

## RESEARCH ARTICLE



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# Ethnomedicinal plants used by the ethnic people living in fringe villages of Rasikbil of Cooch Behar District, West Bengal, India

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## Abstract

**Objectives:** The field study was undertaken at the adjoining villages of Rasikbil of Cooch Behar district, West Bengal, India to record the ethnomedicinal plants used by the Rava, Santal and Oraon people and to explore their traditional knowledge to treat common ailments. **Methods:** With the help of pretested semi-structured questionnaire, tribal men and women were interviewed on ethnomedicinal uses of local flora during July 2018 to January 2020. The questionnaire covered aspects like local name, scientific name, family, used parts, ethnomedicinal uses, among others. Routine methods of plant collection and herbarium techniques were followed and the collected species were identified using relevant sources. **Findings:** A total of 57 plant species of 34 families were found to be used to treat several diseases like cough and cold, diabetes, among others. In few cases, the plant parts were used in combination with other plant parts to prepare traditional medicine. The plant family Fabaceae represents the highest number (6 species) of ethnomedicinal plants among others. Among different plant parts used for the preparation of medicine, leaves were most frequently used (49.12%) for the treatment of diseases. Besides, fruits, seeds, roots, etc. were also found to be used as traditional medicine for the treatment of ailments among human beings. **Applications:** The traditional knowledge of ethnic people regarding the utilisation of ethnomedicinal plants may be used in the preparation of pharmaceutical products which could contribute towards availability of essential drugs at much reduced cost. In addition, populations of medicinal plants must be monitored in order to conserve them and aid in planning sustainable utilisation. **Novelty:** In comparison to earlier reports, present study revealed 14 more plant species having immense ethnomedicinal values and frequently used by the tribal people in the area. In this regard, the study is significant to enrich the existing database.

**Keywords:** Ethnomedicine; Medicinal plants; Rava; Santal; Oraon; Rasikbil; Cooch Behar

## 1 Introduction

The World Health Organization defines traditional medicine (or folk medicine) as “the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness”<sup>(1)</sup>. In India, the folklore systems play a crucial role in meeting the health care needs of the rural community<sup>(2)</sup>. The most ancient records of ethnomedicinal uses of plant species are available in the form of Vedas, Samhitas and Epics like Ramayana and Mahabharata. Traditional knowledge of medicinal plant species is an important source of information for health care, throughout the world<sup>(3)</sup>. Nowadays, despite of the development of the modern medical facilities, the rural people depend on the traditional medicine due to low cost, unavailability of primary healthcare service and the side effect of the synthetic drugs<sup>(4)</sup>. Over 80 % of the World’s population directly depends upon the plants for their health care<sup>(5)</sup>. Recently, the plant species are facing highest threat of extinction mainly due to loss of natural habitat or climate change, urbanization, encroachment of forest lands, etc. So, it is utmost important to conserve the flora from destruction. Conservation and sustainable uses of biological resources are important in the preservation of traditional knowledge<sup>(6)</sup>.

The district of Cooch Behar is in the under developing status and mostly the rural people depend on medicinal plants to treat common physical problems like smaller injuries, cough and cold and abdominal disorder. Although, documentation of medicinal plants have been done earlier in the district<sup>(7–13)</sup>, the present study will definitely enrich the database of medicinal plants by recording new medicinal plant species used by the ethnic people in the district not reported earlier from the district. Keeping all these in mind, the present field survey was undertaken to explore traditional ethnomedicinal knowledge of ethnic people living in fringe villages of Rasikbil of Cooch Behar district of West Bengal, India.

## 2 Methodology

### 2.1 Study Area

The survey work was carried out at the adjoining tribal villages (Atia Mochar, Chengtimari, Madhurbhasa, Paglirkuthi and Takoamari) of Rasikbil (26°25′46.8″N 89°44′56.4″E) in Cooch Behar district of West Bengal. The study area is situated at the North-Eastern part of the district (45 km from district town Cooch Behar). The area was mainly inhabited by Rava, Santal and Oraon communities.

