

**COMPARATIVE KARYOLOGY AND SCANNING CYTOPHOTOMETRIC
DNA MEASUREMENTS OF PROSERIATA (TURBELLARIA):
WITH PHYLOGENETIC CONCLUSIONS**

by

PAUL M. MARTENS (1), MARCO CURINI-GALLETTI (2)
and PATRICK VAN OOSTVELDT (3)

(1) Onderzoeksgroep Dierkunde, Departement SBM, Limburgs Universitair Centrum,
B-3610 Diepenbeek.

(2) Istituto di Biologia Marina, Università degli Studi di Pisa, I-56100 Pisa.

(3) Laboratorium voor Biochemie, Faculteit Landbouwwetenschappen, B-9000 Gent.

Karyological research on Proseriata (Turbellaria) leads to the conclusion that the plesiomorphic karyotype of the family Monocelididae consists of two metacentric chromosomes and one smaller acrocentric chromosome in the haploid set ($n = 3$).

From outgroup comparisons we can assume this to be a plesiomorphic feature for the Proseriata.

On the other hand, the karyotypes of the species belonging to the families Archimonocelididae, Otoplanidae and Coelogynoporidae can be explained as being derived from a basic karyotype with six chromosomes in the haploid set. The morphology of this basic karyotype suggests an origin from the plesiomorphic set of the Proseriata ($n = 3$) via polyploidy. To test this hypothesis, the amount of DNA per nucleus was measured from sectioned material (8-10 μm thick) stained with Feulgen reagent. A computer driven scanning cytophotometric method was used. This relative method was quantified by comparison with relative measurements of human lymphocytes whose absolute amount of DNA is known. The DNA measurements were carried out on 6 species belonging to the Monocelididae and five species of the « polyploid » group (1 Archimonocelididae, 2 Otoplanidae and 2 Coelogynoporidae).

The relative DNA measurements of the « polyploid » group give a mean amount of 408, which is nearly twice the value found in the Monocelididae ($\bar{x} = 206$).

However, a wide range was found in both groups. Comparing karyotype morphologies, we can explain the variation in both groups as resulting from various karyological mechanisms.

The phylogenetic conclusion of this research is that polyploidization is a common apomorphic feature of the families Archimonocelididae, Coelogynoporidae and Otoplanidae, which together, must now be considered to be the sister group of the Monocelididae.



Vlaams Instituut voor de Zee
Flanders Marine Institute