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NOTES ON GEOGRAPHIC DISTRIBUTION

Chaetognatha, Spadellidae, *Paraspadella nana* Owre, 1963: New occurrence from the southwest Atlantic Ocean

Michele Rodrigues Arruda [1], Luiz Ricardo Marques Ávila [2] and Sérgio Luiz Costa Bonecker [1*]

1 Universidade Federal do Rio de Janeiro, Instituto de Biologia, Departamento de Zoologia. CCS, Bloco A, Ilha do Fundão. CEP 21941-590. Rio de Janeiro, RJ, Brasil.
2 Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, Diretoria de Qualidade Ambiental. SCEN Trecho 2 – Edifício Sede IBAMA. CEP 70818-900. Brasília, DF, Brasil.
* Corresponding author. E-mail: *bonecker@biologia.ufrj.br*

ABSTRACT: Chaetognaths are composed by six families and among them Spadellidae is strictly benthic. This study reports the first occurrence of *Paraspadella nana* Owre, 1963 in the coastal zone located in the northern region of Espírito Santo state (19°51'12" S, 40°02'45" W). This species was first recorded from the oceanic region of southeastern Florida and now it was recorded off the coast of Espírito Santo for the first time expanding its distribution to the southwest Atlantic Ocean.

Chaetognaths are exclusively marine, with a worldwide distribution from coastal waters to the open ocean (Bone *et al*. 1991). They reach high densities in the epipelagic zone (Pierrot-Bults 1996). They are active planktonic predators, hermaphroditic and excellent indicators of water masses (Pierrot-Bults 1996; Casanova 1999). About 70 species of chaetognaths exist, belonging to six families, only one of them found in benthic habitats.

The family Spadellidae is strictly benthic and contains 11 described species in a single genus: *Paraspadella schizoptera* (Conant, 1895), *P. anops* Bowman and Bieri, 1989, *P. caecafea* (Salvini-Plawen, 1986), *P. gotoi* Casanova, 1990, *P. johnstoni* (Mawson, 1944), *P. legazpichessi* (Alvariño, 1981), *P. moretonensis* (Johnston and Taylor, 1920), *P. nana* (Owre, 1963), *P. pimukatharos* (Alvariño, 1987), *P. pulchella* (Owre, 1963) and *P. sheardi* (Mawson, 1944).

The distribution of the benthic species is little known in comparison with the pelagic chaetognaths (Owre 1963; Casanova 1999). Off the Brazilian coast, Avila *et al.* (2006) found two individuals of the genus *Paraspadella*, between the states of Bahia and Espírito Santo (18°23'30" S, 39°27'30" W). The lateral fins of these exemplars were destroyed, making species identification impossible.

Studies on *P. nana* are scarce. This is a benthic species found in neritic waters of the tropical Atlantic (Pierrot-Bults 2004). This species was first described from off southeastern Florida, in Soldier Key (Owre 1963), and until now it was recorded only to this region. We now report the occurrence of *P. nana* off the coast of Espírito Santo for the first time, expanding its distribution to the southwest Atlantic Ocean.

The samples were collected in the coastal zone of Aracruz municipal district, located in the northern part of Espírito Santo (19°51'12" S, 40°02'45" W). The area studied included the coastal waters to a depth of 10 m. This region is influenced by industries discharge, by port activities and by freshwater from Barra do Riacho River and Doce River in the north. A mixture of Coastal and Tropical waters predominates in the coastal region (Bonecker *et al*. 1998).

Zooplankton samples were collected by horizontal hauls, using a cylindrical-conical net of mesh size 200 µm and mouth diameter 60 cm, fitted with a calibrated flowmeter. Samples were immediately fixed in 4 % buffered formalin/seawater solution.

In the laboratory, the zooplankton samples were sorted and the chaetognaths were separated using a binocular microscope (Zeiss model SV6). The individuals were stained with Methylene Blue, to facilitate observation of taxonomic structures. The identification was based on the descriptions of Owre (1963) and Pierrot-Bults (2004). The voucher specimens of *P. nana* are deposited in the Chaetognatha collection of the Integrated Laboratory of Zooplankton and Ichthyoplankton of the Universidade Federal do Rio de Janeiro (DZUFRJ).

Three individuals of *P. nana* were found (Figure 1a). This species is typically benthic, but because of the local current patterns and occasional resuspension of sediments these chaetognaths can be found in the water column.

