

# A New Species of *Dysdercus* Guérin Méneville (Hemiptera: Pyrrhocoridae) from Bhutan with Special Reference to its Genitalia and its Relationships\*

IMTIAZ AHMAD AND SYED SALAHUDDIN QADRI\*\*  
Department of Zoology, University of Karachi, Karachi-75270  
Email: iahmad3141@yahoo.com

**Abstract.-** A cotton stainer *Dysdercus rosaceus*, new species is described in detail with special reference to its metathoracic scent auricle, male genitalia including inflated aedeagus and female genitalia including spermatheca. In this light its phylogenetic relationship is also briefly discussed within its subgenus *Paradysdercus* Stehlik.

**Key words:** *Dysdercus rosaceus*, genitalia, Hemiptera, Pyrrhocoridae.

## INTRODUCTION

The representatives of the genus *Dysdercus* Guérin Méneville are the pests of malvacian plants, mainly cotton and distributed in Old and New World. Hussey's (1929) catalogue comprises three subgenera and 77 New and Old-World species. Freeman (1947) revised the genus from Old World. He described the species from Sri Lanka, China, New Guinea, Queensland, Malay Peninsula, Borneo and New Hebrides and gave only brief female spermathecal descriptions, some time without illustration. Freeman (1947) categorised the genus *Dysdercus* in four groups. Freeman (1947) was probably the first to group the *Dysdercus* species on the basis of more reliable characters of male and female genitalia particularly the spermatheca. He split the Old World species into two groups on the basis of presence or absence of vertical process of pygophore. In the first group without this process he placed all Ethiopian species excluding *D. festivus* (Gerstaecker) and further divided group I into two groups *i.e.* Ia on the basis of apex of pygophore rounded, spermatheca with no separate accessory gland, having proximal portion comparatively short and wide probably incorporating glandular cells. Freeman (1947) separated group Ib on the basis of

0030-9923/2007/0006-0375 \$ 8.00/0

Copyright 2007 Zoological Society of Pakistan.

apex of pygophore conical; spermathecal duct long and coiled with separate accessory gland.

In the second group having vertical process Freeman (1947) placed (except the only Ethiopian species *D. festivus*) the Oriental, Australasian, Australomalayan and Oceanic species. He further divided group II into two groups *i.e.* IIa on the basis of second conjunctival appendages of aedeagus simple unbranched, spermathecal duct relatively only a little or entirely uncoiled and accessory gland recurved comprising *D. koenigii* (F.), *D. solenis* (Herrich-Schäffer), *D. evanescens* Distant, *D. olivaceus* (F.), *D. similis* Freeman, *D. poecilus* (Herrich -Schäffer), *D. transversalis* Blöte, *D. concinnulus* Walker, *D. festivus* (Gerstaecker), *D. cingulatus* (F.), *D. sidae* Montrouzier and *D. longiceps* Breddin. Freeman (1947) separated his group IIb on the basis of second conjunctival appendages of aedeagus forked, spermathecal bulb pear shaped and accessory gland balloon shaped, swollen and straight.

Stehlik (1965), following Freeman (1947), formally named his species groups I (a) and (b) and II (a) and (b) as independent subgenera *i.e.* *Dysdercus* s. str., *Neodysdercus* Stehlik, *Paradysdercus* Stehlik and *Megadysdercus* Breddin of equal status adding characters of the paramere and all conjunctival appendages and extending the distribution range of *Dysdercus* s. str. into the new World. However, his parameral characters are not clear cut and show numerous variations.

\* Part of the Ph. D. thesis of second author, University of Karachi, Karachi

\*\* Department of Zoology, Jamia Millia Government Degree College, Malir, Karachi.

