PLUM VARIETY "YUZHNAYA KRASAVITSA": ORIGIN AND CHARACTERISTICS

Shamsiddinov Quvonchbek Azamatovich
Deputy Director of the Navoi Scientific Experimental Station of the Academician Mahmud Mirzayev Research Institute of Horticulture, Viticulture and Winemaking
Komil Yarashev Naimjonovich
Head of the Department of Horticulture and Viticulture Selection Laboratory
Mavlonov Bahodir Tursunovich
Head of the Department of Horticulture and Viticulture Agrotechnics

Received: 24.12.2025
Revised: 25.12.2025
Accepted: 26.12.2025
Keywords:
Prunus domestica L., Plum variety, Yuzhnaya Krasavitsa, Fruit quality, Tree morphology, Adaptability, Yield stability, Economic value

Annotation. The plum variety *Yuzhnaya Krasavitsa* (*Prunus domestica L.*) is a high-quality cultivar developed for cultivation in moderately continental and southern climates. This variety is distinguished by medium to large fruit size, attractive dark purple skin, yellow juicy flesh, harmonious sweet-sour taste, and easy stone separation, making it suitable for fresh consumption and industrial processing. The trees exhibit medium growth vigor, well-formed crown structure, early fruiting, and stable yield. *Yuzhnaya Krasavitsa* is adaptable to drought, high summer temperatures, and moderate winter cold, with moderate resistance to common fungal diseases. This study provides an overview of its origin, biological traits, fruit quality, and economic potential, supporting its suitability for modern horticultural production and commercial orchard establishment.

Introduction. Plum (Prunus domestica *L.*) is one of the most widely cultivated stone fruit species in temperate and subtropical regions, valued for its nutritional content, versatility, and economic significance. Plums are rich in vitamins, minerals, dietary fiber, and bioactive compounds, making them important both for human nutrition and for industrial processing into jams, juices, dried fruits, and other products. The increasing demand for high-quality fruit has stimulated breeding programs worldwide aimed at developing varieties that combine superior fruit quality, adaptability to various agroclimatic conditions, and resistance to pests and diseases. Among European plum cultivars, *Yuzhnaya Krasavitsa* has emerged as a promising variety due to its unique combination of biological traits and commercial potential. The name "Yuzhnaya Krasavitsa," which translates as "Southern Beauty," reflects both its origin in the southern regions and its aesthetically appealing fruits. Developed

through hybridization and selection from high-performing European genotypes, this variety is particularly suited for regions with moderately continental climates, characterized by warm summers, relatively mild winters, and occasional periods of drought. The significance of *Yuzhnaya Krasavitsa* lies not only in its fruit quality but also in its agronomic performance. Medium tree vigor, well-formed crown architecture, early fruit-bearing, and stable yields make it suitable for modern orchard systems. Moreover, the variety demonstrates tolerance to abiotic stresses such as drought and high temperatures, as well as moderate resistance to common fungal diseases, which are increasingly important under conditions of climate variability and intensive cultivation practices. Despite its practical importance, comprehensive studies that integrate the origin, biological traits, adaptability, and economic potential of *Yuzhnaya Krasavitsa* remain limited. Understanding the variety's characteristics is crucial for orchard planning, selection of suitable growing regions, and the optimization of management practices. Furthermore, evaluating its fruit quality, transportability, and processing potential provides essential information for growers, processors, and marketers seeking to maximize productivity and profitability. Therefore, the present study aims to provide a detailed overview of the origin and main characteristics of the plum variety *Yuzhnaya Krasavitsa*, including its tree morphology, flowering and fruiting patterns, fruit quality attributes, and adaptability. By integrating biological and practical perspectives, this research contributes to informed decision-making in plum cultivation and supports the sustainable development of horticultural production in regions suitable for this cultivar.

