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‘Petra’ – new plum (*Prunus domestica* L.) cultivar from Fruit Research Institute, Čačak

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Abstract. This manuscript presents results of comparative study of the most important phenological (flowering and ripening time) and pomological (morphometric, chemical and organoleptic) properties, as well as tree vigour characteristics and productivity of the new plum cultivar ‘Petra’ (‘Stanley’ × ‘Opal’), developed at the Fruit Research Institute, Čačak, and standard cultivar ‘Stanley’. Cultivar ‘Petra’ showed late flowering time, similar to cultivar ‘Stanley’ and very late ripening time (beginning of the second decade of September). Tree vigour of this cultivar is medium and cropping potential is large. This cultivar is characterized with medium-large fruit, ovate in shape and dark blue skin colour with heavy bloom. Fruit flesh is yellow, firm, aromatic, contains high amount of soluble solids and sugars, as well as medium amount of total acids. Evaluating organoleptic characteristics, significant consumer acceptance was determined. In the future period ‘Petra’ could be very interesting cultivar for growing in new orchards due to the very late ripening time, good fruit quality and high cropping potential.

Key words: plum, *Prunus domestica* L., ripening time, fruit, morphometric, chemical and organoleptic properties, yield

Introduction

Since the establishing of a plum breeding programme at the Fruit Research Institute, Čačak, during 1950’s, 17 cultivars have been developed until 2018. At the first phase in late 1970’s five cultivars: ‘Čačanska Lepotica’ (‘Wangenheims Frühzwetsche’ × ‘Požegača’), ‘Čačanska Rana’ (‘Wangenheims Frühzwetsche × ‘Požegača’), ‘Čačanska Najbolja’ (‘Wangenheims Frühzwetsche × ‘Požegača’), ‘Čačanska Rodna’ (‘Stanley’ × ‘Požegača’) and ‘Čačanski Šećer’ (‘Agen 707’ × ‘Pacific’) were developed. In the following decades, some of these cultivars became very important in all plum growing regions across Europe (Blažek & Pištekova, 2009; Molnár et al., 2016). Also, they have been used in a large scale as parents in many breeding programmes especially in Germany (Jacob, 2002; Hartmann & Neümuller, 2006). In the second phase, three cultivars: ‘Jelica’ (‘Požegača’ × ‘California Blue’), ‘Valerija’ (‘Hall’ × ‘Ruth Gerstetter’) and ‘Valjevka’ (‘Agen 707’ × ‘Stanley’) were developed, but only ‘Valjevka’ have been grown in commercial orchards. Between 2004 and 2012, seven cultivars were named and released: ‘Boranka’ (‘California Blue’ × ‘Ruth Gerstetter’), ‘Timo-

čanka' ('Stanley' × 'California Blue'), 'Mildora' ('Large Sugar Prune' × 'Čačanska Lepotica'), 'Krina' ('Wangenheims Frühzwetsche' × 'Italian Prune'), 'Zlatka' ('Large Sugar Prune' × 'Žlta Butilkovidna'), 'Pozna Plava' ('Čačanska Najbolja' × 'Čačanska Najbolja') and 'Nada' ('Stanley' × 'Scoldus'). 'Pozna Plava', besides Serbia, has been grown in Germany for several years, while 'Nada' becomes one of the most interesting new cultivars on Serbian market, and there is also interest for its growing in other European countries. In 2018 two new cultivars were named and released: 'Divna' ('Stanley' × 'Čačanska Rana') and 'Petra' ('Stanley' × 'Opal') (Ogašanović et al., 2018a, b). The main breeding goals in plum breeding in Fruit Research Institute, Čačak, during all these phases were: large fruit size, high fruit quality and yield, very early and very late ripening time and resistance or tolerance to diseases, particularly to Šarka desease (*Plum Pox Virus*) (Milošević et al., 2016; Milošević & Milošević, 2018).

