Unusual record of the Indo-Pacific pomacentrid *Neopomacentrus cyanomos* (Bleeker, 1856) on coral reefs of the Gulf of Mexico

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Received: 19 October 2013 / Accepted: 4 February 2014 / Published online: 17 February 2014

Handling editor: Vadim Panov

Abstract

*Neopomacentrus cyanomos* (Bleeker, 1856), a common damselfish from the Indo-west Pacific, is reported from the southern Gulf of Mexico based on 134 visual observations and the collection of 15 specimens from coral south of Veracruz, Mexico. It was sighted in schools containing 5 to 30 individuals at depths of 2 to 21 m. The introduction and subsequent colonization of this alien species is probably the result of transport in the ballast water of international ships.

Key words: *Neopomacentrus cyanomos*, alien species, coral reefs, Mexico, Atlantic Ocean

Introduction

Damselfishes of the family Pomacentridae are common circumboreal inhabitants of rock and coral reefs (Allen 1991). There are about 369 species in the family (Eschmeyer and Fricke 2013) distributed mainly on reefs of the Indo-Pacific Ocean, but also well represented in Atlantic marine waters. Fourteen species occur in the Gulf of Mexico (McEachran 2009), including 13 recorded on coral reefs in the vicinity of Veracruz, Mexico (Vargas Hernández et al. 2002; Pérez-España and Vargas-Hernández 2008; Rangel-Ávalos et al. 2008; Abarca-Arenas et al. 2012; González-Gándara et al. 2012, 2013).

The regal demoiselle *Neopomacentrus cyanomos* (Bleeker, 1856) is an abundant species, ranging widely in the Indo-west-Pacific region from East Africa and the Red Sea to Australia, Vanuatu, and New Caledonia, northward to Japan. It inhabits inshore and offshore coral reefs; also in harbors and protected outer reef slopes and current prone areas. It is frequently seen in aggregations at depths of 5–18 m (Allen and Erdmann 2012). This small (to about 90 mm total length) pomacentrid is characterized by an ovate to elongate, laterally compressed body, overall black to brown coloration with a large black spot on the operculum, and a yellow (occasionally white) spot at the end of the dorsal fin base (Allen 1991; Randall et al. 1997). Surprisingly, it was recently sighted underwater and collected from coral reefs south of Veracruz, Mexico, and this record from well beyond its known geographic distribution is reported herein.

Methods

A total of 134 underwater visual censuses were made on the coral reefs south of Veracruz, Mexico, (Figure 1) from June to September 2013. We captured 15 specimens from 20 to 54 mm in standard length with a hand net. The fish were preserved in absolute ethyl alcohol and were deposited and cataloged in the fish collection of the Universidad Veracruzana under catalog numbers: VER-PEC-01653; VER-PEC-01657; VER-PEC-01672; VER-PEC-01684; VER-PEC-01738; VER-PEC-01990; VER-PEC-02180; VER-PEC-02181; VER-PEC-02182; VER-PEC-02183; VER-PEC-02184; VER-PEC-02185; VER-PEC-02186; and VER-PEC-
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Figure 1. Record locations of regal demoiselle Neopomacentrus cyanomos on coral south of Veracruz, Gulf of México (see Appendix 1 for localities).

Figure 2. Neopomacentrus cyanomos catalog number: VER-PEC-02183 captured on coral south of Veracruz, Gulf of México. Scale bar 10 mm. Photograph by Vicencio de la Cruz Francisco.

Results

Neopomacentrus cyanomos was sighted in 43 of 134 visual censuses. It was observed in aggregations that included from 5 to 30 fish, although occasionally only one specimen was recorded. The depth of the sightings ranged from 2 to 21 m, but they were more common on deeper reefs such as Palo Seco and Tripie (Figure 1). They were sometimes associated with Chromis scotti Emery, 1968 and haemulid juveniles.

