cytes asd rarely from the young spermatids. The mode of formation of these cells as observed during the present investigations was due to the fusion of the cleaving cells. Rao and Srivastava[5], had suggested that giant cells could be formed by cell fusion, possibly by fatty degeneration of cell membrane. Montgomery *et al.*[6], had also reported that giant cells were formed by the fusion of the plasma membrane.

According to Amoroso[7], the giant cells were generally formed because of the macrophages which swell the young developing spermatids.

The present observations indicate the lag effect due to irradiation thus interfering with the regular spermatocytic divisions and thereby causing the fusion instead of forming the spermatids. The detailed chemical sequence will be published eslewhere.

Thanks are due to Professor A. S. Kapoor, for providing facilities in the Department. One of us (M.S.) also thanks C.S.I.R., for the award of Junior Research Fellowship.

Cell Biology Section,
Department of Zoology,
University of Rajasthan,
Jaipur-4, *September* 22, 1975.

MADHU SAXENA.
R. S. MATHUR.

1. Barratt, J. O. and Arnold, G., *Arch Zellforsch*, 1912, 7, 242.
2. Pitcock, J. A., In : *Effects of Ionising Radiation on the Reproductive System*, Ed., W. D. C. Arlson, and F. X. Gassner, Pergamon Press, London, 1964, p. 156.
3. Deschner, E. E., Rugh, R. and Grupp, E., *Milit. Med.*, 1960, 125, 447.
4. Bhatia, A. L., *Curr. Sci.*, 1975, 44, 470.
5. Rao, A. R. and Srivastava, P. N., *Experimentia*, 1967, 23, 381.
6. Montgomery, P. O. B., Karney, D., Reynolds, R. C. and Mcclendon, D., *Am. J. Path.*, 1964, 44, 727.
7. Amoroso, E. C., In : *Radiation Effects in Physics. Chemistry and Biology*, Ed. M. Ebert and A. Howard, North-Holland, Publishing Co., Amsterdam, 1963, p. 424.

CYTOLOGICAL STUDIES IN ATEMOYA (*ANNONA ATEMOYA* HORT.)

ATEMOYA is a hybrid between Cherimoya (*A. cherimola* Mill.) and Custard apple (*A. squamosa* L.). Atemoya is a distinct improvement in respect of seedlessness and fruit quality on either of the parents. The low bearing habit of this crop is considered to be its greatest drawback. The studies on cytological aspects, *viz.*, pollen sterility, pollen germination and meiosis were undertaken to know the cytological reasons associated with low fruit set.

The pollen sterility, in the present study, was high (Table I), during May and June when the temperature was high and humidity low. Thakur and Singh[1] observed that the pollens were not fertile till the end of July.

TABLE I
Pollen sterility in Annona atemoya

Month	% of sterile pollens	Monthly Av. Temp. in °C		Av. Relative Humidity %
		Max.	Min.	
May	58	39	17	38
June	55	37	15	36
July	33	34	14	66
August	30	31	13	74

The pollen grain germination was tried in sucrose solution (10, 15, 20 and 25%), *plus* agar-agar (1%), stigmatic secretion of *A. atemoya, A. squamosa* and *A. atemoya plus A. squamosa,* Gibberellic acid (10, 25, 50 and 75 ppm) and water. The maximum pollen germination (8·6%) was observed in stigmatic secretion of *A. atemoya.* The low pollen germ nation may be due to the compound nature of pollen grain with thick exine. Thakur and Singh[1], reported 11·6% pollen germination in 20% sucrose solution.

