MICROPALAEONTOLOGY NOTEBOOK

The search for a reliable mounting medium for Recent 'live' foraminifera

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There is no suitable mounting medium for the longterm storage of Recent, 'live' foraminifera. Glycerol has been used for this purpose since the last century, but its properties do not meet our requirements (see below). We therefore began a series of trials in order to find the 'perfect' mountant. The inception of this 'Micropalaeontological Notebook' provides a timely opportunity to highlight the results of our experiments and to elicit a response from the readership to facilitate our search.

In choosing mounting media for experiment it was first necessary to detail our requirements. The latter are as follows: the medium must be clear and possess a refractive index (nD:) close or equal to that of glass. The nD of the mounted specimens should differ from that of the mountant or they will be invisible. It should function as a permanent mount, fixing specimens in a position suitable for light microscopical examination. It should not form aggregations or induce overlap of specimens and should permit easy relocation of small organisms (i.e., fixing them so that their co-ordinates can be read with an England Finder) It should neither be messy nor aspirate air and should not contract, thereby crushing delicate specimens. The mountant must be treated to inhibit bacterial and fungal growths. It must be relatively inexpensive and quick to prepare and must not solidify too rapidly, leaving insufficient time to position specimens. Since the specimens are 'live' it is important that the protoplasmic contents of the cell and the mountant are isotonic. Similarly, if a stain is used, this should not discolour the mountant. It would be ideal (although it is not absolutely essential) that the colour of the stain remain 'fresh'. As with glycerol, if the mountant rendered opaque structures more transparent, this would be advantageous. Specimens should be able to be removed from the mountant, cleaned and re-mounted if required; they should not sink or collapse. A non-acidic mountant would permit the preservation of the test and protoplasm of calcareous foraminifera and agglutinating foraminifera with calcareous cements.

There are two types of mountant: aqueous based and solvent based. The former tend to be less permanent and must be sealed against the air; but it is not necessary to dehydrate specimens prior to mounting and, therefore, the mounting process is quicker and does not lead to shrinkage of the organisms. The solvent (generally alcohol or xylene) based mountants have better refractive indices; but specimens have to be dehydrated pnor to mounting and this can cause shrinkage.

Space will not permit us to outline our reasons for rejecting specific mountants: we simply list those we have found unsuitable. These are: Apathy's mounting medium (formulation R.A. Lamb). Aquamount mountant 'Gurr', Uvinert mountant aqueous solution 'Gurr' (all BDH Chemicals Ltd, Poole, UK) and Hydromount aqueous, non-fluorescing mounting medium (auonal Diagnostics, liSA). We emphasize that these mountants, while not suitable for our particular requirements, are appropnate for other uses.

We recommend the use of glycerine jelly for mounting foraminifera with proteinaceous and non-calcareous agglutinated tests after their fixation. Glycerine jelly is a standard, aqueous based mountant for botanical preparations (Steedman. 1976). Its recipe is as follows: edible gelatine (Rousselot Ltd, London, UK), SOg; distilled water, 300ml: glycerol, 350ml and saturated solution of phenol, ~Iml (to prevent bacterial and fungal growths). The gelatine, water and glycerol are gently heated and stirred until the gelatine dissolves. (We prefer edible gelatine to powdered gelatine (isons, Loughborough, UK).) The mixture must not be boiled and the phenol should be added only when it has been removed from the heat and has cooled, but not set. It should be stored in an airtight, wide-mouthed jar. When mounting specimens a small quantity of the glycerine jelly is melted in a test tube within a 50ml beaker of water on a hotplate. The water is heated to about 50°C. Neither the water nor the glycerine jelly should boil. Warm 15mm glass cavity slides and 22mm diameter coverslips by placing them on the hotplate. Place 2-3 drops of the glycerine jelly (by means of the end of a solid glass stirrer) onto the cavity slide so that the solution almost fills the cavity. Air bubbles may be removed with a OOO-sized picking brush. Position specimens and gently and slowly lower the warmed cover slip onto the solution by means of a mounted pin. The glycerine jelly commonly runs to the edges of the cover slip and stops there. Should the amount of glycerine jelly in the cavity be insufficient to reach the edges, retum the slide to the hotplate and observe until it begins to flow to the edges. Remove from heat. In the rare instances where the glycerine jelly seeps out under the cover slip, the excess can be removed by wiping with a cloth saturated with hot water. After 24 hours seal with glyceel (BDI Chemicals Ltd, Poole, UK). We have slides made in 1973 using glycerine jelly as the mountant; these show no signs of deteriation, although we are aware that syneresis can occur. The most likely cause of this is ineffective sealing of the slide.

We assume the readership is aware of the precautions that should be taken when dealing with hazardous chemicals. Further trials with DPX. Entellan, Polyvinyl lactophenol 'Gurr' (all BDH Chemicals Ltd, Poole, UK), Elvacite (Dupont (UK) Ltd, London) and Hystomount (Hughes & Hughes Ltd, Esex, IUK); and experiments to de-acidify glycerine jelly are in progress. Time will be the proof of their efficacy.

REFERENCE

Steedman, H.F. 1976. Permanent mounting media. In Steedman, H.F. (Ed.), *Zooplankton fixation and preservation.* Monographs on oceanographic methodology, 4, 189-19. The Unesco Press, Paris.