Original Article

New branch on the tree of life of Gastrotricha: establishment of a new genus for limno-terrestrial species

Axell Kou Minowa[1,*], Alexander Kieneke[2], Ariane Campos[1], Maria Balsamo[3], Michael Plewka[4], Loretta Guidi[3], Thiago Quintão Araújo[5] and André RinaldoSenna Garraffoni[1]

[1]Laboratório de Evolução de Organismos Meiofaunais, Departamento de Biologia Animal, Instituto de Biologia, Universidade Estadual de Campinas, Campinas, São Paulo 13083-970, Brazil
[2]German Center for Marine Biodiversity Research (DZMB), Senckenberg am Meer, Suedstrand 44, Wilhelmsmolehaven 26 382, Germany
[3]Department of Biomolecular Sciences, Scientific Campus, University of Urbino, Urbino, Pesaro-Urbino 61029, Italy
[4]Department of Biology, State Gymnasium, Ochsenkamp 100, Gevelsberg 58285, Germany
[5]University of Massachusetts Lowell, Lowell, MA 01854, USA

[*]Corresponding author. Laboratório de Evolução de Organismos Meiofaunais, Departamento de Biologia Animal, Instituto de Biologia, Universidade Estadual de Campinas, Campinas, São Paulo 13083-970, Brazil. E-mail: axellkouminowa@gmail.com

ABSTRACT

Gastrotricha encompass a diversity of free-living micrometazoans typically associated with aquatic or semi-aquatic environments. The discovery of a gastrotrich species in limno-terrestrial habitats challenges existing taxonomic classifications and expands our understanding of their ecological diversity. This study describes *Dendroichthydium ibyrapora* gen. et sp. nov., a new gastrotrich from epiphytic mosses found in Atlantic rainforest within Serra do Japi biological reserve, and establishes its taxonomic status through morphological and molecular analyses. Morphological characterization was conducted using light microscopy, scanning electron microscopy, and confocal laser scanning microscopy, revealing that *D. ibyrapora* exhibits distinctive adaptations suited to limno-terrestrial environments, including unique cuticular adaptations and rearrangement of locomotory cilia. Molecular phylogenetics, using 18S and 28S ribosomal DNA sequences, supports the recognition of *Dendroichthydium* as a new genus, distinctly separated from known genera within Paucitubulatina. Furthermore, we propose reclassifying *Chaetonotus* (*Chaetonotus*) *silvaticus* to *Dendroichthydium silvaticus* comb. nov. based on shared morphological traits. The establishment of the genus *Dendroichthydium* reflects the ongoing need to re-evaluate gastrotrich diversity and taxonomy, highlighting the role of underexplored limno-terrestrial habitats in hosting unique life forms. This study underscores the importance of integrating morphology and genetics to improve our understanding of phylogenetics and the evolutionary dynamics of Gastrotricha.