The aim of this study was to present comparative analysis of the most important phenological (phenophase of flowering and fruit ripening) and pomological characteristics (morphometric, chemical and organoleptic properties of fruits.), tree vigour and productivity of the new cultivar 'Petra' ('Stanley' × 'Opal'), which was named and released in 2018 (Act of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia No. 320-04-00840/2011-11), and the standard cultivar 'Stanley'.

Materials and Methods

Plant material and experimental design. The most important biological and pomological properties of new plum cultivar 'Petra' and standard cultivar 'Stanley' were examined in a two consecutive years (2017–2018). The experiment was carried out at the Ljubić facility of the Fruit Research Institute, Čačak (43°53'N, 20°20'E, 250 *m* a.s.l.) at the plum orchard planted in March 2011 using standard one-year-old nursery trees grafted on Myrobalan (*Prunus cerasifera* Ehrh.) seedlings. Trees were grown under standard practices for plum, without irrigation applied. The experiment was set up as a randomized block design in three replicates with 5 trees each (total 15 trees of both cultivars).

Phenological properties. Flowering phenophase was examined in accordance with methodology recommended by International Pollination Working Group (Wertheim, 1996). Records were made of dates of flowering onset (10% of open flowers on a tree), dates of full bloom (80% of open flowers on a tree) and end of flowering (over 90% of petals fell). The flowering abundance was examined and expressed on a scale 0-5: excellent (5), very good (4), good (3), poor (2), very poor (1) and no flowers (0). Ripening time was determined as a date when the fruits were sufficiently coloured and soft to be eaten (Funt, 1998).

Vigour and yield characteristics. Trunk circumferences (*cm*) were measured at the end of growing season 20 *cm* above the graft union and used to calculate the trunk cross-sectional area (TCSA, cm^2). Yield per tree (*kg*) and per hectare was measured in 2017 and 2018 using an ACS System Electronic Scale (Zhejiang, China). The yield efficiency was calculated as the ratio between yield per tree and trunk cross-sectional area (TCSA).

Morphometric properties of fruits. For a period of two harvest seasons, 25 fruits from both cultivars of each of two replicates were collected and fruit and stone weight (*g*) were measured using an Ohaus Adventurer technical scale (Parsippany, NJ, USA). For determining flesh percentage fruits were cut in half horizontally with a stainless-steel knife and the stones were removed and weighed. The flesh percentage (%) was calculated by subtracting the stone weight from the whole plum fruit weight. For each plum fruit, three linear dimensions, hight, width and thickness were measured using a digital caliper Kronen (Kronen GmbH, Kehl am Rhein, Federal Republic of Germany) with a accuracy of 0.01 *cm*.

Chemical properties of fruits. Chemical properties of fruits were evaluated in the stage of commercial maturity. Soluble solids content (%) was determined by a binocular refractometer (Carl Zeiss, Germany) at 20 °C. The fruit juice pH was assessed by a CyberScan 510 pH-meter (Nijkerk, Netherlands). Total acids (%) were expressed as malic acids and determined by titration with 0.1 N NaOH up to pH 8.1, using phenolphthalein as an indicator. The total sugars and invert sugars content were determined on triplicate samples by the Luff -Schoorl method previously described by Schneider (1979). The sucrose content was calculated according to the relationship: $SU = (TS - IS) \times 0.95$. The results were expressed in % of fresh weight.

Organoleptic properties of fruits. Organoleptic pro-

perties of fruits of cultivar 'Petra' and standard cultivar 'Stanley' were evaluated in accordance with the guidelines for testing the values for cultivation and use of a plum cultivars specified by the Regulations of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia. Attractiveness of fruits (0–6), as well as taste (0–8), aroma (0–4) and consistency (0–2) were assessed by positive scoring by five panellists. The overall organoleptic score (0–20) is the total of all individual points.

