



RESEARCH OF CHEMICAL COMPONENTS  
PRUNUS PERSICA var. Nectarina

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ABSTRACT

This article presents the results of determining the composition of essential oils of two varieties of *Prunus persica* var. *nectarina* growing in the Fergana region of the Republic of Uzbekistan and in comparison with the literature data. The essential oil was obtained by hydrodistillation from the dried leaves of plants.

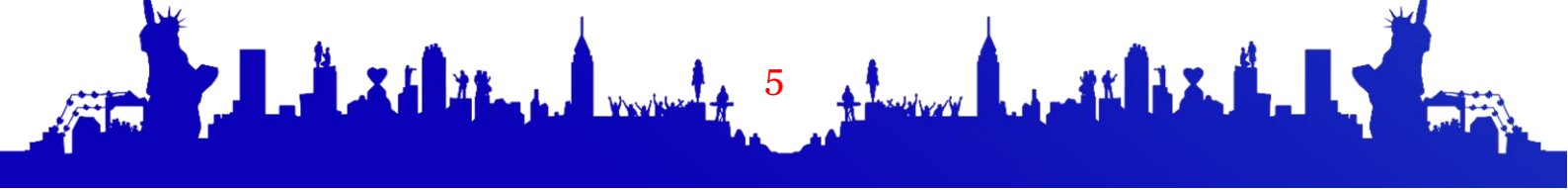
Keywords: *Prunus persica* var. *nectarina*, components, essential oil, chromatomass spectral analysis, hydrodistillation, camphor, isoborneol.

Introduction.

*Prunus persica* var. *nectarina* (syn.: *Prunus persica* var. *nucipersica*) — bare -fruited peaches or nectarines (luchaki-uzb.), belonging to the Rosaceae family. This group of varieties is characterized by hairless fruits with a thin skin. Their fruits are diverse in size, shape and color: small and medium, rounded, less often oval, white, yellow, dark red. The pulp is juicy, tender, sweet with a pleasant sourness and aroma characteristic of nectarine, pleasant taste. The bone is often free. The fruits are mainly consumed fresh, and only some yellow-meaty forms are used for drying.

In modern folk medicine, a decoction of peach leaves and flowers is used in the treatment of diabetes, and also as an anthelmintic. The gruel of the leaves is externally used in the treatment of abscesses, burns, dry and wet eczema, neurodermatitis. A decoction and fresh juice of peach leaves are also used in the treatment of headaches, rheumatism.

In separate literature sources, the chemical composition of the essential oils of peach leaves and nectarine from different regions is given; more than 130 substances have been found, the main ones being benzaldehyde, limonene, 1-methylethylhydrazine, 4-ethenyl-1,4-dimethylcyclohexene, and 3-carene. It should be noted that, depending on the region of growth, the chemical composition of the essential oils of the leaves of *Prunus persica* var. *nectarina* differ significantly, and varieties growing in the Republic of Uzbekistan have not





been previously studied. Therefore, the purpose of this study is to study the chemical components of the leaves of the essential oil of *Prunus persica* var. *nectarina*. In this paper, we present materials on the composition of the essential oil of nectarine growing in Uzbekistan in comparison with the literature data.

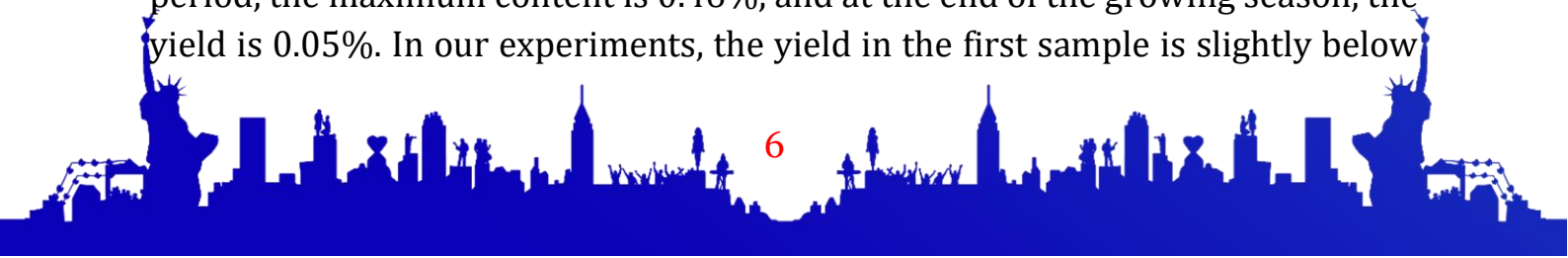
#### Experimental part

Essential oils were analyzed on an Agilent 7890 AGC gas chromatograph with an Agilent 5975C inert MSD quadrupole mass spectrometer as a detector at the Institute of Chemistry of Plant Substances. academician S.Yu.Yunusova AS RUz. Separation of the mixture components was carried out on a HP-5MS quartz capillary column (30m\*250m\*0.25 $\mu$ m) in the temperature regime: 50°C (2 min) – 10°C/min up to 200°C (6 min) – 15° C / min up to 250° C (25 min).

