

## Scientific Note

### A honeymoon in Brazil: the spawning behavior of an exotic reef fish in the western south Atlantic

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The reproductive strategies of surgeonfishes of the genus *Acanthurus* are well known for all Atlantic species except the Monrovia doctorfish, *Acanthurus monroviae*, an eastern Atlantic surgeonfish whose biology remains largely unknown. We provide here the first account on the spawning behavior of *A. monroviae*, an exotic fish on rocky reefs of southeastern Brazilian coast.

As estratégias reprodutivas de peixes-cirurgiões do gênero *Acanthurus* são bem conhecidas para todas as espécies registradas no Atlântico, exceto para *Acanthurus monroviae*, um cirurgião do Atlântico leste cuja biologia permanece pouco conhecida. Apresentamos aqui o primeiro relato do comportamento reprodutivo de *A. monroviae*, espécie exótica registrada nos recifes rochosos da costa sudeste do Brasil.

**Key words:** *Acanthurus monroviae*, Acanthuridae, Reproduction, Laje de Santos, Rocky reef.

Reef fishes have two major spawning strategies: pelagic-spawning, in which buoyant eggs and sperm are shed directly into the water column, and demersal-spawning, in which adhesive eggs are placed on the bottom and usually are guarded by one or both parents until hatching into planktonic larvae (Thresher, 1984). Pelagic spawning species may either spawn in single male-female pairs, or in groups, and some species may even present both spawning strategies (Robertson, 1983; Thresher, 1984; Krajewski & Bonaldo, 2005). Knowledge of reproductive strategies provides important information on life-history and population dynamics of reef fishes, which are essential for a better understanding of their ecology, as well as for effective management (Sale, 2002; Sale *et al.*, 2005).

The reproductive strategies of surgeonfishes of the genus *Acanthurus* (Perciformes: Acanthuridae) are well known for all species recorded for the Atlantic (Thresher,

1984; DeLoach, 1999) with exception of the Monrovia doctorfish, *Acanthurus monroviae*, restricted to areas with hard bottom (Randall, 2002) and whose biology remains largely unknown. The native distribution of *A. monroviae* is the tropical eastern Atlantic, along the coast of Africa (Morocco to Angola) and the São Tomé, Cape Verde and Canary Archipelagos, with recent records for the Mediterranean (Randall, 2002). Recently, an adult individual of *A. monroviae* was reported for the southeastern coast of Brazil (Luiz *et al.*, 2004), and later two other individuals were sighted in the same area. The three individuals have similar sizes (35-45 cm) and their apparent site fidelity allowed for periodical observations of their behavior. Here we report on the reproductive behavior of this species, to the best of our knowledge for the first time. The behavior was recorded on 20 December 2008 (1240-1245 h), at the Laje de Santos Marine Park (about 24°15'S 46°10'W). Two individuals were observed

