



A mutton hamlet *Alphestes afer* (Bloch, 1793) reproductive event in northeast Brazil

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Abstract. We present here the first record of a reproductive event of the mutton hamlet, *Alphestes afer*, in Brazilian waters. Four individuals participated in the event, which lasted approximately 30 minutes at dusk.

Keywords: reproductive event, mutton hamlet, *Alphestes afer*, shallow waters, northeast Brazil

Resumo. Um evento reprodutivo da garoupa-rajada *Alphestes afer* (Bloch, 1793) no Nordeste do Brasil. Apresentamos aqui o primeiro registro em águas brasileiras de um evento reprodutivo da garoupa-rajada, *Alphestes afer*. Quatro indivíduos participaram do evento que durou aproximadamente 30 minutos no período do crepúsculo.

Palavras-chave: evento reprodutivo, garoupa-rajada, *Alphestes afer*, águas rasas, nordeste brasileiro

The Epinephelidae family is an important group of carnivorous marine fishes that occur in tropical and subtropical waters throughout world. The family was recently revalidated following molecular and morphologic studies, which separated some species that were previously part of Serranidae (Smith & Craig 2007). Along the Brazilian coast there are probably 25 species of this family, including groupers and hinds (Carvalho-Filho, pers. com.).

The mutton hamlet, *Alphestes afer*, is found in the southwest Atlantic from Florida (USA) to Santa Catarina (Brazil), including the Bermuda Islands, Bahamas and Cuba in the Caribbean Sea and Western Africa from Guinea, type locality, and São Tomé and Príncipe (Craig *et al.* 2006, Hostim *et al.* 2006, Wirtz *et al.* 2007, Sampaio & Nottingham 2008). It is a relatively small-sized species that reaches 33 cm of total length (TL). The mutton hamlet displays solitary and sedentary habits during the day, sheltering in rocky crevices and above algae. It feeds mainly on crustaceans at dusk and

after nightfall (Randall 1967, Heemstra & Randall 1993, Sampaio & Nottingham 2008).

We report here a reproductive behaviour of a small school of mutton hamlet. Our observations occurred opportunistically in 05 October (2008) in the rocky reef of Farol da Barra, located at the entrance of Baía de Todos os Santos – BTS (northeast of Brazil). We observed the behavior of the fishes using the focal group method while snorkeling (Altmann 1974). Photographic records were obtained with a Sony WPC 4 MP. The sequence of events occurred at dusk (5:20p.m. to 6p.m.) at two meters in depth, during high tide, with ~3m of horizontal water transparency and at crescent moon phase. The site where the observation was made has a sandy bottom, filamentous and foliage algae and the zoanthid *Palythoa* sp.

Four grouped individuals were sighted. The largest individual (A) had ~30 cm TL, apparently a female, presenting a lighter coloration and big belly, while the other three had between 20 to 25 cm TL (B, C, e D) (most likely males) and displayed a

darker coloration, typical of courting male epinephelids (Tresher 1984, DeLoach & Humann 1999). During the observations, individuals B, C, and D followed A, attempting to approach it. However, only one fish (B) was able to maintain direct contact with individual (A). Individual B bit the back of A and also behaved agonistically when the other fishes approached. Subsequently,

individuals A and B rested laterally to the substrate (Fig. 1) where they maintained physical contact between their bellies. The release of their gametes occurred after a few minutes close to the substratum. The other two individuals moved away to a distance of approximately 1 m from the spawning couple. The episode lasted approximately 30 minutes.



Figure 1. Two individuals of *Alphestes afer* during a reproductive event. Note the physical contact between the individuals. Photographed by D.V. Medeiros.

One day before, in same locality and horary was observed many muttons hamlet closeness, probably as same individuals the after day; however no signs of reproduction event were registered.

Reef fish exhibit a great variety of reproductive strategies, from spawning aggregations to spawning in pairs (Tresher 1984, Domeier & Colin 1997, DeLoach & Humann 1999, Krajewski & Bonaldo 2005). Some groupers make their way to spawning sites in the beginning of spring and summer, migrating long distances to a specific location in order to join with other individuals (Tresher 1984, Shapiro 1987, Sadovy 1996, DeLoach & Humann 1999). We believe that because of the small size and sedentary habits, *A. afer* was not pursuing breeding migration.

The majority of marine fish, specially groupers of the Epinephelidae family, that display

lunar spawning rhythms, reproduce at the new or full moon (Domeier & Colin 1997), suggesting that there may be some selective advantages associated with spawning at spring tide as the tide has greater amplitude (Johannes 1978). Moreover, the lunar cycles apparently help to synchronize the spawn (Lowe-McConnell 1999). The event reported here occurred at the crescent moon, making it difficult to associate *A. afer* spawning synchronization with the lunar cycle. Curiously, non-lunar spawning has been reported for a few species of epinephelids (Hereu *et al.* 2006, Erisman *et al.* 2007, 2009).

Among the Atlantic marine fish species, the Epinephelidae, Serranidae and Lutjanidae family received great research and conservation attention because of their characteristic of forming spawning aggregations (Claro & Lindeman 2003, Sadovy & Domeier 2005). A reproductive aggregation occurs

when one or more species convene at a certain place and time with a reproductive end. When a large number of normally dispersed fishes organize in predetermined areas and times, they become highly vulnerable to overfishing (Colin *et al.* 2003, Sadovy & Cheung 2003, Sadovy & Domeier 2005). Previous studies have documented that from the original five historic aggregation sites in the Caiman Island for *Epinephelus striatus*, three are inactive or commercially extinct due to overfishing (Whaylen *et al.* 2004).

In Brazil, the goliath grouper *Epinephelus itajara*, an endangered species according to IUCN (The World Conservation Union) (Tak-Chuen & Ferreira 2006), is known to reproduce during summer, with reproductive aggregations observed in December (full moon) and occasionally in January and February in Babitonga bay, Santa Catarina (Brazil) (Gerhardinger *et al.* 2006, 2007). However, no bibliographic or anecdotal information exists concerning reproductive aggregations of small and cryptic epinephelids, such as *A. afer*. We do not consider the reproductive event described herein a spawning aggregation, since only two individuals spawned simultaneously.

In spite of its relatively small size, *A. afer* is captured for consumption and ornamental trade within BTS (Sampaio & Nottingham 2008). The only similar feature between the reproduction of large groupers and the reproductive event of *A. afer* reported here was the dusk period (Claro & Lindeman 2003).

Our observations confirm that mutton hamlet can spawn in shallow waters. We suggest that shallow reefs inside the BTS are an important reproductive site for *A. afer*. However, future studies focusing on the periodicity of these events, the influence of lunar phases, the average size at sexual maturation and possible occurrence of migration for reproductive events will elucidate some of the questions raised in this paper.

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