



Research Article

MEDICINAL PLANTS FROM DHANAULTY REGION OF WESTERN GARHWAL HIMALAYA, UTTARAKHAND, FOR GASTROINTESTINAL DISORDERS

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ABSTRACT

The present study documents the ethnomedicinal knowledge of plants used for gastrointestinal (GI) disorders in the Dhanaulti region of the Western Himalayas, Uttarakhand, India. A field survey conducted from 2023 to 2024, across spring, summer, and late winter, recorded 54 plant species belonging to 28 families traditionally employed for Gastrointestinal ailments. Data were collected through semi-structured interviews, group discussions, and participant observation with local healers and community members, and verified through standard floras and herbarium authentication. Among the reported species, 22 were primarily used for diarrhoea and dysentery, 11 for abdominal colic, 8 for dyspepsia and appetite stimulation, 7 for hepatic conditions, and 6 for constipation. Herbs dominated the flora (57%), followed by shrubs (24%), trees (11%), and climbers (8%). Plant parts most frequently utilized included roots (20 species), leaves (19), and fruits (13). Asteraceae was the most represented family, with nine species. Notably, 30% of the documented plants were also referenced in classical Ayurvedic literature, reinforcing their traditional applications. The findings emphasize the continued reliance of rural communities on plant-based remedies due to limited healthcare access and highlight the urgent need to conserve and validate this indigenous knowledge for future phytochemical and pharmacological research and augmenting the Ayurvedic repository.

INTRODUCTION

India has a rich and ancient legacy of traditional medicine, with its Materia Medica offering extensive insights into ethnobotanical practices and the therapeutic applications of natural products.^[1] Long before the emergence of modern pharmacology and drug development, herbs formed an integral part of healthcare systems. Plants not only provide essential nutrition but also serve as a major source of medicines for treating a wide range of ailments. Even in the modern era, more than 80% of the population in developing countries continues

to rely on drugs derived from or inspired by natural compounds, owing to their time-tested safety and efficacy.^[2]

Gastrointestinal (GI) disorders are particularly common, often resulting from dietary habits, infections, and environmental factors.^[3,4] In remote areas such as Dhanaulti in the Western Himalayan region, the local population frequently suffers from conditions like anorexia, vomiting, gastric ulcers, diarrhoea, dysentery, constipation, abdominal colic, jaundice, and hepatitis. Due to limited access to modern medical infrastructure, communities in these regions depend heavily on traditional ethnomedicinal practices for managing such ailments.

In line with national efforts to evaluate traditional healthcare systems and integrate them into formal healthcare programs,^[5] the present study documents the ethnomedicinal use of plants for gastrointestinal disorders in the Dhanaulti region. A

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field-based ethnobotanical survey was conducted from 2023 to 2024, strategically timed during spring, summer, and late winter to account for seasonal variation in floral diversity.

A total of 54 plant species belonging to 28 families were identified for their therapeutic application in GI conditions. Each species has been systematically catalogued, including its botanical and local names, plant parts used, geographical distribution, associated GI ailments, and specific ethnomedicinal preparations. Further, the therapeutic uses of the documented plants-as described in classical Ayurvedic literature-have also been included alongside the reported ethnomedicinal applications. [6-13] This dual approach not only strengthens the ethnobotanical relevance of the study but also bridges traditional knowledge systems with classical Ayurvedic insights, enhancing the scope for pharmacological validation.

This study contributes to the growing database of medicinal flora for gastrointestinal disorders and offers valuable leads for future research aimed at the scientific validation and development of safe, plant-based therapeutics.

MATERIALS AND METHODS

The present ethnomedicinal survey was conducted in and around the Dhanaulti forest block, a serene and ecologically rich hill station situated in the Tehri Garhwal district of Uttarakhand, India. Dhanaulti is strategically located along the Mussoorie–Chamba Road, lying approximately 24 kilo meters from Mussoorie and 29 kilo meters from Chamba. The study area forms part of the outer Himalayan range, characterized by temperate climatic conditions and diverse vegetation. Geographically, it is positioned at 30°42' North latitude and 078°24' East longitude, with an elevation ranging from 2000 to 2500 meters above sea level.[14] The site map is illustrated in Figure 1.

Data Collection

A comprehensive field-based ethnomedicinal survey was undertaken from 2023 to 2024 in the Dhanaulti block of the Western Himalayan region, Uttarakhand, India. This region was selected due to its rich biodiversity and strong reliance on traditional medicine among local communities. The surveys were meticulously planned to coincide with the spring, summer, and late winter seasons, enabling the researchers to observe and document a broad spectrum of floral diversity and forest ecosystems across different ecological conditions.

