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First record of the copperstriped cardinalfish *Ostorhinchus holotaenia* (Actinopterygii: Perciformes: Apogonidae) from Toamasina, Madagascar

by

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Résumé. – Premier signalement du poisson cardinal strié *Ostorhinchus holotaenia* (Actinopterygii : Perciformes : Apogonidae) à Toamasina, Madagascar.

Ce papier fait état du premier signalement de l'espèce *Ostorhinchus holotaenia* Regan, 1905 à Madagascar. Cette espèce a été recensée lors d'une campagne d'étude des espèces marines introduites, réalisée en juin 2018 à l'intérieur et à proximité du port de Toamasina, pour le compte de la Commission de l'Océan Indien. Pourtant, bien que la question d'une possible introduction de l'espèce par voie maritime puisse être posée, cette observation constitue probablement davantage une extension de zone de l'espèce, déjà identifiée comme étant de distribution Indo-Ouest Pacifique. Cette étude confirme l'utilité de poursuivre l'échantillonnage, notamment d'habitats habituellement considérés comme d'intérêt scientifique secondaire, dans le but de compléter les listes d'espèces actuelles.

Key words. – Geographic distribution – Range extension – New species – Marine ichthyofauna – Underwater Visual Census – Coral reef.

The marine ichthyofauna of Madagascar has been studied since the 18th century. Numerous census campaigns have since been carried out in order to draw up a representative inventory of this very vast territory (the Exclusive Economic Zones ranking 29th in the world with 1,225,259 km²). The most recent and comprehensive inventory, listing a total of 1,798 species including 158 new records of marine and freshwater species, was published in 2018 (Fricke *et al.*, 2018). However, despite this important sampling effort, new species are regularly identified during investigation works, mainly on sectors little studied in the past (Wickel *et al.*, 2018).

The aim of this paper is to report the presence of the species formerly known as *Ostorhynchus nitidus* Smith, 1961, recently classified as junior synonym of *Ostorhinchus holotaenia* Regan, 1905 by Sadovy and Cornish (2000). This species was observed and photographed for the first time in Madagascar during a research campaign for possible marine species introduced in the port of Toamasina and in its near periphery, financed by the Indian Ocean Commission (IOC).

MATERIAL AND METHODS

The specimen of *Ostorhinchus holotaenia* described in this study was observed and photographed during a sampling survey

conducted by underwater visual census method (UVC). This campaign was conducted on 5th June 2018 between 10:00 am and 11:00 am, in 26.5°C water at 25 m depth (18.13506°N, 49.44132°E), on the inner slope of the Toamasina Great Reef, eastern Madagascar, characterized by a sandy-muddy detritic bottom.

The method implemented consisted in listing all the fish species observed during a 60 min dive following a random course between 2 and 30 m depth. The photographed specimen was classified according to Gon (1986), Lieske and Myers (1994) and Randall (1995).

The visual overestimate of the fish total length (TL), due to the modification of the vision in scuba diving (increasing of the objects length), was adjusted according to Edgar *et al.* (2004). Proportional body measurements were recorded ex post, on photographic basis, to calculate total length (TL), standard length (SL), head length (HL), body depth (BD) and orbit diameter (OD), and presented as percentages of the SL.

RESULTS

The photographed specimen had an estimated TL of 8.0 cm, a SL of 6.4 cm, a HL of 2.2 cm, a BD of 2.5 cm and an OD of 0.7 cm. The HL was 34.4%, the BD was 39.1% and the OD was 10.9% of SL.



Figure 1. – Specimen of *Ostorhinchus holotaenia* photographed on June 2018 near the Toamasina port, Madagascar.

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Six yellow-brown (copper-like) stripes laterally barred the body of the specimen. The fourth stripe barred the eye at its centre and then extended to the end of the caudal fin where its colour gradually became dark brown to black. The third lateral band was shorter than the others: starting at the top of the eye, it only extended to half the standard length of the body. The second dorsal fin was also barred laterally by two yellow-brown strips. Nine electric-blue spots were distributed laterally on the ventral part of the body, under the eye and up to the posterior pelvic fin, forming a discontinuous line (Fig. 1).

The specimen observed was very cautious, swimming freely in a loose group of three individuals close to a dead coral head, and taking refuge under the coral at the slightest approach of a diver. The environment was characterized by heavy sedimentation and the presence of numerous dead coral rubbles, partially colonized by algae and hydroids (detritic facies of the inner barrier reef slope).

DISCUSSION

The morphological description of the specimen observed at Toamasina corresponds perfectly to the *Ostorhynchus nitidus* described by Smith (1961) (“bluespot cardinalfish”), currently treated as a synonym of *Ostorhinchus holotaenia* (“copperstripe cardinalfish”). The total length corresponds to a large adult but is compatible with the lengths usually encountered for this species. In the same way, the water temperature, the environment and the depth of encounter perfectly match those of *O. holotaenia*.

The specimen described in this paper was observed during a survey of introduced marine species, potentially invasive, near the port of Toamasina. The question of whether this species is indigenous to Madagascar or has been introduced by maritime traffic can rightly be raised. However, *O. holotaenia* is widespread in the Indo-West Pacific from the Mozambique Channel, Persian Gulf and Reunion Island east to Indonesia, north to southern Japan (Eschmeyer *et al.*, 2018). It is in particular listed in the species checklists from Reunion (Fricke *et al.*, 2009) and Europa islands (Fricke *et al.*, 2013). So, this new record is not surprising for Madagascar but confirms its presence in the territory.

The late recording of this species in Madagascar may be due to the fact that the Toamasina area was very little sampled during the census work of Fricke *et al.* (2018), with only one reef station sampled in the area. In addition, the cryptic nature and inconspicuous behaviour of the species and its relatively deep distribution, on detritic bottoms, tends to conclude on the interest of carrying out sampling campaigns on these habitats, often considered as of secondary scientific interest. Thus, several surveys carried out in Reunion on non-reef marine habitats (artificial reefs, volcanic flows, estuarine area) have enabled the identification of new species for the island (Pinault *et al.*, 2013, 2014, 2015; Wickel *et al.*, 2016) despite a very strong sampling effort focused mainly on coral reefs.

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