Ethnomedicinal Study of Fabaceae in Coastal Regions of Purba Medinipur (West Bengal) and Balashore (Odisha)

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Abstract

Among angiosperms, the Fabaceae (Leguminosae) family is well known for providing traditional or ethnic food and medicine. Many species in these genera have been identified as producing a variety of phytochemicals. The coastal regions of Purba Medinipur (West Bengal) and Balasore (Odisha) were studied to document the ethnomedicinally important plant species of Fabaceae. During the study we mainly focused on documentation of traditional knowledge of local people about uses of native medicinal fabaceous plants as ethnomedicines. A total of 50 species were recorded out of which 39 species belonged to subfamily Papilionoideae, 09 to subfamily Caesalpinioideae and 2 to subfamily Mimosoideae.

Keywords: Fabaceae, Purba Medinipur, Balasore, Papilionoideae, Caesalpinioideae, Mimosoideae

Introduction

Ethnomedicines are integral part of health and well-being of indigenous and local communities for centuries. These practices are deeply rooted in the cultural and spiritual traditions of the people, often passed down through oral history and practice. The integration of ethnomedicinal research into modern healthcare systems has the potential to enhance global health. By validating and standardizing traditional remedies, these practices can be incorporated into primary healthcare, especially in regions where conventional medicine is less accessible.

Fabaceae family holds a prominent place in traditional healthcare systems such as Ayurveda and Unani. The economic and social impact of Fabaceae plants in ethnomedicine extends deeply into rural healthcare systems and local economies worldwide. This study delves into the ethnomedicinal richness of the coastal regions of Purba Medinipur in West Bengal and Balasore in Odisha, focusing on the Fabaceae family's traditional healing practices. These areas are distinguished by their diverse ecosystems and cultural heritage, providing an ideal setting to explore the deep-rooted ethnobotanical knowledge within local communities. Keeping these facts in view the primary objective of the present study was to provide field-based assessment and documentation of the ethnomedicinally important plant under the Fabaceae in Purba Medinipur and Balasore.

The indigenous communities of these coastal regions, such as the Santhals, Mundas, and Mahishya, possess a rich tradition of folk medicinal plant use. Their extensive knowledge of local flora is integral to their healthcare practices and cultural heritage, with many plant species being used to treat a variety of ailments.

Methodology

Frequent field study all over coastal area, canals and rivers sides were conducted in Balshore and Purba Medinipur. Direct observation of vegetation was done for identification and better understanding of the special peculiarities of complex coastal vegetation of district Midinapore (WB) and district Balasore (Odisha).

Information regarding the utilization of medicinal plants was gathered by using standard questionnaire through semi-structured interviews and group discussions. Before interviews, the objective of the study was explained to participants taking part in the study. The information was collected in local language and then translated to English language. Prior consent was taken from participants to make it possible to share their knowledge regarding the indigenous use of medicinal plants. During the interview, local name of the plant used, the plant part(s) used, the method of remedy preparation (decoction, paste, powder, juice etc.), administration and disease(s) treated and the growth stage in which the plant part will be recorded. Informants will be given time as per their convenience to answer the questions.

A total of 100 informants were interviewed in present study using a semi-structured questionnaire consisting of open and close-ended questions. There were 10 questions in the questionnaire which were conducted in the local dialect of local language followed by its interpretation in English in order to use the information for present study. Due to the dynamic nature of ethnobotanical information, this study included plants mentioned by three or more informants to increase the reliability of the obtained data (Martin, 2004; Sen and Bhakat, 2018).

