

SCIENTIFIC NOTE

Trichoplax from marine cultures in Brazil – First record of the phylum Placozoa in the South Atlantic Ocean

André C. Morandini^{a,*}, Sérgio N. Stampar^b, Fábio L. da Silveira^b

^a*Núcleo de Pesquisas em Ecologia e Desenvolvimento Sócio-Ambiental de Macaé (NUPEM), Universidade Federal do Rio de Janeiro, Rua Rotary Club, s/n., São José do Barreto, 27971-220, [or C.P. 119331, 27910-970], Macaé, RJ, Brazil*

^b*Departamento de Zoologia, Instituto de Biociências, Universidade de São Paulo, C.P. 11461, São Paulo, SP, 05422-970, Brazil*

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Trichoplax adhaerens F.E. Schultze, 1883, phylum Placozoa, is a primitive and enigmatic metazoan. The species was registered in different parts of the world (Mediterranean, Red Sea, North Atlantic, Japan, and Caribbean), most of the records being restricted to warm coastal waters (Pearse 1989). Although several ultrastructure studies have already been conducted with the species (Rassat and Ruthmann 1979; Grell and Ruthmann 1991), scientific community knows little about its biology (Grell 1971; Grell and Ruthmann 1991). A few studies provided some data on the feeding, movement, vegetative reproduction, and growth of the species (Pearse 1989; Thiemann and Ruthmann 1991; Ueda et al. 1999; Maruyama 2004). Due to its extreme simplicity as multicellular animals, the species was always interesting for studies of lower metazoan evolution (see Syed and Schierwater 2002; Ender and Schierwater 2003; Schierwater 2005).

Recent studies considering molecular data presented different results, suggesting that there is more than one lineage of placozoans (Aleoshin et al. 2004; Voigt et al. 2004), with samples from different places, but did not attempt to name them. Although, based on the basic morphology and histology described in the literature

and of the observed material, the specimens from the Brazilian coast match *Trichoplax adhaerens* (from the Gulf of Trieste, Italy); it is wise, based on the results presented by different authors (cf. Aleoshin et al. 2004; Voigt et al. 2004), to refer to the southeastern Brazilian specimens just as *Trichoplax* sp. (Figs. 1–4).

Most of the placozoan records came from aquarium/laboratory observations and long maintained cultures (see Schierwater 2005). A few studies report the group from nature or substrates where they might be over (e.g. Maruyama 2004). Placozoans are widespread all over the world, but only found when “specialists” look for them. Their distribution is mainly restricted to warm coastal waters, and the closest record to our finding is from the Caribbean. The area where our culturing water came from is a harbor region (see below), with relative transit of ships from different parts of the world. Although we might expect that our specimens cluster closer to the specimens from Caribbean we cannot discard the possibility of a marine introduction by ballast water.

The specimens were found crawling on glass watches covered with encrusting benthic green algae, and ciliates. Our culture (ca. 2 months old) started with small plastic vessels (500 ml), filled with filtered sea water from the São Sebastião Channel, São Paulo State, Brazil). The São Sebastião Channel is located on the northern coast of São Paulo State (23°41′–23°53.5′ S; 45°19′–45°30′ W). The channel separates the continent from the São

*Corresponding author.

E-mail addresses: acmorandini@biologia.ufrj.br, andre.morandini@gmail.com (A.C. Morandini), stampar@usp.br (S.N. Stampar), fildsilve@usp.br (F.L. da Silveira).



Fig. 1. Living *Trichoplax* sp. photographed with light microscopy. Scale = 0.5 mm.

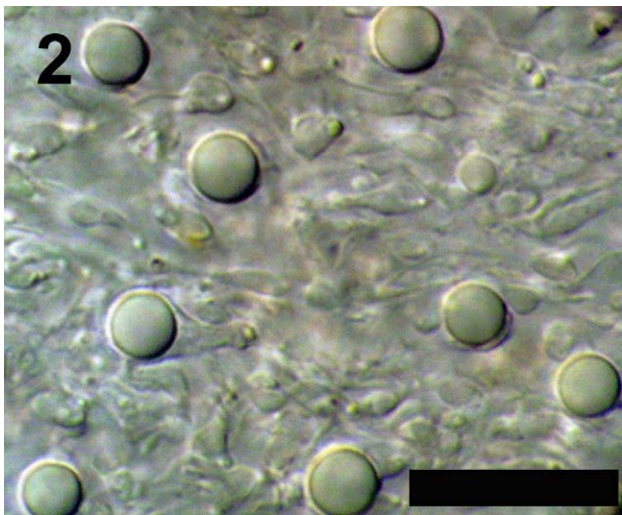


Fig. 2. Detail of the dorsal layer of *Trichoplax* sp., showing the shiny spheres under light microscopy. Scale = 0.002 mm.