Analysis of Literature. Plum (*Prunus domestica L.*) is one of the most widely cultivated stone fruits worldwide, with numerous studies focusing on its genetic diversity, agronomic performance, and fruit quality. European plum varieties, including *Yuzhnaya Krasavitsa*, have been developed to combine high productivity, resistance to environmental stresses, and superior fruit characteristics. Several studies have highlighted the importance of cultivar selection in achieving stable yields and high-quality fruits. Faust (1989) emphasized that the growth habit, flowering, and fruiting patterns of plum varieties significantly influence their adaptability and commercial value. Similarly, Westwood (1993) noted that proper selection of cultivars suitable for local climatic conditions is crucial for successful orchard management and sustainable production. The variety *Yuzhnaya Krasavitsa* has been recognized for its medium tree vigor and well-formed crown structure, which facilitate light penetration and air circulation within the canopy. Sedov et al. (2014) explained that crown architecture affects not only vegetative growth but also fruit quality and disease incidence. Efficient light interception increases photosynthetic capacity, resulting in better fruit development and consistent yield. Early entry into fruit-bearing is another significant trait of *Yuzhnaya Krasavitsa*. Sansavini and Lugli (1997) reported that early-bearing plum varieties reduce the unproductive period of orchards, thereby enhancing economic efficiency. This trait is especially valuable for

commercial orchards, where early returns on investment are critical. In addition, Milatović and Đurović (2012) observed that early fruiting cultivars tend to show more uniform flowering and fruit set, which directly impacts marketable yield. Fruit quality, including size, color, flavor, and ease of stone separation, has been a major focus in plum research. Crisosto et al. (2004) emphasized that consumer preference for plums is strongly influenced by fruit size, color uniformity, and flavor balance. *Yuzhnaya Krasavitsa* produces large, oval-shaped fruits with dark purple skin and yellow juicy flesh, which are attractive for fresh consumption and suitable for industrial processing. Usenik et al. (2008) found that such traits also positively influence antioxidant content and nutritional value, increasing the overall commercial potential of plum cultivars. Adaptability to abiotic stresses such as drought and high temperatures is increasingly important under changing climatic conditions. Erez (2000) highlighted that stress-tolerant plum varieties maintain yield stability even under adverse environmental conditions. Similarly, Okie and Hancock (2008) emphasized that breeding for tolerance to drought, heat, and winter cold is critical for modern plum cultivation. *Yuzhnaya Krasavitsa* demonstrates moderate winter hardiness, good drought tolerance, and satisfactory resistance to common fungal diseases, aligning with these recommendations. From an economic perspective, varieties like *Yuzhnaya Krasavitsa* that combine stable yields, attractive fruits, and good transportability are highly valuable. FAO (2019) noted that marketable fruit proportion, shelf life, and ease of processing directly affect the profitability of orchards. The easy separation of stone from the flesh, observed in *Yuzhnaya Krasavitsa*, allows for broader industrial applications such as jam, juice, and dried fruit production, increasing its market flexibility (Kader, 2002). Despite the growing body of research on plum varieties, there is limited comprehensive information specifically integrating the origin, tree morphology, fruit quality, adaptability, and economic potential of *Yuzhnaya Krasavitsa*. Most studies focus on individual aspects such as fruit quality (Usenik et al., 2008) or disease resistance (Sedov et al., 2014). Therefore, this study aims to provide an integrated evaluation, which is essential for selecting suitable cultivars for commercial orchards and for sustainable horticultural practices. In conclusion, the literature indicates that *Yuzhnaya Krasavitsa* embodies traits sought in modern plum cultivation: medium tree vigor, well-structured crowns, early fruiting, large and attractive fruits, stress tolerance, and economic value. Integrating these biological and economic characteristics makes this variety suitable for both fresh market and processing industries, supporting its introduction and widespread adoption in appropriate agroclimatic regions.

Materials and Methods. Materials. The study was conducted on the plum variety *Yuzhnaya Krasavitsa* (*Prunus domestica L.*), cultivated in a commercial orchard located in a region with a moderately continental climate. The experimental site consisted of loamy soil with good water permeability and average fertility. Trees were grafted onto standard plum rootstocks and planted at a spacing of 5 × 4 meters. The

study focused on mature trees aged 5–8 years, which had reached stable fruit-bearing capacity. All trees were maintained under uniform agronomic practices, including standard irrigation, fertilization, pruning, and plant protection measures commonly applied in commercial plum orchards.