### 2.2 Data Collection

The field survey was carried out during July 2018 to January 2020 to collect information on the medicinal uses of plants found in the studied area. A total of four field surveys were done across different seasons to get maximum information. Routine methods of plant collection and herbarium techniques<sup>(14)</sup> have been followed in the study. The plants were collected in its flowering stage as far as possible, from its natural habitat. Digital photographs of the plants were also taken wherever possible. While collecting information on ethnomedicinal plants, information has been gathered by interviewing the tribal men and women using pretested semi-structured questionnaires<sup>(15)</sup>. Prior Informed Consent (PIC) was taken from each informant before the interview.

Information about the plants were recorded with regards to their vernacular/ local names, plant parts used, uses, process of preparation of medicine either individually or in combination with other plant parts, and mode of application and doses for the treatment of a particular disease(s). All the collected plant specimens were identified using relevant floras and standard literatures<sup>(16–18)</sup> and the voucher specimens were deposited in the Department of Botany, A. B. N. Seal College, Cooch Behar.

## 3 Results and Discussion

Altogether 57 plant species belonging to 34 families ( [Table 1](#) ; [Figure 1](#) ) were found to be used for medicinal purposes by the ethnic people of the studied area to treat several diseases ( [Figure 2](#) ). A total of 32 diseases ranging from common stomach problem to jaundice were treated by the use of these medicinal plants. Mostly traditional medicine found to be used by the tribal people to treat cough and cold and to heal cuts and wounds followed by diabetes, skin problems, intestinal worms, stomach problems, jaundice and dysentery. Most of the traditional knowledge of medicinal plants seems to be confined to the elder people, while the modern generation have little interest about the importance of the medicinal resources available in their surroundings<sup>(19)</sup>.

