CHROMOSOME NUMBERS OF INDIAN CROP PLANTS.

(A) Chromosome Numbers in Jute.*

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The importance of the study of the cytology of crop plants has been recognised in secent years and results of great economic value have been obtained in many cases. A knowledge of the chromosome numbers of the cultivated varieties of crop plants and their near relatives is a necessary preliminary to detailed cytological and genetical investigations. As apart from other considerations, it very often gives us an indication as to the amount of sterility one is likely to encounter in interspecific hybridisation. Investigations on the chromosome numbers of most of the European and American crop plants are complete, and detailed cytological work has been done on a number of plants. Asse and Powers (1) in 1926, published a list of crop plants whose chromosome numbers had been worked out. Further investigations since then, have added many numbers to the series and considerably increased the list. A detailed knowledge of the chromosome numbers of Indian crop plants and the various strains isolated, is far from complete as yet. Excepting cotton (2) and a few cultivated millets (5), very little information is available as to the chromosome complements of our cultivated crop plants. A beginning has been made in this laboratory to work out the chromosome numbers of Indian crop plants, and this paper is the first of the series.

Material and Methods.

The material used in this investigation has been grown in the University College gardens from selfed seeds obtained from the Agricultural Department, Bengal. Fixation was usually carried out in the afternoon and meiosis was noted to be just as frequent on cloudy as on sunny days. The following fixing fluids were tried —Flemming's (weak), Allen's modified Bouin's, Carnoy's and Acetic-alcohol. The penetration of the first two fixatives appeared to be rather poor, Carnoy's fluid caused a good deal of shrinkage, but Acetic-alcohol gave uniformly good results. The material was always fixed in the field and kept in the fixing fluid (Acetic-alcohol) for thirty minutes, it was then dehydrated, and all trace of acetic acid removed, cleared either in several ascending series of Xylols, or in Cedar wood oil (3). Both these procedures gave satisfactory results. The material was finally embedded

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in parafin. Sections were cut 8-10 microns thick, with the idea of obtaining complete cells in the sections which facilitates considerably the counting of chromosomes. Haidenhain's iron-alum hæmatoxylin has been used for staining.

Results.

The chromosome numbers of four agricultural strains of Corchorus capsularis and two of Corchorus olitorius have been determined, as also of Corchorus acutangulus—a weed which grows wild during the monsoon round about Calcutta. The chromosomes were counted from the meiotic stages of the microspore mother cells. Check counts were taken from a large number of flower buds to eliminate any possible source of error.

The haploid chromosome numbers as determined are given below

Corchorus olitorius Linn.		(n)
(a) R. 26			7.
(b) "Chinsura Green"		***	7.
Corchorus capsularis Linn.			
(a) D. 154			7.
(b) R . 85	448		7.
(c) D. 27	***		7.
(d) D. 89			7.
Corchorus acutangulus Lamk			7.



D 89



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The chromosomes of jule appear to be very small in size and careful examination failed to show any difference in shape or size of the various types investigated.

Investigations on the chromosome numbers of the cultivated varieties, and of the wild jute were undertaken with the idea that it might throw some light on the purity of the different strains, as also, on the chromosome relationships in the genus Corchoras. No difference in the chromosome number was noted in all the types eramined nor was any cytological irregularity found. Type D. 50 which is a capsularis variety and which according to Experiment station report was obtained from a cross between D. 154 and a Japanese variety obtained from Formosa Island, showed nothing in melosis to suggest its hybrid origin. Conjugation between the two parental groups of chromosomes appears to have been complete in this case.

As compared to other plant families of economic importance, the family Tiliaceae has not received much attention from cytologists. The chromosome numbers listed for Tiliaceae by Gaiser (4) are *Entelea palmata* 8 (haploid) and Sparmannia africana 80 (haploid). These two plants were investigated by Stenar (6). The number seven obtained for the three species of Corchans investigated show that there is no polyploidy in this family and the chromosome numbers in this genus appear to be quite stable.

Cytological investigations on the development of the male and female gametophyte in Corchorus olitorius and Corchorus capsularis, and also the process of fertilisation in jute is nearly complete, and a detailed communication will be made at an early date.

Summary.

Chromosome numbers of some agricultural strains of Corchorus capadaris and Corchorus olitorius were investigated as also of Corchorus acutangulus. The haploid chromosome number was found to be soven in all cases.

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