FORMATION OF CYNCYTE IN THE POLLEN MOTHER CELLS OF *PETUNIA HYBRIDA*

by

Dr. Islam Mahmood Khan*

Summary. *In the progeny of the X-ray treated plants a haploid was discovered which was then made diploid by treating it with colchicine. The pollen mother cells in the autodiploid petunia showed a remarkable shape with continuous cytoplasm and without partition walls. The chromosomes were scattered in lots of different sizes. These pollen grains resembled the synocytes described by Levan* 1914.

Introduction. Blakeslee et al discovered the Ist haploid (Datura) in 1922. Just after him reports on the haploid higher plants, belonging to different types, started appearing and now the estimate of the haploid plants reported has gone well above 200.

The study of haploid plants normally diploid have revealed very interesting cytological abnormalities specially during meiosis, the pairing of the chromosomes have been of immense value for the cytologist.

In 1963 a haploid *Pentunia hybrida* was produced by the author, Islam M.K. 1963, with the help of X-rays which was further treated with colchicine. In the present work an unexpected change was noticed in Petunia in which all the chromosomes, cytoplasm and the cell wall of all the pollen mother cells was involved.

Material and Methods. *Petunia hybrida* Vilm. h 25 c was given 1700 r dose of X-rays when they were in somewhat seven leaves stage total ca. 2000 plants were treated. After selfing the progeny raised was studied cytologically and for this purpose plants sterile or morphologically effected were selected.

Anthers were fixed in Carnoy's solution 3:1 Alcohol and Acetic acid and stained in Carmine acetic acid Darlington C.D. and Lacour. F.L. The autodiploid were produced by placing cotton soaked in 1% Colchicine solution on the growing regions of the plants.

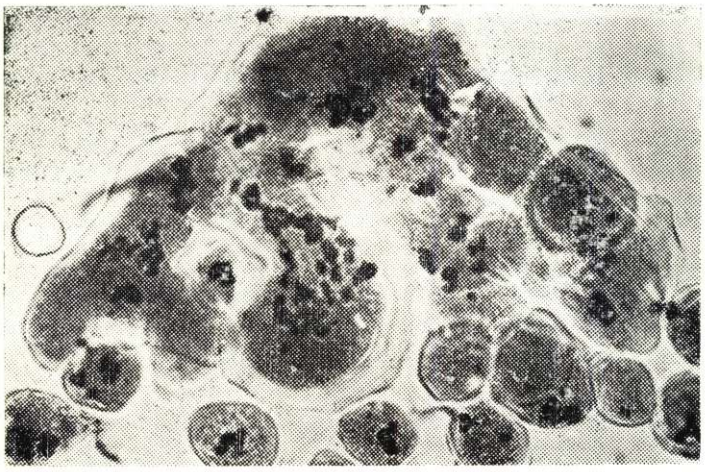
Observations. S 17 plants were produced by treating the haploid with colchicine (S 17 lb.). A single plant differed from the rest of S 17 lb plant morphologically e.g. in yellowish colour smaller and strongly deformed leaves and weaker stems. The meiosis in these plants was remarkable, Fig: 1 and 2. The pollen mother cells did not separate from one another and so large masses were produced in such a way that the cytoplasm was continuous.

The plasma masses could be observed by the nacked eye and easily handled. The chromosomes were found scattered in these large irregular cells and the chromosome

*The author is Assistant Professor in the Botany Dept. University of Peshawar.

number in each of the lot varied from a few to an innumberable extent. S 17 lb was unable to produce any viable pollen grains. The pollen grains formed have been of different and irregular size depending upon the number of chromosome enclosed in them.

Discussion. Gates (1911) used the term cytomixis for the migration of cytoplasm from one pollen mother cell to the adjacent in *Oenothera gigas*, Levan (1914) reported in haploid the fusion of thirty microspores *Phleum pratense* forming large plasmodia or "Syncytes". In this plant the gaint cells was not produced by the dissolving of the wall but failed in forming a wall in a regular way, so that an irregular mass of pollen mother cells in which it is difficult to estimate the number of cells present is produced. This is a strange mutation produced by the X-rays in which P.M.C. is unable to lay a partition wall. The mutations produced uptill now have been genome, chromosome, point and cytoplasmic type. But this mutation was the P.M.C. wall mutation. However this character could not be preserved because of the inviable pollen grains.



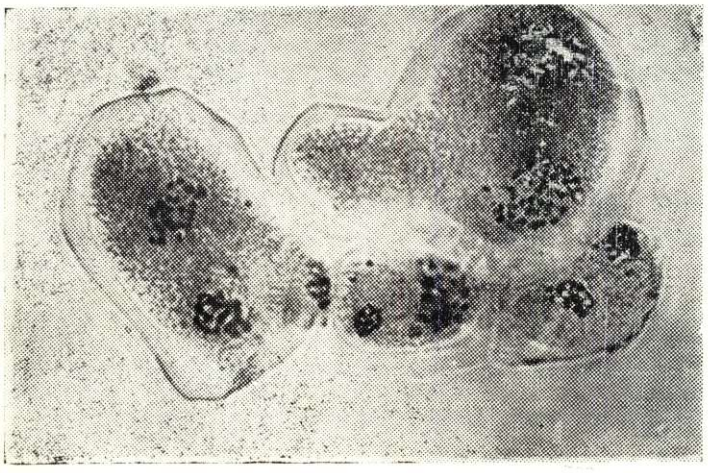


Figure 1 & 2: Pollen mother cells of S 17 lb. plant showing continuous cyto-plasm and chromosomes scattered in lots of different size depending upon the number of chromosomes.

References

1. BLAKESLEE A.F., BELLING, J., FARNHAM M.E., and A.D. BERGNER; "A haploid mutation in the Jimson weed" Science 55, 646-648 (1922).

2. ISLAM M. KHAN, (1963). "Ph.D. Thesis" Submitted to the University of Cologne, West Germany.

3. DARLINGTON, C.D. and LACOUR, F.L. a cour. "The handling of chromosomes" G. Allen, London (1942).

4. STRAUB, J. WEGE ZUR "POLYPLOIDIE" (1941).

5. GATES, R. (1911). "Pollen formation in *Oenothera gigas*" Ann; Bot; 25; 909-940.

6. LEVAN, A. (1914). "Syncyte formation in the P.M.C. of haploid *Phleum pratense*" Hereditas 27; 243-252.