Patterns of reproduction, dispersal and recruitment in seaweeds

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Abstract

Reproductive processes of seaweeds and patterns of propagule production and release, dispersal, settlement and recruitment are reviewed. Present interpretations of the adaptive values of life history aspects such as sexual and asexual reproduction, alternation of generations, isomorphic and heteromorphic cycles and relative allocation of resources to reproduction are discussed. The evidence concerning the abiotic control and the ontogenic, specific and seasonal patterns of propagule production and release are evaluated. The nature of the propagule releasing mechanisms, the morpho-physiological characteristics of the released propagules, their dispersability by biotic and abiotic agents and the factors influencing their settlement, attachment, germination and recruitment are analysed. Overall, the evidence indicates that concepts derived from studies with land plants do not completely explain the reproductive processes of seaweeds. Similarly, the ecophysiological responses of the free-floating propagules are also conspicuously different from the free living plankton to which they have been compared. The literature describes numerous processes that remain poorly understood. Examples are: the mechanisms of spore release; the biological basis for the reduced viability of algal spores; the roles of grazers on spore release and dispersal and the ecological importance of positive interspecific and intraspecific interactions on settlement and recruitment. In addition, numerous ecologically important phenomena have not been reported or studied. These include the nature and dynamics of the spore clouds, the turnover rates and ecological roles of the bank of microscopic forms, alternative ways of spore attachment and the adaptive significance of spore germination. A more realistic understanding of the reproduction, dispersal and recruitment processes of seaweeds will result if ecological concepts and methods are applied to them, with due consideration for their morphological, physiological and life-history characteristics.