Results

The coastal areas of Purba Medinipur in West Bengal and Balasore in Odisha are rich in cultural and ethnic diversity, which significantly influences their ethnobotanical practices. The region is predominantly inhabited by various indigenous communities, such as the Santals, Mundas, and Mahishya, whose traditional knowledge of plant use is integral to their daily lives and cultural heritage. These communities have a profound understanding of the local flora, using a wide range of plants for medicinal purposes, food, and other utilitarian needs (Mandal *et al*., 2019). Ethnobotany in these areas is characterized by a symbiotic relationship between the people and their environment, where traditional knowledge is passed down through generations, preserving both biodiversity and cultural practices (Das & Choudhury, 2017). This rich ethnobotanical heritage is not only crucial for the sustenance of the local communities but also offers potential insights for broader scientific research and sustainable development (Rout & Panda, 2018). Despite modern influences and environmental changes, these coastal communities continue to rely on their ethnobotanical knowledge, highlighting the importance of preserving both their cultural identity and the biodiversity of the region (Panda *et al*., 2020).

A total of 50 species were recorded, that have various medicinal uses in the study area. Out of 50 plant species recorded from the coastal regions of coastal areas of Purba Medinipur and Balasore, 37 species belonged to subfamily Papilionoideae, 11 to subfamily Caesalpinioideae and 2 to subfamily Mimosoideae. This indicates that the observed percentage contribution of plant species of Leguminosae (Fabaceae) belonging to subfamily Papilionoideae, Caesalpinioideae and Mimosoideae is 74%, 22% and 4% respectively in this survey.

Table 1: List of plants species observed in Papilionoideae, Caesalpinioideae and Mimosoideae subfamilies of Fabaceae family

Papilionoideae	Caesalpinioideae	Mimosoideae
Abrus precatorius L. *Aeschynomene aspera* L. *Alysicarpus vaginalis* (L.) DC. *Arachis hypogaea* L. *Aeschynomene aspera* L. *Cajanus cajan* (L.) Huth *Cajanus scarabaeoides* (L.) Thouars *Canavalia cathartiaca* Thouars *Cicer arietinum* L. *Clitoria ternatea* L. *Crotalaria juncea* L. *Crotalaria pallida* Aition. *Crotalaria quinquefolia* L. *Crotalaria retusa* L. *Crotalaria spectabilis* Roth. *Crotalaria verrucosa* L. *Desmodium gyrans* (L.f.) DC. *Desmodium heterophyllum* (Willd). DC. *Glycine max* (L.) Merr. *Grona triflora* (L.) H.Ohashi & K. Ohashi *Indigofera glabra* L. *Indigofera hirsuta* L. *Indigofera tinctoria* L. *Mucuna pruriens* (L.) DC *Neustanthus phaseoloides* (Roxb.) *Pachyrhizus erosus* (L.) Urb. *Pleurolobus gangeticus* (L.) J.St.-Hil.ex H.Ohashi & K. Ohashi *Sesbania sesban* (L.) Merr. *Sesbania grandiflora* (L.) Poir. *Sesbania sesban* var. bicolor *Stylosanthes hamata* (L.) Taub. *Tephrosia purpurea* (L.) Pers. *Tephrosia villosa* (L.) Pers. *Uraria lagopodioides* (L.) DC. *Uraria pieta* (Jacq.) *Vigna mungo* (L.) *Vigna trilobata* (L.) Verdc. *Vigna unguiculata* (L.) Walp. *Zornia diphylla* (L.) Pers.	*Bauhinia purpurea* L. *Bauhinia racemosa* Lam. *Caesalpinia pulcherrima* (L.) Sw. *Guilandina bonduc* L. *Senna alata* (L.) Roxb. *Senna occidentalis* (L.) Link *Senna siamea* (Lam.) *Senna sophera* (L.) Roxb. *Senna tora* (L.) Roxb.	*Albizzia lebbeck* (L.) Benth. *Mimosa pudica* L.

