

# A New Species of *Caystrus* Stål (Hemiptera: Pentatomidae) from New Guinea with Reference to Phylogenetic Relationships\*

MUHAMMAD ZAHID\*\* AND IMTIAZ AHMAD

Dr. Afzal Hussain Qadri Biological Research Center, University of Karachi, Karachi-75270

e-mail: iahmad3141@yahoo.com

**Abstract.-** A new species of the genus *Caystrus* Stål from New Guinea with special reference to its metathoracic scent auricle and male genitalia including inflated aedeagus is described in detail and in this light its phylogenetic relationships within its genus is also briefly discussed.

**Key words :** Pentatomidae, *Caystrus bergmani*, new species, Hemiptera from New Guinea.

## INTRODUCTION

**D**uring a revision of the genus *Caystrus* Stål at world level, the present authors borrowed a large number of determined and undetermined specimens from Rijks Museum Stockholm, Sweden with an aberrant male specimen from Sorong, New Guinea which looked isolated in its genus with paratype widely separated but not enclosing clypeus in front and apically remarkably rounded. With Asiatic stock this remarkable specimen shares paratype in front of eyes making a lobe and lateral margins of pronotum at least slightly bilobed. The male genitalia specially inflated aedeagus is remarkably different and appears isolated among all the species of the genus *Caystrus*. It is, therefore, described as a new species here with reference to metathoracic scent auricle and male genitalia including inflated aedeagus and its phylogenetic relationships within its genus is also briefly discussed.

## MATERIALS AND METHODS

Authentically determined and undetermined specimens of *Caystrus* Stål were borrowed by the courtesy of In Charge Hemiptera Section, Department of Entomology and by the authorities of Rijks Museum of Natural History Stockholm, Sweden (NHMS). The techniques of Ahmad and Kamaluddin (1985) and Ahmad and Afzal (1979, 1989) for measurements and illustrations were followed and for inflation of aedeagus and examination and illustrations of male genitalia that of Ahmad (1986) and Ahmad and McPherson (1990, and 1998) were 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 stereo microscope, using very fine watch maker forceps (5 or finer). The genital capsule (pygophore) was then placed in 10% KOH and was warmed at 40°C for 5-10 minutes in a cavity block. The genital capsule (pygophore) 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

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

\*\*Present address: Department of Zoology, Federal Urdu University of Arts, Sciences & Technology, Gulshan-e-Iqbal Campus, University Road, Karachi, Pakistan.

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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. The measurements are given in millimetre and the illustrations are to the given scale.

