



Definition of families, subfamilies, genera and subgenera of the Eutardigrada, and keys to their identification

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Abstract

The systematic arrangement of the Eutardigrada has radically changed since 1969 due to the new evaluation of characteristics of the claws and of the bucco-pharyngeal apparatus and the use of some characters overlooked before. After that date, as a consequence, four new families and 40 genera have been instituted. Given the changes and number of novelties, the authors have updated the definitions of all familial and generic taxa and have provided keys to aid identification.

Key words: Eutardigrada, definitions, families, genera, dichotomous keys

Introduction

Up until 1969 only two families (Macrobiotidae and Milnesiidae) and five genera were ascribed to the class Eutardigrada. To the Macrobiotidae were ascribed four genera: *Macrobiotus* (subdivided into the subgenera *Macrobiotus* and *Pseudodiphascon*), *Haplomacrobiotus*, *Itaquascon*, and *Hypsibius* (subdivided into the subgenera *Calohypsibius*, *Isohypsibius*, *Hypsibius* and *Diphascon*). A fifth subgenus, *Microhypsibius* Thulin, 1928, according to Marcus (1929) was no longer considered valid. To the family Milnesiidae was ascribed the genus *Milnesium*.

In 1969 Pilato published the paper "Evoluzione e nuova sistemazione degli Eutardigrada" where a new evaluation of the characteristics of the claws and of the bucco-pharyngeal apparatus was proposed. In that paper a reconstruction of the phylogenesi of the eutardigrades and a new systematic arrangement of the families and genera were proposed.

These criteria have been considered valid and accepted by all tardigrade taxonomists.

Pilato (1969b) split the family Macrobiotidae into three families: Macrobiotidae, Calohypsibiidae and Hypsibiidae (the latter subdivided into two subfamilies: Hypsibiinae and Itaquasconinae). He elevated the status of the subgenera *Macrobiotus* and *Hypsibius*, and instituted the new genera *Hexapodibius*, *Parhexapodibius* and *Doryphoribius*.

The re-evaluation of the characteristics of the claws and the bucco-pharyngeal apparatus, with further more precise details regarding many characters (Pilato 1972, 1975, 1981) gave an impulse to the study of the eutardigrades (Maucci, 1986, pag XI). In fact, after 1969 four new families: Necopinatidae Ramazzotti & Maucci, 1983, Eohypsibiidae Bertolani & Kristensen, 1987 (previously Amphibolidae Bertolani, 1981), Microhypsibiidae Pilato, 1998 and Murrayidae Guidetti, Rebecchi & Bertolani 2000 (this taxon was instituted by the authors as subfamily and elevated at level of family by Guidetti *et al.*, 2005) were erected. The new subfamily Diphasconinae was instituted by Dastych (1992). The number of generic novelties currently stands at 39 (*Necopinatum* Pilato, 1971; *Limmenius* Horning, Schuster & Grigarick, 1978; *Pseudobiotus* Nelson, 1980 (in Schuster *et al.*, 1980); *Dactylobiotus* Schuster, 1980; *Minibiotus* Schuster, 1980; *Bertolanus* Özdikmen, 2008 (*nomen novum* for *Amphibolus* Bertolani, 1981); *Thulinus* Bertolani, 1981; *Adorybiotus* Maucci & Ramazzotti, 1981; *Eohypsibius* Kristensen, 1982; *Halobiotus* Kristensen, 1982; *Apodibius* Dastych, 1983; *Ramazzottius* Binda & Pilato, 1986; *Hebesuncus* Pilato, 1987; *Mesocrista* Pilato, 1987; *Platicrista* Pilato, 1987; *Parascon* Pilato & Binda, 1987; *Richtersius* Pilato & Binda, 1989 (the genus formally *Richtersia* Pilato & Binda, 1987); *Haplohexapodibius* Pilato & Beasley, 1987; *Murrayon* Bertolani & Pilato, 1988; *Macroversum* Pilato & Catanzaro, 1988; *Ramajendas* Pilato & Binda, 1990; *Mixibius* Pilato, 1992; *Paradiphascon* Dastych, 1992; *Eremobiotus* Biserov, 1992; *Calcarobiotus* Dastych, 1993; *Pseudohexapodibius* Bertolani & Biserov, 1996; *Xerobiotus* Bertolani & Biserov, 1996; *Astatumen* Pilato, 1997; *Acutuncus* Pilato & Binda, 1997; *Fractonotus* Pilato, 1998; *Milnesioides* Claxton, 1999; *Biserovus* Guidetti & Pilato, 2003; *Minilentus* Guidetti & Pilato, 2003; *Insuetifurca* Guidetti & Pilato, 2003; *Famelobiotus* Pilato, Binda & Lisi, 2004; *Borealibius* Pilato, Guidetti, Rebecchi, Lisi, Hansen & Bertolani,