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# Morphological and molecular characterization of *Hydrolithon rupestre* (Corallinaceae, Corallinales, Rhodophyta): first report from the Mediterranean Sea

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## Abstract

The genera *Hydrolithon* and *Porolithon* are the most discussed taxa of non-geniculate Corallinaceae, as well as the most poorly known. Anatomical observations based usually on thallus construction, number of epithallial cell layers, trichocyte arrangement, occurrence of vegetative filaments between the trichocytes, and presence/absence of cell fusions and secondary pit connections led to different interpretations mainly due to the lack of available reproductive material from type specimens. Recently molecular surveys on the phylogeny of the Corallinales supported the hypothesis of considering *Hydrolithon* and *Porolithon* as two distinct genera but, up to now, several taxonomic questions remain in part unanswered. For these reasons identification of species belonging to these genera is still very difficult and can often lead to misidentification of taxa. In this study we report the discovery of a species of the *Hydrolithon* group found along the coast of Vis Island, Croatia, Adriatic Sea. Samples were identified through morpho-anatomical examinations and the phylogenetic position of this species was investigated through molecular analyses based on the nuclear nSSU and the plastidial *psb*A markers. This finding represents the first report for the Mediterranean Sea of *Hydrolithon rupestre*, one of the few encrusting coralline algae reported to overgrow live corals. The species can represent a possible threat to populations of Adriatic scleractinian corals.

**Keywords**: Adriatic Sea; coral overgrowth; non-geniculate coralline algae; nSSU; *psb*A

## Introduction

Many species of coralline red algae are poorly known and their taxonomic status is still controversial. In fact, some characters traditionally associated with vegetative (e.g. thallus construction, number of epithallial cell layers, trichocyte arrangement, occurrence of vegetative filaments between the trichocytes, presence/absence of cell fusions and secondary pit connections) features used for species identification or genera delimitation are still ambiguous and the unavailability from herbaria of some reference type material make the systematics of this group particularly problematic (Penrose 1991, 1992, Woelkerling & Harvey 1992, Penrose & Chamberlain 1993). Moreover, diverse emphasis given to particular morphological characters led to different interpretations by authorities studying coralline algae. For example, vegetative structures formed the basis of Cabioch's (1972) classification whereas reproductive features are now understood to take priority (Woelkerling 1988). In particular the genera *Hydrolithon* (Foslie) Foslie and *Porolithon* Foslie described for the first time by Foslie (1909), were subsequently revised by Adey (1970) who placed species with solitary trichocytes into the genus *Hydrolithon* and species having trichocytes arranged in pustulose horizontal fields into the genus *Porolithon*. Adey & Johansen (1972), however, did not regard trichocyte arrangement as a reliable character to delineate genera in the Corallinaceae and similarly so did Penrose & Woelkerling (1992) who merged the two taxa in the single genus *Hydrolithon*, which had nomenclatural priority. In contrast to these authors though Maneveldt (2005) recognised the value of the trichocyte arrangement and subsequently proposed the establishment of two subgenera: *Porolithon* to include species possessing trichocytes in large tightly packed horizontal fields lacking vegetative filaments between the individual trichocytes; and *Hydrolithon* to include species possessing trichocytes that are most often solitary, occasionally in pairs and/or small horizontal rows, but notably possessing vegetative filaments between the individual trichocytes when in horizontal rows (see also Maneveldt & Keats 2014:

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