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A Review on Selected Ethnomedicinally Important Plants of Manipur

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Abstract

Traditional herbal medicine system has been used since time immemorial. Medicinal plants are rich sources of new drug molecules which have potentially more efficacy and lesser toxic effects compared to the existing drugs. The indigenous traditional healers of Manipur have their own traditional knowledge of health care practices and treatment. The present study discusses four important medicinal plants- *Clerodendrum indicum, Curcuma amada, Scleria terrestris* and *Phyllanthus urinaria* which are used by the traditional healer of Manipur in the treatment of various ailments.

Keywords

Clerodendrum indicum, Curcuma amada, Medicinal plant*, Phyllanthus urinaria, Scleria terrestris.*

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INTRODUCTION

Manipur is rich in biodiversity with different climatic conditions varying from tropical, subtropical and temperate zones [1]. It has a rich tradition in the use of herbal medicinal plants for treatment of many diseases. Herbal medicines are the most commonly used and ancient source of medicine throughout human history [2]. The modern synthetic medicine has many side effects and sometimes elicits adverse drug reactions [3]. An alternative therapy is required to shift our priorities towards the herbal formulation-based therapy. Globally, there is an increased interest in the local herbal medicine system [4]. The indigenous health practitioners of Manipur have their own traditional knowledge of health care practice and treatment. They have been using herbal remedies as an alternative to modern medical facilities available in Manipur. These plants contain various phytochemical constituent and have therapeutic potential. In the present review, four medicinal plants of Manipur- *Clerodendrum indicum, Curcuma amada, Scleria terrestris* and *Phyllanthus urinaria* were identified in consultation with the traditional healers. A brief description of each plant pertaining to its habitat and distribution, chemical composition and medicinal properties are discussed here.

Clerodendrum indicum

Species of the genus *Clerodendrum* are flowering plants [Fig.1] belonging to *Verbenaceae* and are widely distributed throughout the world [5]. In India, it is widely found in its peninsular parts, Uttarakhand,

Sikkim, Manipur and others north eastern states. The roots of *Clerodendrum indicum* are more than 2.5cm in diameter, stem is herbaceous, hollow and leaves are axillary fascided [http://vikaspedia.in/agriculture/crop-production/package-of-practices/medicinal-and-aromatic-plants/clerodendrum indicum?searchterm=clerode]. It is propagated by stem cutting as well as roots cutting. Roots and leaves are the main part used in the traditional medicine. In Manipur, it is commonly known as charoi utong [5]. It is used in the preparation of folklore medicines for the treatment of various diseases such as cold, hyperpyrexia, asthma, furunculosis, hypertension, rheumatism, dysentery, mammitis, toothache, anorexia, leucoderma, leprosy, arthrophlogosis, and other inflammatory disease in various parts of the world such as India, China, Korea, Japan, Thailand and Africa [6-9]. Its leaf prepared as a paste with honey is taken against common ailment while the semi-dried stem is smoked to get relief from asthma and bronchitis. Additionally, its root decoction and bark powder are used in treating bronchitis and asthma. A variety of bioactive constituents have been isolated and characterized from this genus including monoterpene and its derivatives [10], sesquiterpene [11], diterpenoids [12-13], triterpenoids [14-15], flavonoid and flavonoid glycosides [16], phenylethanoid glycosides [17-18], steroids and steroid glycosides [19], cyclohexylethanoids [20], anthraquinones [21] and cyanogenic glycosides [22]. Some of these constituents have been evaluated with a number of biological properties, mainly anti-inflammatory and antinociceptive, antioxidant, anti-hypertensive, anticancer, antimicrobial, antidiarrheal, hepatoprotective, hypoglycemic and hypolipidemic, memory enhancing and neuroprotective properties [23].

