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## Traditional medicinal plants used by the tribes of Bhadradi Kothagudem district, Telangana - for dysentery and diarrhoea

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### Abstract

An ethno-medico botanical survey of plants used in the treatment of Dysentery and diarrhoea of Bhadradi Kothagudem district, Telangana was conducted. Dysentery and diarrhoea are common and age-old problems among the humans and cattle in the tropics. The traditional medicinal plants for dysentery and diarrhoea that is in practice among the tribes *Konda Reddi*, *Koyas*, etc. in Bhadradi Kothagudem district of Telangana, is presented. Forty four plant species used for gastroenteric problems belonging to 30 families, representing 44 genera of *Magnoliophyta* have been reported. These include 41 dicots and 3 monocots; 34 native and 10 exotic species; 22 trees, 10 shrubs, 2 climber and 10 herbs; and 7 unknown and 37 known remedies.

**Keywords:** Medicinal plants, Ethnogastronomy, Antidysenteric Activity, Antidiarrhoeal Activity, Telangana, *Konda Reddi* Tribe, *Koyas* Tribe, Tribes

### Introduction

Plants have many direct or indirect links with tribal life particularly on the economical front. Tribals of the study area commonly use many plant parts for food, medicine, fibre, oil, gum, resins, tribal craft and other miscellaneous uses. Herbalists or traditional healers from these groups frequently use many plant parts in the treatment of different routine body ailments where diarrhoea, a condition of having frequent loose or liquid bowel movements, is one of them. Acute diarrhoea is a common cause of death in developing countries and the second most common cause of infant deaths worldwide (Anonymous 2004) [1].

*Dysentery* is primarily a disease of humans and animals in the tropics known since ancient times and is leading causes of child and adult mortality. It is the inflammation of mucus membrane and glands of large intestine, resulting in painful diarrhoea. It is characterized by the frequent passage of faeces with mucus and blood. It may lead to severe intestinal problem with bloody diarrhoea. Vomiting and fever may accompany it; there may be abdominal cramps and pain on defecation. The common cause of dysentery is contaminated food and water supplies. Dysentery is common where the sanitation is sought or poor. Bacteria (*Pasteurella multocida*, *Mycobacterium paratuberculosis*, *Escherichia coli*, etc.) viruses (Bovine viral diarrhoea, Foot and mouth disease, etc.), parasites (protozoa like *Coccidia*, helminths like *Ascaris*, tapeworms like *Monezia*, etc.) and nutritional factors cause dysentery in animals, including humans. The most common ailments are bacillary and amoebic dysentery. The bacillary dysentery (*Shigellosis*) is caused by a group of four bacterial species *Shigella boydii*, *S. dysenteriae*, *S. flexneri* and *S. sonnei*. Of these, *S. dysenteriae* type 1 causes epidemic dysentery while *S. sonnei* is the mildest. The amoebic dysentery or *amoebiasis* is caused by protozoan parasite, *Entamoebahistolitica*, which is less severe but can be troublesome when it becomes chronic. The enteropathogenic *Escherichia coli*, *Salmonella enteritidis* and *Salmonella typhi* are also of concern to humans.

India has vast resources of medicinal plants. The use of the plants as medicine is nothing new but according to an estimate there are more than 25000 effective herbal formulations exist in the country (Brahmavarchasva, 2005 and Aneesh, 2009) [3, 2]. But many of them are unwritten. Ahead to this it can be said that each time a tribal medicine man dies, it is as if a library has burned down so there is urgent need of documentation of native knowledge of the before its extinction forever.

Despite of fair scope to achieve great global share in the market of medicinal and aromatic plants, India is lagging behind in world trade and is ranked third in the herbal medicine category.

