CHROMOSOME NUMBER IN *CRYPTOMITRIUM HIMALAYENSE* KASH.

P. N. MEHRA

Botany Department, East Punjab University, Amritsar.

(*Received for publication on May 19th*, 1948).

The genus *Cryptomitrium*, a member of the family Rebouliaceæ, has only two species. *C. tenerum* (Hook) Aust is distributed in America from Washington to Chile, while *C. himalayense* Kash. is reported from India. The former species has been embryologically investigated recently by Haupt (1942). Chromosome number in none of these has so far been reported.

C. himalayense was discovered by Kashyap (1915) from the outer range of the Western Himalayas at an altitude of about 7,000 ft. It grows in thick patches on rocks and stones in moist and shady places. The thallus is broad, delicate, yellowish green, once or twice dichotomously branched and with distinct chambers opening by pores. Plants are hermaphrodite. The antheridial papillæ are arranged in two or three rows behind the terminal female receptacle.

The study of chromosomes was made from dividing spore mother cells. Suitable sized sporogonia were teased out of the female receptacle and fixed in Bouins Fixative Allen's modification $P.F.B._{15}$ at Mussoorie in the last week of August between 12 noon and 4 p.m. The usual process of dehydration was followed. A number of sporogonia were embedded together in one block and sections cut 8-12μ thick. Staining was done in Iron-alum Haematoxylin.

Observations

The capsule is a little too inflated for the number of spore and elater mother cells included within. That is why they appear much scattered within the cavity of the capsule.

The spore mother cells are large, spherical and contain dense cytoplasm. Some of these are abortive and take a jet-black stain. The elater and spore mother cells belong to the same cell generation as in two other members of Rebouliaceæ, namely, *Plagiochasma* and *Reboulia* (Haupt, 1921). By the time the prophasic changes start in the spore mother cells, the elater mother cells have become somewhat elongated and contain thin cytoplasm in which is embedded a prominent nucleus containing 2-4 darkly staining nucleoli.

The first meiotic division spindle of the spore mother cell is flattened at the poles. Nine bivalents are clearly counted at the metaphase plate in the polar view, Fig. 1. The chromosomes appear small in size and are not suitable for a morphologic study. At the end of the metaphase the smallest bivalent of the complement representing the micro-chromosome

pair is invariably the first to undergo disjunction (Fig. 2, not all chromosomes shown) and at anaphase always leads the other no their way to the poles. When looked from the side it appears in the form of a thin elongated line.

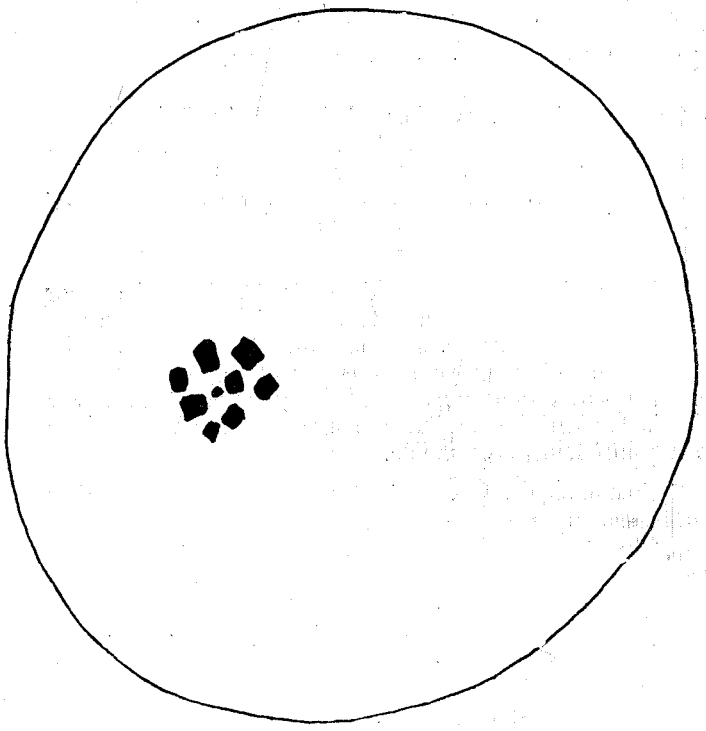

Fig. 1.

Fig. 2.

The second meiotic division is simultaneous and the two daughter spindles may be orientated in any fashion with respect to one another. These spindles are smaller than the previous one.

All the mother cells within a sporogonium are not at the same stage of division. Some of these may be at the metaphase of the first meiotic division, others at telophase of the second meiotic division and still others at the intervening stages.

The tetrad formation is on the same lines as reported in other members of the Rebouliaceæ, like *Reboulia hemisphærica* by Blair (1926) and *Plagiochasma appendiculatum* by von Meyer (1914). Cleavage in the cytoplasm occurs in the equatorial region at the end of the first meiotic division while the spindle fibres disappear. This remains restricted and does not yet extend outwards. When the second meiotic division is complete, similar cleavages appear in the cytoplasm at the equatorial regions of the daughter

spindles. These lines of cleavages join in the centre and then extend outwards to the periphery of the mother cell splitting it into four spores. The spores are tetra-hedral in outline but at maturity tend to be rounded.

Literature Cited

Blair, M. C. 1926. Sporogenesis in *Reboulia hemisphaerica*. Bot. Gaz. Vol. 81, pp. 377-400.

Haupt, A. W. (1921). Embryogeny and sporogenesis in *Reboulia hemisphaerica*. Bot. Gaz. 71, pp. 446-53.

Haupt, A. W. (1942). Studies in Californian Hepaticæ III. *Cryptomitrium tenerum*. Bot. Gaz. Vol. 104, pp. 264-272.

Kashyap, S. R. (1915). Morphological and Biological notes on New and Little known West Himalayan Liverworts III. New Phyt. Vol. 14, p. 2.

Meyer, K. Von (1914). Entwickelungsgeschichte des sporogons bei *Plagiochasma*. Bull. Soc. Moscou.

Tischler, G. (1927, 31, 37, 38). Tabulæ Biologicæ. Vols. 4, 7, 11, 16.