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A new gall-inducing genus and species of Eriococcidae (Hemiptera: Sternorrhyncha: Coccoidea) on Sapindaceae from Brazil

CHRIS HODGSON[1], ROSY M.S. ISAIAS[2] & D. C. OLIVEIRA [3]

[1]*Department of Biodiversity and Biological Systematics, The National Museum of Wales, Cathays Park, Cardiff, CF10 3NP, UK. E-mail: hodgsoncj@cardiff.ac.uk*

[2]*Departamento de Botânica, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Av. Antonio Carlos 6627, Belo Horizonte, Minas Geras, Brazil*

[3]*Instituto de Biologia, Universidade Federal de Uberlândia, Rua Ceará s/n, campus Umuarama, Uberlândia, Minas Gerais, Brazil*

Abstract

A new gall-inducing genus and species of felt scales (Hemiptera: Coccoidea: Eriococcidae) found on the leaves and twigs of *Matayba guianensis* (Sapindaceae) in Brazil is described: *Bystracoccus* Hodgson gen n. and *B. mataybae* Hodgson, Isaias & Oliveira sp. n. This is the first record of an eriococcid inducing leaf and stem galls on Sapindaceae and is only the second example of a member of the Eriococcidae to induce stem galls in which the insects diapause during the dry (winter) season. Only the adult female, second-instar female and crawler are known. The species overwinters as the first-instar nymph in pit galls on the twigs but spends the rest of the year associated with two-chambered galls on the leaves. It has recently become clear that South America has a rich felt-scale insect fauna many of which induce galls. It has proved very difficult to place this new genus in a family as it appears to fall between the Eriococcidae and Beesoniidae but is here placed in the eriococcids based on the similarity of the first-instar nymphs and the abundance of this family in the Neotropics. However, the dorsum of the abdomen of the mature adult female becomes heavily sclerotised, forming a round plug-like structure that completely fills the gall orifice. This structure shows remarkable morphological similarities to that of the beesoniid *Danumococcus parashoreae* Takagi & Hodgson found on *Parashorea tomentella* (Dipterocarpaceae) in Sabah, Malaysia, with which it is compared along with other eriococcid genera known from South America.

Key words: biology, dorsal plate development, leaf galls, stem galls

Introduction

The family Eriococcidae or felt scales is the fourth largest family of scale insects (Hemiptera: Sternorrhyncha: Coccoidea) (Miller & Gimpel, 2000; Ben-Dov *et al*., 2013). It is most abundant in the Southern hemisphere, particularly in New Zealand and Australia but is almost certainly as abundant in South America as, with further collecting, it has become clear recently that this region has a rich eriococcid fauna (Miller & González, 1975; Hodgson & Miller, 2002; Hodgson *et al*., 2004; Kondo *et al*., 2006; Granara de Willink & Diaz, 2007; González 2008a. 2008b, 2009; González & Granara de Willink, 2009; González & Claps, 2011, 2013; overall reviews by Kozár, 2009, and Hodgson & Miller, 2010). Kozár (2009) and Hodgson & Miller (2010) listed the known genera and species from the Region but used slightly different generic concepts. Nonetheless, the latter authors considered that there were 72 species in 24 genera known from South America (i.e. excluding Central America). Since then, two further new genera (one from Central America and the other from South America) and 6 species have been described (Hodgson *et al.*, 2011; González & Claps, 2011; González & Granara de Willink, 2012).

There is mounting evidence that the family Eriococcidae is non-monophyletic—indeed, molecular analyses by Cook *et al.* (2002) and Cook & Gullan (2004) suggest that there are three major lineages in the Eriococcidae *sensu lato*. The fauna currently known from the Neotropics falls into two of these lineages, a basically Gondwanan clade (encompassing Australia, New Zealand and South America) and the more widespread acanthococcid clade (Cook & Gullan, 2004; Kondo *et al.*, 2006). The third clade, known as the BSE clade, includes the Beesoniidae, Stictococcidae

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noted at Panga, i.e. leaflets with 5 or more galls, cause a significant reduction of about 50% in leaf area (mean area of non-galled leaflets 6.61 cm^2, galled leaflets with more than 5 galls 3.2 cm^2) (N = 50). However, the number of generations per year is unclear.

Small galls are also abundant on the twigs of *M. guianensis* during the dry season (winter) (June–August). These are pit galls (Gullan *et al*., 2005), about 2 mm across, each with a single first-instar nymph in the centre (Figs 4, 5); when very abundant, the galls tend to fuse (Fig. 5). These nymphs appear to be morphologically identical to those from the leaf galls and are considered to be female and so no male stages are currently known. It is assumed that these twig nymphs remain in the first instar during the winter (dry season), after which they moult at bud-burst and disperse as second-instar nymphs to the young leaves in August and September, when only the second instar is known. Although adult females are found from October onwards, it is not certain how many more generations there are except that clearly crawlers must be produced in the autumn (May–June) when adult females with eggs have been noted. These then disperse from the senescing leaves onto the twigs. This is the second species of Eriococcidae in Brazil diapausing through the dry season in stem galls, as this strategy is also known for *Pseudotectococcus rolliniae* Hodgson & Gonçalves (Gonçalves *et al*., 2009).

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