



Fishes as living tracers of connectivity in the tropical western North Atlantic: I. Distribution of the neon gobies, genus *Elacatinus* (Pisces: Gobiidae)

PATRICK L. COLIN

Coral Reef Research Foundation P.O. Box 1765 Koror, Palau 96940. E-mail: crrf@palaunet.com

Abstract

In the tropical western North Atlantic the goby genus *Elacatinus* has at least 25 species which can be separated into five eco-morphological suites. Within a suite, geographic distributions of species are usually mutually exclusive. Last reviewed in 1975 numerous published misidentifications have confused the zoogeography in addition to new taxa having been added. The species and their distributions are reviewed, corrected and updated to prepare for an analysis of their zoogeography relative to mechanisms of connectivity through ocean currents.

Key words: marine zoogeography, speciation, endemism, coral reef fishes

Introduction

Most reef fishes of the tropical western North Atlantic (TWNA) occur widely, from northern Brazil through the Caribbean, Gulf of Mexico and Bahamas to the southeastern U.S, being absent only where suitable habitat does not occur. In this region open water gaps between islands are generally less than 100 km. A continuous continental coastline occurs on the south and west while abundant stepping stone islands are present on other margins. It would appear there are no barriers to dispersal for reef fishes with planktonic larvae. Known shore fish endemism levels within the TWNA are low (Floeter et al 2007); a few percent in the Bahamas (Smith-Vaniz and Böhlke, 1991) while Bermuda (the most isolated island in the region) has only 2.9% (Smith-Vaniz, et al. 1999). Other areas are not as well known, but levels of endemism are similar to or less than Bermuda/Bahamas.

The distributions of *Elacatinus* gobies are different. No single species occurs throughout the TWNA. There are 5 suites of eco/morphologically similar species; 4 found in close association with stony corals or sponges and 1 of hovering planktivores. Each of the 17 described species, as well as additional undescribed species and color morphs of nominal species, occupies only a limited part of the TWNA. Species of *Elacatinus* have demersal eggs and their maximum planktonic larval duration is about 3–4 weeks (Taylor and Hellberg 2003, pers. observ.). Within a suite of species (i.e., "shallow-water, sponge-dweller") only a single member generally occurs in any area, but for most suites their overall distribution is nearly ubiquitous in the TWNA. As a result, suite members tend to have allopatric distributions and show, along with some other small coral reef fishes, patterns consistent with observed ocean currents. Distributional breaks involving several species probably indicate dispersal barriers in the region.

A planned series of three papers will examine what has essentially been a natural experiment running since at least the last glacial low water which has integrated the biological and physical aspects of connectivity over time to produce distribution patterns found today. In this paper geographic distributions of TWNA *Elacatinus* are described in detail. Misidentifications of these fishes in scientific and popular publications have tended to confuse the relatively clear zoogeographic limits of these gobies, last summarized by Colin (1975). Future publications will discuss fish distributional patterns consistent with observed ocean currents and indicate probable biogeographic barriers in the region, as well as genetic and ecological