

Cytological Examination of Herbarium Material of Hepatics

It has been found that, when leaves from near the apex of dried herbarium material of various leafy hepatics (Jungermanniales Acrogynae) are stained in acetocarmine, certain of the nuclear components are clearly visible. In *Frullania squarrosa*, female material thirty-three years old and male material two years old have been examined and found to show clearly the heteropycnotic sex chromosomes, heteropycnotic fragments of other chromosomes, and the nucleolus. All these features are also distinguishable after staining of fresh material. Since the sex chromosome mechanism in this species and in other species belonging to the subgenus *Galearia* is an X1-X2-Y mechanism^{1,2}, the sex of the material may be determined by counting the number of heteropycnotic chromosomes.

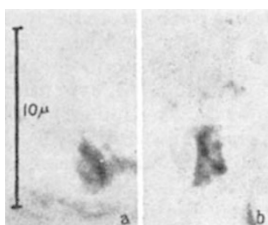


Fig. 1. (a) Male material dried for two years, showing one heteropycnotic chromosome and heteropycnotic fragments of other chromosomes. (b) Female material dried for thirty-three years, showing two heteropycnotic chromosomes and heteropycnotic fragments of other chromosomes

Results with other material have been variable. Sporophytes of *Frullania patula* collected ten years ago showed nucleoli but not heteropycnotic chromosomes in spore mother cells and elaters. Gametophyte material of *Plagiochila squamulosa* collected nine years ago also showed only nucleoli, but since there were two nucleoli in some of the cells the examination showed that this species was probably diploid. The variability of the results obtained may be due to variations in the rate of drying of the material after collection and the conditions of storage.

The cytological examination of herbarium material may be useful in two ways. First, it is a possible way of sexing sterile herbarium specimens of certain hepatics, and of checking on the sex mechanism in species of which fresh material is not available. Secondly, if the normal complement of heteropycnotic chromosomes and nucleoli in related species is known, it is a way of discovering possible polyploid races in herbarium material.

G. K. BERRIE

Botany Department,
University College,
Ibadan, Nigeria.
March 4.

¹ Lorbeer, G., *Jahrb. f. Wiss. Bot.*, 80, 565 (1934).

² Tatuno, S., *Bot. Mag. Tokio*, 50, 526 (1936).

A Modification of the Hensen-Stempel Pipette

ALTHOUGH widely used in plankton studies, the Hensen-Stempel pipette does not seem to have been employed for investigations of the microbenthos. Clearly, its use or potential use is important, since efficient sub-sampling of soil extracts can reduce

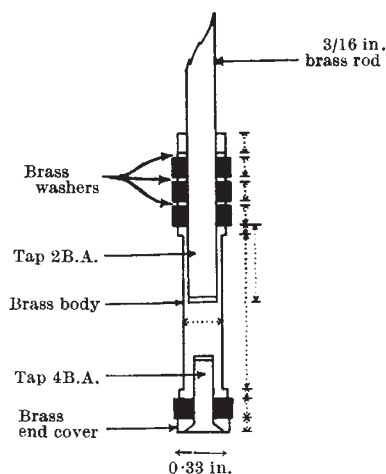


Fig. 1. ■, Neoprene washers

possible errors in estimates of population; but it cannot be used in its normal form owing to the presence of fine particles in the extracts.

Those who are familiar with the Hensen-Stempel pipette¹ will recall that the required volume is taken up in a hollowed portion, the top and bottom of which fit the outer cylinder tightly; while above the top is a series of metal and cork washers which also fit the outer cylinder tightly.

To overcome the effects of fine soil particles caught up in and grinding away the working parts, a piston of the type shown in Fig. 1 was adopted; a chamber designed to hold 1 c.c. gave a constant delivery of 1.1 c.c. over many trials. Although following the basic type, it will be seen that the modification departs from it by use of 'Neoprene' washers which alone fit the outer chamber tightly, the metal washers being so designed that there was sufficient clearance to prevent undue abrasion or jamming. The 'Neoprene' washers, although capable of a tight fit, were sufficiently soft to allow the soil particles to press into them and so reduce undue wear on the outer cylinder.

Few measurements are given in the figure, to avoid confusion; the distance between two dots on the dimension lines is 1/32 in.

E. J. PERKINS

Department of Natural History,
University of St. Andrews.

¹ For example, Welch, P. S., "Limnological Methods", see p. 282 (Country Life Press, New York, 1948).

Antagonistic Effects of *Alternaria tenuis* on Certain Root-fungi of Forest Trees

Alternaria tenuis has been observed to produce antagonistic effects on a number of mycorrhizal-formers for ectotrophic tree species. The two active strains of *A. tenuis* tested were isolated from two forest nursery soils of the arable type in which this fungus is generally abundant. Reactions of the mycorrhizal mycelia to the antagonistic principle of *A. tenuis* were recorded for mixed cultures on a synthetic medium (glucose, 20 gm.; magnesium sulphate, 0.1 gm.; ammonium chloride, 0.5 gm.; potassium dihydrogen phosphate, 1 gm.; malt extract, 20 gm.; agar, 15 gm.; distilled water,