original scientific paper/originalni naučni članak

ratar. povrt.

received: 25 November 2014, accepted: 22 December 2014
published online: 19 March 2015
doi:10.5937/ratpov51-7201
52:1 (2015) 7-13

Effects of Fruit Maturity Stages and Seed Extraction Time on the Seed Quality of Eggplant (*Solanum melongena* L.)

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Summary: Eggplant (*Solanum melongena* L.) is a vegetable from *Solanaceae* family and its fruit is used in human consumption. It is produced from seedlings in the Republic of Serbia and quantity of seed used for seedlings depends on germination and 1000 seed mass, and ranges from 250 to 350 g ha^{-1}. The aim of this paper was to determine effect of fruit maturity stages and storage duration of harvested fruit on eggplant seed quality. Seed was extracted from technologically mature, semi-mature and botanically mature fruit. Germination energy, germination and 1000 seed mass were tested after seed extraction. Part of harvested fruit was stored for 10 and 20 days, after which seed was extracted and the same seed qualities were tested. It was determined that seed from technologically mature fruit had germination around 25%. In semi-mature fruit, germination abruptly increased from 2% (seed extracted after harvest) to 88% (seed extracted 20 days after harvest). Seed obtained from botanically mature fruit had maximum germination after storing for 20 days after harvest and amounted to 99%. In all tested variants, 1000 seed mass increased with storage life, and it reached 5.48 g in botanically mature fruit.
Keywords: 1000 seed mass, eggplant, germination, germination energy, maturity, seed quality, seeds, *Solanum melongena*

Introduction

Eggplant (*Solanum melongena* L.) originates from Southeast Asia. According to statistical data of FAO (Food and Agriculture Organization of the United Nations 2014), areas under this vegetable species amounted to 1,853,023 ha with production of 48.424.295 t in 2014. Out of that amount, circa 87% was produced in Asia. Eggplant is mainly grown in India, Bangladesh, Pakistan, China, Japan, Philippines, Egypt, France, Turkey, Italy, and USA. Average yield amounts to 26.10 t ha^{-1}.

It is estimated that in the Mediterranean basin (Egypt, Turkey, Italy, etc.) around 2.5-2.8 million tons of fruit is produced (Passam et al. 2010). The largest areas under this plant species are in India, 299,770 ha. According to statistical data, it is grown on around 100 ha in the Republic of Serbia with average yield of 20 t ha^{-1}. According to our assessments, it is grown on 1,500 ha, mainly in garden production, and small amount on the open field (Takač & Gvozdenović 2005). It has been grown in Serbia as a vegetable for more than 90 years.

Unfortunately, the cultivation of this vegetable species has never reached significant proportions. For a long time it was considered to be a poisonous plant. This trait was attributed to it due to alkaloid content in the fruit skin, but cooking or baking removes the alkaloids. That is the reason why it is described in medical encyclopaedias as a very poisonous plant. Fresh, mature fruit without thermal treatment is not used as food.

Eggplant is an important source of antioxidants. Fruits with higher dry matter content and low level of phenols should be harvested. Alkaloid solanine M ($C_{31}H_{51}NO_{12}$) gives bitterness to the fruit. In addition to growing conditions, fruit maturity stages during harvest and cultivars differ in the content of glycoalkaloids. It ranges from 0.37 mg to 4.83 mg per 100 mg of fresh fruit. Alkaloid content over 20 mg per 100 g of fresh fruit causes bitterness of the fruit (occurs when the fruit passes technological maturity; the fruit loses its shine and gets darker in colour). Seed yield in the Republic of Serbia is around 250 kg ha^{-1} (Takač 2005), while internationally yields reach 600 kg ha^{-1} (Chen & Li 1995).

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Acknowledgements: This paper is a part of the project TR 31030 financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

In Serbia, the seed production of eggplant takes place through the production of seedlings. It is a development stage of plant which is conditional to further production cycle (Gvozdenović et al. 2008).

