



*Spread in the flora of the Nakhchivan Autonomous Republic of Azerbaijan
Satureja L. (wild grandmother) Biomorphological Characteristics, Results of
Phytochemical Analysis and Perspectives of Use*

*Azərbaycan Nahçıvan Özerk Cumhuriyeti Florasında Yayılış Gösteren
Satureja L.'nin Biyomorfolojik Özellikleri, Fitokimyasal Analiz Sonuçları ve
Kullanım Perspektifleri*

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Received/Geliş Tarihi: 23/01/2021

Accepted/ Kabul Tarihi: 26/06/2021

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doi: 10.35206/jan.865217

e-ISSN: 2667-4734

Abstract

Özet

The article deals with the genus *Satureja* L. Bu makale *Lamiaceae* Lindl. familyasına ait *of Lamiaceae* Lindl. Biomorphology of the *Satureja* L. cinsi ile ilgilidir. Nahçıvan Özerk species of garden mint, ecogeographic Cumhuriyeti florasında yayılan bağ çöl nanesi characteristics, results of phytochemical türünün biyomorfolojini, ekocoğrafik analysis, useful properties, with detailed karakteristik özelliklerini, fitokimyasal analiz comments on the possibilities of its use in sonuçlarını, faydalı özelliklerini ve bilimsel scientific medicine, in the World and in kullanım olanakları hakkında detaylı Azerbaijan and detailed comments have been yorumlarını, ve ayrıca dünyada, given on its distribution in the territories of Azerbaycanda ve Nahçıvan Özerk the Nakhchivan Autonomous Republic. A Cumhuriyeti topraklarında dağılımının thin layer of ethanol extract of the leaves of ayrıntılı açıklamasını içermektedir. *Satureja* the species was chromatographed and Rf-ed. *hortesis* L. yapraklarının etanol özünün ince The ingredients were determined based on tabaka kromatografisi gerçekleştirilmiş ve Rf. the result of spectral and chromatographic değerleri belirlenmiştir. Spektral ve analysis, the compounds in the extracts have kromatografik testler sonucunda identified. In thin-layer chromatography, the ekstraktlardaki bileşikler belirlendi. İnce purely separated part was dissolved in tabaka kromatografisinde, saflaştırılan kısım ethanol and the substances spectra at a etanolde çözülmüş ve bileşenlerin wavelength of 200-700 nm via spektrumları spektrofotometre ile 200-700 nm spectrophotometer. Flavonoids (28.8%) of dalga boyunda kaydedilmiştir. 200.0-294.5 the spectra obtained at 200.0-294.5 (MeOH λ mak. nm) dalga boyunda

wavelengths (MeOH λ_{max} . nm), 340.5-378.5 nm wavelength (26.8%) flavonols, 378.5 nm dalga boyunda flavoioller, flavanones, chalcone 556.5-630.5 nm flavononlar, kalkonlar ve 556.5-630.5 nm wavelength (44.3%) was found to be dalga boyunda (%44,3) antosiyaninler için characteristic of anthocyanins. karakteristik olduğu gösterilmiştir.

Keywords: Chromatography, flavonols, **Anahtar kelimeler:** Kromatografi, spectrum, halcyons, flavonones. flavonoller, spektrum, halyonlar, flavononlar

Abbreviations: UV-VIS, ultraviolet-visible spectrophotometry

1. INTRODUCTION

Research of natural resources in the development of the economy of the Republic of Azerbaijan, its use, restoration and protection are important issues of State importance and Natural resources. One of the important conditions is to protect, restore and direct properly. Azerbaijan National Strategy for the Conservation and Sustainable Use of Biodiversity by the Republic and the action plan has been approved. The chapter is modernized to address issues in the direction to study the situation, to determine the ecological and anthropogenic transformations that are taking place, and its importance both theoretically and practically (Alakbarov 2013; 2015).

Looking at the chronology of the historical study in the flora of the Nakhchivan Autonomous Republic; it appears that Lamiaceae Lindl. (Dalmazkimis, Lipsticks) is a comprehensive chapter not studied, thus the biomorphology, ecology, distribution patterns of this chapter taking in, account's for the relevance of the phytochemical composition, treatment directions and prospects for use and the great need to learn more. For this purpose, in the territory of the Autonomous Republic; research work has been started and is underway distributed in Nakhchivan Autonomous Republic and included in the chapter of collection, drying, botanical, ecobiomorphological, therapeutic, properties, distribution of species, phytochemical composition, pharmacological effect and it's possibilities of use in scientific and folk medicine (Ibadullayeva & Alakbarov, 2013).

