Internat. J. Plant Sci. Vol.2 No.2 July 2007 : 261-263

Review

Variation in the resting period of pollen of successive flowers of five forms of *petunia axillaris* bsp. *In vitro* culture of sugars (D-glucose and sucrose) and further evidence of a criticism of Saoji and Chitaley (1972)

S.A.SALGARE
Salgare Research Foundation Pvt. Ltd., Prathamesh Society, Shivaji Chowk, KARJAT (M.S.) INDIA

(Accepted :May, 2007)

Key words : Palynology, Physiology of pollen, Environmental Sciences.

The sugar acts as an external source of nutritive material for the germination of pollen as well as for the growth of tube. For proper germination, near similarity in the osmotic concentration of the nutrient medium and that of the pollen is a pre-requisite. The role of sugars in the germination is a controversial problem.

Pollen of 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) of 5 forms of *Petunia axillaris* BSP. were collected soon after the dehiscence of anthers in the open flowers. Pollen viability was tested by using 2,3,5-triphenyl tetrazolium chloride (Hauser and Morrison, 1964). Germination of pollen grains of successive flowers was studied by standing-drop technique in the optimum concentrations of D-Glucose and Sucrose (Table 1). Pollen grains were incubated soon after the dehiscence of anthers. The cultures were then transferred to a moist filter chamber, stored at room temperature (27.6-32.8°C) having RH 60% and in diffuse laboratory light. The experiments were run in triplicate and average results were recorded. The rate of pollen germination of successive flowers was determined by fixing the cultures at one hour intervals. Such preparations were continued for 10 hours. Observations on the germination of pollen were recorded 24 hours after incubation. For each experiment a random count of 100 grains was made to determine the pollen viability and germination.

Pollen viability was found highest in white-flowered form and minimum in violet-flowered form of *Petunia axillaries* (Table 1). This proves that the viability of pollen varies from form to form of the same species. Potentiality of germinability of pollen was noted *in vitro* culture of D-Glucose in F and F-24 series of all the 5 forms of *Petunia axillaris*, and in F-48 series of pink-, violet- and white-violet-flowered forms. However, the potentiality of germinability of pollen *in vitro* culture of Sucrose was found to be in F and F-24 series of all the 5 forms, while in F-48 series it was noted only in white-flowered form. This proves that the D-Glucose is the ideal culture medium for *Petunia axillaris* (Table 1).

The delay in pollen germination was interpreted by Saoji and Chitaley (1972) as being due to the grains not being mature enough to effect pollination, immediately after being shed from the anther. Further they stated that 4-5 hours are required for the complete maturation of pollen grains. It was Salgare (1983) who pointed out for the first time that the pollen require resting period before germination. The present work (Table 1) as well as the extensive work of Salgare (1983, 84, 85, 2001, 04, 05a, b, 06), Salgare and Theresa Sebastian (1986), Salgare and Joshi (1991), Salgare and Shashi Yadav (2002, 05) and Salgare and Sanchita Pathak (2002, 05) also supported the theory of Salgare (1983). Further they stated that it was the failure of Saoji and Chitaley (1972) who misinterpreted the resting period for pollen maturity. This resting period differs species to species or even forms to forms of the same species which is also noted in the present investigation (Table 1). This resting period is altered by different chemicals and environmental factors.

In vitro culture of D-Glucose pollen of F as well as F-24 series of light-violet-flowered form were found germinated after one hour of sowing, while the pollen of F-24 series of pink-flowered form and F-48 series of white-violet-flowered form failed to germinate even 10 hours of their sowing. It could be concluded that except for the light-violet-flowered form the resting period of pollen of F-24 series as compared with F series is extended *in vitro* culture of D-Glucose (Table 1). *In vitro* culture of Sucrose pollen of F series of light-violet, pink- and white-violet-flowered forms and F-24 series of white-violet-flowered form showed their germination after one