

## **VIABILITATEA ȘI CAPACITATEA DE GERMINARE A POLENULUI LA UNELE GENOTIPURI DE CĂPȘUN**

### **POLLEN VIABILITY AND GERMINATION CAPACITY OF SOME STRAWBERRY GENOTYPES**

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#### **Abstract**

**Pollen viability and germination capacity of strawberry genotypes were investigated using fresh pollen at 24°C. On 2012 environmental conditions of spring, the pollen viability rates showed significant differences from 2.85% up to 84.46% according to different genotypes. Under in vitro conditions the pollen proved different levels of germination using 1.5 g agar + 15 g sucrose + 0,01 g boric acid medium and incubation for 6-8 hours. For preliminary evaluation of strawberry genitors and cross – pollination, both characteristics are important indicators.**

**Keywords:** genotype, fertility, genitors.

**Cuvinte cheie:** genotip, fertilitate, genitori.

#### **1. Introduction**

Evaluation of the pollen viability and germination capacity in strawberry has proved a practical importance, which is directly related to crop quantity and quality and a theoretical one related to the possibility of using genotypes as genitors in cross-pollination (Cociu et al., 1997; Budan and Gradinariu, 2000; Braniste et al., 2004; Butac et al., 2007).

Viability and germination capacity of the pollen varies depending on species and variety as well as internal and external factors: temperature above 35 ° C (Ledesma and Sugiyama, 2005; Giordano et al., 2003) and below 15 ° C (Chira 1963, Roman and Popescu, 1997), brightness (Goss 1971), pesticides and other chemicals (Mac Daniels and Hieldebrand, 1939, Dubey and Mall, 1972), stage of flower development (Lacerda et al., 1994), the nutritional status of the plant (Howlett, 1936).

The objective of this paper is to study the viability and germination capacity of the pollen in some strawberry genotypes with different ploidy level to determine their value as potential genitors.

#### **2. Material and methods**

On 2012 spring, at Research Institute for Fruit Growing Pitesti the pollen viability and capacity germination of 12 strawberry genotypes ('Premial', 'Onebor', 'Record', 'Benton', 'Alba', 'Miss', 'Cambridge Favorite', 'Honeoye', 'Idea', 'Spadeka 10x', '92 – 7 F') were studied.

Flower buttons were collected from open field and anthers were extracted in Petri dishes, were labeled and allowed to dry at 22-24° C. After 36-48 hours, anthers have cracked and pollen have released.

Pollen viability was determined by the method of staining with acetic carmine. Fertile pollen was stained in carmine red and sterile pollen was stained in pink or remained colorless (Shivanna and Johrei, 1985; Cociu and Oprea, 1989, Dafni, 1992, Shivanna and Rangaswany, 1992, Kearns and Inouye, 1993; Botu, 1997).

Pollen germination capacity was determined "in vitro" by cultivating on solid nutrient medium (1.5 g agar + 15 g sucrose + 0.01 g boric acid in 100 ml distilled water), incubating of 6-8 hours at temperature of 24 ° C and relative humidity of 70-90% (Cociu et al., 1989; Dutra et al., 2000; Gomes et al., 2003, Pio et al., 2007). An electronic microscope MC-5 with the objective ×20 was used for reading.

#### **3. Results and discussions**

Taking into account the ploidy of genotypes the pollen viability percentage has varied in wide limits, from 2.85% in 92 -7F (which is an inter-specific genotype) to 84.46% in 'Onebor' cv. Also, 'Spadeka' (which is 10x) has only a few percent of viability. Cultivars 'Alba', 'Record', 'Premial', 'Honeoye' and 'Onebor' recorded more than 70 % of pollen viability (fig. 1 and 2).

Germination capacity percent ranged between less than 10% in 'Miss' and 92-7F and more than 80% in case of 'Alba', 'Onebor', 'Benton' cvs. (fig. 3 and 4).

It is noted to remark the behaviour of 'Miss' cv. which has showed a good pollen viability (68%), but the germination capacity proved a very low percent (6.34 %), and 'Benton' cv. with the highest percent of germination capacity (90.69 %).

The octoploids proved to have a higher germination capacity than as of the other degrees of ploidy (Spadeka 10X, 92-7F mixoploid).

