

THE INFLUENCE OF THE DEGREE OF MATURITY OF OKRA SEEDS  
ON THE GERMINATION OF ACME CULTIVAR

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**ABSTRACT**

*Okra (Abelmoschus esculentus (L.) Moench) are annual plants with an important content in water (86.1%), protein (2.2%), fat (0.2%), carbohydrate (9.7%), fiber (1%) and ash (0.8 %). The objective of this research was to show the influence of the degree of maturation of the okra seeds on the germination of the Acme variety. The experience was carried out in 2022. The sowing variants were: seeds harvested from the capsules that reached physiological maturity (control); physiologically mature seeds soaked for 24 hours; seeds extracted from capsules which have not reached physiological maturity but which have a brown color; seeds extracted from capsules that have not reached physiological maturity and soaked. The results show that germination was influenced by the degree of seed maturity. The physiologically mature seeds soaked for 24 hours had the best germination (65%).*

**INTRODUCTION**

Okra are annual plants, with green pods up to 30 cm long (Tripathi et al., 2011) and important content in water (86.1%), protein (2.2%), fat (0.2%), carbohydrate (9.7%), fiber (1%) and ash (0.8%) (BARI, 2010). In the past it was considered a minor crop and no attention was paid to its improvement in the international research program (Sanjeet et al. 2010). Okra seeds germinate in a very long time (12-15 days) at a temperature above 20°C and have a low germination (75-90%), according to vegetable quality standards and technical conditions. Some researchers (Besirli et al. 2016) show that okra varieties "Yalova Akkoy 41" and "Yalova Kabakli 11" have different germination capacity, 65.25% and 86.75%, respectively. Several researchers have identified the influence of some factors, namely some soil amendments (Banashree et al., 2015), different chemical or ecological pre-germination treatments (Lamichhane et al. 2021; Masarirambi et al. 2018; Musara et al. 2015; Velepini et al. 2003), some magnetic treatments before sowing (Afshan et al., 2012), EMS mutagenesis (Baghery et al. 2016), sowing date, harvest date and pod position on the mother plant (Mohamed et al. 2016), storage conditions, etc. on the germination of okra seeds. The objective of this research was to show the influence of the degree of maturation of the okra seeds on the germination of the Acme variety.

## MATERIAL AND METHODS

The study was carried out within the Faculty of Horticulture Bucharest on the biological material, the Acme okra variety, harvested from seed culture in 2022. The okra culture was established in May, and the first fruits harvested from the plant at physiological maturity were carried out in September. Towards the end of the period, the capsules have not reached full physiological maturity. However, they were harvested, stored for post-ripening and then the seeds extracted.

Seed germination was determined under greenhouse conditions, by sowing the seeds directly on a substrate composed of 50% peat and 50% perlite with a grain size of 4 mm. The varieties to be sown were: V1 mt – seeds harvested from capsules that have reached physiological maturity; V2 – physiologically mature seeds soaked for 24 hours; V3 – seeds extracted from capsules that did not reach physiological maturity, but which had a brown color; V4- seeds extracted from capsules that have not reached physiological maturity and soaked.

Time to plant emergence, percentage of germinated seeds was tracked and recorded.

## RESULTS AND DISCUSSIONS

The total number of capsules harvested per plant was on average 12 capsules of which 8 reached physiological maturity and 4 immature capsules. The capsules harvested at physiological maturity showed lengths of 14-16.2 cm, and those that did not reach physiological maturity of 10-12.33 cm (figure 1).

Figure 2 shows the moistened and non-moistened seeds.

