CYTOLOGY

A Chromosome Count in *Mohria*

The Schizaeaceae, one of the most ancient families of ferns, are represented to-day by four surviving genera, namely, *Schizaea*, *Lygodium*, *Anemia*, and *Mohria*. The very great age of the Schizaeaceae is attested by the Carboniferous genus *Senftenbergia*, which was demonstrated by Radforth[1] to be beyond reasonable doubt a member of this family. On account of the great antiquity of the family, the cytology of these plants has considerable importance for fern phylogeny. The four living genera are linked together by the very characteristic Schizaeaceous sporangium, but are otherwise notable for the very great morphological differences that exist between them. Morphological investigations thus suggest that only a rather distant affinity exists between the extant genera, and this indication is clearly supported by the chromosome numbers reported so far, namely, $n = 77$[2], *c.* 94[3], 96[4], 103[4], *c.* 270[3], 350–370[5], and *c.* 540[6] in *Schizaea*, $n = 29$[7], 30[4,5,7], 58[7], 60[5], and *c.* 70[6] in *Lygodium*, and $n = 38$[7–9] and 76[7–9] in *Anemia*.

No report of a chromosome count for *Mohria* is so far known to us. The importance of obtaining a chromosome number for *Mohria* has long been recognized in this Department, and the absence of a previous count is attributable to the difficulties experienced in establishing this plant in cultivation. Ultimately, however, after earlier disappointments, plants of *Mohria caffrorum* (L.) Desv. have been available to us, raised at Kew by Mr. H. J. Bruty from spores obtained from a wild collection made in the Transvaal (Prov.: Pietersburg, Div.: Woodbush) on July 10, 1956, by E. A. C. L. E. Schelpe, No. 6042, and now deposited in the Herbarium of the British Museum (Natural History). Chromosome counts have been obtained from both meiosis (J. D. L.) and root-tip mitosis (S. K. R.). Illustrated here are a cell in diakinesis showing $n = 76$ bivalents, and a root-tip cell demonstrating very clearly $2n = 152$ chromosomes. This result evidently suggests that *Mohria* is more closely related to *Anemia* than either of them is to *Schizaea* or *Lygodium*.

Attention has frequently been directed to the similarities (for example, frond morphology, large and few sporangia, etc.) which exist between *Mohria* and the Cheilanthoid ferns, and to some authors these resemblances are significant. Indeed, Bower[10] writes " . . . there is reasonable probability that *Notholaena* and *Cheilanthes* are Schizaeoid derivatives from the type of *Mohria*, . . . ". However, since the Cheilanthoid ferns have chromosome numbers based on $x = 29$ or 30[3,11], our chromosome count for *Mohria* clearly supports the contrary opinion that these morphological similarities are only superficial in character, and represent an example of parallel evolution, rather than evidence of phylogenetic connexion.

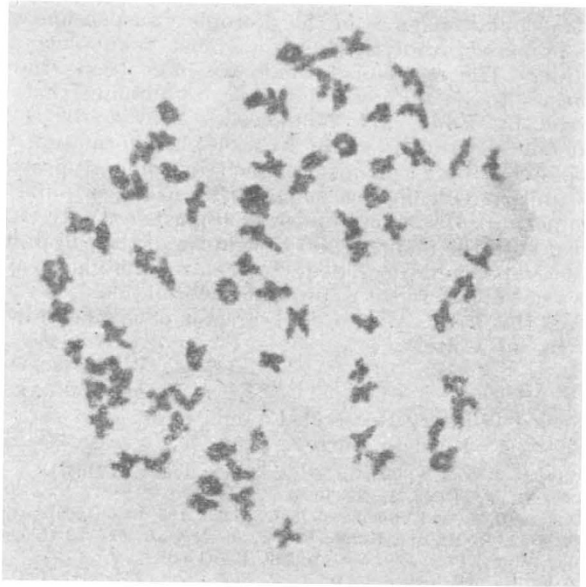

Fig. 1. Diakinesis in *Mohria caffrorum*, showing $n = 76$ bivalents (× 750)

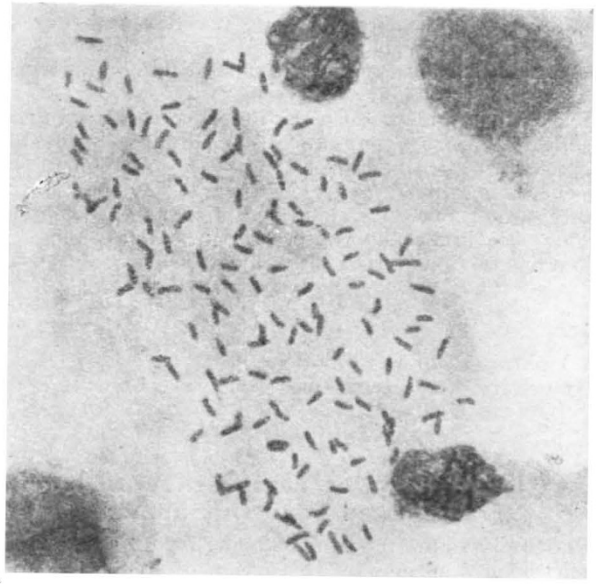

Fig. 2. Root-tip mitosis in *Mohria caffrorum*, showing $2n = 152$ chromosomes (× 750)

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J. D. Lovis
S. K. Roy

Department of Botany,
University of Leeds.

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GENETICS

Cytogenetical Investigations in Relation to the Mechanism of Evolution in Hexaploid *Solanum nigrum* L.

Solanum nigrum L. shows a polyploid series with $n = 12$, 24 and 36 (ref. 1). Although a considerable amount of work has been done on the three cytotypes, yet there is a lot of controversy about the nature of polyploidy and the course of evolution in hexaploid *Solanum nigrum*[2]. An ideal method for tracing the mechanism of evolution of the forms with higher chromosome numbers in species showing polyploid series is by producing these artificially. It has been possible for us to synthesize the hexaploid *Solanum nigrum* by crossing the naturally occurring tetraploid with diploid and then raising the triploid, through colchicine treatment, to the hexaploid-level. This note is concerned with the nature of polyploidy and the probable mechanism of evolution in hexaploid *Solanum nigrum* as brought out