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MICROPALAEONTOLOGY NOTEBOOK

A tray designed to improve the wet-picking method

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RATIONALE

A picking tray has been developed with the wet-picking of benthic foraminifera specifically in mind. The purpose is to reduce the primary disadvantage of the wet-picking method which is time consumption.

WHY WET-PICK?

The wet-picking and counting of samples is seen to be disadvantageous in comparison with the dry method as it is more time consuming and arduous (e.g. Boltovskoy, 1966; Scott *et al*. 2001; Murray, 2006). However, wet-picking offers advantages over dry-picking. One major benefit is that it allows fragile forms (e.g. chitinous or poorly cemented tests) to be recorded that would be deformed or destroyed during drying (e.g. Brodniewicz, 1965). Depending on the scientific questions in focus, samples from certain environments should be wet-picked to prevent damage to thin-shelled forms and allow for a more accurate recording of the assemblage and diversity present (Bernhard & Sen Gupta, 1999). Furthermore the reduction of the protoplasm that results from drying means that detection of whether the protoplasm is stained or not can be more problematic (e.g. Corliss & Emerson, 1990; Bouchet *et al*. 2012). The cell (either stained or not) is more easily seen through the shell while wet, and Schönfeld *et al*. (2013) suggest that tests containing other stained material could be more easily mistaken for cytoplasm in dry samples. Therefore wet-picking also increases accuracy where staining is used to identify living cells. Yet another advantage is that damage to other components of the sample is also minimized and this means the sample can be used again for other studies (Boltovskoy, 1966).

It should be acknowledged that wet-picking is not always the most appropriate method and, depending on the nature of the investigation, it does not always offer an advantage over dry-picking (e.g. Bouchet *et al*. 2012; Schönfeld *et al*. 2013).

TRAY DESIGN

Figures 1 and 2 show the design and appearance of the tray. The tray is made from Poly(methyl methacrylate) (acrylic glass), measuring 80 × 85 × 10 mm. It consists of one picking and one mounting part. The size and shape is designed so as to be easy to handle and manipulate while working with it under the microscope and to facilitate quick transfer of individuals to the microscope slide.

The first part of the tray contains a 10 mm wide, 5 mm deep track consisting of straights and U-turns. This track element resembles that of the counting chamber presented in Bogorov (1927). Bogorov (1927) states that the counting chamber, designed for working with zooplankton, takes only a quarter of the time compared to other counting cells and allows the recognition of rare species. Again working with zooplankton, Russell & Colman (1931) note how their slightly modified Bogorov counting tray facilitates rapid counting of individuals. The method of using the tray presented here is to use a pipette to

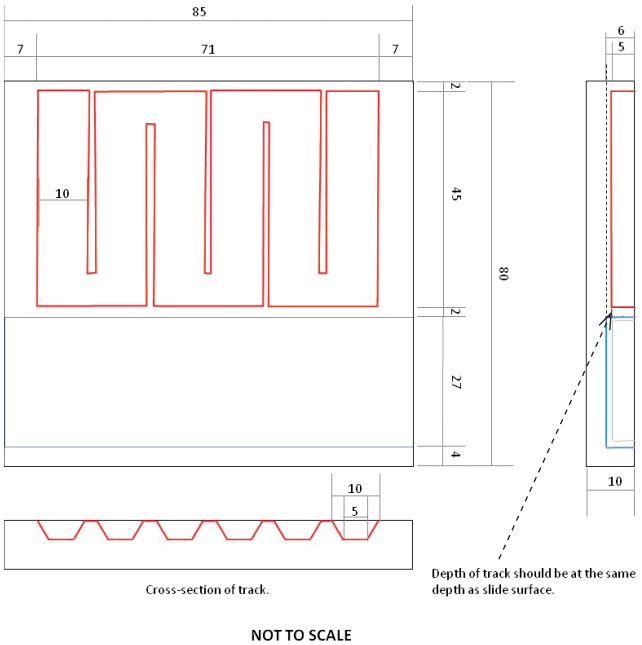

Fig. 1. Schematic showing the tray design and dimensions in millimetres.

Fig. 2. Photograph of the picking tray.

carefully transfer a portion of the sample along this track and work along the track in one direction, taking care not to jolt the tray so as to cause movement of the particles within the track. The track is designed with a flat base so that minimal adjustment of focus on the microscope is required. The sides of the track are at an obtuse angel to the base so that specimens (1) do not become trapped in a corner, (2) do not get obscured from view and (3) can easily be picked up with a brush by utilizing the slope. The use of a track offers an advantage over the use of a Petri dish in that it is easier to track one's progress and that the requirement to move particles not of interest is minimized, especially when counting. This is particularly advantageous in samples where a large amount of easily suspended organic material is present. A narrow track, as opposed to the wide open space of the Petri dish, means minimal movement of material when manipulating the tray.

The second part of the tray is a space designed to fit the dimensions of a standard microscope slide. This element of the design offers further advantages compared to working with a Petri dish and separate slide. The set-up keeps all working surfaces together; they can be moved simultaneously and kept in the same position relative to one another. As with the dry-picking tray of Gombos (1975), this tray has been designed to keep all surfaces in equal focus, so that when the slide is placed into the tray the slide surface is at the height of the base of the track. This removes the need to have something below the slide to adjust its height, further easing manipulation of the work surface. This set-up also allows for swift and immediate transfer of individuals to be mounted from the track to the slide, with minimal adjustment of the focus of the microscope, making any need for a collecting vessel redundant and saving a great deal of time. It is then easy to find one's position on the track once again and resume picking. This offers yet another advantage over the Petri dish or other tray as it speeds up the process of picking.

A possible modification is to add two glass rods to the underside as Russell & Colman (1931) did with their counting tray. This prevents the problem of moisture fixing the tray to the microscope stage. Another addition could be a cover to sit on the picking tray to protect the sample and prevent evaporation should picking be interrupted.

CONCLUSION

The tray has been well tested in the wet-picking and mounting of benthic foraminifera. Compared to existing trays and Petri dishes, a number of characteristics of the described tray have been found to improve efficiency when wet-picking.

- The obtuse angle between the sides and the base of the track prevents particles from getting trapped in corners or obscured from view, and it facilitates 'catching' individual tests with the brush.
- The narrow track minimizes unwanted movement of light, easily suspended organic material or rolling objects.
- All working surfaces can be moved simultaneously and minimal adjustment of focus is required while sorting, picking and mounting, making a collecting vessel redundant.

Collectively, these advantages save time. The tray is therefore presented for use by others who wet-pick in the hope that this will reduce the labour involved and, in so doing, go some way towards alleviating the principal disadvantage of this method.

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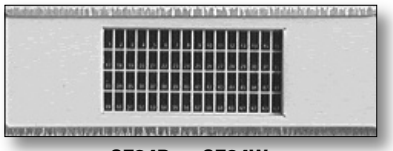

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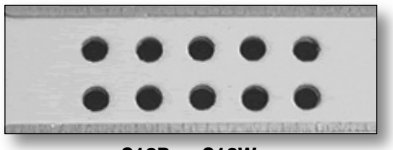

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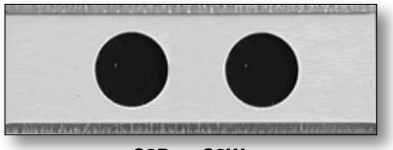

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