In seed production, harvest usually starts 60-70 days after flowering, i.e. when fruit reaches botanical maturity and fruit colour becomes brown. Seed inside the fruit is completely mature 50-55 days after fertilization (Chen et al. 1995, Passam et al. 2010).

In the Republic of Serbia, the most commonly grown cultivar of eggplant is Domaći srednje dugi, which is dormant seed (Zdravković et al. 2011). Dormancy or seed hibernation represents inability to manifest maximum germination in a certain period of time, immediately after harvest. Dormancy occurs more frequently in wild species, while in cultivated species this trait is less frequent (Yogeesha et al. 2006). Problem of determining seed germination sometimes occurs in eggplant seed production. Important dormancy-solving factor is the age of seed at the harvest time (number of days from flowering to harvest).

Wishing to achieve the highest possible yields of seeds, producers harvest fruits that are not fully physiologically (botanically) mature, and sometimes semi-mature fruits. That leads to the problems in seed processing, and germination that is lower than the one prescribed by law. The aim of this study was to determine the effect of maturity stages and storage length on eggplant seed quality.

Materials and Methods

The trial was set up at the Institute of Field and Vegetable Crops in Novi Sad, Serbia. Eggplant seedlings of cultivar Domaći srednje dugi were produced in a greenhouse, and open field planting was performed on 12 May 2012 and 18 May 2013 at 70 x 40 cm distance in three replications with 36 plants per replication. Technologically mature are the fruits harvested about 30 days after flowering (for market or processing; dark blue-purple colour, glossy skin), semi-mature are the fruits harvested about 45 days after flowering (white-purple or white -grey skin colour), and botanically mature are the fruits harvested about 77 days after flowering (brown skin colour). Fifty fruits from all three maturity stages were immediately milled (cut into small pieces) and left to ferment for three to five days. For the second part of the experiment, 50 fruits were stored for 10 and 20 days after harvest in a storage warehouse, without temperature control and then placed on fermentation, followed by seed washing. After washing and drying, seeds were placed in paper bags, and after 60 days they were put on germination. Using standard ISTA method (International Seed Testing Association 1985), 100 seeds were sown on filter paper in petri dishes in four replications for all variations; germination energy was tested in % (read on day 7), seed germination in % (read on day 14) and 1000 seed mass in grams. In order to study the effect of fruit maturity stages, seed extraction time and their interaction on evaluated seed quality parameters, Multivariate Analysis of Variance (MANOVA) was performed using Statistica 9 (StatSoft Inc. Corporation, Tulsa, USA).

Results and Discussion

Seed and seedlings represent a very important factor of high and quality production, especially in vegetable crops (Ćirkova et al. 1989). Flowering and fruit setting are the two most important factors that define the yield of eggplant (Sekara & Bieniasz 2008). Genotype and environmental factors affect the course of flowering and floral morphology, particularly the length of the pistil, which determines the efficiency of fruit set. The same authors studied the effect of the pistil length on seed number in the fruit and found that the greatest number of seeds in the fruit was given by flowers with a long pistil (379 seeds per fruit), and the smallest by flowers with short pistil (179 seeds per fruit). Eggplant seed was able to germinate 41 days after flowering, and maximum germination energy occurs 57 days after flowering (stage at which the fruit is brown) (Yogeesha et al. 2006). According to Demir et al. (2002), grain filling with nutrients occurs 40-42 days after flowering, and maximum seed quality is achieved 10-20 days later. Most researchers believe that fruit should be harvested 55-60 days after flowering for seed production needs, in order to achieve good quality seed (Demir et al. 2002, Rashid & Singh 2000, Chen 2001, Yogeesha 2008, Passan 2010). Eggplant seed is obtained by collecting botanically mature fruit which is then milled, cut or sliced and put on fermentation. Upper fruit part (closer to peduncle) does not contain seeds, so for easier manipulation it is usually cut and thrown away. Seed is concentrated in the bottom half of the fruit (Gvozdenović et al. 2011). After fermentation, seed is rinsed with water, and then washed and dried. In our trial, technologically mature fruit (when it is usually harvested for market or processing), semi-mature fruit (white-purple or white-grey), and botanically mature fruit (brown) were harvested. Fruits from all three maturity stages were chopped immediately, while in the other variants, fruits were left in crates for 10 and 20 days, after which they were chopped and left to ferment. After washing and drying, seed was put in paper bags and after 60 days left to germinate. Germination energy (read on day 7), seed germination (read on day 14) and 1000 seed mass were tested.

