



## ***Coptosoma variegatum* (Herrich-Schäffer, 1838) (Hemiptera, Plataspidae) infesting mango in Kerala and Karnataka with redescription of the species**

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**ABSTRACT:** The incidence of *Coptosoma variegatum* (Herrich-Schäffer, 1838) on mango tree is reported for the first time from south Indian states, Kerala and Karnataka. The bugs colonised and fed on tender shoots of mango trees. Even though the extent of damage was low, the insect in association with other pests may affect the vigour of young trees. The species is redescribed and illustrated based on male and female genitalia. © 2023 Association for Advancement of Entomology

**KEYWORDS:** Heteroptera, host plant, first report, morphology, genitalia

Mango, the most popular fruit in the world, commonly known as ‘King of fruits’, is attacked by 300 species of insect pests in different parts of the world (Patel *et al.*, 2004). Leaf webber, *Orthaga exvinacea* (Hampson), mango leafhoppers, *Amrtitodus* spp. and *Idioscopus* spp., fruit fly, *Bactrocera dorsalis* (Hendel), stem borer, *Batocera rufomaculata* (De Geer), leaf cutting weevil, *Deporaus marginatus* Pascoe and nut weevil, *Sternochetus mangiferae* (Fabricius), are important insect pests. In addition many insects of minor importance are also observed to attack mango trees.

Members of Plataspidae are usually small to medium size, usually orbiculate and coloured black or brown, often shiny with pale stripes or spots and

comprise 66 genera and 606 species from world (Rider *et al.*, 2018). They are reported as phytophagous (Candan *et al.*, 2012). *Coptosoma* was mentioned as the largest genus to effect economic loss to the crops (Schaefer *et al.*, 2000). Species of *Coptosoma* occur in India, China and Southeast Asia through Indonesia to New Guinea (Rider, 2010). According to Zhang *et al.* (2012), adults and nymphs feed on tender stems or leaves of plant family Fabaceae leading to defoliation and reduced photosynthesis due to sooty mold which affects development of pods. The incidence of infestation by *Coptosoma variegatum* (Hemiptera, Plataspidae) on mango flowers was reported for the first time in Malaysia (Huda *et al.*, 2020). The present study reports its incidence and feeding on the tender shoots of mango trees in Kerala

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(Alappuzha) and Karnataka, along with the redescription of the species based on male and female genitalia.

The bug samples were collected during April, 2022 from mango trees located at Rice Research Station, Moncompu, Alappuzha district, Kerala. The trees did not receive any pesticide application. The bugs were found to colonise new flushes of mango trees (Fig.1) and almost all tender shoots. Besides, as per the observations made by the second author, this species was also found feeding on mango inflorescence in Nelamangala, Bangalore, Karnataka (Fig. 3).

The infested shoots were carefully inserted into finely perforated polythene bags of suitable size and thoroughly shaken to collect insects inside the bag. Uninfested fresh shoots were provided as food for the collected insect's in-order to confirm their feeding. Few of the collected insects were preserved in 90 per cent ethanol to facilitate taxonomic identification. They were identified as the black stink bug, *Coptosoma variegatum* (Herrich-Schäffer, 1838) (Figs. 4–5) [based on Distant, 1902; Davidivá-Vilímová, 2006].

***Coptosoma variegatum* (Herrich-Schäffer, 1838) (Figs. 4–15)**

**Colouration-** Dorsum (Fig. 4) shining black with bright markings as follows: head with mandibular plates in front of compound eyes (except lateral margins), broad and oblique line, intersected by a black line on lateral margins of pronotum (including the moderately dilated anterolateral margins), 1+1 small, oval or roughly round well separated spots medially beneath anterior margin of pronotum, 1+1 small round spots mesad of humeri, sometimes with 1+1 minute spots at each basal angles of scutellum; 1+1 elongate (size variable), transverse spots at basal area of scutellum demarcated by a narrow line, circumference of scutellum (except basal margin) and antennal segments (segments IIb–IV with dark brown sheen), yellow. Ventral side of the body shining black (Fig. 5) with well-defined markings as follows: head, extreme lateral margins of meso and meta pleura, abdominal ventrites III–VII, narrow, tumescent linear spots (with spiracles

embedded) mesad of each marginal spots from III–VII, circumference of male genital capsule, yellow. Legs and Labium yellowish with black shade.