In addition to the sexual botanical properties of *Satureja L.* its medicinal value is also important. It is important to study widely. The flowers of the species included in this chapter are 4-15 mm long, bluish-white, light bluish or pink, consisting of 3-7 flower buds, bowl bell-shaped, two-lipped, five-toothed, lower teeth not deep, straight hairs on top the upper lip is straight, the lower lip is curved and triangular. The male is 4 pieces, top shorter than or equal to the lip (Akhundov et al., 1983; Mustafayeva et al., 2015). Unity of shrubs or shrubs of the leaves have

metal-like vesicles on them, the leaves are mostly entirely short-stemmed. Thirty species of this genus are found in Mediterranean countries. Based on the composition of the species; contains biologically active substances with antibacterial and anthelmintic properties. In folk medicine it is used during respiratory infections to cure tachycardia, gastrointestinal diseases, cystitis, flatulence, headache, dizziness, rhinitis, its aqueous extract has insecticidal activity. Essential oil from the products are mainly used in gastric diseases and aromatherapy, Containing carvacrol flavonoid which is antifungal and has also antioxidant effect. It also contains fat acids that reduces the risk of oncological diseases in the brain. Currently used in combination with beans in cooking, peas and other legumes (Kuliev & Ibadullaeva, 2009; Mehdiyeva, 2011).

Family name: Lamiaceae Lindl. –

Genus: Satureja L. - Wild mint

Satureja hortensis L. - Garden mint

This plant is called savory in England, sarriette in France, savouree, bohnenkraut in Germany, pfefferkraut, weinkraut, santoreggia in Italy, ajedrea comun in Spain, segurelha in Portugal. balver plant is united; it is mainly found in dry stony-gravel places, on rocks, in melons gardens and in algae, the body is straight, short-haired, branched, 15-30 cm is high, the root is thin, straight, almost cylindrical and 10-15 cm long, the leaves consisting of narrow or linear scales, sharp, few dots in the form of vesicles is 1.5-2.5 cm. The inflorescence consists of 1-3 flowers and is located in the axils of the upper leaves.

Bowl bell-shaped plant is 3-4 mm long, narrow scissor or linear, ciliated, teeth is the same size. Flower crown is 6-8 mm long, purplish, pink or light blue, the mouthparts are darkly spotted. The lower lip is long and triangular, and the upper lip is short and bipolar.

Fruit 1 mm; consisting of hazelnuts, brown ovate-trilingual. in July-August it blooms and bears fruit in September-November around the Kura of Azerbaijan, from the low mountain belts of the Nakhchivan Autonomous Republic, the stony-gravelly land of the middle mountains to areas, especially in scatterings and bushes, it is a good balverina plant that produces many vaccines (Anonymous, 1989; Wolfe & Malaeiev, 1969). In addition to it's essential oils, it also produces mucus and resic, there are also ingredients. The essential oil is light yellow in color and has a pungent mint odor. Plants very dark aroma (Guliyeva et al., 2016) are found with the composition of carvacrol (30-42%), o-chimol (20%) and triterpene carbohydrates (40%).

As it is spicy, it's freshly dried leaves are used to salt cucumbers and tomatoes in cooking used when laying boiled mushrooms, meat, potato salads, along with green and white peas used in the preparation of fish and poultry, In perfumery and cosmetics because it is an essential oil, it

is especially used in medicine in the preparation of therapeutic teas and tinctures, Besides it is prescribed in bath and it is used for useflatulence, astringent, deworming and strengthening in gastrointestinal diseases (spasms). In Bulgarian medicine it is used as anesthetic, diuretic, laxative, prescribed for tachycardia and migraine, as well as for vomiting, bactericidal, antispasmodic and antitussive, it is considered an indispensable plant in the medicine of European countries (Helnz Rechinqer, 1697), Central and Southern parts of Europe, North America, Portugal, Northern Italy, South France, the Balkans, South Ukraine, the Caucasus, Iran, India, Asia Minor, South Africa and It's widespread in the mountainous areas of Ceylon. It was first introduced to science from Georgia. Spicy, and for the first time as an ornamental plant in Western Europe, the Mediterranean countries, Central Asia and America cultivated it. The plant Contains 0.1-3.2% essential oil, flavanoids: carvacrol, thymol, p-simol, 6.8-35.8%, α -z pinene 0.6-1.5%, sabinen 0.2%, kamfen 0.1%, mirsen 1-2.3%, 1.8-sineol 0.1-0.3%, limonene 0.1- 0.4%, μ terpine 6.3-32.3%, α -terpineol 0.1-3.4%, eugenol 0.1%, apomadendren 0.3%, humulene 0.1-0.3%, p-fellandrene 0.1%, α -tuyen 0.4-1.9%, linalool 0.1-0.8%, citronellol, saponins, C, E, vitamins, triterpenoids in the trunk: 0.17% ursolic acid, 0.4% ursolic acid in the leaves, phenolic acid and its derivatives: rosemary, chlorogen (3-caffeine), 0.012%, tartaric acid, 0.074-0.49% caffeine, 0.0032% L-coumarin, 0.0005-0.011% gentianin, 0.0002-0.0058% salicyl, 0.0003-0.0073% vanillin, 0.0005-0.006% protokatexin, fatty oils in seeds and its hydrolyzate acids: palmitic, 4% stearin, 12% olein, 18% linoleic and 62% linoleic.