Description of the cultivar. Cultivar 'Petra' was described on the base of obtained results and using the UPOV guidelines for the conduct of tests for distinctness, uniformity and stability of European plum (2002), as well as, the methodology recommended by IBPGR (1984) for evaluation the degree of field resistance to causal agents of the economically most important viral and fungal diseases.

Data analysis. Data in the present study were statistically analysed by analysis of variance (ANOVA) using the software package Microsoft Office Excel 2003. The means were separated by LSD test at $p \leq 0.05$.

Results and Discussion

Phenological properties. Flowering onset, full bloom, end of flowering, flowering abundance and harvest time are presented in Tab. 1. In both examined years, 'Petra' and 'Stanley' were blooming during the first decade of April. Flowering of 'Petra' was approximately occurred one day after 'Stanley' which indicates that this cultivar could be classified the same as the 'Stanley', as a late flowering. This can help to avoid late spring frosts in some years. Abundance of flowering is a prerequisite for high yield. In our study, both cultivars showed excellent flowering abundance which is in line with previous results of Mišić (2002) and Glišić et al. (2018), regarding to 'Stanley'.

In both years ripening time of 'Petra' was mid-September, on average 14 days after 'Stanley' (Tab. 1). According to methodology recommended by UPOV (2002) 'Petra' can be classified as a very late cultivar. Considering the small number of quality cultivars which ripens very late, 'Petra' can be very interesting for growing in commercial orchards. Fruits of this cultivar also have very good shelf life and can be present on the market until the end of September and rich better price compared to 'Stanley' and some other earlier cultivars. Very late ripening time is one of the most important breeding objectives and therefore 'Petra' could be very interesting as a donor of this trait in the future breeding programmes.

Vigour and yield characteristics. Tree vigour depends on cultivar (Nenadović-Mratinić et al., 2007), rootstock (Grzyb & Sitarek, 2006; Stefanova et al., 2010), training system, yield, orchard condition (Vitanova et al., 2007), and orchard management, as well as environmental conditions (Blažek & Pišteková, 2009). In our study, tree vigour, presented as trunk-cross sectional area (TCSA) was slightly larger in 'Stanley' compared to 'Petra' (Tab. 2). These results are close with results of Milošević & Milošević (2011) and Glišić et al. (2016) in similar conditions. Based on statement of Milatović (2019) that 'Stanley' is moderate vigourous cultivar and our results in this study, 'Petra' can be also classified as a moderate vigourous cultivar. Yield per tree and per unit area was significantly higher in 'Petra' (25.90 ± 0.39 *kg*; 17.28 ± 0.26 *t* ha^{-1}) compared to 'Stanley' (24.14 ± 0.26 *kg*; 16.10 ± 0.17 *t* ha^{-1}) (Tab. 2). These results are higher than results reported by Milošević et al. (2016) which is probably related to different soil conditions and orchard management but in line with results obtained by Glišić et al. (2016) and Glišić et al. (2018) in similar conditions. High yield efficiency was determined in both cultivars due to the-

Tab. 1. Characteristics of flowering and ripening phenophases of plum cultivars 'Petra' and 'Stanley' (2017–2018, average)
Tab. 1. Karakteristike fenofaza cvetanja i sazrevanja ploda sorti šljive Petra i Stanley (2017–2018. godina, prosek)

	Flowering phenophase/*Fenofaza cvetanja*				
Cultivar *Sorta*	Flowering onset *Početak cvetanja*	Full flowering *Puno cvetanje*	End of flowering *Kraj cvetanja*	Abundance *Obilnost*	Ripening time *Vreme sazrevanja*
'Petra'	April 2nd/*2. april*	April 6th/*6. april*	April 11th/*11. april*	5	September 13th/*13. septembar*
'Stanley'	April 1st/*1. april*	April 5th/*5. april*	April 10th/*10. april*	5	August 29th/*29. avgust*

Tab. 2.Trunk cross-sectional area (TCSA), yield per tree and hectare and yield efficiency of plum cultivars 'Petra' and 'Stanley'
Tab. 2. Površina poprečnog preseka debla (PPPD), prinos po stablu i hektaru i koeficijent rodnosti sorti šljive Petra and Stanley

