

Differential Life History Phase Expression in Two Coexisting Species of *Scytosiphon* (Phaeophyceae) in Northern Chile

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Abstract

The identity of two phaeophycean taxa that monopolized the middle-lower rocky intertidal zone of a coastal area chronically exposed to copper mine wastes in northern Chile was unraveled. One of them was preliminarily identified as the gametophytic stage of *Scytosiphon lomentaria* (Lyngbye) Link. The other, a dark crust, resembled the alternate stage of some *Scytosiphon* species. Comparative analysis of morphology, life history, and DNA sequences strongly suggests that crusts corresponded to sporophytic *S. tenellus* Kogame and confirm that erect thalli belonged to *S. lomentaria*. A clear segregation of erect and crustose thalli was found using internal transcribed spacer region 1 and RUBISCO spacer sequences. Furthermore, whereas crusts always grouped with *S. tenellus*, erect thalli always grouped with *S. lomentaria*. Life history studies failed to connect the two entities. First, field-collected *S. tenellus* produced progeny that either recycled the crust, which reproduced by unilocular zoidangia, or developed into erect thalli. The latter, unlike typical gametophytic *S. lomentaria*, developed patchy sori of plurilocular zoidangia. Second, *S. lomentaria* displayed a direct-type life cycle, in which progeny from erect individuals only developed into erect thalli and produced only plurilocular zoidangia. This constitutes the first experimental study on *Scytosiphon* from the Pacific coast of South America and the first report of *S. tenellus* on this coast. It is also the first report of the crustose stage of *Scytosiphon* appearing as a perennial and dominant algal species in a temperate rocky intertidal system.