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SOME BEE-FLIES (BOMBYLIIDAE : DIPTERA) FROM THAR DESERT

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INTRODUCTION

The members of the family Bombyliidae known as, bee-flies are usually dominant in the tropics and subtropics. They are one of those economically important group of the suborder Brachycera, and act as pollinators in forests, and of agricultural crops.

The Great Indian desert popularly known as Thar desert covers part of the four Indian states viz. Punjab, Haryana, Rajasthan and Gujarat. The present account on Bombyliidae fauna pertains to the state of Rajasthan and Gujarat as this is the area which has been best explored and studied faunistically.

Our knowledge of the bee-fly fauna of the Thar desert is limited. Kumar & Kumar (1996) have reported only 2 species under 2 genera from this area, and recently Parui and Mitra (2000) also reported another 3 species under 2 genera.

The present study revealed 10 species of bee-flies under 8 genera of 4 subfamilies. Of them 5 species (* marked) under 4 genera of 4 subfamilies are reported for the first time from the Indian part of Thar desert area. Comprehensive keys to the subfamilies, genera and species of Bombyliidae treated here are given.

LIST OF SPECIES

A. Subfamily TOXOPHORINAE

- *1. *Toxophora javana* Wiedemann

B. Subfamily BOMBYLIINAE

- *2. *Bombylius maculatus* Fabricius

C. Subfamily ANTHRACINAE

3. *Petrorossia albofulva* (Walker)
4. *Petrorossia nigrofemorata* (Brunetti)
5. *Anthrax bipunctatus* Fabricius
- *6. *Argyromoeba duvaucelii* (Macquart)

D. Subfamily EXOPROSOPINAE

7. *Thyridanthrax (Exhylanthrax) absalon* (Wiedemann)
8. *Exoprosopa (Exoprosopa) collaris* (Wiedemann)
- *9. *Ligyra aurantiaca* (Guérin-Méneville)
- *10. *Ligyra oenomaus* (Rondani)

SYSTEMATIC ACCOUNT

Key to the subfamilies

1. Praefurca comparatively long; 2nd longitudinal vein originating (in knee-shaped form) from it approximately opposite anterior cross vein (at almost half way between origin of praefurca and the cross vein, and this only in some species of *Argyromoeba*); antenna widely separated at base; frons in ♂ nearly as wide as in ♀ 2
 - Praefurca comparatively short, 2nd longitudinal vein originating acutely (not in knee-shaped form) always much nearer to origin of praefurca than of anterior cross vein; antennae nearly always approximate at base; eyes in ♂ normally contiguous or nearly so, sometimes distinctively separated; frons in ♂ always much narrower than ♀ 3
2. Antennal style with a pencil of hairs at end; metapleura bare; squamae with a hairy fringe. *Anthracinae*
 - Antennal style devoid of hairs at end; metapleura hairy; squamae with scaly fringe *Exoprosopinae*
3. Head as wide as or a little wider than thorax; abdomen more or less cylindrical, bare or with bristly hairs; antennae very long, especially 1st joint; thorax more or less humped, generally with conspicuous bristle; 2nd longitudinal vein with loop *Toxophorinae*
 - Head generally narrower than thorax; abdomen short and rounded; frequently with dense furry pubescence; antennae approximate at base; thorax generally arched; 2nd longitudinal vein never with a strong loop near tip *Bombyliinae*

A. Subfamily TOXOPHORINAE

Genus *Toxophora* Meigen

Toxophora Meigen, 1803, *Magazin InsektKde.*, 2 : 270. Type-species : *Toxophora maculata* Meigen

***1. *Toxophora javana* Wiedemann**1821. *Toxophora javana* Wiedemann, *Dipt. exot.*, : 179.

Material examined : 1 ♂, Ghata village, Balaram-Ambaji wildlife sanctuary, 13.viii.2000, Coil. P. Parui.

Diagnosis : Antennae very long, prominent, horizontal, approximate at the base; vertex very small, black with a pair of strong ocellar bristles; thorax black, humped with a coating of very small, oblong, brownish scales lying flat on the surface; abdomen black, long narrow, with a layer of small brownish scales as on the thorax; three posterior cells.

Distribution : Gujarat, Tamil Nadu, Uttar Pradesh; Jawa, Krakatau.

Remarks : This is the first report from the Indian part of Thar Desert.

B. Subfamily BOMBYLIINAE**Genus *Bombylius* Linnaeus**

1758. *Bombylius* Linnaeus, *Syst. Nat. Ed.*, **10** : 606. Type-species : *Bombylius major* Linnaeus.

