

Pollen Viability and Germination Capacity of Some New Sweet Cherry Cultivars

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ABSTRACT

Pollen of 16 new sweet cherry cultivars ('Carmen', 'Katalin', 'Vera', 'Bigarreau Burlat', 'Starking Hardy Giant', 'Early Red', 'Giant Red', 'Lapins', 'Canada Giant', 'Earlise', 'Kordia', 'Karina', 'Merchant', 'Sylvia', 'Regina', 'Summit') was collected and investigated microscopically in laboratory for viability and germination capacity. Pollen viability was determined by applying the colorimetric method, and germination capacity by cultivating pollen on solid medium with 1.5 g agar + 15 g sucrose + 100 ml distilled water. It was noticed that fertile pollen varied from approximately 32 % to 80 %, and the pollen germination percentages after 3 hours of incubation at temperature of 10°C, varied between 15.53 % and 82.75 %. After 24 hours of incubation under the same temperature of 10°C, germination capacity ranged between 23.07 % and 84.51 %. Germination capacity increased with increasing incubation temperature and period, and the highest germination was obtained at the temperature of 20°C after 24 hours of incubation, with 90.09 % capacity of germination in case of 'Carmen' cultivar, and the lowest capacity in case of 'Canada Giant' cultivar, with 42.39 % germination capacity.

Keywords: *Prunul avium L, pollen, sweet cheery, germination, viability.*

INTRODUCTION

Sweet cherry is a fruit-growing tree with a big economic importance, because of the nutritive, commercial and technological characteristics of the fruits (Budan S. and Gradinariu G., 2000). Pollen quality is important because is directly related to crop quantity and quality of the fruits and allows the knowledge of a genotype value as a pollinator in interfertile combination, as well as artificial hybridization (Ardelean, 1994). Pollen germination capacity depends on various conditions, like environmental factors, or nutrition conditions of species and varieties used (Ercisli, 2007).

AIMS AND OBJECTIVES

The objective of this study was to investigate the pollen viability and germination capacity of some new sweet cheery cultivars, using fresh

pollen on the environmental conditions of Cluj-Napoca city, in 2014.

MATERIALS AND METHODS

Pollen viability and germination capacity was evaluate for 16 sweet cherry ('Carmen', 'Katalin', 'Vera', 'Bigarreau Burlat', 'Starking Hardy Giant', 'Early Red', 'Giant Red', 'Lapins', 'Canada Giant', 'Earlise', 'Kordia', 'Karina', 'Merchant', 'Sylvia', 'Regina', 'Summit'), grafted on different rootstocks (Gisella 5, Gisella 6 and Mahaleb) and planted in high density plot (4 x 1,5 m), trained as spindle bush, with trellis system and drip fert-irigation provided. Flowers were collected in April, before opening, from 10 trees of each cultivars. Anthers were removed from flowers in Petri dishes with a medium containing 25% glacial acetic acid and 75% absolute ethyl alcohol. After fixing 2 hours, pollen viability was determined microscopically at

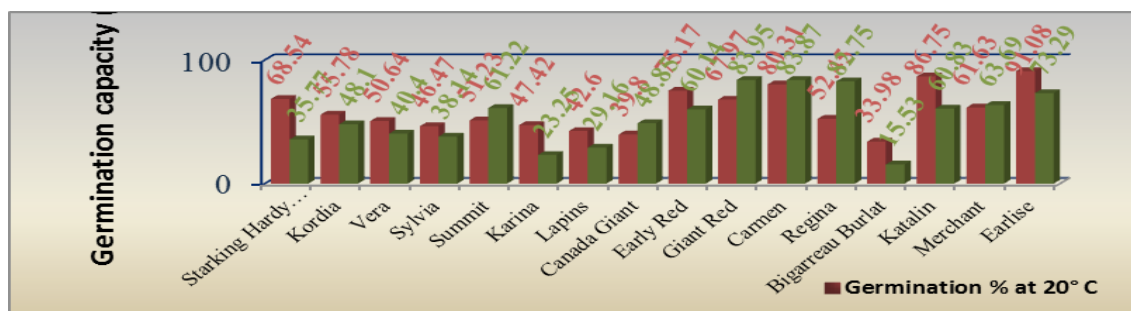


Fig. 1. Pollen germination after 3 hours of incubation at 10°C and 20°C.

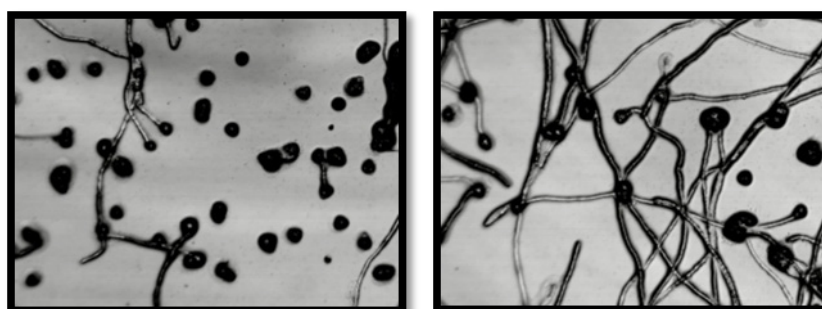


Fig. 2. Pollen germination of sweet cherry cultivars 'Canada Giant' and 'Carmen' after 24 hours of incubation at 20°C.

40x magnification, using the colorimetric method of staining with iodine with potassium iodide. Pollen germination capacity was determined by cultivating pollen in Petri dishes on solid medium using 1.5 g agar + 15 g sucrose + 100 ml distilled water, under 10°C and 20°C incubation temperatures.

RESULTS AND DISCUSSION

Fertile pollen in the presence of the dye, was coloured in carmine red, while sterile pollen remained colourless or slightly coloured. The percent of viability varied from approximately 32 % in 'Summit' and 'Starking Hardy Giant' cultivars to 80% in 'Regina' and 'Carmen' case. Cultivars 'Canada Giant', 'Karina', 'Lapins' and 'Early Red' recorded more than 70% of pollen viability. The pollen germination percentages after 3 hours of incubation at temperature of 10°C, varied between 15.53 % for 'Bigarreau Burlat' cultivar and 82.75 % at 'Regina' cultivar. After 24 hours of incubation under the same temperature of 10°C, germination capacity ranged between 23.07 % in 'Bigarreau Burlat' and 84.51 % in case of 'Carmen' cultivar (Fig. 1).

Maximum pollen germination exceed at the temperature of 20°C after 24 hours of incubation,

with 90.09 % capacity of germination in case of 'Carmen' cultivar, and the lowest capacity in case of 'Canada Giant' cultivar, with 42.39% germination capacity (Fig. 2).

CONCLUSION

From the results in this work, it can be concluded that temperature affect pollen viability and germination capacity, the highest pollen germination rates were obtained at the temperature of 20°C, with 90.09 % capacity of germination in case of 'Carmen' cultivar, and the lowest capacity in case of 'Canada Giant' cultivar, with 42.39% germination capacity.

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