Data were gathered through a combination of qualitative ethnobotanical methods, including semi-structured interviews, focused group discussions, and participant observation. Interactions were conducted with various local community members such as

traditional healers (vaidyas), shepherds, elderly villagers, and forest-dependent populations who possess valuable indigenous knowledge.

Plant identification was initially guided by the vernacular and traditional knowledge shared by informants and was subsequently cross-verified using standard taxonomic references and floras. [15-19] Specimen collection was carried out systematically along forest trails, streambeds (locally called nallahs), and across diverse habitats such as moist temperate forests, grasslands, and transitional zones near human settlements. The collected plant specimens were pressed, dried, mounted, and labelled in accordance with standard herbarium protocols. [20-21]

Taxonomic identification was further validated at the Patanjali Research Foundation Herbarium (PRFH), Haridwar. Accepted botanical names were updated using internationally recognized resources such as the Kew Herbarium Catalogue and Plants of the World Online (POWO). [22-23] ensuring nomenclatural accuracy. Finally, all collected field data were organized and analysed using Microsoft Excel 2016 to compile and interpret ethnomedicinal records systematically.

RESULT AND DISCUSSION

The ethnomedicinal survey data reveals that the local communities of remote areas of Dhanaulti depends on plant resources to cure disorders related to the gastrointestinal system. A total of 54 species belonging to 47 species and 28 families were documented for management of gastro-intestinal diseases (Table 1) and it has been observed that 22 species of the total reported plants are being mostly used for diarrhoea and dysentery followed by 11 species for abdominal colic, 8 as appetiser or for dyspepsia like conditions, 7 for liver and hepatitis like diseases, 6 for constipation, 3 each for blood purification, flatulence and worm infestation, 2 as antiemetic and 1 for gastric ulcer figure -2 .

On analysing the data of all 54 species of plants, 57% plants were herbs followed by Shrub (24%), Tree (11%) and Climbers (8%) figure -3. The maximum number of plants (9 species) were belonging to family Asteraceae, followed by Apiaceae, Lamiaceae and Rosaceae (4 species each), Moraceae, Polygonaceae and Rubiaceae (3 species each), Berberidaceae, Ranunculaceae and Viburnaceae (2 sepeices each). Figure -4. The inhabitant uses specific plant parts viz roots (20), leaves (19), fruits (13), bark (6), stem and seeds (4 each), flowers, and whole plant (3 each). Figure and after critical analysis it was observed that 30 % of the total plant species have their Ayurvedic reference in classical literature that strengthens the ethnomedicinal uses of these plants.