To conduct a study during the fruiting period, the leaves of two varieties of *Prunus persica* var. *nectarina*, growing in the Kuva and Altaryk districts of the Fergana region of the Republic of Uzbekistan, were collected in July 2021. Essential oils were obtained from air-dried leaves of two varieties of peach by hydrodistillation for 3.5 hours using a glass flask and Clevenger nozzle. The resulting essential oils were a pale yellow mobile liquid with a specific odor, which was stored at 0°C until GC-MS analysis. The yields of essential oils were 0.3% for the first sample and 0.45% for the second sample, respectively.

Essential oils were analyzed on the above gas chromatograph with a quadrupole mass spectrometer. Separation of the mixture components was carried out under the above conditions on a quartz capillary column. The volume of the introduced sample is 1 $\mu$ l (hexane, benzene), the flow rate of the mobile phase is 1.1 ml/min. Injector temperature 240°C. Terpenoids and other components were identified based on a comparison of the characteristics of the mass spectra with data from electronic libraries (Wiley and National Institute of Standards and Technology (NIST) libraries (W9N11ST.L)) and a comparison of the retention indices of compounds determined with respect to the retention time of a mixture of n- alkanes.

The yield of essential oil  $\eta$  in terms of air-dry raw materials was 0.3 and 0.45%. According to the literature data, the yield of essential oil, depending on the season and growing season in India, ranges from 0.05% to 0.46%. For example, in the flowering phase, the essential oil yield is 0.14%, during the rainy period, the maximum content is 0.46%, and at the end of the growing season, the yield is 0.05%. In our experiments, the yield in the first sample is slightly below



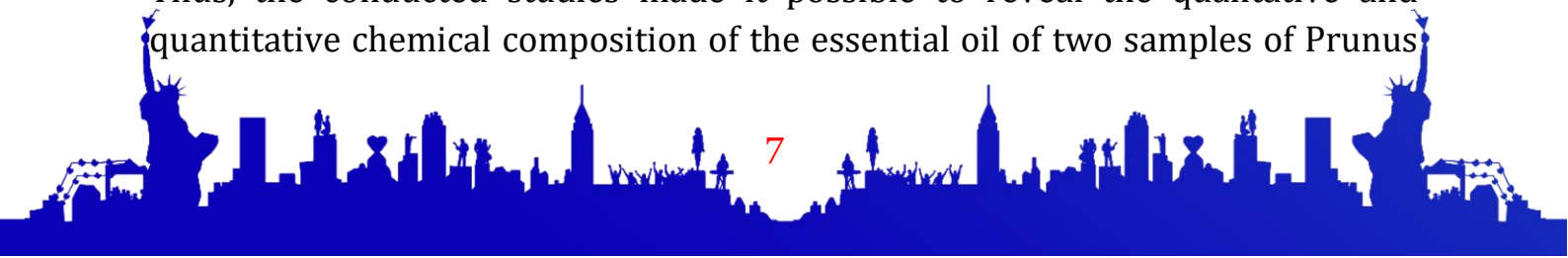


the maximum, while in the second sample it is consistent with the maximum of the compared object. In the composition of essential oils obtained by hydrodistillation, 56 and 61 compounds were identified in the first and second samples, respectively, which is 94.55 and 96.00% of the sum of the components. Of these, 39 are common to two varieties. The first is characterized by 17, and the second by 22 components.

