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An evaluated list of Cenozic-Recent radiolarian species names (Polycystinea), based on those used in the DSDP, ODP and IODP deep-sea drilling programs

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Abstract

A first reasonably comprehensive evaluated list of radiolarian names in current use is presented, covering Cenozoic fossil to Recent species of the primary fossilising subgroup Polycystinea. It is based on those species names that have appeared in the literature of the Deep Sea Drilling Project and its successor programs, the Ocean Drilling Program and Integrated Ocean Drilling Program, plus additional information from the published literature, and several unpublished taxonomic database projects. 1192 names are recognised as valid, and several hundred additional names including synonyms and mispellings are given as well. A brief list of valid names is provided in the main paper, while the full list, with synonyms, author, year of publication, family assignment, geologic age interval and notes is provided as a SOM spreadsheet table.

Key words: plankton, microfossil, taxonomy, protist

Introduction and past work

Radiolarians (as used in this paper, only the Order Polycystinea) are one of the major groups of marine microfossils, with an extensive fossil record extending from the basal Paleozoic to the Recent. The occurrences of different species of radiolarians are extensively used for research in biostratigraphy, paleoceanography and paleobiology (De Wever *et al.*, 2001). Progress in radiolarian research depends fundamentally on improved taxonomy. Inadequate or incomplete species level taxonomy limits all aspects of research, while higher level taxonomy and systematics are essential frameworks for many studies in evolution. Radiolarian taxonomy is still relatively poorly developed in comparison to many other groups of both macro- and microfossils. In comparison to much larger numbers of specialists for foraminifera, coccolithophores, diatoms or dinoflagellates, the radiolarian community is small, and in particular, the number of workers specialising in Cenozoic to Recent (e.g. living) radiolarians has been insufficient to support the development of reasonably comprehensive taxonomic catalogs or checklists of valid species. Lack of taxonomic synthesis, together with the extensive use of radiolarians for biostratigraphic and paleoceanographic studies, has led to an accumulation of radiolarian names in the published Cenozoic literature whose meaning is difficult to assess, increasingly hindering researchers using radiolarians in their work.

While substantial, if incomplete, published taxonomic databases exist for at least some time intervals of the Mesozoic (Baumgartner *et al.* 1995 for mid-Mesozoic low latitude radiolarian species; O'Dogherty *et al.* 2009 for Mesozoic radiolarian genera), for Cenozoic to Recent faunas the situation is less satisfactory. For living species, a major new comprehensive database of radiolarian ecology was recently published (WoRaD, Boltovskoy *et al.*

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