



Folklore Plants from Kamakhya Hills Reserve Forest of Assam, India with their Ayurvedic Indications and Corroborated Pharmacological Activities

¹Devanjal Bora, ²Manajit Bora, ³Neha Dubey

ABSTRACT

Aim: The present communication deals with the report of Medico-ethnobotanical claims and folklore medicinal plants documented during the survey made to Kamakhya Hills Reserve Forest of Nagaon Forest Division situated in Central Assam region in South bank of the mighty river Brahmaputra.

Materials and methods: Field surveys were conducted in the study area where four folk healers were interviewed for documentation of Medico-ethnobotanical information. The reported folklore plant specimens are collected, identified and preserved.

Results: The reported folk claims involve 18 medicinal plants under 18 genera represented by 15 families. Corroborative Ayurvedic indications and reported pharmacological activities have been reviewed against documented folklore medicinal plants for further validation of folk claims. From the review, it is evident that there are total four plant species reported as the folk medicine of the region are not mentioned in any classical Ayurvedic texts as well as in Ayurvedic Pharmacopoeia of India (API). Among these, one plant species have come up with novel disease indications without having corroborative disease indications in Ayurvedic system of medicine as well as in reported pharmacological activities.

Conclusion: Novel folklore plants are suggested for further validation and screening.

Significance: Corroboration with Ayurvedic indication and reported pharmacological activities will validate the use of the folklore plant.

Keywords: Assam, Ayurvedic indications, Ethnobotanical claims, Folklore plants, Medico-pharmacological activities,

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INTRODUCTION

Assam is centrally located in the Brahmaputra valley which is a part of one of the biodiversity hotspots, occupies a special place in North-Eastern India represents 2.4% of India's total geographical area. The annual rainfall of the area starts from minimum 178 cm. to maximum of 305 cm. and temperature ranges between 18 to 37°C, with 83.00% of average humidity.¹ Many folklore medicinal plants are used by different tribes and rural people of Assam as a part of their folklife, scattered in various pockets normally neighboring some forest localities. All the folklore and traditional knowledge are transmitted from one generation to next generation which were elsewhere published in different headings like ethnobotanical studies or folklore practices of Assam among which no article is available focusing Kamakhya Hills Reserve Forest area situated in Nagaon Forest Division in Central Assam. A sincere attempt is being made to present a Medico-ethnobotanical report of recent survey made in this particular forest during June 2015 to document various folklore medicinal plants used for various disease conditions by the folk healers of the region to cater the medical needs of the folk.

Study Area

Kamakhya Hills Reserve Forest is situated in between 26°35.9' to 26°37.2' N and 92°56.1' to 92°59.8' E (Fig. 1) with a minimum altitude of 250 feet above sea level covering an area of approximately 518 hector area surrounded by the mighty river Brahmaputra in the North, Silghat village in West, Silikhaguri, Kamakhyaagaon and Sonarigaon village in the South and Hatimura forest and village in the East. The reserve forest is situated in the extreme North part of Nagaon Forest Division situated in Koliabor subdivision of Nagaon district in Central Assam. A famous temple of Ma Kamakhya is situated within the forest range which was established in 1745 AD having patronage from then Ahom King Swargadeo Pramatta Singha made of stone

¹⁻³Research Officer (Botany)

^{1,3}Regional Ayurveda Research Institute for Gastro-Intestinal Disorders, Guwahati, Assam, India

²Central Ayurveda Research Institute for Drug Development, Kolkata, India

Corresponding Author: Devanjal Bora, Research Officer (Botany), Regional Ayurveda Research Institute for Gastro-Intestinal Disorders, Guwahati, Assam, India, Phone: +91-9401874311, e-mail: devanjal49@rediffmail.com



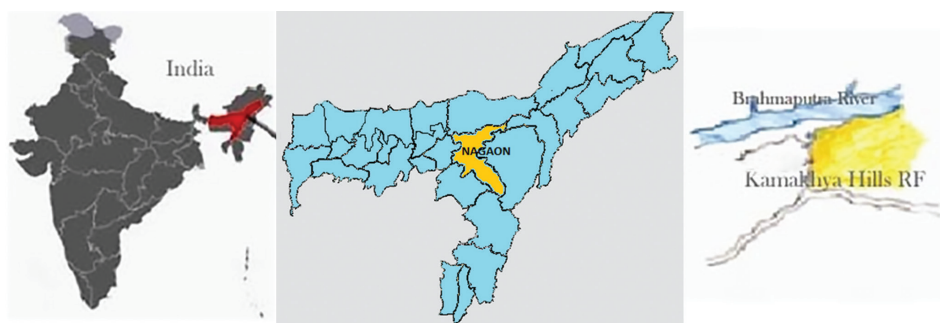


Fig. 1: Map of the study area (courtesy: <https://en.wikipedia.org>)

and brick of that time. Pre-communication links of Central Assam across the Brahmaputra are maintained through a port town named Silghat is situated near to this forest range.