*Dysdercus rosaceus*, new species from Khola, Bhutan is placed in *Paradysdercus* Stehlik on the basis of second conjunctival appendages of aedeagus simple, spermathecal duct relatively only a little or uncoiled and accessory gland recurved. It is described here in detail with special reference to metathoracic scent auricle, male genitalia including inflated aedeagus and female genitalia including spermatheca and in this light its relationship within its group is also briefly discussed, particularly differentiating it from *evanescens* Distant which appears to be its closest ally, in the light of the description of *evanescens* by Freeman (1947) and that of Kapur and Vazirani (1960) and also by comparison of holotype of *evanescens* with those of the presently described new species.

#### MATERIALS AND METHODS

For the study of male genitalia particularly for the inflation of the aedeagus the techniques of Ahmad (1986) and Ahmad and McPherson (1990, 1998) were generally followed. For the inflation of aedeagus the pinned dry specimen after removing the label, was plunged into boiling water in a beaker, for 4-5 minutes. The specimen was then slipped off the pin. The genital capsule (Pygophore) was removed from the relaxed specimen under a binocular stereoscope microscope, using very fine watch maker forceps (5 or finer). The genital capsule was placed in 10% KOH and was warmed at 40°C for 5-10 minutes in a cavity block. The capsule was removed in tap water (room temperature) in a depression dish and was washed thoroughly. The fine forceps were used to hold the basal plate (attaching aedeagus to capsule) and then with the help of forceps the opening of phallosome was widened very carefully and the vesica was pulled out gently. This was done very carefully because the distal tip of vesica is very delicate and breaks off quickly.

For the dissection of the female spermatheca, the entire abdomen was warmed on a bench lamp (after completing the external view diagram of the ovipositor) for 15 minutes. The spermatheca was dissected under water after washing the specimen thoroughly. The components of male and female genitalia were preserved in glycerine in microvials

pinned with the specimens. All measurements given are in millimeters and all illustrations are to the given scales.

#### RESULTS

##### *Dysdercus rosaceus*, new species

(Fig. 1A-H)

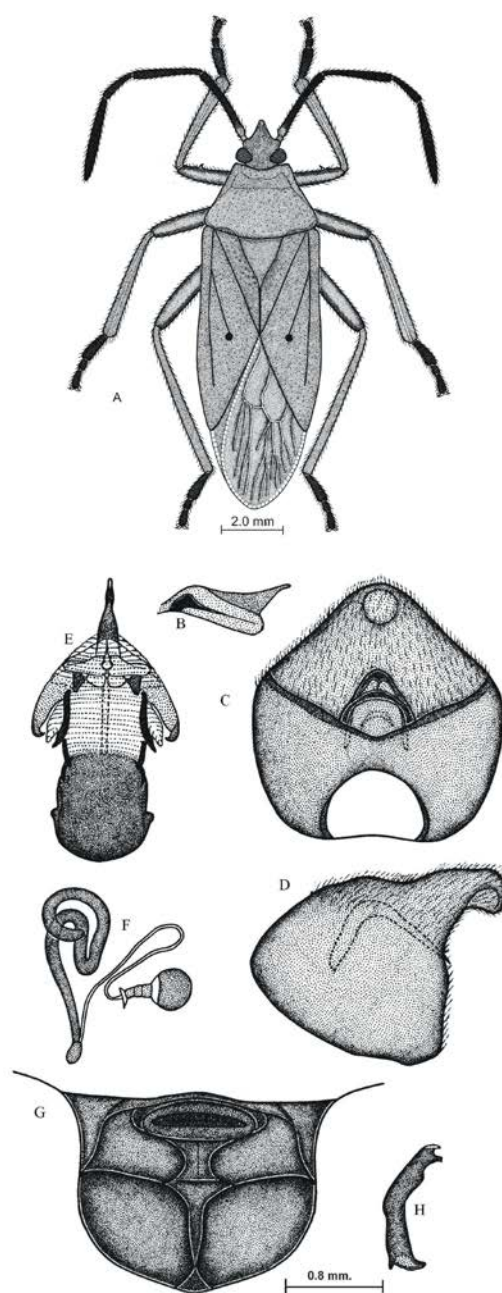


Fig. 1. *Dysdercus rosaceus*, new species; A, entire specimen; B, metathoracic scent gland ostiolar peritreme, ventral view; C, pygophore,

ventral view; D, same, lateral view; E, inflated aedeagus, ventral view; F, spermatheca, lateral view; G, female terminalia, ventral view; H, paramere, inner view.

