



RESEARCH ARTICLE

# Ethnomedicinal plants used by Santhal community in Mayurbhanj, Odisha against diarrhoea: A quantitative approach

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## Abstract

Diarrhoea remains a main public health concern, especially in rural as well as indigenous populations due to lack of modern medical access. The Santhal tribe of Mayurbhanj district in Odisha, India, possesses widespread traditional knowledge of using local medicinal plants for treating diarrhoeal conditions. This traditional exercise reflects their long-standing relationship with the natural environment and its curative potential. An ethnobotanical field study was conducted from 2022–24 to document and analyse the antidiarrhoeal plant knowledge among the Santhal community at Mayurbhanj. Information was gathered from 95 informants through semi-structured interviews and focused group discussions. The significance of each species was assessed using quantitative indices such as the relative frequency of citation (RFC) and use value (UV). The study recognised 37 medicinal plant species from 24 botanical families used traditionally for diarrhoea treatment. Among these, *Punica granatum* L. (RFC = 0.86), *Tamarindus indica* L. (RFC = 0.76) and *Diospyros melanoxydon* Roxb. (RFC = 0.60) were the most mentioned. Various preparation methods were reported, including juicing, grinding into paste, maceration, burning and direct chewing of plant parts. The ethnomedicinal practices of the Santhal community highlight the importance of traditional knowledge systems in primary healthcare. These findings call for further scientific validation of the noted species to assess their therapeutic potential and safety through phytochemical and pharmacological research.

**Keywords:** diarrhoea; ethnomedicinal plants; healthcare; tribal communities

## Introduction

Ethnobotany, the study of the relationship between plants and human cultures, plays a vital role in uncovering the traditional knowledge of indigenous communities (1–4). This field of research has gained significance in recent years. Particularly in the context of healthcare, ethnobotany plays major role as the whole world seeks alternative and sustainable solutions to address various global health challenges (5–7). Among the concern disease, diarrhoea remain a leading cause of morbidity and mortality worldwide, disproportionately affects rural and tribal populations (8). According to the World Health Organization (WHO), diarrhoea accounts for approximately 1.6 million deaths annually, with the majority occurring in developing countries (9). The search for effective, affordable and accessible treatments has led researchers to explore traditional medicine (10). The Santhal tribe, one of India's largest indigenous communities, possesses rich traditional knowledge of medicinal plants (11). They resided primarily in the eastern states of India, including Odisha, Jharkhand and West Bengal. They have developed unique healthcare practices passed down through generations (12). Plants have been an integral part of Santhal culture and medicine for centuries. The expertise of tribals in utilising local

flora to treat various ailments, including diarrhoea, is remarkable. However, this valuable knowledge is rapidly eroding due to urbanisation, acculturation and the lack of documentation (13). The documentation of traditional knowledge is crucial for preserving cultural heritage and promoting healthcare self-sufficiency (14). Although we find there is several previous reports on ethnobotanical study from Odisha and its nearby region but the systematic quantitative documents of plants against the diarrhoea remains limited, specifically used by the Santhal community of Mayurbhanj district. Earlier reports mostly focused on the descriptive way of study and have no statistical assessment of species importance or community-level consensus. Moreover, this study is novel in its community specific focus, indices used to evaluate the quantitative ethnomedicinal knowledge such as relative frequency of citation (RFC) and use value (UV) and its comparative relevance in identifying culturally preferred and frequently utilised antidiarrhoeal plant species. Our study provides a well-structured quantitative approach by combining the quantitative tools with traditional knowledge documentation on medicinal plants used for the treatment of diarrhoea. It is crucial to record and analyse the medicinal plants used by the Santhal tribe to treat different diseases like diarrhoea (14). The study will contribute to the conservation of indigenous

knowledge, promote cultural exchange and provide a foundation for future pharmacological research. Present study also focuses on the ethnobotanical survey conducted in selected areas of Mayurbhanj district of Odisha state, India to gather the plants used by Santhal community in the treatment of diarrhoea. The research provides an in-depth examination of the plants used, their preparations and the RFC values. By exploring the intersection of traditional knowledge and modern healthcare needs, present study seeks to bridge the gap between ethnobotany and evidence-based medicine. Accordingly, the objective are specified in this study, our objectives are to

1. Collect the ethnomedicinal plants information used by Santhal community of Mayurbhanj district, Odisha in the treatment of diarrhoea.
2. Document the methodology used, including the plant parts utilised, preparation process, and mode of administration for patients with diarrhoea.
3. Evaluate quantitatively the importance of reported species using RFC and UV.
4. Assess the ethnic relevance of antidiarrhoeal plants and recognise the key species for forthcoming pharmacological and phytochemical surveys.

## Materials and Methods

### Study area

The present study was conducted in the selected 23 villages of Mayurbhanj district, Odisha, India. It is the largest district of Odisha (15, 16). Study area has highest percentage of tribal communities forming about 60 % of the total population (17). The major tribes of the study area include Santhal, Ho, Bhumij, Munda, Bathudi, Bhuiyan, Kisan, Gond, Sounti and Kharia (18). It is endowed with lush green vegetation consisting of moist deciduous Sal forests, semi-evergreen forests, deciduous hill forests, dry deciduous Sal forests, plain Sal forests, grassland and savannah (18, 19).