MATERIALS AND METHODS

During June 2015 field survey was conducted by the survey team in different localities in and around the Kamakhya Hills Reserve Forest covering Sonari Gaon and Nam Kamakhya villages where folk healers were interviewed for documentation of Medico-ethnobotanical information like local name, parts used, mode of preparation and administration, any other precaution, etc. in respect to the folklore plants used against various disease conditions. The plants were collected by the help of folk healers and preserved properly as herbarium and museum sample which were identified by local flora² and by matching the specimens with the standard pre-identified specimens of the herbarium of the survey of medicinal plants unit, Regional Ayurveda Research Institute for Gastro-Intestinal Disorder (RARIGID), Guwahati (Assam) where voucher specimens were finally deposited for further reference.

RESULTS

Results of the Medico-ethnobotanical survey are enumerated below where folklore medicinal plants are arranged against disease conditions with scientific name, family, habit, Sanskrit name (S), local name (A), parts used and voucher numbers respectively in parenthesis with details of the mode of administration along with the amount of ingredients and doses.

Udarashula (Abdominal Pain)

One to two cm rhizome of *Acorus calamus* L. (Araceae; herb; Vachaa; Boch; Rhizome; AC4585) is crushed with one bulb of *Allium sativum* L. [Liliaceae; Lashuna (S); Naharu (A); Bulb; RD50] and a little amount of kitchen salt to prepare a paste. Three tablets are prepared from this paste and given one tablet orally in empty stomach

for 3 days for relief. If the condition is associated with inflammation, 1 cm rhizome of *Zingiber zerumbet* Rosc. ex Sm. [Zingiberaceae; herb; Mahaabhari-vachaa (S); Barahu (A); Rhizome; AC6573] is mixed with the mixture and administered accordingly.

Pravahika (Dysentery)

Stem juice of *Saccharum officinarum* L. [Poaceae; herb; Ikshu (S); Kuyiyar (A); Stem; FB287] and fruit juice of *Citrus medica* L. [Rutaceae; shrub; Maatulunga (S); Nemu (A); Fruit; AC5712] is mixed in 40:1 ratio and A 1 to 2 table spoon full of the mixture is given orally daily for 2 to 3 times.

Raktaja Pravahika (Blood dysentery)

Twenty to 25 mL leaf juice of *Curcuma longa* L. [Zingiberaceae; herb; Haridra (S); Halodhi (A); Leaf; AC6285] is mixed with sugar and mixture is given in an empty stomach daily for 3 days.

Kamla (Jaundice)

Half spoon leaf juice of *Artocarpus heterophyllus* Lam. [Moraceae; tree; Panasa (S); Kathal (A); Leaf; AC6165] is mixed with the powder of 3 grains of *Oryza sativa* L. (Poaceae; herb; Sali (S); Dhan (A); grains; AC5330] and one cup of cow milk. The mixture is given orally in empty stomach at morning time daily for 3 days.

Kashtartava (Dysmenorrhoea)

A single spoon juice of apical branch of *Leucas aspera* Spreng. [Lamiaceae; herb; Dronapushpi (S); Durun (A); Apical branch; AC5878] is given orally daily from 1st to 3rd day of menstruation period in empty stomach.

Nine to eleven nos. leaves of *Achyranthes aspera* L. [Amaranthaceae; herb; Apaamaarga (S); Uvata bon (A); Leaf; AC6092] are crushed with 3 to 5 nos. fruits of *Piper nigrum* L. [Piperaceae; climber; Maricha (S); Jaluk (A); Fruit; AC6207] and grains of *Oryza sativa* L. [Poaceae; herb; Sali (S); Dhan (A); Grain; AC5330]. The paste is given orally in

empty stomach at morning time daily for 3 days from 1st to 3rd day of menstruation period.

Apasmara (Epilepsy)

Sprout of *Curcuma longa* L. [Zingiberaceae; herb; *Haridra* (S); *Halodhi* (A); Sprout and Rhizome; AC6285] is burn daily and prescribed for deep inhalation at morning time and one pea motor sized tablet prepared from rhizome is given orally for 8 to 9 days.

