

## REDESCRIPTION OF *CAPPAEA ELLENRIEDER* (PENTATOMIDAE: PENTATOMINAE: CARPOCORINI)

RAEES HUSSAIN ZAIDI

*Department of Zoology, University of Karachi, Karachi, Pakistan*

(Received September 18, 1991 revised April 12, 1993)

*Cappaea Ellenrieder* with type species *Cappaea taprobanensis* (Dallas) is redescribed with emphasis on metathoracic scent gland complex, male and female genitalia. It is compared with related genera and its relationships within Carpororini Staal are also briefly discussed.

**Key words:** Revision, Tolumnia, Sub-continent.

### Introduction

*Cappaea taprobanensis* (Dallas) appears to be a potential pest of citrus in India, Assam, Burma, Bangladesh, Sri Lanka and Indonesia [1-3]. Distant (op cit.) described the species mostly on external characters and colour and gave the dorsal view diagram, of metathoracic scent gland complex and female terminalia. Abbasi [4] described it from Bengal with special reference to male genitalia but his diagram and description of aedeagus are incomplete as they were based on partly inflated aedeagus. Ahmad *et al.* [5] also gave the dorsal view diagram and recorded for the first time the species from Bangladesh.

### Material and Method

In the present paper, the genus *cappaea* and the type species *C. taprobanensis* is redescribed with special reference to metathoracic scent gland and male and female genitalia. The aedeagus was inflated following the techniques of Ahmed [6] and for measurements, illustrations, dissection of female genitalia particularly the spermatheca and for description the conventional procedures especially those used by Zaidi and Ahmad [7] were followed. All the measurements are in millimeters.

Following abbreviations are used for the Natural History Museum, London (NHM); Pakistan forest Museum (PFM) and Natural History Museum, Department of Zoology, University of Karachi (NHMUK).

*Cappaea Ellenrieder*. *Cappaea ellenrieder* [8]:146; Mayr [9]:65; Staal [10]:514; Atkinson [11]:122; Distant [1]:149; Kirkaldy [2]:49; Stichel [3]:752; Ahmad *et al.* [5]:38.

Type species *Cappaea taprobanensis* (Dallas).

**Head.** Almost as long as broad; antenniferous tubercles visible from above; labium distinctly passing beyond hind coxae, basal segment not reaching to margin of head; ocelli prominent, closer to the eyes.

**Thorax.** Anterior margin of pronotum concave, usually medially straight, almost equal to head across eyes; posterior

margin sinuate, medially almost straight; pronotum usually 1 1/2x shorter than scutellum; ostiole of metathoracic scent gland complex broad, evaporatoria well developed usually with black spots.

**Abdomen.** Usually broader than long, medially broad, anterior and posteriorly narrowed.

**Male genitalia.** Pygophore with the anterior opening usually broad, almost triangular, the posterior opening usually small lateral margins sinuate; paramere reduced; theca of male genitalia usually elongate with lateral margins sinuate, penial lobe usually broad, plate like.

**Female terminalia.** First gonocoxae mostly concealed, with round, convex posterior margin; 9th paratergites passing beyond fused posterior margin of the 8th paratergites; arcus and triangulin entirely concealed.

**Comparative note.** This genus is closely related to *Croantha* Stål in having paraclypei usually as long as clypeus and never enclosing it in front but it can easily be separated from the same by body with several black spots, ventroposterior margin of pygophore medially deeply concave and paramere reduced in contrast to body uniformly coloured ventroposterior margin of pygophore almost straight and paramere well developed, L-shaped.

*Cappaea taprobanensis* (Dallas) (Figs 1A-H).

*Pentatoma taprobanensis*, Dallas [12]:244.