Sebastião Island, the second largest marine island in Brazil, forming a well-sheltered area ideal for shipping operations. The extension is about 25 km long with two relatively large entrances (6–7 km wide). The middle portion is the narrowest (2 km in width) and the deepest (about 40 m) (Arasaki et al. 2004). Near the place where the water was collected (Grande beach), there is a small mangrove (Araça beach). The mean temperature in the São Sebastião Channel waters varied from 22.4 to 25 °C (data from CEBIMar-USP website, <http://www.usp.br/cbm/ambientais/medias.html>). The culture was established to rear small *Staurocladia* sp. hydromedusae and calanoid copepods. Gentle air bubbling provided some

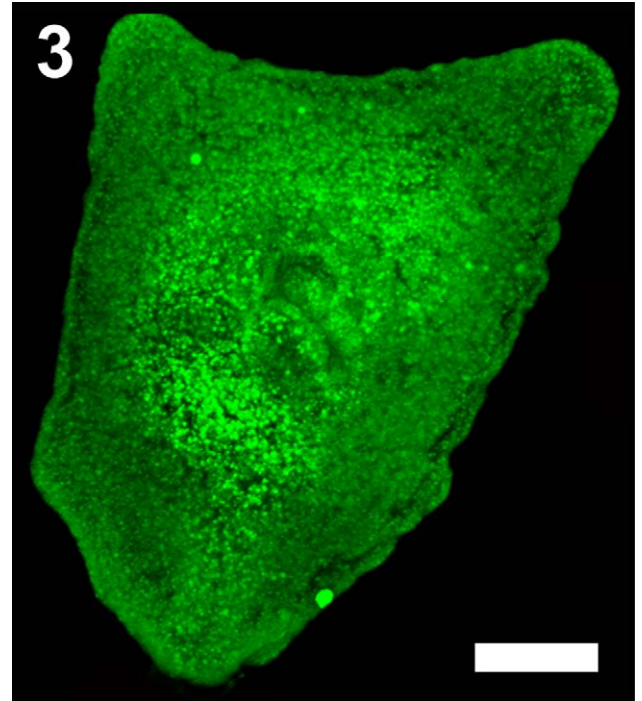


Fig. 3. Living *Trichoplax* sp. (in ventral view) observed in confocal microscopy. Note the white areas showing the natural luminescence of the organism. Scale = 0.1 mm.

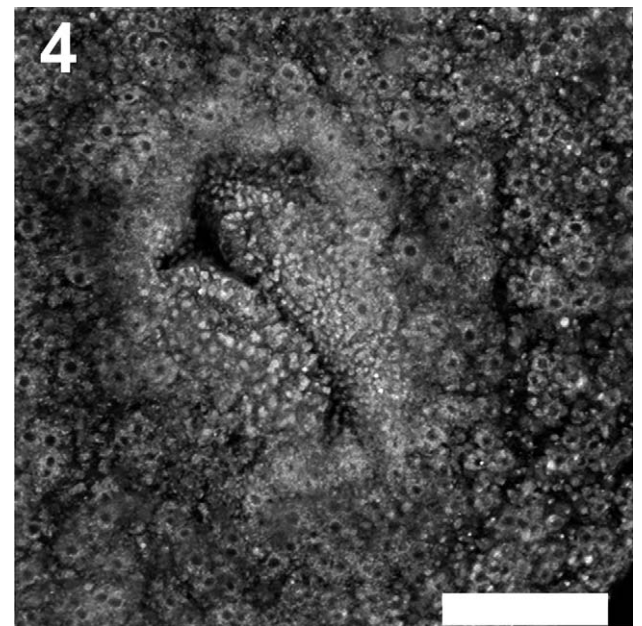


Fig. 4. Living *Trichoplax* sp. (in ventral view) observed in confocal microscopy. Note the outline of the temporary mouth. Scale = 0.05 mm.

water circulation, the vessel remained near a window (natural day light regime), and temperature ranged from 20 to 24 °C. *Artemia* nauplii were provided as food for

the other animals, but some placozoans were observed “crawling around” dead nauplii and seemed to be unaffected by either hydromedusae and copepods.

The vegetative reproduction of *T. adhaerens* was observed in two types, equal and unequal bipartition. The origin of small individuals was observed by unequal division.

Ongoing molecular sequencing will correlate Brazilian specimens to the strains presented by other researchers.

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