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The Amphipod (Crustacea) Stygofauna of Australia: Description of New Taxa (Melitidae, Neoniphargidae, Paramelitidae), and a Synopsis of Known Species

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ABSTRACT. Freshwater amphipods from Australian subterranean waters are discussed. Five new genera and fourteen new species are described; the genus *Wesniphargus* Williams & Barnard is rediagnosed and specimens assigned to *W. nichollsi* (Straškraba) are fully described; a synopsis of subterranean species is provided.

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Introduction

The diversity of Australian sub-surface (stygobiont) amphipods was, until recently, considered to be relatively low; only four or possibly five species were regarded as subterranean (Williams, 1986). However, in a separate footnote to the paper by Williams (1986: 556), Knott foreshadowed greater diversity and noted that a range of undescribed subterranean amphipods occurred in Western Australia. Without formal description of taxa, comments supporting this note were separately published (Knott, 1983, 1985). Descriptions of several subterranean species (Williams & Barnard, 1988; Stock & Iliffe, 1991; Barnard & Williams, 1995; Bradbury & Williams, 1995, 1996a,b, 1997) have provided substantive confirmation that a diversity of forms occur, a phenomenon which includes—as elsewhere—both troglobitic and troglophilic forms (i.e. obligate and facultative sub-surface forms). Bradbury & Williams (1997) discussed and drew attention to this diversity, listed all described sub-surface forms, and noted the occurrence of several further undescribed taxa.

The main aim of the present paper is to describe the further taxa referred to by Bradbury & Williams (1997). Given their number and diversity, the opportunity is taken to update the synopsis of described forms and discuss them briefly. The opportunity is also taken to revise the generic description of *Wesniphargus* Williams & Barnard, 1988, in the light of additional material of *W. nichollsi* collected from a stream flowing from a cave and from a temporary pool.

Although the taxa described herein significantly increase the already considerable known diversity of subterranean Australian amphipods, still further new taxa await description; material is in our possession or known to us which points to the likelihood of new stygobiont taxa from Queensland (*Chillagoe* sp.), New South Wales, South Australia (northwestern, east-central, and southeastern), Tasmania, and Western Australia (Barrow Island, Varanus Island, Ashburton River, Nullarbor Plain). However, given the pressing need to focus attention on surface forms of Australian amphipods, rather than provide an exhaustive study of sub-surface forms, this material will form the basis of a subsequent paper.

While the major aim of this paper is taxonomic, we recognise—together with an increasing number of others (see especially: Christiansen, 1992; Culver *et al.*, 1995; Holsinger, 1994a,b; Kane & Culver, 1992)—that cave faunas, amphipods in particular, are of considerable scientific interest beyond their taxonomy, but that taxonomic studies like ours nevertheless continue to dominate studies of cave faunas. Notwithstanding this recognition, given the only recent knowledge of the extensive diversity of sub-surface amphipods in Australia and its still indeterminate limits, we believe taxonomic studies essential prerequisites at this stage.

Methods of dissection and description

These follow Bradbury & Williams (1996a).

The notation **M**, with an appended number, indicates the position of an object as a fraction of the distance from the base to the apex of an appendage; **S**, large robust seta; **s**, small robust seta. Abbreviations used in the figures are as follows: **A**, antenna; **Abd**, abdomen; **acc**, accessory; **C**, coxa; **d**, dorsal; **dact**, dactylus; **E**, epimeron; **fl**, flake; **flag**, flagellum; **g**, gill; **G**, gnathopod; **Hd**, head; **i**, inner; **juv**, juvenile; **L**, left; **lac**, lacinia mobilis; **lat**, lateral; **LL**, lower lip; **MD**, mandible; **med**, medial; **mol**, molar; **MP**, maxilliped; **MX**, maxilla; **O**, oostegite; **opp**, opposite; **p**, palp; **P**, peraeopod; **pl**, plate; **Pp**, pleopod; **R**, right; **st**, sternal gill; **T**, telson; **U**, uropod; **UL**, upper lip; **UR**, urosome; **1, 2, 3 ...7**, first, second, third ...seventh article, segment, somite or epimeron (as appropriate).

Mandibular palp setae are described using the notation of Karaman (1969) and Barnard & Barnard (1983). Lowry & Stoddart (1993) proposed a modified notation which removed many discrepancies, but as the former notation was developed for freshwater crangonyctoids it has not been necessary to employ the more detailed ones of Lowry & Stoddard (1993).