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Macropharyngodon pakoko, a new species of wrasse (Teleostei: Labridae) endemic to the Marquesas Islands, French Polynesia

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Abstract

A new species of wrasse, *Macropharyngodon pakoko*, is described from the Marquesas Islands, bringing the total number of species of the genus *Macropharyngodon* to 12. *Macropharyngodon pakoko* was found at depths from 0-42 m and is endemic to the Marquesas Islands. *Macropharyngodon pakoko* is similar to *M. meleagris*, which is widely distributed from the central and western Pacific to Cocos-Keeling in the Indian Ocean, but differs genetically and in several coloration characters: males with irregularly curved black humeral blotch with incomplete iridescent blue border; inverted irregular "U"-shaped band on the cheek; a small black spot at the upper base of the pectoral fin; and background color of the body greenish with faint bluish black spots on each scale. Females lack black pigment on the chest posterior to the ventral attachment of the gill membranes; reddish black blotches on the body are widely spaced, particularly on the head where they are more reddish and half the size of those on body; caudal fin with small, bright yellow spots arranged in narrow vertical bands with pale interspaces; pelvic fins pale with three reddish yellow cross-bands; a small black spot at the upper base of the pectoral fin; and small reddish spots along the base of the anal fin. Juveniles have irregular black blotches on the body, a small black spot instead of an ocellus posteriorly on the dorsal fin and lack large black spots and ocellus on the anal fin.

Key words: wrasse, *Macropharyngodon pakoko*, French Polynesia, Marquesas Islands, endemic

Introduction

The Marquesas Islands, located in the South Pacific (7°50'S - 10°35'S; 138°25'W- 140°50'W), are composed primarily of high volcanic islands with almost no barrier reef, very little coral reef cover, plankton enriched waters as a result of the presence of upwelling zones, and highly variable sea temperatures—a combination of factors that are unique for an equatorial archipelago (Gaither *et al*. 2010, Randall 2001a, 2001b). These unusual environmental conditions may contribute to biogeographic isolation of the Marquesan fish fauna, as revealed by a strong genetic break found at the Marquesas for some widespread species (Planes & Fauvelot 2002, Gaither *et al*. 2010) and the high rate of endemism at these islands, 11.6% (Randall & Earle 2000), that could reach up to 12.9% according to Williams *et al.* (2013) as many species collected there remain undescribed.

We collected fish specimens in 2011 during an expedition to the Marquesas Islands, French Polynesia, in which every island in the group was visited and sampled using a variety of collecting techniques. Operating from the M.V. Braveheart, a diversity of habitats was explored through shallow and deep air dives (down to 50–55 m). *Macropharyngodon meleagris* was previously the only species of this genus reported from Marquesan waters (Randall 1978, Randall & Earle, 2000; Randall 2005). However, Randall and Earle (2000) mentioned that the coloration of the male form of the Marquesan *M. meleagris* population differed from the pattern exhibited by males at other localities throughout its range and that further taxonomic investigation was needed. We collected 11 specimens (4 males, 4 females and 3 juveniles) of this new species during our survey and conducted an integrative taxonomic analysis. Morphological and molecular data are used in combination to reveal the existence of the new species described herein.

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ornatus (Fig. 6) have no black spots on the body, but have small blue spots centered on the scales of the body and have an orange to orangish brown background color.

Terminal phase male *Macropharyngodon pakoko* have a humeral spot outlined with iridescent blue, whereas *M. meleagris* males (Fig. 6) have one to three smaller bright yellow spots bordering the humeral spot; *M. pakoko* has an inverted irregular "U"- shaped marking on the cheek, while the cheek markings on the head of *M. meleagris* are arranged as two broken diagonal green bars beneath eye and extending from above posterior end of upper jaw toward upper angle of gill opening; the background color of *M. pakoko* body is greenish to brownish green and lacks defined blue and green spots or stripes, while the background of *M. meleagris* male body is orangish brown with well-defined blue outlined green spots and broad stripes formed from fused spots. Male *M. geoffroy* and *M. ornatus* (Randall in FishBase) lack the black humeral spot of *M. pakoko*.

Juvenile color is similar to that of *Macropharyngodon meleagris*, but the latter has distinctive black spots on the anal fin like the initial phase females (no black spots on anal fin of *M. pakoko* at a similar size). *M. geoffroy* juveniles have small white or bluish white spots on the body that are absent on *M. pakoko* and *M. meleagris* juveniles.

We compared the size of the known specimens of *M. pakoko* to the size of 57 specimens of *M. meleagris* (1 juvenile, 32 initial phase females, 6 females transitioning into terminal phase males and 18 terminal phase males) from 14 locations across the Pacific and 7 specimens of *M. geoffroy* (3 females, 4 males) endemic to Hawai'i (Fig. 7). The largest females examined measure 56.5 mm, 82 mm, 89 mm while the smallest males measure 66 mm, 71.5 mm and 100.5 mm, respectively, for *M. pakoko*, *M. meleagris* and *M. geoffroy.* The transformation of initial phase females into terminal phase males for *M. pakoko* seems to occur at a smaller size for *M. pakoko*.

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