Zootaxa 3926 (1): 001–056
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3926.1.1
http://zoobank.org/urn:lsid:zoobank.org:pub:342DDB94-4739-464B-AF67-4B17C6EE35D7

A review of the Carboniferous and Permian trilobites of Australia

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Accepted by J. Paterson: 11 Nov. 2014; published: 4 Mar. 2015

Abstract

The first complete review of the Carboniferous and Permian trilobite species found within Australia is presented to assess the current standing of Australian taxa in a modern systematic context. The review consists of four families, 20 genera and 61 known species from the early Tournaisian to Moscovian (358.9 Ma to 304 Ma), throughout New South Wales, Tasmania, Western Australia and Queensland. The revision also includes a revised anatomical nomenclature for Australian Carboniferous trilobites. Emended diagnoses are provided for seven genera and 28 species. The genus *Thalabaria* is placed within the subfamily Archegoninae, and the genera *Australokaskia* and *Planokaskia* are placed within Cummingellinae. The subgenera *Brachymetopus* (*Spinimetopus*)*, Bollandia* (*Capricornia*)*, Australokaskia* (*Longilobus*) and *Australokaskia* (*Planilobus*) are suppressed within *Brachymetopus, Bollandia, Australokaskia*, respectively. All *Brachymetopus* (*Brachymetopus*) *maccoyi* subspecies are elevated to species. Species of *Linguaphillipsia* are considered *sensu lato* until there is adequate revision of the entire genus. New combinations include the following: *Aprathia semicircularis* is reassigned to *Weania; Aprathia applanata* is questionably reassigned to *Carbonocoryphe*; and *Phillipsia squamata* is tentatively reassigned to *Palaeophillipsia.* The following have been synonymised: *Conophillipsia* with *Monodechenella*; *Megaproetus* with *Pudoproetus*; *Weberiphillipsia* with *Palaeophillipsia*; *Weania* (*Rosehillia*) with *Schizophillipsia*; *Conophillipsia breviceps dungogensis* with *Monodechenella breviceps*; *Linguaphillipsia raglanensis* with *Linguaphillipsia stanvellensis*; and *Weberiphillipsia girvanensis* with *Palaeophillipsia collinsi*. *Carbonocoryphe* (*Winterbergia*) *elegans, Carbonocoryphe* (*Winterbergia*) *keepitensis* and *Winterbergia*? *waterhousei* are considered representatives of indeterminate genera.

Key words: Aulacopleuridae, Brachymetopidae, Phillipsidae, Proetidae, taxonomy, Trilobita

Introduction

Australian Carboniferous and Permian trilobites are represented by 61 species, 20 genera and four families. The largest body of work on Australian Carboniferous trilobites has been by Engel & Morris (1975; 1980; 1983; 1984; 1985; 1989; 1990; 1991; 1992; 1994; 1995; 1996; 1997), who described (or at least documented) 62 species, 40 of those being new taxa, with several papers focused on their biostratigraphic utility (e.g., Engel & Morris 1997). Prior to the studies of Engel & Morris, Mitchell (1918) produced a monograph on Australian Carboniferous trilobites, significantly building on earlier studies by McCoy (1847), de Koninck (1877) and Etheridge Jr. (1892a, b).

Since the last publication on Australian Carboniferous trilobites by Engel & Morris (1997), only one new Carboniferous taxon has been described from Queensland, *Linguaphillipsia engeli* Talent & Feist in Galtier *et al.* 2007. Until now, little of the systematic work by Engel & Morris has been reassessed. There have also been a large number of publications on Carboniferous trilobites from Europe and America since this time (e.g., Hahn *et al.* 2001; 2003; 2007; Lerosey-Aubril & Feist 2005; 2006), which have re-diagnosed genera also found in Australia.

Australian Permian trilobites are represented by only four species: *Ditmopyge meridionalis* Teichert 1944 from Western Australia; *Doublata inflata* Wass & Banks 1971 from the Hunter Valley in New South Wales; *D. matheri* Engel & Laurie 1978 from Wingham, New South Wales; and *D. pyriforme* Wass & Banks 1971 from eastern Tasmania. No revisions of these taxa have been made since their original descriptions.

This study represents a taxonomic review of the Carboniferous and Permian trilobites of Australia. Generic assignments that have been called into question by Owens (1994), Feist & Petersen (1995), G. Hahn (pers. comm. 2011) and Brezinski (pers. comm. 2012) are addressed. The subfamily and family level placements of the Australian species within the genera *Pudoproetus* Hessler 1963, *Carbonocoryphe* (*Winterbergia*) Hahn & Brauckmann 1975 and *Carbonocoryphe* (*Aprathia*) Hahn & Brauckmann 1975 are reconsidered. Also, in light of more recent literature and data published over the last 20 years, re-diagnoses of genera and species seems appropriate as well as reassessing species and genera that are based on poorly preserved specimens. The status and concepts of the families Proetidae and Phillipsiidae within Proetida follows various works by Hahn & Hahn, but these taxa remain in a state of flux with further revisions required. This review is based solely on existing collections that have been previously described.

Localities. The material used for this study comes from the Carboniferous and Permian of Australia, specifically from Queensland, New South Wales, Tasmania and Western Australia (Fig. 1). Carboniferous material is commonly found in the Manning District (Hunter Valley) and New England regions of New South Wales, the

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