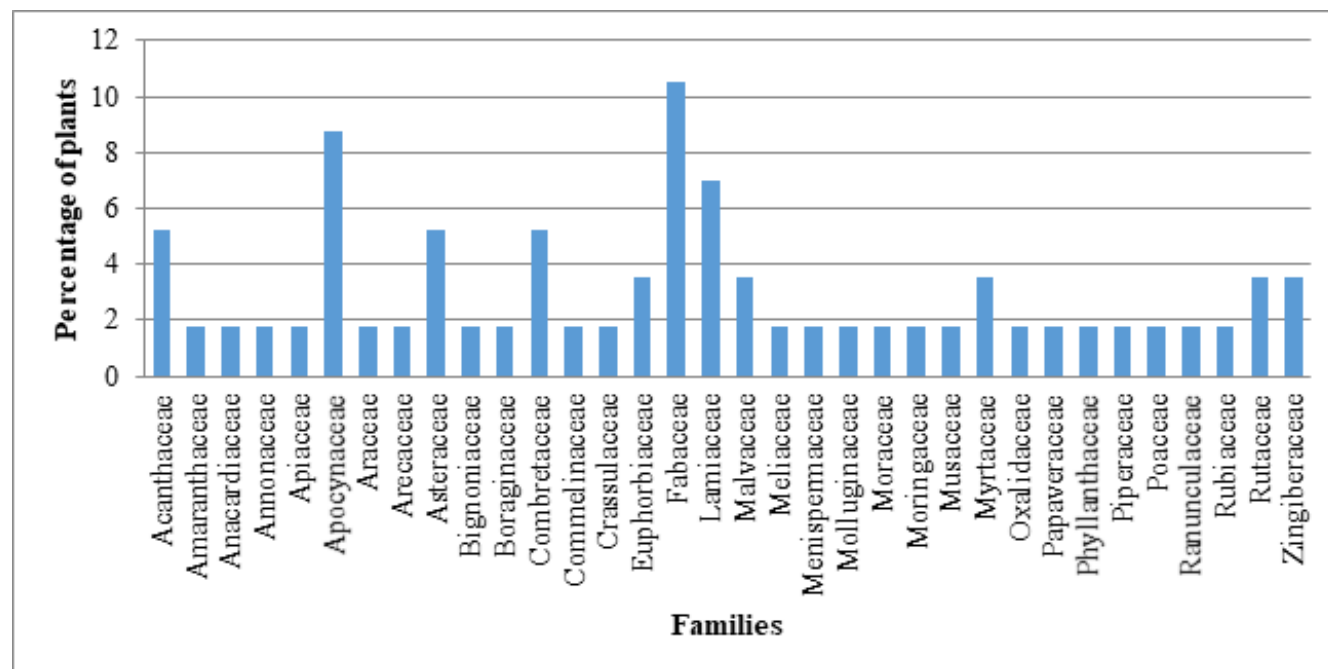


Fig 1. Familywise percentage of ethnomedicinal plants

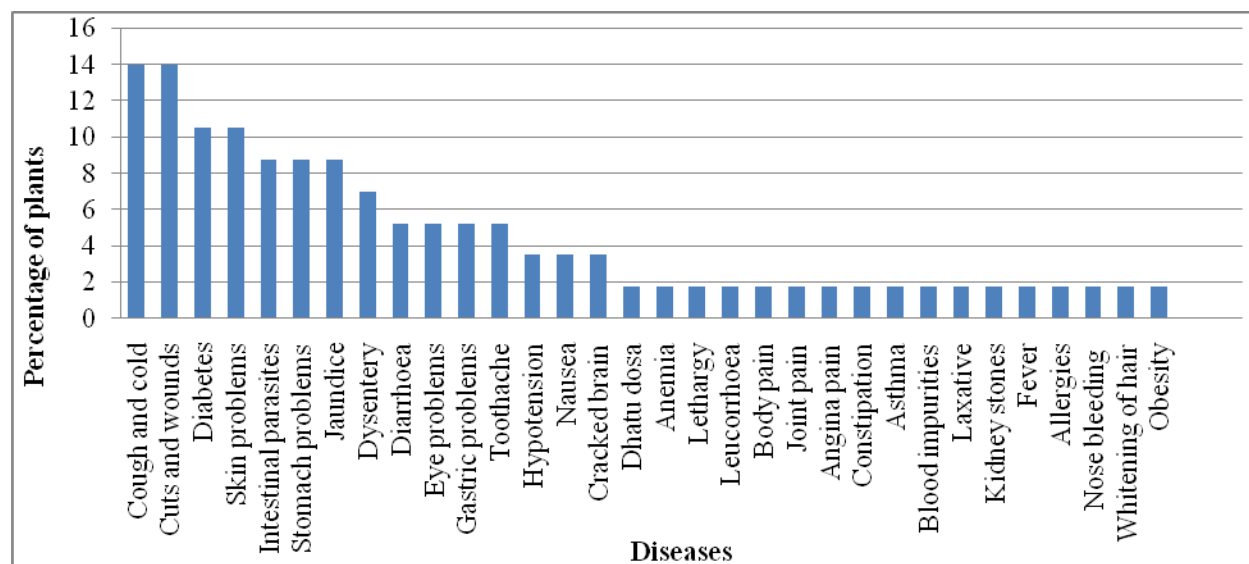


Fig 2. Percentage of plants used for treating various diseases

**Table 1.** Medicinal plants used by tribal people of the studied area

SN	Local Name	Scientific Name	Family	Parts Used	Ethnomedicinal uses
1	Kalmegh (Ra, Or, Sa)	<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	Leaf	Freshly prepared mature leaf decoction is consumed orally to treat cold, cough and jaundice.
2	Kulekhara (Ra, Or, Sa)	<i>Hygrophila auriculata</i> Schumach.	Acanthaceae	Leaf	Freshly prepared leaf extract is used for increasing hemoglobin in blood.
3	Bansak (Ra)	<i>Justicia adhatoda</i> L.	Acanthaceae	Leaf	Freshly prepared leaf extract is taken orally to treat cough and cold.
4	Raktalal (Ra)	<i>Iresine herbstii</i> Hook. ex Lindl.	Amaranthaceae	Leaf	Mature leaves are crushed and directly applied to cuts and wounds.
5	Aam (Ra) +	<i>Mangifera indica</i> L. +	Anacardiaceae	seed (Aam), bark (Arjun), Fruits (Boyra, Haritaki, Aamlaki)	Mentioned plant parts are dried and then crushed and the mixture is taken orally to treat gastric problems.
6	Arjun +	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn. +	Combretaceae		
7	Boyra+	<i>T. bellirica</i> (Gaertn.) Roxb. +	Combretaceae		
8	Haritaki+	<i>T. chebula</i> Retz. +	Combretaceae		
9	Aamlaki	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Fruit	Fruits have anthelmintic properties and given for digestion.
10	Mandargom (Sa), Ata	<i>Annona squamosa</i> L.	Annonaceae		