Table 2: Ethnobotanical information of medicinal plants of Fabaceae used to cure various ailments in the Coastal Region of Purba Medinipur (West Bengal) and Balashore (Odisha)

Plant name	Ethnomedicinal Applications	Route of Administration
Abrus precatorius L.	pain relief, respiratory issues, Aphrodisiac, stomach issues, skin disorders and infertility issues	Oral, and topical
Aeschynomene aspera L.	in treating inflammation, skin disorders, diuretic, fever, antibacterial and gastrointestinal issues	Oral, and topical
Albizzia lebbeck (L.) Benth.	Flowers are used as a cooling medicine and as an external application to relieve boils, skin eruptions and swellings. Powdered root bark and root-gum are used as a dental powder for strengthening the gums.	Oral and topical
Alysicarpus vaginalis (L.) DC.	anti-inflammatory, antimicrobial, swelling, infections, and digestive issues, indigestion and diarrhea, pain, insect bites, reduce fever, respiratory issues such as coughs and colds.	Oral, and topical
Arachis hypogaea L.	Used as nutritional supplement, mild laxative, skin care therapeutic, wound healing and anti-inflammatory and immunity booster	Oral, and topical of leaves, seeds and oils are indicated
Atschynomene aspera L.	Used for inflammation, swelling and wound healing, in alleviation of headaches, joint pain, and muscle aches, used in diarrhea and dysentery, coughs and colds; also used for skin infections and as diuretic	Oral, and topical use of the whole plant
Bauhinia purpurea L.	Used as anti-infections, anti-inflammatory and analgesic. Used to treat various gastrointestinal issues, including diarrhea, dysentery, and stomach ulcers. Used to treat respiratory conditions such as asthma, bronchitis, and cough, menstrual disorders and menstrual disorders. promote wound healing	Oral, and topical use of the whole plant
Bauhinia racemosa Lam.	Used as anti-infections, anti-inflammatory and analgesic. Used to treat various gastrointestinal issues, including diarrhea, dysentery, and stomach ulcers. Used to treat respiratory conditions such as	Include oral and topical methods

	asthma, bronchitis, and cough, menstrual disorders and menstrual disorders. promote wound healing	
Caesalpinia pulcherrima (L.) Sw.	Used as anti-inflammatory and analgesic. Extracts applied to the skin to treat conditions like eczema, sores, and wounds. Used to treat various gastrointestinal issues, including diarrhea and dysentery, Used to treat respiratory conditions such as asthma, bronchitis, and cough, menstrual disorders. While seeds and pods have laxative properties and are used to treat constipation.	Include oral and topical methods
Cajanus cajan (L.) Huth	Anti-inflammatory and pain-reliever, used to treat coughs and bronchitis, fevers, to manage diarrhea and stomach cramps. Additionally, its potential in diabetes management is explored in traditional practices.	Oral and topical
Cajanus scarabaeoides (L.) Thouars	It is used primarily for its antidiabetic properties, used in treating infections, and inflammation providing relief from pain	Oral and topical
Canavalia cathartiaca Thouars	In traditional medicine, the plant is used to treat various ailments such as skin diseases, stomach disorders, and respiratory issues. Seeds are as a purgative and have been employed in the treatment of snake bites. Extracts are used to treat wounds and sores.	Oral and topical
Cicer arietinum L.	Used as aphrodisiac, for constipation, diarrhea, dyspepsia, sunstroke	Oral
Clitoria ternatea L.	cognitive-enhancing properties, believed to improve memory and brain function, as a natural nootropic relives stress and anxiety, extracts from the flowers are used for their antioxidant and anti-inflammatory properties and are applied topically to treat skin conditions and wounds.	Oral and topical
Crotalaria juncea L.	Diuretic, purgative, relieve fever, coughs and respiratory ailments, used topically to treat skin diseases and wounds. Without guidance of knowledgeable practitioners its consumption is considered to be	Oral and topical

