

Research Article

Additions to the Known Distribution of *Epipompilus aztecus* (Cresson, 1869) and *E. excelsus* (Bradley, 1944) (Hymenoptera: Pompilidae)

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Knowledge about the species distribution of *Epipompilus* Kohl, 1884, is largely based on the records from the species description. Recent efforts in South American biodiversity studies indicate that knowledge about the distribution of *Epipompilus* species in the region is in an early stage. Two new records of *E. aztecus* were obtained for the semideciduous Atlantic Forest, in central Brazil, and one record for the Amazonian Forest in northern Brazil, indicating that its distribution extends between Central and South America. The new records of *E. excelsus* were obtained mainly from the Atlantic Forest highlands, indicating that this species is commonly found in the southeastern South American Central Plateau and restricted to forest ecosystem of this region.

1. Introduction

Epipompilus Kohl (1884) is a genus that occurs in the Americas and Australia [1]. Sixteen species are known in the Americas, one for the Nearctic Region and fifteen for the Neotropical Region, and 36 species in the Australian region. The actual knowledge about the distribution of the species indicates that *Epipompilus* arose possibly in the Paleocene, between 53 and 65 million years ago, after separation of Africa and South America + Australia + Antarctica. Knowledge about the biology of *Epipompilus* is based on a single species from Australia [2], which acts like a parasitoid koinobiont. This genus was studied mainly by Evans [3–8], who described most of the species. Its position is somewhat controversial because the species in this genus present several characteristics shared with other species classified in other subfamilies [9]. Recent phylogenetic analysis with morphological data indicates that *Epipompilus* must be classified in the Ctenocerinae [10] even though a more detailed study is necessary to corroborate this

hypothesis. Several species of the genus are described based only on one sex and known from restricted distributions. Although some species like *E. aztecus* and *E. excelsus* are morphologically distinct relative to other species of the genus [5], their distribution is not well known. The distribution of *E. aztecus* is based on efforts to document the biodiversity in Central America while the distribution of *E. excelsus* consists in the records of the specimens studied by Bradley [11] and Evans [6] from the 1940s to the 1970s, respectively. Evans [3] detailed morphological variations observed along the ranges of the two species. This paper presents new records of *E. aztecus* and *E. excelsus* from South America, discussing the observed morphological variations.

2. Material and Methods

The new records were obtained by three different inventory projects: “Dinâmica biológica e a conservação da Mata Atlântica do médio Rio Doce”, supported by the Conselho

Nacional de Desenvolvimento Científico e Tecnológico—PELD/MCT—CNPq (process: 520031/98-9); “Richness and diversity of Hymenoptera and Isoptera along a latitudinal gradient in the Mata Atlântica—the eastern Brazilian rain forest”, supported by Fundação de Amparo à Pesquisa do Estado de São Paulo—Fapesp (process: 98/05083-0); “Fauna and flora from forest fragments in the northwest region of São Paulo State: the basis of biodiversity conservation studies”, also supported by Fapesp (process: 04/04820-3). The specimens collected by the projects are deposited respectively in the scientific collections of the Universidade Federal de Minas Gerais (UFMG), of the Museu de Zoologia da Universidade de São Paulo (MZUSP), and of the Department of Zoology and Botany of the Instituto de Biociências, Letras e Ciências Exatas da Universidade Estadual Paulista (IBILCE). Some new records of *E. excelsus* were obtained from the American Museum of Natural History’s Hymenoptera (AMNH) collection and one specimen of *E. aztecus* was found in the Museu Paraense Emílio Goeldi (MPEG). To confirm the identification of *E. aztecus*, the South American specimens were compared to an identified specimen from Costa Rica, determined and made available by Dr. James Pitts. The *E. excelsus* specimens were compared to specimens identified by Dr. Marius Wasbauer and deposited in the AMNH.

The occurrences of the specimens were obtained from the literature (old records) and in the specimens’ labels (new records). Such data were used to obtain the geographical coordinates with the Google Web and Google Earth to construct distribution maps with the software PanMap [12]. To confirm the identification of both species, the specimens were compared with identified specimens deposited in the American Museum Natural History and in the Department of Biology’s Insect Collection. In this study, only females were considered because the taxonomy of males is based on detailed microscopic examination.

3. Results and Discussion

The new records are listed below.

Epipompilus aztecus:

- 1♀ São João de Pirabas, Boa Esperança, Pará, Brazil—0° 46′ 08″ S 47° 10′ 26″ W—18–24.x.1990—Malaise trap (deposited in the MPEG collection),
- 1♀ Farm Fisher, in Onda Verde, São Paulo State, Brazil—20° 32′ 54″ S 49° 14′ 34″ W—29.x-04.xi.2009—Möericke trap (deposited in the IBILCE collection),
- 1♀ Matão, São Paulo State, Brazil—21° 37′ 14″ S 48° 32′ 14″ W—18.ix.2007—Malaise trap (deposited in the IBILCE collection).

