J.Natn.Sci.Foundation Sri Lanka 2020 48 (2): 213 - 216
DOI: http://dx.doi.org/10.4038/jnsfsr.v48i2.9402

RESEARCH COMMUNICATION

Cicindelinae of Sri Lanka: New record of the arboreal tiger beetle *Tricondyla gounellei* Horn, 1900

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Submitted: 23 August 2019; Revised: 22 April 2020; Accepted: 29 May 2020

Abstract: Information is provided on the newly recorded *Tricondyla gounellei* Horn, 1900, an arboreal tiger beetle, hitherto known only from Southern India, with this being its first from Sri Lanka. Following field surveys conducted from 2017 to 2019 in forty-one locations in the country, this species was recorded from two locations namely, Vellankulam in Mannar District and Kirinda in Hambantota District. *Tricondyla gounellei*, closely resembles *Tricondyla granulifera* Motschulsky, 1857 previously recorded from Sri Lanka. However, *T. gounellei* can be distinguished from *T. granulifera* by the smaller body size, short elytra that are narrower in the middle and palpi with black terminal joints which in *T. granulifera* is red.

Keywords: First record, Sri Lanka, *Tricondyla gounellei*.

INTRODUCTION

Tiger beetles (Coleoptera, Cicindelinae) are an important group of predatory insects that play a major role in ecosystems, being an integral part of the food chains and bioindicators of the environment. Thirty-one species of arboreal tiger beetles are known from Sri Lanka of which twenty-five species are endemic to the island (Dangalle, 2018). According to the existing records (Tennent, 1860; Horn, 1904; Fowler, 1912; Naviaux, 2002) and collections maintained in the country (National Museum of Colombo, Sri Lanka; Horticultural Crop Research and Development Institute, Gannoruwa, Sri Lanka) the arboreal tiger beetles in Sri Lanka belong to five genera – *Collyris* (1 species), *Protocollyris* (1 species), *Neocollyris* (12 species), *Derocrania* (12 species) and *Tricondyla* (5 species). About 45 species of arboreal tiger beetles of the genus *Tricondyla* occur worldwide (Bousquet, 2012). Recent surveys dating from 2017 (Abeywardhana *et al.*, 2018; 2019) were conducted island-wide to recheck the original locations of the previously recorded species and to record the current distribution of the group especially in light of the high endemicity of this group, particularly at a time when their arboreal habitats are subjected to destruction.

An arboreal tiger beetle species previously not recorded from the country (according to past literature and specimen collections) collected during the recent surveys is reported here. This article gives a description of the external morphology, locations and habitat type of the newly recorded *Tricondyla gounellei* in Sri Lanka, and how it differs from its closest species *T. granulifera*.

METHODOLOGY

In a survey conducted from 2017 to 2019, 41 locations in 18 districts covering the nine provinces and three climatic zones of the country were investigated for arboreal tiger beetles (Abeywardhana *et al.*, 2019). A variety of habitat types such as beaches, coastal areas, marshlands, forests, woods, home gardens and agro-ecosystems were surveyed for arboreal tiger beetles using visual encounter surveys (VES). Tiger beetles encountered were collected using insect nets and by

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handpicking. Specimens were preserved in 70 % ethanol for later identification. Taxonomic keys and descriptions by Horn (1904), Maindron (1904), Fowler (1912) and Naviaux (2002) were used for identification.

RESULTS AND DISCUSSION

Of the 41 locations surveyed previously, 13 locations yielded arboreal tiger beetles. Upon identification the collected tiger beetles belonged to seven species in three genera; genus *Derocrania* (4 species), genus *Neocollyris* (1 species) and genus *Tricondyla* (2 species) identified as *T. granulifera* and *T. gounellei*. According to the existing information, six of these species have been previously recorded from several locations in the country (Dangalle, 2018), except *Tricondyla gounellei*, hence, a new record for Sri Lanka.

Collection, location and habitat of *Tricondyla gounellei*

Tricondyla gounellei was recorded from two widely separated arid zone locations in Sri Lanka – Vellankulam in Mannar District, Northern Province (August, 2018) and Kirinda in Hambantota District, Southern Province (March 2018). The habitat type at Vellankulam (9°18′65″N, 80° 15′ 01″E; elevation = 23.4 m) was an agricultural farm consisting of Mango (*Mangifera indica*) and Cashew (*Anacardium occidentale*) trees and *T. gounellei* beetles were found foraging on the trunk and branches of trees. The habitat at Kirinda (6°24′04″N, 81° 33′ 69″E; elevation = 3.20 m) was a sparsely vegetated area alongside a reservoir and *T. gounellei* were found foraging on the trunks of Masan (*Ziziphus mauritiana*) trees.

