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An improved quantitative protargol stain for ciliates and other planktonic protists

By Oliver Skibbe[1]

Freie Universität Berlin, FRG

With 3 figures and 1 table in the text

Abstract

An improved quantitative protargol stain (QPS) is described. Records of entire protozooplankton communities can be obtained by a four hour procedure. Permanent slides prepared with this improved method can be examined using high resolution oil immersion lenses employing bright field, phase contrast or DIC. The numerical results of the improved QPS are comparable to settling chamber counts. Lugol fixed plankton samples may be treated by QPS as well.

Introduction

One essential problem for aquatic biologists interested in the ecology of protozoa is the accurate identification and enumeration of different taxa. Although live observation is still essential for the determination of protists, the clear identification of most species also requires an advanced cytological examination. Especially for ciliated protozoa taxonomists have introduced several methods for species identification, ranging from light microscopical staining procedures to scanning electron microscopy. A compilation of current methods is given by Foissner (1991). Most of these methods are rather time consuming and cannot be employed for quantification of ciliates. Therefore they are not often applied in ecological field studies. On the other hand the more common quantitative techniques like the settling chamber method (Utermöhl 1958) give good estimations for the abundance of ciliates, but only limited information about species composition.

The quantitative protargol stain (QPS) of Montagnes & Lynn (1987) is a very promising step forward to bridge the gap between quantitative and taxonomic methods. This technique is based upon the protargol silver impregnation (Bodian 1936, 1937, Tuffrau 1967, Wilbert 1975), one of the most valuable cytological stains used in ciliate taxonomy, combined with a filtration method for cell enumeration. However, the QPS has not yet been established

[1] Address of the author: Freie Universität Berlin, Institut für Zoologie, 14195 Berlin-Dahlem, Germany.

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