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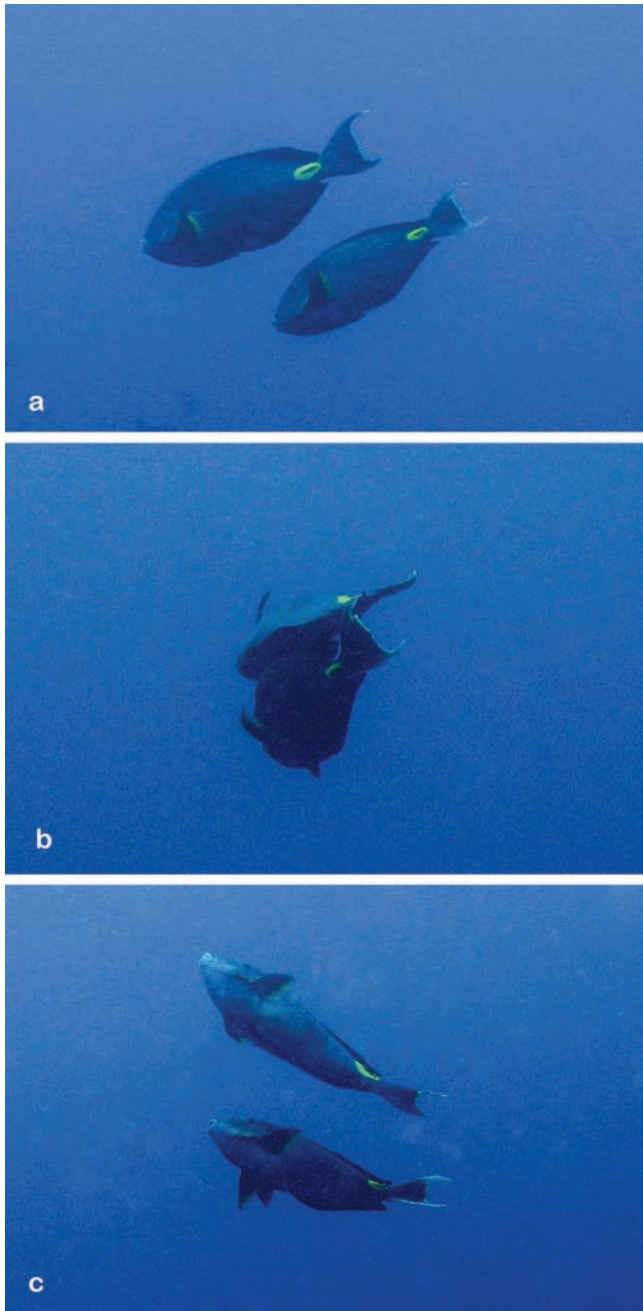
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**Fig.1.** Spawning behavior of *Acanthurus monroviae* at the Laje de Santos Marine Park, Southeastern Brazil. Two individuals swimming side by side, the male (right) displaying to the female (a); the male rolling under the female, both of them in belly contact (b), and breaking away (c).

swimming side by side in the water column at about 4 m down to about 20 m depth over a sand bottom adjacent to the rocky reef (see site description in Luiz *et al.*, 2008). One of the individuals, presumably the male, first displayed itself to the presumed female (Fig. 1a) and then rolled under her (the pair with their bellies in contact), when they likely released gametes (Fig. 1b). After spawning once they repeated the sequence and then broke away (Fig. 1c). No color dimorphism was noticed between sexes.

Spawning in pairs or group is known for acanthurids, some species displaying both strategies (Robertson, 1983). Among western Atlantic surgeonfish species, group spawning is apparently the most common strategy although pair spawning is recorded for very small populations of *Acanthurus bahianus* and *A. coeruleus* (DeLoach, 1999). As there is no published information on the reproductive behavior of *A. monroviae* in its native range, where it aggregates in large schools (Randall, 2002; P. Wirtz, pers. comm.), it remains an open question whether pair spawning is a norm for this surgeonfish species or whether the behavior we recorded is due to reduced population of vagrant individuals.

The knowledge of factors related to success or failure of the establishment of populations in new areas after settlement is one major focus of studies on reef fish ecology (*e.g.*, Robertson, 1988; Caley *et al.*, 1996; Bariche *et al.*, 2004; Figueira *et al.*, 2009). In subtropical rocky reefs, where physical and biological conditions differ from those on tropical coral reefs (Perry & Larcombe, 2003), the settlement and establishment of “true” tropical fish species are not always successful, pending on an array of optimal conditions (McBride & Able, 1998; Figueira *et al.*, 2009). Although the behavior here recorded for *A. monroviae* provides a first glance on its reproductive strategy, the expected chances of only three individuals to establish a reproductively viable population seem unlikely. Continuous monitoring of the individuals at our study site could provide important information on an expatriated tropical marine fish species (*sensu* Hare & Cowen, 1991) in a Brazilian rocky reef. Recent invasions of reef fish species in areas where they did not occur previously – *e.g.* Indo-Pacific lionfish in the north-west Atlantic (Whitfield *et al.*, 2002), and Red Sea species in the Mediterranean Sea (Bariche *et al.*, 2004) – raised concerns about the possibility of other exotic species establishing viable populations in localities where they may occur as vagrants. Reproductive activity of a species in a new area does not mean successful establishment, but is an important step in a bio-invasion scenario (Carlton, 1996).

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