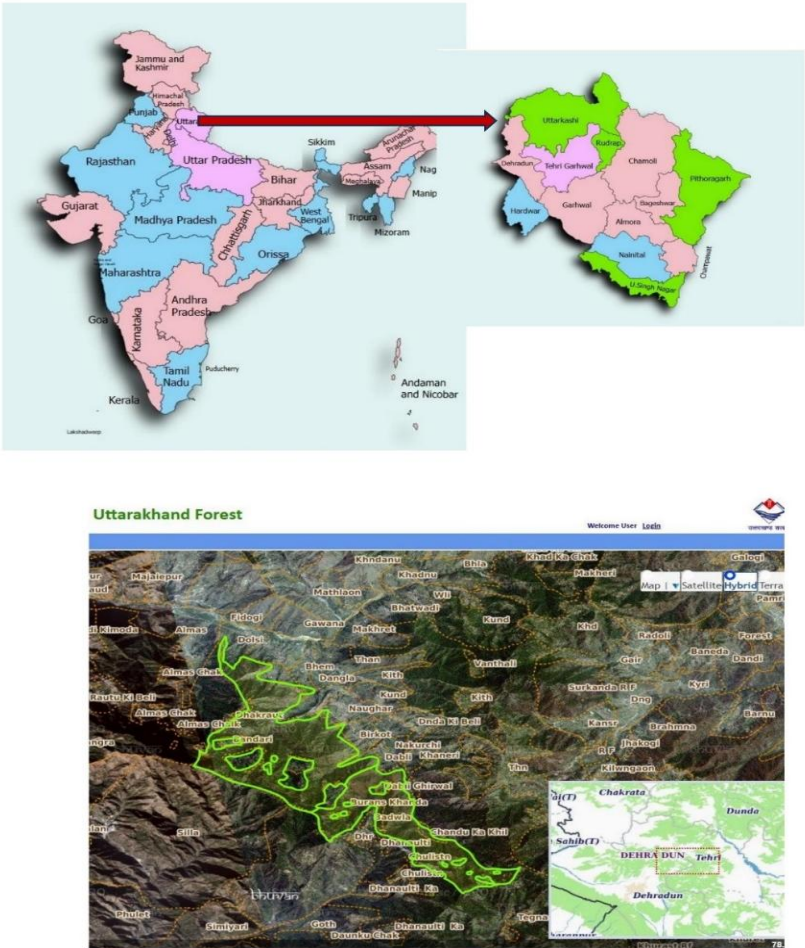


Figure 1 Map showing the location of the study area – Dhanaully forest range, District- Tehri Garhwal, Uttarakhand

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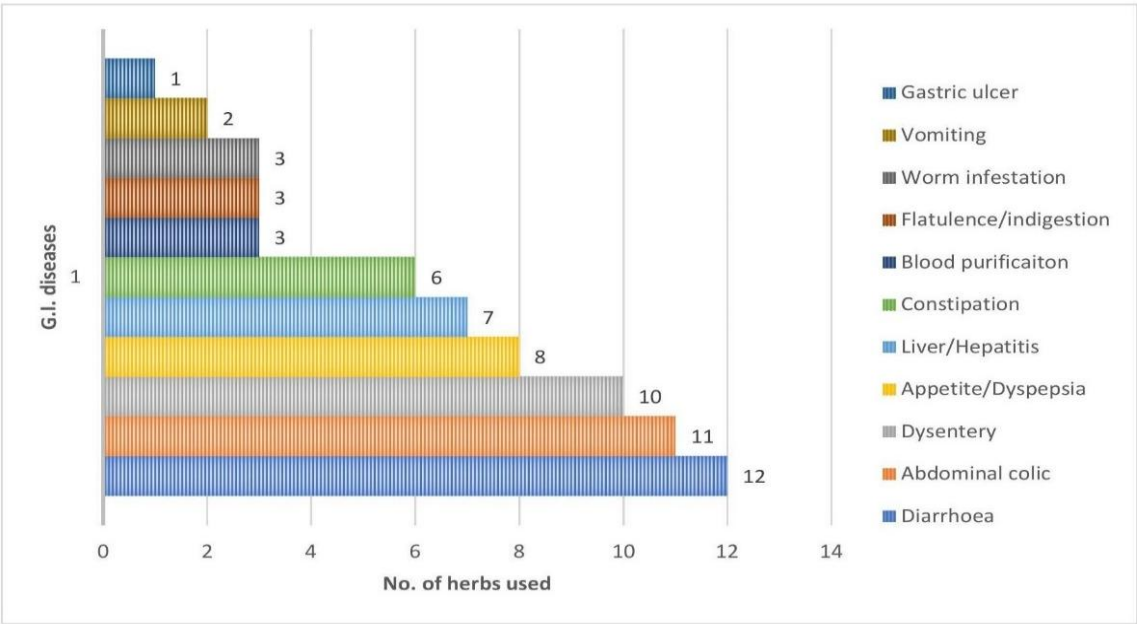


