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Rhodolith-forming species of the subfamilies Neogoniolithoideae and Hydrolithoideae (Rhodophyta, Corallinales) from Espírito Santo State, Brazil

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Abstract

The taxonomy of the rhodolith-forming species of non-geniculate coralline algae from the subfamilies Neogoniolithoideae and Hydrolithoideae (Rhodophyta, Corallinales) found from Espírito Santo State, Brazil, was evaluated based on extensive subtidal sampling. A comparative analysis of the Brazilian material to other recently described species lead us to conclude that one relatively well-known species, namely *Hydrolithon rupestre*, a conferatum species *Neogoniolithon* cf. *brassica-florida* and a probably new species of the genus *Hydrolithon*, are present in the area. All three species can be distinguished by their tetrasporangial or gametangial conceptacle anatomy. This study strengthens the hypothesis that Brazilian rhodolith beds are comparatively more diverse in numbers of rhodolith-forming species than other areas of the world.

Key words: Rhodoliths, *Neogoniolithon* cf. *brassica-florida*, *Hydrolithon rupestre*, *Hydrolithon* sp., Brazil

Introduction

According to the revision of the subfamily Mastophoroideae (Rhodophyta, Corallinaceae) using molecular phylogenetic analysis, Kato *et al*. (2011) proposed the establishment of three new subfamilies: Hydrolithoideae, Porolithoideae and Neogoniolithoideae. Species of these subfamilies have been identified from various Brazilian coral reefs and rocky shores. These include: *Hydrolithon boergesenii* (Foslie 1901: 19) Foslie (1909: 56), *Hydrolithon breviclavium* (Foslie 1907: 20) Foslie (1909: 56) (Henriques *et al*. 2014a), *Hydrolithon farinosum* (Lamouroux 1816: 315) Penrose & Chamberlain (1993: 295) (Taylor 1960), *Hydrolithon reinboldii* (Weber-van Bosse & Foslie) Foslie, 1909: 55 (Tâmega *et al*. 2015), *Hydrolithon rupestre* (Foslie) Penrose (1996: 265) (Crespo *et al*. 2014), *Hydrolithon samoënse* (Foslie 1906: 20) Keats & Chamberlain (1994: 15) (Tâmega & Figueiredo 2005), *Neogoniolithon accretum* (Foslie & Howe 1906: 131–132) Setchell & Mason (1943: 90) (Figueiredo & Steneck 2002, Mateo-Cid *et al*. 2014), *Neogoniolithon atlanticum* Tâmega, Riosmena-Rodriguez, Mariath & M. Figueiredo (284: 10–15) (Tâmega *et al*. 2014), *Neogoniolithon mamillare* (Harvey 1849: 109) Setchell & Mason (1943: 91), *Porolithon onkodes* (Heydrich) Foslie 1909: 57 (Henriques *et al*. 2014a), *Porolithon pachydermum* (Foslie 1904: 4) Foslie (1909: 57): Gherardi & Bosence 1999, 2001, Figueiredo & Steneck 2002, Villas-Bôas *et al*. 2005, Figueiredo *et al*. 2008, Tâmega *et al*. 2014).

The Brazilian continental shelf contains extensive rhodolith beds from 20 to 100 m depth (Kempf *et al*. 1969, Kempf 1980, Amado-Filho *et al*. 2007, Villas-Bôas *et al*. 2009, 2014, Figueiredo *et al*. 2012, Tâmega *et al*. 2013) distributed from 3° to 22° S, and is considered the largest area supporting rhodolith beds in the world (Foster 2001). The continental shelf of Espírito Santo State is considered to be the region with highest marine algal species richness in Brazil (Amado-Filho *et al*. 2007) and is a transitional area from tropical to temperate floras (Guimarães 2003). Recently, some authors have studied rhodolith beds from Espírito Santo in shallow waters (Amado-Filho *et al*. 2007, 2010, Villas-Bôas *et al*. 2009, 2014, Bahia *et al*. 2011) and deep waters (Henriques *et al*. 2011). Fourteen rhodolith-forming species (*Hydrolithon breviclavium* (Henriques *et al*. 2014a), *Lithophyllum corallinae* (Crouan & Crouan 1867: 150,

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