Pada Shwayathu/Shotha (Swelling of Leg)

Five to six cm root of each *Achyranthes aspera* L. [Amaranthaceae; herb; *Apaamaarga* (S); *Uvata bon* (A); Root; AC6092], *Cassia tora* L. [Caesalpiniaceae; herb; *Chakramarda* (S); *Medelua* (A); Root; AC5249] and *Urena lobata* L. [Malvaceae; herb; *Naagabalaa* (S); Root; AC6131] are crushed together, and about 5 gm paste is given orally daily in empty stomach at morning time for 3 days.

Stana-ARBUDA (Breast Tumor)

Paste of *Drymaria cordata* Willd. [Caryophyllaceae; herb; *Laijabori* (A); Whole plant; AC4504] is given daily to apply locally on the breast to allay the tumor.

Pratishyaya/Jwara (Cold Fever)

One to two nos. mud daubers (insect) are crushed finely with 10-15 ml leaf juice of *Ocimum sanctum* L. [Lamiaceae; herb; *Tulasi* (S); *Toloshi* (A); Leaf; AC5076]. About 1 to 2 spoon of the mixture juice is given orally daily to cure the disease.

Netra-abhigata (Eye Injury)

One to two drops juice of *Oldenlandia corymbosa* L. [Rubiaceae; herb; *Kshetrparpata* (S); *Bon jaluk* (A); Whole plant; AC6433] is given locally during eye injury.

Shalyapaharana (Extraction of Foreign Body/Thorn)

One to two nos. leaves of *Argyreia nervosa* (Burm.f.) Boj. [Convolvulaceae; climber; *Vridhdhaaruka* (S); *Takoria alu* (A); Leaf; AC5534] is crushed with 15 to 20 nos. leaves of *Ziziphus jujuba* mill. [Rhamnaceae; shrub; *Badar* (S), *Kola*(s); *Bogori* (A); Leaf; AC5224] and paste is applied on injured area and bind with cotton cloth for a day to remove the thorn.

DISCUSSION

The present Medico-ethnobotanical survey results into report of 11 disease conditions prevailed in the study area. Four folk healers of the region belonging to plain Assamese tribe and Nepali community residing in the study area were interviewed to document these claims which

results into report of 18 medicinal plants under 18 genera represented by 15 families. These plants are sporadic in the area and are collected by the healers as and when required. Many of the reported plants are indicated for specific disease conditions in Ayurvedic Pharmacopoeia of India as well as in different Ayurvedic classics which are tabulated in Table 1 along with respective Ayurvedic indications and reported corroborative pharmacological activities of the medicinal plants. From the table, it is evident that there are total four plant species reported as folk medicine of the region are not mentioned in any classical Ayurvedic texts as well as in Ayurvedic Pharmacopoeia of India, viz., *Drymaria cordata* Willd., *Oldenlandia corymbosa* L., *Urena lobata* L. and *Zingiber zerumbet* Rosc. ex Sm. Many related plant species of the same genus have found a place in Ayurvedic Pharmacopoeia of India as well as in classics, but the respective species which are found in the region are lacking. Among these, one plant species have come up with new disease indications without having corroborative disease indications in Ayurvedic system of medicine which is juice of the whole plant of *Oldenlandia corymbosa* L. reported to be used against eye injury. Reported pharmacological activities suggested that *Oldenlandia corymbosa* L. have other pharmacological activities without having similarities with Ayurvedic indications. Also, leaves of *Artocarpus heterophyllus* Lam. have been reported to be used against Jaundice where no corresponding Ayurvedic indications (indication for other diseases in API are available), as well as pharmacological activities, have been found.

CONCLUSION

The study results in eight non Ayurvedic folklore medicinal plants used by Assamese plain tribes and Nepali community residing in the study area. The folklore plants which are not in classical Ayurvedic texts as well as in Ayurvedic Pharmacopoeia of India and data deficient with regards to their pharmacological activities may be planned for with detail literature review and screening in the line of folklore use for further validation.

