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Occurrence of Cyperus root borer, *Athesapeuta cyperi* Marshall (Curculionidae: Coleoptera: Baridinae) as a minor pest of banana

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ABSTRACT: During the course of field investigation in North-eastern region, Guwahati, Assam the banana plants were found infested with the weevil *Athesapeuta cyperi* and it was a new report.

KEYWORDS: Cyperus root borer, *Athesapeuta cyperi*, banana, Assam.

Banana and plantains are infested more than dozen pests in banana growing areas of India (Padmanaban and Mustaffa, 2010) and more than twenty eight borer pests has been reported in banana worldwide of which stem weevil and corm weevils are economically important (Seshu Reddy et.al., 1993). Two minor coleopterans such as small banana weevil, *Polytes mellerborghii* Boheman and banana beetle, *Sybra praeusta* Pascoe were reported on banana from India (Padmanaban *et.al.* 2001). Cyperus root borer, *Athesapeuta cyperi* Marshall has been reported by many authors infesting on sugarcane and Cyperus (William, 1931; Ramesh and Ramamoorthy, 2012; Poinar, 1964; Marshall, 1928; Gosh, 1921). Biology and other details of Cyperus root borer has been reported by Kadam and Ibrahim (2003) but incidence of this pest on banana has not been reported.

During the field visit to North-eastern region, Guwahati Assam on banana plants a small curculionid weevil was recorded on cv.Malbhog (Silk –Rasthali AB) (Fig 1.a) and these small active weevils were harbouring in between the outer and inner leaf sheath situated below the leaf base area and little below. These weevils were found in aggregation of about 14 weevils per colony and up to 36-56 weevils per plant in four leaf sheaths were recorded. The Weevil makes small holes on the leaf sheath and feeding on the leaf sheath and feeding results in jelly exudation. This weevil was recorded in banana plants Kahikuchi and Bijoy Nagar area of Kamrup district. The weevil is very

Fig.1 a. *Athesapeuta cyperi* Marshall

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active and fast moving when compared to corm weevil and small banana weevil which has been already recorded.

In the field the weevil also found infected with a white cottony fungal growth (Fig. 1.b) and the same was identified as *Beauveria bassiana.* Out of the weevils collected the incidence of fungi was 4.25% (ranging from 1.78 to 3.57).

Fig1. b. *Beauveria bassiana* infected weevil

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First record of the pest termite *Coptotermes beckeri* Mathur and Chhottani (Isoptera: Rhinotermitidae) from Kerala

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ABSTRACT: *Coptotermes beckeri* Mathur and Chhotani, a subterranean termite species under Rhinotermitidae family is reported for the first time from Kerala. Subterranean termites are polyphagous and consume all available cellulose materials- paper, dead wood in structural frames, live wood in plantations and forests alike, hence gain a significant pest status. © 2016 Association for Advancement of Entomology

KEYWORDS: Subterranean, Polyphagous, *Coptotermes beckeri*, Kerala

The invasion of termites has always been a big problem for humans, since the damage caused by them lead to huge economic loss. They are one of the most destructive insect pests (Cheng and Cheung, 2014) all over the world. Among termites, *Coptotermes* spp. (Isoptera: Rhinotermitidae) are widely distributed and highly destructive in nature (Maiti, 2006). Most of the species of this genus are subterranean and are among the major house and structure infesting termites (Scheffrahn and Su, 2000). From India, seven species of *Coptotermes* are reported, *Coptotermes ceylonicus* Holmgren, *Coptotermes gaurii* Roonwal and Krishna, *Coptotermes gestroi* (Wasmann), *Coptotermes heimi* (Wasmann), *Coptotermes kishori* Roonwal and Chhotani, *Coptotermes premrasmii* Ahmad and *Coptotermes beckeri* Mathur and Chhotani, of these, the last three are endemic to India (Krishna *et al.,* 2013). Of the above *C. heimi* is a global invasive and widespread species.

A termite attack was noticed on wooden doors (Fig.5) and some concrete areas in an apartment (located on the third floor), in Chalapuram (lat-11.24°N long- 75.79°E), Kozhikode Dist, Kerala, on 27.xi.2014. A few samples were collected and taxonomically analysed. Based on Roonwal and Chhotani, 1989 and also Maiti, 2006, the termite was identified to be *Coptotermes beckeri* (Fig.1-2) a subterranean species, formerly reported only from Tamil Nadu (Krishna *et al.,* 2013). This report forms the first record of the species from Kerala. Three species of *Coptotermes* known hitherto from Kerala are *C. heimi*, *C. ceylonicus* and *C. kishori* (Amina and Rajmohana, 2014; Mathew, 2015). Sixty species were listed in the recent checklist on termites of Kerala by Amina and Rajmohana, 2014, and the present study updates the total number to 61. The checklist of termites of Kerala, by Mathew, 2015, listed only 58 species, missed to include *Heterotermes indicola* (Wasmann) (Amina and Rajmohana, 2013a) and *Ceylonitermellus periyarensis* Amina and Rajmohana (Amina and Rajmohana, 2013b).

