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NOTE

A hybrid surgeonfish, *Acanthurus triostegus* x *A. polyzona*, from Mauritius

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Abstract

An unusually patterned surgeonfish representing a likely hybrid of *Acanthurus triostegus* and *A. polyzona* was collected and photographed from Mauritius. The specimen possesses an intermediate number of black bars (8) relative to its parent species (6 & 9, respectively), as well as having facial markings showing characteristics of both taxa. This represents the first report of a hybrid for either species.

Key words: coral reef fishes, Indo-Pacific Ocean, ecology, biogeography, endemism

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The surgeonfishes of *Acanthurus* are a diverse, circumtropical group associated with coral reef ecosystems, where they play a dominant ecological role as herbivores (Marshall & Mumby 2015), detritivores (Tebbet, Goatley & Bellwood 2017), and, less commonly, zooplanktivores (Friedman *et al.* 2016). Hybridization is a well-documented phenomenon in this genus and is particularly common in so-called biogeographic “suture zones” (DiBattista *et al.* 2016, Payet *et al.* 2016), where allopatric sister species narrowly overlap. Documented examples include *A. leucosternon* x *A. nigricans* and *A. tennenti* x *A. olivaceus* in the eastern Indian Ocean (Hobbs & Allen 2014) and *A. lineatus* x *A. sohal* at Socotra, western Indian Ocean (DiBattista *et al.* 2015). Several other examples of hybrids are reported for broadly sympatric species: *A. nigricauda* x *A. olivaceus* (Randall, Pyle & Myers 2001), *A. nigricans* x *A. achilles* (Randall & Frische 2000), and *C. strigosus* x *C. hawaiiensis* (Rowlett 2017a).

There is no consensus subgeneric classification for *Acanthurus*, but both morphological (Randall 1956, Winterbottom 1993) and molecular data (Clements, Gray & Choat 2003, Holcroft & Wiley 2008, Sorenson *et al.*

2013) show several major lineages among the 40 recognized species (plus the 9 *Ctenochaetus* bristletooths, which molecular phylogenies consistently include as a derived clade). One of the most distinctive of these lineages is a small basal clade formed of just two recognized species, *A. triostegus* and *A. polyzona*, diagnosed by their reduced caudal spine, truncate caudal fin, and a grey body with black bars.

The Convict Surgeonfish *Acanthurus triostegus* (Linnaeus, 1758) is a widely distributed species found throughout most of the Indo-Pacific Ocean, from East Africa to the Eastern Pacific Ocean, and absent only from the Arabian Peninsula (McIlwain *et al.* 2012). The Hawaiian population is morphologically (Randall 1961) and genetically distinct (Rowlett 2017b) and has been recognized as a subspecies, *A. triostegus sandvicensis* (Streets, 1877). It is a particularly abundant and gregarious fish on reefs, known to form vast shoals. In contrast, the Zebra or Black-barred Surgeonfish *Acanthurus polyzona* (Bleeker, 1868) is a poorly studied species, with almost nothing known of its ecology and life history. It has been documented mostly from the Mascarene Islands, with additional records claimed for Madagascar, Mayotte, Comoros, and the Îles Éparses of the Mozambique Channel (Russell *et al.* 2012). Unlike its prolific sister species, which is also found in the Mascarene Islands, it is never found in large groups, and adults are largely solitary and territorial (M. Gurroby, pers. comm). Juveniles have been observed in shallow silted lagoons swimming alongside *A. triostegus*, but, at least based on photographs by recreational divers, it appears adults of these two species do not normally associate with one another. Both species are regularly collected for the aquarium trade, with *A. polyzona* being among the most valuable of reef fishes, typically selling in excess of \$1,000 USD.

A single subadult specimen of surgeonfish was collected (but not retained) from Mauritius for the aquarium trade (Fig. 1). It displays a combination of phenotypic traits which are intermediate between *A. triostegus* and *A.*



Figure 1. *Acanthurus triostegus* x *A. polyzona*, subadult collected for the aquarium trade by Mohesh Gurroby in Mauritius, image reversed (M. Gurroby).

