

Ecological and biochemical aspects in algal infectious diseases

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Abstract

Infectious diseases in algae are caused by a wide variety of organisms, from virus to other algae. In recent years, important advances in understanding some of these diseases from ecological, cellular and biochemical view points have been done. In an ecological context, epidemiological studies are very limited and restricted to red algal hosts. Those studies show that infections appear to affect large segments of host populations, and the expression of some diseases is clearly aggregated, with consistent patterns of seasonal fluctuation. This, together with host specificity trials and transplant experiments, strongly suggests a genetic base as determinant of host susceptibility and disease expression. In a biochemical context, the highly specific association established between the sporophytic phase of the red algal host *Chondrus crispus* and its green algal endophytic pathogen *Acrochaete operculata* provides an excellent model to investigate the biochemical basis of recognition and signal transduction which determines host susceptibility, specificity and pathogenicity. Our results emphasize the role of oligosaccharide signals in modulating resistance against pathogens in marine algae. These results are discussed in the light of recent reports of an oligoalgininate-induced oxidative burst in the brown algal kelp *Laminaria digitata* and of oligoagarose-induced responses in the association between *Gracilaria conferta* and a pathogenic marine bacterium.