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Ethnobotanical inventory and medicinal potential of mangrove flora in the Sundarbans, West Bengal, India

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Abstract: Through an exploration of the diverse mangrove flora in the Sundarbans, this ethnobotanical study reveals the complex interactions that exist between the local communities and the various plant species that thrive in this exceptional habitat. Between January 2018 and December 2023, an ethno-medicinal survey was conducted in Sundarban, India, exploring the traditional knowledge of the local population regarding healthcare. Interviews were conducted with native and elderly individuals involved in health practices across various villages. The findings indicate the prevalent use of 34 plant species from 18 families, with bark, leaf, and roots, either in their natural form or processed, commonly employed as folk medicine. The study revealed that the enumerated plant species belong to families like Acanthaceae, Apocynaceae, Arecaceae, Avicenniaceae, Bignoniaceae, Boraginaceae, Combretaceae, Euphorbiaceae, Fabaceae, Lauraceae, Meliaceae, Pteridaceae, Rhizophoraceae, Rubiaceae, Rutaceae, Malvaceae, Sonneratiaceae, and Lamiaceae. In Sundarban, India, people rely on plants for everyday necessities and medical treatment; nevertheless, this traditional knowledge, passed down orally down the centuries, is not well documented. The study emphasizes how crucial it is to record these habits because the death of older people may cause important knowledge to be lost.

Keywords: mangroves, sundarbans, ethnobotany

Introduction

India boasts a rich indigenous therapeutic culture with an unbroken tradition spanning more than four thousand years. Despite its age, this heritage remains a crucial resource for the health care needs of people in rural and remote areas, with over 80 % of the global population relying on traditional medicine for primary healthcare (Kumar *et al.,* 2021). Ethnobotanists play a vital role in exploring this mysteriously captivating yet scientifically and economically significant field. Pioneering efforts in identifying, documenting, and recognizing traditional medicine in India have unfolded over the past few decades, revealing locally important plant species crucial for discovering crude drugs (Devi *et al.,* 2023). The

contemporary situation needs more agents from plant wealth and need to screen in rapid mode due to global problems like anti-microbial resistance and drug failure (Kumar *et al.,* 2013). Keeping this in view and attempt has been made to explore the mangroves flora of Sundarbans area in West Bengal, India and gather the ethnomedicinal uses through interaction with local communities. The Sundarbans are the world's largest delta and continuous mangrove forest, classified as moist tropical seral forest, comprising a mosaic of beach and tidal forest, located in Bangladesh and in West Bengal, India. The Sundarbans have a population of over 4 million. The island-based habitation within the Sundarbans faces various hindrances to normal daily life, which forced the local inhabitants to develop their own unique way of living. In this situation, a very long time ago, local people identified the medicinal properties of the mangrove plants (Mondal *et al.,* 2012). They have used different mangrove plants in different forms as medicine to cure some common as well as chronic ailments like fever, malaria, cold and cough, bronchitis, asthma, skin diseases, ulcers, leprosy, small pox, diarrhoea, diabetes, infertility, and dysentery (Shelar *et al.,* 2012). The present exploration work bring attention towards the sustainable utilization of mangroves wealth and making long-term conservation plan.

Materials and methods

A survey was carried out in selected areas of Sundarban during 2018-2023 [1. Koikhali (Kultali Block) 2. Moipith (Kultali Block) 3. Konkondighi (Mathurapur Block - 2) 4. Vagbath Pur (Patharpratima Block) 5. Mousumi Island (Namkhana Block) 6. Jharkhali (Gosaba Block) 7. Jamtala (Kultali Block 8. Nolgora (Joynagar Block 2) 9. Damkal (Mathurapur Block 2) and 10. Manasadwip (Sagar Island) of South 24 pgs district]. Discussion was made with traditional ayurvedic practitioners and local communities (Santal, Munda, Lodha, Bhumij and Mahto) through extensive interviews (Schultes, 1960; Schultes,1962). Plants were identified by the authors followed by published literature (Chaudhuri & Choudhury A, 1994; Naskar & Mandal, 1999).

