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Pharmacognosy of mangrove plants in the system of unani medicine

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ABSTRACT

Mangrove plants are found to have medicinal values and have been used traditionally by local medical practitioners in worldwide. In nature, more than 65 species of mangrove plants, 18 species are found to be widely used by local medical practitioners in many countries like India, Africa, Southeast Asia, South America, Australia etc. Moreover, etanobotanical records regarding medical use of mangrove plants are very limited and very unique. One to its astringent property, tannin is suitable in the treatment of tonsillitis, pharyngeitis, hemorrhoids, slaik eruion and burns. It is taken internally, to diarrhoea and intestinal bleeding. The extracts of barks of *Bruguiera sexangula* are active against two human tumors, sarcoma 180 and lexis lung carcinoma. Tannin is also used as an antidote for metallic, alkaloidal and sylycosidic poisons with which it forms a soluble precipitate. Stigma sterol has been shown to have slight hyper cholesterolinic effect which exerts no effect on heart or liver in unani medicine.

1. Introduction

Mangroves are tropical forest on the sea border, usually in places where large deltas have been created by river. The substratum of the mangrove forest is composed of accumulated deposits of mud and is subjected to constant variation in salinity. The term “mangrove” refers to holophytic species of trees and shrubs that are botanically diverse and belong to 12 families [1, 2, 3, 4]. All these plants are well adapted to grow and flourish in loose and wet soils, which are periodically submerged by tidal waters. These plants usually have some degree of viviparity of propagates [5, 6]. The use of mangrove to man is many fold: it yields timber and tannin; acts as coastal stabilizer and cyclone buffer zone; their branching root system provides shelter to larvae of many commercially important fishes and prawns [7]. In addition, some plants are found to have medicinal values and have been used traditionally by local medical practitioners of many countries.

Since 80% of the diseases are water born, and most of the disease causing organisms are becoming as resistant to the existing drugs, there is a growing need to explore the possibilities of various alternative plants and as well as

alternative system of medicine including unani medicine. Among the three medical practices of India, sidduar, ayurveda and unani, the system of unani medicine actually originates in Greece and the knowledge was transferred to Indians through practicing Arabs [8]. Recently, an importance of unani medicine is attracting world wide attention. Since the vedic period Indians have been using plants in curing various diseases and the use of plants in local medical practices is well appreciated. Even though only a little attention has been paid to document the importance of medicinal plants. In this paper, an attempt has been made to document as used in aenian medical practices.

2. Traditional use of mangroves as medicinal plants

Of the 65 species of mangrove plants, 12 species are found to be widely used by local medical practitioners in many countries like Africa, South East Asia, South America and Australia. These 12 species viz. *Acanthus clicifolius*, *Aegiceras majus*, *Avicennia africana*, *A. marina*, *A. officinalis*, *Ceriops caudolleana*, *Exocoecaria agallocha*, *Kandelia rheedii*, *Nypa fruticans*, *Rhizophora mangle*, *R. mronata* and *Sonneatia caseolaris* are used to cure some diseases like leprosy, elephantiasis, tuberculosis, malaria, dysentery, ulcers and some skin diseases.

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Balsco [9] and Banerjee and Gosh [10] reported that 27 and 65 species of mangrove are present in India respectively. Mangrove forests are distributed in various deltaic regions of the east coast. However, 78% and 12% of the Indian mangrove are found in the east coast and (including Andaman and Nicobar) and west coast respectively [11, 12]. Out of total 65 species, only 18 species are being traditionally used by the people living in the vicinity of mangrove forests. Moreover, ethnobotanical records regarding medical use of mangrove plants are very limited. The following account of medical use of mangrove plants in India as reviewed from the works of Prain [13] and Kirtikar and Baru [14].

2.1. *Acanthus ilicifolius* Linn. (Acanthaceae)

On the west coast of India, particularly on the Konkan region, a decoction of the bark with sugar candy and cumin as given in dyspepsia with acid eructation? In Goa the leaves are used to cure rheumatism and neuralgia. It is also reported that a small amount of powdered leaves and tender shoots soaked in water is used as an antidote for snake bite. In China, this species as reported to be used in curing paralysis and asthma.

