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A new species of *Cardiodactylus* (Orthoptera: Grylloidea: Eneopterinae) from Singapore

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Abstract

Cardiodactylus is a speciose cricket genus belonging to the subfamily Eneopterinae. One new species of *Cardiodactylus* from Singapore is described: *Cardiodactylus admirabilis* Tan & Robillard **n. sp.** Acoustic analysis is also performed on the male calling song. A key to species of Eneopterinae from Singapore is provided.

Key words: Eneopterinae, *Cardiodactylus*, new species, acoustic, key, Singapore

Introduction

The genus *Cardiodactylus* is a speciose cricket genus belonging to the subfamily Eneopterinae (Robillard & Desutter-Grandcolas, 2008). Widely distributed in South East Asia and in the Pacific, more species new to Science have recently been described (Robillard, 2009, 2011; Ma & Zhang, 2010). In Singapore, only one species was previously known: *Cardiodactylus singapura* Robillard, 2011. This species is found mostly in and around the Bukit Timah Nature Reserve and Central Catchment Nature Reserve (Robillard, 2011; Tan, 2012). In a recent taxonomic collection in the natural areas in the northern parts of Singapore, another species of *Cardiodactylus* was discovered and is described here as *Cardiodactylus admirabilis* Tan & Robillard **n. sp.** Acoustic analysis and description of the male calling song are also provided. In addition to the two species of *Cardiodactylus* from Singapore, two other species from two genera of Eneopterinae were recorded in Singapore (Tan, 2012; Tan *et al.*, 2012; Robillard & Tan, 2013): *Lebinthus luae* Robillard & Tan, 2013 and *Nisitrus vitattus* (Haan, 1942). *Lebinthus luae* was only recently described while *N. vitattus* was formally redescribed. This allowed the construction of a key to the species of Eneopterinae recorded in Singapore, as presented in the paper.

Material and methods

Collection. Active collections of specimens were conducted mainly at night in Singapore. Newly collected specimens are deposited in the collections of the Muséum national d'Histoire naturelle, Paris (MNHN), and in the Zoological Reference Collection, Singapore (ZRC).

Photographic images were done with a digital camera mounted to a microscope. Specimens were preserved by drying and pinning. Measurements of dried specimens were made using a 0.05 mm vernier caliper.

Observations and morphological analysis. Direct observations and dissections have been made using a binocular microscope Leica MZ16 at magnifications up to 160 units, equipped with a camera lucida for the line drawings. Male tegminal veins and cells follow terminology by Ragge (1955) and Robillard & Desutter-Grandcolas (2004). Male genitalia have been dissected in softened specimens by cutting the membranes between the paraprocts and the subgenital plate; they have been observed after cleaning with cold KOH and then kept in

Key of the eneopterine species reported from Singapore

1. Habitus slender. Male FW glossy transparent. Colouration vivid and contrasting, mostly yellow, black and white *Nisitrus vittatus* (de Haan)
- Habitus less slender. Male FW opaque or semi-translucent, not glossy transparent. Colouration mostly brown 2
2. Micropterous in both sexes (FW truncated, hind wings absent). Colouration more or less homogenous brown, with lateral yellow bands along the whole body. *Lebinthus luae* Robillard & Tan
- Macropterous in both sexes (FW long, hind wings longer and surpassing FW). Colouration mostly brown but mottled pale yellow or white. *Cardiodactylus*... (3)
3. FW: Colouration more contrasted, with a wide whitish area posterior to mirror. With yellow spot near basal area. Mirror (d1) generally separated in four parts by transverse and oblique veins. Male genitalia: Rami wide, with preapical plate more sclerotised along edge. Ectophallic arc angulated. Ectophallic apodemes lamellate. Endophallic sclerite sclerotized and rather wide, not tapering anteriorly but truncated with the apex acute. Calling song is a short echeme made of a triplet of syllables *Cardiodactylus admirabilis* n. sp.
- FW: Colouration pale, without a whitish area posterior to mirror. Without yellow spot near basal area. Mirror (d1) separated in two parts by transverse and oblique veins. Male genitalia: Rami narrow, with preapical plate equally sclerotised. Ectophallic arc more broadly rounded. Ectophallic apodemes thin. Endophallic sclerite small and tapering anteriorly to an acute apex. Calling song is a short echeme made of single syllable. *Cardiodactylus singapura* Robillard

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