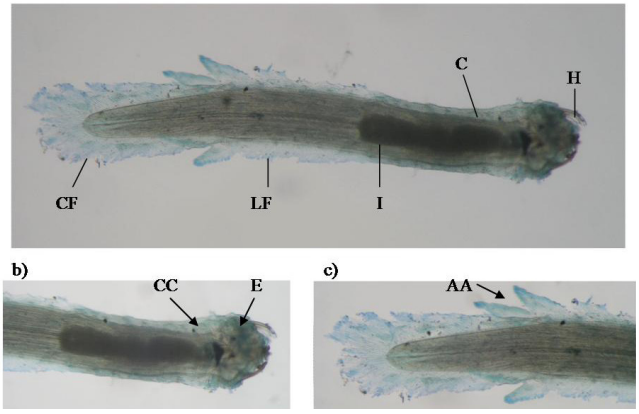

FIGURE 1. a) Dorsal view of *Paraspadella nana* (CF – caudal fin; LF – lateral fin; I – intestine; C – collarette; H – hooks), b) Head and trunk (E – eyes; CC - corona ciliata, c) Tail region (AA - adhesive appendices).

These exemplars have nine nonserrate hooks, three anterior teeth, and no posterior teeth. The corona ciliata is variable in shape and is situated on the anterior trunk in the neck region (Figure 1b). The body is rigid, with transverse musculature in the trunk. There is only one pair of lateral fins, located on the tail, which represents nearly 50% of the total body length. The lateral fins are rounded and completely rayed. They have a long collarette and no intestinal diverticulum. The eyes are large (Figure 1b). The seminal vesicles are conical and reach to the lateral fins as well as to the caudal fin. There are two pairs of adhesive appendices on the posterior tip of the lateral fins (Figure 1c). Total length of three exemplars: 2.5 mm.

Paraspadella nana is the least well-described species of the genus. It resembles *P. schizoptera* in body proportions, numbers of hooks and teeth, and position of the adhesive appendices, and they are unique in that the appendices begin anteriorly from the seminal vesicles. *Paraspadella nana* differs from *P. schizoptera* in the division of the adhesive appendices. In *P. nana* there is a basic division into two processes that are relatively robust, distal and contain muscle fibers originating from dorsal and ventral longitudinal bands of the muscle (Owre 1963). The occurrence of a benthic species in this area broadens the perspective of its biodiversity, and will also allow future studies with these animals.

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Literature Cited

Avila, L.R.M., M.R. Arruda, and S.L.C. Bonecker 2006. Chaetognatha; p. 165-184 *In* S.L.C. Bonecker (ed.). *Atlas do zooplâncton da região central da Zona Econômica Exclusiva*. Rio de Janeiro: Museu Nacional. Série Livros n. 21.

Boltovskoy, D. 1999. Chaetognatha; p. 759-791 *In* D. Boltovskoy (ed). *South Atlanctic Zooplankton*. Leiden: Backhuys Publishers.

Bone, Q., H. Kapp and A.C. Pierrot-Bults 1991. Introduction and relationships of the group; p. 1-4 *In* Q. Bone, H. Kapp and A.C. Pierrot-Bults (ed.). *The Biology of Chaetognaths*. Oxford: Oxford University Press.

Bonecker, S.L.C., A.C.T. Bonecker and C. Bassani 2002. Plâncton Marinho; p. 103-125 *In* R.C. Pereira and A. Soares-Gomes (org.). *Biologia Marinha*. Rio de Janeiro: Interciência.

Bonecker, S.L.C., C.R. Nogueira, A.C.T. Bonecker and C. O. Dias. 1998. Influence of pulp Mill effluent on marine Zooplankton and Ichthyoplankton communities in southern Brazil. *Tropical Ecology* 39(1): 31-38.

Michel, H.B. 1984. Chaetognatha of the Caribbean Sea and adjacent areas. *U.S. Department of Commerce, NOAA Techinical Reports, MMFS* 15: 1-33.

Owre, H.B. 1963. The genus *Spadella* (Chaetognatha) in the western North Atlantic Ocean with descriptions of two new species. *Bulletin of Marine Science Gulf Caribbean* 13: 378-390.

Pierrot-Bults, A.C. 1996. Chaetognatha; p. 529-596 *In* R. Gasca and E. Suarez (ed.). *Introducción al Estudio del Zooplâncton Marino*. ChetumalCidade?OK: El Colégio de la Frontera Sur (ECOSUR), CONACYT.

Pierrot-Bults, A. 2004. *Chaetognatha of the world*. Electronic Database accessible http://nlbif.eti.uva.nl/bis/chaetognatha.php?selected=beschrijving&menuentry=soorten&id=37. Captured on March 05 of 2009.

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