



## Molecular analysis of *Acanthemblemaria macrospilus* (Teleostei: Chaenopsidae) with description of a new species from the Gulf of California, Mexico

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### Abstract

Molecular analysis of the chaenopsid tube blenny, *Acanthemblemaria macrospilus* Brock, reveals species-level differentiation and the existence of a new species, described here as *Acanthemblemaria hastingsi*, using molecular and morphological data. This new species is a member of the *hancocki* species group and is limited to the Gulf of California. It is distinguishable from *A. macrospilus* by mitochondrial gene sequences of cytochrome C oxidase I and D-loop region as well as by coloration. This differentiation is also supported to a lesser extent by the nuclear ribosomal protein S7 first intron. There is no geographic overlap in the ranges of these species, as they occur exclusively on either side of the Sinaloan Gap.

**Key words:** *Acanthemblemaria hastingsi*, Blennioidei, COI, D-loop region, S7-1, Tropical Eastern Pacific

### Introduction

*Acanthemblemaria* is a genus of chaenopsid tube blennies found throughout the new world tropics in the Caribbean and the Tropical Eastern Pacific (TEP). The *Acanthemblemaria* are noted for their combination of conspicuous frontal spines and two rows of palatine teeth (Stephens 1963). *Acanthemblemaria* includes a clade known as the *hancocki* species group. This group (also known as the barnacle blennies *sensu* Hastings and Robertson, 1998) was first recognized by Stephens (1963) and included three species from the TEP (*A. hancocki* Meyers and Reid, *A. balanorum* Brock, and *A. macrospilus* Brock). Since that publication, several new species in the *hancocki* group have been described, including: *A. castroi* Stephens and Hobson, endemic to the Galapagos Islands; *A. rivasi* Stephens, from the southern Caribbean; *A. stephensi* Rosenblatt and McCosker, endemic to Isla de Malpelo; *A. atrata* Hastings and Robertson, endemic to Isla del Coco; and *A. mangognatha* Hastings and Robertson, endemic to Islas Revillagigedo. A ninth species in this group, *A. hastingsi* new species, endemic to the Gulf of California, Mexico (GOC) is described herein.

*Acanthemblemaria macrospilus*, which formerly included *A. hastingsi*, was first described as a subspecies of *A. hancocki* by Brock (1940). Stephens (1963) elevated it to species and reported that its range included the GOC, the coast of southwestern Mexico, Isla del Coco, and Islas Revillagigedo. The Isla del Coco population was later described as *A. atrata*, and the Islas Revillagigedo population was described as *A. mangognatha* (Hastings & Robertson 1998). The remaining two populations are found in two biogeographic regions, the Cortez and Mexican provinces of the TEP, which are separated by the Sinaloan Gap. This gap is an area of soft substrate that lacks appropriate habitat for many reef fishes and forms a barrier to dispersal for several species of blennies (Hastings 2000). Based on coloration, Hastings and Robertson (1998) recognized two morphs of *A. macrospilus*, the northern “Cortez morph” and southern “Mexican morph.” In this paper, molecular (mitochondrial and nuclear DNA) and morphological data are evaluated in order to understand the relationship between the two color morphs. Maternally inherited mitochondrial DNA has a high evolutionary rate and was recently used to distinguish between species in another *Acanthemblemaria* species pair where