***2. *Bombylius maculatus* Fabricius**1775. *Bombylius maculatus* Fabricius, *Syst. Ent.*, : 803.

Material examined : 1 ♂, 1 ♀, Iswania hill, Balaram-Ambaji wildlife sanctuary, 8.viii.2000, Coll. P. Parui.

Diagnosis : Head in ♂ black; frons with elongate white or yellowish-white scales; antennae black; thorax black, a pair of faint bluish well-separated narrow stripes visible on the denuded surface; abdomen black, black hairs surround the tip of the abdomen; wings clear, costal cell yellowish, whole base of wing as far as humeral cross-vein dark brown.

Distribution : Gujarat, Orissa, Tamil Nadu.

Remarks : This is the first report from the Indian part of Thar Desert.

C. Subfamily ANTHRACINAE**Key to the genera**

1. Body large, hairy; third antennal joint short, onion shaped (sometimes more conical), with styliform prolongation always bisected near tip, and bearing an apical pencil of hairs *Argyromoeba* Schiner
- Body small, less hairy; third antennal joint forming a style-like cone with microscopic apical bristle, no pencil of hairs 2
2. Body hairy; wing almost clear *Anthrax* Scopoli
- Body bare; wing membrane wrinkled, not clear *Petrorossia* Bezzi

Genus *Petrorossia* Bezzi

1909. *Petrorossia* Bezzi, *Z. syst. Hymenopt. Dipterol.*, **8** : 32. Type-species : *Bibio hesperus* Rossi.

Key to the species

1. 2nd vein originating in a knee just beyond half way between base of discal cell and anterior cross vein, upper branch of 2nd vein forming a very distinct downward loop towards its end *nigrofemorata* (Brunetti)
- 2nd longitudinal vein normally with a distinct curve, followed by a distinct downward one just before tip, anterior cross vein at one third of discal cell, placed some distance beyond tip of praefurca *albofulva* (Walker)

3. *Petrorossia albofulva* (Walker)

1852. *Anthrax albofulva* Walker, *Insecta Saundersiana*, **1** : 182.

Material examined : 'Not examined'

Distribution : Gujarat, Uttar Pradesh.

4. *Petrorossia nigrofemorata* (Brunetti)

1909. *Argyromoeba nigrofemorata* Brunetti, *Rec. Indian Mus.*, **3** : 219.

Material examined : 'Not examined'

Distribution : Gujarat, Uttar Pradesh.

Genus *Anthrax* Scopoli

1763. *Anthrax* Scopoli, *Ent. Carniolica* : 358. Type-species : *Musca morio* Linnaeus.

5. *Anthrax bipunctatus* Fabricius

1805. *Anthrax bipunctatus* Fabricius, *Syst. Antliat.*, : 118.

Material examined : 'Not examined'

Diagnosis : Body large; antennae blackish, 3rd joint reddish brown; vertex blackish grey, rather shining, with some brown hairs on hind margin; thorax black, moderately shining, with very sparse pubescence; abdomen black, with short sparse black pubescence and a patch of small elongate snow-white scales towards each side of dorsum of 1st segment; wings very dark, blackish brown at base, the colour diminishing distally and posteriorly, but the lightest part of the wing at least pale brown.

Distribution : Assam, Bihar, Gujarat, Tamil Nadu, West Bengal; Bangladesh, Pakistan.

Genus *Argyromoeba* Schiner

1860. *Argyromoeba* Schiner, *Wien. ent. Monatschr.*, 4 : 51. Type-species : *Anthrax tripunctata* Wiedemann.

*6. *Argyromoeba duvaucelii* (Macquart)

1840. *Anthrax duvaucelii* Macquart, *Dipt. exot.*, 2(1) : 63.

Material examined : 1 ♂, Sambalpani, Balaram-Ambaji Wild life Sanctuary, 10.viii.2000, Coll. P. Parui.

Diagnosis : Body moderate; antennae black, with a slight grayish-white shimmer; vertex with a distinct but short and deep indentation; thorax dark, sides of thorax with long thick grayish-white scaly pubescence; the dorsum with sparse yellowish short hairs round the edges; abdomen blackish grey, 2nd segment distinctly but not greatly longer than the five remaining ones; venter blackish with short white hairs; wings almost clear, costa slightly darker, several isolated spots present, devoid of baso-costal oblique band, anal cell open.

Distribution : Gujarat, Himachal Pradesh, Uttar Pradesh, West Bengal; Pakistan.

Remarks : This is the first report from the Indian part of Thar Desert.

