. Ali *et al.*,^[32] reported this species from the canola flowers at Multan.**19. *Eupeodes latifasciatus*** (Macquart, 1829)Material Examined (2 ex.): Shakargarh, 800 ft, 6.i.2016, 2♀, leg. K. Nazir. Host: Collected from *Trifolium alex andrinum*, *Eruca sativa* and *Brassica campestris*. Distribution: Azad Jammu:^[16, 24]. Pakistan: Quetta^[19]. World Distribution:

Afghanistan, India, Nepal [29, 30, 21]. Remarks: Hassan *et al.*, [24] reported this species from the flowers of *Brassica campestris*, wild flowers and while hovering under pine trees (*Pinus wallichiana*). Genus *Scaeva* Fabricius, 1805

20. *Scaeva latimaculata* (Brunetti, 1923)

Material Examined (1 ex.): Shakargarh, 800 ft, 6.ii.2016, 1♀, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa* and *Brassica campestris* Distribution: Azad Kashmir: Rawalakot [24]. Pakistan: Multan, Muzafargarh, Khanewal [28], Chakwal [26]. Remarks: This species was collected from *Brassica campestris* [24]. World Distribution: Afghanistan, India, Nepal [29, 30, 21]. Sajjad and Saeed, [28] observed the same species from the six host plants. Genus *Sphaerophoria* Lepeletier & Serville, 1828

21. *Sphaerophoria scripta* (Linnaeus, 1758)

Material Examined (11 ex.): Shakargarh, 800 ft, (K. Nazir)

8.i.2016, 2♂ 1♀, 6.ii.2016, 1♂, 05.iii.2016, 7♂, leg. K. Nazir. Host: Collected from *Trifolium alexandrinum*, *Eruca sativa*, *Brassica campestris* and weeds. Distribution: Azad Kashmir: Banjosa, Hajira, Rawalakot [24]. Pakistan: Peshawar [8]. Remarks: This species was abundant on grasses, *Brassica campestris*, *Coriandrum sativum*, wild flowers [24], *Nicotiana tabacum*, *Zizyphus jujube* and wild grasses [8]. World Distribution: Afghanistan, India, Nepal [29, 30, 21].

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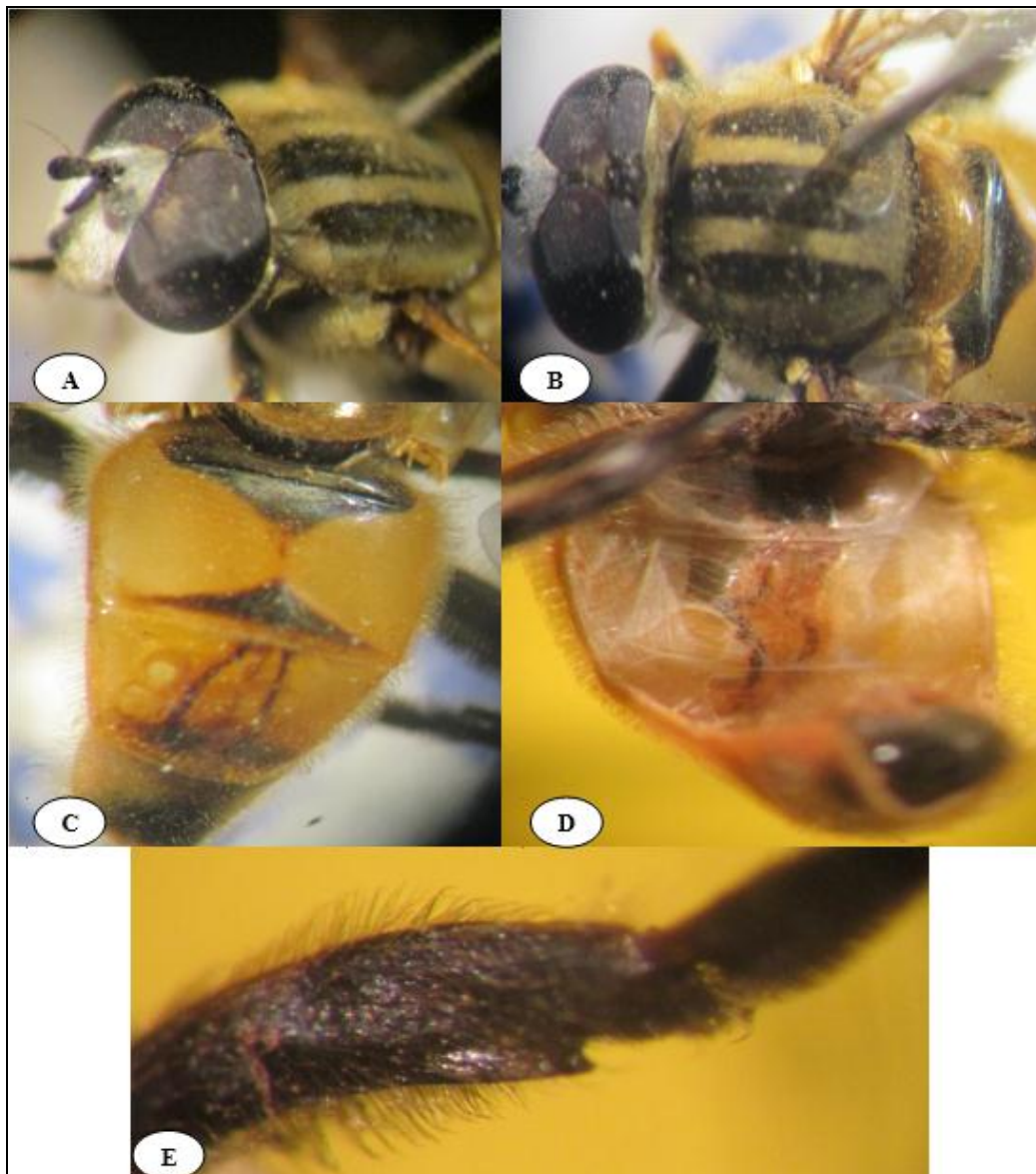


Fig 1: *Mesembrius quadrivittatus* (Wiedemann, 1819), frontal view (A); Abdomen, tergites (C), sternites (D); Hind tibia (E).

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