11	Thankuni (Ra), Khudamanamoni, Dhola-manamoni (Sa, Or)	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Leaf	Freshly prepared leaf extract is taken orally early in the morning on empty stomach to treat stomach complain.
12	Chhatni (Ra), Chhatiani (Or, Sa) +	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Bark + Leaf + Fruit	Dried leaf, fruit and bark are crushed and the mixture is taken orally to treat cough and cold.
13	Tulsi (Ra, Or, Sa) +	<i>Ocimum tenuiflorum</i> L.	Lamiaceae		
14	Golmarich (Ra, Or, Sa)	<i>Piper nigrum</i> L.	Piperaceae	Leaf	Freshly prepared leaf extract used to reduce body pain.
15	Akanda (Or)	<i>Calotropis gigantea</i> (L.) Dryand.	Apocynaceae		
16	Nayantara (Ra, Or), Baromasia (Sa)	<i>Catharanthus roseus</i> (L.) G.Don	Apocynaceae	Leaf	Freshly prepared mature leaf extract is used to treat diabetes.
17	Sarpagandha (Ra)	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Root, leaf	i) Root paste (freshly prepared) is used in cuts and wounds, mild blood pressure. ii) Freshly prepared leaf decoction is used as remedy to the removal of opacity.
18	Koriful (Or, Ra)	<i>Tabernaemontana divaricata</i> R.Br. ex Roem. & Schult.	Apocynaceae	Flower	Freshly prepared flower juice is applied directly on eye to treat eye problem.
19	Kalokochu (Or)	<i>Colocasia esculenta</i> (L.) Schott.	Araceae	Petiole	The pressed juice of the petiole applied on cuts and wounds.
20	Supari, Berel gua (Sa)	<i>Areca catechu</i> L.	Arecaceae	Nut	Dried nuts are used to treat dysentery.