The varieties with higher percentages than 50% - 60% are considered with good capacity of fruits setting and they may be successfully used in breeding.

Pollen viability and germination capacity had averages of 54.83% and 49.67% respectively; standard deviation and variability coefficient had very high values, indicating a high variability and high possibilities to choose genitors for these characters (table 1).

#### 4. Conclusions

'Onebor', 'Premial', 'Record', 'Alba', 'Mira' cvs. may successfully be used in breeding due to their high percent of pollen viability and germination capacity.

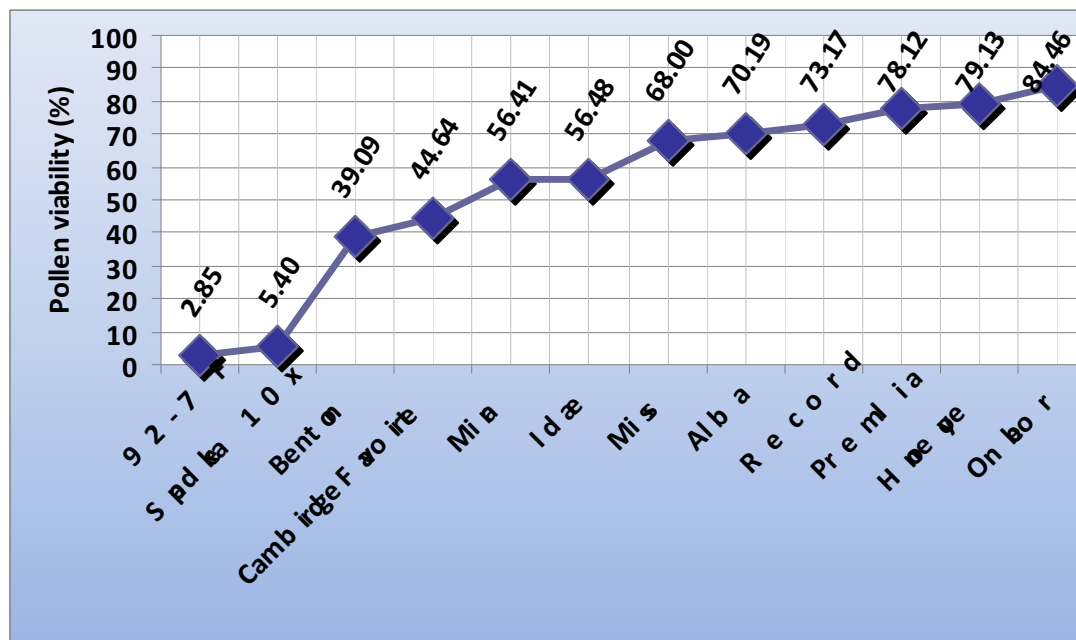
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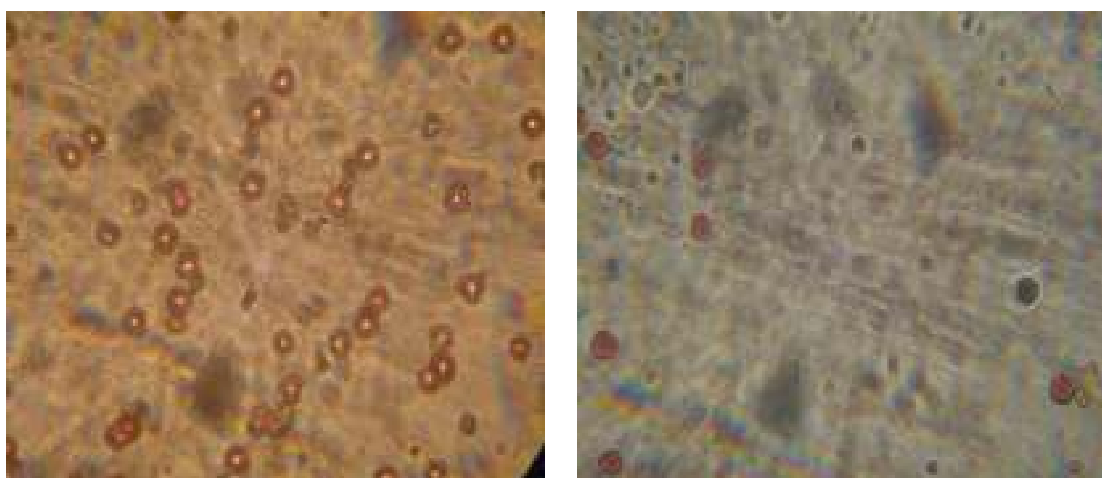
**Tables and figures**