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This emphasizes a great need of scientific backup in validation of existing formulations. To cater to this, such studies and their compilations is becoming popular. Studies of Mahajan and Mishra 2006; Singh and Mall, 2007; Kar and Borthakur, 2008; Das *et al.*, 2008; and Ray *et al.*, 2011 [10, 18, 9, 5, 15] are examples of this. The selected area of study was also explored in some studies (Raju and Reddy, 2005) [13]. The present study is an attempt to collect the information and documentation of the use of plants to treat diarrhoea by local tribes of Bhadradi Kothagudem district, Telangana.

The available antimicrobial drugs are often ineffective as the causative organisms are increasingly turning resistant. So, a search for newer drugs is on. One potential source for new bioactive compounds is plants; humans know plants as medicines at least from the Middle Palaeolithic age (some 60,000 years ago). So, one such means for the drug discovery is *ethnomedicine*. Ethnomedicine used against dysentery for humans and animals are not generally the same. Recently, the available global information on the ethnomedicinal plants has been compiled and the ethno medicinal plants for the treatment of dysentery and diarrhoea were studied in Congo (Otshudi *et al.*, 2000) [12]. Not much information on ethnomedicinal study in Telangana on antidiarrhoeal/antidysenteric plants exists (Ramarao and Henry, 1996; Reddy *et al.*, 1998; Jain, 1999) [14, 16, 7]. So, an attempt was made to record the ethnomedicine for dysentery and diarrhoea in humans and cattle, in vogue in old Khammam (Reddy, 2002) [17] and new Bhadradi Kothagudem district of Telangana (Srivasa Reddy, 2022) [19].

#### Study area

Bhadradi Kothagudem district lies in Telangana between 16° 45' and 17° 55' N latitude and 79° 47' and 80° 47' E longitudes. It is contiguous with Chattisgarh and Andhra

Pradesh states in the North and spread over an area of 7483sq km. As per 2001 census, it has a population of 1069261 with 80% rural population. Achuthapuram, Aswaraopet, Bhadrachalam, Edugaraallapalli, Kalleru, Kunavarum, Moddulgudem, Mothugudem, Palwoncha, Reddigudem, Sukkumamidi and Vinayakapuram areas were covered.

Half of the land in Bhadradi Kothagudem district is under forests and most of it is of reserve category. The district has four forest divisions, North and South Bhadrachalam, Kothagudem and Paloncha. The region receives a rainfall between 1045 mm with the altitude varying from 100-800 m. The mean temperature is 10-45 °C. The forest is largely of dry deciduous type. *Koya*, *Konda Reddi*, *Erukala* and *Lambada* are major schedule tribes. *Erukala* and *Lambada* tribes are largely confined to non-forest areas and plains. The northern region of the district along the Godavari valley has the forests and native tribal inhabitations coexisting. These landscapes fall under the *Koya*, *Konda Reddi* Region of Ethnic India.

#### Methodology

The ethnomedicinal survey included repeated interviews with aged (above 35 years) tribal people, owners of cattle herds, herbal healers, etc. in different seasons for two consecutive years.

#### Observations

The sorted information on ethnomedicine employed for dysentery and/or diarrhoea in Bhadradi Kothagudem district by the local tribal inhabitants and herbal practitioners is presented under alphabetically arranged scientific names of plants, name of the family, vernacular name in Telugu (also the language of the *Koyas* and *Konda Reddis*), and the place of collection/practice and their medicinal uses are presented in Table.1.