Seed is the carrier of basic quality values and hereditary traits. Germinability and germination energy are the most important seed traits. The process of germination is characterized by water uptake, increased respiration rate, enzyme activation, degradation of reserve substances and their translocation (Milošević et al. 1994). Germination energy represents percentage of seeds that germinate in the first days of germination test, and it is performed after day 7 in the eggplant. The results of MANOVA analysis indicated a statistically significant effect of fruit maturity stages, seed extraction time and their interaction on seed germination energy (%), for the confidence interval of 0.95 (Tab. 1).

Table 1. Multivariate analysis of variance (MANOVA) for seed germination energy (%)

Variation source	df	SS	MS	F	p
Fruit maturity stage	2	45546.6	22773.3	1940.12	< 0.05
Seed extraction time	2	18533.6	9266.8	789.46	< 0.05
Fruit maturity stage x seed extraction time	4	13038.3	3259.6	277.69	< 0.05
Error	63	739.5	11.7		
Total	71	77858.0			

Table 2. Effect of maturity stage and storage length of eggplant fruit on seed germination energy (%)

Seed extraction time	Technological maturity		Semi-mature fruit		Botanical maturity	
	2012	2013	2012	2013	2012	2013
Immediately after harvest	0.00	0.00	0.50	0.00	68.50	59.50
10 days after harvest	6.00	0.00	45.50	55.25	68.25	67.25
20 days after harvest	19.00	23.75	85.00	84.25	76.00	76.25

Germination energy ranged from 0%, which was determined by seed extraction after harvesting technologically mature fruit, up to 68% at the stage of botanical maturity (Tab. 2). Storing for 20 days after harvest determined significantly higher values of germination energy, and it amounted to 24% for technologically mature fruit. Germination energy for semi-mature fruit was 85%, while for botanically mature fruit it amounted to 76%. Similar results were published by Passam et al. (2010), who determined that seed obtained from under-ripe fruit showed a number of deficiencies and had low germination. They also claimed that seed in harvested fruit continued to grow which led to germination increase.

We can conclude from Table 2 that germination energy increased for all tested variants by storing the fruit for 20 days. Germination energy of seed extracted immediately and 10 days after harvest increased together with fruit maturity increase, while seed extraction 20 days after harvest decreased germination energy of botanically mature fruit (Fig. 1). Increase of germination energy in all maturity stages was statistically significant compared to the previous stage, except for the stage of semi-mature fruit immediately after harvest. Postponing seed extraction time by storing fruit after harvest had an effect on germination energy increase in all maturity stages, considering that it had the greatest effect at the semi-mature stage, and the least effect on botanically mature fruit. Storing technologically and botanically mature fruit for 10 days after harvest had statistically non-significant effect on germination energy increase.

