6. SUMMARY

(1) A spontaneous autotriploid was studied morphologically and cytologically in the rice variety Ratnagiri-242.

(2) The autotriploid exhibited morphological vigour in comparison to the disomics in various characters like plant height, growth habit, ear bearing tillers, length of ligule, length of spikelet and presence of awn on the spikelets.

(3) Meiotic analysis of autotriploid revealed the highest frequency of trivalents followed by bivalents and univalents. Out of the different shaped trivalents, the frying pan type was most frequent and the triangle type was least frequent. These different shaped trivalents found in the autotriploid pollen mother cells offered mechanical advantage for easy terminalization of chiasmata and clear disjunction of the chromosomes resulting in the formation of gametes with one to few extra chromosome.

(4) Out of 415 seeds obtained from the triploid, only 134 plants were grown but only 82 plants were survived until maturity. 20 were primary trisomics, 22 were double trisomics, 5 were triple trisomics, 4 were trisomics for 4 chromosomes and 1 was trisomic for 5 chromosomes.
(5) These trisomics differed morphologically from each other as well as from the disomic. By considering the distinct conspicuous character, the trisomics were grouped into 12 types such as pale, dwarf, awn, sterile, twisted, bushy, rolled, recurved, stout, boat, pseudo-normal and robust.

(6) The individual extra chromosome in each trisomics were identified on the basis of the pachytene chromosome maps of the diploid Ratnagiri. Following the earlier methods of numbering employed by Indian and Philippines workers, the chromosomes were numbered from 1 to 12 according to the descending order of length and accordingly the 12 primary trisomics were designated as Triplo-1, Triplo-2 and so on upto Triplo-12.

(7) Cytological studies conducted on all the trisomics revealed chromosome pairing abnormalities at pachytene where the extra chromosome though paired mostly with two other homologous chromosomes, fair degree of non-homologous chromosome pairing with other chromosomes was also observed. In later stages of meiosis the extra chromosome was observed as laggard.

(8) The trisomics of extra chromosome had conspicuous effect on meiosis. The trisomics with longer chromosomes normally exhibited more trivalents than the trisomics for shorter chromosomes. Among the different shaped
trivalents, the order of trivalent types were frying pan, chain, Y, ring and triangle type.

(9) The study of transmission of extra chromosome through the primary trisomics revealed the lowest or negligible transmission frequency through pollen and lower transmission frequency as compared to theoretical 50% through female. High pollen fertility, comparatively low germination percentage, the variable reduction of the transmission frequency of rice trisomics might possibly be due to univalent formation, subsequent lagging, misdivision and elimination of extra chromosome.

(10) The primary trisomics obtained from the variety 'Ratnagiri' were studied for the differences in the chlorophyll content and crude protein content. Analysis of chlorophyll component showed conspicuous differences among trisomics. Likewise grain protein analysis following micro-Kjeldahl method showed differences in crude protein content among trisomics which could also be useful in differentiating the trisomics as well as for manipulating the extra chromosome for improving protein content of rice. Both the studies showed good distance with diploid.