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Pereira Dias, Thelma Lúcia
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What do we know about *Anisotremus moricandi* (Teleostei: Haemulidae), an endangered reef fish?

Thelma Lúcia Pereira Dias

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Programa de Pós-Graduação em Ciências Biológicas (Zoologia), Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, Campus I, CEP 58051-900, João Pessoa, PB, Brasil
Corresponding author: Thelma Lúcia Pereira Dias, e-mail: mangrove_rn@yahoo.com.br

Abstract

Dias, T.L.P. **What do we know about *Anisotremus moricandi* (Teleostei: Haemulidae), an endangered reef fish?** *Biota Neotrop*. May/Aug 2007 vol. 7, no. 2. http://www.biotaneotropica.org.br/v7n2/pt/abstract?short-communication+bn04207022007. ISSN 1676-0603.

This article provides general information on habitat, behavior, and conservation status of *Anisotremus moricandi* and reinforces its distribution to the western Atlantic. The species inhabits rocky reefs with low coralline overgrowth and it is found in reef crevices in small groups or solitary individuals. The distribution of *A. moricandi* seems to be discontinuous occurring in the coasts of Panama (Caribbean side), Aruba, Colombia, Orchila Island (Venezuela) and in Brazil (from Ceará State to Espírito Santo State).

Keywords: *coastal reefs, distribution, habitat, conservation, behavior, northeastern Brazil.*

Resumo

Dias, T.L.P. **O que nós sabemos sobre *Anisotremus moricandi* (Teleostei: Haemulidae), um peixe recifal em perigo de extinção?** *Biota Neotrop*. May/Aug 2007 vol. 7, no. 2. http://www.biotaneotropica.org.br/v7n2/pt/abstract?short-communication+bn04207022007. ISSN 1676-0603.

Este artigo fornece informações gerais acerca do habitat, comportamento e estado de conservação de *Anisotremus moricandi* e reforça sua distribuição no Atlântico Ocidental. A espécie habita recifes rochosos com baixo crecimento coralino e é encontrada em fendas do recife em pequenos grupos ou solitária. A distribuição de *A. moricandi* parece ser descontínua, ocorrendo nas costas do Panamá (lado Caribenho), Aruba, Colômbia, Ilha Orquila (Venezuela) e no Brasil (do Ceará ao Espírito Santo).

Palavras-chave: *recifes costeiros, distribuição, hábitat, conservação, comportamento, nordeste do Brasil.*

Introduction

The brownstriped grunt, *Anisotremus moricandi* Ranzani, 1842, is a bony fish belonging to the family Haemulidae. Ranzani (1842) originally described this species from Bahia State, Northeastern Brazil, and after several misidentifications, it was rediscovered and redescribed by Acero & Garzón (1982). Since its first description and its more recent rediscovery, only a few scientific publications (e.g. Jordan & Evermann 1898, Meek & Hildebrand 1925, Humann & Deloach 2002) cited the existence of this species. Although *A. moricandi* is a relatively common species in the northeastern Brazilian coastal reefs (T. Dias, unpublished data) and in the Espírito Santo State (20° S) (its southern limit according to Moura et al. 1999), this species remains poorly studied.

Although *A. moricandi* is an endangered species, accordingly to the IUCN (2006), data on the natural history and abundance of this species is urgently needed. The present study provides basic data on the conservation status, threats, habitat, behavior and distribution of this threatened fish species, and suggests measures for the conservation of *A. moricandi* and their habitat.

Material and Methods

This study is based on data obtained from field observations in Brazil and from literature (e.g. Jordan & Evermann 1898, Meek & Hildebrand 1925, Acero & Garzón 1982, Humann & Deloach 2002). Underwater random observations were carried out from January to May 2002 and January 2007 at three coastal reefs (known as beachrocks) of Paraíba state: Poço reef (07° 01' S and 34° 48' W), Picãozinho reef (07° 07' S and 34° 48' W) and Areia Vermelha reef (07° 01'S and 34° 49' W). Habitat characteristics and species behavior were recorded during 10 hours of underwater observations during the day (five hours) and at night (five hours). Data were recorded on an underwater slate. Depth in the study sites ranged from 0.5 to 6.0 m and water temperature remained between 27-29° C (day) and 26-28°C (at night).

Results and Discussion

In the coastal reefs of Paraíba state, *A. moricandi* inhabits shallow waters (0.5 to 4.5 m deep) usually near reef crevices. It may be sighted solitary (Figure 1) or in small groups (2 to 12 individuals) (Figure 2). Feitoza (2001) also observed individuals of this species in shallow reefs (1 to 7 km off the shoreline) off Rio Grande do Norte state. According to Acero & Garzón (1982), *A. moricandi* seems to avoid insular conditions and is found in turbid, continental areas, apparently restricted to rocky reefs with little, if any, coralline overgrowth. In Paraíba, the coastal reefs where the species occur have clear water (> 8 m horizontal visibility) during low tides in the summer, but during the rain season or during high tides, these reefs presents turbid waters (< 3 m horizontal visibility).

Some specimens deposited in Brazilian Museums were collected from areas relatively distant from mainland, such as the Abrolhos Archipelago, about 50 km offshore southern Bahia State. This area is located in an extensive shallow continental shelf that presents relatively turbid waters due to continental drainage and the high sedimentation rates caused by human activities (Coutinho et al. 1993, Leão & Kikuchi 2001). These characteristics support the hypothesis that *A. moricandi* possibly prefers turbid waters, but not necessarily avoids coastal insular conditions. However, between the Abrolhos Archipelago and the Bahia coast there is a very large development of stone steps and coral growth (mainly the Brazilian endemic species *Mussismilia braziliensis*) (Leão & Kikuchi 2001), which probably helped the colonisation of more distant areas. The factors that favour the settlement and future establishment of *A. moricandi* populations, such as reef topography, food availability, water and habitat characteristics demand further studies.