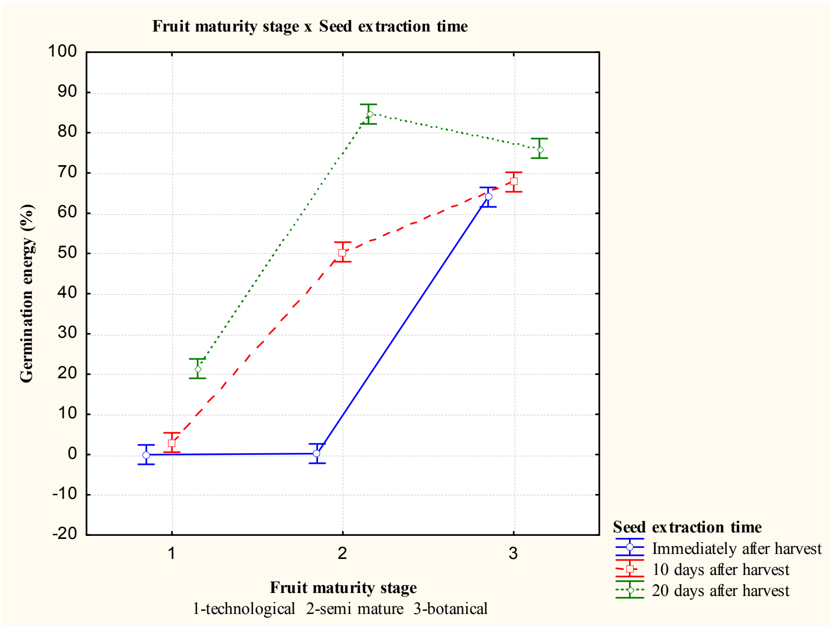

Figure. 1. Effect of fruit maturity stage and seed extraction time on average values of germination energy (%) in 2012-2013 with confidence interval of 0.95

Table 3. Multivariate analysis of variance (MANOVA) for seed germination (%)

Variation source	df	SS	MS	F	p
Fruit maturity stage	2	75925.0	37962.5	2820.33	< 0.05
Seed extraction time	2	17789.7	8894.8	660.82	< 0.05
Fruit maturity stage x seed extraction time	4	16958.4	4239.6	314.97	< 0.05
Error	63	848.0	13.5		
Total	71	111521.1			

Seed germination represents percentage of normally germinated seeds during specific conditions, determined by specified methods for each vegetable species. Eggplant seed has good germination 45-50 days after fertilization and can reach 96.5-99% (Demir et al. 2002).

MANOVA analysis determined statistically significant effect of fruit maturity stage, seed extraction time and their interaction on seed germination (%), for confidence interval of 0.95 (Tab. 3).

In our trial, when seed was extracted immediately after harvest, germination ranged from 0%, in seed of technologically mature fruit, up to 90%, in seed obtained from botanically mature fruit. Seed extracted from fruit 20 days after harvest had significantly higher germination, which ranged from 25% at the technological maturity stage up to 99% at botanical maturity stage (Tab. 4).

We can conclude from Table 4 that storing fruit for 20 days increases total germination for all tested variants. Seed obtained from technologically mature fruit had germination of 25%. Seed from semi-mature fruit that had been stored for 20 days after harvest had germinability of 88%. Fruit harvested while botanically mature gave quality seed in all tested variants, considering that those from fruit stored for 20 days after harvest had germination of 99%. By collecting eggplant in the second and third harvest, Ristić et al. (2013) determined that seed obtained from fruit in the second harvest had lower germination than the seed from the third harvest. Storing seeds for three years increased germination in the first two, but germination decrease was noted in the third year. Passan et al. (2010) showed that seed from fruit that was harvested 25 and 35 days after flowering did not germinate. Fruits that were harvested 45 days after flowering gave seeds with lower germination (70%; minimum germination according to our policy on seed quality is 65%). Seed extracted from fruits that were harvested 55 and 65 days after flowering had 95-98% germination. Storing harvested fruits for 20 days significantly increased seed quality. Same authors stored fruits for 3 months and extracted seed after that. Seed germination increased during process of fruit storage. Seed maturing in the fruit is reasonable for seeds that were extracted from the fruit that is not completely botanically mature (Rashid & Singh 2000). Seed dormancy was not determined in fruits that were harvested 57 days after flowering (Yogeesha et al. 2006).