Vernacular names:

Hindi – Haruchkanta

Sanskrit – Hari Kusa

Tamil – Auttumulli, Kaludaimulli, Kolimulli and Uppu Karinimulli

Vietnamese – O or nuoc

2.2. *Avicennia officinalis* Linn. (Verbanaceae)

In Madras the plants are used to cure small sores. Its roots possess euphrodisiac properties. The unripe seed are used as poultice to cure suppuration of boils and abscesses.

Vernacular names:

Arabic – Sahora and Sciora

Hindi – Bina

Sanskrit – Sagarodhurga

Tamil – Kaudal, vengaudat, korungaudal, madaipatti, and uppattam

Vietnamese – mam luoi dong

2.3. *Ceriops candolleana* Arn. (Rhizophoraceae)

The decoction of the bark is used to stop hemorrhage and applied to malignant ulcers. On the African coast a decoction of the shoot is used as a substitute for quinine.

Vernacular names:

Arabic – Cerioop, Leanna

Hindi – Cando tree

Sanskrit – Manrohurga

Tamil – Pannukkuchi

Vietnamese – naee luoi

2.4. *Excoecoria agallocha* Willd. (Euphorbiaceae)

Commonly called “the sliding tree” since its milky – given exudation from its bark is very acrid and injurious to eyes, of the decoction of the leaves as given in epilepsy in a quarter of a teacup full, twice daily. The decoction is also used as an external application to cure ulcers. From the lower part of the trunk and roots, a soft, reddish; latex is obtained which is sold as an aphrodisiac tonic by the inherent medicine men of western India.

In Fiji it is used to cure leprosy and the method is very crude. The body of the patient is rubbed with green leaves; he is then placed in a small room and bound hand and foot. The patient is suspended over a small fire of the pieces of the wood and the modest of the poisonous smoke. After such a through smoky treatment the patient is remold and the slime is scrapped from his body. He is then left to await the results. In some cases the patient is cured, and in other the patient dies under the orders. The local ordinaries of Point Calmer use the latex to break open boil sores.

Vernacular names:

Sanskrit – Agara

Tamil – Agadil, agi, ambala hai, Tollai and perumdollai

Vietnamese – gia

2.5. *Nypa fruticans* Wurm. (Palmaceae)

The leaves are used to cure ulcers. In Philippines the pounded leaves are used as a remedy for the bites of centipedes and a cure for ulcers. In Malaysia, the juice from a young nipa shoot is mixed with coconut milk and is given for the treatment of herpes. The pulp from which juices is extracted is applied to the open sores. The ash obtained by burning of the roots or leaves is used to treat both tooth ache and headache [15, 16].

Vernacular names:

Sanskrit – Kullalaji

Tamil – Thaneer Thennai

Vietnamese – Nappaa

2.6. *Rhizophora mucronata* Lam. (Rhizophoraceae)

The bark is used as a cure for diabetes. It is also used to help hemorrhage and angina and it's widely used in Indo-China, Brazil, Guiana, and West Indians. The Philippines and West Africa in curing diabetes.

Vernacular names:

Sanskrit – Najidu

Tamil – Surabunnai, Vivipary tree

Vietnamese – mae luoi

2.7. *Sonneratia caseolaris* (L.) Englar (Lythraceae)

The fruit is used in poultice in sprains and swellings. The juice of fruit is said to arrest hemorrhage.

Vernacular names:

Sanskrit – Thamam tree

Tamil – Marammam

Vietnamese – Souaee

3. Bioactive compounds isolated from mangrove plants

Studies on the bioactive compounds of mangrove plants often lead to the discovery of new therapeutic agents. Also a new chemical structure isolated from is used as a lamellate for the preparation of a series of synthetic analogs with effective medicinal value. Some of the isolated bioactive compounds from mangrove plants which have pharmacological values are given below.

Loder and Russel [17] initiated the study of biological active compounds of mangrove plants. They showed that the extracts of barks of *Bruguiera sexangula* are active against two human tumors, sarcoma 180 and lexis lung carcinoma. Fractionation studies of the extract showed that the activity is partly associated with tannin free aqueous and atropine esters of acetic, prop ionic, – butyric, isobutyric and benzoic acid from the bark of the *B. sexangula*. A new alkaloid, brugine, (+) – tropine 1, 2 – dithiolan – 3 – carboxylate is also separated the bark (Fig 1).