**Structure-** Head declivous, rounded apically, broader (including compound eyes) than long, mandibular plates as long as clypeus, not meeting in front of clypeus; basal region of head accommodated in the middle concavity of anterior pronotal margin. Antennae five segmented with segment II<sub>a</sub> shortest; antennal segments from shortest to longest: II<sub>a</sub> < I < II<sub>b</sub> = III < IV. Pronotum convex dorsally with anterolateral margins slightly explanate and convex, anterolateral angles rounded, lateral margins obliquely straight towards humeri; humeri rounded; scutellum broad, medially convex, basal area developed as a narrow transverse stripe and demarcated from rest of the region with a faint suture. Labium reaching posterior margin of ventrite III; peritreme short, spout-like, extends slightly beyond midmetapleuron

**Measurements-** Body length: male: 2.4–2.8 mm; female: 3.05–3.10 mm.

**Male genitalia** (Fig. 6, 8–13) *Genital capsule* subquadrate, ventral rim (vm) shallower than dorsal rim (dm), emarginated medially, ventral rim emargination narrower than dorsal rim emargination; dorsal sinus (ds) of posterior aperture, short and oval, dorsal rim deeply and broadly emarginated; infoldings of dorsal rim impressed laterad of dorsal sinus, deep central impression around posterior aperture; infoldings of ventral rim with a tuft of fine setae at middle. *Paramere* (Figs. 11–12) with crown (cr) slightly broader than stem (st) with apex broadly angulate, crown attached at an oblique angle to stem. *Phallus* short with apical 1/3 moderately sclerotized, remaining 2/3 membranous, basal apparatus sclerotized.

**Female genitalia** (Figs. 14, 15)- **Terminalia** (Fig. 14). Laterotergites VIII (lt8) not separated along midline forming broad, transverse plate posteriad of laterotergites IX (lt9); valvifers VIII (vf8) large elongate more or less triangular, with mesial margins straight. Spermatheca with a prominent spermathecal pump (Fig. 15) and spermathecal duct tube-like; spermathecal pump with apical receptacle

