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A new species of *Endecous* Saussure, 1878 (Orthoptera, Gryllidae) from northeast Brazil with the first X_1X_20 chromosomal sex system in Gryllidae

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Abstract

In this paper we describe a new species of Luzarinae cricket collected from the cave "Gruta de Ubajara, municipality of Ubajara, State of Ceará, Brazil, highlighting phallic sclerites morphology and chromosome complement as diagnostic characters. We presented meiotic and mitotic characterization in order to define the karyotype with 2n = 12 + X_1X_2♂/12 + $X_1X_1X_2X_2$♀. This represents the first record of X_1X_20 chromosomal sex system in Gryllidae.

Key words: insect, Ensifera, Luzarinae, sex chromosome, cave cricket

Introduction

Species of the genus *Endecous* Saussure, 1878 are widely distributed in the Brazilian biomes, and are an interesting cricket group to taxonomic and biological studies (Zefa 2006; Souza-Dias *et al.* 2014). This crickets can be found in forests and cerrado vegetation, living on leaf litter, under fallen logs, inside armadillo burrows, termite nests, crevices, and caves (Desutter-Grandcolas 1995; Zefa 2006). Some species are generalists as *Endecous itatibensis* Rehn, 1918 occurring in the Atlantic Forest, Cerrado, and caves, as well as grasses and shrubs in urban areas (Zefa 2006), other ones are cavicolous or troglophilic. *Endecous apterus* Bolfarini & Souza-Dias, 2014 is troglobitic, with troglobiomorphosis such as pale coloration, and loss of auditory tympana and wings (Souza-Dias *et al.* 2014).

Endecous includes 12 described species, varying from pale to darker yellowish-brown body color (Eades *et al.* 2014). The more divergent features of *Endecous* species are the morphology of the phallic sclerites (Mews & Sperber 2008; Zefa *et al.* 2010a; Souza-Dias *et al.* 2014), calling song (Mello & Pellegatti-Franco 1998; Zefa 2006; Zefa *et al.* 2010a), and the karyotype, the latter varying in number and chromosome morphology in five studied species (Zefa 2010b).

The X0♂-XX♀ sex-determining system occurs in the majority of the Orthoptera species (White 1973; Hewitt 1979), though deviations are frequent, as the neo-XY, and multiple sex system, such as X_1X_2Y♂–$X_1X_1X_2X_2$♀ that have been arising by different means of X/autosome translocations or centric fusions (Saez 1963; White 1973; Mesa *et al.* 2001). The sex-determining system X_1X_20♂/$X_1X_1X_2X_2$♀ was found by Mesa *et al.* (2002) in the Mogoplistidae cricket *Cycloptiloides americanus* (Saussure, 1874), being the first report in Orthoptera.

To date, five species of *Endecous* had their chromosomes studied, all of them with X0♂/XX♀ system (Zefa *et al.* 2010b). In the present paper, we describe a new Brazilian species of *Endecous* collected in the cave 'Gruta de Ubajara' from state of Ceará, Brazil, with the first report of X_1X_20 sex-determining system in Gryllidae.

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