



A new Frenguelliidae (Insecta: Odonata) from the early Eocene of Laguna del Hunco, Patagonia, Argentina

JULIÁN F. PETRULEVIČIUS^{1,3} & ANDRÉ NEL²

¹Museo de La Plata - UNLP - CONICET, División Paleozoología Invertebrados, Paseo del Bosque s/n, 1900 La Plata, Argentina.

E-mail: levicius@museo.fcnym.unlp.edu.ar ²CNRS UMR 7205, Muséum National d'Histoire Naturelle, CP 50, Entomologie, 45 rue Buffon, F-75005, Paris, France. E-mail: anel@mnhn.fr

³Corresponding author

Abstract

The discovery of a new specimen of Frenguelliidae, attributed to the new species *Frenguella iglesiasi*, in Patagonia, Argentina, is noteworthy for the knowledge of the diversity within this little-known family.

Key words: Insecta, Odonata, Eiproctophora, Frenguelliidae, Eocene, Patagonia, Argentina

Introduction

The family Frenguelliidae is based on its type species *Frenguella patagonica* Petrulevičius and Nel, 2003. The type specimen was an isolated wing considered by its morphology as a forewing. More recently we found a second isolated wing attributed to the same species and considered as a hindwing because of the basally closed discoidal cell (Petrulevičius and Nel, 2007). Here we present a third specimen of the family, discovered in the same outcrop at Laguna del Hunco as for the two previous ones. We attribute it to a new species because of its wing morphology.

Frenguella is a very interesting genus that was considered as a basal Eiproctophora, a clade that also comprises the modern Anisoptera (Petrulevičius and Nel, 2003, 2007). As several more advanced Eiproctophora are Late Triassic, this Paleocene family also belongs to a very ancient lineage of Triassic age. The gap in the fossil record of this group between the Triassic and the Paleocene is not necessarily problematic because the recent Epiophlebiidae, another relatively basal eiproctophoran family, has no fossil record. The fossil record of these Odonata is cryptic, maybe in relation to highly specialized biologies as for *Epiophlebia superstes* and *Epiophlebia sinensis* that inhabit the headwaters in rainforests of Japan and North China (Shimura, 2005; Li *et al.*, 2011).

Females of *Epiophlebia superstes* lay their eggs in terrestrial plants such as mosses and *Elatostema umbellatum* on banks of the heads of mountain rivers (Shimura, 2005).

The localities of the Eocene of Patagonia have begun to show a nice diversity of odonate records from ovipositions to nymphs and adults (Petrulevičius, in press). The odonate oviposition traces from Laguna del Hunco were originally considered to be made by Coenagrionidae and Lestidae (Sarzetti *et al.*, 2009), but we cannot exclude their attribution to the odonates present in the locality, as the Frenguelliidae, and in accord to their morphology comparable to that of the basal Eiproctophora Epiophlebiidae (Petrulevičius *et al.*, 2011; Shimura, 2005).

Material and methods

The new specimen of Frenguelliidae is housed in the Museo Paleontológico Egidio Feruglio (MPEF-PI 1006), Trelew, Argentina. The specimen was originally partly covered by sediments and was prepared with a pneumatic hammer.

We follow the wing-venation nomenclature of Riek and Kukalová-Peck (1984), amended by Kukalová-Peck (1991), Nel *et al.* (1993) and Bechly (1996). The abbreviations of names of wing structures used throughout the work are: CA: costa anterior, CP: costa posterior, ScP: subcosta posterior, Ax1 and Ax2: principal antenodals, SN: subnodus, RP: radius