Figure 2 Different Gastro-intestinal diseases reported in the survey

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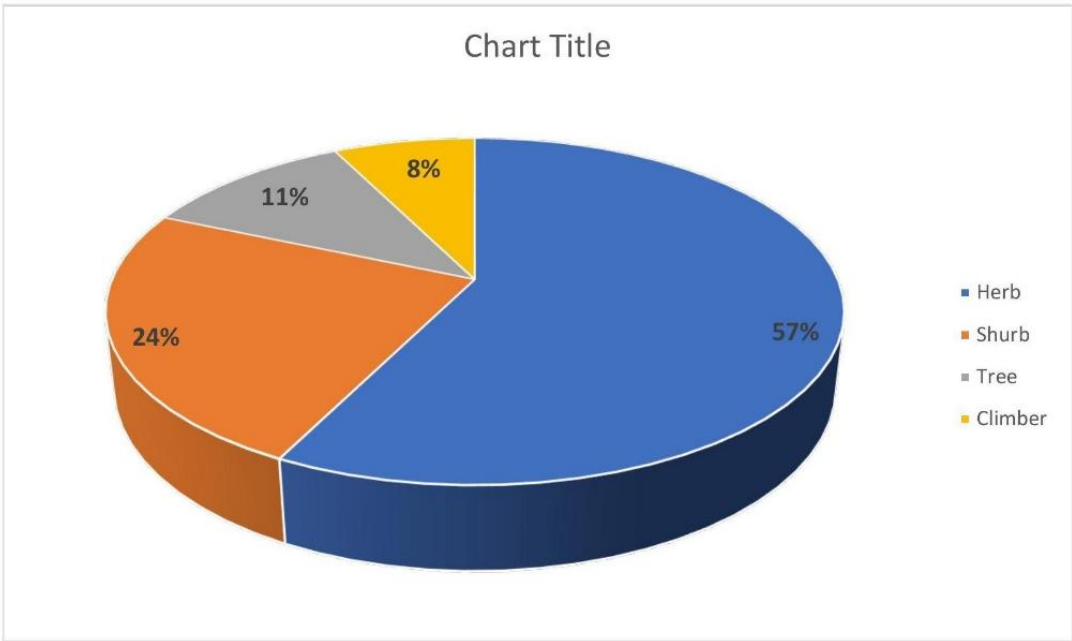


Figure 3 The percentage of habits of all he plants species in the survey

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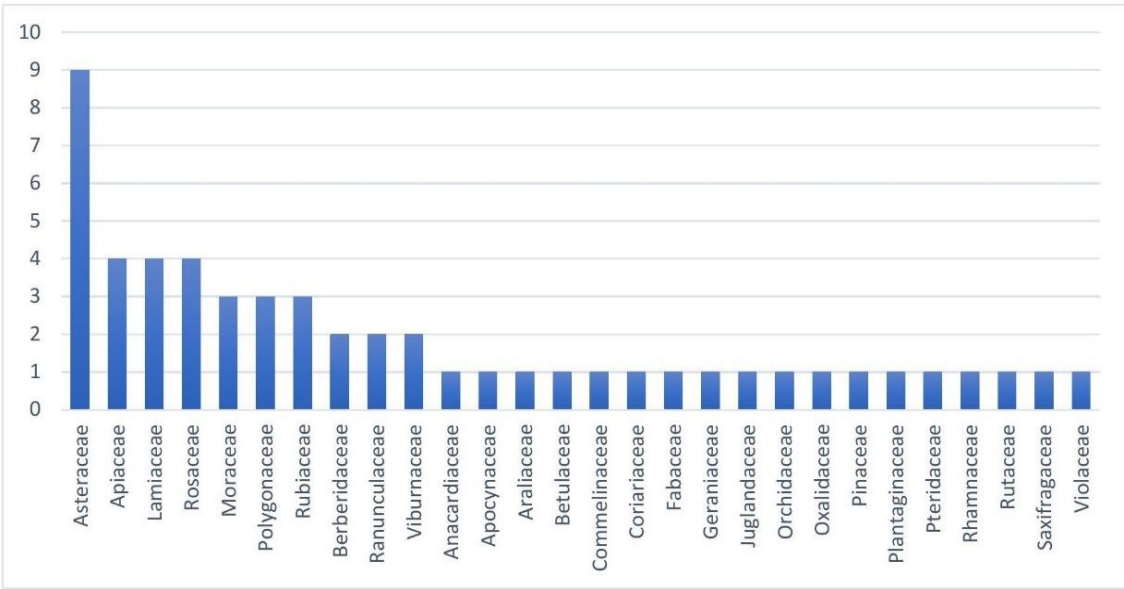


Figure 4 Dominant families with their respective number of species in Dhanaulti area, Uttarakhand