Cultivar *Sorta*	TCSA *PPPD* (cm^{-2})	Yield per tree *Prinos po stablu* (*kg*)	Yield per hectare *Prinos po hektaru* ($t\ ha^{-1}$)	Yield efficiency *Koeficijent rodnosti* ($kg\ cm^{-2}$)
'Petra'	48.59 ± 2.44 b*	25.90 ± 0.39 a	17.28 ± 0.26	0.53 ± 0.03 a
'Stanley'	49.89 ± 1.91 a	24.14 ± 0.26 b	16.10 ± 0.17	0.48 ± 0.02 b

* The different lower-case letters assigned to mean values within the same columns show significant differences for $P \leq 0.05$ after applying LSD test/*Prosečne vrednosti u kolonama praćene različitim malim slovima su značajno različite prema LSD testu za* $P \leq 0,05$

ir moderate growth and good yield and is in accordance with previous results for different plum cultivars (Meland, 2005; Glišić et al., 2016; Milošević et al., 2018).

Morphometric properties of fruits. Data in Tab. 3 showed that cultivar 'Petra' in our comparative study had significantly smaller fruits than standard cultivar 'Stanley'. Fruit weight, as one of the most important quantitative traits which affects yield, fruit quality attributes and consumers' acceptability (Crisosto et al., 2004) was significantly lower in 'Petra' (27.21 ± 0.68 *g*) than in 'Stanley' (28.82 ± 0.33 *g*). This trait is mainly affected by genotype (Nergiz & Yildiz, 1997), as well as yield and cultural practices in the orchard (Gryzb & Sitarek, 2006). Regarding to fruit weight, fruit dimensions (fruit width and thickness) were significantly larger in 'Stanley' (38.36 ± 0.57 *mm* and 33.27 ± 0.66 *mm*) than in 'Petra' (33.12 ± 0.33 *mm* and 32.22 ± 0.43 *mm*). Fruit height was insignificantly larger in 'Petra' (48.80 ± 0.64 *mm*) compared to 'Stanley' (47.27 ± 0.43 mm). Stone weight was significantly smaller in 'Petra' (1.03 ± 0.02 *g*) than in 'Stanley' (1.83 ± 0.04 *g*) which caused that 'Petra' had significantly larger flesh percentage (96.21 ± 0.11%) than 'Stanley' (93.62 ± 0.21%). Flesh percentage is preferable to be as higher as possible (Nenadović-Mratinić et al., 2007). In the previous study of Milošević et al. (2016), results obtained for same cultivars regarding to fruit and stone weight, fruit dimensions and flesh percentage were slightly higher, which can be associated with different climatic and soil conditions, as well as smaller yield. On the other hand, results reported by Glišić et al. (2018) in same conditions were similar to ours.

According to classification reported by Milatović (2019), 'Petra' can be classified in the group of medium sized cultivars, as well as 'Čačanska Rodna', 'Mildora', 'Zlatka', 'Top', 'Topking' and 'Elena'.

Chemical properties of fruits. Chemical properties of fruits of cultivars 'Petra' and 'Stanley' presented in Tab. 4 indicated that 'Petra' had higher amount of soluble solids (22.06 ± 0.51%), total sugars (12.95 ± 0.05%), sucrose (6.05 ± 0.10%) and total acids (0.95 ± 0.02%) compared to 'Stanley', whereas 'Stanley' had the higher amount of inverted sugars (7.27 ± 0.03%) and larger juice pH value (3.96 ± 0.04). The chemical composition of the fruits mostly depends on cultivar and year of study (Usenik et al., 2014). In our work 'Petra' had higher soluble solids content, but lower content of total and inverted sugars and sucrose compared to results previously presented by Milošević et al. (2016). Concerning the 'Stanley', soluble solids

