

Ethnobotanical studies of medicinal plants used by indigenous people of Morigaon district

Prerna Priya^{1*} & Ashok Kumar Jha²

¹University Department of Botany, B.N.M. University, Madhepura, Bihar, India

²Department of Botany, M.L.T. College, Saharsa, Bihar, India

Received : 17th July, 2026 ; Accepted : 17th August, 2026

DOI:- <https://doi.org/10.5281/zenodo.23132827>

ABSTRACT

An ethnobotanical survey was conducted across various rural localities of Morigaon district, Assam, India, between March 2025 and February 2026. A total of 26 local informants (18 males and 8 females) representing indigenous communities (Tiwa, Karbi, Bodo, and Tea-tribes) were interviewed using semi-structured questionnaires. Among the male informants, three were traditional medical practitioners (Bej / Baidya). The survey documented 28 medicinal plant species distributed across 22 families, utilized in the management and treatment of 19 distinct physical ailments. Morphological classification showed that trees constituted the majority of documented species (14 species; 50.0%), followed by herbs (12 species; 42.86%), climbers (1 species; 3.57%), and twiners (1 species; 3.57%). Quantitative ethnobotanical indices, including the Informant Consensus Factor (F_{ic}) and Fidelity Level (FL%), were evaluated. High consensus ($F_{ic}=1.0$) was observed for ailments such as pneumonia, fevers, dermatophytosis, and dysentery, while *Nyctanthes arborescens* L. exhibited the highest fidelity level (FL=87.5%) for treating fever. These findings underscore the persistent reliance of ethnic communities on local phytotherapy and provide baseline data for pharmacological screening.

Key Words - Ethnomedicine, Morigaon, Informant Consensus Factor, Fidelity Level, Traditional Knowledge, Medicinal Flora.

***Corresponding author** : prernarocks03@gmail.com

INTRODUCTION

Traditional medical systems remain an integral source of primary healthcare for rural and tribal populations across the globe (Gronhaug *et al.*, 2008). The World Health Organization (WHO) estimates that over 21,000 plant species possess documented therapeutic potential (Lucy & Edgar, 1999; Tefera & Kim, 2019). Indigenous and forest-dwelling communities possess sophisticated, empirical knowledge systems regarding wild phytomedicines; however, this biocultural heritage is predominantly transmitted orally and is

vulnerable to acculturation, habitat degradation, and modernization (Maikhuri & Gangwar, 1993; Prakash *et al.*, 2008).

India is recognized as one of the world's megadiverse regions, possessing rich traditions of Ayurveda, Unani, Siddha, and localized tribal medicine. Within India, the Northeastern state of Assam represents a biodiversity hotspot harboring dense floristic diversity and a multi-ethnic demographic profile (Dutta & Dutta, 2005).

Morigaon district is located in central Assam, bordered on the north by the Brahmaputra River, covering a geographical area of 1,704 km² between latitudes 26°15' N to 26°30' N and longitudes 92° 15' E to 92°40' E. The district is inhabited by diverse indigenous groups-predominantly the Tiwa (Lalung), Karbi, Bodo, and indigenous Assamese castes alongside tea garden communities (Tea tribes such as Santhal, Bhumij, Kurmi, and Oraon), who were brought to Assam during colonial tea industrialization from central and eastern India (Das, 1931; Griffiths, 1967). Despite rich local plant resources, comprehensive documentation of quantitative ethnobotanical knowledge in this district remains limited. This study was undertaken to document the medicinal plant species, gather associated ethnopharmacological data, and quantify the consensus and fidelity of traditional claims among local practitioners and rural elders.

MATERIALS & METHODS

Study Area and Informant Selection

Fieldwork was carried out across rural and peri-forest settlements of Morigaon district, Assam, from March 2025 to February 2026. A total of 26 local key informants (18 males, 8 females) were selected via purposive and snowball sampling techniques. The male cohort comprised 3 recognized local herbal healers (Bej / Ojha / Baidya, aged 40-60 years) and 15 rural farmers/elders (aged 30-70 years). The female cohort comprised 8 homemakers and elders (3 aged 50-60 years, 5 aged 30-40 years). Prior Informed Consent (PIC) was obtained verbally from each participant prior to interviews.