Results and discussion

The survey works revealed that about 34 plants belonging to 18 families are commonly used to treat several health problems by local communities. Details are presented here.

Enumeration

Acanthus ilicifolius L. (Acanthaceae)
Local Name: Horgoja
Habit: Shrub
Parts Used: Leaves and Root
Medicinal uses: Leaves are used to treat animal bites & decoction of root is used to treat asthma and leucorrhoea.

Acanthus volubilis L. (Acanthaceae)
Local Name: Lota Horgoja
Habit: Climber
Parts Used: Leaves
Medicinal uses: Dried leaves are taken as a remedy for stomach ulcers.

Acrostichum aureum L. (Pteridaceae)
Local Name: Hudo
Habit: Shrub/Understory
Parts Used: Rhizome
Medicinal uses: Rhizome paste is used to treat boils.

Atalantia correa Roem (Rutaceae)
Local Name: Bon Lebu
Habit: Herb
Parts Used: Fruit
Medicinal uses: Oil from the fruit is useful for the treatment of rheumatism.

Avicennia marina (Forssk.) Vierh. (Avicenniaceae)
Local Name: Peyara bani
Habit: Tree
Parts Used: Fruit
Medicinal uses: Bitter aromatic juice used to facilitate abortion.

Avicennia officinalis L. (Avicenniaceae)
Local Name: Kalo Bani
Habit: Tree
Parts Used: Fruit, Seed
Medicinal uses: Unripe fruit is used as a remedy to treat boils.

Bruguiera gymnorrhiza Lam. (Rhizophoraceae; Plate 1c)
Local Name: Kankra
Habit: Tree
Parts Used: Bark
Medicinal uses: Bark macerated, and the extract is useful in controlling diarrhoea.

Bruguiera sexangula Poir. (Rhizophoraceae)
Local Name: Kankra
Habit: Tree
Parts Used: Bark
Medicinal uses: Bark is used to treat food poisoning.

Cassytha filiformis L. (Lauraceae)
Local Name: Akash Bel
Habit: Parasite
Parts Used: Fruit
Medicinal uses: Fruit extract used to treat sexually transmitted diseases.

Ceriops decandra (Griff.) Ding Hou (Rhizophoraceae)
Local Name: Garan
Habit: Shrub
Parts Used: Stem
Medicinal uses: Leaves are used to treat skin infections.

Ceriops tagal (Perr.) Robinson (Rhizophoraceae)
Local Name: Mat-Garan
Habit: Shrub
Parts Used: Bark
Medicinal uses: Stem bark extract used to stop haemorrhages.

Clerodendrum inerme Gaertn. (Lamiaceae)
Local Name: Bon-Jui
Habit: Shrub
Parts Used: Leaves
Medicinal uses: Leaves are used to treat insect bites.

Derris trifoliata Roxb. (Fabaceae)
Local Name: Chuliakanta
Habit: Climber
Parts Used: Root
Medicinal uses: Root is used to treat tuberculosis.

Dolichandrone spathacea (L.f.) K.Schum. (Bignoniaceae)
Local Name: Gorshingiah
Habit: Shrub
Parts Used: Seed
Medicinal uses: Seed powder paste is used as an antiseptic.

Excoecaria agallocha L. (Euphorbiaceae)
Local Name: Genwa
Habit: Tree
Parts Used: Latex
Medicinal uses: Latex is used to cure insect bites.

Finlaysonia obovata Wall. (Apocynaceae)
Local Name: Panlota
Habit: Climber
Parts Used: Leaf
Medicinal uses: Leaf, dried and crushed and used as a remedy for dysentery.

Heliotropium curassavicum L. (Boraginaceae)
Local Name: Nona Hatisur
Habit: Herb
Parts Used: Root
Medicinal uses: Root, dried, ground, and the powder used for treating wounds, cuts, and external ulcers.