Original description of *Tricondyla gounellei*

A description of *T. gounellei* from India is provided by Fowler (1912) in his works of the Cicindelidae of British India. *T. gounellei* specimens collected from trees of Anaimalai Hills, Ramnad in Madras, India have been described with no distinction of the two sexes. According to Fowler's descriptions *T. gounellei* is 23 mm in length with an elongate and parallel-sided pronotum. The elytral surface is covered with transverse punctiform impressions, of which the anterior few are confluent and form irregular wavy lines, middle are more separate and the impressions at the apex are very fine and scanty. The palpi are black while the labrum and first four joints of the antennae are metallic black. The third and fourth joints of the antennae are ringed in red.

Description of *Tricondyla gounellei* collected during the study

Male and female specimens of *T. gounellei* collected are morphologically somewhat similar but the males can be distinguished by the genitalia and the 3rd tarsomere of the fore-leg that has a medial lobe [Figure 1(a)], which is absent in the female [Figure 1(b)]. Males (n = 3) are slightly larger; with a mean body length of 21.16 ± 0.29 mm than the females (n = 2) 20.42 ± 0.14 mm. Adults have metallic black eyes, palpi, labrum, antennae, collar, pronotum, fused elytra and legs (Figures 2 and 3). Pronotum is smooth, cylindrical and elongated with parallel-sides. Elytra fused, cylindrical and humped in apical half (Figure 3).

Specimens of *T. gounellei* (male = 3, female = 2) are deposited in the insect collection held in the Department of Zoology and Environment Sciences of the University of Colombo and bear the voucher specimen numbers LA_DOZE.13, LA_DOZE.14, LA_DOZE.15, LA_DOZE.23, LA_DOZE.24 (5 specimens). All specimens were collected by the first author, Lakmini Abeywardhana.

Tricondyla gounellei and *Tricondyla granulifera*

The newly recorded *Tricondyla gounellei* is very similar to *T. granulifera* in having an elongate, parallel-sided neck and pronotum, uniformly shiny black body, transverse sculpture on elytra, very prominent large eyes, long and filiform antennae and a large labrum with six labral teeth. However, *T. gounellei* have shorter elytra than *T. granulifera*, that are less narrow in the middle and thus are smaller. Elytra of *T. granulifera* are long and are broader in the middle. The elytral sculpture of *T. granulifera* is highly rugose as in rugose corals (Cnidaria, Rugosa), which in *T. gounellei* is much less. Further, *T. granulifera* is slightly larger (Male: 24.08 ± 0.62 mm, n = 2; Female: 23.22 ± 0.76 mm, n = 2) than *T. gounellei* (Male: 21.16 ± 0.29 mm, n = 3; Female 20.42 ± 0.14 mm, n = 2). Identification and separation of species by the authors are based on the keys and descriptions of Horn 1904, Maindron 1904, Fowler 1912 and Naviaux 2002.

The genus *Tricondyla* is represented in Sri Lanka by five species, namely, *Tricondyla femorata*, *Tricondyla tumidula*, *Tricondyla coriacea*, *Tricondyla nigripalpis* and *Tricondyla granulifera* of which the latter three species are endemic (Dangalle, 2018). The present study adds a previously unrecorded species, *Tricondyla*

gounellei to the list. *T. gounellei* has been recorded from India from two locations: from Anaimalai Hills in Ramnad, Madras (Fowler, 1912) and from the Tamil Nadu State (Kirk-Spriggs & Wiesner, 1992). Similar climatic conditions prevail between Southern India and Northern Sri Lanka (Dittus, 2017), resulting in climatically-induced habitat diversification (Bossuyt *et al.*, 2004). Therefore, it is likely that the arboreal tiger beetle *T. gounellei* had dispersed from Southern India to Sri Lanka and established itself in this country due to the similar dry habitats prevailing in the two regions.

The manner in which *T. gounellei* reached Sri Lanka is not known. The Skimmer (*Pantala flavescens*), a small dragonfly with a weak flight ability is believed to have travelled from India to Sri Lanka by flying on winds at altitudes above 1000 m (Rodrigo, 2011). Therefore, it is highly likely that *T. gounellei*, flightless and small bodied got carried over long distances by means of air currents.

With the discovery of *T. gounellei* the genus *Tricondyla* is represented in Sri Lanka by six species, of which three species are endemic to the island and the other three species occur both in Sri Lanka and India.