Continued on next page

Table 1 continued

SN	Local Name	Scientific Name	Family	Parts Used	Ethnomedicinal uses
21	Titepati (Or, Ra, Sa)	<i>Artemisia vulgaris</i> L.	Asteraceae	Leaf	Leaves are used to treat nose bleeding, asthma and diseases of the brain.
22	Kalakheshri (Or), Kesuria (Ra)	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Young leaf, root	i) Freshly prepared leaf extract is used as anti-septic. ii) Fresh roots are used to treat toothache by direct allocation on the tooth cavity.
23	Gada, Ganda (Ra, Or)	<i>Tagetes erecta</i> L.	Asteraceae	Leaf	Freshly prepared leaf extract is used to disinfect cut and wounds and also used to heal burn area.
24	Surimala (Ra, Sa, Or)	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz	Bignoniaceae	Flower	Freshly prepared flower juice is used to treat jaundice, diabetes and to reduce Lethargy.
25	Hatisur (Ra), Sunda (Sa)	<i>Heliotropium indicum</i> L.	Boraginaceae	Leaf	Freshly prepared leaf decoction is used to treat eye infection.
(6)	Arjun (Ra, Or, Sa)	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Bark	i) Dried bark powder is used to treat 'Dhatudosa' (male disorder). ii) Freshly prepared bark decoction is used for angina pain.
26	Kanshira, kakmachi (Or)	<i>Commelina benghalensis</i> L.	Commelinaceae	Petiole	The sap/ juice released from mature petiole is used in cut areas to stop bleeding.
27	Patharkuchi (Or, Ra)	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Leaf	Freshly prepared leaf extract is used to treat gastric problems.
28	Koyedi (Or) +	<i>Jatropha curcas</i> L.+	Euphorbiaceae	Leaf	Leaf sap of Koyedi and freshly prepared leaf extract of Durba are mixed and directly applied on cut and wounds for blood clotting.
29	Durba/Samdubir (Ra)	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae		
30	Varenda, Redi (Ra, Or), Eradom (Sa)	<i>Ricinus communis</i> L.	Euphorbiaceae	Stem	Mature stem, after chewing to release the juice, is tucked in the mouth between the gums and cheek for toothache.
31	Palas, Muru (Sa)	<i>Butea monosperma</i> (Lam.) Taub	Fabaceae	Root	Roots have antihelminthic properties and also used to treat diarrhea.
32	Arhar (Or)	<i>Cajanus cajan</i> (L.) Millsp.	Fabaceae	Leaf	Freshly prepared leaf extract is taken in empty stomach to treat jaundice.

Continued on next page

Table 1 continued

SN	Local Name	Scientific Name	Family	Parts Used	Ethnomedicinal uses
33	Kulthi-Kalai (Ra)	<i>Macrotyloma uniflorum</i> (Lam.) Verdc.	Fabaceae	Seed	Seeds are soaked in water for overnight and the water is taken orally in the next morning in empty stomach to treat kidney stone.
34	Chakunda, Dheda-Deren (Sa)	<i>Senna tora</i> (L.) Roxb	Fabaceae	Leaf	Freshly prepared leaf decoction is used as laxative.
35	Bokful (Ra, Sa)	<i>Sesbania grandiflora</i> (L.) Poiret	Fabaceae	Leaf	Freshly prepared leaf decoction is used to treat blood dysentery and to treat jaundice.
36	Methi (Ra)	<i>Trigonella foenum-graecum</i> L.	Fabaceae	Seed	Seeds are soaked overnight in water and the water is taken orally in the next morning in empty stomach to treat diabetes.
37	Bhat (Or)	<i>Clerodendrum infortunatum</i> L.	Lamiaceae	Young leaf	Freshly prepared young leaf extract is used to treat intestinal worm.
38	Madhuful (Or)	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	Leaf	Mature leaves are boiled in oil and then applied to treat itching.
(13)	Tulsi (Ra, Or, Sa)	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Leaf	Freshly prepared leaf decoction is consumed orally to treat cough and cold.
39	Nishinda (Ra)	<i>Vitex negundo</i> L.	Lamiaceae	Leaf	Freshly prepared leaf extract is used against hair whitening and memory loss.
40	Ulatkambal (Or)	<i>Abroma augusta</i> (L.) L.f.	Malvaceae	Petiole, Root	Petiole and root are cut into small pieces and then dipped into water for overnight. Next day, after discarding the plant parts, the extract is taken orally in empty stomach to treat leucorrhea (female disorder).
41	Joba (Ra, Or, Sa)	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Root, flower, leaf	i) Freshly prepared root extract is used against cough and fever. ii) Flower extract (freshly prepared) is used to treat eczema and allergic problems. iii) Freshly prepared leaf paste is used to treat burning sensation and skin diseases.