Description of collected specimens

Neopomacentrus cyanomos is characterized by slender ovate body, moderately compressed, its depth 2.2 to 2.6 in SL; head length 2.9 to 3.8 in SL; snout length 3.9 to 7.0 in head length; pectoral fin length 3.8 to 4.7 in SL; pelvic fin length 3.2 to 4.7 in SL. Dorsal fin XIII, 11-12; anal fin II, 11-12; pectoral fin 17; caudal fin 02318 (Appendix 1). Specimens were measured with a digital caliper to the nearest millimeter and were taxonomically identified following Allen (1991, 2001)
strong forked, lateral line scales 17 to 18; suborbital edge covered by scales (Figure 2). Fresh coloration: Dark brown body with large black spot on upper edge of operculum; white spot at end of dorsal fin; base of caudal fin dark brown with white outer half.

Discussion

In recent years, human activities have increased the number of non-native species introductions worldwide (Ruiz et al. 1997). The family Pomacentridae (170 species) comprise an important percentage of the aquarium trade imports to the USA (Rhyne et al. 2012). Non-native pomacentrids have been reported from Hawaii and the Mediterranean Sea (Coles et al. 2002; Kalogirou et al. 2012). The regal demoiselle, *N. cyanomos*, is the first non-native pomacentrid recorded in the Gulf of Mexico.

The vector for the presence of *N. cyanomos* in the Gulf of Mexico is most likely the result of heavy marine traffic in Coatzacoalcos Port, where an average of 44 ships docking per month (SCT 2013) was recorded in 2012. Many of these ships originate from international ports, including some in the Indo-Pacific region, and these could be the vectors. Members of the families Pomacentridae, Chetodontidae, Kyphosidae, and others have a tendency to shelter under large vessels (Occhipinti-Ambrogi et al. 2011). It is conceivable that larvae or small juveniles of reef fish such as *N. cyanomos* could be transported in the ballast water of the vessels as was suggested for the Indo-Pacific sergeant major, *Abudelfud saxatilis* (Quoy and Gaimard, 1825), the Western Atlantic sergeant major *A. saxatilis* (Linnaeus, 1758), and some of the other species recorded in the Mediterranean Sea (Vacchi and Chiantore 2000; Wonham et al. 2000; Azurro et al. 2013).

The establishment of regal demoiselle in the Gulf of Mexico should be expected to have negative impacts on native biodiversity that could impinge economic interests (fisheries) and ecosystem health. Our field observations suggest that regal demoiselle is replacing *Chromis multilineata* (Guichenot, 1853) on the coral reefs south of Veracruz. The tolerance of lower salinity by non-native pomacentrid (Setu et al. 2010) appears to confer an advantage to colonize the region of high freshwater drainage of the Papaloapan and Coatzacoalcos rivers. The ecological consequences of the presence of *N. cyanomos* on coral reefs of Veracruz, requires further study.

Acknowledgements

This work was funded by Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), project JF124/12. Our special thanks to SAGARPA for the permits of fisheries (DGOPA.02698.260312.0743 and DGOPA.5458.170512.1381). We thank J Arguelles, A. M. Morales, P. Escañega and G. Ruiz for their help. We also thank Gerald Allen for his critical review of the manuscript and we are also grateful to the reviewers of this document, for their comments which have improved the manuscript.

References


Appendix 1. Records of Neopomacentrus cyanomos from coral south of Veracruz, Gulf of Mexico.

<table>
<thead>
<tr>
<th>Location</th>
<th>Coordinates</th>
<th>Catalogue number</th>
<th>Colector</th>
<th>Record date</th>
<th>Standard length (mm)</th>
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</thead>
<tbody>
<tr>
<td>Tripie reef</td>
<td>18°10'06.9&quot;</td>
<td>94°22'40.5&quot;</td>
<td>VER-PEC-01653</td>
<td>De la Cruz Francisco V.</td>
<td>13/06/2013</td>
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