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On the occurrence of *Carpophilus maculatus* Murray from Kolkata, India (Coleoptera: Nitidulidae)

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ABSTRACT: *Carpophilus maculatus* Murray, 1864, hitherto recorded from Central America, Pacific Islands, Australia, Southeast Asian Islands, Japan, Hongkong and China has currently been found from Kolkata, India. This species is redescribed and compared with the closely related ones.

KEYWORDS: Coleoptera, Nitidulidae, *Carpophilus maculatus*, West Bengal, India, new record, redescription.

INTRODUCTION

Extensive exploration often reveals many interesting distributional records of the taxa of sap beetles. Recently, *Carpophilus maculatus* Murray found mainly in the Pacific Islands, Australia, Philippines and Indonesia was intercepted in the food bait trap in Kolkata. Brown (2012) cited distribution of *C. maculatus* outside Australian Region in the Philippines, Indonesia and the Nicobar Islands (India). The species is now being recorded from the Indian mainland. Earlier, Murray (1864) described the species *Carpophilus maculatus* from Oahu, the Hawaiian Islands. Subsequently, Sharp (1878) while dealing with the Hawaiian Nitidulidae presumed *Carpophilus vittiger* Murray to be closely related to *C. maculatus* and stated 'widely distributed in Malay Archipelago and India'. Later, Grouvelle (1908 and 1913) did not show any record of *C. maculatus* Murray and *C. vittiger* Murray [a synonym of *C. dimidiatus* Fabricius *sensu* Grouvelle] from India. No material record of *C. vittiger* Murray is also traced from India. Leschen & Marris (2005) recorded *C. maculatus* Murray from Kermadec Islands, New Zealand, synonymized *C. vittiger* Murray with this species and cited geographical distribution of the

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species. Jélinek & Audisio (2007) in Palaearctic Catalogue reported *C. maculatus* from China, Hongkong, Japan, Australian and Oriental Regions. Brown (2009) considered *C. maculatus* sensu Leschen & Marris (2005) from Kermadec Island to be *C. oculatus* Murray. The species is characterized, compared with the related species, and its current distribution noted herein. The materials are deposited in the collection of the Zoological Survey of India (ZSIC).

MATERIALS AND METHOD

The specimens were collected from food bait bottle trap set in a garden at Garia, Kolkata (22.466531 °N, 88.383014 °E). The bottle trap (Fig. 1) was made by taking a disposed 2-litre volume plastic pet bottle. The bottle cap was taken off. A horizontal incision was made on the bottle using a sharp blade at about two inches below the bottle neck. The entire neck area was chopped off from the bottle and kept aside. Then, a small transparent, cylindrical, plastic container (without lid) was stuck at the base of the bottle at the bottom with glue and cello tape. Food in the form of banana pelts (two in number) and 40 ml of beer was kept in that smaller container and soap water was poured into the rest of the surrounding region in the bottle excluding the smaller container with food and taking special care that the water level stays much below the mouth of the smaller container. The chopped off portion of the bottle was then inverted and re-inserted into the bottle thereby forming a short funnel. The junction of the funnel and the bottle was sealed with tape and two holes were made onto the sides of the plastic bottle to tie a string on either side so that the device could be hanged. The trap was kept hanging from the branch of a tree at a height of 2 metres from the ground in a garden. The scent of beer mimics the scent of fermenting sap which attracts sap beetles (Nitidulidae). Attracted by the scent of beer and fermenting banana pelt, the nitidulid beetles along with other insects enter the trap from the bottle mouth of the funnel. However, there is no route to escape as the beetles cannot fly high enough to reach the bottle mouth and instead falls into the soap water. Flight is further hindered due to the surface tension of the soapy water and the beetles are trapped. The trap was kept in the garden for a period of 48 hours before removing it and collecting the trapped beetles from it with a soft brush and preserved in 70% alcohol. The specimens were mounted on rectangular hard paper board and pinned with proper locality and habitat data. Mounted dry specimens were relaxed by putting in water for about an hour and the abdomen was dissected out by making an incision between metathorax and abdomen under a dissecting microscope. The abdomen was then placed in 10% KOH solution, for about 24 hours and washed in distilled water and mild acetic acid solution for 10 minutes respectively. It was then passed through different grades of alcohol from 30% to 100% for 10 minutes in each grade for complete dehydration and then transferred to clove oil. The abdomen was then placed on a clear glass slide with a drop of clove oil and the male genitalia was dissected out with two fine dissecting needles under a WILD M5A stereoscopic binocular microscope and placed in a drop of Canada balsam on a piece of cover glass. The cover glass was glued on a piece of ivory paper and pinned with the respective specimen with required data for types and other specimens. External features and other structures were studied using Leica ® M205A stereoscopic microscope and images were recorded, when necessary. Illustrations were made with the aid of Camera lucida; detailed features of the aedeagus were

PLATE- I

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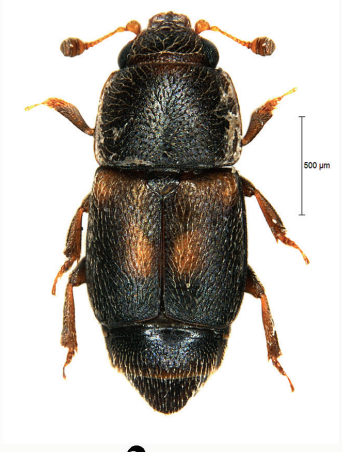

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PLATE I. Figs. 1. Banana-Beer Bottle Trap; 2, *Carpophilus maculatus* Murray (male); 3, *C.maculatus* Murray (female)

sketched by using the digitized images and examination under an OLYMPUS compound microscope.

