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MEDICINAL PLANTS IN THE DAILY DIET OF THE INDIGENOUS PEOPLE OF BHAGABANBASAN VILLAGE: A STUDY IN THE PASCHIM MIDNAPORE DISTRICT OF WEST BENGAL

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ABSTRACT

The village of Bhagabanbasan is in the Paschim Midnapore district of West Bengal, India. Indigenous people of this area are observed to consume some plants and herbs with high medicinal values in their daily diet. Those plants and herbs with exclusive medicinal properties have been used in folk medicine from long time. In this mini review, we have provided a brief account of five such edible herbs and plants from Bhagabanbasan village of West Midnapore. A compact knowledge is necessary for conservation of those plants. Our present study also highlights the immense possibility of sustainable folk medicinal practice in heath and diseases. This study also unfurls a world of possibility to develop minimal or nil side effect bearing potential drugs from plants of this particular geographical region.

KEYWORDS: Plants, herbs, medicinal plants, diet, edible.

INTRODUCTION

India has more than 7000 species of plants with medicinal uses reported. Among those only some 700 are in use and have undergone extensive investigation.[1] Thus, there lies a vast ocean of potential medicinal plant species awaiting exploration. Various formulations from plant sources are also used in folk medicine as well as in our traditional medicines like Ayurvada. Almost 90% of medicinal formulations used in unani and sidha owe their origin in herbal sources Ayurveda being more than 3000 years old has well acceptance in mass in India and is also practiced widely in various countries around the world.[2] Mention of uses of medicinal plants to heal is also there in the ancient holy books of the Vedas.[3] Studies reveal that same species of plants growing in different geographical region vary in their phytoconstituents qualitatively and quantitatively.[4] The district of West Medinipur in West Bengal, India is blessed with rich plant diversity which includes various medicinal plants. Studies conducted on the medicinal plants of the West Midnapore district of West Bengal reveals that the district of West Midnapore is blessed with extensive and diverse medicinal plants.[5,6] There has been studies on the biodiversity of medicinal plants of East Midnapore district of west Bengal India also.[7] Those medicinal plants are in use in villages in large scale for ages. Inspite of advancement in medical science and development of drugs, those plants with pronounced medicinal properties and rich bioactive phytoconstituents are still in use in villages of those region due to their easy & local availability, reliable healing effects on various pathophysiological conditions, cost effectiveness, no side effects and also due to high cost of conventional drugs. Uses of those medicinal plants are being passed from generations to generation through verbal descriptions and communications. Most of the medicinal plants used by local people and tribes of Paschim Medenipur are grown locally and are thus certain indigeneous species of the region.[5]

Ulotkombol (*Abroma augusta*)

Ulotkombol's scientific name is *Abroma augusta*. Genus of the plant is abroma and family is Malvaceae. This plant is commonly known as 'Devil's cotton' and 'ulotkombol', It is a small plant. Entire plant is hairy. The flowers are either red, purple or yellow in colour.[8] The plant's home is in Malasiya.[9] This plant is an aid for various health issues. The bark & the root helps in the regulation of menstrual cycle, lowers absorption of glucose and is used to treat diabetes. Bark and root extract of utolkombol is also known to promote haemoglobin synthesis and is thus used to treat anaemia and they are also known to possess antimicrobial properties.[8] Roots are in wide use in Ayurveda for

treating uterine ailments.[8] Uterine tonic is prepared from the root extract. Root extract of ulot kombol is also used as emmenagogue which enhances blood flow in the pelvic region and is thus useful in resolving uterine ailments related to compromised pelvic circulation. Root extract of the plant is also known to be used as anodyne i.e., a herb that acts as analgesic and relieves pain.[10] Leaves are used to treat gonorrhea.[7] The leaves of ulot kombol is in use as demulcent in ayurveda. Demulcent is something that relieves irritation and inflammation.[10] Smell of the flower of *Abroma augusta* is taken through nose and also the extract of its stem is consumed with alovera extract to treat psychotic situation.[11]

Fig.1. Ulotkombol (*Abroma augusta*).

Studies reveal that the prime phytoconstituents of *Abroma augusta* are alkaloids, tannins, magnesium and fixed oils.[12] Investigations showed that the leaves of ulotkombol contain β-sitosterol, Stigmasterol, Lupeol.[13] The same studies also reported thrombolytic, antioxidant and membrane stabilizing activity of the leaves of *Abroma augusta.*[11] Studies show that methanolic extarct of *Abroma augusta* has potential anti-inflammtory effect by virtue of its rich flavonoids and alkaloids content.[14] Alkaloids, steroids, terpenoids, flavonoids, reducing sugars, and glycosides are reported in the methanolic bark extract of *Abroma augusta*.[15]

Ayapan (*Ayapana triplinervis*)