Methods. 1. Phenological Observations. Phenological stages were recorded throughout the growing season. Observations included bud break, flowering, fruit set, fruit development, and ripening. Timing and duration of each stage were recorded following standard horticultural methods (Faust, 1989; Westwood, 1993).

2. Biometric Measurements. Tree growth was evaluated by measuring the following parameters:

- Tree height (m)
- Trunk diameter at 30 cm above the ground (cm)
- Crown diameter (m)

Measurements were performed annually using standard horticultural tools. These parameters were used to assess tree vigor, canopy architecture, and potential light interception.

3. Yield Assessment. Yield was determined by harvesting all fruits from individual trees. Total fruit mass per tree (kg) was recorded, and average yield per hectare was calculated based on planting density. Annual variations in yield were analyzed over a period of three consecutive growing seasons to assess yield stability.

4. Fruit Quality Analysis. Fruit samples were collected randomly from each tree to evaluate quality parameters:

- Average fruit weight (g)
- Fruit dimensions (length and diameter, mm)
- Flesh firmness (using a penetrometer)
- Soluble solids content (°Brix, measured with a refractometer)
- Titratable acidity (%)

Organoleptic characteristics, including taste, aroma, and juiciness, were evaluated using a sensory panel.

5. Resistance to Environmental Stress. The variety's tolerance to abiotic stresses, including drought, high temperatures, and winter cold, was evaluated by visual assessment of leaf condition, shoot growth, and fruit drop. Disease resistance was assessed by monitoring the presence and severity of common fungal pathogens throughout the growing season.

6. Economic Evaluation. Economic potential was assessed by analyzing yield performance, marketable fruit proportion, transportability, and suitability for processing. Profitability was estimated based on production costs, market prices, and fruit quality.

7. Statistical Analysis. All collected data were subjected to statistical analysis using standard methods. Mean values, standard deviations, and coefficient of variation were calculated to evaluate variability and reliability of the results. Comparative

analysis was performed to determine the significance of observed differences among measured parameters.

Table 1. Biological and Agronomic Characteristics of Plum Variety "Yuzhnaya Krasavitsa"

Parameter	Observed Value / Description	Significance
Tree height	3.5–4.2 m	Medium-sized trees suitable for orchard management
Trunk diameter (30 cm above ground)	12–15 cm	Indicates moderate vigor and stability
Crown diameter	2.5–3.0 m	Allows good light penetration and air circulation
Growth vigor	Medium	Facilitates pruning and maintenance
Beginning of fruiting	3–4 years after planting	Early-bearing, reduces non-productive period
Flowering period	Medium to late	Reduces risk of spring frost damage
Ripening period	Medium-late	Extends harvesting season
Average fruit weight	40–50 g	Large fruits increase market value
Fruit shape	Oval	Preferred shape for fresh consumption
Skin color	Dark purple with waxy coating	Enhances appearance and transportability
Flesh color	Yellow	Indicates good taste and processing quality
Taste	Sweet-sour, balanced	Suitable for fresh consumption and processing
Stone separation	Easy	Advantageous for industrial processing
Yield per tree	25–30 kg	High and stable yield
Yield per hectare	12–15 t/ha	Commercially viable productivity
Drought tolerance	Good	Suitable for water-limited regions
Winter hardiness	Moderate to high	Reduces risk of frost damage
Disease resistance	Moderate	Decreases chemical treatment needs

Parameter	Observed Value / Description	Significance
Economic use	Fresh market, processing, drying	Multifunctional and profitable variety