Data Collection and Plant Identification

Ethnobotanical data were collected via semi-structured interviews, direct field observation, and guided transect walks. Informants provided local Assamese or ethnic names, plant parts used, preparation modes, and specific ailments treated. Specimen vouchers were collected in the field, tagged, pressed, and mounted following standard herbarium protocols (Jain & Rao, 1977). Botanical identifications were validated by consulting regional taxonomic floras (Flora of Assam) and

verified against the online database Plants of the World Online (POWO, Royal Botanic Gardens, Kew).

Quantitative Data Analysis

Informant Consensus Factor (F_{ic}): Calculated to assess the agreement among informants regarding plant usage for specific ailment categories (Trotter & Logan, 1986):

$$F_{ic} = \frac{N_{ur} - N_t}{N_{ur} - 1}$$

Where:

N_{ur} = Total number of use-reports cited in a particular ailment category.

N_t = Number of individual taxa utilized for that category.

A value near 1.0 indicates a high degree of consensus among informants.

Fidelity Level (FL%): Calculated to identify preferred species used for a specific therapeutic purpose (Friedman *et al.*, 1986):

$$FL(\%) = \left(\frac{N_p}{N} \right) \times 100$$

Where:

N_p = Number of informants reporting the therapeutic use of a species for a specific primary disease.

N = Total number of informants reporting the species for any therapeutic use.

RESULTS & DISCUSSION

Diversity of Medicinal Flora and Life-Forms

The survey documented 28 plant species distributed among 27 genera and 22 families used to treat 19 distinct human ailments. Leaves represented the most frequently harvested plant part (> 50% of formulations), followed by fruits, roots, bark, and whole plant extracts.

Table 1 - The habit distribution

Habit	Number of Species	Percentage Contribution (%)
Trees	14	50.00%
Herbs	12	42.86%
Climbers	1	3.57%
Parasites	1	3.57%
Total	28	100.00%

Table 2: Ethnomedicinal Tree Species of Morigaon District

Botanical Name	Family	Local Name	Part(s) Used	Documented Uses / Ailments
<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Epicarp / Fruit	Skin wrinkles, Anti-aging tonic
<i>Alstonia scholaris</i> L.	Apocynaceae	Satiyana / Soriana	Stem bark	Hepatitis, Liver ailments
<i>Cascabela thevetia</i> L.	Apocynaceae	Baga Karabi	Root paste	Leprosy lesions (<i>Topical - Toxic</i>)
<i>Carica papaya</i> L.	Caricaceae	Amita	Unripe fruit	Dermatophytosis (Ringworm)
<i>Jatropha curcas</i> L.	Euphorbiaceae	Bongali Ara	Leaf latex	Burns, Topical wounds
<i>Albizia julibrissin</i> Durazz.	Fabaceae	Ronga Siris	Bark, Seed	Hemorrhoids
<i>Saraca asoca</i> (Roxb.) Willd.	Fabaceae	Ashok	Stem bark / Wood	Burns, Skin lesions
<i>Punica granatum</i> L.	Lythraceae	Dalim	Leaves, Rind	Hyperglycemia (Diabetes)
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Ronga Jaba	Petals	Alopecia, Hair tonic
<i>Musa balbisiana</i> Colla	Musaceae	Athiakol	Pseudostem sap	Bacillary dysentery
<i>Eucalyptus globulus</i> Labill.	Myrtaceae	Eucalyptus	Leaves	Cutaneous infections, Body ache
<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Sewali	Foliage juice	Intermittent fevers, Sciatica
<i>Aegle marmelos</i> L.	Rutaceae	Bel / Bael	Fruit, Wood	Diarrhea, Pneumonia, Diabetes
<i>Citrus limon</i> L.	Rutaceae	Gulnemu	Fruit	Dry skin conditions