RESULTS AND DISCUSSION

SYSTEMATIC ACCOUNT

Family NITIDULIDAE Latreille, 1807

Subfamily CARPOPHILINAE Erichson, 1843

Genus *Carpophilus* Stephens, 1830

***Carpophilus (Myothorax) maculatus* Murray**

Carpophilus maculates Murray, 1864: 372.

Carpophilus vittiger Murray, 1864: 373.

Carpophilus (Myothorax) maculatus: Leschen & Marris, 2005: 15.

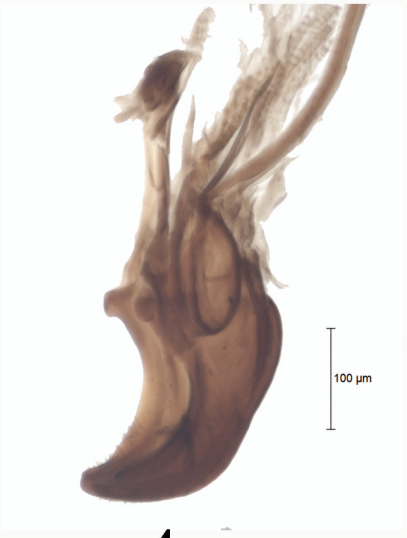
Oblong-ovate, moderately convex, dorsum not unicolorous- head, pronotum and abdomen dark brown to black, pale longitudinal 'T'- shaped patch near the suture and humeral region of the dark brown elytra, suture blackish; cuticle with fine, moderately long, golden, decumbent pubescence; legs and antennae testaceous. Antenna about 1.6x as long as head; antennal club 1.3x as long as broad, rather compact. Prothorax broader than long (1.0: 1.4), nearly quadrangular in shape, front margin almost straight, sides arcuate, hind margin straight with slight sinutation near the scutellum, front angles obtusely rounded, hind angles broadly rounded. Elytra about as long as broad. Legs with tibiae much flattened; tarsi dilated and densely setose. Ventral side darker than dorsum, dark brown and more finely punctate; gular region of head with distinct antennal groove converging posteriorly. Mesosternum devoid of pubescence and median carina. Metasternum with femoral line arising from the mesocoxae forming a small axillary space near the junction of mesocoxae and metepimeron.

Aedeagus with lateral lobes in ventral view (Pl. II Fig. 5,7) broadly elongate, somewhat trowel-shaped, more or less uniformly broad along length, apices convergely bent inward; in lateral view (Pl. II Fig. 4,6) considerably bent, somewhat '**,**' -shaped, gradually narrowed beyond basal third with short setae on borders of lobes near apices.

Measurements (mm.): Total length 2.56–3.17, width of head across eyes 0.48–0.61, length of antenna 0.56–0.70, length and width of prothorax 0.67–0.81 and 0.98–1.17, length and width of elytra 0.98–1.19 and 1.05–1.28.

Material examined: 3 ex. INDIA: West Bengal, Kolkata, Garia, (22.466531°N, 88.383014°E), 15.03.2014, J. Dasgupta, *ex.* Banana-beer bottle trap.

PLATE- II



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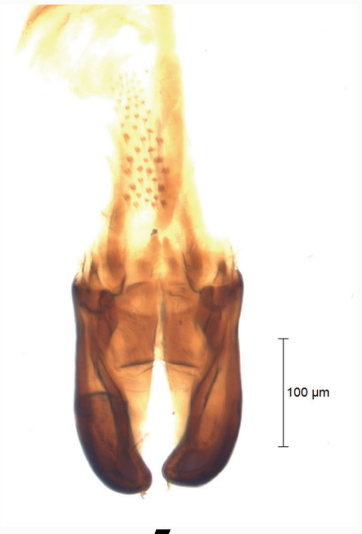

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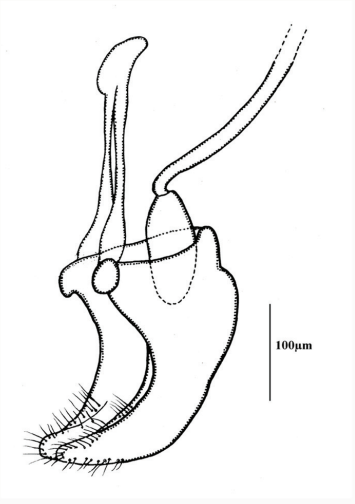

