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EXPLORATION OF ETHNOMEDICINAL PLANTS USED FOR INTESTINAL WORM BY KARBI ETHNIC TRIBE OF KARBI ANGLONG, ASSAM, INDIA

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ABSTRACT:

Karbi ethnic group is rich in its indigenous knowledge. They have relied on traditional medicines adopted from their ancestors. Since age-old they have been in close proximity with nature and depend on forest for food, medicine and their livelihood. The present study has been conducted with the aim to study, recognize and to record the plants used in the ethnomedicine practices for the treatment of intestinal worm. Intestinal worm is parasitical and are deleterious to humans' health. A field study was undertaken from March 2025 to February 2026 and consent of informants and ethno practitioners was obtained to collect information following ethnobotanical methods and empirical field work has been adopted. Documentation of a total of 36 species belonging to 24 families comprising its botanical names, habitat, parts used and mode of use for the treatment of intestinal worms has been done in the present study. Among these 24 families Caesalpinaceae and Solanaceae has been found to be mostly in use. This study emphasizes in conservation of ethnomedicinal plants and to enhance and restores the traditional knowledge among the people and adapt it accordingly.

Keywords - Ethnomedicine, intestinal worm, health, conservation, traditional knowledge

Introduction

Plants have been always associated with human cultures and is not limited to food, clothing and shelter but also includes their use for religious ceremonies, ornamentation and health care (Schultes, 1992). The ethnomedicnal studies of Karbi tribe was initiated by Jain and Borthakur (Borthakur S K. 1976; Jain S K & Borthakur S K, 1980). Medicinal plants and herbs have been in practice globally for their therapeutic and

medicinal elements. Tribal dominated tracts of Northeast India are the storehouse of knowledge about the multiple uses of plants (Arora R.K. 1981).

Karbis' are the notable tribe inhabiting in Karbi Anglong District of Assam. They belong to the Mongoloid racial stock and they have are rich in its indigenous knowledge. The forest of Karbi Anglong is a treasure throve of medicinal plants and these indigenous tribes rely chiefly on it for their healthcare and healing practice. Intestinal worm infection is one of the predominant infections that pose a serious public health issue in this area. Locally available plants are collected by the indigenous communities either from wild or from home garden for treating different ailments. The present paper has been documented with an aim to survey, identify and document some of the plants used in the ethnomedicine practices for the treatment of intestinal worm. Intestinal worm is parasitic in nature which are deleterious to human's health and thrive in the intestines of another organism. It affects more than 1 billion people and are the cause of 1,55,000 deaths annually (WHO, 2023). Intestinal worm can also be cured through ethnomedicine. Folk medicine from the time of Vedas has been in practiced as it is readily available, cost effective and with no side effects. Locally prepared medicines act as an essential element for the documentation of traditional knowledge system of the indigenous communities. The herbal practitioner does not have any written literature or follow any standardize custom as a result the selection of medicinal plants is known only by their descendants.

OBJECTIVE OF THE STUDY

1. This study aims in the documentation of cure of intestinal worms through traditional knowledge and the role of traditional healers in this regard.
2. This study also aims in conservation of these ethnomedicinal plants.

MATERIALS AND METHODS

Study Area:

(i) The research was conducted in many villages of both East and West Karbi Anglong District among the Karbi community people. Karbi Anglong district lies in 25º 33′ and 26º 35′ North latitude and from 92º 10′ to 93º 50′ East longitude; area: 10,434 sq. kms. of Northeast India. It is bounded by six of the other eight sister states of the region (Fig 1). The district occupies a total geographical area of 10,434 sq. km. covering 13.3% of the total geographical area of Assam. It is bounded on the north by the Morigaon, Nagaon and Golaghat districts, on the east by the Golaghat district, on the south by the state of Nagaland and Dima Hasao district of Assam and on the south-west by the state of Meghalaya. The district is dominated by Karbis, an ethnic community of Assam. Forest type varies from semi-evergreen to evergreen forest with mixed crop composition including bamboo, canes and orchids. People are mainly agriculturists with farmers practicing wet cultivation in plains and *jhum* in the hills. Karbis, being animistic in religion, are considered to be the deep-rooted chest of traditional knowledge.