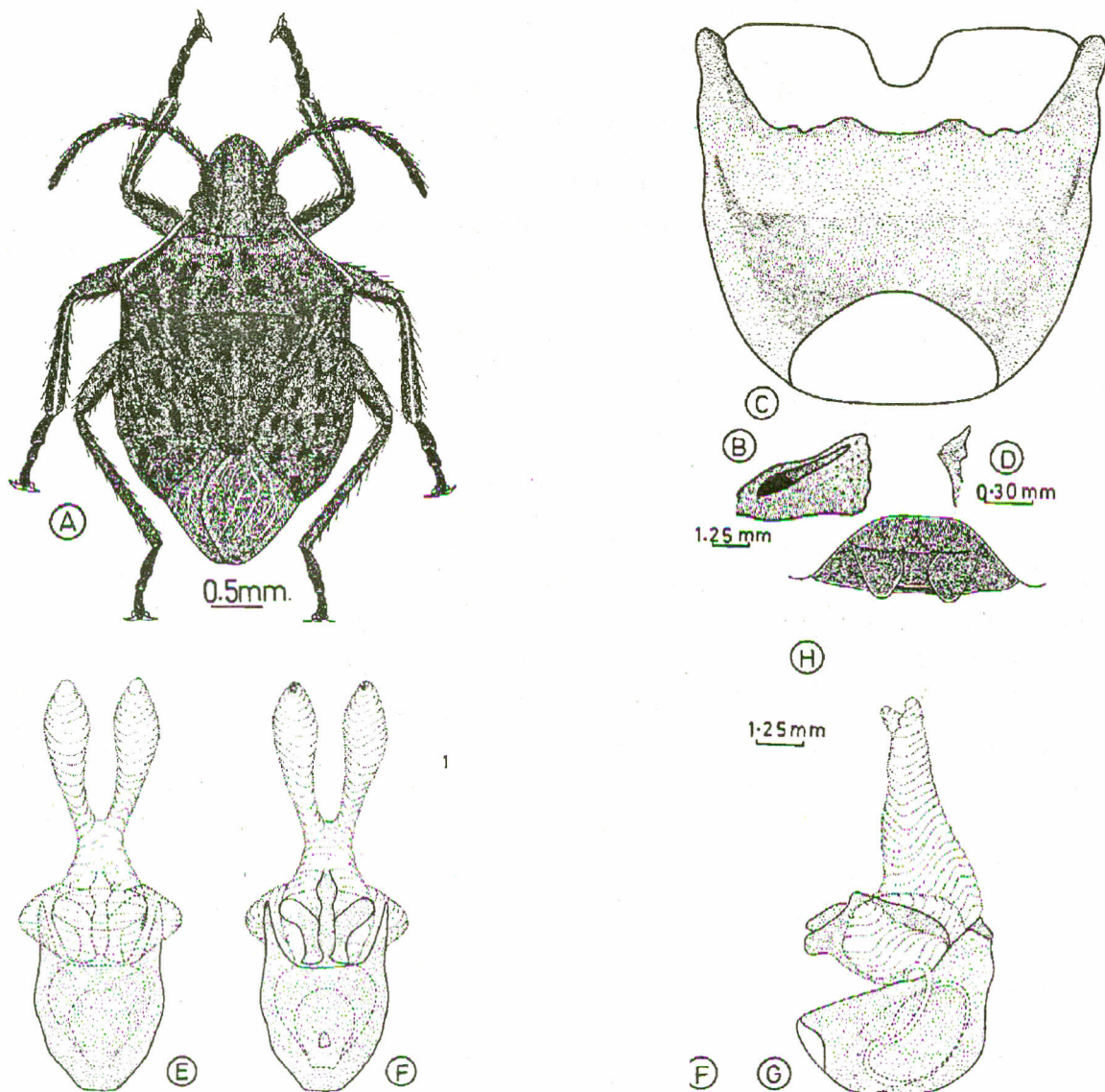
*Cappaea multilinea* Ellenrieder [8]:147

*C. taprobanensis* Atkinson [11]:22; Sharp [13]:409;

Kirby [14]:84; Distant [1]:149; Kirkaldy [2]:49; Stichel

[3]:752; Ahmad *et al.* [5]:38; Ahmad [15]:47

**Colouration.** Body yellowish except four longitudinal stripes on head, numerous spots on pronotum, basal angle of scutellum and two small and four large spots near base of scutellum, numerous spots on hemelytra, spots on connexiva and legs black; eyes brownish black; ocelli pink; antennal proximal segment yellowish brown; 2nd, 3rd and 4th antennal segments and tarsi brown.



