Zootaxa 2065: 51–68 (2009)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Species diversity and distributions of microdrile earthworms (Annelida, Clitellata, Enchytraeidae) from South America

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Abstract

A comprehensive biodiversity database of Enchytraeidae produced 66 nominal species reported to date from South America (*Achaeta*, 6 species; *Buchholzia*, 1; *Cognettia*, 1; *Enchytraeus*, 3; *Fridericia*, 5; *Grania*, 1; *Guaranidrilus*, 10; *Hemienchytraeus*, 12; *Henlea*, 2; *Lumbricillus*, 7; *Marionina*, 12; *Stephensoniella*, 1; *Timmodrilus*, 1; *Tupidrilus*, 4). Almost 76% of this fauna (50 species) is endemic to the South American continent. The remaining 16 species are more or less largely distributed. Detailed South American occurrences are provided. This is the first reassessment of South American enchytraeids in 27 years. The group is conspicuoulsy absent from the northeast region of Brazil. Enchytraeidae are microdrile earthworms, representing the sister group of the Crassiclitellata, or megadrile earthworms. This relationship is supported by molecular phylogenies, ontogenetic transformations, ecological evidence, and several morphological synapomorphies (dorsal pores, contractil dorsal vessel, lateral position of dorsal chaetal bundles, and shape of chaetae).

Key words: biodiversity, Crassiclitellata, Neotropical region, Oligochaeta, sister group of megadrile earthworms, terrestrial taxon

Introduction

Oligochaeta Grube, 1850 have a preponderant role in phylogenetic, zoogeographical, ecological, and agronomical research. They may serve as model organisms for the study of their metameric and coelomic body organizations, they have a slow dispersal capacity (the megadriles are highly endemic), and their role in soil and litter renders them useful to man (Righi 1995).

Enchytraeids are small cylindrical worms that reach 3–4 cm in length (Stephenson 1930a), only exceptionally attaining 10–17 cm in length (Eisen 1904; Rota & Brinkhurst 2000). The Enchytraeidae Vejdovský, 1879 appear to be derived in relation to the aquatic microdriles, having the following characters which I suggest may be autapomorphies: discrete pharyngeal glands in some of the anterior segments (although also occurring in the naidid *Pristina* Ehrenberg, 1828), preseptal portion of *vas deferens* glandular (in rhyacodriline naidids it is the postseptal part of the male funnels that are glandular), presence of penial bulbs (although penial bulbs are absent in many enchytraeid taxa), testes and ovaries in segments 11 and 12, respectively, male pores in segment 12, and spermathecae located far forward, in segment 5. The genera of Enchytraeidae are distinguished by several somatic characters: Shape and arrangement of chaetae, organization of pharyngeal glands, presence or absence of dorsal pores and of oesophageal appendages (peptonephridia) (Erséus 1980). Kasprzak (1984a) also indicates the development of the dorsal vessel as a useful character for the classification of genera. Perhaps the most important single criterion for the identification of Enchytraeidae is the shape of the spermathecae (Nielsen & Christensen 1959). There are circa 650 valid species of Enchytraeidae known in the world (Erséus 2005).

Accepted by B. Sket: 17 Mar. 2009; published: 6 Apr. 2009