

Earthworm taxonomic structure of coffee plantations at three soil associations in Puerto Rico

(Oligochaeta: Glossoscolecidae, Megascolecidae)

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Abstract. The taxonomic structure of earthworms of coffee plantations systems at three different places in Puerto Rico (Las Marías, Lares, and Jayuya), representing different soil types, was assessed. Organisms were manually sorted in a 0.25 m², and various soil analyses were carried out. Eight earthworm species were identified: *Onychochaeta borincana*, *Pontoscolex corethrurus*, *P. melissae*, *P. spiralis*, and *Pontoscolex* sp., which belong to the Glossoscolecidae family, and *Amyntas gracilis*, *A. rodericensis*, and a pheretimoid species which belong to the Megascolecidae family. Some significant differences among soil properties were found between locations, treatments, and the interaction effects, but no clear patterns between these differences accounted for the taxonomic structure and abundance of earthworms at these coffee plantations. Higher abundances of exotic species were found in the most distressed areas as expected. *P. corethrurus* was found at all the investigated coffee plantations. Lares, the second area of highest elevation, had the higher density of earthworms. On the other hand, Jayuya, the most isolated area, had the highest species number. *P. melissae*, a rare species that had been reported from only three locations in Puerto Rico when it was described in 1991, was found only in Jayuya.

Key words. Earthworms, coffee plantations, Puerto Rico.

Introduction

The earthworms of Puerto Rico are the most well known of the West Indies (FRAGOSO et al. 1995). The documentation of *Amyntas rodericensis* (Grube, 1879) and *Pheretima biserialis* (Perrier, 1875) (now *Polypheretima elongata* Perrier, 1872), two peregrine species, was the first mention of terrestrial oligochaetes for the island (MICHAELSEN 1902). Until 1962, when GATES described *Trigaster rufa*, all the species known for Puerto Rico were exotic (BORGES 2004). By 1988, the earthworms reported from Puerto Rico included seven exotic and three native species and a new genus namely, *Estherella*. Subsequent studies (BORGES 1994, BORGES & MORENO 1989, 1990a-b, 1991, 1994, JAMES 1991) have added more species to the list and now 29 species have been reported for Puerto Rico. The majority of earthworms in Puerto Rico are megascolecids and glossoscolecids, representing 35% and 41% of species, respectively; 36% of the reported species are exotic and 64% are native (BORGES 2004).

Even though the ecological studies on the earthworms of Puerto Rico have been few, they have been enough to make some suggestions about the relationships between native and exotic species. These suggestions are: (1) earthworm communities in natural and disturbed