Pollen Viability in Hybrid Seed Production of Eggplant under Tropical Conditions

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Abstract

Eggplant has been cultivated in Brazil mainly using hybrid seeds. Some important physiological aspects must be taken in account in order to obtain both optimum eggplant F1-hybrid seed yield and genetic quality. In general, pollination is done in the morning using pollen harvested from fresh-open flowers on the same day. Sometimes it is necessary to store pollen for a certain period in order to proceed with pollination later and/or be sent to other places during hybrid seed production. This study was carried out in Brasilia, DF, during 2000, aiming to determine the viability of pollen of eggplant 'Ciça' during storage. Pollen was collected from the male line flowers by using a vibrator. Pollen was then stored in Eppendorf microtubes and placed in an aluminum container with silica gel, and kept under refrigeration (5°C). Flowers were manually pollinated using pollen from 0 to 60 days of storage, in ten-day intervals. Fertilization, seed production per fruit, seed weight, and germination were evaluated. Lower fertilization was observed in flowers pollinated with pollen stored for 30 or more days. Pollen stored for 50 and 60 days led to fruits with lower seed quality. For eggplant 'Ciça' at Brazilian conditions, it is advisable to store pollen up to 20 days in order to have high fertilization, optimum seed production, and higher seed quality.

INTRODUCTION

The production of eggplant in Brazil is estimated in 130 ton on 2500 harvested hectares. Annually, about 500 kg of seeds are traded in the whole country. Eggplant has been cultivated mainly by using hybrid seeds.

During hybrid seed production, some important physiological aspects must be taken in consideration in order to obtain both optimum seed yield and genetic quality. In general, pollination is done manually in the morning using pollen harvested from fresh-open flowers in the same day. However, sometimes it is necessary to pollinate later and/or to send the pollen to other places during hybrid seed production. Therefore, it is necessary to store pollen for a certain period. In other solanaceous, as tomato and pepper, studies have reported that pollen may be stored for several weeks, depending on storage conditions, such as temperature and relative humidity, and also on pollen moisture content (Casali et al., 1984; Bezdickova, 1989; Lacerda et al., 1995; Usman et al., 1999; Yogeesha et al., 1999).

The objective of this study was to determine, under tropical conditions, the viability of pollen of eggplant 'Ciça' during storage at 5ºC.

MATERIAL AND METHODS

Plant Material

'Ciça' is an eggplant hybrid from Embrapa Vegetables with resistance to *Colletotrichum gloesporioides* and *Phomopsis vexans*.

Pollen Collection and Storage

Pollen was collected from male flower bud using a vibrator from plants grown under greenhouse conditions. Pollen was stored in Eppendorf microtubes and placed in aluminum container with silica gel and then kept in refrigerator at 5ºC for 0 to 60 days.

Pollination

Female flowers were previously emasculated. Four replications of ten flower buds were manually pollinated in the morning using pollen from each ten-day interval during the storage period.

Seed Extraction and Germination

Seeds were extracted manually from mature fruits, washed, dried for 40 hours at 38ºC and weighted. Four replications of 50 seeds were placed on two layers of germination paper, moistened with distilled water, and incubated at 20-30ºC.

RESULTS AND DISCUSSION

Flowers pollinated with fresh pollen (0 day), 10- and 20-day period had 100% of fruit set (Table 1). Utilization of pollen stored for 30 or more days resulted in lower fruit set. For example, pollen stored for 60 days resulted in only 50% fruit set. Pollen stored for 50 or 60 days also resulted in lower seed production per fruit. In addition, pollen stored for 50 and 60 days led to fruits with lower seed weight and germination (Table 1). In other study, the viability of pollen of *Capsicum* was prolonged under low temperature (Casali et al., 1984). In pepper, Bezdickova (1989) also reported that pollen may be stored for 16 and 60 days at 4ºC and -20ºC, respectively. Further studies of eggplant pollen viability at different store conditions may allow improvements in the hybrid seed production of eggplant under tropical conditions.

CONCLUSIONS

For eggplant cv. Ciça at Brazilian conditions, it is advisable to store pollen at 5ºC up to 20 days in refrigerator (5ºC) in order to have high fertilization, optimum seed production and high seed quality.

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Tables

Table 1. Fertilization rate, seed production, seed weight and seed germination of eggplant 'Ciça'.

Pollen storage (days)	Fertilization rate (%)	Seed production (g / fruit)	Seed weight (g / 100 seeds)	Seed germination (%)
0	100	5.7	0.55	97
10	100	5.0	0.59	99
20	100	5.5	0.59	98
30	60	6.1	0.55	98
40	83	6.3	0.54	99
50	71	2.9	0.47	83
60	50	3.9	0.49	54