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Some of the ethnomedicinal plants of Manipur use in the ayurvedic and homoeopathic treatment

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Abstract

The therapeutic potential of ethnomedicinal plants will encourage their potentiality in the treatment of various ailments in the ayurvedic and modern medicine including homoeopathy. Such treatment often used the plant-derived bioactive compounds for the treatment of chronic diseases, child and female reproductive diseases, cancer, diabetes, Alzheimer's disease etc. the demand for the natural product in the treatment of primary health care has been increasing due to the proven side effects of chemically synthesizing drugs. This needs the management and conservation of medicinal plants including rare and endemic species at the genetic level that could enhance the mass scale production and fulfil the demands of the pharmaceutical industries. Plantation and conservation in their habitat may be the best way of overcoming difficulties in the cultivation practices. While, Manipur being located in the biodiversity hotspot zone, the region could be acted as plant hub, a potential source of bioactive compounds.

Keywords: ethnomedicinal plants, Manipur, ayurvedic, homoeopathic treatment

Introduction

The discovery of ethnomedicinal plants puts forth considering their drug benefit given to the mankind. The potentiality of the study of the traditional knowledge of the indigenous people substantially subsidizes the pharmaceutical research and development relating to the medicinal preparation of bioactive substances and toxins from plants, animals and minerals (Dutfield 2010) [11]. Though the dependence on the natural treatment was reduced due to technological advancement, optimization and mass production of therapeutic substances of natural origin should be enhanced as they act as the point source of the initial leads in the chemical synthesized of drugs (Koehn & Carter 2005; Khosla & Keasling 2003) [25, 24]. While the dependence on traditional medicine was increasing due to the adverse effect of allopathic medicine and about 60% of the world's population used traditional medicine thereby increase demand of medicinal plants (Joshi & Joshi 2013) [21] as the plants supply the chemical residues only in minuscule quantities and expensive to synthesize (Dutfield 2010) [11]. Therefore, the mass cultivation and plantation of the medicinal plants should be enhanced to fulfil the natural base treatment of ailments mainly for the primary health care.

The natural base therapy was the principle of ayurvedic and homoeopathic treatment and these treatments have been derived from traditional knowledge-based medicine. Generally, Ayurveda refers knowledge that balances the three elemental energies and homoeopathy refers the vital force to neutralise and expel the disease based on "law of similar", ie "let like be cured by like (Ernst, 2002) [12]. These treatment used hundreds of plant-based medicine besides animal and mineral origin. At present, this treatment had been considered as second and third preferred treatment next to allopathic and less expensive and cost-benefit treatment in India (Ghosh 2010) [16]. The application of the natural products derived drugs is still practised in a dose-dependent manner by them as well as traditional healers. Therefore the study of the ethnomedicinal plants used by the indigenous community is an indispensable part of the modern synthesis of drugs for ailments in the treatment of certain diseases. Thus the present investigation was conducted to find out the consistency of uses of plants by the traditional and modern medicine.

Material and Method

Topographically Manipur located in the subtropical belt of the earth and one of the diversity hotspot region of the world. It is situated in the extreme northeast corner of the Indian mainland. In the present investigation, an ethnobotanical data of some of the selected plant species which abundantly grow in the wild habitat in the soil of the region was performed based on the semi-structured interviews with a knowledgeable person, priest etc. Information

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regarding the medicinal use and their efficiency of the plants derived bioactive compounds in the treatment of different diseases in the modern biological sciences was gathered.

Result and Discussion

The ethnomedicinal plant is used widely in the treatment of different diseases in ayurvedic and homoeopathic treatment, giving emphasis on both traditional use and modern method of treatment of the ailment. They are also used in the synthesis of the variety of drug in the different pharmaceutical and chemical industry. In the present investigation, some of the wildy grown plant species in the different habitat of the region that needs the attention of the pharmaceutical industry is given.

1. *Acorus calamus* Linn. (Family: Araceae)

This act as antisecretory and antiulcerogenic sedative and analgesic properties. It also acts as a protective effect against cytodestructive agents, used for bronchial catarrh, chronic diarrhoea and dysentery (Khare 2007) [23]. However, the native people used externally in the prevention of cough, diarrhoea especially for the children that keep the child healthy. The extracted solvent by the decoction of rhizome was applied externally to treat pile. The phytochemical analysis of this plant showed the presence of glycosides, flavonoids, saponins, tannins, polyphenolic compounds, mucilage, volatile oil. Alcoholic extracts have a higher percentage of β -asarone, preiso calamendiol, acorone and sesquiterpenes (Paithankar *et al* 2011) [28]. Liu *et al* 2016 [27] reported that the β -asarone is effective against Alzheimer's disease due to the presence of β -asarone in the rhizome of this plant.