C. beckeri is one of the smallest species among *Coptotermes* (Table-1). Their soldiers can easily be distinguished from other species by their small

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Table-1: **Measurements (in mm) of soldiers of *Coptotermes* spp**

Body parts	*C. beckeri*	*C. ceylonicus*	*C. heimi*	*C. kishori*
Head length to base of mandible	1.08-1.13	1.25-1.50	1.20-1.45	1.13-1.25
Max. head width	0.90-0.98	1.00-1.20	1.00-1.35	0.95-1.08
Head width index (width/length)	0.80-0.87	0.82	0.77-1.04	0.84-0.86
Mandible length	0.70-0.78	0.80-0.90	0.70-1.00	0.73-0.83
Head mandibular index (mandible length/head length	0.65-0.69	0.63	0.50-0.65	0.58-0.66
Length of postmentum	0.75-0.83	0.85-1.00	0.75-1.05	0.77-0.80
Maximum width of postmentum	0.31-0.34	0.35-0.40	0.38-0.45	0.35-0.38
Width of postmentum at waist	0.21-0.23	0.20-0.25	0.25-0.34	0.18-0.20

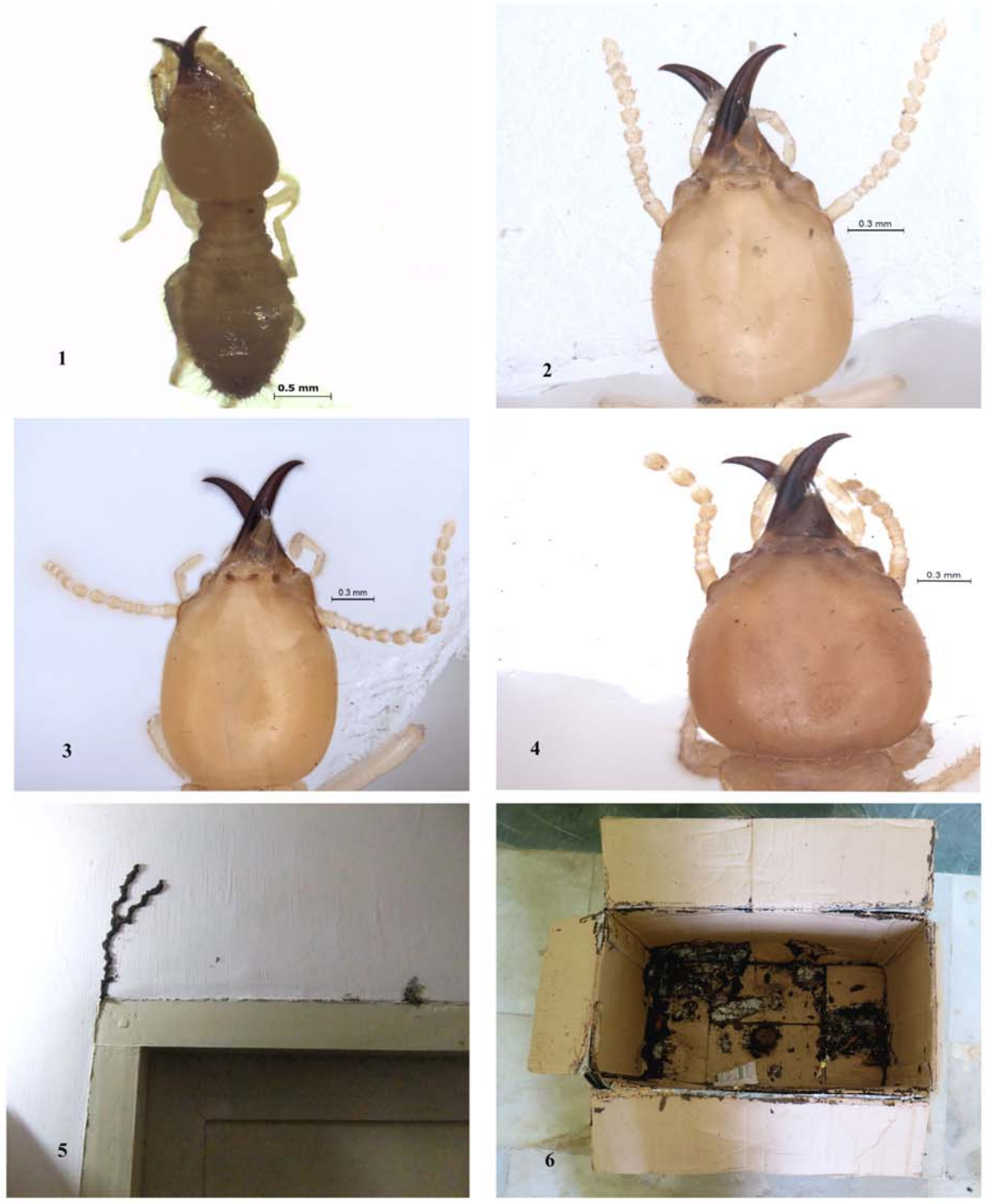
ovoid head, labrum subtriangular, sides strongly converging and terminating in a hyaline pointed apex. Antennae have 13 segments, segment 3 varying in size. Mandibles comparatively smaller in proportion to head length. Postmentum club-shaped and wide at waist. In worker caste, head capsule is subcircular and antennae are with 13 segments, of which segment 3 is sometimes subdivided and the postclypeus is slightly swollen.