### Data collection of informants

Present study carried out in 2022–24 using a set of questionnaires. The interviewees in the present study were mainly farmers, housewives, traditional healers and forest watchers whose ages ranged from 35–65 years (20, 21). The informants were interviewed with their consent (22, 23). The questionnaire consisted of the individual and socio-economic particulars of the informants like name, age, gender, occupation and tribe. A simple random sampling technique was used for interviews (25, 26, 22). A total of 95 informants were selected to ensure adequate representation of ethnobotanical knowledge across different tribal groups, occupations and villages within the study area. The sample size was considered sufficient to capture recurring and consensus-based traditional knowledge while remaining feasible for in-depth interviews across 23 villages. Informants were selected using simple random sampling from different age groups and both genders to minimise selection bias. The age range of 35–65 years was chosen as individuals in this group are generally more experienced in traditional practices and possess greater knowledge of medicinal plant use. Efforts were made to include both male and female informants, as well as diverse occupational categories such as farmers, housewives, traditional healers and forest watchers, to ensure balanced representation and comprehensive documentation of ethnomedicinal practices in the region.

### Data collection on ethnobotanical uses of selected medicinal plants from study areas

The data were collected from the informants through semi-structured interviews, group discussions, note-making and open-ended conversations (27–29). Most of the information collected from the interviewees was related to the personal details of the informants, documented the uses and treatment methods using the selected medicinal plants to cure different health ailments, along with the origin of knowledge for traditional remedies (30).

### Herbarium preparation of selected medicinal plants

The plant specimens of the selected medicinal plants were collected during field surveys for easy identification (31). The specimens were pressed, dried and poisoned properly before pasting them on the herbarium sheets. The voucher specimens of plant species were deposited in the Herbarium unit of Biodiversity and Conservation Lab, Agasthyamala Plant Research Facility (APRF), Cuttack, Odisha.

### Calculation of relative frequency of citation (RFC)

The RFC is an ethnobotanical quantitative analytical technique that emphasises the importance of a specific plant species for the treatment of any health ailments in a particular study area. It can be calculated as the ratio of the informants mentioning the use of a plant species to the total number of informants, where the higher RFC value indicates the higher use of the plant species within a community (32).

$$RFC = \frac{FC}{N}$$

Where, FC=Informants mentioning the use of plant species

N=Total informants

### Calculation of use value (UV)

The UV accesses the relative importance of local plant species within a community, taking into consideration the medicinal, culinary, festive and other uses of a particular plant species (33).

$$UV = \frac{\sum U}{N}$$

Where, U = Number of uses mentioned by each informant for a given plant species

N=Total informants interviewed for a particular plant

### Calculation of fidelity level (FL %)

Fidelity level (FL %) demonstrates the use of a single plant species in the treatment of a single disease (34).

$$FL \% = \frac{NP}{N} \times 100$$

Where, NP =Number of informants mentioning the use of a plant species in the treatment of a particular disease

N=Total informants interviewed

### Calculation of informant consensus factor (ICF)

The ICF is the value that shows the degree of agreement among participants on the medicinal uses of the plant species for a particular health ailment (35).

$$ICF = \frac{Nur - Nt}{Nur - 1}$$

Where, Nur=Number of times an ailment was mentioned

Nt=Number of plants mentioned to treat that ailment

## Results and Discussion

The study involved 95 informants, comprising 69 males and 26 females (Fig. 1, 2), aged between 35 and 65 years (Fig. 3). The study documented ethnobotanical knowledge from 95 informants selected across 23 villages, providing broad representation of the local population. The age distribution (35–65 years) ensured inclusion of individuals with substantial experience and long-term engagement in traditional practices. Both male and female informants from diverse occupational backgrounds, including farmers, housewives, traditional healers and forest watchers, were represented, contributing to a balanced and comprehensive dataset. The consistency of plant-use information across multiple informants and villages indicates that the sample size was sufficient to capture representative ethnomedicinal knowledge of the study area. The informants resided in 23 areas which included 3 villages namely Dadhasahi, Jampada and Jamadiha, from where most of the data was collected and the other 20 villages confirmed the collected data. The demographic distribution of informants indicates a broad representation of traditional knowledge holders within the Santhal tribe. A total of 37 plant species were reported to be used in treating diarrhoea (Table 1). These plants belong to 24 families, with Apocynaceae, Combretaceae and Lythraceae being the most represented (Fig. 4; Plates 1–4). The study recorded the use of various plant parts, including leaves, roots, bark, fruits, seeds and whole plants (Fig. 5). The modes of preparation varied, including juice, paste, maceration, burning and chewing (Fig. 6). The most notable plants used by the Santhal community include *Acacia nilotica* (L.) Willd. ex Delile, *Achyranthes aspera* L., *Aegle marmelos* (L.)

Correa and *Punica granatum* L. (Table 2). The RFC analysis revealed that *P. granatum* (0.86), *Tamarindus indica* L. (0.76) and *Diospyros melanoxylon* Roxb. (0.6) were the most frequently cited plants (Fig. 7). The RFC values ranged from 0.09 to 0.86, indicating varying levels of importance attributed to each plant species (Table 2). A high RFC value for a plant used against diarrhea signifies a strong consensus and widespread acceptance among local traditional healers and community members regarding its effectiveness and importance. It indicates that the knowledge about using this specific plant for treating diarrhoea is widely recognised and consistently practiced in a given region.