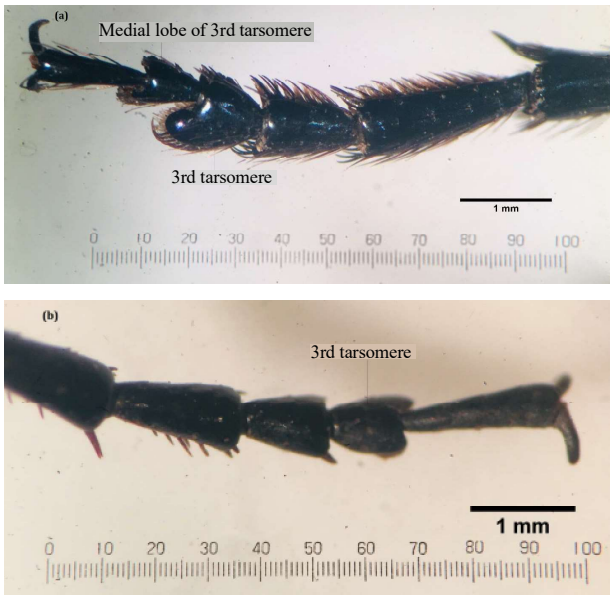

Figure 1: Left fore-leg of *Tricondyla gounellei* (a) male (b) female

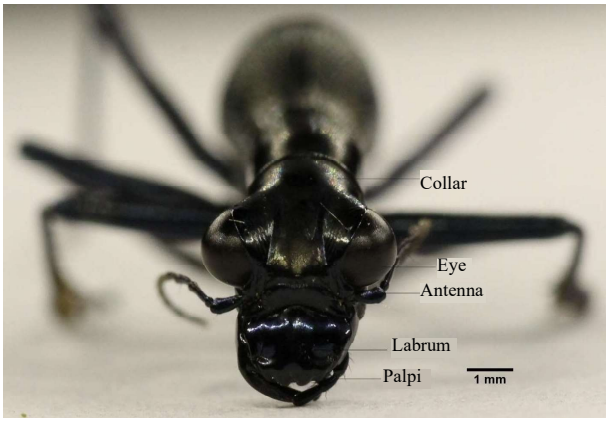

Figure 2: Head region of *Tricondyla gounellei*

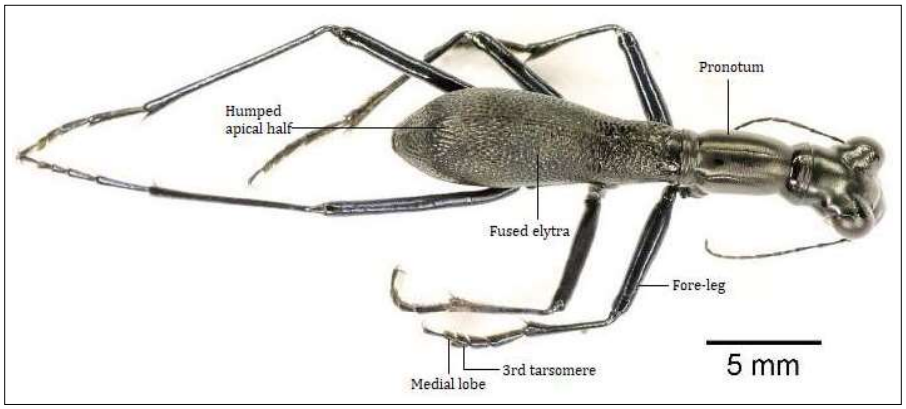

Figure 3: *Tricondyla gounellei* - male

According to Fowler (1912) *Tricondyla gounellei* in India were found running on the bole of trees in the month of May. In the present study too, this arboreal tiger beetle species was found foraging on the trunks and branches of trees; *Mangifera indica*, *Anacardium occidentale* and *Ziziphus mauritiana*. Furthermore, the tiger beetle, *T. gounellei* in Sri Lanka was collected in the months of March and August.

CONCLUSIONS

The arboreal tiger beetle collected from Vellankulam and Kirinda in the Arid Zone of the island is identified as *Tricondyla gounellei*, a new record for Sri Lanka. *T. gounellei* was previously known only from Madras and Tamil Nadu State in Southern India. The newly recorded *T. gounellei* closely resembles *T. granulifera*, previously recorded from Sri Lanka, but differs from it in several key features. Currently, the number of species in the genus *Tricondyla* stands at six in Sri Lanka.

Acknowledgement

The authors gratefully acknowledge the financial support by the National Science Foundation of Sri Lanka (Grant RG/2017/EB/01). Gratitude is expressed to the Department of Zoology and Environment Sciences, Faculty of Science, University of Colombo for laboratory facilities and technical assistance.

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