Microsc. Microanal. 26 (Suppl 1), 2020

doi:10.1017/S1431927620001269

Use Of Scanning Electron Microscopy (SEM) In Foraminiferal Research

Totah[1], V. I., Tricárico[2*], F. G. y Watanabe[3], S.

[1.] Laboratorio de Foraminíferos / Museo Argentino de Ciencias Naturales "B. Rivadavia" (MACN) - CONICET, CABA, Argentina.
[2.] Servicio de Microscopía Electrónica de Barrido / Museo Argentino de Ciencias Naturales "B. Rivadavia" (MACN) - CONICET, CABA, Argentina.
[3.] Laboratorio de Foraminíferos / Museo Argentino de Ciencias Naturales "B. Rivadavia" (MACN) - CONICET, CABA, Argentina.
* Corresponding author: fabitrica@gmail.com

Foraminifera are marine protists provided with a shell usually less than 1mm in size, made of calcium carbonate or agglutinated particles selected from the environment. They include current planktonic and benthic species, and a large number of fossil forms. Their taxonomy is almost exclusively based on the morphology of the shell, which is examined under a stereomicroscope at magnifications up to 80x, but for very small species and/or detailed analyses of their surface structures SEM (Scanning Electron Microscopy) is employed.

In order to compare the information obtained by Light Microscopy (LM) and SEM, we worked with specimens from the Foraminiferal National Collection (MACN-Fo), acquiring images of the same specimens with both techniques. For each species, specimens were selected from a picking tray under a LM, and mounted on an aluminium stub with double-sided adhesive tape in the desired position. LM images were first obtained with a Zeiss Discovery V20 stereomicroscope at magnifications up to 225x. The specimens were then coated with Pd/Au (60/40%) for 3 minutes in a Quorum Technologies SC7620 sputter coater and examined and photographed with a PHILIPS XL 30 SEM at 15 kv.

SEM images allowed to better visualize the surface morphology of the shells and to detect structural details poorly visible in LM images, whereas in translucent species LM images reveal internal structures not visible with SEM. Thus, the two techniques furnish complementary information for the identification of the species and the study of new taxa.

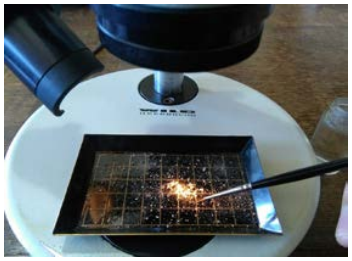

Figure 1. Selection and cleaning of foraminiferal shells in a picking tray under a stereomicroscope.

Figure 2. Mounting of the shells on a SEM stub with double-sided adhesive tape.

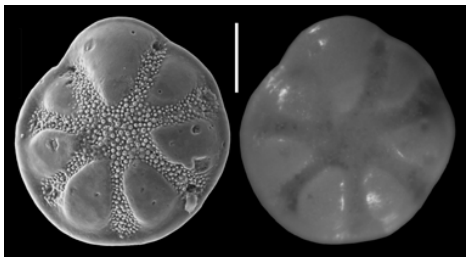

Figure 3. *Buccella campsi* (left: SEM, right: LM). In not translucent shells, the LM images do not provide additional information (scale bar: 100µ).

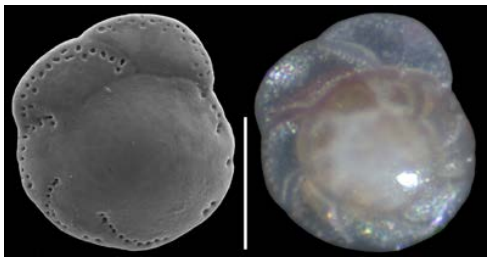

Figure 4. *Discorbis williamsoni.* In translucent shells, SEM images conceal details that can be seen by transparency in LM (scale bar: 100µ).

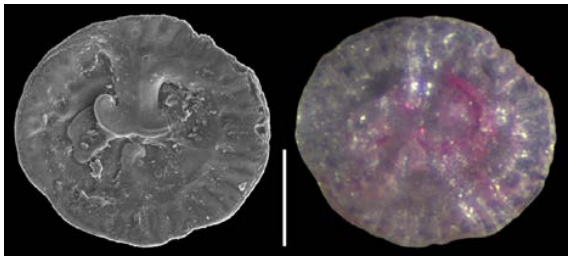

Figure 5. *Patellina corrugata* (left: SEM, right: LM). In some species the transparency of the shell obscures surface features, which are conspicuous in SEM images (scale bar: 100µ).

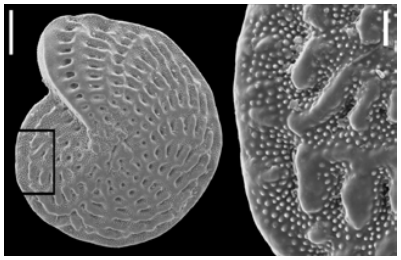

Figure 6. *Elphidium macellum* (SEM) Right: detail of the specimen on the left. SEM is particularly useful in the case of small species and for the analysis of details of the surface structure (scale bars, left: 100 µ; right: 20µ).

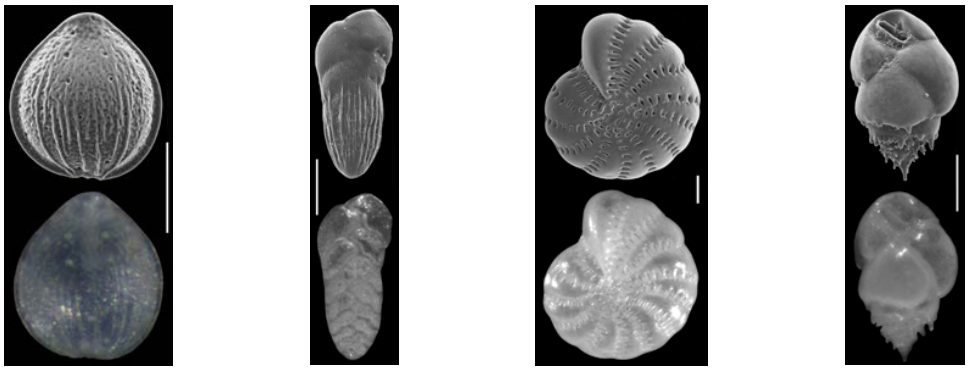

Figure 7. *Fissurina pulchella, Bolivina striatula, Elphidium articulatum and Bulimina marginata,* from left to right (upper row: SEM, lower row: LM). The information provided by LM and SEM is complementary (scale bars: 100µ).

https://doi.org/10.1017/S1431927620001269 Published online by Cambridge University Press