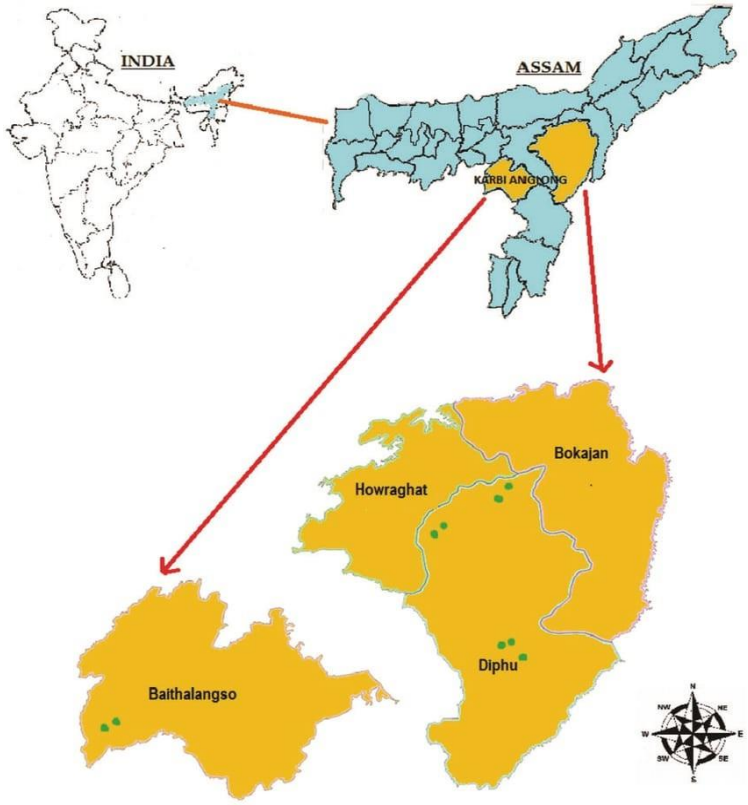


Fig. 1: Map of Karbi Anglong with study area.

(i) Methodology

Ethnobotanical field work was conducted during March 2025 to February 2026 within Karbi Anglong district. Extensive field data collection and survey, ethnomedicine practices and application of plants was personally monitored with the help of ethnomedicinal practitioner and phytotherapist were undertaken by prior permission. The informants were selected by conferring with the Village chief for collection and documentation. This study also covered daily and weekly markets, which are Lorulangso (Diphu), Main market (Diphu), Manja weekly market (Manja), Silonijan weekly market (Silonijan), Sarhajan weekly market (Sarihajan), Borlangfer weekly market (Borlangfer), Dongkamukam weekly market (Dongkamukam), Baithalangso weekly market (Baithalangso), Hamren weekly market (Hamren). The selection of the markets was purposeful because in these market sellers are mainly the indigenous communities dwelling in or near the hills who largely depends upon resources derived from natural forests for food and medicine due to its free and easy access and simplicity in their uses.

Informations were collected following ethnobotanical methods of group discussion and semi-structured interview (Martin, 1995; Alexiades, 1996). Checklist of medicinal plants with their local names, parts used, application and method of preparation was prepared as per disclosed by the informants. Ethnomedicine plants were identified and collected with the key informants and identified with the local floras (Hooker, 1875-1897; Kanjilal & Bor, 1934-1940; Prain, 1903). For the collection of information a frequent field visit, group discussion photographs of the specimen were collected from the field and as well as from household garden.

RESULT AND DISCUSSION

The current study documented, 36 plant species that belongs to 24 families which were being used by the Karbi ethnic group of both East and west Karbi Anglong to treat intestinal worms in human. In this study, different recorded families are - Apocynaceae, Asteraceae, Bromeliaceae, Caesalpinaceae, Caricaceae, Costaceae, Euphorbiaceae, Fabaceae, Gentianaceae, Lamiaceae, Liliaceae, Meliaceae, Minispermeacea, Moringaceae, Myristicaceae, Nyctaginaceae, Nycthanthaceae, Olecaceae, Poaceae, Rubiaceae, Rutaceae, Sapindaceae, Solanaceae and Zingibearceae. Herbs, shrubs, climbers and trees are the main habitat exhibited by the documented plants. Herbs constituted the highest number recorded with 14 species, closely followed by shrubs 11 species, trees 10 species and 1species of climber.

