

<u>Category</u>	<u>Frequency</u>	<u>Per cent</u>
1. Normal plants	43	58.33
2. Plants with interchanges	26*	36.05*
3. Plants with accessory chromosomes	4*	5.56*
4. Plants with aneuploid chromosome number	1	1.39

While there is a good increase in the percentage of individuals with interchanges in the mixed population from 20 - 25 (earlier report) to 36.05, there is either a total disappearance or a reduction in frequency of plants with other chromosomal abnormalities when compared to the observations recorded from the original populations. In Coix aquatica it may be assumed that when all the plants in the population are provided equal chance of survival and growth in the experimental garden, it appears likely that translocations float in the population with increased frequency rather than being lost like the other chromosomal variations.

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#### 4. Variation in pollen fertility in a population of Coix aquatica.

Pollen fertility in 40 plants of a mixed population of Coix aquatica was determined by counting stained pollen grains in acetocarmine. Pollen fertility varied between 28.12% and 95.88% in plants with normal meiosis and about three-fourths of these plants showed pollen fertility of over 50%. The plants with chromosomal interchanges, involving nucleolar and non-nucleolar chromosomes, forming higher associations of 3, 4, 5 and 6 chromosomes at meiosis have a pollen fertility ranging from 17.10% to 94.00%. Nearly one-half of these plants have more than 50% of pollen fertility. It may therefore be assumed that at least some of the interchanges do not seem to have any adverse effect on pollen fertility and the plants with interchanges show as high or as low a pollen fertility as normal plants. This is perhaps indicative that in C. aquatica pollen fertility is more a function of the genetic make-up of the individual than the effect of the chromosomal interchanges.

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#### 5. Meiosis in autotetraploid Chionachne koenigii.

Autotetraploidy was induced in Chionachne koenigii through colchicine treatment. Root portions of seedlings (raised from seed obtained from Maharashtra) with 2-3 leaves were dipped in 0.4% aqueous solution of

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\*Two plants which showed the presence of interchanges as well as accessory chromosomes are included in both categories for the purpose of calculating the frequency and percentage.

colchicine for 12 hours. The seedlings were then thoroughly washed in running water and planted in pots under shade. Out of 30 plants treated, 10 survived to maturity. Of these three are complete autotetraploids ( $4n = 40$ ). The rest of the seven plants showed sectorial autotetraploidy of varying degrees, either limited to a few panicles on the same plant or only to a few meiocytes in an anther. In one of the plants showing sectorial autotetraploidy, meiosis was studied. Chromosome associations were studied in 60 cells at diakinesis. The types of associations observed were quadrivalents, trivalents, bivalents and univalents. Quadrivalents varied in number from 0-6 per cell. Trivalents, not more than one per cell, were observed in four cells. A univalent was observed only when a trivalent was present in a cell. The average frequency of chromosome associations per cell was 2.73iv, 0.07iii, 14.5ii, 0.07i; 27.83% of the chromosomes have gone into the formation of multivalents. The average chiasma frequency per cell in tetraploid was 33.67, which is more than twice the 15.63 in the diploid ( $2n = 20$ ) undoubled sectors of the same plant. Laggards 1-4 and irregular distribution of chromosomes at either pole (19:21) were observed in 18.75% of the cells each; bridges were found in 12.5%, and normal distribution of 20:20 chromosomes was observed in 50.00% of the cells at anaphase I. In the second division, laggards and/or micronuclei (1-4) and bridges were seen in 38.46% of the cells examined. Micronuclei (1-3) were found in 22.28% of the pollen tetrads.

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6. Colchicine induced autotetraploids of Job's tears (*Coix lachryma-jobi*).

Induction of autopolyploidy in Job's tears was reported last year (MNL 40: 165, 1966). This year seedlings raised from seed collected from open pollinated plants of *Coix lachryma-jobi* ( $2n = 20$ ) growing wild in the University campus were treated with colchicine in the manner described for *Chionachne* (item 5 above). Out of 28 plants so treated only three survived and lived to maturity. All three plants exhibited gigas characters and cytological examination of pollen mother cells showed that these are autotetraploids ( $4n = 40$ ). The tetraploid plants, like the diploid ones, produce stem suckers from the basal nodes of the original tillers. Cytological check of the male florets borne on the stem suckers also showed a tetraploid chromosome number and behavior. Seed set is extremely poor in the tetraploids in spite of selfing, intercrossing among tetraploids or crossing tetraploid with diploid plants. For cytogenetical study, besides propagation through seed, it is expected that it should be possible to propagate the tetraploid stock vegetatively by carefully nursing the stem suckers.

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