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Abstract

The mucilage “phenomenon” of marine waters, a sporadic but massive accumulation of gelatinous material at and below the water surface, can create serious environmental and economic problems. To address these problems, we must understand better the causes of the phenomenon, its modulation by environmental factors and its adverse effects on ecosystems. In the context of an improved understanding, this brief review describes the means to characterize mucilage types and mucilage aggregates in their native condition, or as close to native as state-of-the-art technology will permit. Biological, chemical and physical factors interact to determine mucilage “speciation” and thus the specific properties of mucilaginous materials. These factors and their interactions are described briefly in relation to the molecular biology of mucilage synthesis, the formation of submicroscopic “particles” of

mucilage and the morphology of mucilage aggregates. To facilitate current attempts to relate mucilage fine structure to the macroscale morphology of large aggregates (e.g., as found in the Adriatic Sea), attention will be focused on the "fibril", a ribbon-like colloid rich in polysaccharide molecules. Such colloids (submicrometre particles) present many morphotypes which are identifiable by transmission electron microscopy; several fibril types appear as basic structural units in many kinds of mucilage aggregates in aquatic ecosystems. Attention will also be focused on (1) the problems of coping with analyzing mixtures of highly-hydrated, physically-unstable materials and (2) the detection, assessment and minimization of colloid instability artifacts which have confounded morphological analyses of mucilage aggregates in the past.



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Keywords

Mucilage; Adriatic Sea; Fibrils; Polysaccharides; Fine structure; Colloids

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