Table 1: Plant species used as ethnomedicine for the treatment of intestinal worm by the Karbi ethnic tribe.

Sl. No.	Botanical name [Family]	Local name	Habitat	Applications	Parts Used	Method of use
1	*Aegle marmelos* L. Corr. [Rutaceae]	Thepli/Thebo	Forest	Intestinal worm	Leaves	Green leaf juice is taken orally
2	*Aloe barbadensis* Mill [Liliaceae]	Bap Ingsu	Home Garden	Intestinal worm	Leaves	Fresh aloe vera gel mixed with turmeric, consumed once or twice daily
3	*Ananas comosus* [Bromeliaceae]	Parok Jangphong/Mati kathal	Crop Field	Intestinal worms	Leaves and Fruits	Decoction of leaves and fruits are eaten raw.
4	*Azadirachta indica* A. Juss. [Meliaceae]	Neem keho	Forest, Home Garden	Intestinal worm	Leaves	Decoction of leaves.
5	*Baliospermum montanum* (Willd.) Muell-Arg.[Euphorbiaceae]	Parok hanthu	Forest, Home Garden	Expulsion of worms	Leaves	Leaves are boiled and eaten as curry
6	*Bauhinia racemosa* Lamk. [Caesalpiniaceae]	Ingku kelok	Forest	Expulsion of worms in flatulence	Roots and barks	Decoction of roots or barks.
7	*Bauhinia variegata* Linn. [Caeselpiniaceae]	Ingku ke-er	Forest	Expulsion of worms in flatulence	Roots and barks	Decoction of roots or barks.
8	*Boerhavia diffusa* Linn. [Nyctaginaceae]	Bitu apham	Forest	Antihelmintic	Entire plant	Whole plant is eaten as curry

9	*Caesalpinia bonducella* (Linn.) Fleming [Caesalpiniaceae]	Kamboro	Forest	Antihelmintic	Leaves	Leaves are taken as decoction, infusion or as vegetables.
10	*Caesalpinia pulcherima*(Linn.) Swartz. [Caesalpiniaceae]	Mir Radha	Forest, Roadside	Intestinal worm	Flower	Decoction of flower
11	*Carica papaya* L. [Caricaceae]	Mensopi	Home garden	Intestinal worm	Seeds	Take the dry seed powder
12	*Costus speciosus* Smith. [Costaceae]	Ai-upo	Forest	Helminthiasis	Leaves and Roots	Aerial part of the plant is eaten as curry. Fresh roots are crushed coarsely and soaked overnight with water is consumed.
13	*Croton tiglium* Linn. [Euphorbiaceae]	Chukok	Forest	Expulsion of worm	Bark and seeds	1 teaspoon of its seed is given with hotwater.
14	*Curcuma amada* Roxb. [Zingiberaceae]	Tharmit tharve	Home Garden, Crop Field	Expulsion of worm	Rhizome	Freshly rhizome is ground with mortar and pestle and the extract is consumed
15	*Curcuma longa* Linn. [Zingiberaceae]	Tharmit	Home Garden, Crop Field	Intestinal worms and relieve pain	Rhizome	Freshly rhizome is ground with mortar and pestle and the extract is consumed
16	*Erythrina variegata* Linn. [Fabaceae]	Mandar	Forest	Antihelmintic	Leaves	Leaves extract mixed with honey is consumed
17	*Euphorbia hirta* Linn. [Euphorbiaceae]	Bapchulang	Roadside	Removing worms in children	Whole plant	Fresh plant is ground with mortar and pestle