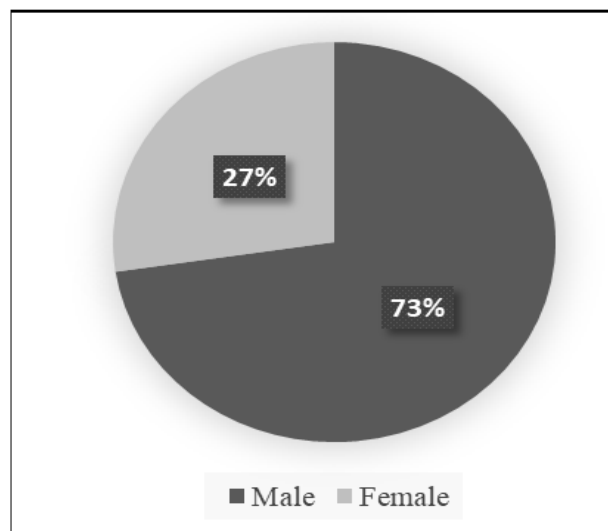


Fig. 2. Gender ratio of informants.

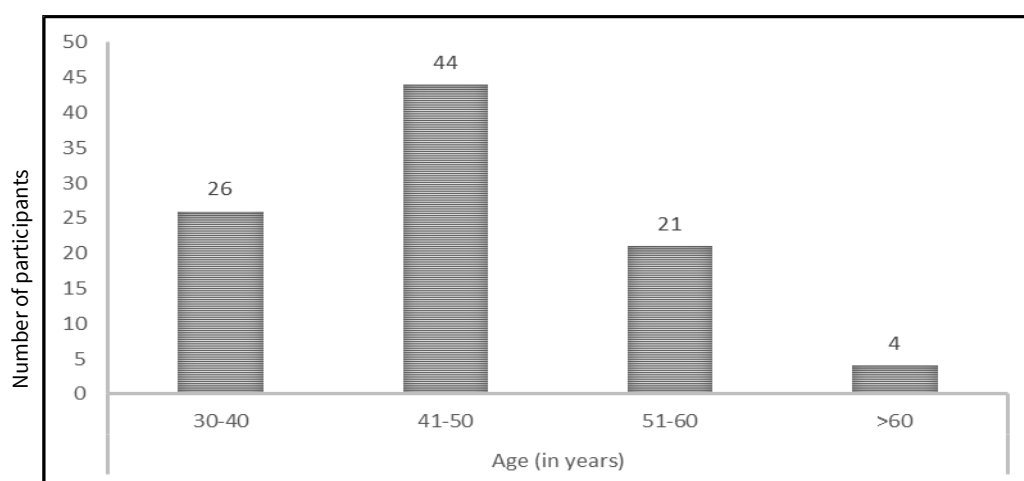


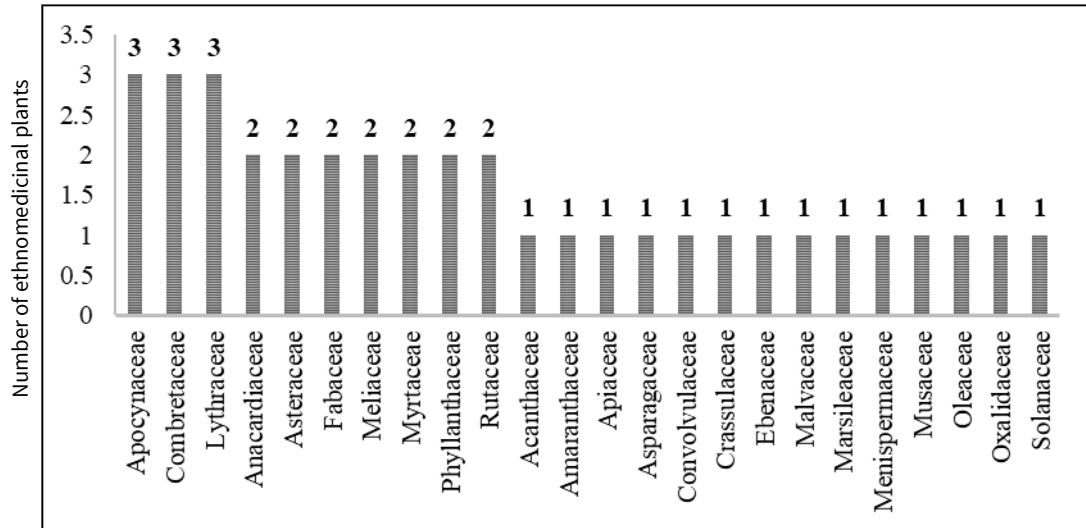
Fig. 1. Age groups of informants in present study.



Fig. 3. Occupation of informants.