The identified components belong to the following classes. Almost half of the components are terpenes. Acyclic monoterpenes - o-cymene, cis-ocymene, alloocymene. Monocyclic monoterpenes - dl-limonene, eucalyptol,  $\alpha$ -terpinolene,  $\beta$ -phellandrene,  $\alpha$ -terpinene,  $\gamma$ -terpinene, R(+)-limonene, (-)-carvone, d-(+)-carvone, p-1, 5,8-mentathriene, 1,4,8-mentathriene. Bicyclic monoterpenes - (+)-2-bornanone,  $\alpha$ -thujone,  $\beta$ -thujone, sabinene, (+)-2-karene,  $\beta$ -pinene, (+)-4-karene, 1R- $\alpha$ -pinene,  $\alpha$ -pinene, isoborneol, 4-isopropyl-3-carene. Tricyclic monoterpene tricyclene. Monocyclic sesquiterpene - $\alpha$ -humulene. Tricyclic sesquiterpenes-9,10-dihydroisolongifolene, (-)- $\alpha$ -cedren. Saturated hydrocarbons-n-tetradecane. Unsaturated hydrocarbons - isoprene, trans-1,4-hexadiene, trans, trans-2,6-dimethyl-1,3,5,7-octatetraene. Alicyclic hydrocarbons-1-methylcyclohexa-1,3-diene, ethylidenecyclopropane, 4-acetyl-1-methylcyclohexene, 1-methyl-4-(1-methylethylidene)-cyclohexene, (1s)-2,2-dimethyl-3-methylenebicyclo heptane, 3-methylenecycloheptene, 4-methyl-3-(1-methylethylidene)-cyclohexene, 1-aza-2-phenyl-4-methoxycarbonylcyclopent-1-ene. Arenes - 4-ethyl-o-xylene, 3-e-o-xylene,  $\alpha$ -dimethylstyrene, 5-ethyl-m-xylene, 2-ethyl-p-xylene, 1-methyl-2-isopropylbenzene, benzoacetonitrile. Alcohols- n-butan-1-ol, n-hexanol, cis-3-hexen-1-ol, (1S-endo)-acetate-1,7,7-trimethyl-bicycloheptan-2-ol, $\alpha$ -hydroxytoluene, phenylethyl alcohol. Aldehydes and ketones - benzaldehyde, ethylbenzaldehyde, 4-(1-methylethyl)-benzaldehyde, n-hexanal, trans-2-methyl-2-butenal, trans-2-hexenal, 2,2,6-trimethylcyclohexanone,  $\alpha$ -ionone, 6-methyl-5-hepten-2-one, 5-(1-methyl-ethyl)-bicyclo[3.1.0]hexan-2-one. Furan derivatives-2-amylfuran, trans-2-(2-pentenyl)furan, cis-2-(2-pentenyl)furan, furfural, sylvan. Phenols and their esters - homoveratrol, cis-methylisoeugenol, trans-methylisoeugenol, eugenol, 2-methoxy-4-vinylphenol, carvacrol. The experimental results show that the composition of the chemical components of nectarine essential oils is rich in bicyclic monoterpenes.

### Conclusions

Thus, the conducted studies made it possible to reveal the qualitative and quantitative chemical composition of the essential oil of two samples of Prunus

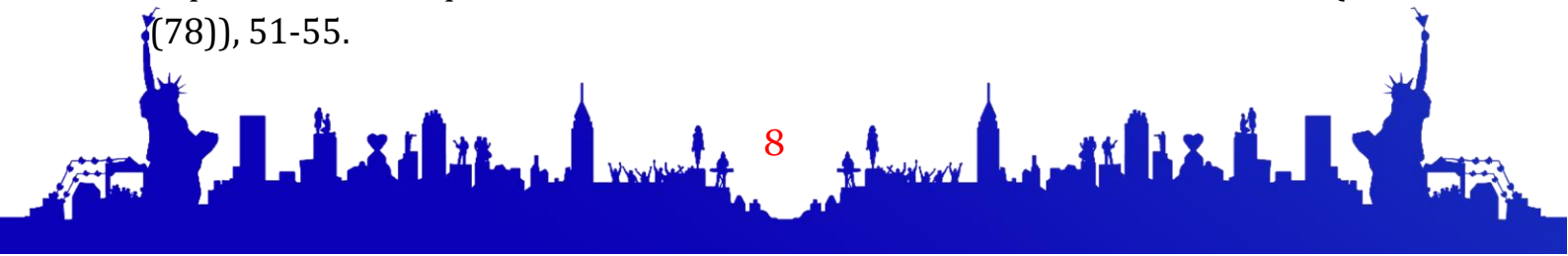




persica var. nectarina, growing in the Fergana region. It has been established that the component composition and content of individual substances significantly depend on climatic conditions and the growing season of the studied plants. The studied varieties of *Prunus persica* var. nectarina can serve as a raw material for the production of essential oil, the main components of which are camphor and isoborneol.

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