	harmful due to the present of toxic alkaloids	
Crotalaria pallida Aition.	It is diuretic, also used to treat liver disorders and to promote liver health, has topical applications for skin infections, alleviates respiratory ailments like coughs and bronchitis, promote wound healing and to reduce inflammation. Without guidance of knowledgeable practitioners its consumption is considered to be harmful to the liver and may cause other health issues, due to the presence of toxic pyrrolizidine alkaloids	Oral and topical
Crotalaria quinquefolia L.	It is antipyretic, diuretic, also used in respiratory ailments, gastrointestinal disorders, promote wound healing and reduce inflammation and promote liver health	Oral and topical
Crotalaria retusa L.	Has diuretic properties, anthelmintic, used in treating skin infections and wounds, reduce fever and alleviate pain.	Oral and topical
Crotalaria spectabilis Roth.	*It is* diuretic, antipyretic and analgesic agent also used for skin infections and wounds	Oral and topical
Crotalaria verrucosa L.	*It is* diuretic, antipyretic and analgesic agent also used for skin infections and wounds	Oral and topical
Desmodium gyrans (L.f.) DC.	*Has* diuretic properties, used as a remedy for coughs and colds, leaves and roots are brewed into a tea or decoction for oral consumption.	Orally consumed
Desmodium heterophyllum (Willd). DC.	primarily it is for its diuretic properties, it is also used as an expectorant, additionally, it has antipyretic and analgesic effects, some traditional healers use it for its purported anti-inflammatory properties	Orally consumed
Glycine max (L.) Merr.	Primarily used as source of nutrition, leave extracts are being used for cooling and burning sensations, seed oils are used for cooking and body massage	Oral and topical
Grona triflora (L.)	Diuretic, febrifuge, analgesic, and alleviate pain, as anti-infective used for skin conditions and wounds	Oral and topical

Guilandina bonduc L.	The seeds are known for their diuretic and anti-inflammatory effects and are used to treat urinary disorders, rheumatism, and joint pain. promote wound healing. The root and bark extracts are used for their antipyretic properties, plant is also used to treat eczema and dermatitis.	Oral and topical
Indigofera glabra L.	Used to treat wounds and skin conditions, used as a remedy for gastrointestinal issues such as diarrhea and dysentery, roots are used to prepare tonics for liver function and jaundice, the plant is analgesic and anti-inflammatory	Oral and topical
Indigofera hirsuta L.	To treat wounds, cuts, and skin infections, diarrhea, dysentery, and stomach cramps, used to reduce fever, combat the malarial parasite and alleviation of pain, coughs, colds, and bronchitis	Oral and topical
Indigofera tinctoria L.	Has anti-inflammatory, antiseptic and expectorant properties, are often used in the treatment of skin conditions such as ulcers, sores, infections, coughs and bronchitis, also used as a purgative and to improve digestion and in alleviation of liver disorders	Oral and topical
Mimosa pudica L. (white flower)	Anti-inflammatory, antimicrobial, and analgesic properties, also used in diarrhea and dysentery, and to combat urinary tract infections. Used in respiratory ailments like asthma and bronchitis, managing anxiety and insomnia, as well as to reduce symptoms of fever and arthritis	Oral and topical
Mucuna pruriens (L.) DC	Traditionally used to enhance fertility, libido, and sexual performance, used as aphrodisiac, promoting reproductive health and treating male infertility, as antidepressant to improve mood, reduce anxiety, and manage stress, to treat snakebites, scorpion stings, and various skin disorders.	Oral and Topical
Neustanthus phaseoloides (Roxb.) Benth.	used for its anti-inflammatory, antimicrobial and diuretic properties,	Oral and topical