Fig 1: *Clerodendrum indicum*

Fig 2: *Curcuma amada*

Fig 3: *Scleria terrestris*

Fig 4: *Phyllanthus urinaria*

Curcuma amada

The genus *Curcuma* belonging to the family *Zingiberaceae* is widespread throughout tropical Asia and Australia [24]. It is generally found growing in the wild habitat of low altitude hills. *Curcuma amada* is commonly known as Mango ginger. In Manipur, it is also commonly known as Yai-heinounambi [5]. *C. amada* has a morphological resemblance with ginger but the rhizome has similar characteristics to raw mango in flavour and odour [fig.2]. It is a rhizomatous aromatic herb with a leafy tuft of 60-90cm in height [24]. The mango ginger leaves are long, petiolate and their flowers are white which are arranged in spikes in the centre of the tuft of the leaves [fig.2]. At the rhizome nodes, scaly leaves are arranged circularly giving the appearance of growth rings with scars on the surface. The rhizomes are branched, and the branching is sympodial [fig.2]. The oldest herbal system of medicine in India attributed multiple uses of rhizome as an appetizer, alexteric, antipyretic, aphrodisiac and laxative. *Curcuma* are well known for their multiple uses as medicines, cosmetic, dyes, flavourings and neutraceuticals [25]. It has been reported that rhizome was benefits to biliousness, itching, skin diseases, asthma and inflammation due to injuries [26]. Rhizomes has carminative properties as well as being useful as a stomachic and used on contusions, sprains which contains an essential oil (1,8-eineole, myrcene), Curcumene, Pinene, Camphor, b- and a- Curcumene [5].

The medicinal properties of mango ginger include antioxidant activity, antibacterial activity, antifungal activity, anti-inflammatory activity, platelet aggregation inhibitory activity, antiallergic activity, hypotriglyceridemic activity, enterokinase inhibitory activity, CNS depressant and analgesic activity. The major chemical constituents include starch, phenolic acids, volatile oils, curcuminoids and terpenoids like difurocumenonol, amadannulen and amadaldehyde [25]. The antioxidant activity of methanol extract of mango ginger leaves and rhizomes by β-carotene bleaching method was reported [27]. The antioxidant activity of sequential extracts of mango ginger with increasing polarity of solvents was reported [28]. They reported different antioxidant activity assay like DPPH radical scavenging activity, superoxide radical scavenging activity, metal chelating activity and lipid peroxidation activity [29]. The aqueous and organic solvent extracts of mango ginger are antibacterial against *Escherichia coli*, *Bacillus subtilis* and *Staphylococcus aureus* [30]. The volatile oil from mango ginger rhizomes are antifungal in nature. Myrcene (4.6%) and pinene (80.5%) are the major components of volatile oils responsible for antifungal activity [31]. The ethyl alcohol extract of mango ginger rhizome has anti-inflammatory activity in acute and chronic administration in albino rats [32]. It also reported the presence of chemical compounds with hydroxyl, ester, carbonyl and olefin functional groups in ethyl alcohol extract. Platelet aggregation inhibitory activity of ethyl acetate extract and acetone extract is reported to be very high compared to methanol extract. Cytotoxicity of the hexane, chloroform, ethyl acetate, acetone and methanol extracts of mango ginger towards both normal and cancer cell cultures were reported [33]. *C. amada* is reportedly used in various herbal preparations, including antiallergy formulations [34]. It is also used an insecticide or pesticide and exhibited 100% adult mortality and a reduction in oviposition, even at 0.5% concentration. Essential oils from *C. amada* showed 100% repellent activity [35]. Mango ginger extract showed hypotriglyceridemic activity and influences on both liver synthesis and blood clearance [36]. The water extract of mango ginger rhizomes showed brine shrimp (*Artemia salina*) lethal activity [37]. A fraction obtained from ethanol extract of mango ginger rhizome exhibited CNS depressant and analgesic activity [38]. The mango ginger also has enterokinase inhibitory activity and antitubercular activity [39]. The labdane-type diterpenoids, labda-8, 12-diene-15, 16-dial and its modified analogues have antitubercular properties [40].