**Table 1:** Systematic enumeration of crude drugs for dysentery and/or diarrhoea

S. No	Scientific Name	Family	V.Name	Place	Medicinal uses
1	<i>Acalypha hispida</i>	Euphorbiaceae	Kuppinta	Mothugudem	Flower of this plant are used in diarrhea by <i>Konda Reddis</i> .
2	<i>Acacia arabica</i> L.	Leguminosae	<i>Thumma</i>	Mothugudem	Leaf sap with whey or two beans of plant can eat with whey by <i>KondaReddis</i> .
3	<i>Achyranthes aspera</i> L.	Amaranthaceae	<i>Uttareni, apamargamu</i>	Mothugudem	Root Simple strapping of small piece of root on the wrist is believed to check diarrhea by <i>Konda Reddis</i> .
4	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	<i>Maredu.</i>	Mothugudem	Fruit pulp (1 teaspoon) administered twice daily for 2 days by <i>Konda Reddis</i> .
5	<i>Ailanthus excelsa</i> Roxb.	Meliaceae	<i>Peddamaanu</i>	Vinayakapuram	Stem bark extract (50 ml) administered once daily for 3 days by local Vaidyas. Stem bark powder is mixed with <i>kadugu</i> (in rice wash) by <i>Koyas</i> .
6	<i>Allophylus cobbe</i> (L.) Raeusch.	Sapindaceae	<i>Gajuchettu</i>	Vinayakapuram	Root decoction (12 ml) administered daily thrice for two days by <i>Koyas</i> .
7	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees.	Acanthaceae	<i>Nelemu, Kanduvepa</i>	Achuthapuram	Roots crushed with that of <i>Sugandhipala</i> ( <i>Hemidesmus indicus</i> L. (Each 10 gm) and 2 garlic cloves ( <i>Allium sativum</i> ), made into pills (seed size of Jowar) and administered 3 times a day by <i>Konda Reddis</i> .
8	<i>Anogeissus acuminata</i> (Roxb. ex DC.) Guill. & Perr.	Combretaceae	<i>Pasi, Paachichettu</i>	Vinayakapuram	Tender shoots (about one dozen) chewed and the sap swallowed by <i>Koyas</i> .
9	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	<i>Panasa</i> . Jack fruit	Bhadrachalam	Unripe fruits eaten as recommended by local Vaidyas.
10	<i>Barringtonia acutangula</i> (L.) Gaert.	Barringtoniaceae	<i>Nirukanki</i>	Achuthapuram	Leaf juice (2 glasses) administered orally by <i>Nayaks</i> for dysentery in cattle.
11	<i>Bauhinia racemosa</i> Lam.	Caesalpiniaceae	<i>Are, Chinna are</i>	Edugaraallapalli	Stem bark (10-12 gm) paste administered twice a day by <i>KondaReddis</i>
12	<i>Bixa orellana</i> L.	Bixaceae	<i>Jabaru kaya</i>	Aswaraopet	Seed pulp (2 gm) administered twice a day by