						and the extract is consumed
18	*Holarrhena antidysenterica Wall.* [Apocynaceae]	Beng-voi	Forest	Intestinal worm	Leaves	Juice from the pounded leaves is taken orally to kill worms.
19	*Kaempferia galanga* Linn. [Zingiberaceae]	Bithi phakno	Forest, Home Garden	Helminthiasis	Rhizome	Freshly rhizome is ground with mortar and pestle and the extract is consumed
20	*Myristica kingii* Hook.f. [Myristicaceae]	Dettok arong	Forest	Intestinal worm	Fruit	Fruits are consumed raw
21	*Moringa oleifera* Lam. [Moringaceae]	Sondon	Forest. Home Garden	Intestinal worms	Fruits	Fruits are eaten as curry
22	*Nephelium longana* Camb. [Sapindaceae]	Marle-arong	Forest	Antihelmintic	Fruits	Fruits are consumed raw
23	*Nyctanthes arbor-tristis* L. [Nyctanthaceae]	Hewali	Home garden	Antihelmintic	Leaves	Oral intake of leaf juice kills the worms.
24	*Olax acuminata* Wall. ex Benth [Olacaceae]	Hanboka	Forest	Intestinal worm	Leaves	Leaves are eaten as curry
25	*Ocimum basilicum* Linn. [Lamiaceae]	Babong Ai	Roadside	Antihelmintic	Leaves	Fresh leaves are ground with mortar and pestle and the extract is consumed
26	*Ocimum sanctum* Linn. [Lamiaceae]	Tulohi ke-ik	Home Garden	Destroy intestinal worm	Leaves	Fresh leaves are ground with mortar and pestle and the extract is consumed

27	*Randia dumetorum* Poir. [Rubiaceae]	Ruthe-arong	Forest	Expulsion of worm	Seeds	Seeds are very effective to kill worms in intestine.
28	*Rauwolfia serpentina* (Linn.) Bentham.ex Kurz [Apocynaceae]	Jok –an so/ Methan krokdi	Forest	Antihelmintic	Roots	Fresh roots are ground with mortar and pestle and the extract is consumed
29	*Solanum nigrum* Linn. [Solanaceae]	Hipi sokran	Roadside	Intestinal worm	Fruits	Three mature fruits are taken, once daily after meal for three days.
30	*Solanum spirale* Roxb. [Solanaceae]	Jok-ho	Roadside	Medicine for worm	Leaves	Leaves are eaten in the form of curry
31	*Solanum torvum* Swartz [Solanaceae]	Hipi kumbong	Roadside	Intestinal worm	Fruits	Five mature fruits are taken, twice daily after meal for five days.
32	*Swertia chirayita* (Roxb. ex-flam) Kanst. [Gentianaceae]	Narikolom/ Bap Naikoi	Roadside	Antihelmintic	Whole plant	Stem are soaked in water overnight and that water is used to treat intestinal worm
33	*Tinospora cordifolia* (Willd.) [Menispermaceae]	Ri-et so	Forest	Intestinal worm	Fruits	Oral intake of fruits expels the worms
34	*Vernonia cinerea* Less. [Asteraceae]	Han bijuli	Forest	Antihelmintic	Seeds and Roots	2.5 g of seeds is taken with water in empty stomach
35	*Vetiveria zizanioides* (Linn.) Nash. [Poaceae]	Thubong	Scrubs	Antihelmintic	Roots	Decoction of roots

36	*Withania somnifera* (Linn.) Dunal. [Solanaceae]	Hipi et-so	Forest	Antihelmintic	Leaves	Leave extract



Bauhinia racemose



Bauhinia variegata Linn.



Boerhavia diffusa Linn.



Costus speciosus



Curcuma longa



Kaempferia galanga



Myristica kingii



Nyctanthes arbor-tristis



Olax acuminata



Rauwolfia serpentina



Swertia chirayita



Vetiveria zizanioides

Fig. 2: Photographs of some ethnomedicinal plants used for treatment of Intestinal worm by the Karbi tribe of Karbi Anglong, Assam.

The most dominant family recorded for the treatment of intestinal worm was found to be Ceaselpinaceae and Solanaceae with 4 number of species (11.11%), which was followed by Euphorbiacea (3 species) and Zingiberacea (3 species) making it to 8.33% and Apocynaceae and Lamiaceae with 2 species each (5.55%) and the rest with 1 species each. A bar diagram of different plant families used for intestinal worm purpose is shown in Fig. 3.

