



Reports of *Cubiceps baxteri* McCulloch 1923 from Indian Ocean are probably misidentifications of *Cubiceps whiteleggii* (Waite 1894)

V. VIJI^{1*}, K.C. HARISH^{1,2} & B. MADHUSOODANA KURUP^{1,3}

¹*School of Ocean Science and Technology, Kerala University of Fisheries and Ocean Studies (KUFOS), Kochi, 682 506, India*

²✉ harishkrishna86@gmail.com; <https://orcid.org/0000-0002-3946-5927>

³✉ kurup424@gmail.com; <https://orcid.org/0000-0003-1914-1420>

*Corresponding author. ✉ vijisamod@gmail.com; <https://orcid.org/0000-0003-2877-9733>

Cubiceps baxteri McCulloch 1923 was described based on a single, imperfect (devoid of a tail) stranded specimen collected from a beach in Lord Howe Island, Tasman Sea. Though *C. baxteri* was reported as a widely distributed tropical species (Butler 1979), it was mainly a result of its incorrect identification (see Agafonova 1994; Stewart and Last 2015). The distribution of *C. baxteri* is reported to be restricted to the Pacific Ocean, from Japan and eastwards to Baja California (Mexico), southwards to the Hawaiian Islands, New South Wales (Australia), and Lord Howe Island (Tasman Sea) to the Southern parts of Chile (Eschmeyer *et al.* 2017; Mundy 2005; Agafonova 1994).

Several records of *C. baxteri* are available from the Indian Ocean region including the Arabian Sea (Adam *et al.* 1998; Jayaprakash *et al.* 2006; Remesan *et al.* 2016; Sileesh *et al.* 2017; Viji *et al.* 2017) and the Bay of Bengal (Kumar *et al.* 2016, 2017), but none take into account the pioneering work of Agafonova (1994), which is by far the most comprehensive taxonomic account of the genus *Cubiceps* Lowe 1843. While Jayaprakash *et al.* (2006) did not mention the details of literature used for their species-level identification, Kumar *et al.* (2016) cited Alcock (1898, 1899) and FAO (1984) as their source of literature. A critical evaluation of this literature showed that, contrary to claims made by the above authors, no species-level description of *C. baxteri* is available in either of Alcock's works (1898, 1899) or FAO (1984). Therefore, the species identity of *C. baxteri* reported by the above authors is questionable.

Previous studies by Viji *et al.* (2017) and Sileesh *et al.* (2017) followed the brief taxonomic key and description provided in Smith & Heemstra (1986) to identify *C. baxteri* from the Arabian Sea. A critical evaluation of detailed taxonomic characters in Agafonova (1994) and a re-examination of our collection in the Marine Biodiversity Museum, India, (GB.31.99.1.5.1) reveals that previous identification of *C. baxteri* (Viji *et al.* 2016 & Sileesh *et al.* 2017) were incorrect. For example, the species has deciduous scales (Agafonova 1994) but Smith & Heemstra (1986) states that they are adherent. Additionally, Smith & Heemstra (1986) generalized the presence of uniserial teeth on the roof of the mouth and tongue as a generic character, whereas, Agafonova (1994) specifically mentioned the presence of uniserial teeth in the vomer, palatine, and also on the tongue, a valid character for the species-level identification.

Recently, Kumar *et al.* (2017) recorded 27 specimens of *C. baxteri* from the Andaman Sea in the northern Indian Ocean and illustrated the otolith morphology. Although the authors mentioned using Alcock (1898, 1899) and FAO (1984) for species-level identification, interestingly none of these sources have a detailed taxonomic key to identify *C. baxteri* and therefore, the identity of the specimens mentioned in Kumar *et al.* (2017) is questionable. No photographs or morphological characters were provided, nor was there any mention of whether voucher specimens are available. However, Kumar *et al.* (2017; p 4) provided an image of an otolith from a specimen which they had identified as *C. baxteri*. Due to the reasons stated above, it would be highly illogical to consider that the otolith in the image actually represents *C. baxteri*.

A critical comparison of the otolith morphology of *C. baxteri* provided in Kumar *et al.* (2017, p 4) with that illustrated by Agafonova (1994; p 120) clearly showed that they are distinct. It is also evident from these comparative illustrations that the specimens identified as *C. baxteri* by Kumar *et al.* (2017) are *C. whiteleggii* (Waite 1894) (Fig:1), a species that has been previously recorded from the Indian Ocean including the Andaman Sea (Rajan *et al.* 2013; Agafonova 1988, 1994; Venu & Kurup 2002; Butler 1979).

In the context of misidentifications made in previous studies (Adam *et al.* 1998; Jayaprakash *et al.* 2006; Remesan *et al.* 2016 and Kumar *et al.* 2016, 2017), it is now pertinent to question the validity of all earlier reports of *C. baxteri* from the Indian waters. The voucher specimens (BMNH 1997.9.17.27—Adam *et al.* (1998); GB.31.99.1.1—Manissery *et al.*

(2012); and SAIAB 200204, 35584, 17784,17186 (Western Indian Ocean); SAIAB 203613 (Andaman Sea)) of this species are available from the Indian Ocean. However, it is also possible that specimens report by Jayaprakash *et al.* (2006) and Kumar *et al.* (2016; 2017) might still be available in the collections of their respective institutions. A re-examination of all such material following the key of Agafonova (1994) and a comparison with the holotype of available at the Australian Museum (IA 686; image available from the museum website) and additional topotypic specimen at the Natural History Museum, London (BMNH 1926.6.30.50) could be useful in establishing the correct identity of the *Cubiceps* species occurring in the Indian waters. Until such confirmation is made, we wish to caution researchers in identifying specimens of *Cubiceps* from India's oceanic waters as *C. baxteri*. Until this taxonomic fiasco is resolved, further research may result in publications pertaining to a species that does not exist in the Indian Ocean”.



FIGURE 1. Holotype of *Cubiceps whiteleggii* (Waite 1894), Maroubra, New South Wales, AMS I.3297.

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