## RESULTS

### *Caystrus bergmani*, new species (Fig. 1)

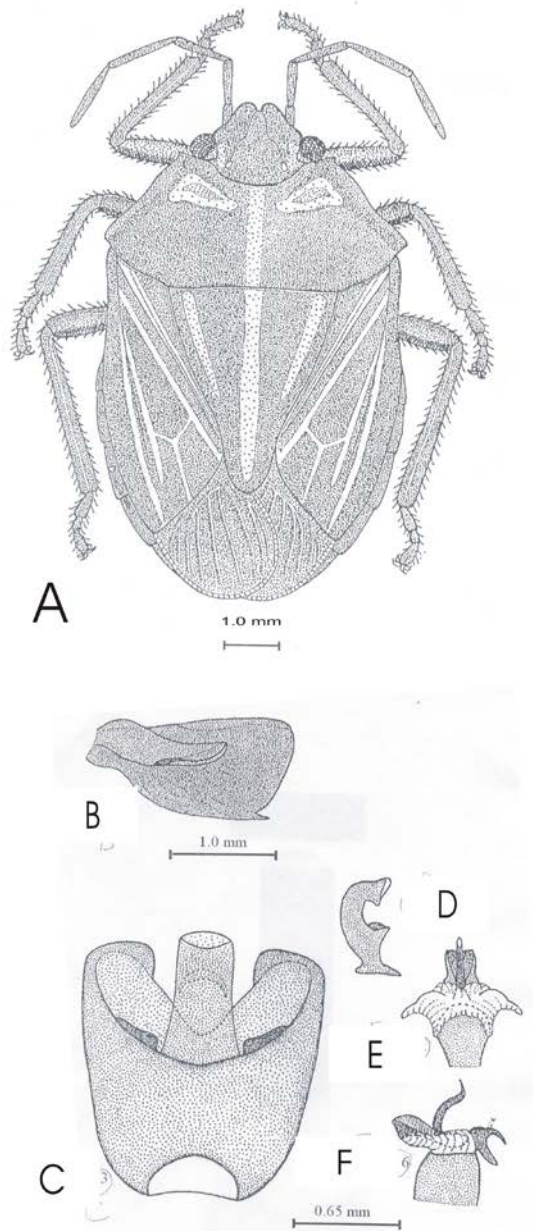


Fig. 1. *Caystrus bergmani*, new species; A, dorsal view; B, metathoracic scent auricle,

ventral view; C, pygophore, dorsal view; D, paramere, inner view; E, inflated adeagus, ventral view; F, inflated adeagus, lateral view.

### Colouration

Body ochraceous brown with dense black punctures, antennae and legs without punctures; eyes brownish black; ocelli pinkish; membrane hyaline.

### Head

Distinctly broader than long, antecular distance shorter than remainder of head; paraclypei longer than clypeus but not enclosing the later, lateral margins slightly sinuate; clypeal lobe in front of eyes with subrounded angle, apex of head smoothly rounded; antennae with basal segment about equal to head apex, second segment slightly shorter than third, fifth longest, length of antennal segments I 0.5, II 0.8, III 0.9, IV 1.15 and V 1.4, antennal formula 1<2<3<4<5; labium passing beyond mesocoxae, second segment longest, fourth shortest, length of segments I 0.7, II 1.0, III 0.90 IV 0.65, labial formula 4<1<3<2; antecular distance 0.8, remainder of head 1.0, width of head 2.4; interocular distance 1.35; interocellar distance 0.85.

### Thorax

Pronotum more than 2.25x broader than its length, anterior margin broader than head width across eyes, anterior angles laterally toothed, humeral angles sub-acutely produced, lateral margins distinctly sinuate, length of pronotum 2.1, width 5.0; scutellum with three longitudinal fasciae and rounded apex, length of scutellum 3.9, width 3.0; metathoracic scent ostioler complex (Fig. 1B) with peritreme elongate, thumb like, apex subacute, reaching more than  $\frac{1}{2}$  of evaporatoria, anterior margin of peritreme concave and posterior margin largely convex, ostiole slit like; distance base scutellum-apex clavus 2.9; apex clavus-apex corium 1.8; apex corium-apex abdomen including membrane 1.3; apex scutellum-apex abdomen including membrane 2.3.

### Abdomen

Convex beneath, connexiva exposed at repose, shorter than membrane of hemelytra; total length 10.1.

*Male genitalia*

Pygophore (Fig. 1C) longer than broad, somewhat rectangular, dorsomedian surface concave, dorso inner process broad, plate like, lateral lobe broad with convex posterior margin, ventroposterior margin deeply concave; paramere (Fig. 1D) F-shaped with blade short and apex broadly truncate, outer margin convex, inner margin slightly sinuate; aedeagus (Fig. 1E, F) without thecal appendages, inflated aedeagus with pair of ventrolateral membranous conjunctival appendages, vesica longer than penial plates.

*Material examined*

Holotype male, NYA GUINEA, Sorong, 28.6.1949, Stem Bergman; in NHMS.

*Comparative note*

This species is most closely related to *C. pallipes* Stål in having paraclypei apically round in front and third antennal segment much reduced but it can easily be separated from the same in having dorsomedian line prominent and longitudinal fasciae basally on either side on scutellum present.

