ESTIMATING THE SPECIES RICHNESS OF SOIL PROTOZOA USING THE "NON-FLOODED PETRI DISH METHOD"

WILHELM FOISSNER

Universität Salzburg, Institut für Zoologie, Hellbrunnerstrasse 34, A-5020 Salzburg, Austria

INTRODUCTION

Many methods have been recommended for the estimation of the species richness of soil protozoa. The best method for testate amoebae is the careful inspection of watered soil suspensions and the flotation of empty tests by gas bubbles (1, 3).

Estimation of the richness in the other groups of soil protozoa (flagellates, naked amoebae, ciliates) is much more difficult, because these cannot be directly extracted so successfully from the soil. Therefore, enumeration involving various more or less complicated culture techniques have been suggested (e. g., 5). A very simple and highly effective "non-flooded petri dish method" was independently described by Varga (6), Starr (4) and Foissner (2).

PROTOCOL

1. Put 10-50 g of a fresh or air-dried soil or litter sample in a petri dish with 10-15 cm diameter.
2. Saturate but do not flood the sample with distilled water. Water should be added to the sample until 5-20 ml will drain off when the petri dish is tilted (45°) and the soil is gently pressed with a finger. Complete saturation will need up to 12 hours. Check, thus, culture after this time.
3. Cover petri dish and pinch a clip between bottom and lid to enable gas exchange.
4. Inspect cultures on days 2, 6, 12, 20 and 30 by taking a few milliliters from the run-off which contains a fauna of ciliates, flagellates, and naked amoebae, often unexpectedly rich. Later inspections add but few species.

COMMENTS

1. Air-dried soils yield often more individuals and species, probably due to reduced microbiostasis.
2. The sample should contain much litter and plant debris and must be spread over the bottom of the petri dish in at least a 1 cm thick layer.
3. Sample (soil) must not be flooded!
4. The run-off is often very rich in individuals and thus ideal for preparations, such as silver staining.
5. No systematic comparisons with other techniques are known. So many new species of soil ciliates have been discovered by myself with this method that it may be argued that it is more effective than other more frequently used and more complicated techniques. Repeated investigations of some soils showed that 2-5 samples distributed over one year produce 50-80 % of the species found in 10 samples investigated over two years. Thus, the method is not perfect and workers should be encouraged to look for a better alternative.

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