Tab. 3. Morphometric properties of fruits of plum cultivars 'Petra' and 'Stanley'
Tab. 3. Morfometrijske osobine ploda sorti šljive Petra i Stanley

Cultivar *Sorta*	Fruit weight *Masa ploda* *(g)*	Fruit height *Dužina ploda* *(mm)*	Fruit width *Širina ploda* *(mm)*	Fruit tickness *Debljina ploda* *(mm)*	Stone weight *Masa košrtice* *(g)*	Flesh percentage *Randman ploda* *(%)*
'Petra'	27.21 ± 0.68 b*	48.80 ± 0.64 a	33.12 ± 0.33 b	32.22 ± 0.43 a	1.03 ± 0.02 b	96.21 ± 0.11 a
'Stanley'	28.82 ± 0.33 a	47.27 ± 0.43 a	38.36 ± 0.57 a	33.27 ± 0.66 a	1.83 ± 0.04 a	93.62 ± 0.21 b

* The different lower-case letters assigned to mean values within the same columns show significant differences for $P \leq 0.05$ after applying LSD test/*Prosečne vrednosti u kolonama praćene različitim malim slovima su značajno različite prema LSD testu za* $P \leq 0,05$

Tab. 4. Chemical properties of fruits of plum cultivars 'Petra' and 'Stanley'
Tab. 4. Hemijske osobine ploda sorti šljive Petra i Stanley

Cultivar *Sorta*	Soluble solids *RSM* (%)	Total sugars *Ukupni šećeri* (%)	Inverted sugars *Invertni šećeri* (%)	Sucrose *Saharoza* (%)	Total acids *Ukupne kiseline* (%)	pH *pH*
'Petra'	22.06 ± 0.51 a*	12.95 ± 0.05 a	6.58 ± 0.06 b	6.05 ± 0.10 a	0.95 ± 0.02 a	3.79 ± 0.04 b
'Stanley'	19.57 ± 0.42 b	12.81 ± 0.03 b	7.27 ± 0.03 a	5.26 ± 0.04 b	0.81 ± 0.02 b	3.96 ± 0.04 a

* The different lower-case letters assigned to mean values within the same columns show significant differences for $P \leq 0.05$ after applying LSD test/*Prosečne vrednosti u kolonama praćene različitim malim slovima su značajno različite prema LSD testu za* $P \leq 0,05$

content in our study was significantly higher than in the study of the same authors, whereas contents of total, inverted sugars and sucrose were similar. These differences could be probably caused by different climatic conditions and maturity stage at harvest date. On the other hand, our results regarding the previous mentioned traits, as well as the total acids amount and juice pH are close to results of Glišić et al. (2018) obtained under the similar conditions. The relationship between soluble solids content and total acids has an important role in consumer acceptance of apricot, peach, nectarine and plum cultivars. Plums with soluble solids content ≥ 12.0% had ~75% consumer acceptance, regardless of total acids (Crisosto et al., 2004). Therewith, various organic acids and their relative contents differ in the level they have an effect on sugars (Colarič et al., 2005). In this regard, the premise is that 'Petra' could satisfy consumer requirements.

Organoleptic properties of fruits. The subjective perception of the consumers is of great importance in the final assessment and acceptance of new cultivar (Crisosto et al., 2007). Test of organoleptic properties of fruits of 'Petra' and 'Stanley' showed big similarity between these two cultivars because 'Stanley' is one of the parents of the cultivar 'Petra'. Fruits of examined cultivars differed only in flavour and aroma in which 'Petra' was slightly better rated (Tab. 5). Generally, 'Petra' was rated high for all organoleptic properties which indicate that it could be well accepted from consumers.