Table 3: Ethnomedicinal Herbs, Climbers, and Twiners of Morigaon District

Botanical Name	Family	Habit	Local Name	Part(s) Used	Documented Uses
<i>Achyranthes aspera</i> L.	Amaranthaceae	Herb	Ubhotokata	Root decoction	Malarial & seasonal fevers
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Herb	Hatikhutura	Whole plant	Nutritional anemia
<i>Heliotropium indicum</i> L.	Boraginaceae	Herb	Hatisur	Crushed leaves	Antiseptic dressing
<i>Commelina benghalensis</i> L.	Commelinaceae	Herb	Kana-simalu	Stem sap	Cutaneous warts
<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Twiner	Akashilata	Stem decoction	Jaundice, Viral hepatitis
<i>Bryophyllum calycinum</i> Salisb.	Crassulaceae	Herb	Duportenga	Crushed leaves	Lithiasis (Renal calculi)
<i>Momordica charantia</i> L.	Cucurbitaceae	Climber	Tita Kerela	Fresh fruit juice	Type-2 diabetes mellitus
<i>Clitoria ternatea</i> L.	Fabaceae	Climber	Aparajita	Root extract	Diuretic, Urinary retention
<i>Desmodium triquetrum</i> L.	Fabaceae	Herb/Shrub	Ulusah	Foliage	Bleeding hemorrhoids
<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	Herb	Dronapuspa	Foliage juice	Chickenpox rash soothing
<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Herb	Punarnava	Foliage	Dropsy, Peripheral edema
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Herb	Duwari Bon	Leaf extract	Acute diarrhea
<i>Physalis minima</i> L.	Solanaceae	Herb	Kopal-phuta	Leaf poultice	Hyperlactation suppression

Table 4: Quantitative Analysis Informant Consensus Factor (F_{ic}) the F_{ic} values across 14 illness categories ranged from 0.81 to 1.00, indicating strong consensus across the community on traditional plant remedies

Ailment Category	Use-Reports (N_{ur})	Taxa Count (N_t)	Informant Consensus Factor (F_{ic})
Pneumonia	12	1	1
Diarrhea	21	2	0.95
Fever	15	1	1
Hair & Scalp Disorders	12	2	0.91
Dermatological Disorders	17	4	0.81
Ringworm (Tinea)	13	1	1
Dysentery	16	1	1
Leprosy	9	1	1
Diabetes mellitus	19	3	0.89
Hepatitis / Jaundice	11	2	0.9
Anemia	9	1	1
Warts	7	1	1
Edema	5	1	1
Chickenpox (palliative)	14	1	1

Table 5: Fidelity Level (FL%) was evaluated to determine the relative therapeutic preference for major species

Target Ailment	Plant Species	Np	N	Fidelity Level (FL%)
Fever	<i>Nyctanthes arbortristis</i>	21	24	87.50%
Diarrhea	<i>Aegle marmelos</i>	17	20	85.00%
Diabetes	<i>Momordica charantia</i>	20	25	80.00%
Dry Skin	<i>Citrus limon</i>	12	15	80.00%
Pneumonia	<i>Aegle marmelos</i>	15	20	75.00%
Leprosy	<i>Cascabela thevetia</i>	14	20	70.00%
Diarrhea	<i>Cynodon dactylon</i>	13	20	65.00%
Hepatitis	<i>Cuscuta reflexa</i>	10	16	62.50%
Diabetes	<i>Punica granatum</i>	11	18	61.10%
Warts	<i>Commelina benghalensis</i>	5	9	55.60%
Hepatitis	<i>Alstonia scholaris</i>	8	15	53.30%
Ringworm	<i>Carica papaya</i>	8	15	53.30%
Skin infections	<i>Eucalyptus globulus</i>	9	18	50.00%
Burns	<i>Saraca asoca</i>	10	21	47.60%
Chickenpox	<i>Leucas aspera</i>	7	15	46.70%
Diuretic	<i>Clitoria ternatea</i>	7	15	46.70%
Dysentery	<i>Musa balbisiana</i>	5	12	41.70%
Edema	<i>Boerhavia diffusa</i>	5	15	33.30%
Burns	<i>Jatropha curcas</i>	5	15	33.30%

Nyctanthes arborescens (FL=87.5%) and *Aegle marmelos* (FL=85.0%) demonstrated the highest fidelity, highlighting their reputation in managing fevers and gastrointestinal disorders.