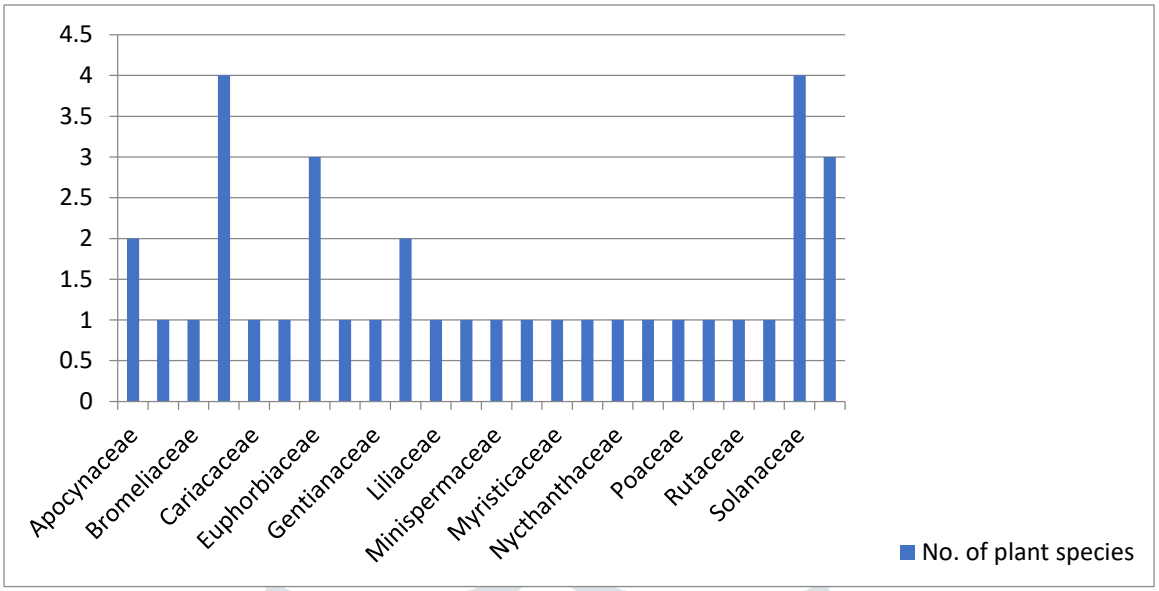


Fig. 3: Number of plant families used against intestinal worm

Leaves, stem, barks, fruits, roots and seeds are the main parts used for the medicament of intestinal worm infection. It was recorded that leaves (15 plant species) were mostly used followed by roots (6 plant species), fruits (5 plant species), seeds (4 plant species), barks (3 plant species), entire plant (3 plant species), rhizome (3 plant species) and flower (1plant species). A pie diagram of various parts of plant used for intestinal worm is depicted in fig. 4.