Germination in all three different periods of seed extraction increased together with fruit maturity increase (Fig. 2). Seed germination of fruits from all maturity stages showed statistically significant increase, compared to previous maturity stage, except for seed that was extracted immediately after the harvest of semi-mature fruit. Seed germination increased by postponing the seed extraction time at all fruit maturity stages, except for botanical maturity when germination decreased after 10 days of storing. At the stage of technological maturity, storing for 10 days had statistically non-significant effect on germination increase, compared to seed extracted immediately after harvest. The effect of different seed extraction time largely reflected on germination increase at the stage of semi-mature fruit, and every determined increase of germination was statistically significant. Seed germination of botanically mature fruit stored for 10 days decreased compared to seed extracted immediately after harvest, considering that determined difference was statistically non-significant. Germination increase 20 days after harvest was statistically significant.

Table 4. Effect of maturity stage and storage length of eggplant fruit on seed germination (%)

Seed extraction time	Technological maturity		Semi-mature fruit		Botanical maturity	
	2012	2013	2012	2013	2012	2013
Immediately after harvest	0.00	0.00	2.00	0.00	90.00	90.50
10 days after harvest	7.00	0.00	60.50	58.50	73.50	88.75
20 days after harvest	23.50	24.75	88.00	87.25	98.75	91.00

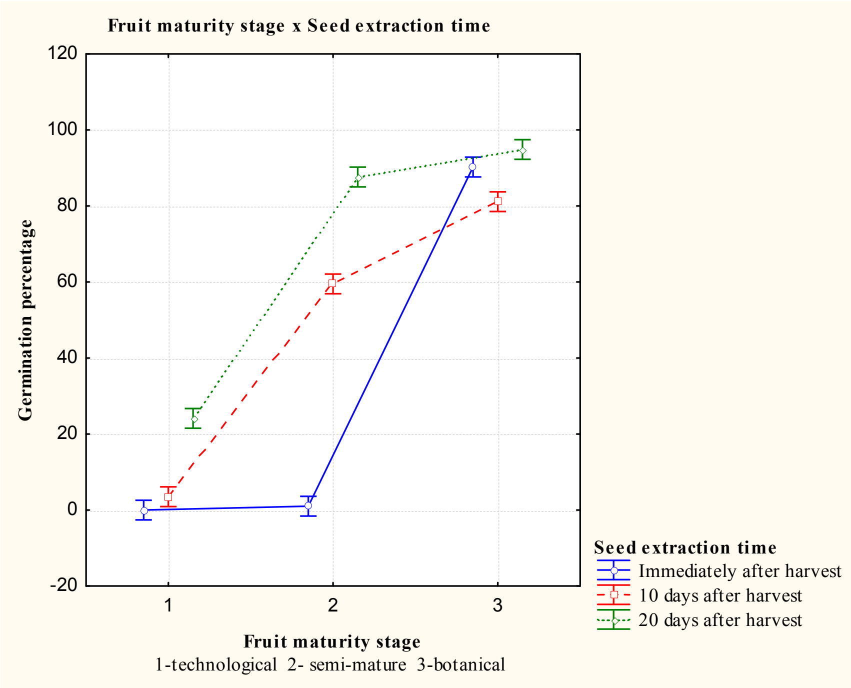

Figure 2. Effect of fruit maturity stage and seed extraction time on seed germination average values (%) in 2012-2013 with confidence interval of 0.95

Thousand seed mass (absolute mass, AM) is an important indicator of seed quality. Sowing rate is determined based on AM and germination. Seeds with higher AM have more reserve substances, faster and more evenly germination and emergence, they are more tolerable to stress conditions, give stronger developed plant and as such they can be easily and longer stored. Thousand seed mass of eggplant is 4-5 g. Maximum value is reached 70 days after fertilization (Demir et al. 2002). Seed AM from under-ripe fruits ranged from 1 to 2.4 g, and from mature fruits amounted to 4-5.3 g (Passam et al. 2010).