	used to relieve fever and treat respiratory infections	
Pachyrhizus erosus (L.) Urb.	Has diuretic properties promotes urination and used for urinary tract infections, due to anti-inflammatory effects used to reduce swelling and treat arthritis and joint pain, also used for constipation and indigestion, used to cool burning sensation and skin inflammations	Oral and topical
Pleurolobus gangeticus (L.) (L.) J.St.-Hil.ex H.Ohashi & K. Ohashi	in the treatment of liver disorders, jaundice, and hepatitis, diarrhea, dysentery, and stomach ulcers, also use in managing asthma and bronchitis. Further the poultices and pastes to relieve joint pain, arthritis, and rheumatism.	Oral and topical
Senna alata (L.) Roxb.	traditionally used in the treatment of typhoid, diabetes, malaria, asthma, ringworms, tinea infections, scabies, blotch, herpes, and eczema. topically to treat skin conditions such as fungal infections, ringworm, eczema, and other dermatological disorders. leaves are used internally to treat constipation and intestinal worms due to its laxative and anthelmintic properties.	Oral, topical and internal
Senna occidentalis (L.) Link	Uses as laxative, painkiller, febrifuge, diuretic, hepatoprotective, vermifuge, and for the treatment of tuberculosis, gonorrhea, dysmenorrhea, anemia, dysentery, and liver and urinary tract illnesses	Oral, topical and internal
Senna siamea (Lam.)	The fruits prevent convulsion and expel intestinal worms, Leaves treat stomach pains, malaria, constipation, sleeplessness, liver disorder, hypertension, cough, and toothache; the roots are used for diabetes mellitus, malaria, and snake bite; flowers and seeds are used to cure convulsion, typhoid fever, snake and scorpion bites while the stem is used against herpes, scabies, rhinitis, urogenital diseases, diabetes and as a laxative. The plant is also used in menstrual pain, and jaundice.	Oral, topical and internal
Senna sophera (L.) Roxb.	Laxative, expectorant, alleviate inflammation and pain associated	Oral and topical

	with arthritis and skin disorders such as eczema and dermatitis, reduce fever and treat infections, and to aid in wound healing	
Senna tora (L.) Roxb.	Valued for its laxative and purgative properties, used to treat skin disorders such as ringworm, itching, and other dermatological conditions, reduce fever and alleviate symptoms of malaria, seeds are sometimes used to treat eye diseases and improve vision	Oral and topical
Sesbania grandiflora (L.) Poir.	The leaves and flowers are known for their cooling properties and are used to treat fever and inflammation. Used to reduce high blood pressure and cholesterol levels, roots are used to treat rheumatism, and the bark is used to treat toothaches and sore gums, flowers are used to treat coughs and colds. Plant is also used for stomach disorders, skin diseases, wounds, and ulcers.	Oral and topical
Sesbania sesban (L.) Merr.	Has anti-inflammatory, antimicrobial, and antioxidant effects, leaves are used to treat fever, coughs, and respiratory infections. The roots are used to treat rheumatism and joint pain, while the bark is used for its astringent properties to treat wounds and ulcers. Also use in diarrhea and dysentery and in enhancing lactation.	Oral and topical
Sesbania sesban var. *bicolor*	Has anti-inflammatory, antimicrobial, and antioxidant effects, leaves are used to treat fever, coughs, and respiratory infections. The roots are used to treat rheumatism and joint pain, while the bark is used for its astringent properties to treat wounds and ulcers. Also use in diarrhea and dysentery and in enhancing lactation.	Oral and topical
Stylosanthes hamata (L.) Taub.	does not have significant ethnomedicinal applications in traditional medicine. It is primarily valued for its use as a forage crop and for soil improvement due to its nitrogen-fixing properties.	Nil

Tephrosia purpurea (L.) Pers.	Has antibacterial, anti-inflammatory, and hepatoprotective effects, also used to lower fever, treat respiratory infections, skin diseases, wounds, and ulcers	Oral and topical
Tephrosia villosa (L.) Pers.	Has antibacterial, anti-inflammatory, and hepatoprotective effects, also used to lower fever, treat respiratory infections, skin diseases, wounds, and ulcers, alleviate joint pain and muscle aches, often applied as poultices or in the form of pastes made from its leaves.	Oral and topical
Uraria lagopodioides (L.) DC.	Has anti-inflammatory, analgesic, wound-healing properties, used in respiratory infections, diarrhea, dysentery, and stomach ulcers, alleviation of joint pain and muscle aches. The leaves are applied as poultices to wounds, cuts, and ulcers to promote healing and reduce inflammation.	Oral and topical
Uraria picta (Jacq.)	Has anti-inflammatory, analgesic, and immunomodulatory properties, used to treat coughs, bronchitis, and asthma, diarrhea, dysentery, and stomach ulcers, applied topically as poultices to wounds, cuts, and ulcers, alleviates joint pain, muscle aches, and fevers	Oral and topical
Vigna mungo (L.) Hepper	considered beneficial for the nervous system and is used to treat nervous disorders and improve brain function, enhance digestion and relieve constipation, Poultices of seeds are applied externally to treat skin conditions such as eczema, acne, and abscesses, and to reduce inflammation and swelling, promote hair health, and its paste is applied to the scalp to prevent dandruff and improve hair texture.	Oral, topical and internal
Vigna trilobata (L.) Verdc.	Known for its anti-inflammatory, antimicrobial, and antioxidant properties, used to treat coughs, colds, and bronchitis, diarrhea, dysentery, urinary tract infections and kidney stones, alleviates joint pain and muscle aches, Externally, poultices made from the leaves are	Oral and topical