**Table 1.** Plants used against diarrhoea and their mode of uses

Plant name	Mode of uses
<i>Acacia nilotica</i> (L.) Willd. ex Delile	Leaves are macerated with rice water and kept consuming about 50 mL each time, twice daily for 3–5 days to cure diarrhoea.
<i>Achyranthes aspera</i> L.	Leaf pastes with jaggery and butter or curd is taken twice a day to cure blood dysentery. About 21 seeds of black pepper and 2 g of <i>A. aspera</i> root are mixed and ground with water to make juice and then one tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Aegle marmelos</i> (L.) Corrêa	The inner fruit of <i>A. marmelos</i> is mixed with water then some seeds of black pepper are added and ground with water to make one glass juice. One glass of juice is drunk before a meal until the diarrhoea stops.
<i>Alstonia scholaris</i> (L.) R.Br.	About 15 black pepper seeds and 1 g of dry ginger are mixed with the <i>A. scholaris</i> bark, ground with water and juice extracted. One tablespoon of juice is taken 3 times daily until diarrhoea stops.
<i>Asparagus racemosus</i> Willd.	About 10 seeds of black pepper, 2 g of dry ginger, 100 g of crystal sugar and <i>A. racemosus</i> tuber are mixed and ground to make juice. Then one tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Azadirachta indica</i> A.Juss.	About 21 black pepper seeds and 1 g of dry ginger are mixed with the neem tree bark, ground with water and juice extracted. One tablespoon of juice is taken 3 times daily until diarrhoea stops.
<i>Bryophyllum pinnatum</i> (Lam.) Oken	1 g of dry ginger is mixed with one leaf of <i>B. pinnatum</i> and then ground with water to make juice. One tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Centella asiatica</i> (L.) Urb.	About 2 g of <i>C. asiatica</i> root is mixed with 1 g of dry ginger and ground to make juice. One tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Cissampelos pareira</i> L.	About 5 seeds of black pepper and the root of <i>C. pareira</i> are mixed and ground with water to make aqueous juice. Juice is taken thrice a day until diarrhoea stops.
<i>Citrus × limon</i> (L.) Osbeck	About 21 black pepper seeds are ground with an immature fruit of <i>C. limon</i> with water to make juice. One glass of juice is taken 6 times per day until diarrhoea stops.
<i>Cuscuta reflexa</i> Roxb.	Paste of the climber with calcium oxide is taken orally to treat diarrhoea.
<i>Diospyros melanoxylon</i> Roxb.	Ripe kendu is taken orally to cure diarrhoea.
<i>Elephantopus scaber</i> L.	About 20 black pepper seeds are mixed with 1 g roots of <i>E. scaber</i> and ground with water to make juice and one cup is taken 3 times per day until diarrhoea stops.
<i>Hibiscus × rosa-sinensis</i> L.	Paste of hibiscus flower and leaf with sugar crystals are taken orally to cure diarrhoea.
<i>Holarrhena pubescens</i> Wall. ex G.Don	About 21 seeds of black pepper and dry root of <i>H. pubescens</i> are mixed with 1 g dry ginger and ground to make juice. One tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Justicia adhatoda</i> L.	About 5 g of dry root of <i>J. adhatoda</i> is ground with water to make juice. One cup of juice is taken 3 times per day until diarrhoea stops.
<i>Lawsonia inermis</i> L.	Paste of henna leaf taken orally to cure diarrhoea.
<i>Mangifera indica</i> L.	The bark is ground to paste with water and taken twice daily to check diarrhoea which is effective for both children and adult.
<i>Marsilea minuta</i> L.	About 4 g roots of <i>M. minuta</i> are ground with water to make juice. One tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Musa × paradisiaca</i> L.	The immature fruit is burnt and mixed with 1 g of dry ginger. The mixture is taken 3 times a day until diarrhoea stops.
<i>Nyctanthes arbor-tristis</i> L.	Leaves are mixed with 1 g of ginger to make juice with water. One spoon of juice is taken 2 times per day until diarrhoea stops.
<i>Oxalis corniculata</i> L.	Raw leaf juice (50 mL) taken twice a day for 3 days as a cure for chronic diarrhoea.
<i>Phyllanthus emblica</i> L.	Chewing raw amla to cure diarrhoea.
<i>Phyllanthus fraternus</i> G.L.Webster	Root paste is administered to children below 2 years twice a day for 3 days to treat diarrhoea.
<i>Psidium guajava</i> L.	Chewing guava leaf and stem cures diarrhoea.
<i>Punica granatum</i> L.	Leaf, bud or unripe fruit is made to paste with rice-washed water and administered orally along with a minute pinch of opium. Half a cup is taken a day to check diarrhoea. (Although traditionally described as a ‘minute pinch’, opium lacks standardised dosage and exhibits high variability in alkaloid content. Even small amounts may pose risks of toxicity, dependence and adverse neurological effects. Therefore, such remedies should be considered ethnobotanical records only and not recommended for therapeutic use without clinical validation and medical supervision) Juice of pomegranate and its leaves are taken orally to cure diarrhoea.
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Leaf paste is taken orally to cure diarrhoea.
<i>Solanum viarum</i> Dunal	Leaf and root juice are taken orally twice daily for 3 days.
<i>Soymida febrifuga</i> (Roxb.) A.Juss.	The dry bark of <i>S. febrifuga</i> is mixed with Arjun fruits and honey and ground with water to make juice. One tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Sphaeranthus indicus</i> L.	3-4 leaves of <i>S. indicus</i> are mixed with honey and made juice. One tablespoon of juice is taken 3 times per day until diarrhoea stops.
<i>Spondias pinnata</i> (L.f.) Kurz	Stem bark paste (20 g) along with curd is taken twice daily on an empty stomach as a cure for diarrhoea.
<i>Syzygium cumini</i> (L.) Skeels	Chewing raw and ripe fruits cures diarrhoea.
<i>Tamarindus indica</i> L.	Chewing the seed of tamarind treats diarrhoea in adults.
<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Small pieces of Arjun bark are ground with water to make juice. One tablespoon of juice is taken 2 times per day until diarrhoea stops.
<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Powder from burned fruit is taken with rock salt to cure diarrhoea.
<i>Terminalia chebula</i> Retz.	Fruit pulp is used to treat diarrhoea and dysentery.
<i>Woodfordia fruticosa</i> (L.) Kurz	About 7 seeds of black pepper and dry root of <i>W. fruticosa</i> are mixed and ground to make juice. One tablespoon of juice is taken 2 times per day until diarrhoea stops.



