

The medicinal plants and their species diversity in Lake Victoria Basin

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Abstract

The management of medicinal plants has become a matter of international concern because these plants are generally wild in distribution and very few species are cultivated or planted. Presently, almost every Aayurvedic and many allopathic medicines can be obtained from lower plants; and also from the roots, underground parts, stem, aerial branches, leaves, flowers, fruits, seeds, barks of angiosperms. These medicinal plants produce a definite physiological action on human body. The most important of these substances are the alkaloids; compounds of carbon, hydrogen, oxygen and nitrogen; glucosides, pharmacologists to manufacture medicines, utilize essential oils, resins, mucilage, and gums. Some of these materials are very powerful poisons. The medicinal plants have been of great importance to mankind in relieving many diseases from ancient time. The knowledge of the primitive men has been modified very much with the advancement of civilization and technology to harvest these medicinal plants for commercial purposes. Therefore, this natural resource is really declining at a faster rate than its natural growth due to over exploitation of their economic products. This paper particularly focuses on the medicinal plants and their medicinal values.

Keywords: Medicinal plants, Species Diversity

Introduction

Medicinal plants have been of great help to mankind in relieving many diseases from ancient time. Primitive people in all ages have had some knowledge of medicinal plants. The knowledge of the primitive men has been modified very much with the advancement of civilization. Presently, almost every Aayurvedic, Siddha and Unani medicine used are obtained from the plants. Also in this modern age, majority of the allopathic medicines are extracted from the plants.

Large-scale losses are continuing due to natural disasters and human induced habitat modifications and degradation of the ecosystems. The habitats of these medicinal plants are also threatened due to deforestation for new settlements, fresh farmland, mining, industrialization, construction of dams, railway, roads and airports etc are also the direct threat. The question of disrupting the biological resources and their natural habitats really concerns nature conservationists, ecologists, herbalists, pharmacologists, biologists, and also biochemists.

In this modern industrial age, the productivity of all the types of our natural renewable plant resources including the medicinal plants is declining a lot and still continuing due to human induced habitat modifications and degradation of ecosystem.

Medicinal plants are generally wild in distribution and very rarely they are cultivated. These drug plants are collected in a crude way for shipment from their native habitats. Later on the organic compounds are extracted from these plants to manufacture medicines.

The medicinal value of these drug plants is due to the presence of substance(s) that produce a definite physiological action on the human body. The most important of these substances are alkaloids, compounds of carbon, hydrogen, oxygen and nitrogen, glucosides, essential oils, fatty oils, resins, mucilage, tannins and gums. Some of these materials are powerful poisons, that is why the preparation and administering of drugs is left entirely in the hands of skilled pharmacists and physicians.

The drugs are extracted from lower plants and also from the parts of higher plants such as roots, rhizomes, stem, aerial branches, bark, leaves, flowers, fruits and seeds.

Materials and methods

Several plant species were collected in different seasons from the areas of Lake Victoria Basin. Collected plant species were tagged and pressed. The plant species were identified by using taxonomic keys according to Dale and Greenway (1961), Clayton (1970), Agnew (1974), Clayton et al. (1974), Clayton and Renovoize (1982), and Haines and Lye (1983).

Results

Literature search, personal experience and information from the local community were used to establish the medicinal value of plants growing in Lake Victoria basin. The details are as follows:

Ergot:

Ergot is obtained from *Secale cornutum* and also from the dried fruiting body of *Claviceps purpurea*, which is a parasitic fungus on grasses, on seeds of *Ricinus communis* (Euphorbiaceae) and also on the seeds of *Agonandra brasiliensis* (Olacaceae).

Ergot is used chiefly to increase blood pressure, particularly in cases of haemorrhage, following birth and other uterine disturbances.

Liquorice:

The drug is obtained from the roots of *Glycyrrhiza glabra* of the family Leguminosae. The plant is a perennial herb. The roots are dried in shade and are shipped in cylindrical pieces. Liquorice is used in medicine as a demulcent and expectorant, and to disguise the taste of nauseous preparation.