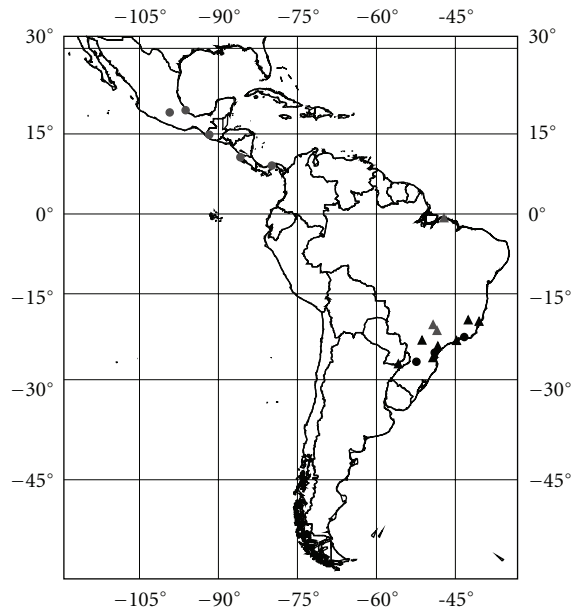
Epipompilus excelsus:

- 7♀ Rio Doce State Park, in Marilândia, Minas Gerais State, Brazil—19° 42′ 35″ S 42° 36′ 00″ W—720 meters above the sea level (a.s.l.)—02–09.xii.2003—Malaise trap—R. Parentoni & eq. col (deposited in the UFMG collection),

- 1♀ Estação Biológica Santa Lúcia, Santa Teresa, Espírito Santo State, Brazil—19° 58′ 18.5″ S 40° 18′ 26.5″ W—09–12.iv.2001—750 meters a.s.l.—Malaise and Möericke traps (yellow pans) (deposited in the MZUSP collection),
- 1♀ Rolândia, Paraná State, Brazil—23° 19′ 25″ S 51° 21′ 15″ W—vii.1948 (deposited in the AMNH collection),
- 3♀ Serra do Mar State Park, Ubatuba, São Paulo State, Brazil—1 specimen in 23° 21′ 436″ S 44° 49′ 22″ W around 50 meters a.s.l.—24–27.i.2002—Malaise trap; 2 specimens in 23° 17′ S 44° 47′ W—900 and 1001 meters a.s.l.—Möericke traps (1 specimen sampled by blue pan and 1 by yellow pan) (deposited in the MZUSP collection),
- 2♀ Ribeirão Grande, São Paulo State, Brazil—24° 18′ 16″ S 48° 21′ 53″ W—around 750 meters a.s.l.—11–14.xii.2000—Möericke traps (yellow pan) (deposited in the MZUSP collection),
- 1♀ Centro de Estudos e Pesquisas Ambientais Rugendas, São Bento do Sul, Santa Catarina State, Brazil—26° 19′ 25.6″ S 49° 18′ 26.5″ W—16–19.x.2001—Malaise trap (deposited in the MZUSP collection),
- 1♀ Encarnacion Peña, Paraguay—27° 21′ 35″ S 55° 51′ 45″ W—xii.1971 (deposited in the AMNH collection).

Comparing the specimens of *E. excelsus* showed the same morphological variation observed by Evans [6]. However, the *E. aztecus* specimens from Central and South America show some morphological differences. The South American specimens have darker clypeus than Central American specimens and fore legs fuscous with rufous maculations on the coxae and femur. The South American specimens’ mesosoma is rufoferruginous like in the specimen from Costa Rica, but slightly darker. Evans [6] describes that specimens from Barro Colorado, Panamá, are somewhat darkly colored. Other variation observed is in the propodeal rim; Central American species show whitish propodeal rim while the South American specimens’ propodeal rim is rufous like the rest of propodeum. Moreover, the *E. aztecus* from São João de Pirabas, Pará, shows long whitish streak on the eye margins, clypeus margin, and interantennal tubercle. On the other hand, the specimen from Matão does not show such whitish maculations on the head.

Figure 1 shows the range of the two species. In spite of the discontinuity between the occurrence records of *E. aztecus* for Central and South Americas, our records suggest that *E. aztecus* presents a wide distribution. Considering that some *E. aztecus* were sampled up to 1,000 meters a.s.l. and the geological structure of Northern Andes that shows similar elevations to *E. aztecus*’ areas of occurrence [13], the distribution may be continuous. Since the 1970s no researcher has studied the genus, and the discontinuity observed for *E. aztecus* distribution is possibly determined by the lack of studies in forest ecosystems along the range. *E. nigribasis* (Banks, 1925) shows a rather similar distribution,



Scale: 1:58224157 at latitude 0°

FIGURE 1: Occurrence records of *Epipompilus aztecus* (Cresson, 1869) (gray marks) and *Epipompilus excelsus* (Bradley, 1944) (black marks). The circles represent the old records of the species and the triangle represents the new records.

being recorded in Panama, Colombia, and southeastern Brazil [6]. A large sample effort is necessary, mainly for the Cerradão (forest type of Brazilian Savanna) and Amazonian Forests, to recognize the real distribution of these species.

Our data indicate that *E. excelsus* is restricted to the Atlantic Forest, occupying the biogeographical Atlantic and Paranaense Provinces [14], which consists respectively of the Atlantic Rain Forest at the Brazilian coast and the Atlantic Semideciduous Forest at the southeastern inside of Brazil, reaching eastern Paraguay [15, 16]. In the Atlantic Rain Forest, *E. excelsus* was recorded more commonly in the highlands, suggesting that its occurrence is linked to South American Central Plateau's forest ecosystems.

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