#### Colouration

Body reddish except antennae, eyes, a small oblong spot on middle of each corium castaneous white; anterior margin of pronotum white; membrane hyaline.

#### Head

Anteocular distance about  $1\frac{1}{2}x$  remainder of head, length of head slightly shorter than its width, length of head 1.8 (1.8-2.1), width of head 1.9; antennae with second antennal segment more than  $1\frac{3}{4}x$  the length of third, length of segment I 3.2 (3.0-3.2), II 2.5 (2.4-2.7), III 1.3 (1.3-1.5), IV 3.15 (2.9-3.2), antennal formula  $3 < 2 < 4 < 1$ ; labium just reaching on to fourth abdominal venter, basal segment slightly shorter than the length of second and distinctly longer than the length of third, length of segments I 1.9 (1.9-2.4), II 2.0 (2.0-2.5), III 1.6 (1.6-2.1), IV 1.3 (1.3-1.8), labial formula  $4 < 3 < 1 < 2$ ; length anteocular distance 1.1 (1.1-1.25); length remainder of head 0.7 (0.7-0.9); interocular distance 0.9 (0.9-1.2).

#### Thorax and abdomen

Width pronotum slightly less than  $1\frac{1}{2}x$  its length, anterior angles of pronotum subacute, lateral margins concave, length of pronotum 2.6 (2.5-2.8), width 3.7 (3.6-4.1); scutellum slightly broader than long, length scutellum 1.5 (1.5-1.8), width 1.6 (1.6-1.9); metathoracic scent gland ostiolar peritreme (Fig. 1B) large, blade-like with apex broad; distance base scutellum-apex clavus 3.3 (3.3-4.1); apex clavus-apex corium 4.2 (4.0-4.5); apex corium-apex abdomen including membrane 10.5 (10.5-12.6) apex scutellum-apex abdomen including membrane 6.8 (6.7 - 14.6). Total length male 10.4, female 19.5.

#### Male genitalia

Pygophore (Figs. 1C, D) some what spherical, as broad as long, dorsoposterior margin concave, ventroposterior margin some what conically projected, sides slightly concave, vertical process not medially broad having stripe like arm with bluntly rounded tip; paramere (Fig. 1H) curved with three teeth like projections, two teeth on inner

side and one on outside, second tooth of inner side large with truncate apex, inner and outer margins distinctly sinuate; inflated aedeagus (Fig. 1E) with narrow dorsolateral membranous conjunctival appendages and pair of large broad third conjunctival appendages with hook-like apex; pair of second elongate conjunctival appendages with pointed apex, pair of first conjunctival appendages with pointed apex.

#### Female genitalia (Fig. 1G)

First gonocoxae large, broad with posterior margin slightly sinuate; ninth paratergites some what triangular and much longer than eighth paratergites, second gonocoxae with posterior margin slightly sinuate; proctiger broad with posterior margin concave; spermatheca (Fig. 1F) with prominent proximal flange, bulb somewhat spherical, pump region short, cup-like, spermathecal duct short, curved, accessory gland convoluted, tube-like.

#### Material examined

Male Holotype, Bhutan : Khola, 1972 Expedition, lodged at NHM. Basel, Paratypes : 4 male, 5 female, Bhutan : Phuntsholling, Thinphu, Kotoka-Gogona : East Nepal : Dhaukua: India: UP, Bhimtal, 1972, 15-5-1978, 23-5-1983, Ecker-Racz, W. Wittner, at NHM. Basel and lodged at Natural History Museum, Department of Zoology, University of Karachi.

