

GENERALIA

Pathology of seaweeds: Current status and future prospects

Introduction*

by John H. Andrews

Department of Plant Pathology, University of Wisconsin-Madison (Wisconsin 53706, USA)

The importance of seaweeds as an integral component of coastal ecosystems has long been acknowledged by biologists. Their economic significance, however, other than in areas of the world where they provide food, has only been emphasized relatively recently. This realization is largely due to rapidly expanding pharmaceutical, cosmetic, and processed food industries, wherein algal products have figured prominently, together with the prospective use of seaweeds in tertiary sewage treatment or as a supplementary energy source. Within the past decade, seaweed mariculture, both directly in the ocean and in raceways on land, has been established as a realistic venture. Overshadowing these trends are the exploitation of continental shelves for natural resources or waste disposal purposes, and accelerated tanker traffic with attendant risks of pollution damage to plants and animals.

These developments pose two critical questions: The first concerns the nature, severity and prospective control of pest problems generally, and diseases in particular, which can be anticipated in seaweed mariculture. The second question, more fundamental, difficult, and beyond the scope of this discussion, is how best to develop the coastal ecosystem so that it can be utilized without undue damage.

The following contributions represent the proceedings of a symposium held on August 17, 1978, at the 3rd International Congress of Plant Pathology in Munich. This marks the first time that plant pathologists and marine biologists have jointly addressed the issue of seaweed pathology. We present an overview of the ecological and economic importance of seaweeds (contributions by Vadas and Wheeler et al.), followed by a consideration of abiotic causal agents as exemplified by thermal effluents (Vadas), of representative pathogens (fungi, Kohlmeyer; viruses, Dodds), and of host-parasite interactions (red rot of *Porphyra* discussed by Kazama). These aspects are then integrated by a discussion (North) of biotic and abiotic problems from the perspective of a particular host, *Macrocystis*. The text is concluded with a comparison (Andrews) of terrestrial and marine pathology and recommendations for disease control. Throughout this article, disease is considered to be the abnormal, injurious and continuous interference with physiological activities of the host. Apart from the obvious esthetic and ecological implications, disease usually, but not invariably, results in loss of economic value.

* Contribution from the College of Agricultural and Life Sciences.

Seaweeds: An overview; ecological and economic importance

by Robert L. Vadas

Department of Botany and Plant Pathology and Departments of Oceanography and Zoology, University of Maine, Orono (Maine 04469, USA)

Seaweeds are heterogeneous groups of attached (benthic) photosynthetic plants characterized more by the lack of structures identifying them with higher green plants than by their commonality of character. Marine higher plants such as seagrasses and salt

marsh grasses often are included with seaweeds because of similarities in habitat and function in nearshore marine ecosystems. Although the algae number only about 30,000 species (ca. 10% of the plant kingdom, Dawson¹), they may well be the most