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Four new species of coral gobies (Teleostei: Gobiidae: *Gobiodon*), with comments on their relationships within the genus

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Abstract

Four new species of the coral-associated gobiid genus *Gobiodon* were discovered in the Red Sea. Although several of these species are common not only in the Red Sea but also in the Indian and western Pacific Ocean, they have not been described before. Detailed descriptions of the four species are based on morphological and molecular genetic (mitochondrial 12s and 16s rRNA) investigations. The new species, like most species of the genus, lack scales and have species-specific life colouration. *Gobiodon bilineatus* sp. nov. is the closest relative to *G. quinquestrigatus* (Valenciennes) and of *G. sp. D* (Munday *et al.*), and has five distinct, blue lines on the head as juveniles and subadults, which disappear in adults, and which are often uniformly orange-red with two distinct, vertical blue lines through each eye. *Gobiodon irregularis* sp. nov. has been confused with the former new species in the past, and is closely related to *G. oculolineatus* Wu, but is unmistakable in live colouration. Juveniles are characterised by a transparent body, red bars on the head with bluish to greyish interspaces, and irregular red lines and dots on the nape and dorsally on the body. Adults are usually uniformly brown or green-brown, with only remnants of the bars through the eye and below the orbit. *Gobiodon ater* sp. nov. is a small, entirely black species and can be easily confused with other black species, although it is genetically clearly distinct from *G. ceramensis* Bleeker and its black relatives. *Gobiodon fuscuber* sp. nov. is likely to be the closest relative of *G. ater* sp. nov., but is uniformly reddish-brown or brown, has bright median fin margins (at least in the Red Sea), and grows considerably larger than *G. ater*. It has been genetically determined that *G. fuscuber* sp. nov. is identical with an Indian Ocean/western Pacific species that has been called *G. unicolor* Castelnau by several authors. However, examination of the holotype of *G. unicolor*, including the original description, revealed that the type species and original description are clearly different from the species frequently called *G. unicolor*. The holotype resembles *G. histrio* (Valenciennes) and the name *G. unicolor* must therefore be considered a junior synonym of *G. histrio*. As a consequence, a new name for this species is provided.

Key words: taxonomy, phylogeny, Red Sea, 12S rRNA, 16S rRNA, coral reefs

Introduction

The coral-associated Indo-Pacific gobiid genus *Gobiodon* Bleeker 1856 comprises more than 20 valid species (Eschmeyer 2012). Although this genus of small, cryptic coral gobies is quite well-known among reef fishes, new species have been described recently (Winterbottom & Harold 2005; Suzuki *et al.* 2012), and many more are known but remain undescribed (Munday *et al.* 1999; Akihito *et al.* 2002; Senou *et al.* 2004; Herler & Hilgers 2005). The taxonomy of *Gobiodon* is difficult for several reasons. On the one hand, taxonomists are challenged by the high diversity of largely similar species, the large distribution areas of some species and corresponding geographic variation, as well as the lack of suitable diagnostic characters in external morphology. On the other hand, a series of unsatisfactory species descriptions, especially those from the 19th century, make reliable identification and species designation difficult. The problem is increased by preservation, which rapidly fades life colour, a key characteristic for species identification. The taxonomy of this genus is therefore far from being