Discussion. The study of the plum variety *Yuzhnaya Krasavitsa* demonstrates a combination of biological resilience and economic potential that makes it suitable for modern commercial cultivation. The morphological and agronomic characteristics observed in this research align with previous findings on high-performing European plum cultivars. The medium tree vigor and well-formed, moderately dense crown structure facilitate efficient light interception and air circulation, which are essential for healthy vegetative growth and fruit development (Sedov et al., 2014). Such crown architecture reduces disease incidence and enhances photosynthetic efficiency, ultimately contributing to stable fruit production. Early fruit-bearing, which occurs within 3–4 years after planting, provides a significant economic advantage. Early-bearing cultivars reduce the unproductive period of orchards and increase the profitability of plantation systems (Sansavini & Lugli, 1997). The observed annual yields of 25–30 kg per tree and 12–15 t/ha confirm the variety's commercial viability, indicating stable productivity even under moderately variable climatic conditions. Fruit quality attributes are particularly noteworthy. *Yuzhnaya Krasavitsa* produces large, oval-shaped fruits with dark purple skin and yellow, juicy flesh. The sweet-sour taste is well balanced, and the stone separates easily from the flesh, which makes the variety suitable for both fresh consumption and industrial processing (Crisosto et al., 2004; Usenik et al., 2008). These traits enhance market appeal and post-harvest handling, reducing losses during transportation and storage. The variety's adaptability to environmental stresses, including drought and high summer temperatures, is a critical factor in its suitability for southern and moderately continental climates. Moderate winter hardiness ensures survival during cold spells, while moderate resistance to common fungal diseases reduces reliance on chemical protection (Erez, 2000; Okie & Hancock, 2008). Together, these traits support sustainable orchard management and lower production costs. From an economic perspective, the combination of high-quality fruit, stable yield, and adaptability makes *Yuzhnaya Krasavitsa* a versatile cultivar. Its fruits can serve multiple market purposes, including fresh consumption, processing, and drying, which increases profitability and reduces market risk (FAO, 2019; Kader, 2002). Moreover, the ease of stone separation enhances its industrial potential, allowing efficient use in jams, juices, and compotes.

Conclusion. The study of the plum variety *Yuzhnaya Krasavitsa* confirms its suitability for cultivation in moderately continental and southern climatic regions. This variety demonstrates a combination of desirable biological, agronomic, and economic traits, making it a promising cultivar for modern commercial orchards. The trees exhibit medium vigor, well-formed crowns, and early entry into fruit-bearing,

contributing to efficient orchard management and reduced non-productive periods. The variety produces large, attractive fruits with yellow juicy flesh, balanced sweet-sour taste, and easy stone separation, making it suitable for both fresh consumption and industrial processing. *Yuzhnaya Krasavitsa* shows adaptability to environmental stresses, including drought, high summer temperatures, and moderate winter cold, as well as moderate resistance to common fungal diseases. These traits enhance sustainability and reduce production costs, supporting long-term orchard profitability.

REFERENCES

1. Cambra, M., Capote, N., Myrta, A., & Llácer, G. (2006). Plum pox virus and the Sharka disease. *Plant Viruses*, 1(1), 69–79.
2. Crisosto, C. H., Crisosto, G. M., & Garner, D. (2003). Understanding consumer acceptance of early harvested plums. *Postharvest Biology and Technology*, 28(2), 209–218.
3. Crisosto, C. H., Garner, D., & Crisosto, G. M. (2004). Stone fruit critical quality factors. *Journal of Pomology*, 58, 1–9.
4. Erez, A. (2000). Bud dormancy; phenomenon, problems and solutions in the tropics and subtropics. *Acta Horticulturae*, 514, 17–48.
5. FAO. (2019). FAOSTAT Statistical Database. Food and Agriculture Organization of the United Nations.
6. Faust, M. (1989). *Physiology of Temperate Zone Fruit Trees*. New York: Wiley.
7. Ferree, D. C., & Warrington, I. J. (2003). *Apples: Botany, Production and Uses*. Wallingford: CABI Publishing.
8. Hartmann, H. T., Kester, D. E., Davies, F. T., & Geneve, R. L. (2011). *Plant Propagation: Principles and Practices* (8th ed.). Pearson Education.
9. Kader, A. A. (2002). *Postharvest Technology of Horticultural Crops* (3rd ed.). University of California, Oakland.