Figs. 1A. *Cappaea taprobanensis* (Dallas) dorsal view; 1B. Scent gland ventral view; 1C. Pygophore dorsal view; 1D. Paramere inner view; 1E. Aedeagus dorsal view; 1F. Aedeagus ventral view; 1G. Aedeagus lateral view; 1H. Female terminalia ventral view

**Head.** Distinctly longer than pronotum; laterla margins of the paraclypei entire, slightly shorter than clypeus; antecular distance distinctly longer than remainder of head; antennae with 2nd segment distinctly longer than 3rd, length of antennal segments (I) 0.7, (II) 0.95, (III) 1.3, (IV) 1.5, (V) 1.5; antennal formula  $1 < 2 < 3 < 4 = 5$ ; labium reaching to 3rd abdominal venter, 3rd segment distinctly shorter than 2nd, length of labial segments (I) 1.6-1.7, (II) 1.8-.9, (III) 1.45 1.50, (IV) 1.6-1.7, labial formula  $3 < 1 = 4 < 2$  length of the antecular distance 1.4- 1.5; length of the remainder of head 1.0; width 2.4; interocular distance 1.5; interocellar distance 0.9.

**Thorax.** Width of the pronotum distinctly more than  $2 \frac{1}{2}x$  wider than its length; anterior angles toothed, directed anteriorad, humeral angles acute, laterla margins substraight;

length of the pronotum 2.1-1.15, width 5.5-.5.6; scutellum slightly broader than long, distinctly longer than head length, apex of apical lobe subround; length of scutellum 3.5- 3.7, width 3.4-3.6; metathoracic scent gland ostiole (Fig. 1 B) large, triangular, peritreme elongate, passing beyond half of the evaporatoria; membrane of hemelytra distinctly longer than abdomen; length base scutellum- apex clavus 2.7-2.8; apex clavus-apex corium 2.15-2.00; apex corium-apex abdomen including membrane 1.40-1.55; apex scutellum- apex abdomen including membrane 2.4-2.55.

**Abdomen.** Broader than long; 7th female abdominal sternum concave; connexiva slightly exposed at repose; total body length male 10.30-10.75.

**Male genitalia.** Pygophore (Fig. 1 E) almost as long as

broad, dorsoposterior margin straight, medially deeply concave, lateral lobes subround, ventroposterior margin sinuate; paramere (Fig. 1 D) almost T-shaped, inflated aedeagus (Fig. 1 E, F & G) with pair of elongate thecal conjunctival appendages, pair of elongate ventral membranous conjunctival appendages, apically sclerotized, pair of ventral lobe-like membranous conjunctival appendages; vesica short, not passing beyond half of dorsal membranous conjunctival appendages.

*Female genitalia* (Fig. 1 H). First gonocoxae triangular; 9th paratergites lobe-like; arcus and triaguline concealed; spermatheca mutilated.

*Material examined.* Holotype male, *Pentatoma taprobanensis* Dallas; India, several male and female specimens from Sri Lanka, Java, Sumatra and India in BMNH; 1 male and 1 female Bangladesh; Dacca on unidentified grass lodged at NHMUK and PFM.

*Relationships.* Stål [16] in his key to the Carpacorine genera recognized three groups which were later named by Atkinson [11] as Tropicoryphera, Cappacaria and Carpocoraria at a level of division. Later Distant [1] rightly merged them within carpocoraria (tribe carpocorini) but defined it not on the basis of apomorphies but plesiomorphies (discussed in detail by Zaidi [17]). However Distant (op cit.) did recognize an apomorphy for Cappacaria in its central lobe i.e. clypeus more prominent than lateral lobes i.e. paraclypei. This trait, however is also shared by some other carpocorine genera viz Kamaliana Ahmad and Zaidi, Mormidella Horvath, Codophila Mulsant and Rey, not included by Atkinson (op cit.) in his Cappacaria. Therefore this apomorphy also does not justify the elevation of Cappacaria to tribal level.

