

A Revision of the *Onthophagus pexatus* Species-group, with Description of a New Brachypterous Species (Coleoptera: Scarabaeidae: Scarabaeinae)

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ABSTRACT. The *Onthophagus pexatus* species-group is revised, with the known species—*O. longipes* Paulian, 1937; *O. nammuldi* Matthews, 1972; *O. pexatus* Harold, 1869; *O. squalidus* Lea, 1923—redescribed and a new species: *O. bulga* sp. nov., described. This species-group is centred in New South Wales, where both *O. bulga* and *O. nammuldi* are endemic. *Onthophagus bulga* is only the second flightless species of this large genus known from Australia.

Introduction

The dung beetle genus *Onthophagus* Latreille, 1802 is almost cosmopolitan and includes about 2300 described species (Monteith & Storey, 2013; Gunter *et al.*, 2019). The genus is distinctive and is the dominant coprophagous scarabaeine in most parts of the world (Cambefort, 1991). These beetles are generally tunnellers, pushing dung into tunnels under or beside the dung. Recent phylogenetic studies have placed a small number of African species outside *Onthophagus* and these have been removed to genera such as *Digitonthophagus* Balthasar, 1959 and *Hamonthophagus* Roggero, 2016, both of which occur in Australia as single introduced species (Breeschoten *et al.*, 2016; Philips, 2016; Roggero *et al.*, 2017a,b; Gunter *et al.*, 2019a). Phylogenetic studies have also suggested that the native Australopapuan fauna of *Onthophagus* is the result of radiations from one or two Asian ancestors rather than many independent invasions by different ancestors (Breeschoten *et al.*, 2016; Gunter *et al.*, 2019b).

There are 197 species of *Onthophagus* native to Australia (Gunter *et al.*, 2019a). To aid in identification, these species have been placed in 24 informal species-groups (Matthews, 1972) defined by easily discerned external characters, but

which are often restricted to the males. The species-groups were developed when only 164 native described species were known (Matthews, 1972) but are relatively robust to the addition of new taxa. This species-group system has been extended to include the New Guinea fauna, as it is closely related to the Australian fauna (Krikken & Huijbregts, 2012).

In 1993 the Australian Museum was involved in NSW State Government funded surveys of invertebrates of the North-east Forests bioregion, encompassing Barrington Tops to the Queensland border (Ferrier *et al.*, 1999). Almost 2500 unbaited pitfall traps were placed in closed forests for 6 weeks, with ethylene glycol as preservative. Many of these forests had never been surveyed for insects and therefore it was inevitable that new and interesting ground dwelling beetles would be caught. One of those species was a new flightless *Onthophagus*, designated *Onthophagus* NSW4 in an informal system of code numbers devised by Geoff Monteith (Queensland Museum) and Tom Weir (Australian National Insect Collection) for use in databasing museum collections in Australia. The full list of species is given in Monteith & Kenyon (2011). In 2021, the authors, based at the Australian Museum, had the opportunity to revisit some of

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