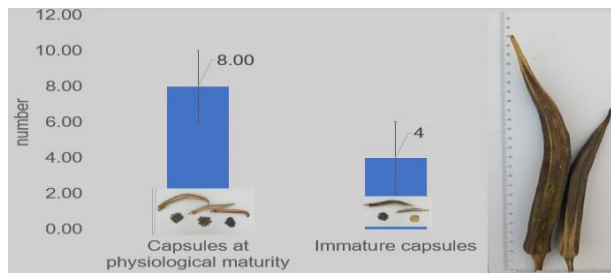


Fig. 1. Number of capsules formed on plants

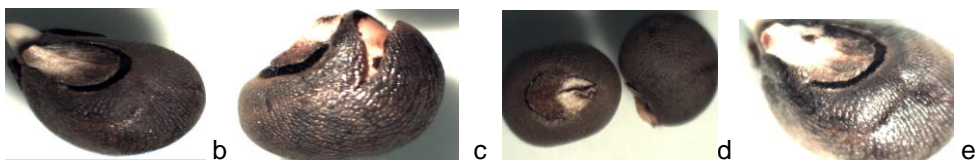


Fig.2. V1-unmoistened seeds (a); V2-moistened seeds (b); V3-unmoistened immature seeds (c); V4-moistened immature seeds (d)

Seed germination determinations showed that seeds that reached physiological maturity showed a higher percentage of germination compared to those from immature capsules. Thus, in V1 mt - seeds harvested from capsules that have reached physiological maturity, seeds not soaked, the germination percentage was 62%, and in those moistened for 24 hours 65% (V2 - seeds that have reached physiological maturity soaked for 24 hours). In the case of seeds

taken from immature fruits, the germination percentage was only 22% (V3 - seeds extracted from capsules that did not reach physiological maturity) respectively 18% (V4 - seeds extracted from capsules that did not reach physiological maturity and softened). It should be noted that in both situations, the moistened seeds germinated in a higher percentage after 9 days.

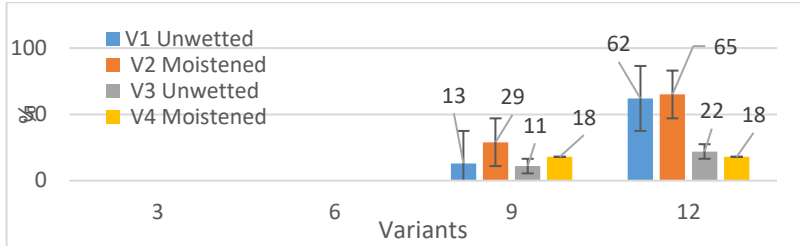


Fig. 3. Germination percentage of okra seeds

Figure 4 shows aspects regarding the emergence of plants after 12 days from sowing.



Fig. 4. Appearance of sprouted okra seedlings

It should be noted that there was a very significant negative correlation regarding the percentage of emergence between the varieties that used seeds at physiological maturity and immature and moistened and non-moistened varieties ( $R^2 = 0.8039$ ), figure 5.

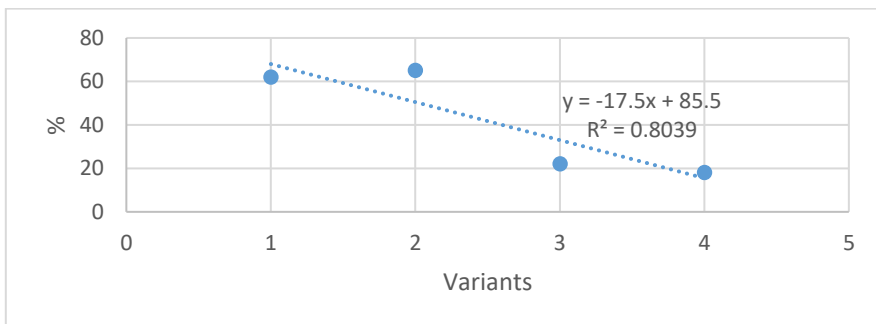


Fig. 5. The influence of the degree of physiological maturity of the seeds on the percentage of emergence in conditions of wetting and non-wetting of okra seeds

## CONCLUSIONS

The results showed that the germination was influenced by the degree of maturation of the seeds. The seeds that reached physiological maturity had a higher percentage of germination compared to those from immature capsules; those that reached physiological maturity soaked for 24 hours had the best germination (65%).

It is recommended to harvest okra capsules at physiological maturity and apply some technological measures (moistening) to obtain optimal results.

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