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MORPHOLOGICAL, ECOLOGICAL AND PHARMACOLOGICAL DESCRIPTION OF CERTAIN SPECIES OF THE TAMARIX GROUP

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ABSTRACT

The flora of Uzbekistan is rich in colorful plants. That is why many scientists are interested in the flora of this country. Tamarix family is also important as a plant with biologically active substances. Although information about this plant is provided in various sources, literature and scientific articles, there is not enough information about the chemical composition and biological activity of Tamarix plants distributed in different regions of Uzbekistan. The main object of our research is to study the morphological, ecological and pharmacological description of some species belonging to the Tamarix genus.

Keywords: Halophyte, Tamarix ramosissima, Tamarix hispida, Tamarix laxa, Tamarix elongata.

Plants are sources of many biologically active compounds of various nature. Various chemicals in their composition play a key role in the treatment of various human and animal diseases. Currently, researchers of developing countries are conducting scientific research on plants and plant products containing biologically active compounds [1].

Tamaricaceae - family are dicotyledonous plants. It is a medium-sized tree or shrub, sometimes in the form of small bushes. Leaves (often reduced) alternate, small, usually lanceolate or lanceolate. The flowers are small, bisexual, panicle-like or umbellate. In Europe, Asia, Africa, there are 3-4 families, about 120 species. Mainly, it grows in saline lands, on the shores of reservoirs in deserts and semi -deserts, and on dry slopes of mountains.

Tamarix – Tamaricaceae are trees or shrubs belonging to the family. South Europe, South Africa 54 species are distributed in deserts, semi-deserts and in Asia (up to India). of Russia South, Caucasus, Kazakhstan and Central Asia it can be found on the banks of rivers and streams , in forests, in thickets, on the shores of lakes and seas. There are about 250,000 Tamarix groves in Uzbekistan. The height of shrub Tamarix is 1-3 m, tree-like 6-8 m. The leaves are small tan or scaly, the flowers are small white, light pink, purple, collected in a long scaly inflorescence. The fruit is a capsule with 3-5 petals . Tamarix Light-loving, drought-, salt- , and poison-resistant plant. Lives up to 40-50 years. Withstands -40.2°C cold. Tamarix species are used to strengthen portable sands, as well as fuel, and various articles are woven from its branches. The bark contains coloring and flavoring substances. Tamarix is a good honey plant,

some species are ornamental. It grows quickly, it is propagated from seeds, rhizomes and cuttings. Tamarix bark contains tannin.

According to the information in the studied literature, Tamarix ramosissima, Tamarix tetrandra roots contain 16-18%, and 11-12% in leaves. However, Professor IPSukervanik, who conducted scientific research in the laboratory of the Chemistry Faculty of the Central Asian State University (UzR National University), did not confirm the above indications. According to his findings, the tannin content in the bark of Tamarix leptostachys is from 0.6% to 10.8%. Tamarix has been found to contain 5.2% tannins. Tamarix elongata rhizome contains 6.5%, stems 3.2%, leaves 3.5%, flower shingles 0.6%. Also, the chemical structure and presence of hydrolyzable tannins and related compounds have been described from local species of Tamarix plants using chromatographic methods, spectral analysis methods [2]. Tannins are the most common substances in many plants. These compounds are widely used in medicine as antimicrobial, antitumor and hemostatic agents [3]. European scientists Freudenberg, Haslam, Schmidt, Mayer take the leading place in the study of tannins [4]. In recent decades, Japanese researchers have conducted systematic analysis of more than 300 medicinal plants, discovered about 100 new structures of tannins [5]. There is evidence that plants of the Tamaricaceae family (Tcimcirix, Reamuria, Miricaria) are also rich in hydrolyzable tannins. Thus, monomer and dimer derivatives of gallo- and ellagitannins were isolated from Tamarix aphylla, Tamarix nilotica, Tamarix pakistanicci plants: hirtellin A, B, C; tamarixin A, B, C, T 1, T 2 ; hemin D and liglanin were determined using high performance liquid chromatography [6]. Therefore, the study of hydrolyzable tannins of local plant species of the genus Tamarix growing in our country is of scientific and practical importance. The object of this research is Tamarix ramosissima, Tamarix hispida, T amarix laxa, T amarix elongata, which grow in different regions of Uzbekistan.