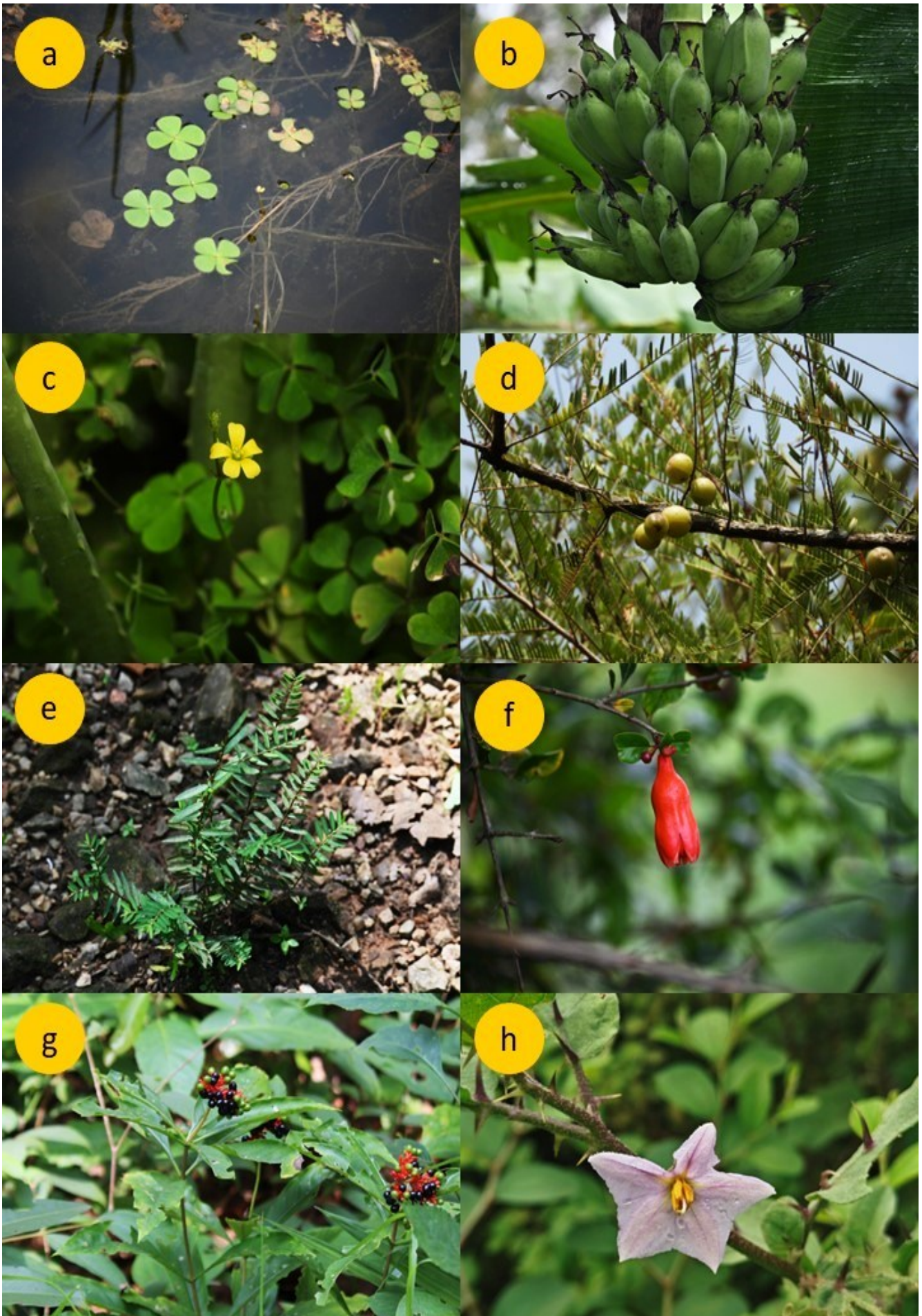
**Fig. 4.** Diversity of ethnomedicinal plants used to treat diarrhoea family-wise.