Colchicum/Colchicine:

This is obtained from the tubers of *Gloriosa sperba* belonging to family Liliaceae. Colchicine is used in modern medicine for treatment of rheumatism and gout. The extract from the tubers also have some antibiotic property.

This drug is purgative, hot and pungent. It is used in leprosy, piles, colic, boils and to expel intestinal worms. The white starchy powder obtained by repeated grinding and

washing of the tubers is used in treatment of gonorrhoea. The tubers are also given to cattle for expulsion of worms.

The paste of the tubers has numerous important uses as an external application. It is used in cases of parasitic skin diseases, bites of poisonous insects, snakes and scorpion sting. If any foreign matter is embedded in the muscular part of the body, the application of paste in small quantity brings it out.

The tubers and seeds of the plant pounded with sour gruel can be applied to relieve boils caused by insects. It is also used in genetical engineering for doubling of chromosomes.

Polygalitol (Senega):

The drug is obtained from the roots of the plant *Polygala senega*, and *P. amara* a small perennial herb belong to family Polygalaceae. This is a glucosidal drug, which is used by Indians for treating snakebites. Senega is also used as an expectorant, emetic and stimulant.

Pinitol:

This is found in *Artemisia dracunculus* and in the inflorescence of *A. afra* (of the family Compositae). It is also present in some members of the family Moraceae, and in *Grevillea robusta* (Proteaceae). The inflorescence, stem, leaves, bark and roots are used to relieve pain.

Arachidic, behenic or lignoceric acids:

These are organic acids present in *Tephrosia* spp., *Trifolium subterraneum* (family Papilionaceae); *Cassia tora* (Caesalpiniaceae), and *Moringa* spp. (Moringaceae). They help to relax and make drowsy. Therefore, some fisherman collects the whole plant, crush and spread over the water surface to catch fish.

Achyranthus aspera:

This is a coarse herb, belonging to the family Amaranthaceae. Sometimes, it grows in arable lands as an annual, but under suitable conditions, can last a number of years and reach a height of 4-5 ft. Herbalists collect this plant, dry and burn on slow fire and obtain ash, which is prescribed to cure colds and cough.

Latex of *Calotropis* sp.

The milky latex is obtained from the stem of *Calotropis procera* and other species of *Calotropis* of the family Asclepiadaceae. These plants are very common in all the arid and the semi arid areas of the world. The latex is used in the treatment of leprosy and rheumatism.

Mheni / Mhina:

Young leaves of *Lawsonia alba* Lam. family Lythraceae are collected and crushed to make a paste which is externally applied to cure skin diseases and also to reduce heat from head, hands and legs during summer season, and also advised for external use by psychiatrics.

The plant is an erect stemmed, spiny shrub with opposite leaves, glabrous, short petiolated, elliptic or ovate, with acute apex and up to 3.5cm long and has white scented flowers developed in large panicle.

Otto of Roses and Rose Water:

This valuable oil is obtained from the flowers of *Rosa damascena* and also from *Rosa centifolia* of the family Rosaceae. It is the most liked perfume oil with very pleasant aroma. The rose oil can be obtained by distillation process. The otto of rose is used in hair oil, soaps and diluted solution is used in the preparation of eye drops and in various other medicines.

Belladonna :

This is an important and old drug, which is obtained from dried leaves of *Atropa belladonna*, family Solanaceae. The plant grows wild on upland areas and is also cultivated in different regions of the world. The leaves of this plant have several alkaloids.

The Belladonna is used externally to relieve pain and internally to check excessive perspiration and cough. It is also used as an antidote in opium poisoning and in asthma. An alkaloid **atropine** present in the leaves is used to dilate the pupil of the eye during eyesight testing.

Aloe:

This is obtained from several species of Aloe plant (e.g., *Aloe barba*, *A. densis*, *A. Perryi*, *A. forex* etc). The plant has succulent leaves, which contain a resinous juice having several glucosides. The juice of leaves from all the species of *Aloe* is extracted and by evaporation, a solidified viscous black mass known as Aloe can be collected. This Aloe is used mainly as purgatives.