					local Vaidyas
13	<i>Bridelia airyshawii</i> P.T. Li ( <i>B. retusa</i> (L.) Spreng.)	Euphorbiaceae	<i>Anepuchettu, Koramaddi, Koramanu, Koramattachettu, Kummarichetti</i>	Murmooru	Stem bark crushed with those of <i>Terminalia bellerica</i> (equal proportions) and the prepared is paste administered (of red gram size) once daily for 3 days by <i>Koyas</i> .
14	<i>Canthium parviflorum</i> Lam.	Rubiaceae	<i>Balsu</i>	Kunavarum	Unripened fruits eaten as recommended by local <i>Vaidyas</i> . Root bark decoction (a spoon a day for 3 days) for dysentery in infants is given by <i>Jatapus</i> and <i>Savaras</i> .
15	<i>Cassia auriculata</i> L.	Caesalpiniaceae	<i>Tangedu</i>	Palwoncha	Anthers (5 gm) is administered twice daily for 2 days by <i>Koyas</i> .
16	<i>Cassia fistula</i> L.	Caesalpiniaceae	<i>Rela</i>	Kunavaram	Stem bark (25 gm) crushed with 5 pepper grains and the prepared extract is administered once daily for 3 days by local <i>Vaidyas</i> .
17	<i>Ceiba pentandra</i> (L.) Gaertner	Bombacaceae	<i>Tellaburuga, Kapok</i>	Palwoncha	Stem bark extract (4 teaspoons) administered twice daily for two days by <i>Koyas</i> .
18	<i>Celosia argentea</i> L. var. <i>cristata</i> (L.) O. Kuntze	Amaranthaceae	<i>Seetammajeda</i>	Moddulgudem	Seed decoction (3-4 teaspoons) is administered twice daily for 2 days.
19	<i>Commelina diffusa</i> Burm.f.	Commelinaceae	<i>Adavienadri</i>	Sukkumamidi	Leaf decoction (two teaspoons) is administered twice daily for 2 days by <i>Konda Reddis</i> .
20	<i>Curcuma amada</i> Roxb.	Zingiberaceae	<i>Mamidiallam</i>	Sukkumamidi	The rhizome powder is taken with jaggery for diarrhea by <i>Konda Reddis</i> .
21	<i>Diospyros melanoxyloides</i> Roxb.	Ebenaceae	<i>Tuniki, Tunnikchetti</i>	Vinayakupuram	Tender shoots (10 Nos) are chewed and the sap is swallowed by <i>Koyas</i> .
22	<i>Erythroxylum monogynum</i> Roxb.	Erythroxylaceae	<i>Devadari</i>	Edugaraallapalli	Stem bark paste (4 g) administered daily twice for two days by <i>Koyas</i> .
23	<i>Ficus Glomerta</i> Roxb.	Moraceae	<i>Brahma Mamidi, Attimaaram</i>	Vinayakupuram	The stem bark decoction is given in case of diarrhea by <i>Koyas</i> .
24	<i>Hedyotis corymbosa</i> (L.) Lam.	Rubiaceae	<i>Tikkchetti</i>	Achuthapuram	Whole plant decoction (4 teaspoons) is administered thrice a day by local <i>Vaidyas</i> .
25	<i>Helicteres sisora</i> L.	Sterculiaceae	<i>Adavichamanthi, Naarachamanthi, Nultada</i>	Kalleru	Root paste (5 gm) mixed with 15 ml of water is administered twice daily for 2 days to infants by <i>Koyas</i> .
26	<i>Madhuca indica</i> J. Gmel. <sup>[19]</sup>	Sapotaceae	<i>Ippchetti</i>	Edugaraallapalli	Stem bark along with those of <i>Bridelia montana, Dalbergia latifolia</i> and <i>Oroxylum indicum</i> (1:1:1) crushed and the extract (12 gm) is administered 4 times a day for dysentery in cattle by <i>Konda Reddis</i> .
27	<i>Manilkara hexandra</i> (Roxb.) Dubard	Sapotaceae	<i>Peddapala</i>	Kalleru	Stem bark decoction (5 teaspoons) administered twice daily for 2 days by <i>Konda Reddis</i> .
28	<i>Manilkara zapota</i> (L.) P. Royen	Sapotaceae	<i>Sapota</i>	Achutapuram	Unripe fruits eaten as recommended by local <i>Vaidyas</i> .
29	<i>Melochia corchorifolia</i> L.	Sterculiaceae	<i>Gubatada</i>	Achutapuram	Whole plant decoction (3 teaspoons) administered thrice a day by local <i>Vaidyas</i> .
30	<i>Mucuna pruriens</i> L.	Fabaceae	<i>Dhula gondi</i>	Sukkumamidi	The aqueous root paste is taken twice a day for two days by <i>Konda Reddis</i> .
31	<i>Musa rosacea</i> Jacq.	Musaceae	<i>Adaviarati</i>	Sukkumamidi	Root extract (2 glasses) is administered orally for dysentery in cattle by local <i>Vaidyas</i> .
32	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz	Bignoniaceae	<i>Bapana, Naga dundilamu, Pumpena</i>	Palwoncha	Root bark (5-6 teaspoons) decoction is administered twice daily for three days by local <i>Vaidyas</i> .
33	<i>Oxalis corniculata</i> L.	Oxalidaceae	<i>Pulichinta</i>	Achuthapuram	Leaf juice (3 teaspoons) is administered twice daily for 2 days by local <i>Vaidyas</i> .
34	<i>Pavonia zeylanica</i> (L.) Cav.	Malvaceae	<i>Karubenda</i>	Achuthapuram	Root decoction (4 teaspoons) is administered twice daily for 2 days by local <i>Vaidyas</i> .
35	<i>Punica granatum</i> L.	Punicaceae	<i>Danimma</i>	Kalleru	Extract of fruit epicarp (20-25 ml) is administered twice a day by local <i>Vaidyas</i> .
36	<i>Rumex vesicarius</i> L.	Polygonaceae	<i>Chukka koora</i>	Achuthapuram	Leaf juice (3 teaspoons) is administered once daily, till cure by local <i>Vaidyas</i> .
37	<i>Strychnos nux-vomica</i> L.	Lopganiaceae	<i>Musti</i>	Vazeedu	Stem bark extract (1 teaspoon) is administered with honey twice daily for 2 days for dysentery by <i>Koyas</i> .
38	<i>Stereospermum colais</i> (Dillwyn) Mabb.	Bignoniaceae	<i>Gollchetti, Kala gotti, Kala goru</i>	Reddigudem	Stem bark paste (2 teaspoons) is administered twice daily for two days by <i>Konda Reddis</i> .
39	<i>Taccaleantho petaloides</i> (L.) O. Kuntze	Taccaceae	<i>Adavikanda</i>	Kunavarum	Boiled rootstock (10-15 gm) is administered with jaggery daily thrice a day by <i>Konda Reddis</i> .
40	<i>Terminalia catappa</i> L.	Combretaceae	<i>Badam</i>	Chintur	Stem bark decoction (250 ml) is administered twice a day by local <i>Vaidyas</i> for dysentery in cattle.
41	<i>Terminalia chebula</i> Retz.	Combretaceae	<i>Karakkaya</i>	Chintur	Fruit powder (12 gm) is administered twice a day by <i>Konda Reddis</i> .
42	<i>Trichosanthes</i>	Cucurbitaceae	<i>Potla kaya</i>	Mandalapalli	Root decoction (3 teaspoons) is administered with



