

SHORT COMMUNICATION

First record of a reef coral spawning event in the western South Atlantic

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Summary

The first record of coral spawning in the South Atlantic was observed among *Mussismilia hispida* colonies at the “Laje de Santos” (24°19' S, 046°11' W). Several colonies were observed spawning for about 15 min, early on the night of April 29, 2000. Some colonies did not spawn and no colonies were observed spawning later than circa 20:00 h. The report of *M. hispida* spawning in Santos came from the southernmost area of occurrence of this species. Data from this record are compared with those from previous studies on the reproduction of this species.

Key words: Coral, *Mussismilia*, spawning, western South Atlantic, Brazil

The only published information on the reproductive biology of *Mussismilia* spp. was the study by Pires et al. (1999) in the Abrolhos Reef Complex, where findings were based exclusively on histological analysis of periodic samples. All species of this genus are hermaphrodite broadcasters, with the development of female and male gametes starting at different times in the same breeding season. They all present annual reproduction cycles, each lasting approximately 11 months (Pires et al., 1999). The genus *Mussismilia* plays an important role as a reef builder in Brazil where all three recent species are endemic. Among these, *M. hispida* presents the widest distribution (Fig. 1), extending from Paraíba State (approximately 07°S) to off Santos, São Paulo State (approximately

24° S); it also occurs in the offshore areas of Manoel Luís Reefs (00°50' S, 044°15' W), Atol das Rocas (03°52' S, 033°49' W), and the Fernando de Noronha Archipelago (03°50' S, 032°25' W) (Laborel, 1969; Leão-de-Moura et al., 1999; Castro and Pires, 2001).

The first record of coral spawning in the South Atlantic was observed among *M. hispida* colonies (Fig. 2) at the “Laje de Santos” (24°19' S, 046°11' W). This area comprises a Marine State Park lying 22 nautical miles off the city of Santos. The park has an area of approximately 50 km² with depths up to 40 m and with rocky outcrops up to some 30 m above the water. The main island is 500 m long, 100 m wide, and presents several smaller, surrounding rocky formations. The northern side of the island is usually

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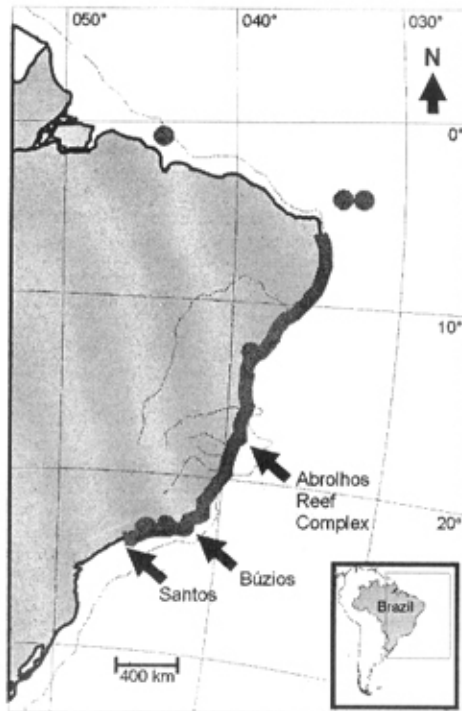


Fig. 1. Distribution of *Mussismilia hispida* and localities where studies on its reproduction were conducted.

sheltered. The spawning was recorded on April 29th, 2000, during day 25 of the lunar cycle (waning moon; new moon on May 4th). The duration of the event was inferred by consecutive dives by the first author. No spawning was observed during the first dive that started at 16:40 h and lasted 70 min (approximately 17:50 h; circa 0:20 h after sunset, Brasil, 1999). A second dive started at approximately 19:00 h (circa 1:30 h after sunset), and several colonies of *M. hispida* were soon observed spawning. Spawning was observed and photographed for about 15 min. Some colonies did not spawn during this dive. No colonies were observed spawning by the end of the 60-min dive (approximately 20:00 h; circa 2:30 h after sunset); seawater temperature during this dive was 22°C (measured with a dive computer SUUNTO Solution Alfa).

Pires et al. (1999) suggested that *Mussismilia* may spawn twice during consecutive months. Such a conclusion was based on samples in which some colonies had ripe gonads while others had only empty mesenteries. The current report suggests this interpretation is correct, as only part of the colonies was seen spawning. A subsequent spawning may include colonies that did not spawn before (instead of the whole colony presenting two consecutive spawning periods).

Unpublished data showed probable spawning by *M. hispida* from the end of April to mid-June at the