In fact Cappacaria and Codophila appear to form sister group relationship and share the apomorphies of oval body, head anteriorly narrowed and body surface with elongate coloured stripes and patches [18] a genus placed by Atkinson (op cit.) under altogether entirely different division Carpocoraria. Atkinson (op cit.) defined his Carpocoraria on the basis of apomorphy of a short or very short peritreme of metathoracic scent gland complex but it is interesting to note that at least two species of Codophila i.e. *C. maculicollis* Dallas and *C. sariabensis* Ahmad and Zaidi (Ahmad and Zaidi [18]) do not share this apomorphy.

*C. taprobanensis* is considered here more derived having autapomorphy of an elongate peritreme passing beyond 0.5 of the evaporatoria of metathoracic scent gland complex.

**Acknowledgement.** Author would like to express sincere

thanks to his Ph.D supervisor Professor Dr. Imtiaz Ahmad, Department of Zoology, University of Karachi, for the critical review of the manuscript and for the guidance during this work. Author also would like special thanks to Director, MAH Qadir Biological Research Centre, University of Karachi for providing the working facilities.

#### References

1. W.L. Distant, *The Fauna of British, India Including Ceylon and Burma* (Rhynchota 1, Taylor and Francis London, 1902).
2. G.W. Kirkaldy, *Catalogue of the Hemiptera* (Heteroptera) with Biological and Anatomical references, List of Host/Food Plants and Parasites etc. 1 Cimicidae (Felix Dames, Berlin) (1909).
3. W. Stichel, 1960-62. Illustrierte Bestimmungstabellen der wauzen, 11 Europe (Hemiptera: Heteroptera) Berlin 104 (11-14) (1960-62).
4. Q.A. Abbasi. Pakistan J. Ent. Kar. suppl., 5, 56 (1986).
5. I. Ahmad, Q.A. Abbasi, A.A. Khan, Karachi ent. Soc. Suppl., 1, 1 (1974).
6. I. Ahmad, Pakistan J. Ent. Kar., 1,(2), 111 (1986).
7. R.H. Zaidi and I. Ahmad, Pak. j. sci. ind. res., 23, 95 (1989).
8. C.A. Ellenrieder, Nat. Tijdschr. Ned. Ind., 4 (24), 130 (1862).
9. G.L. Mayr, Verh. Zool. Bot. Ges. Wien., 16, 361 (1866).
10. C. Stål Ofv. K. Svenska, Vet. Akad. Forh., 25 (7), 495 (1987).
11. E.T. Atkinson, J. Asial Soc. Begn., 57, 1 (1888).
12. W.S. Dallas List of Specimens of Hemipterous Insects in Collection of the British Museum, Brit. Mus. Pust. London (1851).
13. Sharp, Trans. R. ent. Soc. Lond., 399 (1890).
14. W.F. Kirby, J. Linn. Soc. Lond., Zool., 24, 72 (1891-1892).
15. I. Ahmad, Karachi ent. Soc. suppl., 4 (1), 1 (1979).
16. C. Stål, K. svenska vet. Akad. Handl., 9, 1 (1876).
17. R.H. Zaidy, 1988. Aspects of Morphology and Taxonomy of Aeliini Stål and Carpocorini Stål (Pentatomidae: Pentatominae) of Indo-Pakistan Subcontinent with their Cladistic Analysis, Ph.D. Thesis Submitted to Department of Zoology, University of Karachi. (Unpublished) (1988).
18. I. Ahmad and R.H. Zaidi, Bull. Dela Soc. Entomologique Suisse (1990).