

the number of chromosomes in the pollen mother cells became doubled. Most of the PMCs showed the formation of 22 bivalents and there were very few quadrivalent formation (figures 1–6). Occasionally trivalents were also noticed. The range of quadrivalent formation was 0–10 (table 1). The anaphase separation of chromosomes was more or less regular with rare occurrence of lagging chromosomes. Microsporogenesis was also normal except occasional formation of diads, triads and pentads. Pollen sterility was low with only 13–16% sterile pollen grains as compared to 5% in the diploids. Pollen size was also bigger in the autotetraploids than in the diploids.

Table 1 Metaphase I configuration in induced autotetraploids of *Salvia coccinea*

Variety-Pink Pearl and Red Indian,
Total number of metaphase observed 38 and 53.

Nature of configuration	Frequency (No. of PMC)
22 II	15
1 IV + 20 II	4
2 IV + 18 II	3
3 IV + 16 II	2
4 IV + 14 II	6
5 IV + 12 II	2
6 IV + 10 II	4
8 IV + 6 II	2
22 II	17
1 IV + 20 II	7
2 IV + 18 II	6
3 IV + 16 II	3
4 IV + 14 II	4
5 IV + 12 II	4
6 IV + 10 II	6
7 IV + 8 II	1
8 IV + 6 II	2
9 IV + 4 II	2
10 IV + 2 II	1

Formation of tetravalents is one indication of autotetraploidy, but in the present investigation tetravalent formation was low. This may be due to several factors. Stebbins⁴ stated that in the first place, even when 4 chromosomes are completely homologous with each other, they do not always form quadrivalents at first metaphase. Since at pachytene, chromosome segments associated with another homologue over only a part of its length. If chiasmata fail to form in these paired regions the chromosomes will not remain paired at metaphase. Since chiasma frequency depends on chromosome length, polyploids in plants

having small chromosomes are much less likely to form multivalents than those with large chromosomes. Furthermore, since chiasma frequency is, in part, genotypically controlled, diploids which contain genes for lower chiasma frequency are likely to produce polyploids forming a few or no multivalents. Studies by the author⁵ on the chiasma frequency of the diploids of *S. coccinea* may be attributed to their minute chromosome size. It is also likely that some genes may be responsible for low chiasma frequency that facilitates more bivalent formation. The low percentage of pollen sterility may also be explained on the basis of low chromosomal abnormalities in the autotetraploids.

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2. Haque, M. S., *Indian J. Bot.*, 1982, 5, 83.
3. Khoshoo, T. N., *Indian J. Genet.*, 1968, A28, 187.
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A HOODED MUTANT IN BARLEY

