

**FIRST MOLECULAR EVIDENCE FROM THE EXISTENCE OF CRYPTIC SPECIES
IN THE COSMOPOLITAN, EURYHALINE FLATWORM *GYRATRIX*
HERMAPHRODITUS (RHABDOCOELA, KALYPTORHYNCHIA)**

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Morphological and karyological studies have suggested the existence of many cryptic species within *Gyratrix hermaphroditus* Ehrenberg, 1831, a cosmopolitan, euryhaline 'species' of free living flatworms. Molecular data, however, are completely lacking. In this study we have investigated the genetic relationships between morphologically identical, European populations (both freshwater and marine). The analysis is performed using a part of the nuclear ITS1 gene sequence. These analyses revealed the presence of 28 haplotypes. The Neighbour-joining tree shows a deep divergence between different monophyletic groups, with a basal dichotomy consisting of a monophyletic freshwater and a monophyletic marine clade. This result raises some very interesting questions concerning the evolutionary history and the biogeography of this species complex. Furthermore, very different haplotypes, belonging to different deep monophyletic clades, occur at the same location. This is an indication that a high number of species can occur sympatrically.