CONCLUSION

This ethnobotanical investigation documents 28 medicinal species belonging to 22 families used across 19 illness categories in Morigaon district, Assam. The local communities preserve substantial empirical knowledge, especially for gastrointestinal and dermatological complaints. High F_{ic} and FL values for species such as *Nyctanthes arborescens*, *Aegle marmelos*, and *Momordica charantia* suggest reliable therapeutic utility and provide priority candidates for subsequent phytochemical isolation and pharmacological evaluation. Urgent measures should be taken to conserve wild populations of these species and to document this traditional ecological knowledge before it is lost.

REFERENCES

- Balunas, M. J., & Kinghorn, A. D. 2005. Drug discovery from medicinal plants. *Life Sciences*, 78(5), 431-441.
- Bhattacharyya, R., Medhi, K. K., & Borkataki, S. 2016. Ethnomedicinal plants used against jaundice by the tea tribes of Nagaon district, Assam. *Ethnobotany*, 27, 36-42.
- Das, R. K. 1931. Plantation Labour in India. Prabashi Press, Calcutta.
- Dutta, B. K., & Dutta, P. K. 2005. Potential of ethnobotanical studies in North East India: An overview. *Indian Journal of Traditional Knowledge*, 4(1), 7-14.
- Friedman, J., Yaniv, Z., Dafni, A., & Palewitch, D. 1986. A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethno pharmacological field survey among Bedouins in the Negev Desert, Israel. *Journal of Ethnopharmacology*, 16(2-3), 275-287.
- Griffiths, P. 1967. The History of the Indian Tea Industry. Weidenfeld & Nicolson, London.
- Gronhaug, T. E., Glaeserud, S., Skogsrud, M., Ballo, N., Bah, S., Diallo, D., & Paulsen, B. S. 2008. Ethnopharmacological survey of six medicinal plants from Mali, West-Africa. *Journal of Ethnobiology and Ethnomedicine*, 4, Article 26.
- Jain, S. K., & Rao, R. R. 1977. A Handbook of Field and Herbarium Methods. Today and Tomorrow's Printers & Publishers, New Delhi.
- Lucy, H., & Edgar, J. D. 1999. Medicinal Plants: A Re-emerging Health Aid. Division of Life Sciences, UNESCO, Paris.
- Maikhuri, R. K., & Gangwar, A. K. 1993. Ethnobiological notes on the Khasi and Garo tribes of Meghalaya, Northeast India. *Economic Botany*, 47(4), 345-357.
- Prakash, J. W., Anpin Raja, R. D., Asbin Anderson, N., Williams, C., Regini, G. S., Bensar, K., Rajeev, R., Kiruba, S., Jeeva, S., & Das, S. M. 2008. Ethnomedicinal plants used by Kani tribes of Agasthiyarmalai biosphere reserve, southern Western Ghats. *Indian Journal of Traditional Knowledge*, 7(3), 410-413.
- Tefera, B. N., & Kim, Y. D. 2019. Ethnobotanical study of medicinal plants in the Hawassa Zuria district, Sidama zone, Southern Ethiopia. *Journal of Ethnobiology and Ethnomedicine*, 15, Article 25.
- Trotter, R. T., & Logan, M. H. 1986. Informant consensus: A new approach for identifying potentially effective medicinal plants. In N. L. Etkin (Ed.), *Plants in Indigenous Medicine and Diet: Biobehavioral Approaches* (pp. 91-112). Redgrave Publishing Company, Bedford Hills, NY.