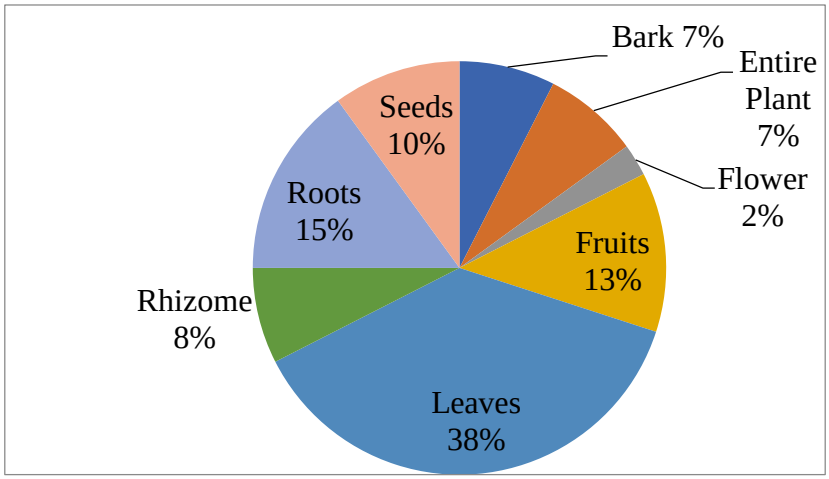


Fig. 4:- Ethnomedicinal plant parts used against intestinal worm

Various mode of preparation forms was noticed like decoction, extraction, infusion, juice, powdering, raw fruit and in the form of curries and oral consumption shown in fig. 5. The highest popular method of medicinal preparation was plant extract (10 species) which was prepared mainly from rhizomes of *Curcuma amada, Curcuma longa* and *Kaempferia galanga*, leaves of *Aloe barbedensis, Erythrina variegate*, *Ocimum basilicum, Ocimum sanctum,* roots of *Rauwolfia serpentina, Withania somnifera* and entire plant of *Euphorbia hirta*. The second highest medicinal preparation was decoction (7 species) prepared from *Ananus comosas, Azadirachta indica*, *Bauhinia racemose, Bauhinia variegate, Caesalpinia bonducella, Caesalpinia pulcherina* , *Vitiveria zizanioides* , raw fruits (7species) of *Ananus comosus, Myristica kingii, Moringa oleifera, Nephelium longana, Solanum nigrum, Solanum torvum* and *Tinospora cordifolia,* curry (6 species) prepared from *Balliospermum montenum, Boerhavia diffusa, Costus spaciosus, Moringa oleifera, Olax acuminata* and *Solanum spirale,* juice (5 species) prepared from *Aegle marmelos, Aloe barbedensis, Holarrhena antidysenterica, Nyctanthes arbor-tristis* and *Swertia chirayita* , infusion (2 species) of *Caesalpinia bonducella* and *Croton tiglium* and powder (1 species) prepared from *Carica papaya*.

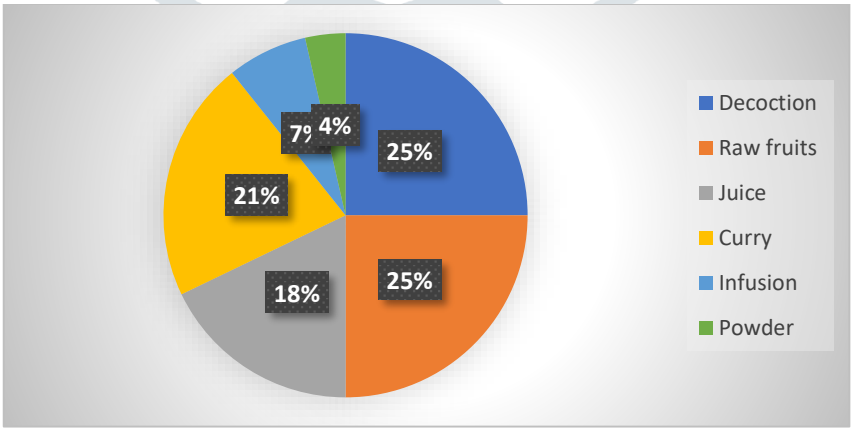


Fig. 5: Method of medicinal preparation by the ethnomedicinal practitioner.

Conservation perspectives:

In Karbi Anglong, large areas are under forest protection. But due to extreme encroachment by the people, the forest that seem to be protected are now under threat. Many wild plant species have been lost. Forest dwellers mainly depend on forest product for food, medicines, wood, fodder and income as a source of livelihood. But due to the clearance of forest land, the number of wild species are depleting day by day. Not only it causes problem to the forest dweller but the environment as well. If the conditions continue the plants available now

in the forest will be threatened or in near future it may become extinct. To preserve the gene pool of the wild species, conservation in their natural habitat is a must as the wild plant when domesticated the gene begins to alter and loss their original traits due to the change in the environment they are being cultivated. It will be a challenge to conserve these medicinal plant resources if not monitored in their natural environment from over exploitation. The presence of great diversity of medicinal plants and occurrence of gastrointestinal infections have been validated by conducting numerous ethnomedicinal studies (Tariq et al.,2015).

Conclusion

The current study has recorded a total of 36 medicinal plants which were used as a remedy for intestinal worm infection and its related symptoms in human by the ethnic group of Karbi Anglong district. These plants contain anti-parasitic potency with a potential compound. A thorough analysis for their phytochemical, pharmacological and toxicological profile is recommended for anthelmintic activity and an anti-parasitic test should be carried out to explore their true potential. Hence, before the traditional culture is eroded completely it is an urgent need to record the indigenous ecological knowledge among the diverse ethnic communities. The ethnomedicinal plants, particularly threatened ones, should be cultivated in herbal gardens, agroforestry systems and home gardens to encourage their sustainable utilization and hence conservation.

These edible ethnomedicines and its by-products offer a pleasant nutritious and healthy food, besides its therapeutic benefits. The identified species are marketable and aids to their income sources. It also helps to preserve the old age tradition of human living in close proximity with nature.

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