Continued on next page

Table 1 continued

SN	Local Name	Scientific Name	Family	Parts Used	Ethnomedicinal uses
42	Neem (Ra, Or, Sa)	<i>Azadirachta indica</i> A.Juss.	Meliaceae	Leaf	Sun dried leaves are crushed and then pan fried and taken with food to treat blood impurities and skin disease.
43	Gulancha (Ra, Or, Sa)	<i>Tinospora cordifolia</i> (Thunb.) Miers	Menispermaceae	Stem	Freshly prepared stem decoction is used to treat diabetes.
44	Gima sak (Or)	<i>Glinus oppositifolius</i> (L.) Aug. DC.	Molluginaceae	Leaf	Freshly prepared leaf extract is taken to treat diabetes.
45	Kathal (Ra, Or)	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Leaf	Freshly prepared mature leaf extract is used in intestinal worm and to treat amoebic dysentery.
46	Sajnia (Ra)/Chainna (Sa)	<i>Moringa oleifera</i> Lam.	Moringaceae	Leaf	Mature leaves are boiled and taken orally to treat low blood pressure.
47	Atiakala (Or)	<i>Musa sapientum</i> L.	Musaceae	Entire plant	Freshly extracted sapling's sap is used to treat dysentery.
48	Peyara (Or)	<i>Psidium guajava</i> L.	Myrtaceae	Branch	Tender branches are crushed and the juice is used to treat intestinal worm and dysentery.
49	Lobongo (Ra)	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry	Myrtaceae	Flower bud	Dried flower bud decoction is used to treat toothache.
50	Kamranga (Or)	<i>Averrhoa carambola</i> L.	Oxalidaceae	Fruit	Fresh fruits are used in the treatment of diarrhea, vomiting, acidity and jaundice.
51	Atkuti (Sa)	<i>Argemone mexicana</i> L.	Papaveraceae	Seed	Seed paste is used to treat joint pain.
52	Kalojeera (Ra)	<i>Nigella sativa</i> L.	Ranunculaceae	Seed	Seed paste is used to treat cough and cold. Seeds are also boiled in water and inhale the fumes to reduce nasal congestion.
53	Gandhapatali (Ra)	<i>Paederia foetida</i> L.	Rubiaceae	Leaf	Leaf paste (freshly prepared) is consumed to treat diarrhea.
54	Bel (Or, Ra, Sa)	<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	Fruit	Freshly prepared fruit juice is used in severe constipation and stomachache.
55	Karipata (Or, Ra)	<i>Murraya koenigii</i> (L.) Sprengel	Rutaceae	Leaf	Mature leaves are soaked in water for overnight and the decoction is consumed orally to reduce fat and diabetes.
56	Holud (Ra, Or, Sa)	<i>Curcuma longa</i> L.	Zingiberaceae	Rhizome	The paste (freshly prepared) of rhizome is used in wound healing.

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Table 1 continued

SN	Local Name	Scientific Name	Family	Parts Used	Ethnomedicinal uses
57	Ada (Ra, Or, Sa)	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Rhizome	Rhizome is used to treat stomach upset, stomachache and vomiting.

Ra- Rava, Or- Oraon, Sa- Santal

The plants listed are in the alphabetical order according to families, followed by genus and species within each family. The reported plants are arranged according to their vernacular name(s) (as recorded during the field work), scientific name, family, parts used and ethnomedicinal uses. Although, the respondents revealed preliminary information regarding the methodology of herbal preparations; but in most cases, they usually hesitate to disclose their knowledge about the exact methodology of herbal preparation and dosage as they believe that upon disclosure of the knowledge (particularly to urban people) the effect of medicine will vanish.

Most of the plants reported in this study were collected from their natural habitat (68.42%) and the rest from the home gardens (31.58%). On the basis of their growth habit, herb (38.60 %) dominates among plant types followed by tree (33.33%), shrub (22.81 %) and sub-shrub (5.26 %).