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Table 1: Reported Folklore medicinal plants with Ayurvedic indications and corroborated pharmacological activities

S. N.	Medicinal plants as reported in folk claims	Part used	Dosage form	Reported disease condition	Ayurvedic indications	Corroborated pharmacological activities
1.	<i>Acorus calamus</i> L.	Rhizome	Paste form made into tablet	Abdominal pain	<i>Shula, Apasmara, Svasa, Kasa, Vibandha, Unmada, Adhmana, Karna Srava</i> ³	Plant extract shows antispasmodic ⁴ and antimicrobial ⁵ activities
2.	<i>Achyranthes aspera</i> L.	Leaf Root	Leaf paste and root as paste	Dysmenorrhoea, Swelling	<i>Udara Roga, Arsha, Kandru, Medoroga</i> ⁶	Aerial parts shows analgesic and central nervous system depressant activity. ⁷ Root extract shows anti-inflammatory activity. ⁸
3.	<i>Alium sativum</i> L.	Bulb	Paste made into tablet	Abdominal pain	<i>Jvara, Krimiroga, Gulma, Kustha, Kshaya, Svasa, Vrana, krrmi etc.</i> ⁹	Bulb Powder shows analgesic and anti-nociceptive activity. ¹⁰ It has also antimicrobial activities. ¹¹
4.	<i>Argyreia nervosa</i> (Burm.f.) Boj.	Leaf	Crushed leaves as paste	To remove penetrated thorn from skin	<i>Sula, Sopha, Apasmara, Arsha, Aruchi, Amavata, Anaha, Kasa etc.</i> ¹²	Plant is hypoglycaemic ¹³ and leaf extract shows wound healing activity ¹⁴
5.	<i>Artocarpus heterophyllus</i> Lam.	Leaf	Juice form with rice grain powder	Jaundice	<i>Atisara, Daha, Rakta-pitta, Sotha, Tvakroga</i> ¹⁵	Data deficient with regards to treatment of jaundice but having antibacterial, antimalarial and antifungal activities ¹⁶
6.	<i>Cassia tora</i> L.	Root	Crushed root as paste	Swelling	<i>Kapha-vatajanya Vikara, Kustha, Vrana, Dadru, Pakshaghata, Vibandha, Gulma, Krimi, Pama</i> ¹⁷	Leaf extract shows anti-inflammatory effect ¹⁸
7.	<i>Citrus medica</i> L.	Fruit	Juice in mixture	Dysentery	<i>Raktapitta, Svasa, Kasa, Aruchi, UdaraRoga, Vibandha, Madatyaya</i> ¹⁹	Fruit is antimicrobial ²⁰ and peels/ leaf extract shows antiparasitic and antiprotozoal activity ²¹
8.	<i>Curcuma longa</i> L.	Leaf, sprout	Juice of leaf and inhalation by burning of sprout	Blood dysentery, Epilepsy	<i>Pandu, Prameha, Vrana, Visa-vikara, Kustha, Tvakroga, Sitapitta, Pinasa</i> ²²	Anti-microbial ²³ Rhizome shows anti-inflammatory ²⁴ and anticonvulsant activity ²⁵
9.	<i>Drymaria cordata</i> Willd.	Whole plant	Paste applied locally	Breast tumor	Not in Classical Ayurvedic texts	Whole plant shows cytotoxic Activity ²⁶ , antiinflammatory, analgesic, antinociceptive, antibacterial, antipyretic, anxiolytic activities ²⁷
10.	<i>Leucas aspera</i> Spreng.	Apical branch	Juice	Dysmenorrhoea	Not in Classical Ayurvedic texts	Whole plant shows anti-inflammatory and analgesic activity ²⁸
11.	<i>Ocimum sanctum</i> L.	Leaf	Juice	Cold fever	<i>Ashmari, Svasa, Chardi, Hikka, Kasa, Krimiroga, Kustha, Netra-roga</i> ²⁹	Leaf extract shows anti-inflammatory, analgesic and antipyretic activity ³⁰ ; antifungal, immunomodulatory, and antiviral ³¹
12.	<i>Oldenlandia corymbosa</i> L.	Whole Plant	Juice	Eye injury	Not in Classical Ayurvedic texts	Data deficient with regards to treatment of eye injury but having hepatoprotective, cytotoxic anti-oxidant, oxytocic and anti-malarial activities ³²
13.	<i>Oryza sativa</i> L.	Grains	Powder form	Jaundice	<i>Stanya-kshaya, Mutrakricchra</i> ³³	Anthocyanin-rich extract shows hepatoprotective and anti-oxidant action ^{34,35}
14.	<i>Piper nigrum</i> L.	Fruits	Crushed with other ingredients	Dysmenorrhoea	<i>Anaha, Gulma, Krimi-roga, Udara-roga, Vata-roga</i> ³⁶	Fruit extract shows antispasmodic effect ³⁷ and an Alkaloid (Piperine) shows anti-inflammatory and antiarthritic effects ³⁸
15.	<i>Saccharum officinarum</i> L.	Stem	Juice form in the mixture	Dysentery	<i>Raktapitta, Visarpa, Mutrakricchra, Ōjokshaya, Raktasrava, Grahani, Pandu</i> ³⁹	Cane extract shows antibiotic activity ⁴⁰ along with antioxidant and anti-inflammatory activities ⁴¹

