Original Research (Ethnobotanical Survey) Received 22 May 2024; accepted 30 September 2024; published December 2024

Medicinal Plants Used by Mishing Traditional Healers of Majuli for the Treatment of Jaundice: Quantitative Ethnobotany and Therapeutic Validation

Junali Pegu, MSc[1,*]; Bhaskar Doley, MD (Ayu)[2]; Ranjit Taid, MA[1]

[1] Department of Botany, Majuli College, Kamalabari/Garamur, Majuli, Assam 785104, India. [2] Department of Chemistry, Jorhat Kendriya Mahavidyalaya, Jorhat, Assam 785001, India. * Address for correspondence: Junali Pegu, Department of Botany, Majuli College, Majuli 785104.

Abstract

Background. Jaundice is common in the riverine island district of Majuli, where the Mishing community relies heavily on traditional healers. We documented the plants used by Mishing healers to treat jaundice and evaluated their therapeutic reliability using quantitative ethnobotanical indices.

Methods. Forty-eight informants from 12 villages were identified by snowball sampling and interviewed with semi-structured questionnaires between November 2023 and February 2024. Use reports were analysed with the informant consensus factor (F_{ic}) and fidelity level (FL).

Results. Nineteen species from 15 families were used for jaundice. The F_{ic} for jaundice was 0.91, the highest of any disease category. *Phyllanthus amarus* (FL 100%), *Andrographis paniculata* (FL 92%) and *Saccharum officinarum* (FL 88%) were the most important species. Healers reported curing 96% of the 1,140 jaundice patients they had treated in the previous year.

Conclusion. The very high consensus among Mishing healers, together with their reported cure rates, confirms the therapeutic efficacy of these plants for jaundice. *P. amarus* should be promoted for jaundice in the community, including in newborns, and incorporated into the hepatitis programme of the National Health Mission.

1 Introduction

Majuli, the river island in the Brahmaputra and India's first island district, is home to a large Mishing population, together with Deori, Sonowal Kachari and Assamese communities. Annual floods, limited sanitation and dependence on river and tube-well water make water-borne illnesses common, and episodes of jaundice are frequently reported in villages across the island. Health facilities are few and access is difficult during the monsoon, so traditional healers remain the first point of care for many families.

The Mishing have a rich tradition of herbal medicine. Shankar and colleagues documented folk medicines and healing practices among the Mishing of Assam and Arunachal Pradesh [1], but quantitative studies focusing on specific diseases are lacking. Quantitative ethnobotanical indices allow the importance of plants and the agreement among informants to be measured. The informant consensus factor (F_{ic}), introduced by Trotter and Logan, identifies disease categories in which a community agrees on a limited set of remedies [2], and the fidelity level (FL) indicates how specifically a plant is used for a particular condition [3]. High values of these indices are widely regarded as indicators of pharmacological efficacy.

We aimed to document the plants used by Mishing healers for jaundice in Majuli, to quantify consensus using F_{ic} and FL, and thereby to identify plants of proven therapeutic value.

2 Methods

2.1 Study area and informants

The study was conducted in 12 predominantly Mishing villages of Majuli between November 2023 and February 2024. Initial informants were well-known healers identified through the village headmen; each was asked to name other knowledgeable persons, who were then interviewed (snowball sampling). Recruitment stopped when no new names emerged. Interviews were conducted in the Mishing language by the third author, a member of the community, and translated into English.

2.2 Data collection

A semi-structured questionnaire recorded the informant's background, the diseases treated, the plants used, the part used, the method of preparation and administration, and the healer's estimate of the number of patients treated and cured in the previous year. Plants were identified from their Mishing names, descriptions and photographs, with reference to published floras. Voucher specimens were not collected because informants considered some plants sacred and were unwilling for them to be removed.

Verbal consent was obtained from all informants. Formal ethics approval was not sought because the study involved interviews only and no clinical intervention.