In the present observation, the termite attack was manifested outwardly by a brownish-black colored tunnel on the wooden frames of kitchen door. When the tunnel building activity of *C. beckeri* was regularly monitored for a week, it was observed that at the onset, the tunnel length recorded an increase of 2cm after 24 hours since its first appearance on the wooden frames. On the second day, the tunnel had grown by 4cm and the following day, it had branched with a further addition of 2cm each along the branch and also the main course of the tunnel. By the seventh day, the main branch of the tunnel had grown further, till it touched the roof of the kitchen and diverged variably. It was observed that on a day to day basis, an active termite colony added atleast a minimum of 2cm to the original length of their tunnel.

Another instance of attack by *C. beckeri* was noticed on 16.v.2015, in a cardboard carton, kept inside the store-room in the same apartment mentioned earlier. A clear gape was made on the bottom of the carton (Fig.6). The two instances above reinforce the fact that *C. beckeri* is a polyphagous species with immense pest potential-attacking wood, concrete and paper, alike. Attack of this species on wood works of buildings was previously reported by Sundararaj *et al.,* 2013. The present study reports the attack of the species on paper too.

Other subterranean species like *C. heimi* (Fig.4), *C. ceylonicus* (Fig.3), *H.indicola* and *Heterotermes malabaricus* Snyder (Amina and Rajmohana, 2013a; Maiti, 2006; Roonwal and Chhotani, 1989; Sundararaj *et al.*, 2013), are similar to *C. beckeri* in their attacks. All of them attack both live and dead wood in agricultural/ plantation crops and forests alike. It can be concluded that the subterranean termites are mostly polyphagous and since they attack all the available cellulose materials, they gain a significant pest status.

Any cellulose material that can hold sufficient moisture can sustain small colonies of subterranean termites. Hence human transportation of plant parts and also wood for structural works, for constructing railway sleepers, as wooden posts, as wood packaging, as firewood, etc have largely promoted the spread of such termite pests. Though quarantine regulations that prohibit the transportation of materials infested with termites exist in some countries, such quarantine have been found virtually unenforceable (Henderson, 2014).



Figures: 1. Soldier of *Coptotermes beckeri* Mathur and Chhotani
2. Head of *C. beckeri* in dorsal view
3. Head of *C. ceylonicus*
4. Head of *C. heimi*
5. *C. beckeri* attack on wooden door
6. Attack on cardboard carton

In cases of extensive infestation by subterranean termites, tenting and fumigation of the entire building is advised (Oi *et al*., 1993). Oil- based chlorinated chemicals like lindane, chloroprin etc. as wood protectors when applied, prevent such attacks to some extent.

Material examined: INDIA: Kerala: Chalappuram, Kozhikode, 27.xi.2014, M. Shweta, 7 soldiers, 8 workers, colony code: ZSI/WGRC/IR/INV/5191 (deposited at ZSI, Kozhikode)

INDIA: Kerala: Chalappuram, Kozhikode, 16.v.2015, M. Shweta, 4 soldiers, 6 workers, colony code: ZSI/WGRC/IR/INV/5192 (deposited at ZSI, Kozhikode)

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