**Plate 1.** Enumerated ethnomedicinal plants from study areas against diarrhoea. (a) *Acacia nilotica*; (b) *Achyranthes aspera*; (c) *Aegle marmelos*; (d) *Alstonia scholaris*; (e) *Asparagus racemosus*; (f) *Azadirachta indica*; (g) *Kalanchoe pinnata* and (h) *Centella asiatica*.



**Plate 2.** (a) *Cissampelos pareira*; (b) *Citrus limon*; (c) *Cuscuta reflexa*; (d) *Diospyros melanoxylon*; (e) *Elephantopus scaber*; (f) *Hibiscus rosa-sinensis*; (g) *Justicia adhatoda* and (h) *Mangifera indica*.



**Plate 3.** (a) *Marsilea minuta*; (b) *Musa paradisiaca*; (c) *Oxalis corniculata*; (d) *Phyllanthus emblica*; (e) *Phyllanthus fraternus*; (f) *Punica granatum*; (g) *Rauwolfia serpentina* and (h) *Solanum viarum*.



**Plate 4.** (a) *Soymida febrifuga*; (b) *Sphaeranthus indicus*; (c) *Syzygium cumini*; (d) *Tamarindus indica*; (e) *Terminalia arjuna*; (f) *Terminalia bellirica*; (g) *Terminalia chebula* and (h) *Holarrhena pubescens*.

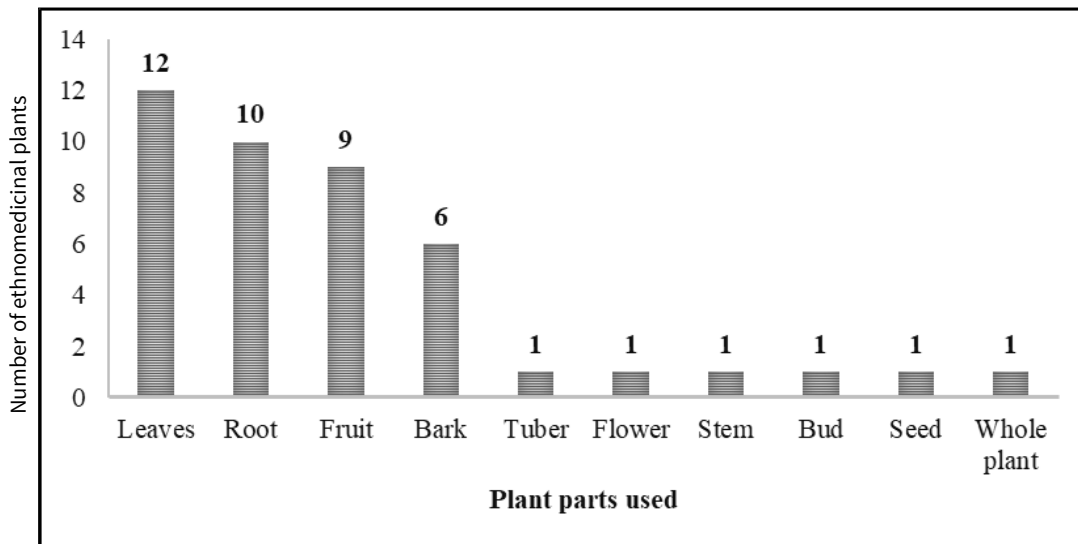


Fig. 5. Diversity of plant parts used in present study by Santhal community.

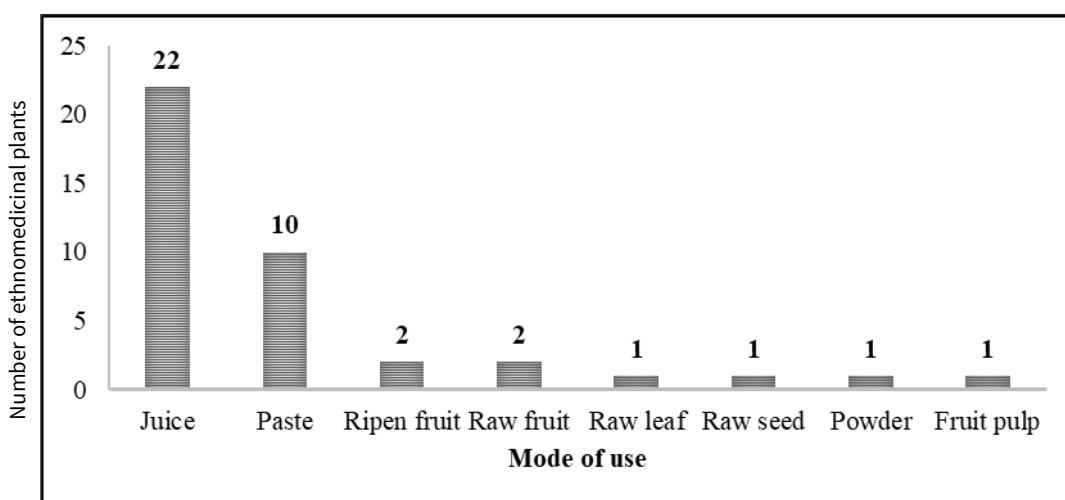


Fig. 6. Different modes of use of enumerated ethnomedicinal plants used to cure diarrhoea.