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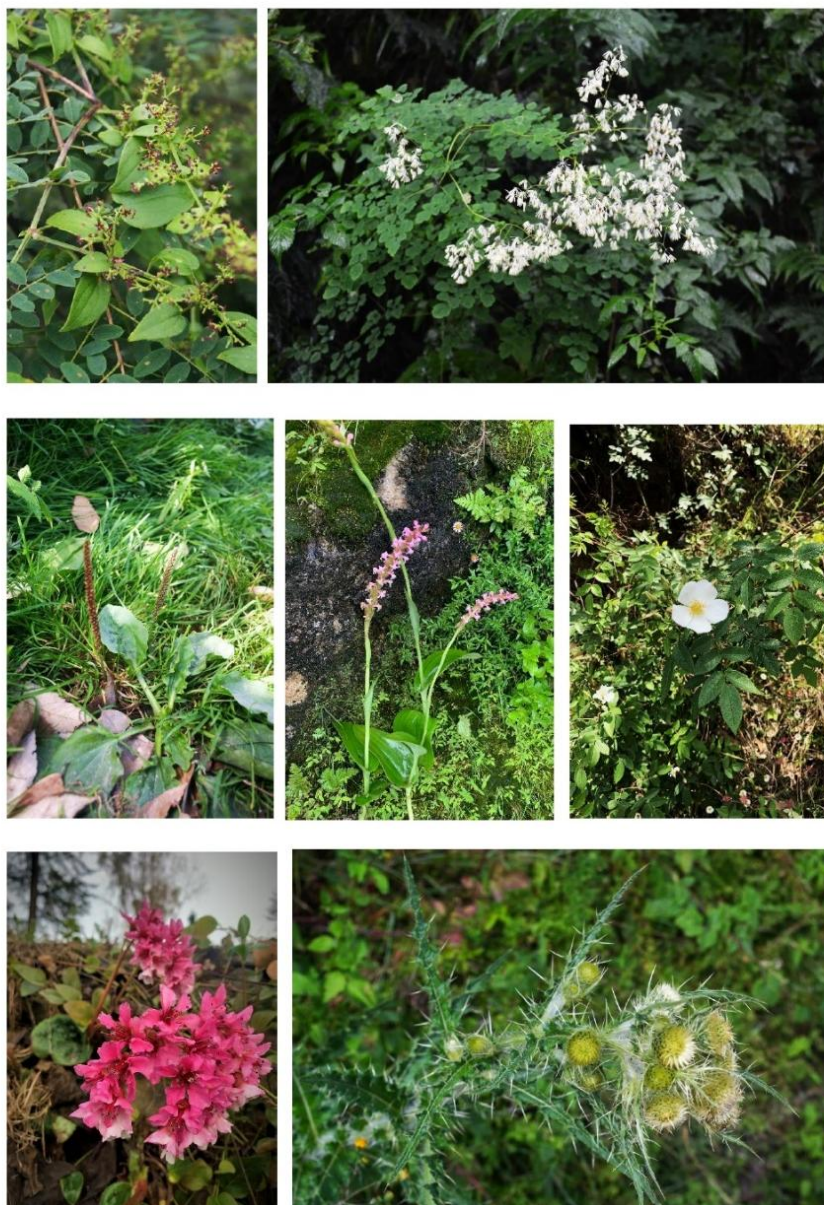


Figure 5 (A) *Rubia manjith* (B) *Thalictrum foliolosum* (C) *Plantago asiatica* subsp. *Erosa* (D) *Satyrium nepalense* (E) *Rosa brunonii* (F) *Bergenia ciliata* (G) *Cirsium falconeri* in Dhanaulti, region, Uttarakhand. Photos: Dr. Kush Pandey

Figure 5 (A) *Rubia manjith* (B) *Thalictrum foliolosum* (C) *Plantago asiatica* subsp. *Erosa* (D) *Satyrium nepalense* (E) *Rosa brunonii* (F) *Bergenia ciliata* (G) *Cirsium falconeri* in Dhanaulti, region, Uttarakhand. Photos: Dr. Kush Pandey

Table 1: Details of medicinal plants used in the management of various gastrointestinal diseases from Dhanaulty region of Western Garhwal Himalaya, Uttarakhand

