

EVALUATING TWO DIFFERENT METHODS FOR SAMPLING AND ASSAYING INTERTIDAL MICROALGAE.

Dr Terence Ocaña / Marine Section, Gibraltar Ornithological and Natural History Society

The microbial film which coats the surface of rocks is an important component of shore communities. Diatoms, bacteria and protozoa all form part of this film, and in addition it is the first attachment site for all macroalgal propagules which settle and germinate on and in it. The biofilm is the principal food resource of microphagous grazers whose grazing activities can control or even prevent macroalgal recruitment and growth and thus play an important part in determining the dynamics of rocky intertidal community assemblages.

Despite the importance of the microbial film there have been relatively few investigations into the composition of the biofilm due to the practical difficulties of obtaining and assaying undamaged samples of sufficient homogeneity. This research note therefore presents the results of a comparative study of two techniques:

- a) the brushing of the rock surface;
- b) chipping samples from rock surfaces.

Brushing the rock surface.

Ten 5 x 5 cm areas of the rock surface were outlined, moistened with seawater and scrubbed with a toothbrush until no further discoloration could be discerned. The slurry which accumulated was washed into a specimen tube containing 10% formalin-filtered seawater solution. 0.5 ml was removed with a pipette and placed on a slide for light microscope observation.

Comunicaciones

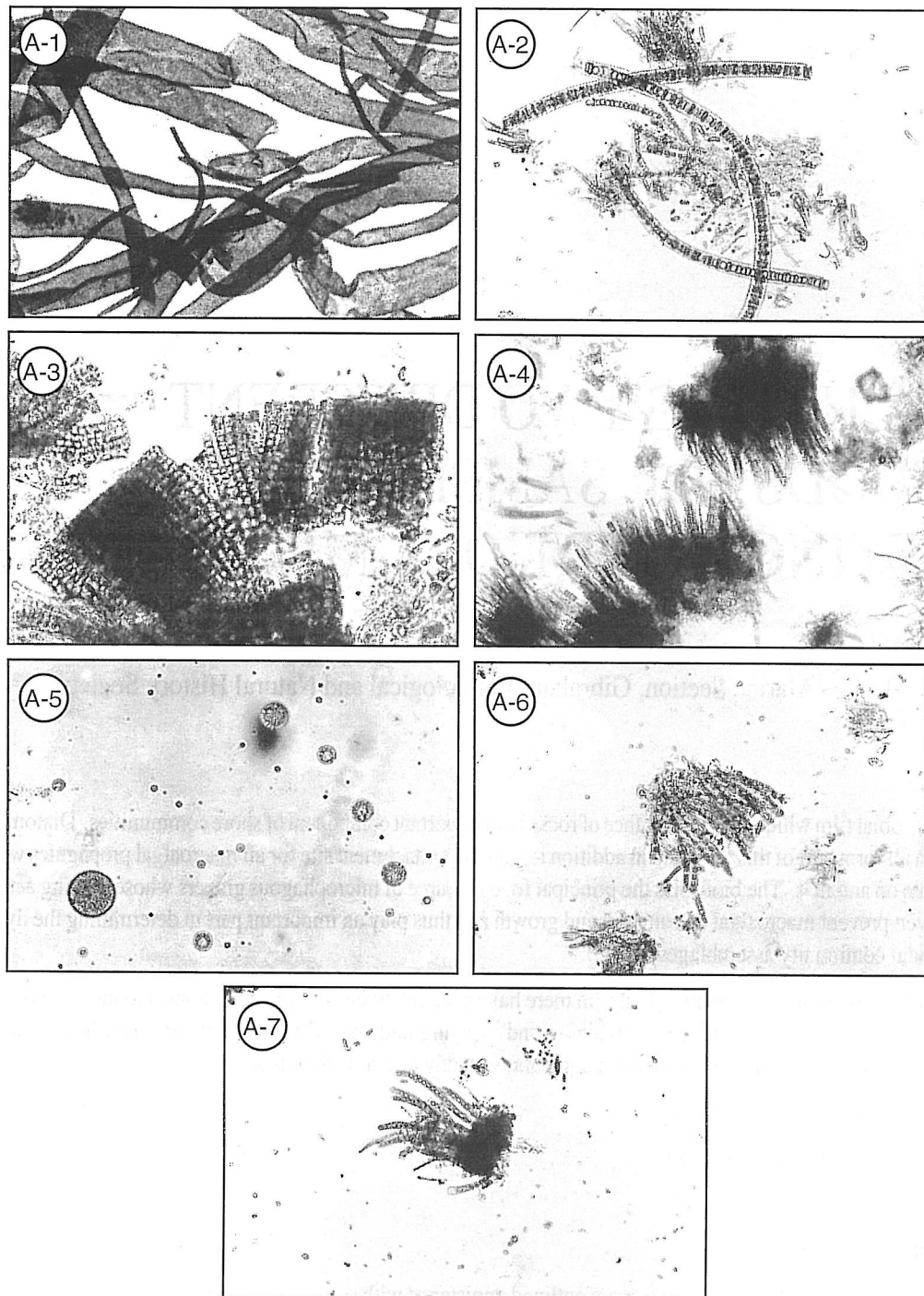


Figure 1. A Toothbrushings / Light microscope. A1. *Blidingia* spp., A2. *Bangia* spp. A3. *Ralfsia* spp., A4. *Calothrix* spp., A5. Spores, A6. Filamentous green, A7. Filamentous blue-green.

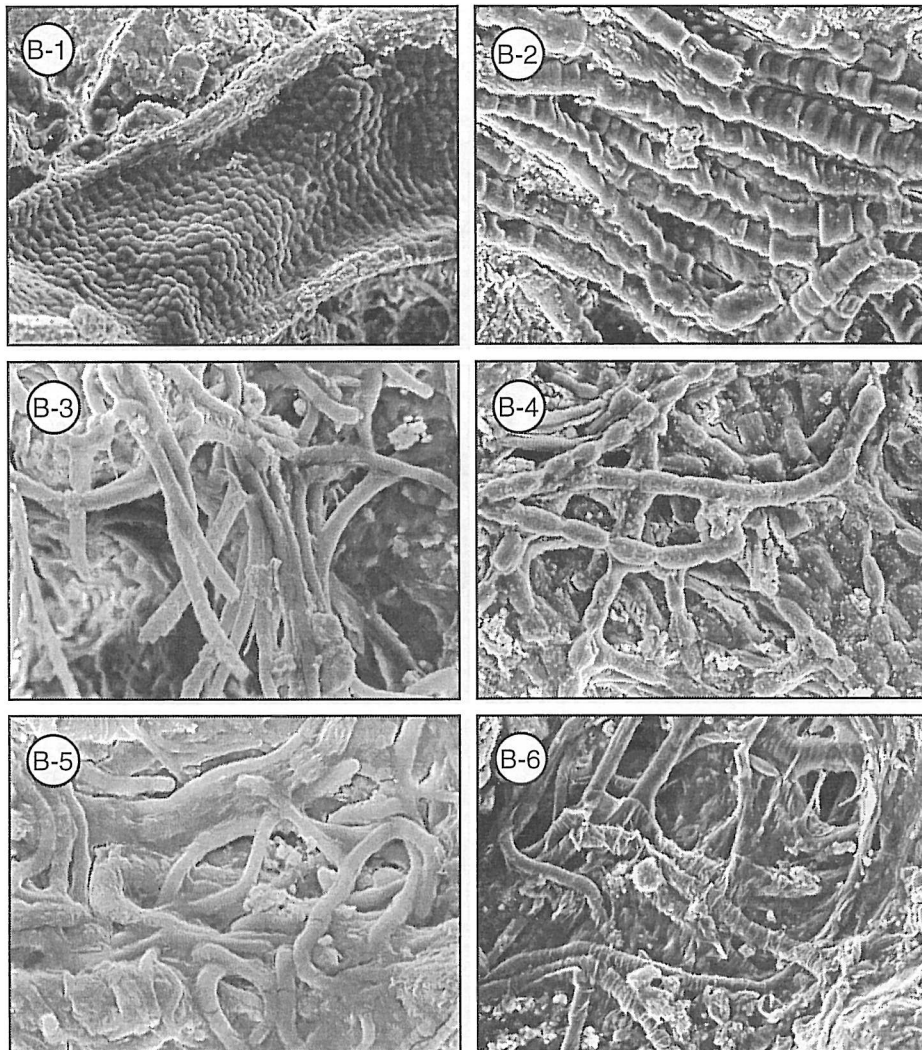


Figure 2. B Rock chips / S.E.M. B1. *Blidingia* spp., B2. *Bangia* spp., B3. *Calothrix* spp., B4. Filamentous green, B5. Filamentous blue-green, B6. Unidentified filamentous.

Rock chips.

Ten small 1 x 1 x 0.5 cm portions of the surface rock were chipped from the substratum and were placed in specimen tubes containing 10% formalin-filtered seawater solution. The rock chips were then air-dried for 24 hours. The samples were then glued onto stubs, sputter-coated with gold and examined under a scanning electron microscope.

The first sampling method yielded the following algae; *Blidingia* spp. (green alga), *Bangia* spp. (red alga), *Ralfsia* spp. (brown alga), *Calothrix* spp. (blue-green), spores, one unidentified type of filamentous green alga and one unidentified type of filamentous blue-green alga.

