

Table 1  
Variation in chiasma frequency at diakinesis in anthers of Groups 1-3 (No. of anthers studied is given inside parentheses)

Line (#1 - #8 are inbred lines)	Anther group based on the frequency of division stages		
	Group 1 (diak. & early stages)	Group 2 (mostly diak.)	Group 3 (diak. & late stages)
#1 Nayagarh	18.73 (4)	18.38 (4)	18.09 (7)
#2 Ext 357	18.40 (2)	17.35 (4)	17.14 (5)
#3 Kenduguda	---	18.75 (4)	17.90 (4)
#4 Ext 139	---	17.38 (4)	17.34 (3)
#5 Jhadgan	18.47 (3)	18.20 (4)	17.50 (1)
#6 Jeypore	18.30 (1)	18.30 (4)	17.80 (3)
#7 Ext 355	19.00 (1)	18.63 (3)	--
#8 Ext 127	18.30 (3)	17.83 (4)	17.97 (3)
#9 Ext 355 X Ext 357	17.80 (1)	19.15 (4)	19.18 (4)
#10 Ext 357 X Ext 139	17.50 (2)	17.58 (4)	17.97 (3)
#11 Ext 139 X Ext 127	19.20 (1)	18.05 (4)	--
All inbred lines (Pooled)	18.52	18.10	17.72
All hybrids (Pooled)	18.00	18.26	18.66

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## 2. Dissociation of the nucleolus from the organizer site in a few lines of maize.

In the course of a study of the comparative cytology of inbred and hybrid maize particularly in relation to developmental homeostasis, the nucleolus was found to be dissociated from the nucleolus organizer in a few PMC's at diakinesis. The condition was not due to any mechanical damage during squashing, nor could it be considered as a normal situation associated with the late stage of diakinesis. In the PMC's exhibiting this abnormality, the nucleolus was found to be appreciably larger than those in the normal cells in the comparable stage of division. A survey of several local inbred lines and a few hybrids appeared to reveal this abnormality more frequently in the vigorous hybrids rather than inbreds. The frequency of appearance of this condition in different lines has been indicated in Table 1.

Table 1  
Frequency of nucleoli dissociated from the organizer site at diakinesis in PMC's

	No. of spikelets studied	No. of PMC's examined	No. of PMC's showing dissociation		
			Wide apart	Slightly apart	Total
Inbred lines:					
Jhadgan	1	600	1	0	1
Gandasahi	8	4,790	0	0	0
Mahabirapur	10	8,956	0	0	0
Guali	6	2,240	0	0	0
Chheliguda	2	754	0	0	0
Hybrids:					
Ganga 101 (double-cross)	6	2,920	33	16	49
(105 X 101) X (115 X 111)	5	590	11	0	11
Kenduguda X Jhadgan	12	720	1	0	1

There are reasons to believe that the size of the nucleolus is directly proportional to its synthetic activity, particularly RNA and protein synthesis. Since the nucleoli dissociated from the organizer sites are often large, it is necessary to examine whether these cells and their nucleoli are more active in RNA/protein synthesis, and whether this activity has any relationship to vigor. We are particularly interested to ascertain if synthetic activity can be used as a measure of combining ability of inbred lines. In case some kind of easy-to-detect morphological cellular manifestation (e.g. the nucleolar condition reported here) is related to synthetic activity and vigor, means would be provided for studying combining ability at the cellular level and thus to understand the cellular basis of the phenomenon.

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3. The nature of variation in some quantitative traits in terms of adaptation.

The contention that heterozygosity would lead to developmental stability or homeostasis at least in outbreeding species has been examined by us in respect to several quantitative characters including different aspects of meiotic chromosomal behavior. These studies have revealed that heterozygosity per se may not ensure developmental homeostasis. But the phenomenon is more likely to be encountered in heterozygotes rather than homozygotes. Our interest in the study of phenotypic variation in inbred