Let's look at some of them:

Tamarix articulata - T. articulata is the most common wild plant that grows in the deserts of Saudi Arabia. T. articulata is biologically active and its total phenolic and flavonoid content has effective antioxidant and antibacterial activity.

Gram-positive and gram-negative bacteria are significantly affected by all methanolic extracts. Moreover, all methanolic extracts show antiproliferative activity against MCF-7 (breast cancer) and RKO (colorectal cancer) [6].

Tamarix aphylla - leafless Tamarisk or Leaflet. Tamarix without leaves (lat. Tamarix aphylla) is the largest species of the family, its height reaches up to 18 meters. This species has many other names, including English - Atheltamarisk; Athel Tree; Athelpin; Athel salt cedar. An evergreen tree that grows in parts of North, East and Central Africa, the Middle East, West and South Asia. T.aphylla extract (100 µg/ml) showed weak activity against six human pathogens. It was concluded that these plants have therapeutic value in the treatment of 18 types of diseases with important phytochemical components and antioxidant effects that justify the therapeutic use of these plants in traditional medicine [8].

Tamarix dioica is a shrub or small tree with reddish bark that grows to a maximum height of 6 m. The leaves are grey-green, small and overlapping along the stem. It has been determined that the main chemically active compounds are more in the pink or purple flowers of the inflorescences up to 8 cm in length compared to the leaves. Flowers and leaves mainly consist

of carbohydrates (51.54%) and phenolic compounds (17.70%). The essential oils of T.gallica flowers and leaves have been found to have antibacterial properties [9, 10].

Tamarix elongata - bushy plant with dark pink flowers. The pink bark is rich in coloring and flavoring substances. A good honey-producing plant, some species are also ornamental. Tamarix elongata root bark contains 6.5%, 3.2% in stems, 3.5% in leaves, and 0.6% in flower petals [2].

Tamarix gallica L - It is a deciduous shrub that grows up to 4-6 m at an average speed and blooms from June to August of the year. T. gallica L is used as an external compress on wounds to stop bleeding. Also, a number of phytochemicals with antihyperlipidemic, antinociceptive, antidiarrheal, antioxidant, anticancer, antimicrobial, liver carcinogenesis and hepatoprotective properties have been identified [1].

Tamarix gracilis WILLD (French Tamarisk) is a shrub or tree found along rivers and lakes throughout California. Tamarix gracilis is associated with dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity. It can also be confused with Tamarix ramosissima or Tamarix chinensis.

WILLD in Tamarix hispi - is a species belonging to the Tamaricaceae family. Mainly distributed in various regions of Central Asia. This plant with blue-green leaves blooms in autumn. Flavonoids were found in the flowers of T.hispida, coumarins, cyclitols in the bark of the stem, as well as phenolic acids and alkaloids in its structure. For therapeutic purposes, the bark is used as an astringent. Buds and flowers of T.hispida have diuretic properties.

Tamarix laxa WILLD - the bark is used as an astringent. T.hispida leaves and T.ramosissima, T.laxa buds are used for immunity, digestive system diseases, as well as diseases of blood and blood-forming organs [3].

Tamarix parviflora DC is also a deciduous, loosely branched shrub or small tree. The leaves are rhomboid, ovate, the sharp tip is gradually narrowing, the length is 0.5–3.0 mm. The edges of the leaves are thin, dry and membranous. The flowers are white or pink. Flowers are most abundant in April-August, but can be found at any time of the year. The petals are usually preserved in the fruit. The seeds are collected in a 3-4 mm long lanceolate ovoid capsule, the seeds are about 0.45 mm long and 0.17 mm wide and have unicellular hairs about 2 mm long at the tip. The seeds have no endosperm and weigh about 0.00001 grams. Its flowers are one of the species rich in flavanoids [3].

Tamarix ramosissima means banded comb or multi-banded comb. The distribution of the species covers the Caucasus, Central Asia, Asia Minor, Iran, Afghanistan, China, and Mongolia. The stems and leaves of T. ramosissima contain up to 27.3% steroids. T. ramosissima has antibacterial effect, and it also has coloring, melliferous, decorative and sand strengthening properties [2].