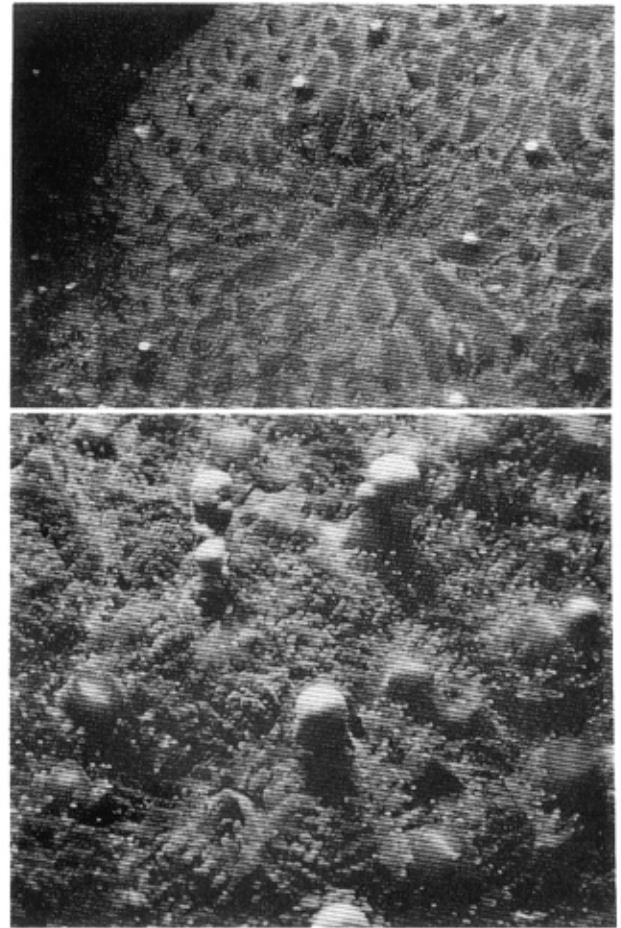


Fig. 2. *Mussismilia hispida* spawning in the "Laje de Santos" (24°19' S, 046°11' W) (photos by C.L.B. Francini).

Abrolhos reefs (18° S), and between mid-February and mid-March in Búzios (23° S) (see Pires et al., 1999). The current record (24°19' S), therefore, occurred nearer the spawning period of the farthest population. Therefore, this population may present either spawning periods similar to the Abrolhos population or an intermediate condition between the Abrolhos and Búzios populations.

Weekly mean sea surface temperatures (SST) obtained from satellite data from the United States National Oceanographic and Atmospheric Administration (NOAA) (Reynolds and Smith, 1994), show different annual temperature ranges on different localities along the distribution of *M. hispida* (Fig. 3). In Santos, the spawning was observed by the beginning of the temperature fall after the summer, as reported from Abrolhos by Pires et al. (1999). Temperature data from Búzios are not available and satellite data are not reliable due to the oceanographic conditions of the area (upwelling nearshore and warm: Brazilian Current a few miles offshore).

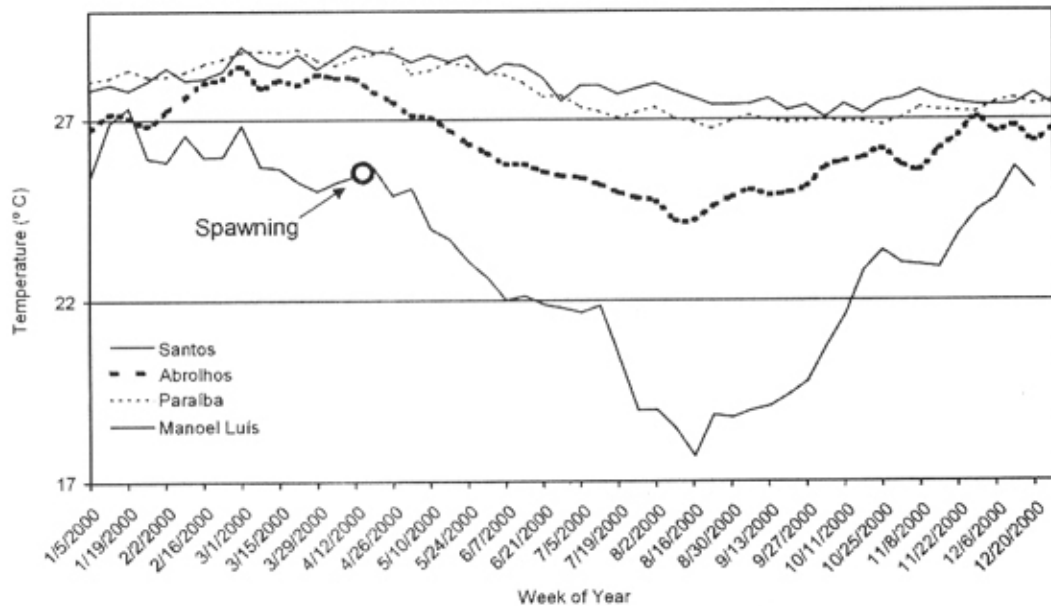


Fig. 3. Weekly mean sea surface temperature (estimated by remote sensing) in different localities along the distribution of *Mussismilia hispida*. Circle indicates spawning event in Santos.

The report of a *M. hispida* spawning in Santos occurred at the southernmost area of occurrence of this species.

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References

- Almanaque Náutico para 2000. Diretoria de Hidrografia e Navegação, 56th ed., Brasil, 1999, pp. 1–285.
- Castro, C.B. and Pires, D.O., Brazilian Coral Reefs: what we already know and what is still missing. *Bull. Mar. Sci.*, 69 (2001) 357–371.
- Laborel, J., Madreporaires et hydrocoralliaires récifaux des côtes Brésiliennes. Systématique, écologie, répartition verticale et géographique. *Annls. Inst. Océanogr.*, Paris, 47 (1969) 171–229.
- Leão-de-Moura, R., Rodrigues, M.C.M., Francini-Filho, R.B. and Sazima, I., Unexpected richness of reef corals near the southern Amazon River mouth. *Coral Reefs*, 18 (1999) 170.
- Pires, D.O., Castro, C.B. and Ratto, C.C., Reef coral reproduction in the Abrolhos Reef Complex, Brazil: the endemic genus *Mussismilia*. *Mar. Biol.*, 135 (1999) 463–471.
- Reynolds, R.W. and Smith, T.M., Improved global sea surface temperature analyses using optimum interpolation. *J. Climate*, 7 (1994) 929–948.