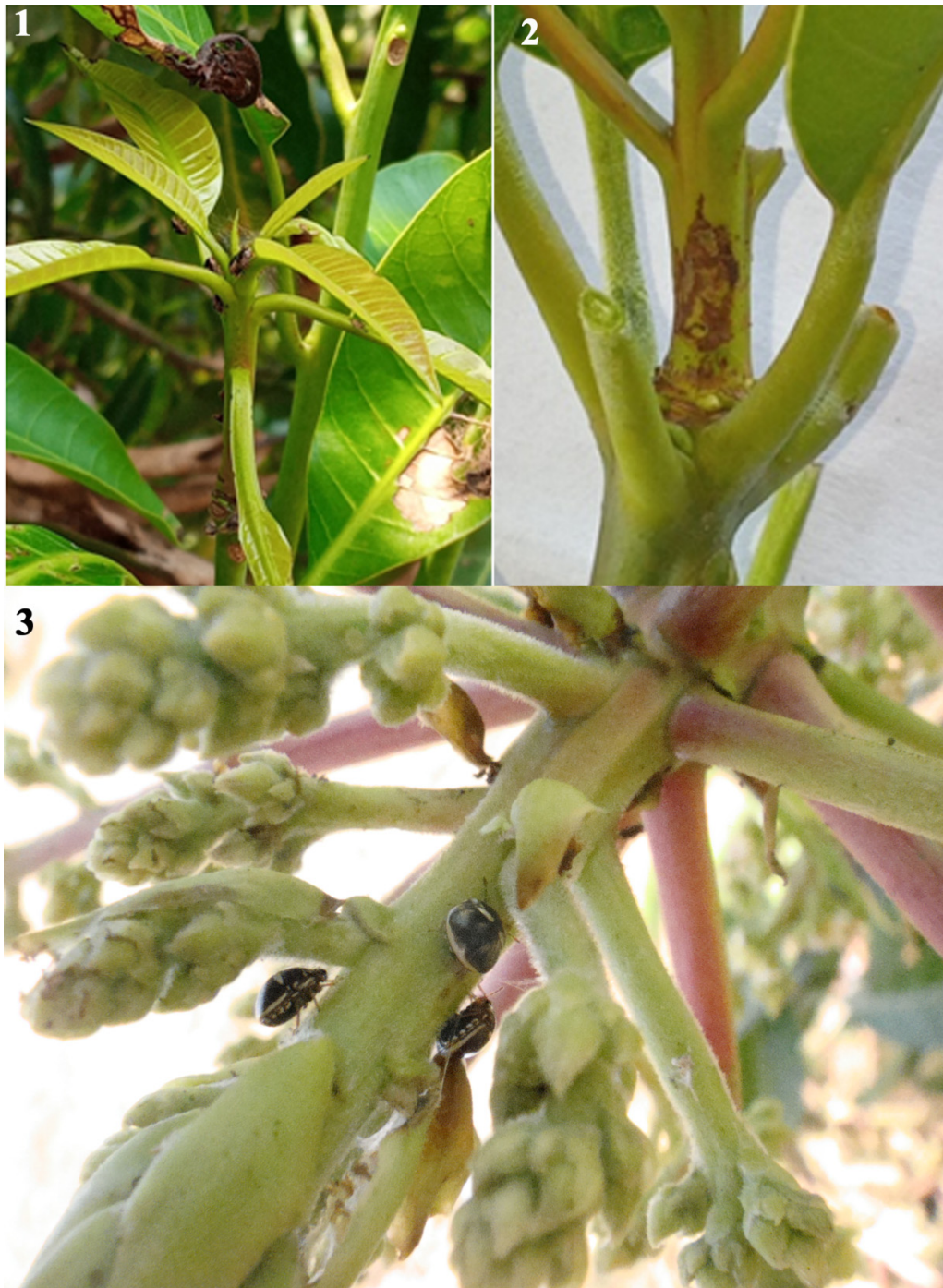
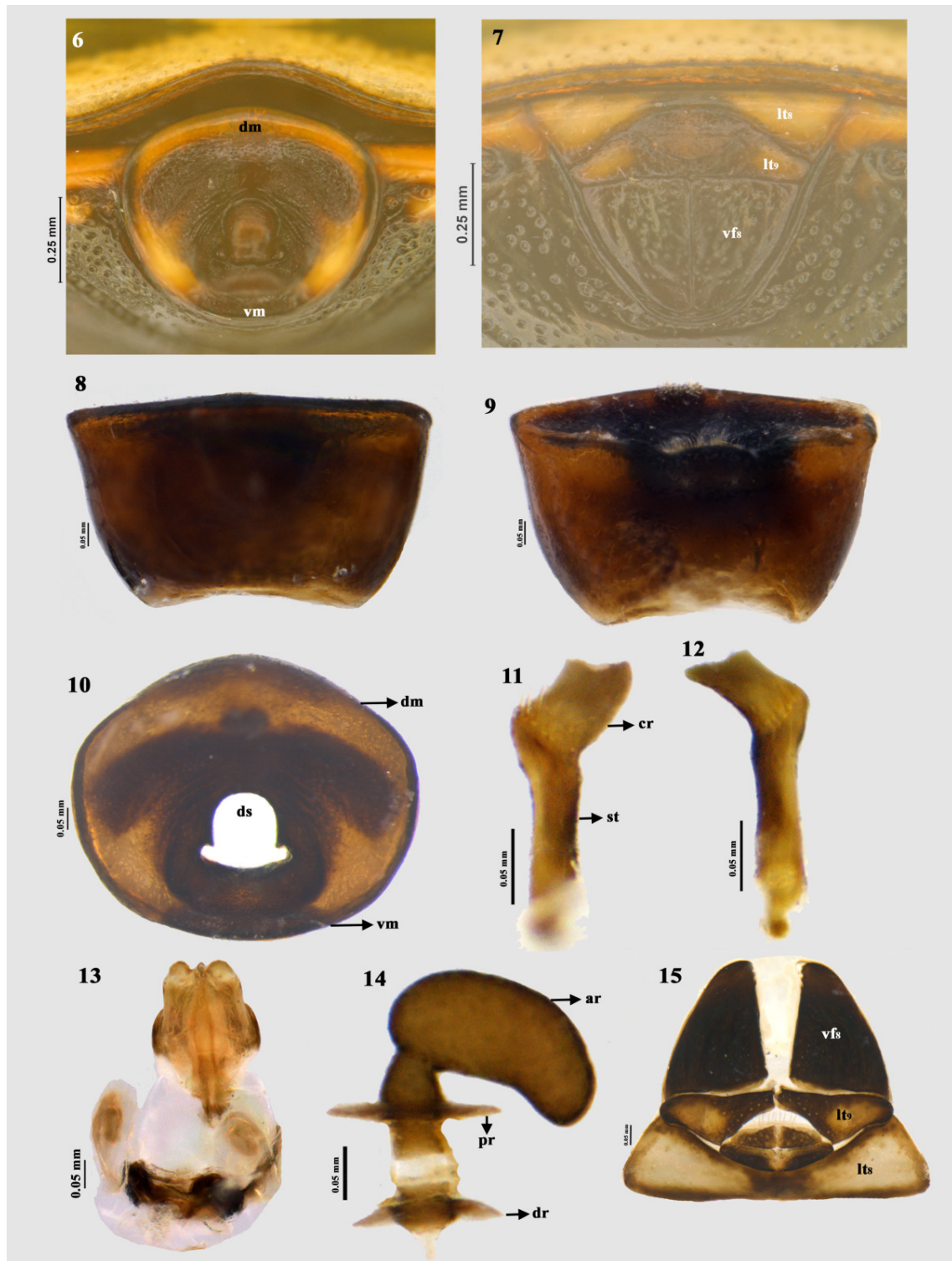