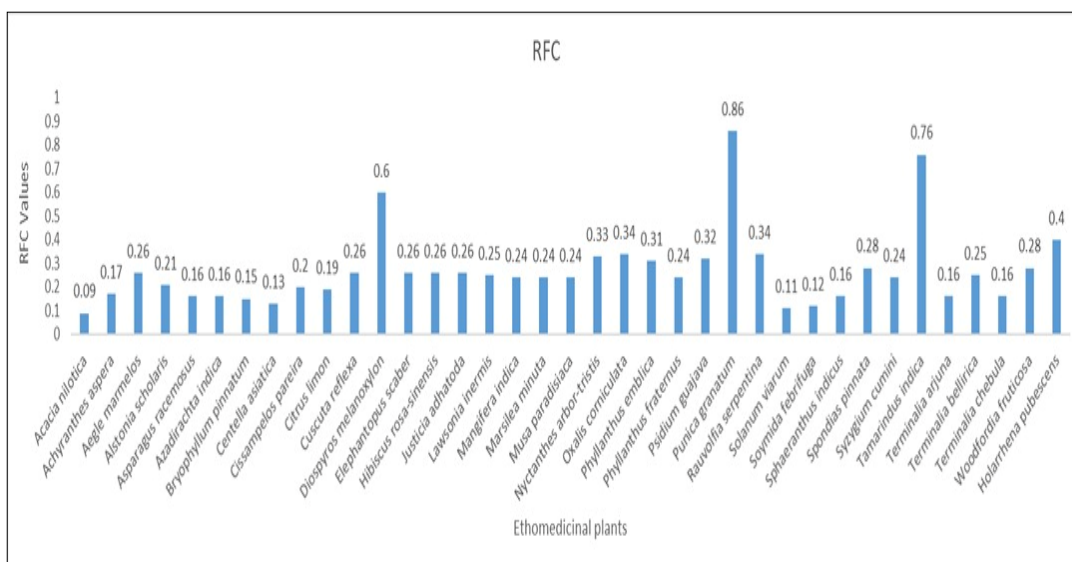


Fig. 7. Relative frequency of citation values of enumerated ethnomedicinal plants.

**Table 2.** Plants used against diarrhoea, parts used and their relative frequency of citation

Plant name	Family	Local name	Parts used	RFC	Collection site
<i>Achyranthes aspera</i>	Amaranthaceae	Chip chirit	Leaves and root	0.17	Dadhiasahi, Jamadiha, Jampada
<i>Azadirachta indica</i>	Meliaceae	Nimba	Bark	0.16	Dadhiasahi, Jamadiha, Jampada
<i>Aegle marmelos</i>	Rutaceae	Sinjo	Fruit pulp	0.26	Dadhiasahi, Jamadiha, Jampada
<i>Acacia nilotica</i>	Fabaceae	Babla	Leaves	0.09	Dadhiasahi, Jampada
<i>Asparagus racemosus</i>	Asparagaceae	Kedar nari	Tuber	0.16	Dadhiasahi, Jamadiha, Jampada
<i>Alstonia scholaris</i>	Apocynaceae	Chatni	Bark	0.21	Dadhiasahi, Jamadiha, Jampada
<i>Bryophyllum pinnatum</i>	Crassulaceae	Amarpoi	Leaves	0.15	Dadhiasahi, Jamadiha, Jampada
<i>Citrus limon</i>	Rutaceae	Lembu	Fruit	0.19	Dadhiasahi, Jamadiha, Jampada
<i>Cissampelos pareira</i>	Menispermaceae	Tejomela	Root	0.2	Dadhiasahi, Jamadiha, Jampada
<i>Cuscuta reflexa</i>	Convolvulaceae	Nirmuli	Whole plant	0.26	Dadhiasahi, Jamadiha, Jampada
<i>Centella asiatica</i>	Apiaceae	Thalkudi	Root	0.13	Dadhiasahi, Jamadiha, Jampada
<i>Diospyros melanoxylon</i>	Ebenaceae	Tiril	Fruit	0.6	Dadhiasahi, Jamadiha, Jampada
<i>Elephantopus scaber</i>	Asteraceae	Manjurjuti	Root	0.26	Dadhiasahi, Jamadiha, Jampada
<i>Heliotropium pubescens</i>	Apocynaceae	Hat	Root	0.4	Dadhiasahi, Jamadiha, Jampada
<i>Hibiscus rosa-sinensis</i>	Malvaceae	Mandara	Flower & leaves	0.26	Dadhiasahi, Jamadiha, Jampada
<i>Justicia adhatoda</i>	Acanthaceae	Basanga	Root	0.26	Dadhiasahi, Jamadiha, Jampada
<i>Lawsonia inermis</i>	Lythraceae	Manjuati	Leaves	0.25	Dadhiasahi, Jamadiha, Jampada
<i>Mangifera indica</i>	Anacardiaceae	Uli	Bark	0.24	Dadhiasahi, Jamadiha, Jampada
<i>Mentha minuta</i>	Marsileaceae	Sunsunia	Root	0.24	Dadhiasahi, Jamadiha, Jampada
<i>Musa paradisiaca</i>	Musaceae	Kadali	Fruit	0.24	Dadhiasahi, Jamadiha, Jampada
<i>Nyctanthes arbor-tristis</i>	Oleaceae	Saparon	Leaves	0.33	Dadhiasahi, Jamadiha, Jampada
<i>Oxalis corniculata</i>	Oxalidaceae	Tandi chatom arak	Leaves	0.34	Dadhiasahi, Jamadiha, Jampada
<i>Phyllanthus emblica</i>	Phyllanthaceae	Meral	Fruit	0.31	Dadhiasahi, Jamadiha, Jampada
<i>Phyllanthus fraternus</i>	Phyllanthaceae	Bhuin anla	Root	0.24	Dadhiasahi, Jamadiha, Jampada
<i>Punica granatum</i>	Lythraceae	Dalimba	Leaves, bud & fruit	0.86	Dadhiasahi, Jamadiha, Jampada
<i>Psidium guajava</i>	Myrtaceae	Pijuli	Leaves & stem	0.32	Dadhiasahi, Jamadiha, Jampada
<i>Rauwolfia serpentina</i>	Apocynaceae	Patala garuda	Leaves	0.34	Dadhiasahi, Jamadiha, Jampada
<i>Syzygium cumini</i>	Myrtaceae	Jamu	Fruit	0.24	Dadhiasahi, Jamadiha, Jampada
<i>Swertia febrifuga</i>	Meliaceae	Ruhen	Bark	0.12	Dadhiasahi, Jamadiha, Jampada
<i>Sida indicus</i>	Asteraceae	Belaunja	Leaves	0.16	Dadhiasahi, Jamadiha, Jampada
<i>Spondias pinnata</i>	Anacardiaceae	Amra	Stem bark	0.28	Dadhiasahi, Jamadiha, Jampada
<i>Solanum viarum</i>	Solanaceae	Bheji baigana	Leaves & root	0.11	Jamadiha, Jampada
<i>Terminalia arjuna</i>	Combretaceae	Kahua	Bark	0.16	Dadhiasahi, Jamadiha, Jampada
<i>Terminalia bellirica</i>	Combretaceae	Lopong	Fruit	0.25	Dadhiasahi, Jamadiha, Jampada
<i>Terminalia chebula</i>	Combretaceae	Rola	Fruit pulp	0.16	Dadhiasahi, Jamadiha, Jampada
<i>Tamarindus indica</i>	Fabaceae	Jojos	Seed	0.76	Dadhiasahi, Jamadiha, Jampada
<i>Woodfordia fruticosa</i>	Lythraceae	Icha	Root	0.28	Dadhiasahi, Jamadiha, Jampada

