Global diversity and distribution of the Phreodrilidae (Annelida: Clitellata)

Adrian M. PINDER

Science Division, Department of Environment and Conservation, P.O. Box 51, Woodvale, 6946, Western Australia, AUSTRALIA.

adrian.pinder@dec.wa.gov.au

Phreodrilids were first recorded from groundwater in New Zealand, with the description of *Phreodrilus subterraneous* by Frank Beddard in 1891. There are now 51 species described, but there are potentially dozens more undescribed (there are at least 17 undescribed in Australia and probably many more). Almost all of these inhabit Gondwanan landmasses, including South America (3 species), New Zealand (5), Australia (32), Africa (5), Arabian Peninsula (2), Sri Lanka (1) or southern oceanic islands (Falklands, South Georgia, Kerguelen, Crozets, Campbell and Macquarie, with a total of 7 species). Exceptions to Gondwanan pattern are unidentified worms from Northern Ireland and a species known only from Japan. As for many groups of Gondwanan origin, phreodrilids are most diverse in cooler mesic climates and where they occur elsewhere they usually inhabit relictual and/or refugial habitats that may provide protection from drought and/or high temperatures. Thus, in Africa they are found in deep rift valley lakes, high altitude or in groundwater. The Sri Lankan species is also found at high altitude and in Australia greatest diversity is found in temperate Tasmania and south-western Australia, though curiously not in south-eastern Australia which is generally cooler and wetter than south-western Australia. In arid and subtropical Australia phreodrilids are strongly associated with groundwater or groundwater fed surface habitats and contribute to the spectacularly diverse stygofauna of in inland and northern Western Australia. An exception to the generally mesic or refugial habitat association is the occurrence of several species in temporary habitats, such as moss beds and associated seepages and pools, on granite inselbergs in semi-arid south-western Australia. Very little is known about the biology and ecology of phreodrilids other than their habitat associations. Three are commensal on crayfish but the rest are free living and appear to be sediment dwelling detritivores.

The current accepted classification divides phreodrilids into eight genera, most of which are represented on multiple continents, the exceptions being two monospecific genera: *Phreodriloides* of south-western Australia and *Gondwanadrilus* of southern Africa. *Nesodrilus* is notable for occurring primarily on islands. Molecular work would most likely likely to lead to a substantial revision of the current classification and help to resolve some of the outstanding taxonomic issues such as the vague separation of *Insulodrilus* from *Astacopsidrilus*. It may also help to resolve the *lacustris/litoralis* species complex and determine whether widespread 'species' such as *Antarctodrilus niger* and *Phreodrilus branchiatus* really are.

Keywords: Phreodrilidae, diversity, biogeography.

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