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БИОМОРФОЛОГИЧЕСКИЕ И ЛЕЧЕБНЫЕ СВОЙСТВА ВИДА *CAPPARIS HERBACEA* L, РАСПРОСТРАНЕННЫХ В ФЛОРЕ НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКИ**BIOMORPHOLOGIC AND THERAPEUTIC FEATURES OF *CAPPARIS HERBACEA* L. SPECIES IN THE FLORA OF THE NAKHCHIVAN AUTONOMOUS REPUBLIC OF AZERBAIJAN**

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В статье представлена информация о фитохимическом составе *Capparisherbacea*L, распространенного в территории Нахчыванской Автономной Республики. Просмотрены некоторые литературные источники зарубежных и местных исследователей об общем распространении и химическом составе вида, и выявлено, что химический состав растения очень богат. Также приобретены подробные сведения о наличии флавоноидов и каротиноидов. Установлено, что флавоноиды - одна из составных частей содержания большинства растений, и они имеют важное медицинское значение. Получены экстракты из плодов вида посредством полярных и неполярных растворителей и изучены составы экстрактов с применением различных методов. С целью очистки веществ, проведена колоночная и тонкослойная хроматография, экстракты разделены на фракции и вычислены их Rf показатели. В результате колоночной хроматографии получены 6 фракций и ИВ спектр каждой фракции запечатлен спектрофотометром

The article provides information about phytochemical investigation, medical and nutritional importance of fruits of *Capparisherbacea* L. including *Capparaceae*Juss. family in the area of the Nakhchivan Autonomous Republic. Some solvents had been applied, fruit and leave extracts had been bought. The purification and identification of content of plant extracts had been investigated with spectroscopic and chromatographic methods. The saponins, carotinoids, chlorophyll pigments and flavonoids had been revealed in the content of extracts. The extracts have been acquired from fruits of this species by use of polar and nonpolar solvents and the composition of extracts have been studied with different applied methods. The column and thin layer chromatography carried out in order to purification of contents and extracts were fractionation and Rf values were calculated

Ключевые слова: МЕДИЦИНСКИЙ, CAPPARIS, ФИТОХИМИЧЕСКОМ, АНТИОКСИДАНТ, БИОАКТИВ КОМПОНЕНТ, ХРОМАТОГРАФИЧЕСКИЙ

Keywords: MEDICAL, CAPPARIS, PHYTOCHEMICAL, ANTIOXIDANT, BIOACTIVE COMPONENTS, CHROMATOGRAPHY

Doi: 10.21515/1990-4665-128-034**Introduction**

Plants had been utilized by people for different purposes as source of food, medical preparation and some useful natural components from ancient time.

The applying new analyzing and development of defining methods, phytochemical analyzing of plants had been alleged as purpose. The plants are significant source of important contents and natural antioxidants for human body. Therefore studying of useful components in the content of plants and their use in people nutrition are crucial process in modern time. The main natural antioxidants, existing in food and protecting body from harmful radicals are mainly vitamins (ascorbic acid, α -tocopherol, vitamin E), carotenoids, polyphenolic contents and flavonoids. These compounds mainly exist in different vegetables, fruits, corns and medicinal plants. The carbohydrates, organic acids, nitrous substances, aromatic and dye stuff, mineral salts, vitamins, ferments, glucosides and pectins exist in fruit and vegetable content for human body. The vitamins increase resistance of human body against different disease which exist in fruits and vegetables. Recently the studying of rich biological active components of plant species and determining of components is actual problem of modern science. For this aim getting of biological active components and studying, applying to different fields of industry consider very crucial matters [6, 9].

The area of Nakhchivan Autonomous Republic is rich with useful plants, therefore it is need for comprehensive studying of these plants. To investigate modern position of the family and to determine the ecological and anthropological transformations happened with them have both theoretical and practical importance. The plants including in *Capparaceae* Juss. family are in the important place in the rich flora of Nakhchivan Autonomous Republic. *Capparis herbacea* L. described from Southern Europe. It is bush plant for bio morphological features. The roots excrete special ether and grow well in stony, gravelly and clayey soil. Distribute in plain, rarely and mountainous areas. *Capparaceae* Juss. family has more than 350 species. The branches of these family plants up to 2 m length, sprawling shrubs. According to life form the leaves

of these species are curved grass and shrubs. The leaves are egg-round or elliptical, short stalk and located in shifts [10, 11].