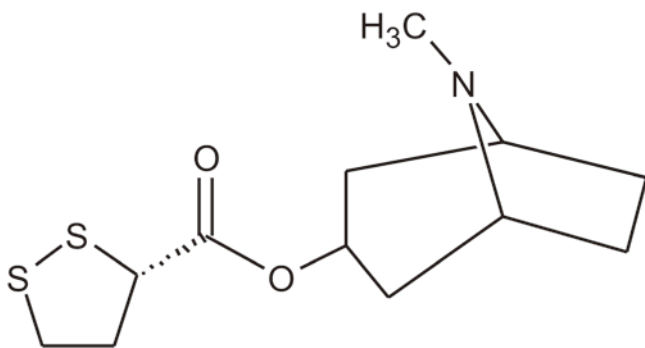


Fig. 1. Brugine (+) – tropine 1, 2 – dithiolan – 3 – carboxylate

From the root of *A. ilicifolius*, Kokpol *et al.* [18] isolated a number of compounds such as octacoyslalcohol, stigma sterol, and benzoxazoline–2–one and stigma sterol – β –D–

glncopyraroside [12]. A new alkaloid acanthiafoline has been separated from the root [19]. The roots of *A. ilicifolius* acts against a number of diseases and the medicine properties of this plant may be attributed the presence of benzoxazoline–2– one. The roots extract has been shown to exhibit biological activity against leukemia in mile [20, 21]. Benzoxazoline–2– one has been extensively studied as a central nervous system depressor which exhibit analgesic, antipyretic, anticonvulsant, hypnotic and muscle relaxant activity. It has also been reported to possess a resistance factor against fungi [22]. Ribose derivatives of benzoxazoline–2– one has been shown as an active anticancer and anti viral agent. Stigma sterol has been shown to have slight hyper cholesterolinic effect which exerts no effect on heart or liver [23, 24].

4. Other chemical compounds isolated from mangrove plants

In addition to the about mentioned biodynamic compounds, other chemical compounds have also been isolated from different mangrove plants and they are given in Table 1.

5. Prospects of mangroves as medicinal plants

Many species of family rhizophoraceae are good sources of tannin and it has also been observed that *Ecococaria agallocha* can yield high amount of tannin than *Rhizophora* sp. and *Ceriops* sp. [12, 25]. One to its astringent property, tannin is suitable in the treatment of tonsillitis, pharyngeitis, hemorrhoids, slaik eruion and burns. It is taken internally, to diarrrohea and intestinal bleeding. Tannin is also used as an antidote for metallic, alkaloidal and sylycosidic poisons with which it forms a soluble precipitate [26, 27, 28, 29]. Some Indian mangrove plants such as *Rhizophora mucronata*, *Ceriops candalleana*, *C. tagal* and *Ecococaria agallocha* are good sources of tannin. Despite the fact that the traditional use of mangroves in Unani medicine has not been documented; its pharmacological value has been recognized Unani medical practices. Ethnobotanical studies of mangrove plants in various diseases, particularly to cure leprosy. However, systematic scientific study in this aspect is lacking and such a study may reveal the importance of mangroves in curing leprosy. In addition, a number of chemical products have also been isolated from different mangrove species and their

Table 1

Chemical compounds isolated from mangrove plants

S.No	Name of the plants	Name of the compounds extracted	Reference
1.	<i>Rhizophora mucronata</i>	Rhizophorine	[19]
2.	<i>R. conjugata</i>	β – amyryn– β – amyryne toraxerol, β – siatosterol and triacontanol	[20]
3.	<i>Xylocarpus granntum</i>	xylocarpin, N – methyl flindersine and acctonyl dihydrochelerythine	[21]
4.	<i>X. moluccensis</i>	Xylomolin, xyloccensins A, B, O and F	[4]

importance in Unani medical practice. It is suggested that more importance is to be given to this field of emerging research to as to open up in Unani medical practices.

Conflict of interest statement

We declare that we have no conflict of interest.

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