MANOVA analysis determined statistically significant effect of fruit maturity stage and seed extraction time for confidence interval of 0.95 (Tab. 5). Effect of interaction between maturity stage and seed extraction time was statistically non-significant.

In our study the lowest value of AM (1.66 g) was measured in seed obtained from technologically mature fruit, and highest (5.48 g) in seed obtained from botanically mature fruit (Tab. 6). That means that seed filling was continued in harvested fruit, which is obvious not only by AM increase, but also by germination energy and seed germination increase. Increase of 1000 seed mass ranged from 30% in seed extracted from botanically mature fruit to 49% in seed extracted from technologically mature fruit.

Similar results were published by Passam et al. (2010) who studied seed quality of fruit that was stored for 20 days after harvest at the temperature of 25°C. They found that seed filling with nutrients continued. This is an important indicator for seed production of eggplant. The most quality seed is obtained from fruit that reached botanical maturity, and it increased its germination energy, germinability and AM by being stored for 20 days. These findings have practical value because they indicate the possibility of harvest time reduction from maternal plant, which would enable nutrient filling into following fruits, and therefore total fruit yield would increase. If there are more fruits on a plant, seed size is reduced because they compete for nutrients (Petrov et al. 1981, Passam & Khah 1992).

Table 5. Multivariate analysis of variance (MANOVA) for absolute seed mass (g)

Variant source	df	SS	MS	F	p
Fruit maturity stage	2	69.5645	34.7822	538.31	< 0.05
Seed extraction time	2	5.4679	2.7340	42.31	< 0.05
Fruit maturity stage x seed extraction time	4	0.6297	0.1574	2.44	0.06
Error	63	4.0706	0.0646		
Total	71	79.7327			

Table 6. Effect of maturity stage and storage length of eggplant fruit on absolute seed mass (g)

Seed extraction time	Technological maturity		Semi-mature fruit		Botanical maturity	
	2012	2013	2012	2013	2012	2013
Immediately after harvest	1.73	1.66	2.91	2.37	4.21	4.13
10 days after harvest	2.02	1.94	3.13	2.86	4.21	4.26
20 days after harvest	2.48	2.48	3.22	3.14	5.48	4.30

Absolute seed mass showed statistically significant increase by fruit maturation (Fig. 3). Postponing the seed extraction time also caused absolute mass increase, considering that difference was statistically non-significant in all occurrences. In technological maturity absolute seed mass showed statistically non-significant increase by storing fruits for 10 days, compared to mass of seed extracted immediately after harvest. The seed extraction time affected absolute seed mass increase the least at the stage of semi-mature fruit, and statistically significant difference in mass was determined just between seed extracted immediately after harvest and the seed extracted 20 days after harvest. Absolute seed mass at the stage of botanical maturity showed statistically non-significant increase by storing the fruit for 10 days compared to seed extraction immediately after harvest.

