TAMARIX GALLICA – AN OVERVIEW

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ABSTRACT

The use of plants as medicines predates written human history. The records show the study of herbs dates back over 5,000 years. The use of traditional medicine is globally expanding to newer horizons primarily due to low cost and less side effects associated. India is a vast repository of medicinal plants used in traditional medical treatments. There are estimated to be around 25,000 effective plant-based formulations, used in folk medicine and known to rural communities in India. It is estimated that there are over 7,800 medicinal drug-manufacturing units in India, which consume about 2,000 tonnes of herbs annually. The various indigenous systems of medicine in India such as Siddha, Ayurveda, Unani and Allopathy have been using several plant species to treat different ailments. Taking these points in view Tamarix gallica plant is briefly reviewed in this article for its history, anatomy, phytochemical constituents and pharmacological activities.

Keywords: Tamarix gallica, Anatomy, Phytochemical constituents, pharmacological activities.

INTRODUCTION

Tamarix gallica belongs to the genus Tamarix (tamarisk, salt cedar). There are about 50-60 species of flowering plants in the family Tamaricaceae. The generic name originated in Latin and is believed to refer to the Tamaris River in Spain. Following are some of the known species of genus Tamarix -

Tamarix africana Poiret.
Tamarix androssowii
Tamarix aphylla (L.) Tamarix karelinii Bunge
Tamarix arceuthoides
Tamarix austromongolica
Tamarix boveana
Tamarix canariensis
Tamarix chinensis Lour.
Tamarix dalmatica
Tamarix dioica Roth.
Tamarix ducetinii
Tamarix elongata
Tamarix gallica L.
Tamarix gansuensis
Tamarix gracilis Wild.
Tamarix hamppeana
Tamarix hispida Wild.
Tamarix indica

HISTORY

Tamarix gallica L. (Syn. T. Troupii) is commonly known as "Jhau" in Hindi, Shavaka in Sanskrit and Tamarisk in English. It was first described for botanical classification by the taxonomist Carolus Linnaeus in 1753, but had already been in cultivation since 1596. These deciduous, herbaceous, twiggy shrub or small tree reaching up to about 5 meters high are indigenous to Saudi Arabia and the Sinai Peninsula, and are very common around the Mediterranean region. It is present in many other areas as an invasive introduced species, often becoming a noxious weed. It has fragile, woody branchlets that drop off in autumn along with the small, scale-like leaves that cover them. The leaf-shape is an adaption over time to exceedingly dry conditions. The pink flowers are tiny, hermaphroditic, and are borne on narrow, feather-like spikes. They frequently bloom earlier than the leaves, first in May, and sometimes a second time in August. It has been grown as an ornamental plant for its profuse production of showy pink flower spikes. This plant is mainly found in the salty regions and is found between interdunal areas of the desert.
wood\textsuperscript{12}, burning well even when green due to the wax content of the wood\textsuperscript{13}. It is very tolerant of maritime exposure and is a good shelter hedge in coastal gardens. It is excellent for soil stabilisation because of its extensive root system and is suitable for use in erosion control in sandy soils\textsuperscript{14}.

**PHYTOCHEMICAL CONSTITUENTS**

The phytochemical analysis of this plant shows that it is rich in antioxidants such as tannin (50%), tamarin, tamarixetin, trypsin, 4- methylcoumarin and 3, 4-di-0-methylellagic acid\textsuperscript{15}. The principle constituents are tamarix and its traces of aglycone, tamarixetin, Tamarrxin-3-glucoside, Quercetin and Kaempferol. The plant contains a high level of tannin (ellagic and gallic) and quercetol (methyllic esther)\textsuperscript{16}. Furthermore, the Tamarix is found to be rich in polyphenolic compounds such as flavonoids, phenolic acids and coumarins\textsuperscript{17, 18}. The Quercetin glycosides are found abundant in plants and their 30-0-methyl (isorhamnettin) derivatives are also not uncommon. However, the 40-0-methyl Quercetin (Tamarixetin) glycosides are rare in nature. Compositions of sterols of Tamarix gallica have been reported in light petroleum extract\textsuperscript{19}. Trans- Coniferol alcohol, 4-O-Sulphate and flavonoid sulphates from some Tamarix species have been isolated\textsuperscript{20}. Several types of polyphenols (anthocyanins, tannins, flavonones, resveratrol and ellagic acid) have also been reported in addition to terpenoid antioxidant compounds like carotenoids and essential oils. Whole aerial parts of Tamarix boveana are rich in acid compounds like Hexadecanoic acid (18.14\%), docusane (13.34\%), germacrene-D (7.68\%) eincyl acetate (7.34\%) and Benzyl benzoate (4.11\%)\textsuperscript{21}.

