Light microscope histochemistry of Diatoms in the Gulf of Trieste (North Adriatic Sea)

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Benthic Diatoms are able to attach to surfaces whether natural (different grain-size sediment) or artificial (glass, ceramic, PVC, etc.). For this reason they are one of the component of the fouling. Attachment is invariably associated with the extracellular secretion of mucilagineous substances which may either remain a simple layer interposed between the Diatom and its substrate, or, through continued secretion, develop into morphologically distinct structures (DANIEL *et al.*, 1987). These morphological structures in unialgal cultures were differentiated by means of several cytochemical reactions (DANIEL, 1983; DANIEL *et al.*, 1987). The aim of this work is to investigate the polysaccharidic component of fouling Diatoms in their natural environment.

Twenty microscope slides fixed on a PVC support were dipped (lm. beneath the surface) in a station localized near the Marine Biology Laboratory (Trieste) in the winter of 1990. These slides were collected and then fixed for 24 h in a 4% (v/v) acid formaldehyde solution in filtered sea water. Ten slides were afterwards stained with Alcian Blue at 2.5 pH (BARKA & ANDERSON, 1963), while the remaining ten slides were stained with Ruthenium Red (BLANQUET, 1976). All light microscope observations were conducted using a Leitz diaplan microscope equipped with a Wild Photoautomat camera using Kodak Ektachrome films.

Using these cytochemical tests we have examined in detail some attachment systems. The stalk of both the *Licmophora* species (Fig. 1, 2) examined comprise polysaccharides of anionic reaction. The stalk is flat and with many branches which yield colonies. *Licmophora flabellata* (Carm.) Ag. (Fig. 1) stalk shows longitudinal striations which correspond to the fused secretions of the individual cells. The stalk of *Striatella unipunctata* Lyngb. (Fig. 3) is weakly stained for anionic polysaccharides. Well developed is the basal and unipolar pad of *Synedra* sp. (Fig. 4) showing intense reaction after Alcian Blue staining. The intercellular adhesive pads of *Grammatophora* sp. (Fig. 5) are also stained with Ruthenium Red and appear as a strong purple spot. Furthermore the subfrustular layer appears like an area weakly stained. *Achnanthes longipes* Ag. (Fig. 6) species shows a stalk with a characteristic collar at basal cell pole and intense staining with Ruthenium Red.

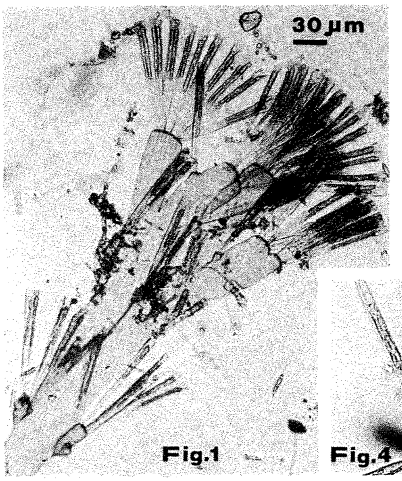

Fig.1

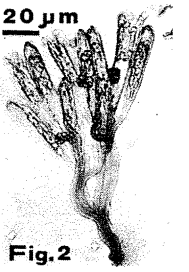

Fig.2

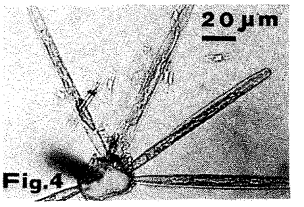

Fig.4

Fig.3

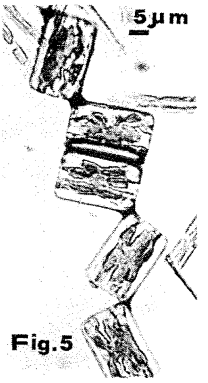

Fig.5

Fig.6

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