

Contact Responses Between Spores and Sporelings of Different Species, Karyological Phases and Cystocarps of Coalescing Rhodophyta

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Abstract

Coalescence is a well documented event in many red algal orders. However, it is as yet unknown if genetic compatibility and phylogenetic relationships could be factors limiting coalescence. Using controlled laboratory experiments complemented with cytological and ultrastructural analysis, in this study we test whether or not coalescence may occur between different seaweed species and between karyological phases of the same species. We also evaluate the effects of one species or karyological phase on the germination rates, germling survival and differentiation of erect axes of sporelings of a second species or phase and whether the uni - or polycystocarpic origin of the coalesced germling may affect the germination and growth or the morphology of the resulting sporeling. Results indicated that the process of coalescence is restricted to intraspecific partners only. A thick interphase with crushed cells and remains of cell walls developed in all the interspecific contacts studied. Results also indicated that coalescence may be expected between individuals of different karyological phases, as in the two cases tested (*Mazzaella laminarioides* and *Sarcothalia crispata*) the filaments of both phases grow intertwined in the new tissue of the coalesced crust. Germination rates, sporeling survival and differentiation of erect axes were all affected by the different types of experimental cultures tested. However, results suggest that allorecognition among seaweeds seems to play a minor role in coalescence. The process appears as less sensitive to genetic recognition than the cell fusion processes described for other red algal species or than the colonial fusion described for colonial invertebrates and fungi.