Plant Family	Plant Species	Local Name	Habit	Part Used	Ethnomedicinal notes	Classical Reference
Anacardiaceae	<i>Searsia parviflora</i> (Roxb.) F.A.Barkley	Tungla, Hinsar, Tintikika	S	Fr	The fruit powder mixed with honey or buttermilk is given to manage dysentery. The powdered dried fruit is given to children and adults to expel intestinal worms. Infusion of leaves is also given in cholera.	Astringent, IBS
Apiaceae	<i>Anethum graveolens</i> L.	Sowa, Satpushpi	H	Fr	Fruits used in infusions, decoctions, or powders 1-2 grams to treat indigestion, flatulence, and abdominal discomfort.	Diarrhoea, Abdominal pain, ulcer.
Apiaceae	<i>Bupleurum falcatum</i> L.	Jangli Jeera	H	Rt	root decoction is consumed for liver, stomach disorders	No reference found
Apiaceae	<i>Bupleurum hamiltonii</i> N.P.Balacr.	Jangli-Jeera	H	Rt	root decoction is consumed for liver disorders, stomach discomfort.	No reference found
Apiaceae	<i>Pimpinella acuminata</i> (Edgew.) C.B.Clarke	Raulee	H	Wp	whole plant extract is taken with curd for diarrhoea and dysentery	No reference found
Apocynaceae	<i>Asclepias curassavica</i> L.	Laima, Kaktundi	H	Rt	root powder used to induce vomiting.	No reference found
Araliaceae	<i>Hedera nepalensis</i> K.Koch	Banda, Laguti, Lablab	C	Lf	leaf juice is given in dyspepsia.	No reference found
Asteraceae	<i>Taraxacum sect. Taraxacum</i> F.H.Wigg.	Kanphuliya, Dugdhfeni	H	Rt	Root decoction consumed early morning or taken empty stomach for the treatment of headache, migraine, hepatitis.	Appetizer, Wound healing, Antidote for poisoning
Asteraceae	<i>Artemisia capillaris</i> Thunb.	Manva, Jhirun	H	Lf	Leaves are used as bitter tonic as a decoction often mixed with pinch of black salt for worms and abdominal colic.	Deodorant, pruritis, Aphrodisiac, tonic, Aam har
Asteraceae	<i>Sonchus asper</i> (L.) Hill	Pili dudhi	H	St	the decoction prepared from stem given for blood purification, also used in Hepatitis.	No reference found

Asteraceae	<i>Myriactis nepalensis</i> Less.	Bakura	H	Lf, Ys	Leaves and young shoots are reported to be used as blood purifier	No reference found
Asteraceae	<i>Cirsium falconeri</i> (Hook.f.) Petr.	Kandaya	H	Rt	root is applied in the form of past in chest pain, also taken for constipation.	No reference found
Asteraceae	<i>Ainsliaea latifolia</i> (D.Don) Sch.Bip	Kauru	H	Lf, Rt	root is administered as decoction for abdominal colic; leaf extract used as a remedy for cough	No reference found
Asteraceae	<i>Cordiofontis peduncularis</i> (Wall. ex Nees) G.L.Nesom	Phulyan	H	Rt, Wp	plant extract used for renal stones, root powder with Luke warm water given for abdominal pain.	No reference found
Asteraceae	<i>Erigeron bonariensis</i> L.	Gujju-gha	H	Lf, St	decoction of stem and leaves used in diarrhoea and dysentery.	No reference found
Asteraceae	<i>Erigeron karvinskianus</i> DC.	-	H	Lf	decoction of leaves used in diarrhoea and menstrual problems.	No reference found
Berberidaceae	<i>Berberis aristata</i> DC.	Kingora, Tatar, Daruharidra	S	Rt, Bk	Bark and root are taken orally to treat Jaundice & menorrhagia	Eye diseases, oral disorders, anaemia,
Berberidaceae	<i>Berberis lycium</i> Royle	Kingora, Rasaut, Daruharidra	S	Rt, Bk, Sd	Decoction of Roots and bark taken for jaundice and menorrhagia. Seeds are consumed to relieve constipation.	Eye diseases, oral disorders, liver disorders
Betulaceae	<i>Alnus nepalensis</i> D.Don	Utees, Ust	T	Bk, Rt	the bark and root is used as a decoction to treat dysentery and stomach-ache.	No reference found
Commelinaceae	<i>Commelina paludosa</i> Blume	Kapla	H	Lf	the leaf extract is taken orally 2–3 times daily to treat dysentery	No reference found
Coriariaceae	<i>Coriaria nepalensis</i> Wall.	Makroli, Masuri, Gangara	S	Fr	fruits are powdered and administered in small quantity to induce vomiting	No reference found
Fabaceae	<i>Indigofera heterantha</i> Wall. Ex Brandis	Shakina, Kathi, Kathoj	S	Rt, Lf, Fl	Root or leaves decoction (prepared by boiling 10–15 g dried root in 200 ml water till reduced to half) is taken orally 2–3 times daily with black pepper or rock salt for chronic dysentery.	Abdominal disorders, Worm infestation, abdominal Distension, indigestion
Geraniaceae	<i>Geranium ocellatum</i>	Kaphlya	H	Rt	The root paste (made by crushing fresh or dried	No reference