2. *Adhatoda vasica* Nees (Family: Acanthaceae)

This is one of the novel medicinal shrub used in the ayurvedic and Unani systems of medicine stressing its importance in the traditional medicine for the primary health care (WHO 1990) [38]. Traditional practice uses the consumption of solvent extracted through decoction was used in jaundice and steaming in cold cough treatments. It is also reported as the species of highest cultural index values, having been used in stomach disorder, fever, dehydration, and dysentery (Abbasi *et al* 2013) [1]. Ethanol extracts showed anti-implantation and uterotonic abortifacient activity which is concomitant with the traditional method applied by the indigenous people of Manipur through oral consumption, though it has a controversial issue in the modern medicine (Kapgate & Patil 2017) [22]. Clinical studies prove that it showed antimicrobial activity against various microbe including *H. pylori*, hepatoprotective effect against CCl_4 and D-galactosamine, thrombolytic activity, the radioprotective effect on the testis, anti-diabetic, anti-gingival, and anti-Alzheimer activity which supported the traditional application of this species in the control of certain diseases (Kapgate & Patil 2017) [22]. The chemical constituents quinazoline alkaloid, vasicine, vasicol, adhatonine, vasicinone, vasicinol and vasicinolone (Bhat *et al* 1978) [3] and alkaloids adhatonine, adhavasicinone, anisotine, and peganine, betaine, steroids, alkanes (IDMA, 2002). Besides this, they showed the presence of vitamin C, steroids, fatty acid, ketone, terpene, phenolic ether and antioxidant (Wealth of India 1998) [37]. Due to their chemical properties, this species act as a potential source of drugs in the modern medicine.

3. *Meyna spinosa* Roxb (Family: Rubiaceae)

This species is one of the promising folk medicine commonly distributed in northeastern India. This species grows in the wild habitat of tropical and sub-tropical forest ecosystem of Manipur. Ethno-medicinal uses of this species was applied in the treatment of pile cases where external application of the decoction of fruit solvent, hair washing, preparation of hair shampoo, diabetes and as food in the region while it is used in the treatment of inflammation, kidney stone, gastrointestinal disorder by the tribes of Assam (Quazi and Molvi 2014) [29]. The fruit and bark was also used extensively in the treatment of pimples, skin infection, abortion, peptic ulceration, dysentery, indigestion, intestinal worm, and painful urination etc. by the different tribes of northeast India (Sen 2014, Sen *et al* 2011) [32, 33]. However modern medicine applied in the treatment of female disease, mucus membrane formation, tumor and as a blood purifier (Ganesh *et al* 2010, Raihana 2012) [15, 30]. Phytochemical analysis showed the presence of phenolic compounds, tannins, flavonoids, saponin, triterpenoid, oleanolic acid (Chatterjee *et al* 2011, Buragohain 2008, Gogoi & Sarma 1995,1997) [6, 5, 17, 18] which is used in the treatment of chronic diseases, hepatic disorder, anti-oxidant, anti-tumour, anti-inflammatory, anti-diabetic, anti-microbial effects (Ayeleso *et al* 2017) [2].

4. *Datura arborea* Linn. (Family: Solanaceae)

This plant species is widely distributed in the river bank, road side and waste land in the foothills of the valley area of the studied region. It is reported that this plant counteracts the reinforcing and motor effects of morphine and cocaine in a dose-dependent manner (Bracci *et al* 2013) [4]. The homoeopath also applied the decoction of the fruit in the treatment of pile at dose dependent manner, likewise, the traditional healers also applied. It is known for its anti-inflammatory, analgesic, vulnerary, decongestant, and antispasmodic properties, particularly in the treatment of rheumatic conditions (Feo, 2004) [13]. The alcoholic extract of this plant is also used in the treatment of spinal irritation, vertigo, confusion, clairvoyance by the homoeopath. The phytochemical extract showed the presence of active components such as the tropane alkaloids hyoscyne, atropine, norhyoscyne, and scopolamine (Feo 2002) [14].

