effect and the zebra locus might also be linked with dwarfing habit.

Some of the mutant progenies as well as F_2 and F_3 progenies showed a high degree of chlorophyll deficiency at seedling stage, with leaves completely white or rarely with only one or two green transverse bands. Some (4 to 5%) of these seedlings died within 15 to 25 days after germination and this may, however be accounted for, a recessive lethal deficiency of zebra mutants, a situation very similar to that observed in many of the induced mutants which are sub-vital[7].

From the present findings it has not been possible to outline any definite explanation to account for the development of zebra pattern in leaves. However it is noticed that under ambient temperature and diurnal fluctuation of light, the zebra pattern of leaves is expressed better whereas change in these factor leads to irregularity in the expression. This suggests that possibly under the influence of temperature and light fluctuation in day and night the zebra gene results in such localized chlorophyll development of leaves.

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Cytogenetics Laboratory, A. K. NANDA.*
Central Rice Research Institute, R. N. MISRA.
Cuttack 753 006, Orissa, *May* 2, 1975.

* Department of Botany, Ravenshaw College, Cuttack.

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A CYTOGENETICAL NOTE ON DOUBLE-GRAINED RICE (*ORYZA SATIVA* L. VAR. *PLENA* PRAIN)

Oryza sativa L. var. *plena* Prain is popularly known as double-grained rice, cultivated in localised areas in West Bengal as wet season crop. Sikder[4] studied its floral morphology in detail. Two types of grains are found in this variety, long and short. The present note deals with the karyotype and meiotic studies on plants, grown from these two types of grains and compared with the normal single-grained variety.

The long and short and the normal grains were de-husked and germinated in Petridishes on moist filter paper. Suitable root tips were selected, pretreated with aqueous solution of Aesculine[1,3], at 8° C for 3 hours and fixed in Propionic acid alcohol 1 : 2 for 30 min. Propiono-orcein staining technique was followed. For meiotic study, Propiono-carmine staining technique was followed after fixing the spikelets in propionic acid alcohol 1 : 2 for 24 hours.

Somatic chromosome number, karyotype configuration and haploid number of these three types of plants are given in Tables I and II.

TABLE I

Somatic chromosome number and karyotype configuration of 3 plants grown from double-grained rice

Source of the taxon	Somatic chromosome number	Types observed			Ranges between short and long chromosome in μ
		A	B	C	
Long grain ..	$2n = 26$	4	8	14	0·8–2·2
Short grain ..	$2n = 22$	4	10	8	0·1–2·0
Normal grain ..	$2n = 24$	4	6	14	0·8–2·5

Type A: Medium size chromosome with secondary constriction.
Type B: Medium size chromosome with median to submedian primary constriction.
Type C: Short size chromosome with median to submedian primary constriction.

