Chromosomes and Chromocentres in the Nuclei of *Halidrys siliquosa* (L.) Lyngb.

DIVIDING nuclei in the apical groove of *Halidrys siliquosa* show large numbers of small chromosomes, and at metaphase more than 55 have been counted (Fig. 1*c*, *d*, *e*). Metaphase plates at the first three divisions in developing antheridia have given counts of the order of 30 chromosomes (Fig. 1*b*), and one at the first division of the oogonium of approximately 28 chromosomes. This indicates that the thallus of *H. siliquosa* is diploid with meiosis at the first division of the gametangia, as is usual in the Fucales[1].

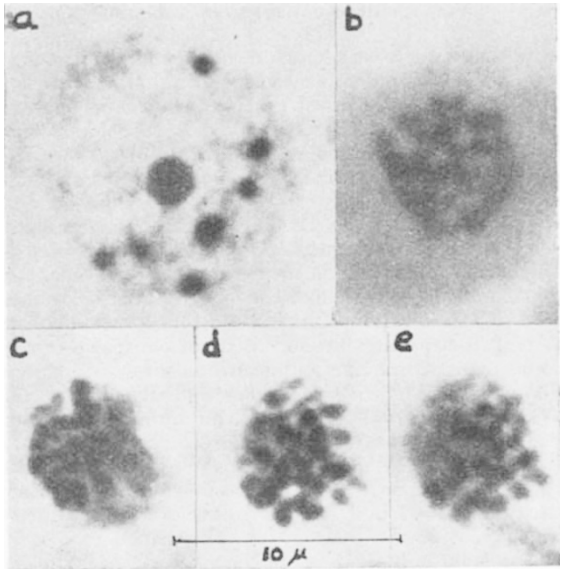

Fig. 1. Photomicrographs of nuclei of *Halidrys siliquosa*, all to the same scale. *a*, Acetocarmine smear of a nucleus of a medullary cell showing the nucleolus and seven chromocentres; *b*, Feulgen-stained metaphase plate at the first division of the antheridial initial: this plate gave a count of 34; *c*, *d*, *e*, three optical planes of a metaphase plate of a dividing meristoderm cell in the apical groove. This plate gave a count of 55 chromosomes plus several more the number of which could not be accurately determined, lying in a higher plane. The illustration was prepared by W. H. Smithson from untouched negatives

The resting nuclei of *H. siliquosa* contain several Feulgen-positive granules about 1μ in diameter (Fig. 1*a*) and slightly larger than the chromosomes, as has been described by le Touzé[2] and Roy[3]. The number of granules varies from cell to cell but is usually between 2 and 9, whether the cell is diploid, as in the somatic cells, or haploid, as in the developing gametangia. Such variability in number and independence of chromosome complement is a characteristic of chromocentres[4]. It seems possible that the eight chromosomes recorded by Moss and Elliot[1] in both somatic and reproductive cells of *H. siliquosa* correspond to these bodies, which are probably chromocentres.

A more detailed account of this work will appear elsewhere[5].

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[2] le Touzé, M. H., *Rev. Gen. Bot.*, **24**, 33 (1912).
[3] Roy, K., *Rev. Algol.*, **11**, 101 (1938).
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[5] Naylor, M., *Ann. Bot.*, N.S., **22** (1958).

Cytology of Indian Species of *Artemesia*

CONSIDERABLE cytological work has been done on the genus *Artemesia* in North America[1,2], Japan[3] and Europe (cf. Darlington and Wylie[4]); but so far nothing has been known about the Indian species. The genus, besides being of medicinal importance, is extremely interesting from the cytotaxonomic and cytogeographic points of view. It was therefore thought worth while to work out the available species of the genus. Following the conventional taxonomic treatment we have worked out 11 species out of 27 reported by Hooker[5] from the Indian subcontinent. In the present investigation the various species have been primarily sampled from the north-western Himalayas; but material from the eastern Himalayas and other areas has also been studied. This has been supplemented with the study of herbarium specimens. Most of the species have been worked out for the first time. In addition to the 11 Indian species, the chromosome number in *A. vulgaris* Linn. from Germany has also been investigated. The chromosome numbers are given in Table 1.

Table 1

Species	Chromosome No. *n*	*2n*
A. scoparia Waldst. and Kit.	8	16
A. absinthium Linn.	9	—
A. glauca Pall.	18	36
A. laciniata Willd.	—	18
A. maritima Linn. (Kashmir)	18	—
A. maritima Linn. (Japan)	27	—
A. parviflora Roxb.	9	18
A. roxburghiana Bess.	9	18
A. roxburghiana Bess.	18	36
A. tournefortiana Reichb.	9	18
A. vestita Wall.	9	18
A. vulgaris Linn. (Germany)	—	16
A. vulgaris Linn. (India)	18	—
A. vulgaris Linn. (India)	27	54
A. species	9	—

One of the interesting aspects of this study is the cytological situation in Indian *A. vulgaris*. In this connexion, it is pertinent to mention that *A. vulgaris* Linn. was originally described from northern Europe[6]. The chromosome number of this species ($2n = 18$) was worked out by Weinedel as early as 1928 (cf. Darlington and Wylie[4]). In view of all the subsequent work it is reasonable to revise the above number to $2n = 16$[1,7–10]. This is fully borne out by the present investigation since we also found 16 chromosomes in root-tips from seeds collected at Kitzeberg near Kiel (Germany) and sent to us by Prof. H. D. Wulff. This is a significant point, since Indian *A. vulgaris* has been compounded from the basic number 9 and not 8 as expected on the basis of true *A. vulgaris* from Europe. Evidently the former taxon has to be appropriately evaluated taxonomically.

The Indian *A. vulgaris* complex is also interesting phytogeographically. We have found only diploids in the innermost Himalayas, in regions which have undergone a period of glaciation, and often at such places glaciers are still in existence. In the middle Himalayas diploids are at the tops of mountains and perhaps extend farther down. The tetraploid forms occur only at lower altitudes and extend also into the valleys below. In the outer Himalayas the diploids of this complex are either rare or have not been found so far, whereas tetraploid forms are preponderant. The hexaploid forms appear at lower altitudes and have also been found in valleys between the outer Himalayan foothills and the Siwalik Ranges. Furthermore, hexaploid has also moved down to the Nilgiri Hills