Fig. 1 Colonization of bugs on tender shoots in mango tree, Fig. 2 Feeding marks developed on mango shoots, Fig. 3. Aggregation of bugs on mango inflorescence



Figs. 6–15. *Coptosoma variegatum* (Herrich-Schaeffer) (male and female genitalia). Fig. 6 close up of male genitalia; Fig. 7 close up of female genitalia; Fig. 8 genital capsule (dorsal); Fig. 9 genital capsule (ventral); Fig. 10 genital capsule (caudal); Fig. 11–12 paramere (different planes); Fig. 13 phallus; Fig. 14 spermatheca; Fig. 15 terminalia. Lettering: ar—apical receptacle; cr—crown; dm—dorsal rim; dr—distal flange; ds—dorsal sinus; lt8—laterotergite VIII; lt9—laterotergite IX; pr—proximal flange; st—stem; v8—valvifers VIII; vm—ventral rim.



Figs. 4–5. *Coptosoma variegatum* (Herrich-Schaeffer). Fig. 4 habitus (dorsal); Fig. 5 habitus (ventral).

(ar) elongate oval, distal flange (dr) nearly equal size to proximal flange (pr).

**Remarks:** The number and size of spots on pronotum are variable among the collected specimens. The illustration of various specimens shows slight variation especially in the shape of the parameral crown and also in dorsal and ventral rim of the genital capsules as mentioned earlier by Davidivá-Vilímová (2006). Therefore, the observed variability in the present investigation is considered as mere variation unless a thorough revision of this problematic *Coptosoma* genus group is completed. The nomenclature of antennal segments follows Leston (1956).

In the present investigation, bugs colonized tender shoots and sucked plant sap (Fig. 1). The feeding marks later turned into brown patches (Fig. 2). Bugs moved to the tip of the new flushes to continue feeding. The bugs were not present on mature twigs. Though the incidence of *C. variegatum* was not observed to reduce the vigour of the trees, the development of new flushes was affected. The heavy incidence on tender shoots may suppress the vigour of young tress or seedlings. In addition to this, the infestation may also extend to the inflorescence as recoded by Huda *et al.* (2020)

from Malaysia. Indirect effects caused by the feeding of *C. variegatum* have to be studied.

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