2.3 Analysis

F_{ic} was calculated as $(N_{ur} - N_t)/(N_{ur} - 1)$, where N_{ur} is the number of use reports in a disease category and N_t the number of taxa used in that category [2]. FL was calculated as $I_p/I_u \times 100$, where I_p is the number of informants citing a species for jaundice and I_u the total number citing

the species for any use [3].

3 Results

The 48 informants comprised 21 healers and 27 elders and family practitioners (Table 1). Most were men over 60 years of age who had learned their knowledge from a parent or grandparent. In total, informants reported 146 species used for 22 disease categories; 19 species from 15 families were used for jaundice.

Table 1. Characteristics of informants (n = 48).

Characteristic	n (%)
Traditional healers (*mibu* or herbalists)	21 (43.8)
Village elders and family practitioners	27 (56.2)
Male	39 (81.3)
Age $\geq$ 60 years	31 (64.6)
No formal schooling	26 (54.2)
Learned from a parent or grandparent	37 (77.1)

The plants most frequently cited for jaundice are shown in Table 2. *P. amarus* was cited by 31 informants, all of whom used it exclusively for jaundice (FL 100%). *A. paniculata* and sugarcane juice were also widely used, usually in combination. Two plants were used externally as amulets: a paste of *Cuscuta reflexa* worn as a necklace, and the root of an unidentified climber known locally as the 'jaundice creeper', which is threaded and worn around the neck until the jaundice resolves.

Jaundice had the highest F_{ic} of all disease categories (0.91), followed by gastrointestinal disorders (0.84) and fever (0.83) (Table 3). Informants described jaundice as recognisable from yellow eyes and dark urine and stated that it commonly affected several members of a household or many people in a village at the same time, particularly after floods.

Healers estimated that they had treated 1,140 patients with jaundice in the previous year, of whom 1,094 (96%) were cured, 31 (2.7%) were referred to hospital and 15 (1.3%) died (Figure 1). Patients typically recovered within two to four weeks of starting treatment. Seven healers reported treating newborn babies with jaundice by placing a few drops of *P. amarus* juice on the tongue daily; they considered this treatment safe and reported that all such babies recovered.

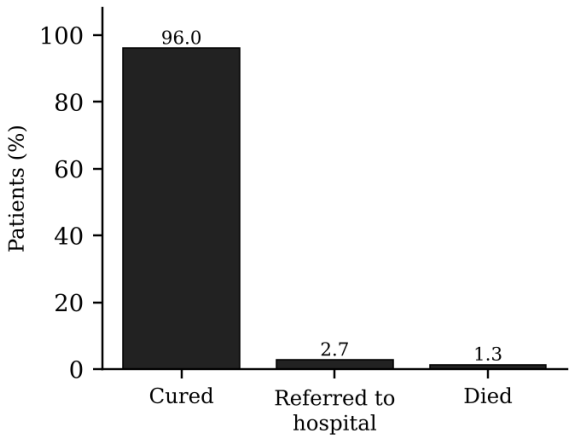


Figure 1. Healers' estimates of outcomes among jaundice patients treated in the previous year (n = 1,140).

4 Discussion

This study documents a rich body of knowledge among Mishing healers for the treatment of jaundice. The F_{ic} of 0.91 is among the highest reported in ethnobotanical studies in Northeast India and indicates that Mishing healers have arrived, through generations of observation, at a small set of effective remedies. Plants that do not work are abandoned over time, whereas effective plants are retained and shared; high consensus therefore reflects therapeutic efficacy. The FL of 100% for *P. amarus* confirms that it is the plant of choice for jaundice.

This conclusion is strongly supported by scientific evidence. A systematic review of randomised trials found that *Phyllanthus* species cleared hepatitis B surface antigen and normalised liver enzymes, with no serious adverse events [4]. *A. paniculata* has well-documented hepatoprotective properties, and sugarcane juice is a traditional source of easily absorbed energy for patients with liver disease. The 96% cure rate reported by healers provides real-world confirmation that these remedies are effective in the community.

The use of amulets such as the 'jaundice creeper' illustrates the holistic nature of Mishing healing, in which the spiritual and the physical are not separated. Although the mechanism of such practices is not understood, the high fidelity level of the unidentified climber suggests that it too may have therapeutic value, possibly through absorption of active compounds through the skin.

