



## Review of the fish-parasitic genus *Ceratothoa* Dana, 1852 (Crustacea: Isopoda: Cymothoidae) from Australia, with description of two new species

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### Abstract

The genus *Ceratothoa* Dana, 1852, is revised for Australian waters. *Ceratothoa* is represented in Australia by nine species, including two new species: *Ceratothoa barracuda* sp. nov. described from Cairns and *Ceratothoa globulus* sp. nov. described from Lord Howe Island. *Ceratothoa imbricata* Fabricius, 1775 is redescribed, with *Ceratothoa trillesi* (Avdeev, 1979) and *Ceratothoa huttoni* Filhol, 1885 placed into junior synonymy; the preferred hosts are species of the genus *Trachurus* (Carangidae). *Ceratothoa banksii* (Leach, 1818) is validated and brought out of synonymy with *Ceratothoa imbricata*; host species are from the families Kyphosidae, Scombridae, Latridae, Carangidae, Mugilidae, Salmonidae,

Scatophagidae, Pomatomidae and Hemiramphidae. Species excluded from the Australian fauna are *Ceratothoa trigonocephala* (Leach, 1818) with an unknown host identity and type locality; and *Ceratothoa lineata* Miers, 1876a, that here is transferred to the genus *Mothocya* Costa, 1851, with *Mothocya ihi* Bruce, 1986 placed into junior synonymy. *Ceratothoa contracta* (Miers, 1880), the New Zealand *Ceratothoa novaehollandiae* Filhol, 1885 and the East Pacific *Ceratothoa gaudichaudii* (Milne Edwards, 1840) are regarded here as *species inquirenda*. A key to the Australian species of *Ceratothoa* is presented.

**Key words:** Isopoda, Cymothoidae, *Ceratothoa*, *Mothocya*, fish parasites, Australia

## Introduction

The Cymothoidae are marine parasitic isopods, with 384 species in 40 genera (Smit *et al.* 2014). They occur on a great diversity of fishes worldwide, generally displaying high host and site specificity. The family was subject to a comprehensive world revision by Schioedte & Meinert (1881, 1883, 1884) with significant species documentation from the 1970s to 1990s (e.g. works by Avdeev, Bruce, Thatcher, Trilles, Williams & Bunkley-Williams [in either combination], see Smit *et al.* 2014 and Trilles 1994 for details). Smit *et al.* (2014) reviewed the state of knowledge for the family, with emphasis of its historical species discovery, taxonomy, biodiversity, and ecology.

The Cymothoidae appears to be a well-known family, but there are still many gaps in our knowledge of the family. Marine isopods have generally received considerable taxonomic attention in areas or regions around and close to well-developed population centres (Poore & Bruce 2012). Despite sampling bias and extensive collections from these better known regions, many specimens remain unregistered, unidentified or await description (Poore & Bruce 2012). In particular, tropical regions and coral-reef species remain under researched, especially from hosts of non-commercial fish species. Smit *et al.* (2014) demonstrated that the absolute numbers and cumulative percentage of published species from the family Cymothoidae spiked in the 1880s and the 1980s, but the number of taxonomic publications has decreased since the 1980s.

Polymorphism is another problem faced by cymothoid taxonomists. Prior to the 1950s, new species were routinely described from single female specimens, often with brief descriptions, accompanied by few or no illustrations (Brusca 1981). Historical records rarely referred to type material, resulting in unclear identities and, over time, both complex and unresolved synonymies. Descriptions from the nineteenth century and the first half of the twentieth century contained mainly generic and family-level characters. As new species characters are recognized and used, redescription of type material is essential for both identification and characterization of species.

The genus *Ceratothoa* Dana, 1852 is one of the most speciose buccal-attaching genera in the family, with 33 known species (Smit *et al.* 2014). The genus occurs worldwide (except in polar waters), with recent reviews by Brusca (1981) for the eastern Pacific, Horton (2000) for the northeast Atlantic and the Mediterranean and Hadfield *et al.* (2014a) for southern Africa. Like most isopods, the diversity and distribution of *Ceratothoa* in most oceans remains poorly known.

*Ceratothoa* was first recorded in Australia by Haswell (1881) who described *Ceratothoa argus* (Haswell, 1881) [as *Codonophilus*; here regarded as *species inquirenda*]. Thereafter, the genus remained largely unreported from Australian waters until Hale's (1926) account of the Australian Cymothoidae, which included only *Ceratothoa imbricata* (Fabricius, 1775). More recent contributions to the Australian *Ceratothoa* are those of Avdeev (1979a, b), Bruce & Bowman (1989) and Martin *et al.* (2013).

One particular long-standing problem has been the lack of resolution over the identity and validity of three widely recorded species: *Ceratothoa imbricata* (Fabricius, 1775), *Ceratothoa banksii* (Leach, 1818) and *Ceratothoa trigonocephala* (Leach, 1818). A point was reached where these three species were impossible to separate or synonymise, nor was it possible to ascribe a published record to a name (e.g. see Bruce *et al.* 2002) with any degree of confidence. *Ceratothoa lineata* Miers, 1876, another poorly known species that belongs to the genus *Mothocya* Costa, in Hope, 1851, is indistinguishable from *Mothocya ihi* Bruce, 1986 in the strongly vaulted dorsum and elongate body (Bruce 1986). *Mothocya ihi* is here placed as a junior subjective synonym of *Mothocya lineata* (Miers, 1876) **comb. nov.** *Ceratothoa contracta* (Miers, 1880), though not listed in the Zoological Catalogue of Australia (Bruce *et al.* 2002), was collected "from Australia" (Miers 1880) without figures or detailed description; this species is here regarded as *species inquirenda*.