The flower buds for meiotic studies were fixed in propiono-acetic alcohol and squashed in 1% propiono-carmine. The meiotic study confirms $n = 7$ as chromosome number of Atemoya. The regular meiosis was observed in only 52% of the cells (Table II). The presence of univalents was due

TABLE II
Chromosomal associations at Diakinesis and Metaphase in Annona atemoya

No. of PMC's observed	Chromosomal bodies	Univalents	Bivalents	% of particular association
4	9	4	5	16
3	8	2	6	12
1	13	12	1	4
2	14	14	0	8
1	10	6	4	4
13	7	0	7	52
1	11	8	3	4

to the lack of pairing and the most common configuration was found to be 5 II + 4 I. However, data reveal irregular meiosis in 48% cells. Thakur and Singh[2], reported $n = 7$ as chromosome number of Atemoya and observed varying number of univalents in some of the cells.

The chromosomal separation in anaphase-I (Table III) was abnormal in 36% of the cells. Three chromosomal groups were also observed in some of the cells. This extra group of chromosomes was due to the formation of laggards which might have resulted from the failure of chromosomal pairing. Thakur and Singh[2], have also reported unequal anaphase separation and three groups of chromosomes.

TABLE III

Distribution of chromosomes at anaphase-I in Annona stemoya

Sl. No.	Extent of un/equal distribution	No. of cells	% of cells
1.	PMC's with equal distribution as 7:7	16	64
2.	PMC's with unequal distribution as (1) 6:8	1	4
	(2) 5:9	1	4
3.	PMC's with unequal distribution with laggards	7	28

The present study indicated high (43·9%) pollen sterility which is due to irregular meiosis (48%) and subsequent abnormal chromosomal distribution (36%). The low pollen fertility and germination finally hinder fruit setting in *A. atemoya*.

Marathwada Agricultural University,
Parahani,
August 28, 1975.

S. V. KSHIRSAGAR.
S. T. BORIKAR.
N. N. SHINDE.
U. G. KULKARNI.

1. Thakur, D. R. and Singh, R. N., *Ind. J. Hort.*, 1965. 22. 10.
2. — and —, *Ind. J. Genet.*, 1965, p. 367.

OLIGOGYNOPHORIA, A VIRUS INDUCED LESION IN THE GROUNDNUT, *ARACHIS HYPOGAEA* L.

FOLLOWING the report of the new virus, infecting the groundnut *Arachis hypogaea* L.[1], physiological alterations brought about by this virus on its host were studied. These studies[2] and field observations formed the basis for postulation of "oligogynophoria" as a pathological condition resulting in the host plant under the hegemony of groundnut chlorotic spot virus. The term "oligogynophoria"[2] was tentatively defined as "pathological reduction in the number of gynophores".

With an aim to obtain a clearer definition of oligogynophoria in the groundnut plant under viral influence, a batch each of healthy and infected (under apparent attack of groundnut chlorotic spot virus) plants were collected from fields near Nagari, Andhra Pradesh. A visual examination of the healthy and infected "fruit systems" revealed *prima facie* oligogynophoria (Fig. 1). Three types

FIG. 1. Oligogynophoria in groundnut (*Arachis hypogaea* L.) under the influence of groundnut chlorotic spot virus. Upper row—Healthy "fruit systems" ; Lower row—Virus-affected "fruit systems".

of gynophores were marked out for statistical processing[3] of numerical data. Fruiting gynophores : gynophores with terminal fruits with hardened shells ; headed gynophores : with terminal fruits in which no hardening of shell was noticeable[3] ; headless gynophores : bearing no terminal fruit (gynoecium) at all. The total gynophores (aggregate of fruiting, headed and headless gynophores of each fruit system) showed no statistically significant difference between healthy and affected plants (Table I). Viral attack evidently does not cause numerical diminution of gynophores, Even the headless gynophores (which probably represent flowers which were not cleistogamously fertilized) exhibited no statistical alteration under viral infection. On the other hand the "fruiting" and "headed" gynophores showed statistically significant alterations under viral influence. The numbers of fruiting and headed gynophores exhibited an inverse alteration under viral affectation : The fruiting gynophores were predominant in the healthy plant over headed gynophores and in the virus-affected plants, the "headed" gynophores were preponderant. In the healthy (virus-unaffected) plants greater number of headed gynophores should obviously have been driven into the condition of "fruiting" ;