AN INVESTIGATION OF THE STAINING PROPERTIES OF AN UNIDENTIFIED GROUP OF PIGMENTED MICROORGANISMS FROM APHOTIC OCEANIC REGIONS

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ABSTRACT

A variety of stains, enzymes and chemicals were used in an attempt to determine the chemical composition of the olive-green cells, which are a common constituent of the oceanic aphotic community, in order to evaluate their taxonomic status and potential nutritive value for aphotic organisms.

Staining indicates that the cells are composed in large measure of carbohydrate with small amounts of lipid and almost no protein. Although the cells take up nuclear stains, the reactions are atypical. They can be partially degraded by enzymes, particularly pectin methyl esterase and lysozyme. While many cells are surrounded by a thickened bounding layer, they can be destroyed by oxidizing agents and strong bases.

The taxonomic status of the cells remains obscure. Although evidence, such as their size, shape, color and distribution, the apparent presence of respiratory enzymes, the presence of apparently dividing cells and the fact that they are removed from and apparently replaced in the water column, exists to indicate that the cells are viable entities, staining and enzymatic action give no clear indication that they are.

The carbohydrate nature of these cells makes them a prime candidate for a supplementary food source for filter-feeding aphotic organisms.