Tamarix rosea BUNGE - low, erect shrub, up to 2 m tall, with thin, bluish or green branches and reddish annual buds. The leaves are narrow, ovoid, up to 1.5 mm long, and the ends are bent towards the bud. The flowers are pink, in dense, complex branches, up to 5 cm long. Blooms from June to September. Grows in any sunny, well-drained soil. Winter hardiness zone: 6 zones (–17.8 ÷ –23.3°C).

CONCLUSION

It is aimed to study the chemical composition and biological activity of several species of the Tamarix genus, which is the object of the study. Because based on the studied and analyzed sources, it can be said that the chemical composition and level of biological activity of Tamarix species in Uzbekistan have not yet been sufficiently studied. One of the reasons for the research is that several species of the Tamarix family occupy the majority of halophytes in the part of the "Aral Sea" that has become a desert due to the drying up of the "Aral Sea", which has become an ecological problem not only in Uzbekistan but also in the whole of Central Asia. This plant is found both in watery areas and in desert areas where water is scarce. That is, it is adaptable to the external environment. It is necessary to test the chemical composition, similarities and differences of these plants distributed in different regions, the presence or absence of biologically active substances, and which diseases they can be used for, comparing them with the scientific works of foreign scientists. Tamarix ramosissima, Tamarix hispida, and Tamarix laxa are three species of the Tamarix family found in Uzbekistan. The studied plants were collected from the banks of the Sirdarya River in Fergana region and the desert area of Yozhiovon district. It is necessary to study the composition of these plants in comparison with the species of the island. Planned work, laboratory work on determining the chemical composition and biological activity of these plants is being carried out at the Institute of Plant Substances Chemistry of the Federal Republic of Uzbekistan.

REFERENCES

1. Mujahid M., Khalid M., Usmani A. Tamarix gallica: Traditional uses, phytochemical and pharmacological potentials. Journal of Chemical and Pharmaceutical Research. 8(1):809-814. India. 2016

2. Sultonova N.A., Umbetova A.K., Burasheva G.Sh., Abilov J.A. Study of the chemical composition of Kazakh euhalophyte species T. hispida, T. ramosissima, T. laxa, T. elongata from the genus Tamarix // NTO Kazakh materials, 2007. - No. 17. -P. 225–227.

3. Sharma S.K., Parmar RS New constituents of Tamarix species.//.!. science. and Indus Res. - 1998. - vol. 57. - B.873-890.

4. Enter phytochemical studies and determine the biological activity of plant substances. The team of authors / Ed. Mamonova L.K. and Muzy sh kina R.A. - Almaty, 2008. - S. 18-31.

5. Cor ch agin A.A. Species (floristic) composition of the plant community and methods of its study. Polevaya geobotany. T. 3. - M.-L., 1964. - S. 39-60.

6. Akzhigitova N.I. Halophilous plants of Central Asia and their indicator properties. - Tashkent. SCIENCE, 1982. 189 p.

7. Alnuqaydan, A.M., Rah, B., 2019. Tamarix articulata (T. articulata)-an important halophytic medicinal plant with potential pharmacological properties. Curr. Pharm. Biotechnol. 20, 285–292.

8. Souleman A.M.A., Ahmed A.M. Sulphated flavonols of Tamplexicaulis flowers/ / Nat. Prod. Sci. 1998. V. 4, N4. B. 215-220.

9. Bughio S.H., Samejo.M.Q Sh. Memon (2017) Chemical composition of the essential oils from Tamarix dioica and determination of its antibacterial activity, International Journal of Food Properties, 20: sup3, S2660-S2667, DOI:10.1080/10942912.2017.1387138

10. Wild useful plants of Russia. - St. Petersburg, 2001. - P. 544-545.
11.Sultanova N.A. Phenolic compounds of plants of the genus Tamarix and their biological activity // Current problems of the chemistry of natural compounds: International abstracts. conf. - To sh kent. - 2009 b. - S. 198.
12. https://ru.abcdef.wiki/wiki/Tamarix_dioica