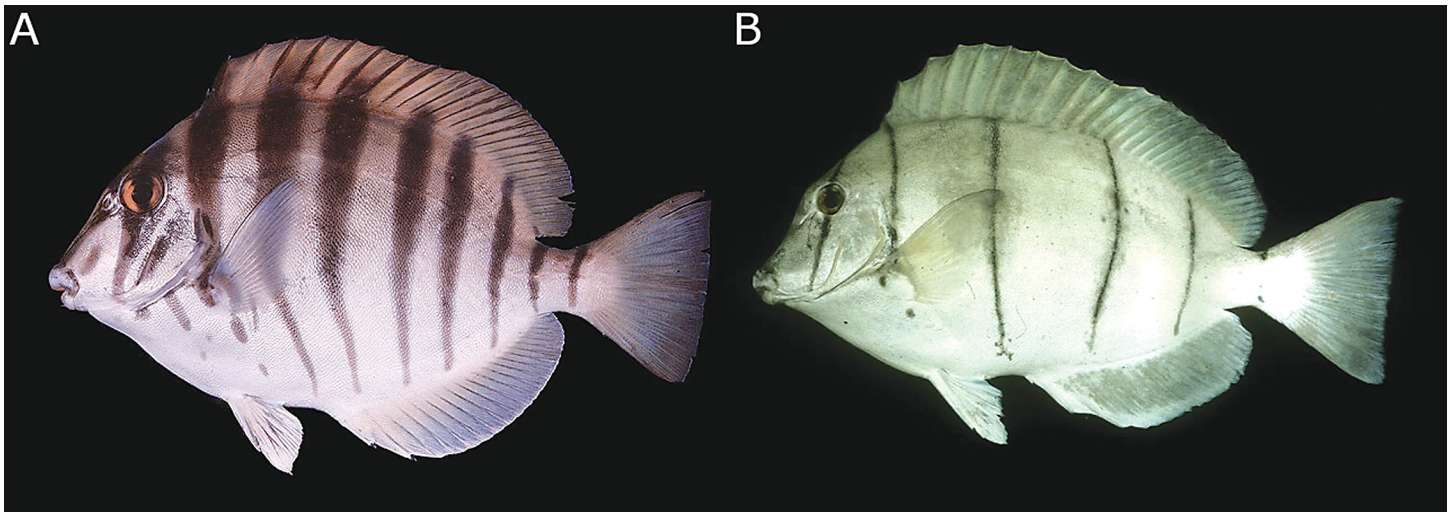


Figure 2. A: *Acanthurus polyzona*, Mauritius B: *Acanthurus triostegus*, Minami-Tori-Shima, Japan (J.E. Randall).

polyzona (Fig. 2). A total of 8 vertical black bars are present: one through the eye, two on the caudal peduncle, and 5 which correspond to dorsal-fin interradiation membranes 1, 5, 9, 14, and 26. The sixth stripe is strongly bent posterodorsally; the seventh stripe is similarly bent, but less so. A small, oblong, black spot is present beneath the pectoral fin, and another faint spot occurs below the nares.

Acanthurus triostegus has 6 vertical black bars, while *A. polyzona* possesses 9. The position of these bars with respect to the dorsal-fin interradiation membranes also differs (*A. triostegus*: 1, 6, 14, 21; *A. polyzona*: 1, 4, 7, 15, 19, 24), and in neither species are any of the bars bent posterodorsally. The forebody of *A. triostegus* is devoid of any additional black spots or markings, while *A. polyzona* has a series of black lines and spots which show minor variations within the species. Included among these markings is a black spot beneath the pectoral fin and a black line associated with the nares.

The combination of traits observed in the putative hybrid specimen—specifically the intermediate number of dark bars and spots—indicates that this individual is likely a hybrid of *A. triostegus* x *A. polyzona*. Genetic confirmation was not possible in this case since the specimen was not retained. Rare individuals of *A. triostegus* have been photographed with additional black spots on the face and caudal peduncle, but none have additional or misaligned black bars. Notably, the collector Mohesh Gurroby reports that he has observed and collected several additional specimens showing a similar hybrid phenotype at the same locality. In summary, this is the first reported hybrid for either species, despite the abundance and wide range of *A. triostegus*.

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