The genus of *Capparis* L. is the largest genus of this family and include 150 species. The branches are sprawling, 50-200 cm. The leaves are egg formed, tip part is sharp. Fruits are longish with long stalk is 20-45 mm [5].

The species of *Capparisherbacea* L. is called field watermelon and field leek. *Capparisherbacea*L. is a perennial species that rounded fleshy leaves and big white pinkish-white flowers. Under of leaves are thorny. The leaves are ellipsoid. Stalks of leaf are short and sharp. Petals are white or pale pink, length 30-50 mm. There are a lot of stamens in the flower. Fruits are ellipsoid and long stalk, length 20-45 mm. *Capparisherbacea* L. is an important crop in Mediterranean countries, where it also grows spontaneously in diverse ecosystem. It is hot climate plant. *Capparisherbacea* L. (Capparaceae) is an aromatic plant growing wild in the dry regions. The root of the line, up to 10-12 m long. Stems numerous, prostrate, up to 1.5 m long. Stipules are as yellowish spines, straight or curved. Leaves on short petioles, rounded, obviate or in May-June, fruiting in August-September [5, 9].

General distribution zones: *Capparisherbacea* L. species has been spread in the area of Western and Eastern Mediterranean, Russia, Turkey, Balkans, Iranian areas. Caucasus - all areas (except high mountains and areas with high humidity, Central Asia - the southern and central regions with the exception of sandy deserts, high mountains and lowland areas). As wild plant, it is spread the south of Europe, middle of Asia, Pakistan and India. Also this species spread in the Absheron, Shamakhi, Sumgayit, Khizi, Nakhchivan regions of Azerbaijan [2, 5, 9, 11].

Distribution zones in Azerbaijan: from Samur-Shabran plain to Caspian sea, Absheron, rarely east part of great Caucasus, south part of Little Caucasus,

Gobustan, Kur-Araz lowland Shamakhi, Sumgayit, Lankaran, Mugan, Khizi, Nakhchivan regions of Azerbaijan [10,11].

Distribution zones in Nakhchivan Autonomous Republic: This species distribute in the desert and semideserts of mountainous and foothills regions, mainly lowland, foothill, plain, stony and rocky areas, low mountainous zones, along the rivers. Also this species spread in the grey soils, slopes of low mountainous areas, hole and meadow. The territory of Badamli, Kechili, Shahbuzkand, Kulus, Salasuz, Batabat of Shahbuz region, Kyrna, Gal-Shurud, Nahadjir of Julfa region, Bilev, Pezmeri, Dirnis, Keleki of Ordubad, Kyvrag, Boyukduz of Kangarli, Validagh territory, Akura village of Sharur region, Disa, Zeyneddin, Shikhmahmud, Cehri of Babek regions of Nakhchivan Autonomous Republic [5, 9, 11].

The use of the plant

The *Capparis herbacea* L. species has a lot of medicinal features. Caper is an important species in our natural environment and economy for high nutrition flowers and buds, high adaptation capability and medicinal efficiency.

The studying of biochemical content of *Capparis herbacea* L. species including in *Capparis* L. genus had been started from 1960. Some scientific researchers had investigated bioactive components in the content of this species. Thus, it was determined that *Capparis herbacea* species is rich with phenolic components, flavonoids, carotinoids, glucosinolates, saponins, tocopherols and mineral components. Different flavonoids had been studied in caper bush and capers: rutin (quercetin 3-rutinoside), quercetin 7-rutinoside, quercetin 3-glucoside-7-rhamnoside, kaempferol-3-rutinoside, kaempferol-3-glucoside, and kaempferol-3-rhamnorutinoside. Rutin is a powerful antioxidant bioflavonoid in the body and used as a dietary supplement for capillary fragility. Also this species is rich with

mineral elements K, Ca, Mg, P, Si, Fe. There are fatty acids palmitin, olein, linol, linolein, also Al, Ca, Cu, Fe, K, Mg, Na, P, Zn in the seeds [1, 3].