In Nakhchivan Autonomous Republic Ordubad district; Gilanchay, Bilav, Shahbuz district; Nursu, Badamli, Julfa district; Goynuk, Arafsa, Khoshkeshin the plants are especially in dry areas of the former Paradash spreads in sandy, stony-gravelly and rocky places. It is used in rheumatism as antiperspirant, anthelmintic, neurological diseases, gastralgia and bath, has lactogenic properties. The extract has antibacterial and antifungal activity, are included in the official medicinal plants of France, it is used as in flatulence in Indian medicine, in folk medicine; it is prescribed as an appetite suppressant, cough suppressant, anthelmintic for ore tachycardia, dizziness, gastrointestinal tract, urinary tract, flatulence, rhinitis and used in acute respiratory infections. It is however used as spices for canned food, sausages and other products used in the preparation. Aqueous extract has insecticidal activity as it is an essential oil for stomach cramps and includes spicy foods. It has antibacterial and antifungal properties, Especially carvacrol has antifungal effect, cucumbers and culinary, as the leaves spice is used in marinating tomatoes, it's fatty oils can replace the composition of flax.

1.1. *Satureja macrantha* C.A. Meyer - Large Mint

It is a perennial plant, its body is numerous, slender, rod-like, hard as a tree, simple and weak, 30-50 cm high and branched. The leaves are numerous, linear or oblong-oblong, blunt. Bowled 5 mm long, tubular-bell-shaped, two-lipped, short, scattered hairy, bizarre teeth, 3 times shorter than the tube. Flower crown 12-15 mm long,

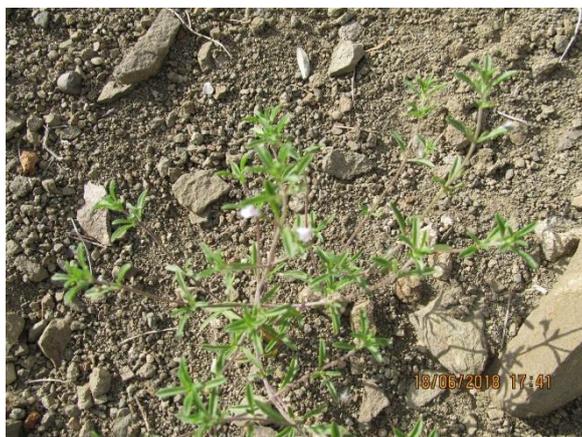


Figure 1. *Satureja macrantha* C.A. Meyer

It is pink, the tube is narrow and long from the flower crown, the stamen column from the crown is long. Fruits are 1.5 mm long, brown, ovate, consisting of colored hazelnuts. It blooms in May-July and bears fruit in July-September. Fruits are used as a spice due to its aromatic essential oil content when freshly collected, however the presence of phenolic compounds (toxic) prevents the use of this plant as a spice, therefore, it is advisable to use less of this plant as a spice. It is found In the woods, It is moderately widespread in bushes, rocky slopes and areas up to the middle mountain belts (Anonymous, 2013; Davis, 1969).

It is widely spread in the East and South Caucasus and northern Iran. For the first time from the South Caucasus it was included in science (Kasumov et al., 1977). it can be found in the Nakhchivan Autonomous Republic Ordubad district; Bilav, Kalaki, Pazmari, Kotam Julfa district; Nahajir ("Intermediate" territory), Goynuk, Arafsa, Kazanchi (Berdikdag), Shahbuz district; South Qishlag, and It is distributed in dry sandy, stony, gravelly and rocky areas of coal areas, Contains 0.34-2.33% essential oil: 27.5% thymol, 20.1% μ -terpine, α -pinene, p-pinene, α -tuyen, amphen 2.8% p-mirsen, limonene, p-fellandren, 8% methyl carvacrol, 4% p-karyophylline, 3.6% Contains kalakoren, apomadendron, nerol, heranilol, camphor, vitamins C, E and flavanoids. As it contains essential oil, it is used in perfumery, in diseases due to its antibacterial properties and the stems are used to flavor cheese. Balveren is a plant. It's Biological activity in the flora of the Autonomous Republic are traced with the substances like (flavonoids,

alkaloids, coumarins, polycarbohydrates, glucosides, etc.), as well as folk ; confectionery, soft drinks, pharmaceuticals and other in different areas of the economy. There is a great need for it's use in those fields. For this purpose, *Satureja hortensis L.* - Garden field mint is dried by standard method, analyzed by extract preparation.

