

A Review :

MONITORING OF HERBICIDE (MH) TOXICITY BY USING POLLEN AS INDICATORS - POLLEN OF *Phaseolus aureus* ROXB. VAR. J -781 - MUNG: FURTHER EVIDENCE OF A CRITICISM OF BANERJI AND GANGULEE (1937), DHARURKAR (1971 - Ph.D. THESIS), NAIR, NAMBU DIRI, THOMAS (1973), BERG (1973), BRANDT (1974), VICK AND BEVAN (1976), RASMUSAN (1977), NAVARA, HORVATH AND KALETA (1978), MHATRE (1980 - Ph.D. THESIS), MHATRE, CHAPHEKAR, RAMANI RAO, PATIL, HALDAR (1980), SHETYE (1982 - Ph.D. THESIS) AND GIRIDHAR (1984 - Ph.D. THESIS)

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ABSTRACT

Foliar applications of all the concentrations of MH above 800 mg/ml prevented the flowering. None of the concentrations of MH could suppress the cent percent pollen fertility which is essential for the successful plant breeding program. However, as low as 400 mg/ml MH treatment suppressed the germinability of pollen of *Phaseolus aureus* Roxb. Var. J-781 mung. When there is no germination of pollen than the transfer of the male gametes to the female does not take place. Hence we should explore this new method of plant breeding which is very economical one. The treatment of 400 mg/ml MH inhibited the germination of pollen and tube growth even after 8 weeks of treatment. This proves that the pollen is highly sensitive and acts as an ideal indicator of pollution. However, the treatment of 100 and 200 mg/ml MH stimulated the germination of pollen as well as tube growth. This proves that MH can be used as growth substance. Pollen of F-24 and F-48 series produced higher percentage of germination with the longer tubes than F series. This proves that the use of pollen of F series is not ideal for pollen storage and their subsequent use in plant breeding program which is used in the existing method. Present investigation also proves that the pollen tube growth is more sensitive than pollen germination.

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Palynology, in recent years has attracted the attention of workers of different disciplines on account of its numerous applications to problems of plant taxonomy, palaeobotany, genetics, geology, medical and agricultural sciences. Pollen physiology furnishes the information required for effecting hybridization of plants growing in different geographical and climatic regions with blooms in different seasons.

MATERIALS AND METHODS

Seeds of *Phaseolus aureus* Roxb. Var. J-781 mung were obtained from the authorized dealers and were sown in the garden soil at the Institute of Science, Mumbai.

Foliar applications of 5, 10, 25, 50, 100, 200-200-1000, 1000-1000-5000 mg/ml maleic hydrazide (MH) (1,2-dihydropyridazine, 3-6-dione) were given to 3 weeks old crop (at pre-flowering stage) of *P. aureus* by an air-compressor. After 8 weeks of treatment successive flowers (*viz.* F, F-24, F-48, F-72 series *i.e.* open flowers and the flower buds which require 24, 48, 72 hours to open respectively.) were plucked at the same time after the dehiscence of anthers (in open flowers). Pollen viability was tested by using 2,3,5-triphenyl tetrazolium chloride⁶. An optimum concentrations (10% for F-24 series, 20% for F and F-48 series, 30% for F-72 series) of sucrose were used for the germination of pollen of successive flowers. Pollen grains were incubated soon after the dehiscence of anthers. The cultures were then transferred to a moist filter chamber, stored at room