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SHORT NOTE

A Simple Elutriator for Extracting Meiofauna from Sediment Matrices

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ABSTRACT: A simple and inexpensive elutriating system for extracting sediment-dwelling meiofauna is described. The elutriator is constructed from the readily available Quickfit glassware range.

This short note describes a simple apparatus for extracting the epipsammic, endopsammic and mesopsammic fauna from sediment cores – whether composed of mud or sand, and of freshwater or marine origin. The apparatus (Fig. 1) is made of readily available Quickfit glassware (Corning Ltd, Stone, Staffordshire ST15 OKB). It has been used in quantitative studies of the meiobenthic harpacticoid copepod (Crustacea) fauna of the Ythan estuary, Aberdeenshire (Hockin and Ollason, in press), and is based on a system devised by Goodman (1980), who studied a wide range of meiofaunal taxa; see also McIntyre's system in Uhlig et al. (1973).

The sediment fauna is usually killed, fixed, and preserved in hexamine-buffered 5 % V/V formalin prior to extraction. A stain, such as Rose Bengal, is commonly incorporated into the preservative to allow the smaller meiofaunal organisms to be seen more readily. The preserved sediment core is placed in the separating funnel, and water is pumped through the sediment from below, washing the fauna onto a fine square-meshed grid of 50 μm aperture. Should a live extraction be required, the elutriator can be incorporated into a system comprising a pump and a reservoir, circulating sea-water containing 60 g dm^{-3} dissolved magnesium chloride (a narcotising agent). The rate of water flow determines the size of particle carried to the grid: the faster the flow, the heavier the organisms that are transported. The extraction time depends primarily on the type of sediment and its detritus content (Uhlig et al., 1973). For sandy substrates few problems are encountered: cores of about 100 cm^3, placed in a separating funnel of 500 cm^3, can be processed in about 1 h. Processing times are longer for muddy substrates, with greater detritus contents. Initially a low flow rate must be used to float as much as possible of the fine silt particles onto, and through the grid, where retained particles are removed and examined for their fauna. Once the silt is removed, a higher flow rate is employed to extract the remaining fauna. The extracted organisms are washed from the grid, again using the hexamine-buffered 5 % V/V formalin, either for immediate identification and counting, or for storage.

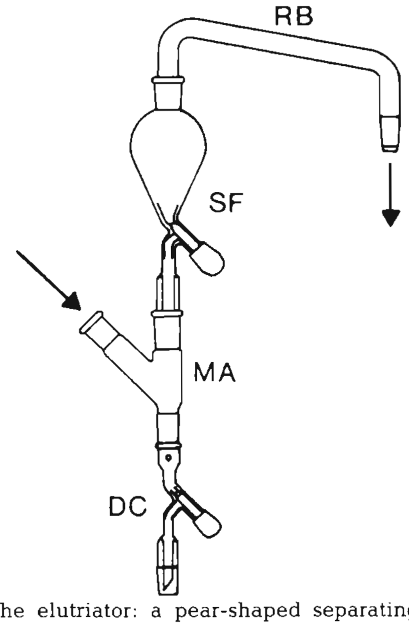

Fig. 1. The elutriator: a pear-shaped separating (droping) funnel, SF, of 500 cm^3 capacity (D32/2/500); a multiple adaptor, MA, with 2 necks, 1 vertical, into which the separating funnel fits, the other at 45°, through which water is pumped, either from the main supply, or from a portable electric pump (MA2/2); an adaptor to fit to the base of the multiple adaptor to enlarge the bore (DA25) – this allows a wide-bore draincock, DC, to be fitted, through which the sediment can be run off once elutration has been completed (MF4/5); a recovery bend, RB, delivering the suspended organisms onto the fine-meshed grid, placed directly underneath the outflow (SH2/22). Arrows indicate direction of flow of circulating water

The results obtained with this elutriator are more suitable for quantitative analyses than those obtained from simple decanting methods, such as that of Hig-

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gins (1964). Previously described elutriating systems, such as that of Boisseau (1957), as reviewed by Hulings and Gray (1971) and Holme and McIntyre (1971), are considerably more complicated than the apparatus here described. This elutriator is a modification of an already existing design. However, its use should allow rigorous comparisons between studies because of its standardised design. The techniques involved are much simpler than those of Heip et al. (1974), Thiel et al. (1975) and Sikora (1977), involving ultrasonification and centrifugation of the sediment sample, as used by Fleeger (1979). Although less suited to muddy sediments than de Jonge and Bouwman's (1977) technique involving density separation, this method allows larger sample volumes to be processed and is adapted to Barnett's (1980) technique for extracting the benthos from clays and muds.

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