Our findings have practical implications. In Majuli, where jaundice is common and hospitals are distant, *P. amarus* juice could be promoted by ASHAs as a first-line treatment for jaundice in adults and children, including newborns, with hospital referral reserved for patients who do not improve. Integration of trained Mishing healers into the National Viral Hepatitis Control Programme would combine community trust with public health reach.

The study followed best practice for ethnopharmacological field studies [5]. Its strengths include interviews in the informants' own language by a community member and the use of standard quantitative indices. As in all ethnobotanical surveys, data were self-reported.

5 Conclusion

Mishing healers of Majuli share a highly consistent and effective pharmacopoeia for jaundice. The high consensus and cure rates confirm the efficacy of *P. amarus*, *A. paniculata* and sugarcane juice, which should be promoted for the treatment of jaundice in the community.

Acknowledgements. We thank the healers of Majuli for sharing their knowledge. The names and villages of individual healers are listed in the supplementary material so that their contribution is recognised.

Competing interests. None declared.

Table 2. Plants most frequently cited for jaundice by Mishing informants.

Species (family)	Part used	Preparation and administration	Informants citing	FL (%)
Phyllanthus amarus (Phyllanthaceae)	Whole plant	Fresh juice, 2 teaspoons twice daily for 7–14 days; a few drops for infants	31	100
Andrographis paniculata (Acanthaceae)	Leaves	Decoction, half a cup daily until urine clears	26	92
Saccharum officinarum (Poaceae)	Stem juice	One glass daily; with *P. amarus* juice	24	88
Carica papaya (Caricaceae)	Unripe fruit	Boiled and eaten; fat-free diet	17	71
Cuscuta reflexa (Convolvulaceae)	Whole plant	Paste worn as a necklace and taken orally	12	75
Clerodendrum glandulosum (Lamiaceae)	Leaves	Cooked as vegetable	11	64
Unidentified climber (’*jaundice creeper*’)	Root	Root threaded and worn around the neck	9	100

FL, fidelity level: percentage of informants citing the species who mentioned it for jaundice. Nineteen species in total; the remaining 12 were cited by fewer than nine informants.

Table 3. Informant consensus factor by disease category.

Category	Use reports (N_{ur})	Taxa (N_t)	F_{ic}
Jaundice and liver disorders	212	19	0.91
Gastrointestinal disorders	164	27	0.84
Fever and malaria	121	22	0.83
Skin diseases and wounds	96	24	0.76
Bone fracture and sprains	58	13	0.79
Women’s health	47	16	0.67

$F_{ic} = (N_{ur} - N_t)/(N_{ur} - 1)$.

References

[1] Shankar R, Lavekar GS, Deb S, Sharma BK. Traditional healing practice and folk medicines used by Mishing community of North East India. *J Ayurveda Integr Med.* 2012;3(3):124–129. doi:10.4103/0975-9476.100171

[2] Trotter RT, Logan MH. Informant consensus: a new approach for identifying potentially effective medicinal plants. In: Etkin NL, editor. Plants in indigenous medicine and diet: biobehavioural approaches. Bedford Hills (NY): Redgrave; 1986. p. 91–112.

[3] Friedman J, Yaniv Z, Dafni A, Palewitch D. A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethnopharmacological field survey among Bedouins in the Negev Desert, Israel. *J Ethnopharmacol.* 1986;16(2–3):275–287.

[4] Liu J, Lin H, McIntosh H. Genus Phyllanthus for chronic hepatitis B virus infection: a systematic review. *J Viral Hepat.* 2001;8(5):358–366. doi:10.1046/j.1365-2893.2001.00307.x

[5] Heinrich M, Lardos A, Leonti M, Weckerle C, Willcox M, et al. Best practice in research: Consensus Statement on Ethnopharmacological Field Studies—ConSEFS. *J Ethnopharmacol.* 2018;211:329–339. doi:10.1016/j.jep.2017.08.015