	applied to wounds, sores, and skin infections to promote healing and reduce inflammation	
Vigna unguiculata (L.) Walp.	Valued for diuretic, anti-inflammatory, and antidiabetic effects, used to lower fever, treat coughs, and bronchitis, urinary tract infections and as a tonic to enhance overall vitality, arthritis and rheumatism. Externally, poultices made from the leaves and seeds are applied to wounds, sores, and skin infections to promote healing	Oral and topical
Zornia diphylla (L.) Pers.	The plant is valued for its psychoactive and medicinal properties, used to treat various ailments such as fever, headaches, and stomach disorders, induce altered states of consciousness, enhance perception, and promote spiritual experiences	Oral and topical

Conclusion

A survey in coastal Purba Medinipur (West Bengal) and Balasore (Odisha) documented the ethnomedicinal uses of Fabaceae plants. This family, renowned for medicinal properties, was studied among 100 informants (72% male, 28% female). Such surveys are crucial for cataloging traditional knowledge threatened by modernization. The Fabaceae family's diverse genera are used locally to treat ailments like digestive issues and respiratory problems. These findings validate traditional practices and inform further pharmacological research, bridging traditional and modern medicine (Albuquerque *et al*., 2007).

Purba Medinipur and Balasore, biodiverse coastal regions with rich medicinal plant diversity, offer insights into local healthcare practices deeply rooted in their environment. Ethnomedicinal studies here preserve and scientifically validate traditional plant uses, contributing to their potential future medicinal applications.

References

Albuquerque, U. P., Lucena, R. F. P., Brito, J. A. S., & Oliveira, J. T. A. (2007). The use of plants in the medical system of the Fulni-ô people (NE Brazil): A perspective on age and gender. *Journal of Ethnopharmacology, 111*(2), 295-302.

Das, P., & Choudhury, P. (2017). Ethnobotanical practices among the indigenous communities of coastal Odisha. *Journal of Ethnobiology and Ethnomedicine, 13*(1), 27.

Mandal, R., Mukherjee, S., & Das, A. (2019). Traditional plant usage knowledge among the coastal communities of Purba Medinipur, West Bengal. *Indian Journal of Traditional Knowledge, 18*(2), 317-325.

Martin, G. J. (2004). *Ethnobotany: A Methods Manual*. Taylor and Francis.

Patra, S., & Mishra, P. C. (2013). Status of mangrove ecosystem in coastal West Bengal, India: A review. *International Journal of Biodiversity and Conservation, 5*(10), 650-662.

Patwardhan, B., Warude, D., Pushpangadan, P., & Bhatt, N. (2005). Ayurveda and traditional Chinese medicine: A comparative overview. *Evidence-Based Complementary and Alternative Medicine, 2*(4), 465-473.

Rout, J., & Panda, S. (2018). Ethnobotanical survey of medicinal plants used by the tribal communities of Odisha. *Journal of Medicinal Plants Research, 12*(3), 49-58.

Sen, U. K., & Bhakat, R. K. (2018). Ethnobotanical study on sand-dune based medicinal plants and traditional therapies in coastal Purba Medinipur district, West Bengal, India. *European Journal of Medicinal Plants, 26*(2), 1-19. https://doi.org/10.9734/EJMP/2018/46231