2. MATERIALS AND METHODS

The details of the biologically active substances contained in the garden mint species studies research depicts the future use of its constituent substances mainly in the direction of scientific medicine as considered quite relevant. It is from this point of view that this type of E.A. apply the Wolf method (Wolfe & Malaeev, 1969); learned by passing Garden mint for 3 hours through hexane and ethanol, which are solvents of different polarity using Hitachi U-2900 UV-VIS spectrophotometer DC-fertigfolien ALUGRAM SIL G / UV 254, while chromatographic analysis are carried out through the layer through Solvent system for thin-layer chromatography: butanol: vinegar acid: water 4: 1: 5 and petroleum ether: acetone: chloroform 3: 1: 1 by volume, analyzed according to the methodology (Anonymous,1983).

3. RESULT AND DISCUSSION

Satureja hortensis L. - ethanol extract from the leaves of garden mint is performed through thin layer chromatography and the ingredients were determined based on Rf values (Fig.). The composition of Simultaneous spectral and chromatographic analysis of leaf and stem extracts was determined on the basis of the resulting prices Figure 2. *S.hortensis L.* - UV spectrum of ethanol extract from the body of garden wild mint, the Hitachi U-2900 was captured at a wavelength of 200-700 nm using a UV-VIS spectrophotometer. Flavonoids of the spectra (28.8%) obtained at a wavelength of 200.0-294.5 nm (MeOH λ max. nm) - baikalein, apigenin, flavanols - galangin, flavanones - pinosembrin, chalcones - dihydroxyalkon, 340.5-378.5 nm wavelength (26.8%) flavonols-guerchetin, formononetine, genistein, ramnetin, isoramnetin, galangin, kempferol, herbasetin orobol, flavanones - dihydrocempferol, dihydroquercetin, pinosembrin, naringenin, hesperetin to chalcans -dihydroxyalkon, 556.5-630.5 wavelength (44.3%) was found to be characteristic of anthocyanins.

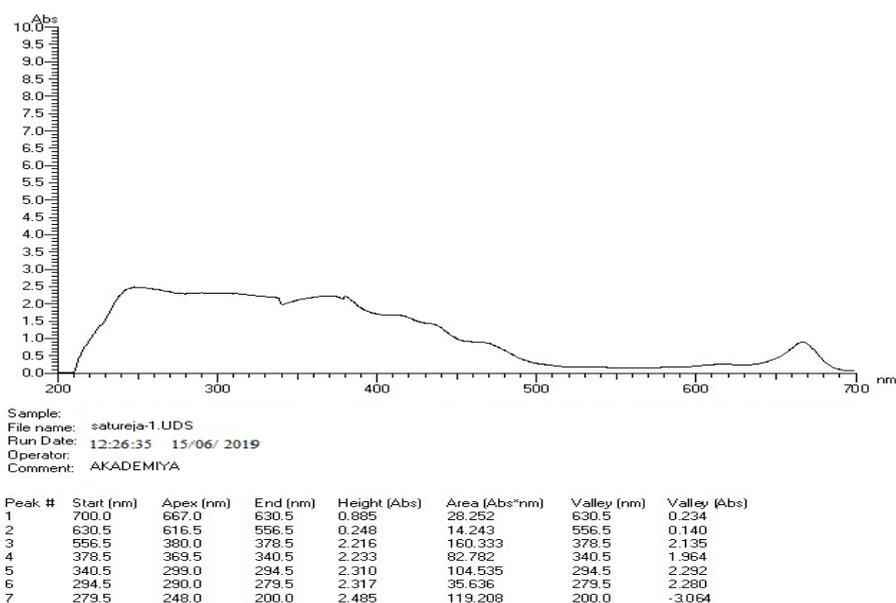


Figure 2. *Satureja hortensis* L. - UV spectrum of ethanol extract of garden field mint's stem.

It was captured by the Hitachi U-2900 spectrophotometer at a wavelength of 200-700 nm. (28.8%) spectrum of 200.0-294.5 nm (MeOH λ_{max} . nm) determined for flavonoids - baikalein, apigenin, flavanols - galangin, flavonones - pinosembrin, chalcones – dihydroxyalkon; the wavelength of 340.5-378.5 nm with (26.8%) was determined for flavonols-guerchetin, formononetin, genistein, ramnetin, isoramnetin, galangin, kempferol, herbasetin orobol, flavanones - dihydrocampferol, dihydroquercetin, pinosembrin, naringenin, hesperetin chalcones – dihydroxyalkon; and (44.3%) of 556.5-630.5 nm wavelength determined for anthocyanins.

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