Description of the cultivar. 'Petra' is a moderate vigour cultivar with dense crown. Flowering time is late, similar with 'Stanley'. It is characterized with early bearing and high cropping potential. This cultivar shows tolerance to Sharka virus (*Plum Pox Virus*) as well as to causal agents of economically most important fungal diseases [*Polystigma rubrum* (Pers.) DC, *Tranzschelia pruni-spinosae* (Pers.) Dietel., *Monilinia laxa* (Aderhold & Ruhland)] in the field conditions. It ripens very late, at the beginning of the second decade of September (similar to cultivar 'Divna'). The fruit is medium sized, ovate in shape, having dark blue skin colour with heavy bloom. The flesh is yellow, firm, aromatic and testy, non-adherent to stone. The fruits are suitable for fresh consumption, brandy production and other types of processing.

Tab. 5. Organoleptic propertieas of fruits of plum cultivars 'Petra' and 'Stanley'
Tab. 5. Organoleptičke osobine ploda sorti šljive Petra i Stanley

Cultivar *Sorta*	Year *Godina*	Attractiveness *Atraktivnost* (0–6)	Flavour *Ukus* (0–8)	Aroma *Aroma* (0–4)	Consistency *Konzistencija* (0–2)	Total *Ukupno* (0–20)
'Petra'	2016	5.00	7.00	2.00	3.00	17.00
	2017	5.00	7.00	2.00	3.00	17.00
'Stanley'	2016	5.00	6.00	1.00	3.00	15.00
	2017	5.00	6.00	1.00	3.00	15.00

Conclusion

Comparative testing of the most important phenological, morphometric, chemical and organoleptic properties as well as the tree vigour characteristics and productivity of new released cultivar 'Petra' from Fruit Research Institute, Čačak and standard cultivar 'Stanley' showed that 'Petra' had very good productive traits and could be very interesting for growing in new orchards in the Republic of Serbia. The great advantage of this cultivar, over others, is the very late ripening time, which, in combination with productive characteristics, can provide it a significant place in the plum assortment. Therewith, 'Petra' could be very important parent cultivar in future breeding programme in the Fruit Research Institute, Čačak as well as in other breeding programmes.

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References

Blažek J., Pišteková I. (2009): Preliminary evaluation results of new plum cultivars in a dense planting. Horticultural Science, 36: 45–54.

Colarič M., Veberič R., Štampar F., Hudina M. (2005): Evaluation of peach and nectarine fruit quality and correlations between sensory and chemical attributes. Journal of the Science of Food and Agriculture, 85: 2611–2616.

Crisosto C.H., Crisosto G.M., Echeverria G., Puy J. (2007): Segregation of plum and pluot cultivars according to their organoleptic characteristics. Postharvest Biology and Technology, 44: 271–276.

Crisosto C.H., Garner D., Crisosto G.M., Bowerman E. (2004): Increasing 'Blackamber' plum (*Prunus salicina* Lindley) consumer acceptance. Postharvest Biology and Technology, 34: 237–244.

Funt R.C. (1998): Plums: A guide to selection and use. Ohio State University Extension Fact Sheet, 1–2.

Glišić I., Milošević N., Karaklajić-Stajić Ž., Đorđević M., Lukić M. (2018): 'Divna' – new plum (*Prunus domestica* L.) cultivar developed at Fruit Research Institute, Čačak. Journal of Pomology, 52(201): 7–13.

Glišić I.P., Milošević T., Glišić I.S., Ilić R., Paunović G., Milošević N. (2016): Tree vigour and yield of plum grown under high density planting system. Acta Horticulturae, 1139: 131–136.

Grzyb S.Z., Sitarek M. (2006): The influence of different rootstocks on the tree growth, yield and fruit quality of plum tree 'Dabrowice Prune' planted in exhausted soil. Sodinkiste ir Daržininkiste, 25: 292–295.

Hartmann W., Neumüller M. (2006): Breeding for resistance: breeding for *Plum pox virus* resistant plums (*Prunus domestica* L.) in Germani. EPPO Bulletin, 36: 332–336.

IBPGR (1984): In: 'Descriptor List for Plum and Allied Species', Cobianchi D., Watkins R. (eds.), Committee on disease resistance breeding and use of genebanks, IBPGR Secretariat, Rome, Italy, pp. 31.