5. *Panax ginseng* Meyer (Family: Araliaceae)

Panax ginseng is used in the treatment of different diseases in ayurvedic and homoeopathic medicine. The root has been used as an energy tonic and in treating many health problems by the indigenous people. Homoeopaths used as an amazing remedy for the treatment of sciatica, lumbago and chronic rheumatism (Unger 2004) [35] besides they are also applied as an agent of antifatigue, antistress, anti-ageing, anti-amnesic, antioxidative and antidiabetic, cardiovascular protection ad as neuroprotein (Wang and Lee 2000, Chen *et al* 2005, Choi 2008, Xie *et al* 2004) [36, 7, 8, 39]. The active component includes ginsenosides, polysaccharides, peptides, polyacetylenic alcohols, phenolic compounds, and fatty acids (Lee *et al* 2010) [26] and they counteracted high fat, hyperlipidemia hyperglycemia and lipogenesis (Chung *et al* 2016) [9]. This perennial herb also known as the elixir of life based on their medicinal properties is growing in the natural habitat of broadleaf sub-tropical and temperate forest ecosystem of Manipur. This plant is very sensitive to temperature and light factor and has been affected by the climate warming. Considering their medicinal and economic importance, it needs special attention for the conservation

practice in a sustainable way as the degree of resource extraction is very high in their wild habitat.

6. *Euryale ferox* Salisb (Family: Euryalaceae)

This species used in traditional medicine to treat disease like kidney problems, chronic diarrhoea, excessive leucorrhoea and hypofunction of the spleen, myocardial ischemic reperfusion injury due to its antioxidant and glucosides activities (Das *et al* 2006) ^[10]. They are also used as deobstruent, astringent, nervine tonic, spermatorrhoea and sexual affections and debility (khare 2007) ^[23]. In Manipur, this species adapted well in ponds, lake and demanded in large scale during the growing season by the ethnic community for consumption. Traditional healers also used the different parts of the plant in the treatment of diuretic, dropsy, jaundice and gonorrhoea, scabies, chronic diarrhoea due to dyspepsia and urorrhoea, spermatorrhoea, diabetes, constipation (Singh & Gupta 2006) ^[34] which is concomitant with Chinese medicine and ayurvedic treatment (Liu *et al* 2016, khare 2007) ^[27, 23]. Recently it is reported as an antidepressant effect (Huang *et al* 2018) ^[19]. The medicinal properties might be related to the presence of tannins, tocopherol polymers, fucosterol, resorcinol, pyrogallol, cyclic dipeptides, glucosylsterols, cerebrosides, and polyphenol which is reported by Row *et al* 2007 ^[31].

Besides the above mention species, there are many varieties of species in the region which is used in the treatment of different diseases by the ayush and homoeopaths such as *Garcinia pedunculata* Roxb ex Buch-Ham, *Flacourtia jangomas* (Loureiro) Raeus, *Phyllanthus emblica* Linn. *Oroxylum Indicum* Vent. etc having high potential sources of medicinal drugs including cancer, but they are facing the threat of habitat destruction. Besides the rare woody species, there are many herb and shrub such as *Holmskioldia Sanguinea* Retz, *Mussaenda frondosa*, Linn. *Solanum ferox*, Linn, *Phlogacanthus thyrsoiflorus*, Nees, *Plantago erosa* Wall, *Artemisia nilagirica* (C.B. Clarke) Pamp, *Centella asiatica* Linn, *Hydrocotyle sibthorpioides* Lam., *Euphorbia hirta* Linn, *Pogostemon purpurascens* Dalz, *Leucas aspera* spreng, *Bonnaya brachiata* Link & Otto, *Linaria ramosissima* Linn, *Clerodendrum colebrookianum* Walp in the wild habitat though they have been used in the primary health care by the nature base medical practitioner. However, they are facing threat due to biotic pressure in their habitat. Therefore, in situ and ex situ initiative for the conservation of medicinally valuable drugs should be taken up for wide scale cultivation and mass production. Such an initiative should enhance the economy of the people. Considering a variety of the medicinal importance of naturally adapted species in the region, an attempt must be made to vitalized and strengthen the promotion of the use of the natural product in the treatment of various ailments through ayush and homoeopathy. It is clear that the ethnomedicinal study through traditional knowledge has been concomitant with the application in modern medicine is clear by their molecular and phytochemical analysis that increase the attention of plant derived bioactive compounds in the pharmacological research and synthesis of drugs. From the present investigation, it is also concluded that the region acted as a source of rare and endemic plant hub with a scientific temperament in the ethnic people. Further, awareness to disseminate the scientific knowledge of the use of plant derived bioactive compounds to the people and promoting research and development of the medicinally important plants and the availability of raw

material should be promoted through different conservation and plantation strategy.

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