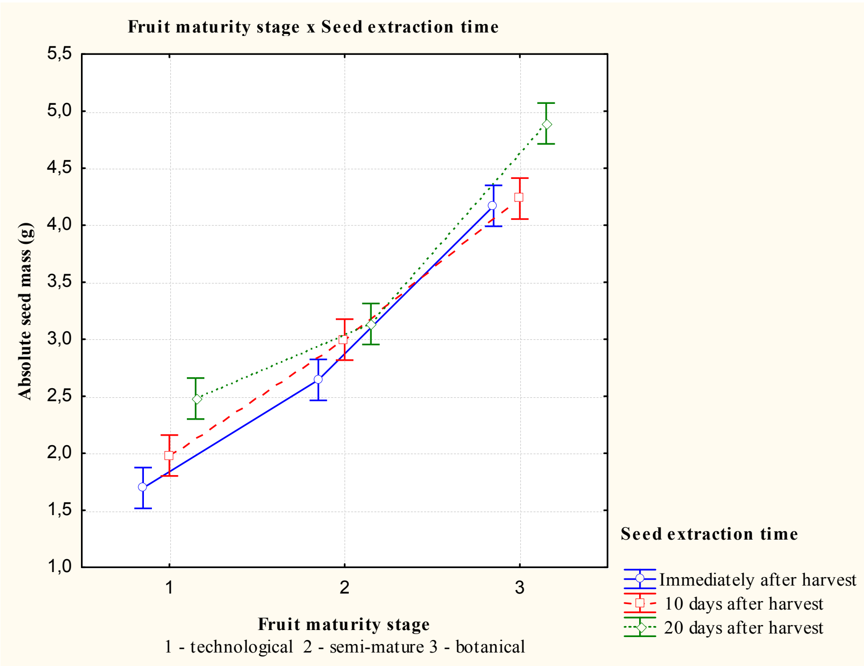

Figure 3. Effect of fruit maturity stage and seed extraction time on average values of absolute seed mass (g) in 2012-2013 with confidence interval of 0.95

Conclusions

Seed extraction immediately after harvest of technologically mature fruit determined germination energy that amounted to 0%, while at the stage of botanical maturity it reached 68%. Storing fruit for 20 days after harvest significantly increased value of germination energy.

Seed extracted immediately after harvest at the stage of technological maturity had germinability of 0%, but due to storing for 20 days it increased up to 25%. Seed extracted from semi-mature fruit had germinability from 2% to 88%, while seed extracted from botanically mature fruits amounted to 90-99%.

Absolute seed mass (1000 seed mass) of technologically mature fruit was 1.66 g, while this value was much higher (5.48 g) with fruit maturing and reaching botanical maturity. Storing for 10 and 20 days after harvest at all tested variants affected increase of all studied seed qualities. The most quality seed obtained from botanically mature fruit and extracted 20 days after harvest had germinability of 99% and absolute mass of 5.48 g.

References

Chen, N.C., & Li, H.M. (1995). *Cultivar and seed production of eggplant*. Asian vegetable research and development center, Shanhua, Tainan, Taiwan, 1-12.

Ćirkova-Georgijevska, M., Šljivančanin, D., Marković, V., Miladinović, Ž., Martinovski, Đ., & Lovković, J. (1989). Stanje i perspektive za razvoj proizvodnje semena povrća u Jugoslaviji. *Semenarstvo* 6: 53-61.

Demir, I., Mavi, K., Sermenli, T., & Ozcoban, M. (2002). Seed Development and Maturation in Aubergine (*Solanum melangena* L.). *Gartenbauwissenschaft*, 67(4): 148-154.

Gvozdenović, Đ., Bugarski, D., Gvozdanović Varga, J., Vasić, M., Červenski, J., Takač, A., & Jovićević, D. (2008). Doprinosi unapređenju povrtarske proizvodnje za 70 godina rada Instituta za ratarstvo i povrtarstvo. *Zbornik radova Instituta za ratarstvo i povrtarstvo Novi Sad*, 45: 113-129.

Gvozdenović, Đ., Červenski, J., Gvozdanović-Varga, J., Vasić, M., Jovićević, D., Bugarski D., & Takač, A. (2011). Proizvodnja plavog patlidžana, p. 173-220, In: M. Milošević, B. Kobiljski (eds), *Semenarstvo*. Vol 3. Semenarstvo povrća. Institute of Field and Vegetable Crops, Novi Sad.

Passam, H.C., Theodoropoulou, S., Karanissa, T., & Karapanos, I.C. (2010). Influence of harvest time and after-ripening on the seed quality of eggplant. *Scientia Horticulturae* 125: 518–520.

Food and Agriculture Organization of the United Nations (2014). FAOSTAT database. FAO, Rome. Retrieved from http:// faostat.fao.org in September 2014.

Milošević, M., & Ćirović, M. (1994). *Seme*. Institute of Field and Vegetable Crops, Novi Sad.

