

Cryptic diversity in the *Dendrobaena schmidtii* complex (Lumbricidae, Annelida)

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Key words: earthworms, cryptic taxa, *Dendrobaena schmidtii*, *cox1*, ITS2

Motivation and Aim: Even the most well-studied earthworm species were found to contain high cryptic genetic diversity [1], which is due to the paucity of diagnostic morphological characters and considerable intraspecific variation. *Dendrobaena schmidtii* (Michaelsen, 1907) is a Caucasian endemic with many described subspecies and high morphological diversity. Here we studied genetic diversity of a sample of *D. schmidtii* from several populations from the Western Caucasus with pronounced variation in size and color.

Methods and Algorithms: *D. schmidtii* individuals were collected in seven locations from the Western Caucasus. Fragments of the *cox1* gene and the ITS2 nuclear ribosomal spacer were amplified using universal primers; phylogenetic trees were constructed in MrBayes v.3.2.6. We also performed a GBS analysis of seven specimens of *D. schmidtii* of different size morphs; the obtained reads were assembled using Stacks v.2.55 and analyzed in Structure v.2.3.4.

Results: For both genes studied, we found that our sample was split into two groups [2]. The first group included somewhat bigger (3–7.5 cm) individuals that were only slightly pigmented or totally unpigmented (when fixed by ethanol). The second group contained small (1.7–3.5 cm) specimens with dark purple pigmentation. In one of the studied locations these two groups were found in sympatry. However, there were no absolute differences either in general appearance (pigmented/unpigmented, small/big) or among diagnostic characters. Although the two groups differed in size (the majority of individuals from the first group were 5–6 cm long, and of the second one, 2–3 cm), the studied samples overlapped to a certain degree. Pigmentation, despite apparent differences, was also unreliable, since it was heavily affected by fixation of the specimens. GBS analysis suggested that the studied sample was split into two to four groups, and notably one specimen belonging to the small form was found to contain similar number of alleles of the small and large forms.

Conclusion: Based on the obtained data we can conclude that *D. schmidtii* consists of at least two species that have identical states of diagnostic characters, but differ in general appearance. However, first generation hybrids between these cryptic species may form.

Acknowledgements: Supported by the Russian Foundation for Basic Research (RFBR) grant No. 20-54-56030_Iran_t.

References

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