	<i>anguina</i> L.				sugar thrice daily for 2 days by local <i>Vaidyas</i> .
43	<i>Xanthium indicum</i>	Asteraceae	Marulu tige	Vazeedu	The root decoction mixed with black pepper 2gm is taken orally a day by <i>Koyas</i> .
44	<i>Ziziphus oenoplia</i> (L.) Miller	Rhamnaceae	<i>Pariki, Mulla rengu</i>	Kunavarum	Fruits are eaten by local tribes. Use of stem bark decoction (5 teaspoonful a day till cure) for dysentery by <i>Konda Reddis</i> and <i>Valmikis</i>

### Discussion and Conclusion

Acute amoebic dysentery is associated with abdominal pain, tenesmus and bloody mucoid stools. Chronic amoebic dysentery usually presents itself with vague symptoms of anorexia, abdominal pain and intermittent diarrhoea or constipation. Amoebiasis can be intestinal, extra-intestinal and hepatic. *Kurchi/Kutaja* (*Holarrhena antidysenterica* Wall.) bark (with 2% alkaloid) is useful in intestinal amoebiasis. Chloroquine is used for extra-intestinal amoebiasis. Although Metronidazole is the drug of choice, emetine hydrochloride or dehydroemetine are used for hepatic amoebiasis. The amoebicide, emetine, is an alkaloid obtained from the root of *Cephaelisipe cacuanha* (Brot.) A. Rich. Diarrhoea, the frequent discharge of watery stools, as per pathophysiology can be osmotic, secretory, deranged intestinal mobility; altered mucosal morphology, food allergy, drug-induced, and is neurological and endocrine disease. In developing countries, bacteria in adults and *E. coli* in infants usually cause diarrhoea. In the developed countries, diarrhoea is viral; so antibiotic therapy for it is of no use. The powdered roots of *Kutaja* are used for ages as household remedy for abdominal pain and diarrhoea in India. Nutmeg (*Myristica fragrans* Houtt.) with ginger (*Zingiber officinale* Rosc.) and ghee is a household remedy against diarrhoea in India. *Shigellosis* responds to co-trimoxazole to tetracycline. *Lactobacillus* (probiotic) promotes recovery from rotavirus diarrhoea and reduces the incidence of antibiotic induced diarrhoea in children.