Also saponins were studied in the content of this plant. Saponins are high-molecular-weight glycosides, consisting of a sugarunit(s) linked to a triterpene or a steroid aglycone. Many saponinshave detergent properties. They lower the surface tension of aqueoussolutions and therefore give stable foams when in contact with water. In fact, the name “saponin” stems from the latin word sapo (soap). Saponins are also known to cause haemolysis (lysis of erythrocytes with the release of hemoglobin), have a bitter taste, and be toxic to cold-blooded animals. Even though these attributes are not common to all known saponins, they are sometimes used to characterize this class of compounds [7, 8].

Materials and Methods

During the visited expedition to the area of Babek region of Nakhchivan, the plant *Capparis herbacea* L. were collected and brought to the laboratory. The slip parts of the plant separated from other parts, dried in the shade and kept in the paper bags until use. Samples were powdered in blender and 5 g of sample was taken and extracted with different solvents. Firstly was extracted with 50 ml distilled water, then with hexane 2 times for separating from lipofil items and chlorophylls in 25°C, with ethanol and ethanol+water solvents during 4 hours. The separation procedure was carried out with column chromatography and TLC. Extracts were measured at between 200-700 nm by Hitachi U-2900 UV-VIS. Labconco Clear Drying Chamber with Valves 7443500. Thin layer chromatographic analysis has been carried with DC-fertigfolien ALUGRAM SIL G/UV 254. The qualitative analysis of flavonoids have been studied with Fe (III) chloride and cyanidin tests [3, 7, 8].

The saponins were determined with following methods. The stock solution (1 ml) was taken in a test tube and diluted with 20 ml of distilled water. It

was shaken by IKA vortex genius 3 for 15 min. A foam layer was obtained on the top of the test tube. This foam layer indicated the presence of saponins [4].

Conclusion

11 fraction obtained from column chromatography. In the conclusion it was determined that there are saponins in the water extract, carotinoids and chlorophyll in hexan extract. The end of investigation show that the tests give positive results for saponins.

The UV spectrum of extracts had been measured between 200-700 nm wavelength. 230-450 nm depict carotinoids, 664 nm chlorophyll a, 240-380 nm illustrate flavonoids.

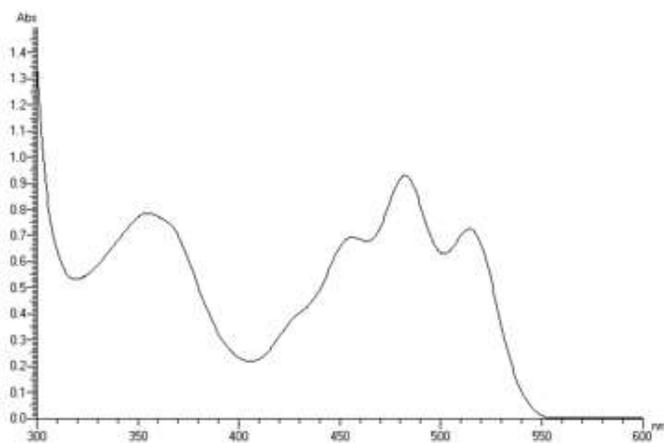


FIGURE 1. UV spectrum of fraction 3 of hexan extract

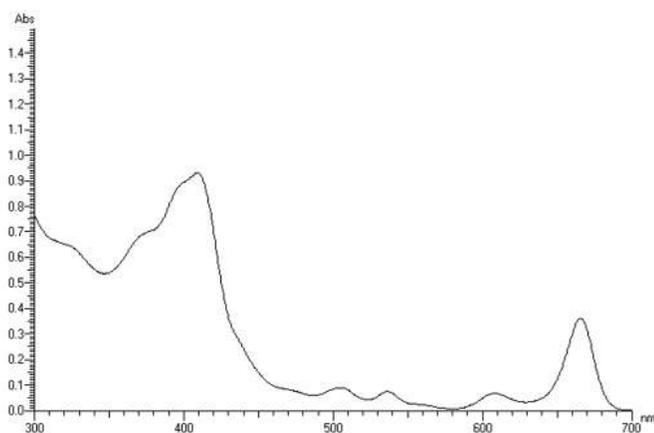


FIGURE 2. UV spectrum of fraction 10 of hexan extract

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