In terms of activity period, this species seems to be more active at night since specimens collected during the day had empty stomachs (Acero & Garzón 1982, T. Dias, unpublished data). Acero & Garzón (1982) examined the stomach of one individual of *A. moricandi* collected at midday and no food was found, but the intestinal tract contained digested remains of crabs, filamentous algae, gastropod shells, and polychaete worms, suggesting an omnivorous diet. In some coastal reefs of Paraíba state (about 0.8 km distant from the shoreline), Brazil, the species was seen foraging on algae patches at daylight hours.

Since 1996 *A. moricandi* is included in the IUCN Red List of Threatened Animals (IUCN 1996). Although this list has no legislative value, it acts as warning flag to alert people to species that may be in danger. In the case of *A. moricandi*, the species is listed in the category "endangered" (criteria A2c). This category means that the best available evidence indicates that it could be facing a very high risk of extinction in the wild. The criteria A2c indicates that the species presents a reduction in population size due to several factors,

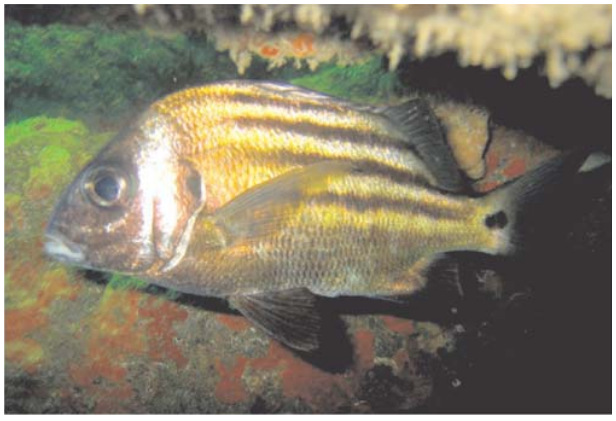

Figure 1. Solitary adult *Anisotremus moricandi* in a reef crevice at Bahia coast, Northeastern Brazil. Photo by A. Bertoncini.

Figura 1. Adulto solitário de *Anisotremus moricandi* em uma fenda recifal na costa da Bahia, Nordeste do Brasil. Foto por A. Bertoncini.

Figure 2. Small group of *Anisotremus moricandi* at a coastal reef, Paraíba coast, Northeastern Brazil. Photo by T. Dias.

Figura 2. Pequeno grupo de *Anisotremus moricandi* em um recife costeiro, costa da Paraíba, Nordeste do Brasil. Foto por T. Dias.

including a decline in area of occupancy, extent of occurrence and/or quality of habitat (Hilton-Taylor 2000).

In fact, the distribution of *A. moricandi* is apparently discontinuous and according to Acero & Garzón (1982), it occurs in the coasts of Panama (Caribbean side), Colombia, and in Brazil. According to Lindeman & Toxey (2003), the species also occurs in the Orchila Island (Venezuela) and in Aruba. In the Colombian Caribbean it has been registered in Tierra Bomba and Isla Arena (Departamento de Bolívar) and in the bays of Santa Marta and Gayraca (Departamento del Magdalena) (A. Acero, personal communication). In the Brazilian coast, it occurs from Ceará State (3° S) to Espírito Santo State (20° S) (cf. Moura et al. 1999).

In terms of human utilisation, *A. moricandi* is not a commercially important fish, but it is now being introduced into the marine aquarium trade (Gasparini et al. 2005). In some coastal areas it is used as food by small-scale fishers and it is caught by spearfishing, tarrafa net fishing and hook and line. According to Floeter et al. (2006), the species is suffering a heavy fishing pressure in Southeast Brazil. At present, the conservation status of *A. moricandi* in Brazil is still poorly known. However, the additional pressure of the aquarium trade and the increased utilisation of this species in other markets can bring serious negative impacts to this threatened fish species.

Although *A. moricandi* is not threatened due to high commercial exploitation, as occurs to the majority of marine organisms that are endangered, it has been a victim of the human impact on coastal areas. These impacts include disorganised recreational activities on reefs, high sedimentation rates coming from the mainland, and discharges of pollutants that reach coastal reefs (Hodgson 1999). Another threat is the direct destruction of reef environments through the anchorage of boats and retreat of reef builders. For example, in places such as Areia Vermelha Reef and Picãozinho Reef (Paraíba, Brazil), reef walking on exposed surfaces of reefs, boat anchors, diving, fishing and extraction of corals for aquarium purposes could damage seriously the reef ecosystem. Since there is a dearth of information on the biology and ecology of *A. moricandi* coupled to the fact that this species is at risk of extinction, habitat protection is an important first step to protect this species, and the study of population parameters (e.g. growth rates, mortality estimates, reproduction) and ecology in the wild is a critical information to implement conservation measures.

Considering that *A. moricandi* is apparently range-restricted and unstudied, the major threat for this species is the habitat degradation. Some conservation recommendations are: (a) the protection of reef environments through the implantation of Marine Protected Areas, (b) the regulation of the exploitation of *A. moricandi* for fisheries and aquarium purposes, and (c) the regulation of human activities such as tourism and recreational fishery in coastal reef areas.

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