Polyploidy in *Polypodium vulgare*

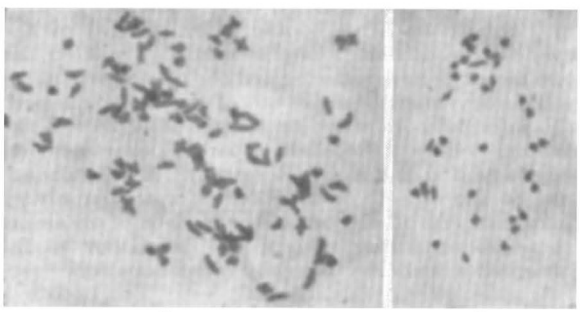
THE common polypody (*Polypodium vulgare* L.) is such an apparently well-defined and isolated species, being the only one of its kind hitherto recognized in Europe, that it was a matter of considerable surprise to detect in it cytological complexities recalling those of the Male fern[1] without, fortunately, quite equalling the full intricacies of that 'species'. *Polypodium* is, however, complicated enough to need a very large collection of living samples from all over its geographical range before it will be adequately understood, and it is in the hope of soliciting the co-operation of correspondents both in Great Britain and farther afield that this note has been offered for publication.

Polypodium sporangia mature late in the season (August or September in northern England). The first chromosome count made with any pretension to accuracy was obtained in September 1944 from a normal-looking and apparently wild plant in the grounds of the Biological Station at Wray Castle (Windermere). One cell is shown in Fig. *a*, and the chromosome number, known to be accurate to within three chromosomes, was at first recorded as $n =$ 'approx. 112'; there is now (see below) strong reason for believing that the correct number for this plant is $n = 111$.

In the hope of removing the slight uncertainty hanging over the original count, fixings were taken in July 1946 of some well-known greenhouse strains of the species kindly placed at my disposal by Dr. Cromwell of Hull. Far from confirming the original count, these fixings revealed an entirely different situation. Vars. *semilacerum* and *omnilacerum* had $n = 37$ with no uncertainty of any kind regarding the number (see Fig. *b*), and var. *cornubiense* had $n = 74$. It is clear that the numbers 37, 74 and 111 form a polyploid series, which is the reason for believing that 111 and not 112 is the correct number for the Windermere specimen. None of these plants showed any sign of multivalents.

It was obvious, however, that most if not all of these specimens could have been modified by man, for the vars. *semilacerum*, *omnilacerum* and *cornubiense* are known to have been in cultivation for more than half a century since their first discovery as wild 'sports', and the Windermere plant from its position in the grounds of Wray Castle could have been a garden-escape. Further collections of normal wild material were, therefore, necessary to establish the basic facts for the wild species.

Preliminary results of such a survey have confirmed the reality of the problem. The hexaploid (as the Windermere plant may be called) has not so far been found again, but specimens from a wood near Kendal (Westmorland) and from a very remote spot on Rannoch Moor (Perthshire) were tetraploid (that is, $n = 74$). Diploids ($n = 37$) were found at Dartmouth (Devon), the Cheddar Gorge (Somerset), and in a plant brought back from the neighbourhood of Montpellier (Pont du Gard) in southern France in 1946. The Montpellier plant belongs to *P. vulgare* var. *serratum*, which is the only representative of *Polypodium* in that part of Europe, and it is probable that the British diploids will also be referable to var. *serratum*, though their characters are less clearly defined than in the French material.



a *b*

MEIOTIC METAPHASES IN ACETOCARMINE OF A HEXAPLOID AND A DIPLOID *Polypodium*. × 500. (*a*) MORPHOLOGICALLY NORMAL SPECIMEN FROM WINDERMERE; (*b*) THE HORTICULTURAL VARIETY 'SEMILACERUM'

While it seems highly probable that 'var. *serratum*' will need to be recognized as a second European species of *Polypodium*, it is clearly desirable, before this is done, for information on a much larger scale to be assembled. All forms of *Polypodium* are easily recognizable as such even by amateurs, and they are remarkably tolerant of rough handling. If firmly wrapped to prevent desiccation, they will probably survive a postal period of several weeks.

I would be very grateful for any living specimens that can be sent to me from Great Britain, Europe or America, provided that the place of origin is clearly indicated. To facilitate transmission from abroad, non-British parcels may be addressed to the Keeper of the Herbarium, Royal Botanic Gardens, Kew, Surrey.

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Dec. 10.

[1] Manton, I., *Nature*, **144**, 291 (1939).

Effect of Temperature of Storage on the Rate of Loss of Fertility of Stock Cultures of *Melanospora destruens*

MYCOLOGICAL literature contains many references to loss of fertility by fungi in culture. During an investigation of the physiology of perithecial production in *Melanospora destruens* Shear, the strain became progressively less fertile. Fertile saltants developed in cultures grown at the relatively high temperature of 37° C. These were isolated and their growth-rates were compared with those of sterile saltants at various temperatures.

At relatively low temperatures, namely, laboratory temperature (18° C.) and 20° C., growth of the sterile strains began several hours before that of the fertile ones. At 25° C. the difference was reduced, while at 30° C. and above, the growth-rates of the sterile and fertile strains were approximately equal.

Thus it is clear that if stock cultures of this fungus are kept at laboratory temperature, the chances of picking up any sterile saltants present when subculturing would be greatly increased, since these are likely to become established before the fertile ones commence growth, and so would probably prevent the development of the latter. If, however, the stock cultures were incubated at 30° C. for at least two days after subculturing, the chances of survival of the fertile strains would be greatly increased. This problem is being investigated, and it is hoped to publish a fuller account later.

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