**PHARMACOLOGICAL ACTIVITIES**

Tamarix Gallica has been reported to be useful in leucoderma, spleen trouble and eye diseases\textsuperscript{22}. Tamarix species are employed in traditional medicine as astringent, aperitif, stimulant of perspiration and diuretic\textsuperscript{23}. It is used as an antihemihctia, antihaemorrhoid haemostat and for diarrhoea and gingivitis. The plant is used to cure dromedary galls\textsuperscript{24}. Several researches have proved antioxidant and antimicrobial activities of Tamarix species such as T. ramosissima\textsuperscript{25} and T. hispida\textsuperscript{26}. In Algeria and surrounding areas the plant has been used medicinally for rheumatism, diarrhoea, and other maladies. Vegetable and fruit peels of the plant are used as a novel source of antioxidant\textsuperscript{27}. Antimicrobial activity of Tamarix gallica has also been reported\textsuperscript{28}. It can be used as prophylactic and therapeutic remedies to cure malaria as folk medicine\textsuperscript{29}. The bark is bitter and an astringent, tonic; fruit and roots are useful for dysentery and chronic diarrhoea\textsuperscript{30}. The manna produced on the plant is detergent, expectorant and laxative\textsuperscript{31}. It is used as an anthelmintic, antihaemorrhoid, haemostat and for diarrhoea and gingivitis. The plant is used to cure dromedary galls\textsuperscript{32}. Several researches have proved antioxidant and antimicrobial activities of Tamarix species such as T. ramosissima\textsuperscript{33} and T. hispida\textsuperscript{34}. In Algeria and surrounding areas the plant has been used medicinally for rheumatism, diarrhoea, and other maladies. Vegetable and fruit peels of the plant are used as a novel source of antioxidant\textsuperscript{35}. Antimicrobial activity of Tamarix gallica has also been reported\textsuperscript{36}. It can be used as prophylactic and therapeutic remedies to cure malaria as folk medicine\textsuperscript{37}. The bark is bitter and an astringent, tonic; fruit and roots are useful for dysentery and chronic diarrhoea\textsuperscript{38}. The manna produced on the plant is detergent, expectorant and laxative\textsuperscript{39}. The sweet and mucilaginous manna is believed to be produced by exudation from the insects. Galls produced on the plant as a result of insect damage are astringent\textsuperscript{40}. 5-Hydroxy-4, 3,7-trimethoxyflavone (1), 3,5,7-Trihydroxy-4 - methoxyflavone (2) have been isolated from Tamarix gallica L. and evaluated against both standards and the isolated strain and T. hispida. Leaves and flower infusion have been reported to have anti-inflammatory and anti diarrheic properties. Antioxidant and antimicrobial activities of leaf and flower extracts and their phenolic composition have been reported\textsuperscript{41, 42}. The extract of Tamarix gallica L. is very rich in acid compounds that are used as an inhibitor of antimicrobial activities of leaf and flower extracts and their phenolic composition have been reported\textsuperscript{43}. The principle constituent is tamarixin and its traces of aglycone, tamarixetin, and T. hispida\textsuperscript{44}. Furthermore, the Tamarix is found to be rich in polyphenolic compounds such as flavonoids, phenolic acids and coumarins\textsuperscript{45, 46}. The Quercetin glycosides are found abundant in plants and their 30-0-methyl (isorhamnettin) derivatives are also not uncommon. However, the 40-0-methyl Quercetin (Tamarixetin) glycosides are rare in nature. Compositions of sterols of Tamarix gallica have been reported in light petroleum extract\textsuperscript{47}. Trans-Coniferol alcohol, 4-O-Sulphate and flavonoid sulphates from some Tamarix species have been isolated\textsuperscript{48}. Several types of polyphenols (anthocyanins, tannins, flavonones, resveratrol and ellagic acid) have also been reported in addition to terpenoid antioxidant compounds like carotenoids and essential oils. Whole aerial parts of Tamarix boveana are rich in acid compounds like Hexadecanoic acid (18.14\%), docusane (13.34\%), germacrene-D (7.68\%) eincyl acetate (7.34\%) and Benzyl benzoate (4.11\%)\textsuperscript{49}.

**COMMERICAL APPLICATIONS**

Tamarix Gallica has found its use in many commercial medicines like Bonnisan, Geriforte, Liv 52, Digtron, geriforte Aqua Vet, Liv 52 vet, Liv 52DS\textsuperscript{50}.

**CONCLUSION**

The current review indicates that Tamarix Gallica is a highly useful plant and have already found its application in wide array of medicines to cure Leucoderma, spleen trouble \textit{e}ye diseases, rheumatism, diarrhoea and gingivitis to mention a few. It is however found that not all phytoconstituents present in the plant have been studied in depth and needs be explored more. In future study, the isolated principles from Tamarix Gallica needs to be evaluated in scientific manner using specific experimental animal models and clinical trials to understand further the medicinal activities of the plant.

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