	Jacquem. ex Cambess.				roots with a little water) is reported to be used in fever, liver disorders	found
Juglandaceae	<i>Engelhardia spicata</i> Lechen ex Blume	Gad Mahua	S	Bk, Lf	Fresh or dried leaves or bark are boiled in water to form a decoction and consumed orally for diarrhoea	No reference found
Lamiaceae	<i>Prunella vulgaris</i> L.	Kaluth	H	Wp	cold infusion of whole plant is consumed in gastritis.	No reference found
Lamiaceae	<i>Micromeria biflora</i> (Buch.-Ham. ex D.Don) Benth.	Ban ajwain	H	Lf	Fresh or dried leaves are boiled in water; a decoction is administered for abdominal colic	No reference found
Lamiaceae	<i>Salvia cana</i> Wall. ex Benth.	Ghanyajhar, Ghaniya	H	Lf	fresh leaves simmered in water given in abdominal colic.	No reference found
Lamiaceae	<i>Scutellaria scandens</i> D.Don	Kutlaphul, Kappu	H	Lf	a mild decoction of leaves given 2-3 times in dysentery and vomiting	No reference found
Moraceae	<i>Ficus auriculata</i> Lour.	Timla, Tirmul	T	Fr	A paste of ripe fruit pulp is given in small amounts (1-2 teaspoons) to promote appetite and improve gastrointestinal motility	No reference found
Moraceae	<i>Ficus semicordata</i> Buch.-Ham. ex Sm.	Khaina, Jharpati	T	Fr	Ripe figs are eaten raw, either alone or mixed into chutneys, as a light, palatable snack before meals to ignite appetite, also a health promoter	No reference found
Moraceae	<i>Ficus palmata</i> Forssk.	Bedu	T	Fr	fresh ripe fruit consumed to aid digestion and juice of fruits is taken empty stomach to ease constipation	No reference found
Orchidaceae	<i>Satyrium nepalense</i> D.Don	Salang mishri	H	Rt	warm decoction 50-100ml given 2-3 times for diarrhoea and used as general tonic 50ml daily often sweetened with some jaggery	No reference found
Oxalidaceae	<i>Oxalis corniculata</i> L.	Bhilmori, Khati-Buti, Amlalonika, Chukra	H	Lf	Leaves are also used as infusion or more popularly as chutney for loss of appetite, diarrhoea, and dysentery.	IBS, Piles, appetite, diarrhoea
Pinaceae	<i>Cedrus deodara</i> (Roxb. ex D.Don) G.Don	Deodar, Dedar	T	Bk	Decoction of the bark is administered for indigestion, abdominal distension, flatulence, and intestinal worms	Abdominal distension, Constipation, worm infestation
Plantaginaceae	<i>Plantago asiatica subsp.</i>	Lahyrya	H	Sd	Seeds soaked in water swell and become mucilaginous. Used to check loose motions and	Diarrhoea, febrile Dysentery,

	<i>erosa</i> (Wall.) Z.Yu Li				dysentery, particularly in children and elderly.	burning micturition.
Polygonaceae	<i>Rumex nepalensis</i> Spreng.	Kharura, Amly, Pahari Palak	H	Lf	decoction prepared from leaves given 100 ml twice a day for 2-3 days helps to relieve dysmenorrhea and abdominal colic	No reference found
Polygonaceae	<i>Fagopyrum tataricum</i> (L.) Gaertn.	Phaphar, Kotu	H	Sd	few seeds boiled in water strained and 50ml given twice a day to relieve colic pain	No reference found
Polygonaceae	<i>Bistorta amplexicaulis</i> (D.Don) Greene	Kutrya, Amli	H	Lf	leaf decoction with water given in dysentery	No reference found
Pteridaceae	<i>Onychium siliculosum</i> (Desv.) C.Chr.	-	H	Rt, Lf	rhizomes are cleaned crushed to prepare a decoction water given twice a day orally for diarrhoea, dysentery. Leaf juice in small dose with water is also administered for the same	No reference found
Ranunculaceae	<i>Thalictrum foliolosum</i> DC.	Mamiri, Kirmuli	H	Rt	Root decoction is given in fever and abdominal pain. A dilute root infusion used for eyewash for red and watery eye conditions.	Intermittent fever, Post fever debility, Eye diseases
Ranunculaceae	<i>Clematis b Buchananiana</i> DC.	Kanguli, Lagulia	C	Rt, St	decoction prepared by chopped root and stem often mixed with jaggery or honey given orally empty stomach relive constipation, powder of root is given with Luke warm water for gastric ulcer.	No reference found
Rhamnaceae	<i>Helinus lanceolatus</i> Brandis	Jhum Laguli, Kkukrya	S	Sd, Fr	seed and ripe fruit decoction given in dysentery.	No reference found
Rosaceae	<i>Prunus persica</i> (L.) Batsch	Aadu	T	Fr	Ripe fruit is consumed to relieve constipation, stimulate appetite and improve digestion.	Appetizer, Piles, Flatulence, Bleeding disorders
Rosaceae	<i>Rosa brunonii</i> Lindl.	Kubjak, Sewati	C	Fl	Flowers are dried and powdered and used for diarrhoea. Herbal tea prepared using flowers (petals) is helpful to treat acidity.	Aphrodisiac, astringent, Anti-diarrhoea, Mild laxative
Rosaceae	<i>Cotoneaster microphyllus</i>	Bugarchilla,	S	Lf, St,	a decoction is prepared by boiling crushed	No reference