Scleria terrestris

The genus *Scleria* belonging to the family *Cyperaceae* is widely distributed in tropical and subtropical Asia. In India, it is found in the Andaman and Nicobar, Tamil Nadu, Kerala, Andhra Pradesh, Madhya Pradesh, Manipur, Orissa, Karnataka and Maharashtra and Uttar Pradesh [41]. It generally grows in marshy and moist places in rainforest, vine forest, eucalypt forest, and various types of woodlands [42]. *Scleria terrestris* is a perennial herb with woody rhizome, growing in partial shady areas near streams in secondary forests or undergrowth wet forests [41]. Leaves are hairy on adaxial surface; sheaths widened upwards, scabrid, contraligule with short lobe covered in dense hairs. Inflorescence with peduncles single at the nodes, scabrid; primary bracts overtopping the inflorescence; unisexual spikelets, lanceolates, glumes rusty to purplish brown with a green keel; a disk with shortly rounded lobed and ferruginous [fig.3]. The scarious brown band along the margin of the contraligule is one of the best characters to distinguish *S. terrestris* from its nearest species. In Manipur, *S. terrestris* is commonly known as Lam thangjou. The indigenous people of Manipur use boiled extract of the plant [42], mostly for the treatment of hyperglycemia. However, there

is very less scientific reports on the medicinal value of this plant which makes it a prime target for ethnomedicine research.

Phyllanthus urinaria

The genus *Phyllanthus* belonging to the family *Euphorbiaceae* [5] is found only in Asia, tropical America, West Africa and Australia [43]. *Phyllanthus urinaria* is a small herb that grows upto 60cm, bears ascending herbaceous branches. The plant is bitter in taste, leaves are small, green, short petiole and alternately arranged when touched the leaves are automatically folded. The flowers are greenish white, unisexual, monoecious and appear at axiles of the leaves along with the seed capsules. The fruit is a capsule, globose and smooth are found along underside of the stems [fig.4]. *P. urinaria* is commonly known as Chamber bitter. In Manipur, it is commonly known as Chakpaheikru [5]. It is widely used as medicinal herb in the treatment of jaundice, liver and urinary disorders. The plant is commonly used as a diuretic and purgative to treat a wide variety of uro-genital disorders, diarrhoea and diabetes. It is also used as a bitter tonic and to treat fevers, including malaria. It is a popular traditional herbal remedy and has been found including lignans, ellagitannins, terpenoids, flavonoids, phenolic compounds and waxes [43]. The leaf juice with coconut milk is appetizer and diuretic for children. The following chemical constituents have been found: lignans (e.g. phyllanthin, phyltetralin, hypophyllanthin, urinatetralin, dextrobuschernin, 5-demethyoxynirathin and urinaligran), ellagitannins (e.g. corilagin, geraniin, hippomanin A, phyllanthusin F and G, repandinin B and phyllanthusiin U), terpenoids (e.g. β-amyrin, lupeol acetate and β-sitosterol), flavonoids (quercetin, astragalin, quercitrin, rhamnocitrin, isoquercitrin, kaempferol, daucosterol, triacontanol and rutin), phenolic compounds (e.g. caffeic acid, ellagic acid, gallic acid, methylesterdehydrochebulic acid, methyl brevifolincarboxylate, hexacosanoic acid, brevifolin, brevifolin carboxylic acid, pyrogallol, n-octadecane, methylgallate, trimethyl-3,4-dehydrochebulate, 1,3,4,6-tetra-O-galloyl-β-d-glucose) and waxes (montanoic acid methyl ester, triacontanol) [43]. The biological activities include deobstruent, diuretic, astringent and cooling analgesic, antibacterial, antihepatotoxic, anti-inflammatory, antimalarial, antilithic, antimutagenic, antinociceptive, antispasmodic, antiviral, aperitif, carminative, choleretic, deobstruent, digestive, diuretic, febrifuge, hepatonic, hepatoprotective, hypoglycemic, hypotensive, laxative, stomachic, tonic and vermifuge [http://www.la-medicca.com/products-singleherbcapsules-bhuiamla.html].

CONCLUSION

The present review has presented comprehensive details of four important medicinal plants used in the traditional medicine system of Manipur. We concluded that the indigenous plants have many unexplored bioactive compounds which can be identified and utilized to prepare new drugs. It is high time to conserve the natural bioresources against exploitation and validate scientifically to support the evidence of herbal traditional system.

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