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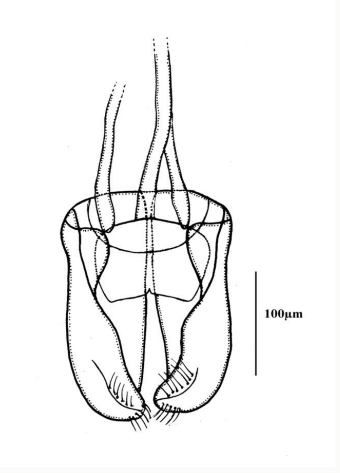

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PLATE II. Figs. 4-7. Male genitalia of *C. maculatus* Murray ; 4- lateral view- photo; 5- ventral view - photo; 6 - lateral view – drawing and 7 - ventral view -drawing

Distribution: INDIA: West Bengal (New record), Nicobar Islands; Central America [Cuba]; Pacific Islands [Bismarck Archipelago, Caroline Islands, Cook Islands, Easter Island, Fiji, Gilbert Islands, Guam, Hawaii, West Papua, Kiribati, Marquesas Islands, Mariana Islands, Marshall Islands, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Society Islands, Solomon Islands, Tokelau, Tonga, Tuamotu Archipelago, Austral Islands, Tuvalu, Vanuatu, Christmas Island, Cocos-Keeling Islands, Malaku Islands]; New Zealand (?); Australia; Philippines; Indonesia, China, Hongkong, Japan [see Map- I].

Remarks: There was a taxonomic paradox regarding the specific status of this species and *Carpophilus oculatus* Murray. The latter species is also found primarily in the Pacific Islands. *Carpophilus maculatus* can apparently be distinguished from *C. oculatus* Murray by the colour pattern; *C. oculatus* Murray has apex of lateral lobe of aedeagus in lateral view either pointed, re-curved or emarginate *vs*. presence of pale longitudinal or oval patch near the suture and base of each elytron often forming the shape of 'T' and lateral lobes of aedeagus with apex rounded in lateral view in *C. maculatus* Murray. Moreover, there are also differences in punctation and width of pronotal carinae. Though these two species show range of colour variation and occasionally create confusion in species determination by external characters, structure of male genitalia is found to be the reliable basis for species differentiation. Brown *et al.* (2012) resolved the problem and confirmed the separate specific status of these two species using molecular study.

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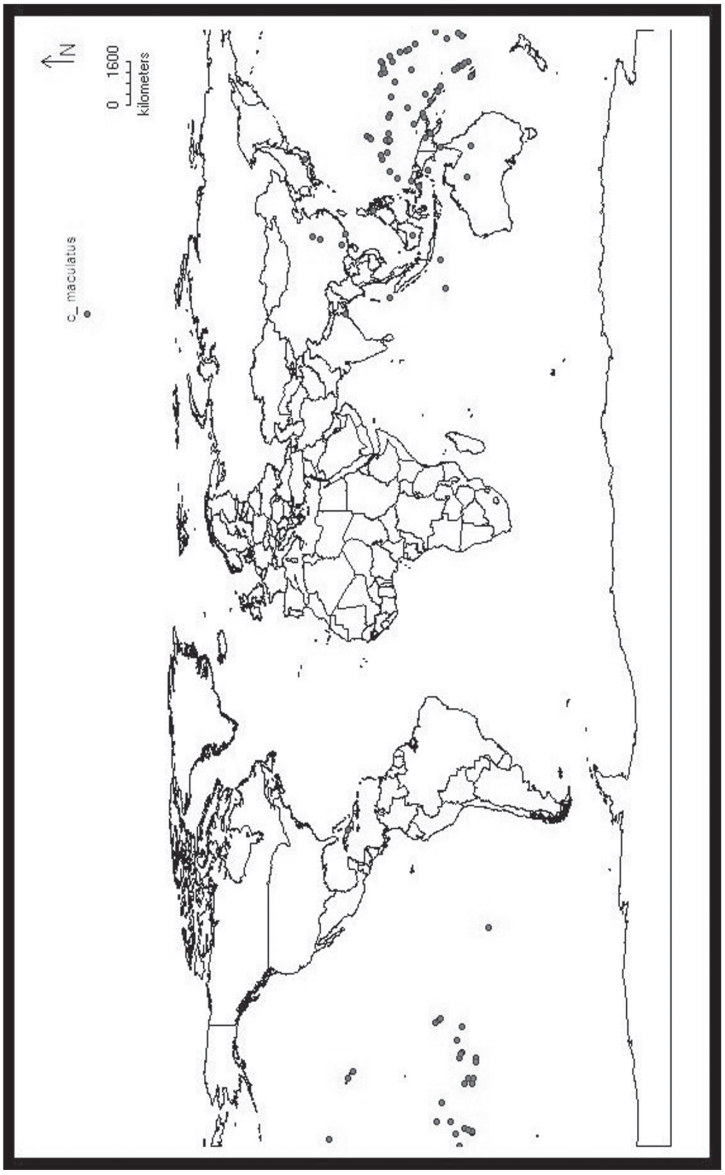
MAP- I



MAP I. Current distribution of *C. maculatus* Murray in the world [marked in dots].

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