Acanthobdellida (hook-faced fish worms) – molecular analyses and external morphology shed light on the history of the ancient leech group

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Abstract

Acanthobdellids (hook-faced fish worms) are regarded as the sister group to true leeches (Hirudinida). Acanthobdellida comprises two known species: *Acanthobdella peledina* Grube, 1851 and *Paracanthobdella livanowi* (Epstein, 1966), each placed in a separate family (Acanthobdellidae and Paracanthobdellidae). These leech-like annelids are blood-feeding fish parasites; like their closest relatives, they are equipped with suckers, and they also bear chaetae which are absent in true leeches. They live in the Northern Hemisphere, from Scandinavia to Alaska, however, *P. livanowi* was found in the Russian Far East only. We present new molecular data (selected sequences of nuclear and mitochondrial genes) for two populations of *A. peledina* (Scandinavian and Alaskan) and, for the first time, sequences for *P. livanowi* (COI, 12S, 18S and 28S). We also analysed the external morphology of both species using light microscopy and SEM, mainly concentrating on the anterior suckers with hooked chaetae and gonopores which are the main features distinguishing the species. Our analyses showed species-level differences in the anterior sucker and facial hooks; molecular phylogenetics mirrors this divergence between species (*P. livanowi* is sister to *A. peledina*). Alaskan and Scandinavian *A. peledina* populations are morphologically similar but appear distinct genetically. Molecular data suggest that hook-faced fish worms are an ancient lineage; however, both species and populations have diverged relatively recently. Due to not very distinct differences between the two species, we propose to abandon the family Paracanthobdellidae. To match better leech taxonomy, we propose to erect a new suborder Acanthobdelliformes. We also propose the common name 'hook-faced fish worms' for acanthobdellids to underline the presence of characteristic bent, hook-like chaetae.

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