*Ethno gastroenterology* is the study of treatment of intestinal problem using ethnic or traditional medicine. Aesculetin from *Fraxinus rhynchophylla* Hemsl. Is effective against dysentery. Andrographolide from *Andrographis paniculata* Wall. Ex Nees, berberine from *Berberis vulgaris* Linn. And hemsleyadin from *Helmsleya amabilis* Diels. Are excellent medicine for bacillary dysentery, which have an ethnobotanical origin (Fabricant and Farnsworth, 2001)<sup>[6]</sup>. Ethnobotanical surveys and literature review revealed 408 plants that are used in Guatemala for the treatment of gastrointestinal disorders. Of 84 of plant species, 34 have been reported to inhibit one or more of the enterobacteria (Caceres *et al.*, 1993)<sup>[4]</sup>. These results indicate a scientific basis for use of these medicinal plants for attacking enterobacterial infections in humans. Gastrointestinal disorders are a major problem in Andhra Pradesh. According to one estimate, 40% of the people suffer from it. Twenty six antidiysentricals from the eastern Ghats of Andhra Pradesh have been reported earlier (Ramarao N & Henry, 1996)<sup>[14]</sup>. Six *Magnoliophyta* (*Asparagus racemosus*, *Bytneria herbacea*, *Clitoria ternatea*, *Dioscorea bulbifera*, *Mimosa pudica* and *Ziziphus oenoplia*) were reported as the ethnoveterinary medicine for dysentery from the adjacent Warangal district of Telangana<sup>[16]</sup>. Later, 58 plant species for dysentery and 70 plants for diarrhoea in animals have been reported<sup>[7]</sup>.

In the present study, 44 *Magnoliophyta* are recorded which offer biomolecules from traditional medicine for the gastrointestinal problems of humans and cattle. Usually, single plant drug is used except in two cases for dysentery

(roots of *Andrographis paniculata* wall. Ex Nees with that of *Hemidesmus indicus* R. Br.; stem bark of *Madhuca indica* J. F. Gmel. (Srinivasa Reddy, 2022)<sup>[19]</sup> With that of *Bridelia montana* Willd., *Dalbergia latifolia* Roxb. and *Oroxylum indicum* Vent.). The medicines have come from stem bark (12), roots (8), fruits (8), leaves (7), whole plant (3), tender shoots (2), seeds (2), root bark (1) and flower (1). Plant species represent, 44 genera, 43 *Magnoliopsida* (39 dicot families) and 4 *Liliopsida* (3 monocot families), 34 native species and 10 exotics, and 22 trees (4 small), 10 herbs, 10 shrubs and 2 climber. The tribes depend (57%) on trees for their herbal drugs. The ethnic region still has relatively less disturbed forests with minor exodus from the exotic invasions. Besides, there are 30 plant species recorded here which were not listed by Johnson 1999<sup>[8]</sup> that has an entry of 28,659 ethnobotanical plants (607 and 629 entries each for dysentery and diarrhoea, respectively). Even among the 14 known ethnic uses (7 used for dysentery and diarrhoea, 3 for dysentery and 4 for diarrhoea), treatment (dosage), drug composition and source of drug (plant part) are usually different in the present case. This suggests that there is difference in the ethnomedicine from both locale and tribe-wise. Variations and differences of knowledge and practices exist between different communities and sites (Ong and Nordiana, 1999)<sup>[11]</sup>. So, there is a need to document ethnomedicinal information from every locale and tribe from all over the ethnic globe.

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