D. Subfamily EXOPROSOPINAE

Key to the genera

1. Ocellar tubercle a long way from vertex; antennal segment 3 like an elongated cone, with a style divided from it by a distinct suture; wing with 3 to 4 submarginal cells; claws usually with along sharp basal tooth 2
 - Ocelli more or less close to vertex; antennal style mostly not divided by a suture; wing with 2 submarginal cells only; claws usually without basal tooth, or at most with a small and obtuse tubercle *Thyridanthrax* Osten Sacken
2. Antennal segment 3 with a terminal style bearing a microscopic bristle; 3 submarginal cells in wing *Exoprosopa* (Macquart)
 - Antennal segment 3 with a terminal style bearing a minute appendage; 4 submarginal cells in wing *Ligyra* (Newman)

Genus *Thyridanthrax* Osten Sacken

1886. *Thyridanthrax* Osten Sacken, *Biologia cent.-am. (Zool.)*, : 123, Type-species : *Thyridanthrax selene* Osten Sacken.

7. *Thyridanthrax (Exhyalanthrax) absalon* (Wiedemann)

1828. *Anthrax absalon* Wiedemann, *Analecta Ent.*, : 24.

Material examined : 'Not examined'

Diagnosis : Head semicircular; proboscis short; antennae porrect, short, wide apart at base, 1st joint short, cylindrical, 2nd cup shaped, 3rd varying from elongate conical to flat onion-shaped; thorax quadrate, with rounded angles; abdomen flat, oblong; wings brown with more or less hyaline spots.

Distribution : Gujarat, Maharashtra, Orissa, Tamil Nadu; Sri Lanka, Malayasia.

Genus *Exoprosopa* (Macquart)

1840. *Exoprosopa* Macquart, *Dipt. exot.*, 2(1) : 35. Type-species : *Anthrax pandora* Fabricius.

8. *Exoprosopa (Exoprosopa) collaris* (Wiedemann)

1828. *Anthrax collaris* Wiedemann, *Aussereurop. zweifl. Insekt.*, 1 : 271.

Material examined : 'Not examined'

Diagnosis : Frons distinctly narrower at vertex than above antennae; probosis dark, withdrawn; antennal 1st and 2nd joints ferruginous, 3rd black; thorax black, with sparse black pubescence, covered with very short depressed yellowish brown scale like hairs; abdomen black, the sides often more or less reddish; wings pale grey with the basal third dark brown, a small clear spot at upper corner of 2nd basal cell, with a small yellowish spot immediately above it, and a slight pale yellowish tinge about the middle of the 1st posterior cell.

Distribution : Rajasthan.

Genus *Ligyra* Newman

1841. *Ligyra* Newman, *Entomologist*, 1 : 220. Type-species : *Anthrax bombylifformis* Macleay.

Key to the species

1. Wing dark blackish brown, without any considerable clear or nearly clear part
..... *aurantiaca* (Guérin-Méneville)
- Wing with apical part and considerable portion of posterior half practically clear
..... *oenomaus* (Rondani)

*9. *Ligyra aurantiaca* (Guérin-Méneville)

1844. *Anthrax aurantiaca* Guérin-Méneville, *Icon., du regne anim. Dipt.*, 3 : 539.

Material examined : 1 ♂, Balaram nursery, Balaram-Ambaji wildlife sanctuary, 17.viii.2000, Coil. P. Parui.

Distribution : Gujarat, Arunachal Pradesh, Bihar, West Bengal.

Remarks : This is the first report from the Indian part of Thar Desert.

*10. *Ligyra oenomaus* (Rondani)

1875. *Hyperalonia oenomaus* Rondani, *Annali Mus. Civ. Stor. nat. Giacomo Doria*, 7 : 453.

Material examined : 2 ♂, Balaram nursery, Balaram-Ambaji wildlife sanctuary, 17.viii.2000, Coil. P. Parui.

Distribution : Gujarat, Arunachal Pradesh, Assam, Sikkim, West Bengal; Borneo, Malaysia, Philippines.

Remarks : This is the first report from the Indian part of Thar Desert.

SUMMARY

The distribution pattern of 10 species of the family Bombyliidae so far known from the Indian part of Thar desert shows that all the species are predominantly Oriental in distribution. Of them, 8 species (80%) are restricted to the Oriental region, whereas the remaining 2 species (20%) extend beyond the limit of this region. Of the 8 species distributed in the Oriental region, 6 species namely, *B. maculatus*, *P. albofulva*, *P. nigrofemorata*, *E. (E) collaris*, *L. aurantiaca* and *L. oenomaus* are endemic to India, and *E. (E) collaris* is restricted to Rajasthan.

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