The plant is scientifically known as *Ayapana triplinervis, Eupatorium ayapana,* and *E. triplinerve.* All three names refer to the same plant. The plant family is asteraceae. Leaves of ayapan are known to have detoxifying effect on snake bite. Stem and leaves extracts are used to treat digestive issues. Leaves also have sedative effect.[16] It bears flowers which are pink in colour. It has a general detoxifying effect on the body. The plant is easily propagated by seeds.[17] The whole plant has medicinal use in Indian folk medicine and also in various other countries.[17] It helps to revive and restore liver functions and cleanse all body organs.[18] Studies show that the plant has antiseptic properties which help in healing wounds and preventing formation of ulcerations. If consumed orally it helps in preventing bleeding in any part of the body. It's leaves have properties that can help to control fever, cough and cold naturally.[17] The plant is known to have antioxidant, antimicrobial, anticoagulant and analgesic properties.[17] Essential oils from the plant are known to have antitumorogenic activity.[18] The plant is known to have healing effect on fever, cough and cold; It has laxative effect also.[18] The leaves have antiseptic properties. Entire plant has detoxifying effect on the body.[18] Studies reveal antifungal activity of the leaves extract.[16] The leaves juice is used in folk medicine to treat mouth ulcers and gingivitis.[16]

Studies reveal that the plant is rich in terpenoids and coumarin derivatives.[17] The plant is rich in coumarins. Ayapanin and ayapin are the two coumarins reported from the plant.[16] Those are known to be responsible for the anticoagulant property of the plant. Another coumarin namely herniarin (7-methoxycoumarin) is also reported from ayapan). Herniarin is reported to be responsible for its antitumor and antibacterial and antifungal activities.[16] Other bioactive coumponds present in ayapan are quinones. Several medicinal properties of ayapan such as antiinflammtaory, immunomodulatory. A quinone namely thymoquinone. is known to be responsible for the cardioprotective, gastroprotective, hepatoprotective and nephroprotective effects of ayapan.[16] Studies also reveal the presence of another Quinine in leaves of ayapan, namely thymohydroquinone has been found to be responsible for antihiataminic, neuroprotective and COX-1 inhibitor potentials od ayapan.[16]

Fig.2. Aayapan (*Ayapana triplinervis*).

Some other phytochemicals reported from ayapan are 1-8 cineol, alpha-phellandrene, alpha-terineol, beta-selinene, borneol, bornyl-acetate, daphnetin, dipentene, thymohydroquinone, umbelliferone, hydrangetin, linalol, methylene-dioxy-6,7-coumarin, sabinene, stigmasterol.[16]

Methi or fenugreek (*Trigonella foenum-graecum*)

This is a common edible herbaceous plant and can be even grown at home easily with little efforts. This plant's scientific name is *Trigonella foenum-graecum*. It is usually grown for its leaves and seeds which are used as spices in dried form. Fresh leaves of fenugreek are consumed as green leafy vegetable as well. Both leaves and seeds of fenugreek have medicinal use from ancient time.[19] It is an annual plant in the family fabaceae, with leaves consisting of three small obovate to belong leaflets. The plant is used to treat increased body weight, skin wounds and also is in use to treat diabetes. Fenugreek is also used to deal with eye problem.[20] Whole seeds of fenugreek are traditionally used to cure antacids, treat deseyntery and to treat various gastric disorders.[19] Cold water extact of fenugreek is used to treat respiratory ailments including pneumonia and bronchitis. *Trigonella foenum-graecum* is extensively used in folkmedicine for ages.[19] It hashypoglycaemic and antimicrobial activities and various other beneficial effects on human health.[19,20] Health benifits of fenugreek are mentioned in Ayurveda and in traditional Chinese medine also.[21] Fenugreek has been reported to be rich in certain phytochemicls with potential medicinal properties. Some such phytochemicals are fenugreekine, diosgenin, 4-hydroxy isoleucine, galactomannan and trigonelline. Medicinal properties of fenugreek seeds are due to its rich phytochemical constituents.[20] Studies reveal that fenugreek has ability to lower blood glucose and blood cholesterol levels.[22] Studies show that fenugreek has anticancer potential and can destroy cancer cells selectively without effecting normal cells.[23] Fenugreek has potential neuroprotective activity and has been reported to have roles in treating neurological disorders.[24] Both fenugreek leaves and seeds have been reported to have effect on insulin in our body and thus those are a very potential traditional medicinal aid in treating diabetes.[25] Leaves of fenugreek have also been repoted to have antiinflmmatory and antipyretic potentials.[26] Studies reveal that leaves of fenugreek contain various phytochemicals compounds most of which have been established to be bioactive and responsible for the excellent medicinal potential of fenugreek. Luksosa, beta-dl-arabinopyranose, glycerol, sucrose, raffinose, xylitol have been repoted to be present in the leaves extracts of fenugreek. Several amino acids namely L-alanine, L-valine, L-proline, Lthreonine have been found in fenugreek leaves. The oxyacetic, succinic, 2,3-dioxypropanoic, 2,3,4-threehydroxybutyric acids and fatty palmitic and alpha-linolenic acids have also been repoted to be present in fenugreek leaves extracts. Essential oil like hexadecene, eicozanol, ethyl palmitate, ethylinoleate, beta-hydroxy-butyric, beta-aminoizobutyric, hydroxybutanedicarbonic, 1,2,3-propanethreecarbonic acids have been found to be in the leaves of fenugreek.[27]

Fig.3.Fenugreek plant (*Trigonella foenum-graecum*).