Heritiera fomes Buch Ham. (Malvaceae)
Local Name: Sundari
Habit: Tree
Parts Used: Seed
Medicinal uses: Seed powder is used to treat diarrhoea.

Hibiscus tiliaceus L. (Malvaceae)
Local Name: Bhola
Habit: Herb
Parts Used: Leaf
Medicinal uses: Leaf extract used as a laxative.

Kandelia candel (L.) Druce (Rhizophoraceae)
Local Name: Goria
Habit: Shrub
Parts Used: Leaf
Medicinal uses: Leaf decoction is used to reduce urination in diabetes.

Lumnitzera racemosa Willd (Combretaceae)
Local Name: Kripal
Habit: Shrub
Parts Used: Stem
Medicinal uses: Stem paste is used to treat skin itching.

Nypa fruticans Wurmb. (Arecaceae; Plate 1b)
Local Name: Golpata
Habit: Shrub
Parts Used: Fruit
Medicinal uses: Fruits are edible as tonic.

Pentatropis capensis (L.f) Bullock (Apocynaceae)
Local Name: Dudhilata
Habit: Climber
Parts Used: Latex
Medicinal uses: Latex of the stem is used to cure burns.

Phoenix paludosa Roxb. (Arecaceae; Plate 1a)
Local Name: Hetal
Habit: Shrub
Parts Used: Fruit
Medicinal uses: The fruit pulp is used to reduce inflammation.

Scyphiphora hydrophylacea C.F.Gaertn (Rubiaceae)
Local Name: Tagri Bani
Habit: Shrub
Parts Used: Shoot
Medicinal uses: Shoot is used to treat liver problems.

Sonneratia apetala Buch Ham. (Sonneratiaceae)
Local Name: Keora
Habit: Tree
Parts Used: Fruit
Medicinal uses: Fruit is used as a spice.

Sonneratia caseolaris Engler. (Sonneratiaceae)
Local Name: Chak Keora
Habit: Tree
Parts Used: Fruit
Medicinal uses: Fruits are used to cure stomach worm.

Sonneratia griffithii Kurz. (Sonneratiaceae)
Local Name: Ora
Habit: Tree
Parts Used: Fruit
Medicinal uses: Fruit is used to treat cold.

Tylophora tenuis Blume. (Apocynaceae)
Local Name: Antomul
Habit: Herb
Parts Used: Leaves
Medicinal uses: Leaf is used to treat liver problems.

Xylocarpus granatum Koenig. (Meliaceae)
Local Name: Dhudul
Habit: Tree
Parts Used: Bark
Medicinal uses: Bark is used to treat diarrhoea.

Xylocarpus mekongensis Pierre. (Meliaceae)
Local Name: Pasur
Habit: Tree
Parts Used: Bark
Medicinal uses: Bark is used to treat dysentery.

Tamarindus indica Linn. (Fabaceae)
Local Name – Tentul
Habitat – Tree
Parts Used – Fruit and Leaf
Medicinal uses: Fruits are used to treat constipation.

Clerodendrum infortunatum L. (Lamiaceae)
Local Name – Ghentu
Parts Used - Twig & flower
Medicinal uses: Twig and flowers decoction is used to kill stomach worm.

Borassus flabellifer Linn.
Local Name – Tal (Arecaceae)
Parts Used – Fruit pulp
Medicinal uses: Fruit pulp is used as cooling agent.

Plate 1: Field survey in study areas; a) *Phoenix paludosa*, b) *Nypa fruticans*, c) *Bruguiera gymnorrhiza*

Other researchers have also reported the ethnomedicinal plants and uses from Mangroves of Sundarbans. About 98 medicinal plants are reported used by the Munda tribes of Sundarbans of Bangladesh (Islam *et al.,* 2022).

Conclusion

The present study finds that mangrove plants are utilized as remedies for several ailments. Traditional claims need to be verified by phytochemical analysis and bioactivity. The study also highlights the necessity of addressing sustainable consumption to protect nature's abundance of plants.

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