

SALVADORA OLEOIDES (MEETHI- JAL) SALVADORACEAE: PHYTO-CHEMICAL STUDY

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ABSTRACT

Salvadora oleoides is a large evergreen oil-yielding medicinal and multipurpose tree, belongs to the family Salvadoraceae. It is popularly known as 'Meethi Jal' or 'Pilu'. The plant have many alkaloid, terpenoids, glycosides and flavanoids which are responsible for many pharmacological activities. This review aims at describing the botanical description, classification, phytochemical profiles of various parts of *Salvadora oleoides*.

Keywords: Phytochemistry, *Salvadora oleoides*, Flavanoids, Traditional.

INTRODUCTION

Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources, many based on their use in traditional medicine. Higher plants, as sources of medicinal compounds, have continued to play a dominant role in the maintenance of human health since ancient times. ¹ Over 50% of all modern clinical drugs are of natural product origin and natural products play an important role in drug development programs in the pharmaceutical industry. ² India is rich source of medicinal plants and is called "Botanical Garden of the World" with enormous wealth of biodiversity. There are almost 45,000 plant species recorded in India so far³ of which 7,500 species have been used for medicinal purposes. ⁴ Medicinal plants are used in the treatment of much life threatening disease. These medicinal plants may offer a new source of antibacterial, antifungal and antiviral agents with significant activity against infective microorganisms.

Salvadora oleoides is an oil-yielding medicinal and multipurpose tree, belongs to the family Salvadoraceae, a family of 3 genera and 12 species, distributed mainly in tropical and subtropical Asia and Africa. It is commonly known in India as "Mithi Jal" or "Peelu". It is facultative

halophyte found in dry and arid regions of India (Rajasthan, Haryana, Punjab, Maharashtra and Gujarat). In Rajasthan it forms dominant part of vegetation of Jodhpur, Barmer, Bikaner, Jaisalmer, Churu, Jhunjhunu and Nagaur.

Salvadora oleoides have many alkaloid, terpenoids, glycosides and flavanoids which are responsible for many pharmacological activities. The leaves of plant is acrid, sweet, sour, appetizer, laxative, carminative,⁵ stem bark is stimulant,⁶ alexipharmic; useful in piles, tumors, bronchitis, disease of the spleen, hypoglycaemic, rheumatic pain,⁷ antihyperlipidemic activity,⁸ and very strong antibacterial use is also reported.⁹ The tree is primarily sourced for its fruits known as desert grapes. This species is decreasing very rapidly due to over exploitation, indiscriminate collection, low rate of seed set, poor viability and inefficiency of propagation by vegetative means.^{10,11}

CLASSIFICATION

Kingdom = Plantae
Division = Magnoliophyta
Class = Magnoliopsida
Order = Brassicales
Family = Salvadoraceae
Genus = *Salvadora*
Species = *S.oleiodes*



Fig. 1: Whole plant of *Salvadora oleoides* (Meethi jal)

BOTANICAL DESCRIPTION

Salvadora oleoides is a shrub or small tree, attaining 6-9m height under favorable conditions; trunk short, often twisted or bent, up to 2m in diameter; branches drooping, numerous, stiff, often swollen at forks; bark grey or whitish-grey. Leaves are bluish-green, linear-or ovate-lanceolate, leathery and somewhat fleshy, dark greenish-yellow when young, grey when mature. Flowering occurs during January to March in western parts of India. Flowers are sessile, greenish-white, minute in panicle spikes, often clustered; calyx cup-shaped, in 4 rounded, obtuse lobes.⁷ Fruiting is in the month of May. The fruits are greenish yellow; red brown when ripe, globose drupe. Fruits are plucked or felled by shaking the trees vigorously. The yield of fresh fruits per tree from mature trees is 10 - 15 kg or 2 - 3 kg dried fruit.¹² Fruits have sweet agreeable aromatic, slightly pungent and peppery taste. They can be eaten raw when ripe e.g. by children or may be cooked or preferably dried and stored by nomadic tribes. They contain 1.7 - 1.86% glucose, fructose and sucrose and are used by

villagers to prepare squash. Fermented drinks are also made from fruits.¹³

PHYTOCHEMISTRY

Leaves of *Salvadora oleoides* contain high concentration of phenolic compounds (25.7%) and stems contain high concentration of hydrocarbons (41.3%). Twenty three chemical constituents were common in the essential oil of both leaves and stems of *Salvadora oleoides*. Among all these compounds methoxy-4-vinylphenol (25.4%), (Z)-cis-3-Hexenyl benzoate (16.8%), phytol (13.9%), n-hexadecanoic acid (6.9%) and trans- β -damascenone (2.1%) were the main constituents of the essential oil of leaves whereas stems contain high concentration of 2-methoxy-4-vinylphenol (21.6%), phytol (12.9%), n-hexadecanoic acid (3.6%), octacosane (7.9%), nonacosane (7.3%), 1-octadecene (5.8%), heptacosane (5.9%), hexacosane (4.5%), pentacosane (3.4%), squalene (3.9%) and trans- β -damascenone (2.3%) [4]. This species contains other constituents such as salvadorine, salvadorene, vitamin C, alkaloids, salts mostly as chlorides. Methanolic extract of aerial parts

contains 4-hydroxy benzoic acid, stearic acid, lupeol, β - amyryl, Ursolic acid, oleanolic acid, β - sitosterol-3- O- β - D- glucoside, 3 β - erythrodiol, Trimethylamine, saponins, resins, tannins, proteins, carbohydrates, fatty acids, amino acids, dibenzylurea, tetracosone, noctacosanol, β -sitosterol, flavonoids, mucilage and gums.^{14,15,16} Seeds contain about 42% fat which on hydrolysis produces fatty acids like myristic acid (28.4%), lauric acid (47.2%), palmitic acid (28.4%), oleic acid (12%) and linoleic acid (1.3%). Unsaponifiable seed fat fraction constitutes compounds like benzylisothiocyanate, sitosterol, and s- di benzyl thiourea.¹⁷

CONCLUSION

India is one of among the most popular country in the world, where traditional medicine system is practiced in primary health care. Multiple drug resistance has developed due to indiscriminate use of commercial antimicrobial drugs that are commonly used in the treatment of infectious diseases, making it a global growing problem. *Salvadora oleoides* is an important source of various types of compounds with diverse chemical structures as well as many pharmacological activities. Till date no more pharmacological work is done on this plant. Ironically, *S. oleoides* is decreasing in very fast rate due to overexploitation, its low seed germination power, low seed viability. There is an urgent need to protect and develop new drugs for the treatment of infectious diseases from this medicinal plants, which may be less toxic to humans and possibly with a novel mechanism of action.

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