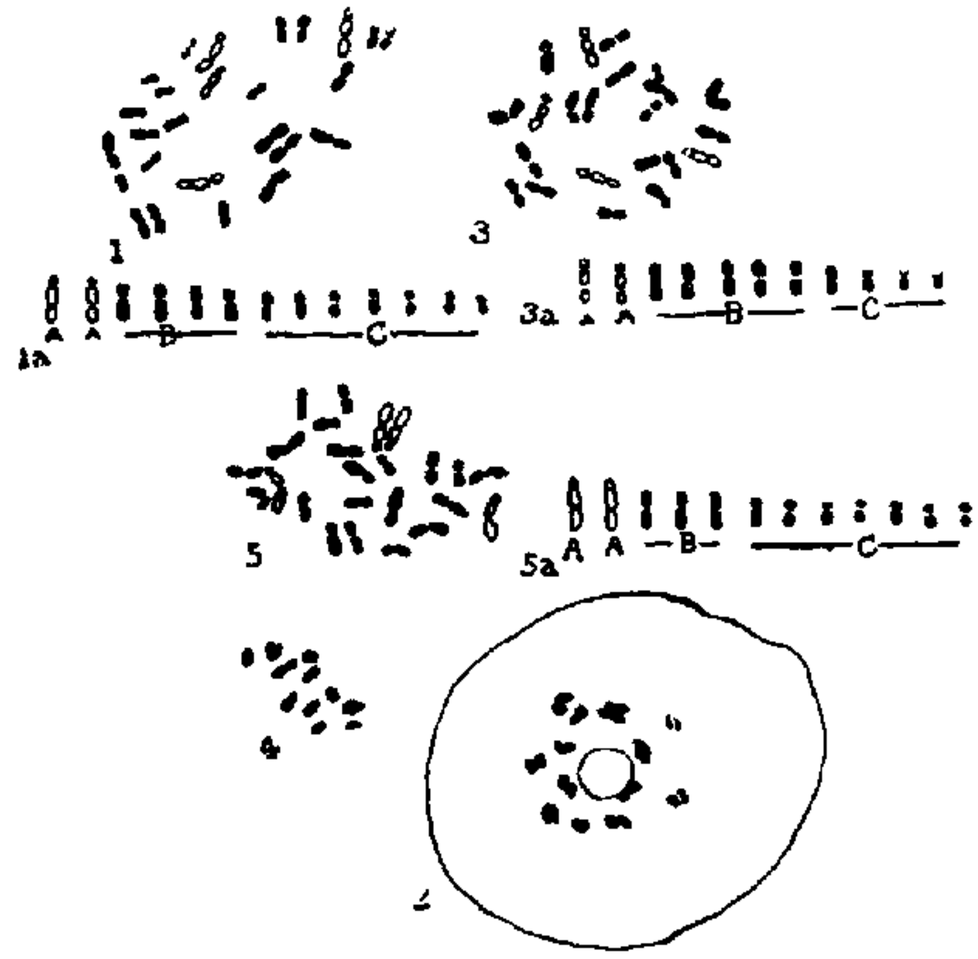
TABLE II

Haploid number of 3 plants grown from double-grained rice

Source of the taxon	Total number of cells observed	12 II	13 II	11 II	Percentage
Long grain	65	15	45	5	12 II, 23 13 II, 69·3 11 II, 7·3
Short grain	65	18	Nil	47	12 II, 27·7 13 II, Nil 11 II, 72·3
Normal grain	65	55	5	5	12 II, 84·6 13 II, 7·7 11 II, 7·7

The normal chromosome number of rice[2] (*Oryza sativa* L.) is $2n = 24$. In the present investigation, two different chromosome numbers have been observed from the plants developed from the two types of grains obtained from the double-grained variety. In the plants developed from long grains, the chromosome number was found to be $2n = 26$ and at meiosis, 69% cells had $n = 13$ chromosomes. In the plants developed from short grains, the somatic chromosome number was $2n = 22$ and 72% of the cells showed $n = 11$ bivalents in meiotic study. Thus, the two types of plants developed from seeds of the same double-grained variety, selected from bulk showed somatic chromosome number of 26 and 22 which are unusual for *Oryza sativa* L. as the parent variety had the normal chromosome number $2n = 24$.

It is remarkable that in nearly all the two types of plants derived from the double-grained rice, the karyotype difference is not pronounced (Figs. 1 *a*, 3 *a* and 5 *a*) and no distinction can be made between one taxon and another on the basis of the karyotype. The presence of $2n = 26$ and $2n = 22$ chromosomes, indicates the evidence of aneuploidy at an intravarietal level. It is likely that in the natural population of the double-grained variety, spontaneous occurrence of triploids and monosomics is quite possible. These may give rise in later generations to heterogeneous plants giving tetrasomic $(2n + 2)$ and nullisomic $(2n - 2)$ plants which may have survived in natural selection.



FIGS. 1–5 *a*. Fig. 1, 1 *a* and 2. Somatic metaphase, idiogram and diakinesis of the plant, grown from long grain showing $2n = 26$ and $n = 13$ chromosomes. Figs. 3, 3 *a* and 4. Somatic metaphase, idiogram and meiotic metaphase of the plant grown from short grain showing $2n = 22$ and 11 chromosomes. Figs. 5 and 5 *a*. Somatic metaphase and idiogram of the plants grown from the normal grain.

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Chinsurah, West Bengal, A. K. MITRA.
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CHROMOSOMES PAIRING IN AN AUTOTRIPLOID RICE

IDENTIFICATION of autotriploids in a short duration, photoinsensitive rice variety which can be grown in both dry and wet seasons, will be useful for the development of aneuploid lines. The meiotic behaviour of such an autotriploid, isolated from M_2 population of the variety *Sona* (IET. 1991) treated with 0·2% aqueous solution of EMS for 6 hours preceded by a presoaking in distilled water for a period of 6 hours is reported here. The frequency of occurrence of this autotriploid was 3 (0·05%) out of 5437 M_2 population.

This triploid exhibited gigas habit, having long bold spikelets, increased plant height, short and robust awn similar to the earlier reports of spontaneous autotriploids[3,7,9,11,12,15]. The pollen and spikelet sterility observed in this triploid were 94·3% and 99·7% respectively, compared to the earlier reports (from 76·3% to 88·4% in the case of pollen and from 96·6% to 99·4% in the case of spikelet)[11-13].

Cytological study of meiosis in autotriploids has been attempted by many earlier workers[1-3,7,10,11], who reported various types of meiotic abnormalities regarding the number and type of multivalents. However, the maximum number of trivalents were observed in the autotriploids so far was 10 per PMC[12]. Cytological analysis of PMCs at metaphase and anaphase I stages in the autotriploids reported here revealed the occurrence of very high frequency of trivalents followed by bivalents and univalents in lesser frequency. The maximum number of PMC's showed 11 trivalents whereas the frequency of trivalents ranged from 4–12 (Fig. 1) and the bivalents and univalents varied from 0–6 per PMC (Table 1). The occurrence of equal proportion of bivalents and univalents indicated that they might have arisen due to the failure of formation of trivalents or to early terminalization of chiasmata.