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Two New Species of Black Flies (Diptera: Simuliidae) from the High Andes of Colombia

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Abstract

The females, males, pupae, and larvae of two new species of *Simulium* are described and illustrated from a small stream 3950 m above sea level in the Lake Otún area of the Colombian Andes Mountains. *Simulium* (*Pternaspatha*) *quimbayium* **n. sp.** represents a 630-km northeastern extension of the distributional range of previously known members of the subgenus *Pternaspatha*, and *Simulium* (*Psilopelmia*) *machetorum* **n. sp.** represents the highest altitude recorded for a species of the subgenus *Psilopelmia*. These species illustrate the unique simuliid biodiversity in the páramo ecosystem of the high northern Andes.

Key words: new species, páramo, *Psilopelmia*, *Pternaspatha*, *Simulium*

Introduction

The tropical Andes region leads the list of endemism hot spots in the world, presenting geographic barriers that have facilitated speciation and fostered new ecological interactions (Myers *et al.* 2000, Morrone 2006). The North Andean Páramo Province consists of isolated peaks and valleys at elevations above 3000 m from Venezuela to northern Peru, and contributes significantly to Andean biodiversity and endemism (Sklenář & Ramsay 2001). Collecting efforts for black flies in the high Andes of Colombia have been limited, biasing an understanding of taxon distributions.

The 27 species in the subgenus *Pternaspatha* are restricted to the mountains of South America (Adler & Crosskey 2013) above 2000 m, especially in the puna grassland ecoregion, an area with dry to moist climate. The puna contrasts with the more northern and permanently humid páramo (Coscarón & Wygodzinsky 1972). The northern and southern Andes are cleaved by an arid valley, the Marañón Gap, or Huancabamba Depression, corresponding roughly with the Peru-Ecuador border, which forms a significant barrier for organisms in the cordillera (Weigend 2002). Coscarón & Wygodzinsky (1972) revised *Pternaspatha* and suggested that northern Ecuador represents the northern limit of this subgenus. The subsequent discovery of *Simulium cotopaxi* north of the Marañon Gap and more than 1000 km north of the previously known limit of *Pternaspatha* (Wygodzinsky & Coscarón 1979) showed that this feature is not a barrier restricting the subgenus to the southern Andes or to the puna ecosystem.

The classification of species currently placed in the subgenus *Psilopelmia s.l.* (Shelley *et al.* 2010) has been controversial (Miranda Esquivel & Muñoz de Hoyos 1995). The species have been variously arranged in the subgenera *Ectemnaspis* and *Psilopelmia s.s.*, with the latter consisting of several species groups (Coscarón & Coscarón Arias 2007). The history of these subgenera and species groups has been summarized by Shelley *et al.* (2010), who redefined the species groups based on cibarial armature of the females. Although the classification of Shelley *et al.* (2010) requires further testing, we follow their arrangement here. *Psilopelmia s.l.* is principally Neotropical, although some species occur in the Nearctic Region (Coscarón & Coscarón Arias 2007).

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