**Table 1. Statistic index on pollen viability and germination**

Statistic index	Pollen viability (%)	Germination capacity (%)
Average	54.83	49.67
Standard deviation	27.4	33.98
Variability coefficient	49.97	68.42



**Fig.1. Pollen viability**



**Onebor cv.**

**Fig. 2: Pollen viability**

**Spadeka cv.**

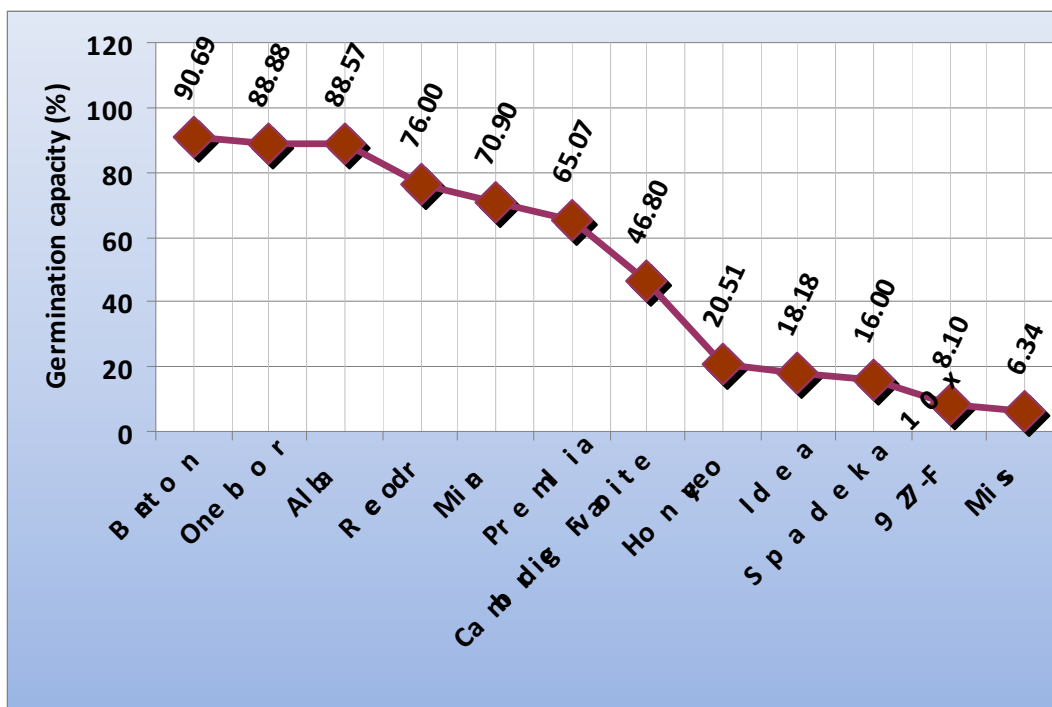


Fig. 3: Germination capacity

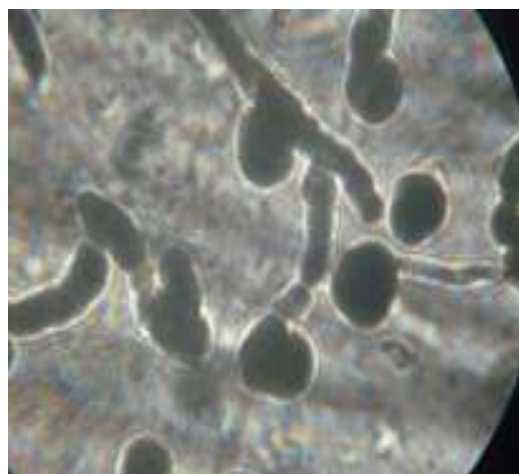


Fig. 4: Germination capacity  
Onebor cv. Spadeka cv.