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## Four new species of Plakinidae (Porifera: Homoscleromorpha) from Brazil

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### Abstract

Seven species of Plakinidae are currently known from Brazil, belonging to genera *Plakina* (*P. trilopha*), *Plakinastrella* (*P. microspiculifera*, *P. onkodes*), and *Plakortis* (*P. angulospiculatus*, *P. halichondrioides*, *P. insularis*, and *P. microrhabdifer*). In this study we describe four new species of the genera *Plakinastrella* and *Plakortis*, increasing the number of plakinid species in Brazil to eleven.

*Plakortis petrupaulensis* **sp. nov.** is encrusting, light brown; the skeleton is disorganized with few traces of reticulation; lacunae are absent; the spicules are diods and tuberculate microrhabds; spheres are common and triods are absent. *Plakortis spinalis* **sp. nov.** is encrusting, gray, cartilaginous, has a reticulated ectosomal skeleton, and is distinguished by the spines in some of the diods and triods; microrhabds are also tuberculate and smooth spheres are common. *Plakortis potiguarensis* **sp. nov.** is encrusting, brown with gray tinges, and cartilaginous; the skeleton is disorganized and scarce, composed of thin, irregular diods, triods and relatively large microrhabds. *Plakinastrella globularis* **sp. nov.** has a globular shape and dark blue color *in vivo*; the ectosomal skeleton has a double tangential reticulation and the choanosomal skeleton is reticulated. The spicules are diods, triods, calthrops and microrhabds; spheres are common. Two of the new species have characters previously unknown in their respective genera: the spined diods and triods of *Plakortis spinalis* **sp. nov.** and the blue color and microrhabds of *Plakinastrella globularis* **sp. nov.** The presence of microrhabds in *Plakinastrella* suggests a close relationship of this genus with *Plakortis*.

**Key words:** *Plakortis*, *Plakinastrella*, taxonomy, São Pedro e São Paulo Archipelago, Fernando de Noronha Archipelago, Potiguar Basin, Salvador, Almirante Saldanha Seamount

### Introduction

The scientific interest in the Class Homoscleromorpha (Phylum Porifera) has increased in recent years due to molecular phylogenetic studies that indicate they may be closer to the main line of animal evolution than the other sponge groups (Gazave *et al.* 2010). The presence of a basement membrane made of type IV collagen and the asynchronous spermatogenesis inside of a same spermatocyst also support this relationship (Boute *et al.* 1996; Ereskovsky *et al.* 2009a; Muricy & Diaz 2002). The presence of acrosome in spermatozoa was considered an exclusive character of Homoscleromorpha among the Porifera (Bacetti *et al.* 1986; Muricy & Diaz 2002), but an atypical acrosome was recently found in spermatozoa of *Crambe crambe* (Riesgo & Maldonado 2009; Ereskovsky 2010). The Homoscleromorpha further differ from other sponges by their exclusive cinctoblastula larvae and the presence of flagellated exopinacocytes (Boury-Esnault *et al.* 1990, 2003).

The classification of the Homoscleromorpha has changed considerably over the years, with its ranking elevated from suborder to order, subclass and class (Topsent 1895; Dendy 1905; Lévi 1973; Gazave *et al.* 2010, 2012). These changes reflected the increasing knowledge of their biology and the discovery of new exclusive characters within the phylum. The phylogenetic relationships within the group are also challenging: its two families Oscarellidae (without skeleton) and Plakinidae Schulze 1880 (with siliceous spicules) have been merged in the end of the 20<sup>th</sup> century (Solé-Cava *et al.* 1992; Diaz & van Soest 1994; Boury-Esnault *et al.* 1995; Muricy *et al.* 1996, 1999) but both are now accepted as valid again (Gazave *et al.* 2010, 2012, 2013). The family Plakinidae currently