**DISCUSSION**

Zahid (2006) revised the world species of *Caystrus* on the basis of male and female genitalia. The members of *Caystrus* appear to fall into two groups. One group appears to represent Asiatic stock defined by the synapomorphic characters i. e., paraclypei in front of eyes making a lobe and lateral margins of pronotum at least slightly bilobed. This Asiatic clade represented by *pallipes*, Stål *bergmani* sp.n., *orientalis* Zhang and Linn and *obscurus* Distant appear neatly held together by the synapomorphic character i.e., paraclypei only slightly longer and never enclosing clypeus. This clade (Fig. 2) appears to fall into two sister groups, i.e. the first represented by *pallipes* and *bergmani* appears held together by the synapomorphic characters i.e., paraclypei apically rounded in front. This sister group plays out group relationship with the other sister group of this subclade represented by *orientalis* and *obscurus* which appears neatly held together by the synapomorphic trait i.e., paraclypei

apically angulate in front. In its sister group of subclade, *C. bergmani* appears entirely isolated on the basis of autapomorphic characters i.e., longitudinal fasciae present basally on either side of scutellum and median dorsal line prominent.

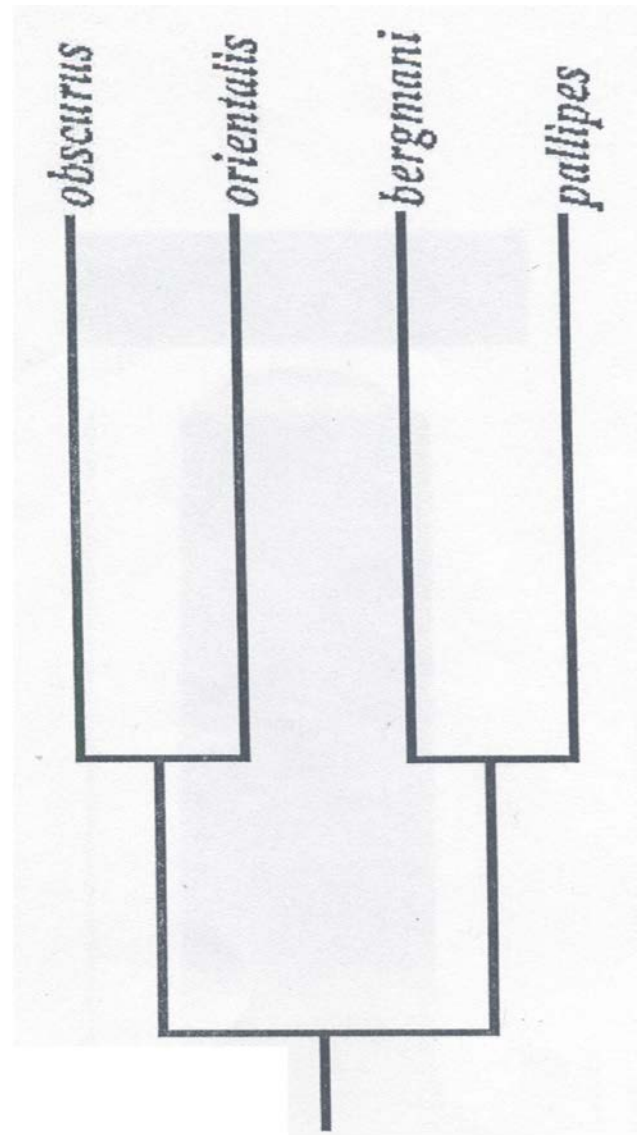


Fig. 2. Cladogram showing phylogenetic relationship of *bergmani* with related species.

The presently described new species *bergmani* also appears entirely isolated in its Asiatic stock on the basis of ventromedian surface of pygophore (v-shaped) deeply concave, paramere with blade short and apex knob-like and inflated

aedeagus without thecal appendages and with pair of ventrolateral membranous conjunctival appendages and vesica longer than penial lobes. Its entirely isolated position among the species of *Caystrus* necessitate its designation as a new taxon.

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