Nuniya or Purslane (*Portulaca oleracea*)

The plant's scientific name is *Portulaca oleracea*. This plant family is portulacaceae. It reduces high blood pressure.[28] Studies reveal that purslane seed lowers triglyceride level in serum but has no impact on high density lipoprotein.[28] It can help to control skin problem. It is used to improve wrinkles and ageing effects on skin.[29] It has antiallergic impacts on skin also.[30] This plant helps to strengthen bones in our body, improves vision, keeps our heart healthy and also is known to resolve various gastrointestinal issues. This plant is also in use in traditional folk medicine for loosing weight.[31] This plant is used to control spleen disease and kidney diseases also and has been found to have no toxic effects on experimental animal's spleen and kidneys.[32,33] The plant has been found to have rich antioxidant phytoconstituents which includes glutathione, ascorbic acid, tocopherol, beta carotene etc., The plant has also been reported to contain omega-3 fatty acids.[34] Aalpha-linolenic acid is also present in leaves, stems and seeds of *Portulaca oleracea*.[34-37] The plant contains carbohydrates, lipids, glycosides, alkaloids, triterpenes, sterols, coumarins, and flavonoids. Phenolic compounds present in the plant include scopoletin, lonchocarpic acid, bergapten, isopimpinellin, robustin, genistein etc.[38-42]

Fig.4. Nuniya or Purslane (*Portulaca oleracea*)

Gima (*Glinus oppositifolius*)

This plant's scientific name is *Glinus oppositifolius*. This plant's family name is molluginaceae. This plant leaves have extensive medicinal use. The plant use in jandis, fever. It helps control stomach infection, used to enhance digestion and salivation. The plant is also used to treat bowel complains and syphilis.[43] Several phytochemicals present in *Glinus oppositifolius*have been reported. Some of those phytochemicals which are reportd to be present in leaves of gima are oppositifolone, squalene, spinasterol, oleanolic acid, phytol, lutein etc., spergulagenin A has been found to be present in the stem of the plant. A wide range of sterols have been reported from Glinus oppositifolius. Some such aromatic compounds reported from gima are benzoic acid, 4-hydroxybenzoic acid, 4 hydroxy-acetophenone, 4-hydroxybenzaldehyde, acetosyringone, methyl 4-hydroxybenzoate, vanillin, 2-(4- hydroxyphenyl ethanol, anisic acid, 4-hydroxy-3-methoxyacetophenone, 4-hydroxy-3,5-dimethoxy benzaldehyde, 4-hydroxybenzyl alcohol, cinnamic acid, trans-ferulic acid etc.,[44-46] The plant is rich in various polyphenols and flavonoids also. This rich phytochemicals constituents of the plant is responsible for its wide medicinal potential.

Fig.5. Gima (*Glinus oppositifolius*)

CONCLUSION

Paschim Midnapore district of West Bengal has a rich plant biodiversity. The village we considered in our present study is in the Pachim Midnapore district of West Bengal. People consume locally grown and availablegreen leafy vegetables almost in their daily diet. Most of those green leafy vegetable are highly rich in bioactive phytocompounds which are responsible for their pronounced medicinal properties. Several studies reveal that crude extracts of certain plants have strong medicinal effects and protective effects on various organs in our body.[47,48] This justifies the fact that dietary consumption of those local medicinal plants by indigenous people of the village provide beneficial effects on their health. Such plants with medicinal properties are known to have no side effects when consumed orally.[49] This is due to combined effects of several phytocompounds in them which work together and complement each other.[47,48] Besides, certain medicinal plants have been reported to have synergistic medicinal effects when used with other pure compounds.[50,51] Such effects have been found to be stronger than when either the extract is used alone or the conventional compound.[50,51] Such kind of investigation about combinatorial; therapeutic potential still awaits to be conducted on the five local medicinal plants of Bhagabanbasan village we have considered in our study. Many of these leafy vegetables are also in extensive use as medicinal herbs in folk medicine. In this study we have given a brief account of only five such local plant of Bhagabanbashan village of Paschim Midanopre which are consumed regularly by the indigenous people of the village and are also used for various medicinal purposes by the people. There have been several studies and investigations on these plants and many bioactive phytocompounds have been isolated and identified from them but many others are still awaiting exploration. Also, elaborate study and further investigations using modern tools of drug development and delivery including computational biology and detailed studies on experimental animals and human are needed. Using modern tools of computational biology millions of bioactive compounds can be screened at a time and their effect and mechanism of action against targeted pathogens and pathogenic proteins and antigens can be easily studied in a time saving and cost effective manner.[52] A compact knowledge is necessary for conservation of those plants. Our present study also highlights the immense possibility of sustainable folk medicinal practice in heath and diseases. This study also opens a world of possibility to develop minimal or nil side effect bearing potential drugs from plants of this particular geographical region.

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