Passam, H.C., & Khah, E.M. (1992). Flowering, fruit set and fruit and seed development in two cultivars of aubergine (*Solanum melongena* L.) grown under plastic cover. *Scientia Horticulturae*, 51: 179–185.

Passam, H.C., Makrogianni, D., Gregoriou, F., & Karapanos, I.C. (2010). The size and germination of eggplant seed in relation to fruit maturity at harvest, after-ripening and ethylene application, *Analele Universitati din Oradea-Fascicula Biologie*, XVII(2): 225-229.

Petrov, H., Doikova, M., & Popova, D. (1981). Studies on the quality of eggplant seed. *Acta Horticulturae,* 111: 273–280.

Rashid, M.A., & Singh, D.P. (2000). *A manual on vegetable seed production in Bangladesh*. AVRDC-USAID-Bangladesh Project. Horticulture Research Centre, Bangladesh Agricultural Research Institute, Joydebpur, Bangladesh, 119.

Ristić, N., Todorović, V., Adžić, S., & Zdravković, J. (2013). Promene klijavosti semena palvog patlidžana (*Solanum melongena* L.) u periodu skladišćenja poreklom iz plodova različite starosti. *Selekcija i semenarstvo*, 19(1): 35-41.

Agnieszka, S., & Bieniasz, M. (2008). Pollination, fertilization and fruit formation in eggplant. (*Solanum melongena* L.). *Acta Agrobotanica*, 61(1): 107-113.

Takač, A., & Gvozdenović, Đ. (2005). *Plavi patlidžan*, Partenon, Beograd.

Yogeesha, H.S., Upreti, K.K., Padmini, K., Bhanurakash, K., & Murti, G.S.R. (2006). Mechanism of seed dormancy in eggplant (*Solanum melongena* L.). *Seed Sci. Technol.* 34: 319–325.

Zdravković, J., Ristić, N., Girek, Z., Pavlović, S., Pavlović, N., Đorđević, M., & Zdravković, M. (2011). Dormantnost semena selekcionih linija plavog patlidžana (*Solanum melongena* L.). *Selekcija i semenarstvo*, 17(2): 17-34.

Uticaj faza zrelosti ploda i momenta vađenja semena na kvalitet semena plavog patlidžana (*Solanum melongena* L.)

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Sažetak: Plavi patlidžan (*Solanum melongena* L.) je povrće iz familije *Solanaceae* čiji plodovi se koriste u ljudskoj ishrani. U Republici Srbiji se proizvodi iz rasada, a količina utrošenog semena za proizvodnju rasada zavisi od klijavosti i apsolutne mase semena i kreće se od 250-350 g za 1 ha useva. Cilj ovog rada je bio da se utvrdi uticaj faza zrelosti ploda i dužine čuvanja ubranog ploda na semenske kvalitete plavog patlidžana. Seme je vađeno iz plodova koji su dostigli tehnološku zrelost, iz poluzrelih plodova i iz botanički zrelih plodova. Nakon vađenja semena ispitana je energija klijanja, klijavost i apsolutna masa semena. Deo ubranih plodova je ostavljen da stoji 10 i 20 dana, a potom je vađeno seme i ispitani su isti semenski kvaliteti. Ustanovljeno je da seme iz plodova u tehnološkoj zrelosti imalo klijavost oko 25%. Kod semena iz poluzrelih plodova klijavost se naglo povećala sa 2% (seme vađeno nakon berbe) na 88% (seme vađeno 20 dana nakon berbe). Seme dobijeno iz botanički zrelih plodova imalo je maksimalnu klijavost stajanjem ploda 20 dana nakon berbe i iznosila je 99%. Kod svih ispitivanih varijanti stajanjem ploda apsolutna masa semena se povećavala, a iz botanički zrelih plodova dostigla je 5,48 g.

Ključne reči: apsolutna masa semena, energija klijanja, klijanje, kvalitet semena, *Solanum melongena*, plavi patlidžan, seme, zrelost