

POLLEN GERMINATION CAPACITY AND MAINTENANCE OF POLLEN IN *PRAECITRULLUS FISTULOSUS* (STOCKS) PANGOLA (CUCURBITACEAE)

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Abstract

Pollen germination of *Praecitrullus fistulosus* L., of the family Cucurbitaceae was examined in fresh and stored pollen upto 48 weeks at different temperatures i.e., -30°C refrigerator (+4°C), freezer (-20° C, -30°C) and freeze drier (-60°C). Pollen stored at low temperature showed better germination percentage as compared to pollen stored at +4°C and fresh. Pollen stored at -30°C (freezer) showed the highest germination percentage.

Introduction

Cucurbits are a well-recognized source of secondary metabolites and important group of vegetable crop comprising both wild and cultivated species (Whitaker & Davis, 1962). Pollen storage is the most efficient method to overcome barrier to hybridization between plants flowering at different times or growing in different regions. Vasil (1960) reported that -5°C to 8°C and 20-50% relative humidity are suitable for long term storage of cucurbits pollen. Lilium pollen showed good germination at -30°C and -60°C and under low humidity (Saxena & Saini, 1997). Pollen shows better germination capacity at low temperature than at high temperature and the ability of pollen to grow is dependent upon the inherent chemistry of the pollen (Stanley, 1971).

There are several reports on pollen germination and viability of different taxa like Maestro & Alvarez (1988), Stree & Stree (1989), Nepi & Panini (1993), with varied aims and objectives. Recently, extensive studies have been carried on storage and viability of pollen, such as Kopp *et al.*, (2000), Thomas (2000), Ondrej *et al.*, (2002) and Perveen (2007).

In vitro pollen germination of *Cucumis sativis* L., (Cucumber) and viability has been examined by Vizintin & Bohanec (2004). Similarly, Khan & Perveen (2006 a,b) studied the germination capacity of *Abelmoschus esculentus* and *Solanum melongena*.

Zaman (2006) studied pollen germination and viability of fourteen cultivated and wild species of Cucurbitaceae from Bangladesh. However, present investigation is the first attempt to examine the storage condition of *Praecitrullus fistulosus*. No reports are available on maintenance and germination capacity of stored pollen of this economically important plant.

Materials and Methods

Pollen were collected in large quantity from farms during the flowering period of *Praecitrullus fistulosus*. Fresh pollen were systematically subjected to preliminary viability tests (Alexander, 1969). Pollen culture media were prepared according to standard method of Brewbaker & Kwack (1963).

Table 1. Germination capacity of stored pollen of *Pracitrullus fitulosus* (Cucurbitaceae) at different temperature and humidity conditions in sucrose and boric acid solutions.

Different temperature and humidity condition							
Period in week	% of Germination at 4°C	% of solutions	% of Germination at -20°C	% of solutions	% of Germination at -30°C	% of solutions	% of Germination at -60°C
4	58.30	30	60.00	40	78.90	40	87.30
8	50.00	30	55.00	30	73.80	40	86.10
12	55.5	30	62.00	30	74.30	40	86.00
16	56.50	30	54.00	30	80.00	40	84.70
20	54.50	30	58.30	30	75.00	40	80.50
24	61.10	30	66.60	30	71.10	40	75.30
28	59.00	30	57.70	30	67.20	40	75.10
32	51.61	30	52.00	30	63.00	40	70.30
36	45.66	30	50.60	30	65.60	40	71.20
40	43.00	30	31.20	30	65.60	40	68.50
44	40.00	30	48.70	30	64.60	40	63.10
48	38.0	30	41.70	30	66.00	40	60.00

Pollen tube equal to at least twice the diameter of pollen grains were considered as germinated, while burst pollen were not considered. The viability of stored pollen was assessed in terms of germination percentage. The stored pollen were germinated in humidity chamber in different sucrose solutions ranging from 20-70% to which 10% boric acid was added. Pollen grains were mounted in unstained glycerin jelly for light microscope and observations were made with a Nikon type- 2 microscope.

Results and Discussions

Pollen viability of *Praecitrullus fistulosus* (Cucurbitaceae) has been examined upto 48 weeks in different storage conditions viz., refrigerator at (+4°C), freezer (-20°C, -30°C) and freeze drier (-60°C). Pollen grain are trinucleate. Pollen at room temperature showed 66% germination in 40% sucrose solutions to which 10% boric acid was added.

This species showed better germination percentage upto 32 weeks in all storage conditions such as +4°C, 20°C, -30°C and -60°C but the germination percentage decreased slowly after 32 weeks. Pollen stored at low temperature i.e., in freezer and freeze drier showed better germination percentage in 30%, 40% solutions in between 36 weeks, but after that germination percentage decreased slowly. *Cucumis melo* L., pollen showed better germination at 30°C (Maestro & Alvarez, 1988). Zaman (2006) recorded highest germination in *Cucurbita maxima* Duch ex Poir. (Pumpkin) and lowest in *Trichosanthes dioica* Roxb. (pointed gourd). *Citrullus lanatus* L. pollen showed 51.50% germination after 48 weeks of storage in freeze drier (Khan & Perveen 2010). Pollen stored at +4°C and -20°C showed reasonable germination but with the increase in time the germination percentage gradually decreased and after 48 weeks the germination was 38% and 41.70 % respectively (Table 1). However, germination percentage of fresh and freezer pollen (-30°C) after 48 weeks of storage is almost same (66%). Pollen stored at -60°C showed 60% after 48 weeks of storage compared to -30°C (freezer) (Table 1). Hence, -30°C is more suitable condition than freeze drier for *Praecitrullus fistulosus* for long term storage. *Cucumis melo* L., pollen showed better germination at 30°C (Maestro & Alvarez, 1988).

Acknowledgement

We are grateful to Pakistan Science Foundation for providing the financial support.

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(Received for publication 10 February 2010)