ACCESSORY GYNOECIA AND CARPELS IN *SOLANUM NIGRUM* L. COMPLEX THROUGH GAMMA RAYS

Dry seeds of diploid, tetraploid and hexaploid *S. nigrum* having 11 per cent moisture were irradiated with 10, 20, 30, 40, 50, 60, and 70 k rad doses of gamma rays in the Radiation Biology Laboratory of the Institute from a60°C Source. Plants survived up to 40 k rad in diploid, 50 k rad in tetraploid and 30 k rad in hexaploid.

Diploid, tetraploid and hexaploid plants under un-irradiated conditions have a single gynoecium per flower and this gynoecium is composed of two carpels ; the ovary is syncarpous and bilocular. In plants grown from gamma irradiated seeds, the gynoecium constitution in majority of the cases examined was similar as described for the control. However, variations in the number of carpels in a gynoecium occur in a good number of cases where it was either three or four having tri- or tetralocular ovaries respectively (Fig. 1). Formation of tetracarpellary gynoecium was not so common as tricarpellary ones. Frequency of tri- or tetracarpellary gynoecia was higher in diploid, tetraploid and hexaploid group given 40, 50 and 30 k rad respectively as compared to lower dosages. In general, frequency of tricarpellary condition was higher in diploid and tetraploid as compared to hexaploid, as is evident from the table 1.

Beside this, presence of two separate gynoecia per flower was observed in all the ploidy group under treatments of 10 and 20 k rads in diploid, 50 k rad in tetraploid and 30 k rad in hexaploid (Figs. 1, 2). These gynoecia were encircled by the same whorl of calyx, sometimes carolla also, thus indicating additional gynoecia per flower. In constitution, the accessory gynoecia in addition to bicarpellary condition may be either tri- or tetracarpellary (Figs. 1, 2).

Formation of accessory gynoecia due to irradiation has been reported by SINGH AND GUNCKEL (1965) in *Ricinus communis*. Accessory gynoecia have also been observed in control plants by FAROOQ (1952) in *Citrus media* and SINGH (1956) in *Trewia nudiflora* which are parennials.

Table-1—Variations in the number of carpels per gynoecium in the flowers of different ploidy group in response to higher doses of treatments

S. no.	Ploidy group	Treatament	Total no. of cases studied	Gynoecium with two carpels		Gynoecium with three carpels		Gynoecium with four carpels	
				No.	%	No.	%	No.	%
1	2 × ..	Control ..	55	54	98.2	1	1.8	×	×
2	2 × ..	40 k rad ..	50	45	90.0	4	8.0	1	2
3	4 × ..	Control ..	66	66	100.0	×	×	×	×
4	4 × ..	50 k rad ..	50	40	80.0	8	16.0	2	4
5	6 × ..	Control ..	54	54	100.0	×	×	×	×
6	6 × ..	30 k rad ..	50	47	94.0	2	4.0	1	2

GUNCKEL AND SPARROW (1954, 1961) and HESLOP—HARRISON (1957) have suggested that accessory gynoecia are formed due to induced physiological changes rather than genetic ones. Present authors also agree with the suggestion of the above workers and think that the formation of extra primordium (primordia) is the basis for such variations.

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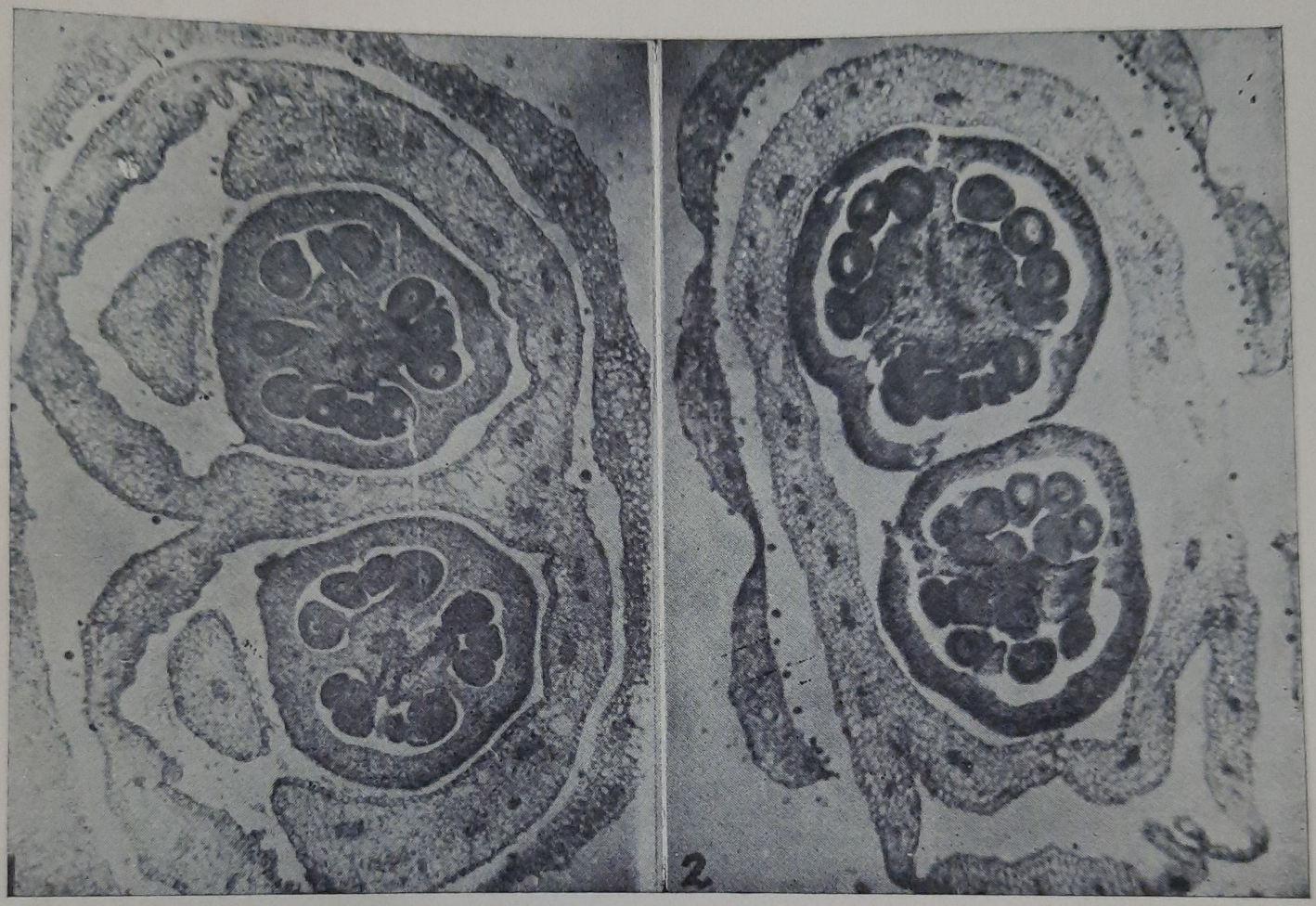
EXPLANATION OF PLATE 1

1-2 : 1. C. S. of flower showing accessory gynoecia, ovary in one is trilocular, while in other it is tetralocular (Tetraploid at 50 k rad) ×30. 2. C. S. of flower showing accessory gynoecia, ovary is trilocular (diploid at 10 k rad) ×50.


1
2