#### Comparative note

This species is most closely related to *evanescens* Distant in general appearance, corium pale ochraceous or deep red, concolorous with head, callus, pronotum and scutellum and corial spots like small dots with pale membrane but it can easily be separated from it in having paramere with second tooth beak like and first gonocoxae large with proximal angles rounded in contrast to paramere with second tooth truncate and first gonocoxae large with proximal angles concave in *evanescens*.

### DISCUSSION

The presently described new species is placed in *Paradysdercus* Stehlik on the basis of second conjunctival appendages of aedeagus simple,

spermathecal duct relatively only a little or uncoiled and accessory gland recurved. The apomorphy of short spermathecal duct and tube like spermathecal

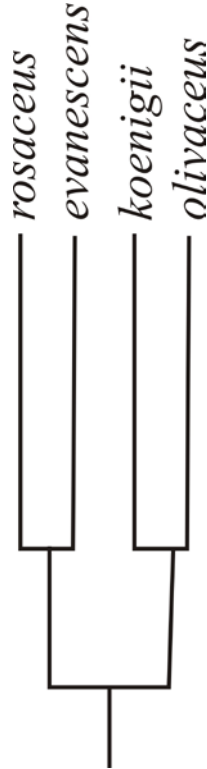


Fig. 2. Cladogram showing phylogenetic relationship of *Dysdercus rosaceus*, new species with related species.

gland, broadly long arms of vertical process and paramere with three teeth like processes closely relate *concinulus*, *evanescens*, *festivus*, *koenigii*, *olivaceus*, *poecilus*, *rosaceus*, *similis*, *solenis* and *transversalis*. In this complex of species *concinulus* appears to be entirely isolated playing outgroup relationship with the rest of clade. The new species *rosaceus*, *evanescens*, *koenigii* and *olivaceus* appear isolated and playing outgroup relationships with the rest of the species of

*Paradysdercus* in having the apomorphy of pygophoral ventral rim upturned with apex bilobate and vertical process not medially broad. Thus *D. rosaceus* and *D. evanescens* appear to play sister group relationship with each other and outgroup relationship with *koenigii* and *olivaceus* in having the apomorphy of corial spots small dot like with membrane pale. The new species appears isolated from *evanescens* in having apomorphy of first gonocoxae large with proximal angle rounded and parameral second tooth beak like (Fig. 2).

## REFERENCES

- AHMAD, I., 1986. A fool proof technique for inflation of male genitalia in Hemiptera (Insecta). *Pakistan J. entomol. Soc. Kar.*, **1**: 111-112.
- AHMAD, I. AND MCPHERSON, J. E., 1990. Male genitalia of the type species of *Coriomelaena* White, *Cydnoides* Malloch and *Galgupha* Amyot and Serville (Hemiptera : Cydnidae : Coriomelaeninae) and their bearing on classification. *Ann. entomol. Soc. Am.*, **83**: 162-170.
- AHMAD, I. AND MCPHERSON, J.E., 1998. Additional information on male and female genitalia of *Parabrochymena* Lariviere and *Brochymena* Amyot and Serville (Hemiptera: Pentatomidae). *Ann. entomol. Soc. Am.*, **91**: 800-807.
- FREEMAN, P., 1947. A revision of the genus *Dysdercus* Boisduval (Hemiptera: Pyrrhocoridae), excluding the American species. *Trans. R. entomol. Soc. Lond.*, **98**: 373-424.
- HUSSEY, R.F., 1929. *Pyrrhocoridae General catalogue of the Hemiptera. Part III*, pp. 144. Smith Coll., North Hampton, Mass, USA.
- KAPUR, A. P. AND VAZIRANI, T. G., 1960. The identity and geographical distribution of the Indian species of the genus *Dysdercus* Boisduval (Hemiptera: Pyrrhocoridae). *Rec. Indian Mus.*, **54**: 107-150.
- STEHLIK, J. L., 1965. Pyrrhocoridae and Largidae collected by E. S. Brown on Solomon Island (Heteroptera). *Acta Mus. Morav. Sci. nat. vedy prirodn.*, **50**: 253-292.

(Received 19 March 2007, revised 14 May 2007)