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Synopsis of *Bakeriella* Kieffer, 1910 (Hymenoptera, Bethyliidae)

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Abstract

Thirty valid species and their junior synonymy were investigated. Neotropical species of Epyrinae were also examined in order to find possible misclassified species of *Bakeriella*. Diagnoses and illustrations of all valid species are provided. Male genitalia of 14 previously described species are first described and illustrated. The lectotypes of *Bakeriella flavicornis* Kieffer, 1910 and *Epyris montivagus* Kieffer, 1910 are designated. The status of *Bakeriella lindigi* (Kieffer, 1910), **stat. resurr.** is resurrected from the synonyms of *Bakeriella montivaga* (Kieffer, 1910). The new synonymy is proposed for *Bakeriella polita* Evans 1964 = *Bakeriella vicina* Azevedo & Moreira, 2005, **syn. nov.**; *Bakeriella lindigi* Kieffer, 1910 = *Epyris bogotensis* Kieffer, 1910, **syn. nov.**; *Bakeriella flavicornis* Kieffer, 1910 = *Bakeriella depressa* Kieffer, 1910, **syn. nov.** Keys to males and females of *Bakeriella* are also provided. Twelve species had their distribution broadened.

Key words: Hymenoptera, Bethyliidae, *Bakeriella*, Taxonomy, Neotropical, male genitalia

Introduction

Bakeriella Kieffer is restricted to the New World. Currently it is represented by 31 valid species, with all of them being recorded from the Neotropical region and two from the Nearctic region as well. The genus is easily recognized as belonging to Epyrinae by the presence of a pair of conspicuous anterior pits on the scutellum.

Kieffer (1910a) described this genus to accommodate one Epyrinae species with carinate pronotum and separated scutellar pits (*B. flavicornis* from Para, Brazil). Evans (1979) expanded the concept of this genus describing one species with the scutellar groove, *B. erythrogaster* from Costa Rica and Colombia.

As far as known, nothing is recorded regarding the hosts of *Bakeriella*. Specimens of this genus are rare in collections (Azevedo 1994) and it is an infrequently captured bethyloid genus, regardless of trap type or vegetation type. As an example, out of the 14,532 Bethyliidae collected in several sites in Brazil only 18 are *Bakeriella* (see data at Azevedo (1991a, 1996), Azevedo & Helmer (1999), Azevedo *et al.* (2002a, 2002b, 2003, 2006) and Mugarib *et al.* (2008)). This represents 0.12% of the bethyliids collected. Evans and Fullerton (1997) and Lanes *et al.* (2004) found eight specimens of *Bakeriella* in about 6,000 specimens of Bethyliidae in Orlando (USA) Florida. This represents about 0.13%.

The main goal of this study is to organize the taxonomic knowledge of the species of *Bakeriella*, based mostly on the review of primary type material of all available names.

Material and methods

Efforts were made to study every holotype and allotype specimens of all the valid species, including their junior synonymy. The material was kindly provided by the following institutions: CASC—California Academy of Sciences, USA (R. Zuparko); CMNH—Carnegie Museum of Natural History (John Ashe); CNCI—Canadian National Collection of Insects, Canada (J. Huber); CUIC—Cornell University, USA (E.R. Hoebecke); DCBU—Universidade Federal de São Carlos, Brazil (A.M. Pentead-Dias); IAVH—Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Colombia (E. Torres); INPA—Instituto Nacional de Pesquisas da

Terayama (2003) and Azevedo (2006). The pits are usually rectangular wider than long, so they are transverse (Fig. 25, for instance). In ten species they are rounded or subrounded (*B. absens*, *B. aurata*, *B. cristata*, *B. grossensis*, *B. inconspicua*, *B. mira*, *B. reclusa*, *B. rossi*, *B. subcarinata*, and *B. sulcaticeps* (Fig. 56, for instance). In two of these species only one sex has the pits rounded, in *B. inconspicua* only the female has rounded pits and *B. subcarinata* only the male.

The propodeal disc has always three discal carinae, one median (see if complete or not) and a pair of paramedian carinae that is usually sinuous (Figs 25, 107, for instance). This pattern is unique among the genera of Bethyridae and so helps to recognize the genera within the Epyrinae. However in several species such as *B. absens*, *B. lindigi*, *B. mira*, *B. quinquepartita* and *B. cristata* the paramedian carinae are straight and parallel to the median one (Figs 22, 92, for instance). In the later species these carinae are very thick resembling the species of *Epyris* group *flavivrus* (see Evans 1969, Fig. 154)

The parameres provide good tools for differentiating the species. They are usually wide, with external surface evenly convex following the bethyrid style. The apex is not arched inward and the shape can vary sometimes conspicuously from species to species. However two species differs from this pattern a lot, in *B. polita* the parameres are very slender (Fig. 117) and in *B. absens* they are completely absent (Fig. 5). The cuspis of *Bakeriella* is divided into two arms (Fig. 88, for instance), but in three species (*B. absens*, *B. cristata* and *B. mira*) have cuspis uniramous (Fig. 96, for instance). The aedeagus is long and wide, the apex usually reaches the level of digitus apex (Fig. 12, for instance), but in *B. absens* the aedeagus is short, about 0.6 x as long as genitalia (Fig. 4). In two species (*B. labans* and *B. polita*) the aedeagus is narrow resembling *Aspidepyris* and *Epyris*.

As we can realize there is a body plan for *Bakeriella*, but it is weak because for the most characters there are exceptions. In *Bakeriella* the color usually has no metallic reflections, the mandible usually have five apical teeth, the pronotal is usually disc carinate, the scutellar pits are usually transverse, the scutellar groove almost always absent, the paramedian carinae are usually sinuous, the parameres are usually regularly wide, the cuspis is usually biramous and the aedeagus is usually long and wide. The only character that all species share is the presence of a projection on the apex of aedeagus curved anterad and downward (Fig. 42). This feature is exclusive of this genus and although no cladistic analyses have been ran for this genus yet, this condition constitutes in a candidate to be synapomorphy of *Bakeriella*. That demonstrates the play that genitalia role even at genus level in bethyrids. Many other genera are better recognized through genitalia as *Dissomphalus* Ashmead (Azevedo 2003), *Trichiscus* Benoît (Azevedo 2014), *Pristocera* (Benoît 1963).

Although the genitalia are important for *Bakeriella*, here the external morphology also plays useful taxonomic role, because of the richness of sculptures with wide range of variations such as carinae in the propodeal and pronotal disc and temples, shape of scutellar pits, mandible teething.

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