Jacob H.B. (2002): New plum and mirabelles varieties out of the breeding work and development in Geisenheim. Acta Horticulturae, 577: 173–176.

Meland M. (2005). High density planting systems of European plums – the effect of growth and productivity of three cultivars after nine years. Acta Agriculturae Scandinavica. Section B - Soil and Plant Science, 55: 51–57.

Milatović D. (2019): Šljiva. Naučno voćarsko društvo Srbije, Čačak, Republika Srbija.

Milošević N., Glišić I.S., Lukić M., Đorđević M., Karaklajić-Stajić Ž. (2016): Properties of some late season plum hybrids from Fruit Research Institute, Čačak. Conspectus Agriculturae Scientificus, 81(2): 65–70.

Milošević N., Glišić I., Đorđević M., Lukić M. (2018): Pomološke i proizvodne osobine nekih novijih sorti šljive. Zbornik radova XXIII savetovanja o biotehnologiji, Čačak, 1: 154–161.

Milošević T., Milošević N. (2011): Growth, fruit size, yield performance and micronutrient status of plum trees (*Prunus domestica* L.). Plant, Soil and Environment, 57(12): 559–564.

Milošević T., Milošević N. (2018): Plum (*Prunus* spp.) Breeding. In: 'Advances in Plant Breeding Strategies: Fruits', Volume 3, Al-Khayri J.M., Jain M.S., Johnson D.V. (eds.), Springer International Publishing AG, pp. 165–215.

Mišić P.D. (2002): Specijalno oplemenjivanje voćaka. Institut za istraživanja u poljoprivredi SRBIJA i Partenon, Beograd, Republika Srbija.

Molnár A.M., Ladányi M., Kovács S. (2016): Evaluation of the production traits and fruit quality of German plum cultivars. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 64(1): 109–114.

Nenadović-Mratinić E., Milatović D., Đurović D. (2007). Biological characteristics of plum cultivars with combined traits. Journal of Pomology, 41(157/158): 31–35.

Nergiz C., Yildiz H. (1997): Research on chemical composition of some varieties of European plums (*Prunus domestica*) adapted to the Aegean district of Turkey. Journal of Agricultural and Food Chemistry, 45: 2820–2823.

Ogašanović D., Jevremović D., Glišić I. (2018a): Nova sorta šljive (*Prunus domestica* L.) 'Divna', priznata od Ministarstva poljoprivrede, šumarstva i vodoprivrede Republike Srbije rešenjem br. 320-04-00841/2011–11.

Ogašanović D., Milošević N., Đorđević M. (2018b): Nova sorta šljive (*Prunus domestica* L.) 'Petra', priznata od Ministarstva poljoprivrede, šumarstva i vodoprivrede Republike Srbije rešenjem br. 320-04-00840/2011–11.

Schneider F. (1979): Sugar analysis. Official and tentative methods recommended by the International Commission for uniform

methods of sugar analysis. ICUMSA, Peterborough, pp. 41–73.

Stefanova B., Dragoyski K., Dinkova H., Djouvinov V. (2010): The plum cultivar 'Jojo' grown under the conditions of the central Balkan mountains in Bulgaria. Acta Horticulturae, 874: 281–288.

UPOV (2002): Guidelines for the conduct of tests for distinctness, uniformity and stability. European plum (*Prunus domestica* L.). Geneva, Switzerland.

Usenik V., Stampar F., Kastelec D. (2014): Indicators of plum maturity: When do plums become tasty? Scientia Horticulturae, 167: 127–134.

Vitanova I., Dinkova H., Dragojski K., Dimkova S. (2007): Biological characteristics of the growth and fruitfulness of the Bulgarian plum cultivar Gabrovska. Journal of Pomology, 41(157/158): 37–40.

Wertheim S.J. (1996): Methods for cross pollination and flowering assessment and their interpretation. Acta Horticulturae, 423: 237–241.