	Wall.	Wanni		Fr	leaves/twigs in water given in diarrhoea. edible fruits.	found
Rosaceae	<i>Prinsepia utilis</i> Royle	Bekal, Dhatira	S	Fr	fleshy part of ripe fruit helpful for indigestion.	No reference found
Rubiaceae	<i>Rubia manjith</i> Roxb.	Majethi, Manjeet, Lichkuru	C	Rt, Fl	Roots decoction is widely used as blood purifier. Infusion or decoction of dried flowers is used to control dysentery often mixed with Bael fruit or Fennel.	Anti-pyretic, Blood-purifier, Piles, Diarrhoea, Detoxifying
Rubiaceae	<i>Himalrandia tetrasperma</i> (Wall. ex Roxb.) T.Yamaz.	Ghere, Bhedra	S	Fr	a more concentrated decoction of fruit is used induce vomiting.	No reference found
Rubiaceae	<i>Spermadictyon suaveolens</i> Roxb.	Padera, Padar, Mahabal, Prasami	S	Rt	Root powder or decoction 100ml given twice before meals for diarrhoea	No reference found
Rutaceae	<i>Boenninghausenia albiflora</i> (Hook.) Rchb. ex Meisn.	Pishumar, Upniya ghas	H	Rt, Lf	A water-based decoction is prepared from the leaves and consumed twice daily in small dose to relieve dysentery, vomiting	No reference found
Saxifragaceae	<i>Bergenia ciliata</i> (Haw.) Sternb.	Silphara, Pashanbheed	H	Rt	Root decoction used for indigestion, abdominal pain, flatulence.	Urinary calculi, Piles, Diseases, Abdominal lumps
Viburnaceae	<i>Viburnum cotinifolium</i> D.Don	Bhatnoi, Guya, Matyanu, TUmnllya.	S	Fr, Bk	fruits edible, a decoction of leaves or bark is given once or twice daily empty stomach for hepatic and digestive troubles	No reference found
Viburnaceae	<i>Viburnum cylindricum</i> Buch.-Ham. ex D.Don	Rashina, Kala Titmaliya	S	Fr	fruits edible, the ripe fruit is sometimes eaten raw in small quantities to relieve constipation or to support bowel regulation	No reference found
Violaceae	<i>Viola pilosa</i> Blume	Vanfsa, Kauru	H	Lf	Leaf juice given with Mishri empty stomach in jaundice.	Fever, Expectorant, Bleeding piles

Note: H="Herb" S="Shrub" T=" Tree" C=" Climber" Rt=" Root" St=" Stem" Bk=" Bark" Lf=" Leaf" Fl=" Flower" Fr=" Fruit" Sd=" Seed" Wp=" Whole plant"

CONCLUSION

The present study highlights the rich ethnomedicinal knowledge possessed by local communities regarding the use of medicinal plants in the treatment of various gastrointestinal disorders, including diarrhoea, dysentery, abdominal colic, loss of appetite, dyspepsia, liver ailments (including hepatitis), constipation, blood purification, flatulence, worm infestations, nausea, and gastric ulcers. Due to the limited availability and accessibility of modern healthcare facilities, local populations continue to rely on traditional healers, considering their remedies safe, accessible, and cost-effective. However, increasing urbanization marked by infrastructural development and migration of younger generations to urban centres for education and employment has led to a gradual erosion of this traditional knowledge. This underscores the urgent need to systematically document these medicinal plants and their traditional uses while the knowledge still resides with a few remaining informants. Furthermore, the findings not only contribute to the expansion of the Ayurvedic Materia Medica but also offer valuable leads for future phytochemical and pharmacological investigations aimed at validating the generated data.

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