Tulsi :

The plant *Oscimum sanctum* belongs to family Labiaceae is commonly known as tulsi in India. It is a sacred plant, which grows wild, herbaceous and also cultivated in many countries experiencing tropical climate. The leaves and the seeds have medicinal value due to presence of alkaloids.

It is very good as a medicine to cure liver disorders, colds and cough. It is also used to relieve stomach pains; as an expectorant and stimulant; and to treat malaria.

Neem :

The plant *Azadirachta indica* belonging to the family Meliaceae, is commonly known as Neem. The root, stem, bark, leaves, flowers and fruits of this plant are used in medicinal industry. It cures more than forty diseases and still lot of research is going on.

All the parts of neem plant are used as carminative, expectorant and insecticidal. The plant is used to cure jaundice, various skin diseases, pyorrhoea, malaria, venereal diseases and also in birth control.

Bhang:

This is obtained from the leaves of *Cannabis sativa* of the family Cannabinaceae. The plant is an annual herb, grows wild and also cultivated in many tropical countries.

The Cannabis leaves contain several alkaloids. Therefore, the leaves are sedative, necrotic, digestive and diuretic. This is of great use in dysentery, diarrhea, and in digestion. Many drugs such as charras, ganja and heroin are also obtained from this plant, which are very valuable in medicinal industry.

Senna:

This is obtained from the dried leaves of several species of *Cassia* (family: Papilionaceae). Senna is used as a purgative. Several other drugs have been extracted from the leaves of *Cassia* species to cure several diseases because the plant contains tannins and alkaloids.

Chamomile:

This drug is obtained from the flower heads of *Matricaria chamomila* and *Anthemis nobilis* of the family Compositae. This is used as a tonic, gastric stimulants, sprains, bruises and rheumatism.

Santonin:

This is obtained from the unopened flowers of *Artemisia cina* of the family Compositae. The plant is a small perennial shrub. This drug is one of the best remedies for intestinal worms.

Colocynth:

This drug is obtained from the dried spongy pulp of the fruits of *Citrullus colocynthis* of the family Cucurbitaceae. The plant is a perennial and is native to warmer parts of Africa and Asia.

The fruits of this plant are used to extract colocynth, which is a very powerful purgative.

Nuxvomica:

This valuable drug is obtained from the seeds of *Strychnos vomica* of the family Loganiaceae. The ripe seeds are obtained from its fruits, which are very hard and bitter.

The seeds contain strychnine and brucine alkaloids. The drug is used as a tonic and stimulant, and also used in the treatment of nervous disorders and paralysis. This drug is also a powerful poison. Therefore, it must be used in small doses and with strict advice of a physician.

Caster oil:

This is obtained from the seeds of *Rinicus communis* of the family Euphorbiaceae. This plant grows in many countries of the world. The oil is extracted from the seeds by cold expression and is used as a good purgative. It can also be used to manufacture several other products.

Acacia nilotica and Prunus Africana:

This plant *Acacia nilotica* belongs to family Mimosaceae. The rough bark is chopped, crushed and boiled. Later on the concentrated solution consisting alkaloids is used as an anti-diarrhoea mixture.

Recommendations

- Regular observation and collection of plant species is necessary for this type of work.
- Specific alkaloids, glucosides, essential oils, resins and gums will be extracted and tested for their medicinal values
- Community awareness about the medicinal value of wild plant species is necessary
- Unidentified flora should not be cleared and identified plants should be studied for their vast economic values.
- Efforts should be started to domesticate these useful plants, which are currently wild.

Conclusion

It can be concluded that these medicinal plants are very useful to human life. We must conserve, protect and preserve the habitats of these valuable natural resources, which are the most important wealth of our tropical ecosystems.

We must plan for sustainable development and by protecting the ecosystem diversity, we will be able to protect species diversity as well as genetic diversity of our Lake Victoria basin.

Therefore, to protect this wealth of our natural ecosystems, apart from the government support, the community participation and public support is strongly required. This floral diversity must be conserved and managed through sustainable development so that our future generations will also be able to use them.

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