Present ethnobotanical study documents the traditional knowledge of medicinal plants used to treat diarrhoea among the Santhal tribe (35). The research highlights the significance of 37 plant species, with varying modes of preparation and RFC values. The plants with a high RFC against diarrhoea are that most frequently mentioned plant by local people and traditional healers for this purpose, indicating a strong traditional belief in their effectiveness and a high level of local knowledge about them. This high RFC often correlates with the presence of specific phytochemical compounds that have proven anti-diarrheal properties, which have been validated in future work. The findings underscore the importance of preserving indigenous knowledge and promoting cultural exchange between traditional and modern healthcare systems. Future pharmacological and phytochemical studies are recommended to validate the efficacy and safety of these plants (26, 34). The study contributes to the conservation of traditional knowledge and provides a foundation for future research on antidiarrheal agents. The documentation of Santhal traditional medicine has implications for healthcare self-sufficiency, particularly in rural areas where accessibility and affordability are concerns. Integrating traditional knowledge into mainstream healthcare can enhance the effectiveness and sustainability of healthcare systems.

## Conclusion

The documentation of traditional knowledge on medicinal plants used to treat diarrhoea reveals a diverse array of 37 plant species, belonging to 24 families. The most frequently used plant parts were leaves (57.5 %), followed by roots (20 %), fruits (12.5 %) and bark (10 %). The RFC values ranged from 0.09 to 0.86, indicating varying levels of usage and popularity among the local communities. *Punica granatum* (0.86), *T. indica* (0.76) and *D. melanoxylon* (0.6) had high RFC values, indicating their popularity and effectiveness in treating diarrhoea. The predominance of leaf-based remedies highlights sustainable harvesting practices and their importance in traditional healthcare systems. While the study provides valuable ethnomedicinal documentation, it is limited by reliance on qualitative traditional knowledge and the absence of experimental validation of efficacy and safety. Future research should prioritise phytochemical, pharmacological and toxicological evaluation of the highly cited species to scientifically validate their antidiarrhoeal potential. Such studies will aid in bridging traditional knowledge with modern medicine, support conservation efforts and contribute to the development of safe, plant-based therapeutic alternatives.

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## Authors' contributions

SP conducted the ethnobotanical field surveys, collected data from informants and drafted the initial manuscript. JNM conceived and designed the study, supervised the research work and critically revised the manuscript. SK assisted in field investigations, participated in data compilation and supported quantitative analysis. All authors have read and approved the final manuscript.

## Compliance with ethical standards

**Conflict of interest:** Authors do not have any conflict of interests to declare.

**Ethical issues:** None

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