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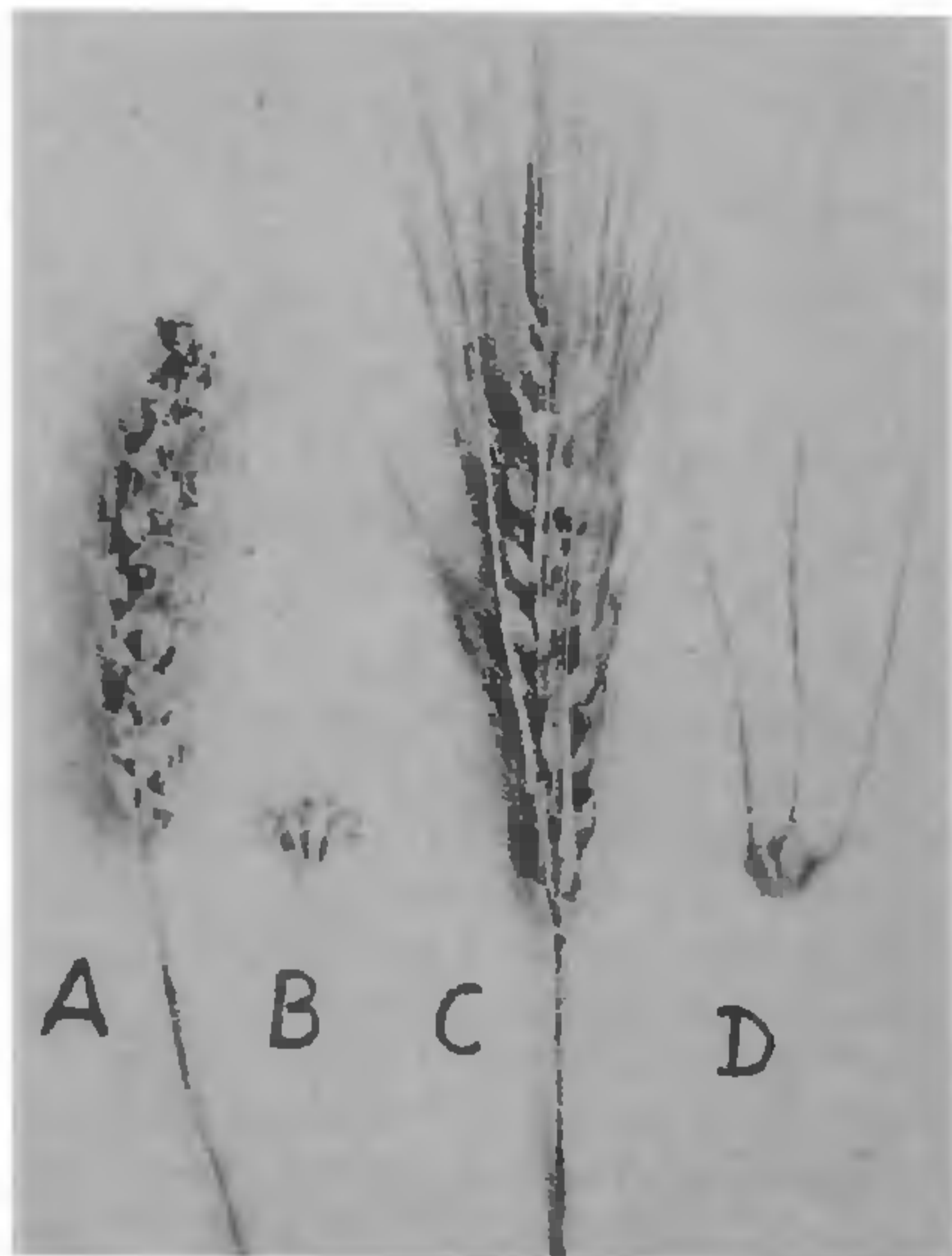
IN the F_2 generation of a cross BG108 × DL70, a hooded plant was identified. There was a small awn at the tip of each hood (figures A–D). As there was a single such plant in the large F_2 population of the above said cross, it was inferred that it is a spontaneous mutant and not a recombinant. When its progeny was grown, it bred true. This mutant (hooded) was crossed with BG108 and DL70 (normal). The heterozygous F_1 's were normal. In the F_2 generation, the characters segregated in the ratio of 3 normal and 1 hooded (table 1). When the F_2 plants were selfed and their progenies were examined, as expected, all the F_2 hooded plants were homozygous, but only a third of the normal plants were homozygous, and gave rise exclusively to normal progeny. The

Table 1 Segregation of normal and hooded ear heads in F_2

Cross	F_1	F_2		Expected ratio	X^2	P
		Normal	Hooded			
BG108 × Mutant	Normal	256	93	3:1	0.505	.01-.30
DL 70 × Mutant	Normal	244	91	3:1	0.837	.01-.30
Pooled		500	184	3:1	1.318	.01-.20

Table 2 Breeding behaviour of F_3 progenies in respect of normal and hooded ear heads

Cross	F_2 phenotype	F_3 breeding behaviour			X^2	P
		Normal	Segregating	Hooded		
BG108 × Mutant	Normal	12	30	—	0.428	.01-.50
	Hooded	—	—	10	—	
DL70 × Mutant	Normal	16	26	—	0.499	.01-.50
	Hooded	—	—	10	—	



Figures A-D. A. Hooded ear, B. Traid of spikelets from hooded ear, C. Normal ear, D. Traid of spikelets from normal ear.

remaining two thirds were heterozygous as shown by segregation in the F_3 (table 2).

The inheritance of the present mutant revealed that it was recessive and hooded character to be monogenically controlled. Based on its genetic control the gene responsible for hooded trait may be designated as *kk*. In literature, hooded trait has been reported of dominant type¹.

This mutant is a very good combiner as in the segregating generation it invariably gives segregates of stiff straw and long ear heads.

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1. Wiebe, G. A. and Reid, D. A., *U.S. Deptt. Agric. Tech. Bull.*, 1961, 1224.