The plant family Fabaceae is represented by the highest number of species (6 species; 10.53%), followed by Apocynaceae (5 species; 8.77%), Lamiaceae (4 species; 7.02%), Acanthaceae, Asteraceae and Combretaceae (3 species each; 5.26%), Euphorbiaceae, Malvaceae, Myrtaceae, Rutaceae and Zingiberaceae (2 species each; 3.51 %), and the rest of the families are represented by single plant species each ( Figure 1). Among different plant parts used ( Figure 3) for the preparation of medicine, leaves are found to be the most frequently (49.12 %) used plant parts followed by fruits (14.04 %), seeds and roots (8.77 % each), flower and petiole (5.26 % each), bark, stem and rhizome (3.51 % each) and only in one occasion, the use of entire plant, flower bud and branch (1.75 % each) are also recorded. In few cases, the plant parts are used in combination with other plant parts to prepare the traditional medicine. Most of the ethnobotanical studies confirmed that leaves are the major portion of the plant used in the treatment of diseases<sup>(10–13,20–25)</sup>.

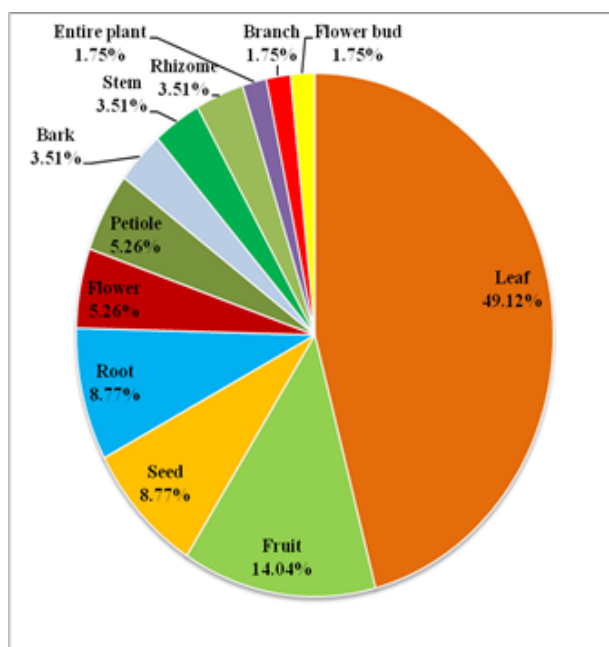


Fig 3. PlantParts used for ethnomedicinal purpose

Scientific documentation of the plant species utilised for different ethnomedicinal purposes by the ethnic communities in the Cooch Behar district have been done earlier by several authors<sup>(7–13)</sup> but the present survey has reported additional 14 medicinal plant species which is definitely a new inclusion in the existing database.

Although, the use of medicinal plants among the ethnic people in the studied area to treat different diseases is certainly outnumbered by the modern medicine, still their dependency on surrounding plants to get relieved from day-to-day ailments is



undeniable. Recently many medicinal plant species used by them are disappearing from the natural vegetation due to loss of natural habitat, encroachment of forest lands, illegal cattle grazing, etc. Bhattacharya et al. <sup>(26)</sup> has recommended few management strategies for the betterment of socio-environmental structure. Proper training and awareness programme from appropriate authority on the importance of biodiversity resources as well as harmful effects of deforestation may protect the natural habitat from destruction <sup>(26)</sup>. Sustainable uses and cultivation of these medicinal plants may restore the natural vegetation in the studied area. The conservation and sustainable use of medicinal plants have been studied extensively <sup>(27–29)</sup>.

## 4 Conclusion

There seems to be an in-depth knowledge about the curative properties of many plants among the tribal population living at the adjoining villages of Rasikbil, and the list of taxa presented here is by no means exhaustive. During the course of the study, 57 plants are found to be used by ethnic people in the studied area. In spite of the development and spread of modern medicine in the studied areas, traditional medicine is of prime importance to address health problems. Traditional knowledge of medicinal plants and their uses by ethnic communities are useful for conservation of inherited traditional medicine as well as for drug development. However, modern generations are least interested for traditional medicine. This study may help in the utilisation of these plants as crude drugs or as raw material in the preparation of pharmaceutical products required in the promotion of primary health care. This could contribute towards the availability of essential drugs at much reduced cost. However, it would only be possible if populations of medicinal plants are monitored scientifically in order to plan the proper conservation and sustainable utilisation.

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