PETRA – NOVA SORTA ŠLJIVE (*Prunus domestica* L.) STVORENA U INSTITUTU ZA VOĆARSTVO, ČAČAK

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Rezime

U radu su predstavljeni rezultati uporednog ispitivanja najvažnijih fenoloških (vreme cvetanja i vreme sazrevanja ploda) i pomoloških (morfometrijske, hemijske i organoleptičke), osobina, kao i karakteristika bujnosti stabla i rodnosti nove sorte šljive Petra (Stanley × Opal) stvorene u Institutu za voćarstvo, Čačak i standardne sorte Stanley. Kod sorte Petra je utvrđeno pozno vreme cvetanja, slično kao kod sorte Stanley što u pojedinim godinama može da bude veoma značajno zbog izbegavanja pozih prolećnih mrazeva. Ovu sortu odlikuje veoma pozno vreme sazrevanja ploda, početkom druge dekade septembra, što je čini posebno interesantnom jer u tom periodu sazreva vrlo mali broj sorti šljive. U obe ispitivane godine, kod sorte Petra je utvrđena visoka obilnost cvetanja, kao veoma značajnog preduslova visoke rodnosti, što je inače i veoma važna osobina ove sorte. Rezultati dobijeni ispitivanjem karakteristika bujnosti stabla su ukazali da se sorta Petra može svrstati u sorte umerene bujnosti, pa sa tog aspekta može biti interesantna i za gajenje u nešto gušćem sklopu. Plod sorte Petra je srednje krupan, ovalno-izduženog oblika, tamnoplave boje sa obilnim pepeljkom. Prosečna masa ploda sorte Petra je bila manja u odnosu na masu ploda standardne sorte Stanley (27,21 ± 0,68 *g*, odnosno 28,82 ± 0,33 *g*). U vezi s tim, kod sorte Stanley su utvrđene veće vrednosti širine i debljine ploda (38,36 ± 0,57 *mm* i 33,27 ± 0,66 *mm*) u odnosu na sortu Petra (33,12 ± 0,33 *mm* i 32,22 ± 0,43 *mm*). Kod sorte Petra je utvrđena veća visina ploda (48,80 ± 0,64 *mm*) u odnosu na sortu Stanley (47,27 ± 0,43 *mm*) koja nije bila statistički značajna. Mezokarp ploda sorte Petra je žute boje, čvrst i aromatičan. Sorta Petra imala je veći sadržaj rastvorljivih suvih materija (22,06 ± 0,51%), ukupnih šećera (12,95 ± 0,05%), saharoze (6,05 ± 0,10%) i ukupnih kiselina (0,95 ± 0,02%), dok je sorta Stanley imala veći sadržaj invertnih šećera (7,27 ± 0,03%) i veću pH vrednost soka (3,96 ± 0,04). Koštica sorte Petra je sitna i lako se odvaja od mezokarpa ploda. Usled toga, ova sorta ima veliki randman mezokarpa ploda (96,21 ± 0,11%), što je značajno veća vrednost u poređenju sa standardnom sortom Stanley (93,62 ± 0,21%). Ispitivanjem organoleptičkih osobina ploda utvrđeno je da bi sorta Petra mogla da ima visok nivo prihvatljivosti od strane potrošača, zbog atraktivnosti i kvaliteta ploda. U budućem periodu ova sorta bi mogla da bude veoma interesantna za gajenje u novim voćnjacima zahvaljujući veoma poznom vremenu sazrevanja ploda, kao i dobrom kvalitetu i velikom potencijalu rodnosti. Pored toga, sorta Petra može da bude veoma značajna za oplemenjivački rad kao potencijalni donor osobina kao što su veoma pozno vreme sazrevanja i dobar kvalitet ploda.

Ključne reči: šljiva, *Prunus domestica* L., vreme sazrevanja, plod, morfometrijske, hemijske i organoleptičke osobine, prinos

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