The second sampling method yielded the following algae; *Blidingia* spp. (green alga), *Bangia* spp. (red alga), *Ralfsia* spp. (brown alga), *Calothrix* spp. (blue-green), spores, one unidentified type of filamentous green alga and one unidentified type of filamentous blue-green alga, bacteria, 5 different types of diatoms and several unidentified filamentous forms. The

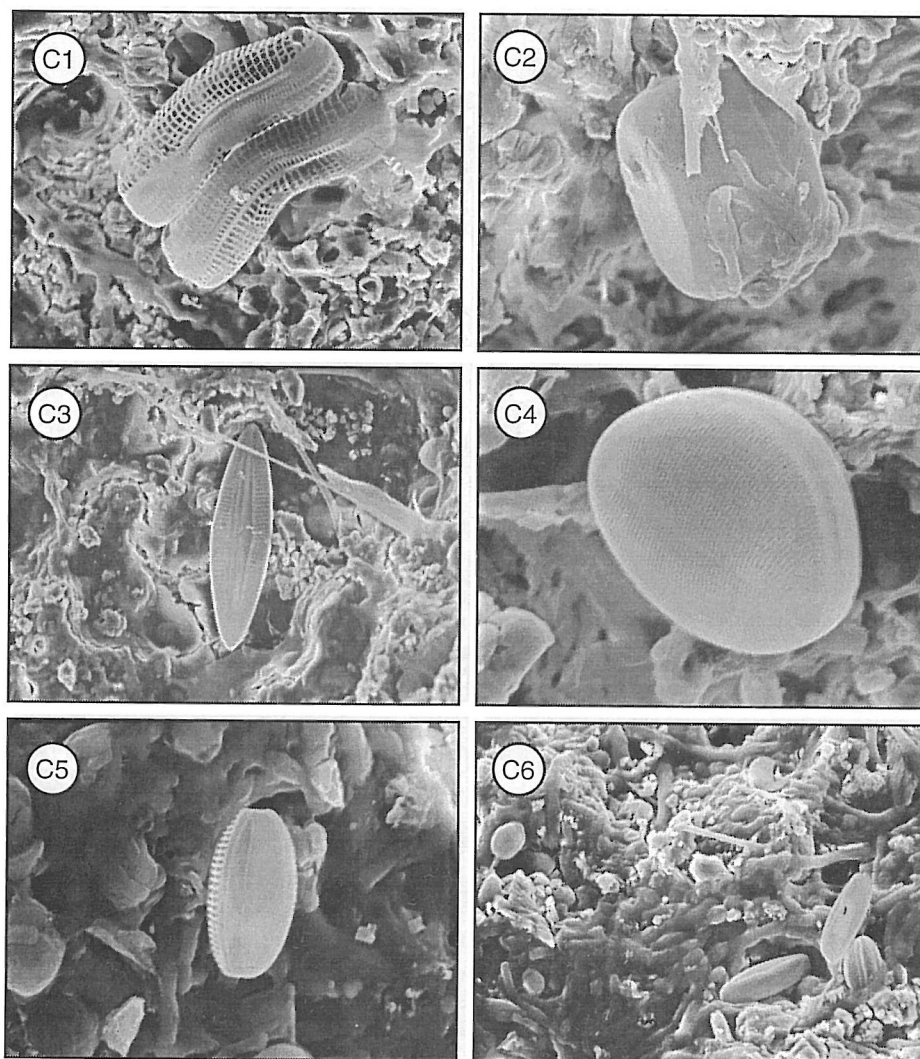


Figure 3. C Diatoms C1. *Achnanthes* spp., C2. *Actinocyclus* spp., C3. *Fallacia* spp., C4. *Cocconeis* spp., C5. *Amphora* spp., C6. Diatoms, bacteria and filamentous alga.

two different sampling techniques appear to yield similar results. However, it would seem that brushing does not remove embedded microflora and light microscope examination may also fail to detect smaller forms such as diatoms. Nevertheless, brushing the rock surface is very suitable for routine sampling because it is quick and easy to perform, it allows the re-sampling of the same area and it maintains the cellular integrity of specimens. The use of rock chips was also a quick and easy method of collecting samples. However, this type of sampling is very destructive because the same area could not be re-sampled. Moreover, S.E.M. samples required a substantial amount of preparation and the process could lead to the distortion of the cell structure. Nonetheless, S.E.M. examination of rock chips allows for the sampling of embedded microflora and for the identification of diatoms, a major component of the microalgal assemblage. It is concluded that for reliability and reproducibility of results and for the ease of application to routine sampling, light microscope studies of samples obtained by brushing the rock surface are most suitable.