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S. N.	Medicinal plants as reported in folk claims	Part used	Dosage form	Reported disease condition	Ayurvedic indications	Corroborated pharmacological activities
16.	<i>Urena lobata</i> L.	Root	Crushed root as paste	Swelling	Not in Classical Ayurvedic texts	Root extract shows diuretic activity ⁴²
17.	<i>Zingiber zerumbet</i> Rosc. ex Sm.	Rhizome	Paste made into tablet	Inflammation	Not in Classical Ayurvedic texts	Antioxidant, antidiarrhoeal, antibacterial, immunomodulatory, antidiabetic, anti-nociceptive and anti-inflammatory ^{43,44}
18.	<i>Ziziphus jujuba</i> Mill.	Leaf	Crushed leaves as paste	Extraction of foreign body/thorn	<i>Tvaka, Raktatisara, Vrana</i> ⁴⁵	Anxiolytic, Antimicrobial, Antiulcer, hypotensive ⁴⁶

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हिन्दी सारांश

असम (भारत) के कामाख्या हिल्स संरक्षित वन से लोकदावे पादपों के साथ उनके आयुर्वेदिक लक्षण और संपुष्टित फार्माकोलाजिकल गतिविधियाँ

उद्देश्य: वर्तमान सूचना मध्य असम क्षेत्र में ब्रह्मपुत्र नदी के दक्षिणी किनारे पर स्थित नागाँव वन विभाग के कामाख्या हिल्स संरक्षित वन में सर्वेक्षण के दौरान चिकित्सीय-प्रजातीय वानस्पतिक दावे और लोकदावे चिकित्सीय पादप पर रिपोर्ट से संबंधित है।

सामग्री और पद्धति: अध्ययन क्षेत्र में क्षेत्र सर्वेक्षण किया गया जहाँ चार लोक चिकित्सकों का चिकित्सीय-प्रजातीय वानस्पतिक सूचना के प्रलेखन के लिए साक्षात्कार लिया गया। प्रतिवेदित लोकदावे पादप के नमूनों को एकत्रित किया गया, उनकी पहचान की गई एवं उनका संरक्षण किया गया।

परिणाम: प्रतिवेदित लोक दावों में 15 संतति की 18 जाति के अंतर्गत 18 चिकित्सीय पादपों को सम्मिलित किया गया है। संपुष्टित आयुर्वेदिक लक्षण और प्रतिवेदित फार्माकोलाजिकल गतिविधियों की समीक्षा लोक दावों के आगे के विधिमान्यकरण के लिए प्रलेखित लोकदावे चिकित्सीय पादपों के लिए की गई। समीक्षा से, यह स्पष्ट है कि क्षेत्र की लोक चिकित्सा में कुल 4 पादप प्रजाति को प्रतिवेदित किया गया जिसका भारतीय आयुर्वेदिक फार्माकोपिया के साथ-साथ किसी शास्त्रीय आयुर्वेदिक मूलपाठ में वर्णन नहीं है। इनमें से, 1 पादप प्रजातियाँ नॉवेल रोग लक्षण के रूप में है जिसमें फार्माकोलाजिकल गतिविधियाँ और आयुर्वेदिक औषधि पद्धति में संपुष्टित रोग लक्षण नहीं हैं।

निष्कर्ष: नॉवेल लोकदावे पादपों को आगे के विधिमान्यकरण और जाँच के लिए सुझाया गया है।

महत्व: आयुर्वेदिक लक्षण और प्रतिवेदित फार्माकोलाजिकल गतिविधियों के साथ संपुष्टित लोकदावे पादपों के प्रयोग का विधिमान्यकरण करेंगे।

मुख्य शब्द: असम, आयुर्वेदिक लक्षण, चिकित्सीय प्रजातीय वानस्पतिक दावे, लोकदावे पादप, चिकित्सीय-फार्माकोलाजिकल गतिविधियाँ।

