

## Ethnomedicine for dysentery and diarrhoea from Khammam district of Andhra Pradesh

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Dysentery and diarrhoea are common and age-old problems among the humans and cattle in the tropics. As a lead for new drug discovery, the ethnomedicine for dysentery and diarrhoea that is in practice among the tribes *Konda Reddi*, *Koyas*, etc. in Khammam district of Andhra Pradesh, is presented. Thirty seven plant species used for gastroenteric problems belonging to 28 families, representing 34 genera of *Magnoliophyta* have been reported. These include 34 dicots and 3 monocots; 28 native and 9 exotic species; 21 trees, 6 shrubs, 1 climber and 9 herbs; and 23 unknown and 14 known remedies.

**Keywords:** Ethnogastronomy, Antidysenteric Activity, Antidiarrhoeal Activity, Andhra Pradesh, Ethnomedicine, *Konda Reddi* Tribe, *Koyas* Tribe, Tribes

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*Dysentery* is primarily a disease of humans and animals in the tropics known since ancient times. 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, *Entamoeba histolytica*, which is less severe but can be troublesome when it becomes chronic. The enteropa-

thogenic *Escherichia coli*, *Salmonella enteritidis* and *Salmonella typhi* are also of concern to humans.

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,<sup>1</sup> and the ethnomedicinal plants for the treatment of dysentery and diarrhoea were studied in Congo.<sup>2</sup> Not much information on ethnomedicinal study in Andhra Pradesh on antidysenteric/antidiarrhoeal plants exists.<sup>3-5</sup> So, during 1999-2001, an attempt was made to record the ethnomedicine for dysentery and diarrhoea in humans and cattle, in vogue in Khammam district of Andhra Pradesh.<sup>6</sup>

### Study area

Khammam district lies in Telangana region of Andhra Pradesh (Fig. 1) between 16° 45' and 18° 35' N latitude and 79° 47' and 80° 47' E longitudes. It is contiguous with Chattisgarh and Orissa states in the North and spread over an area of 16029 sq km. As per 1991 census, it has a population of 1215809 with 80%

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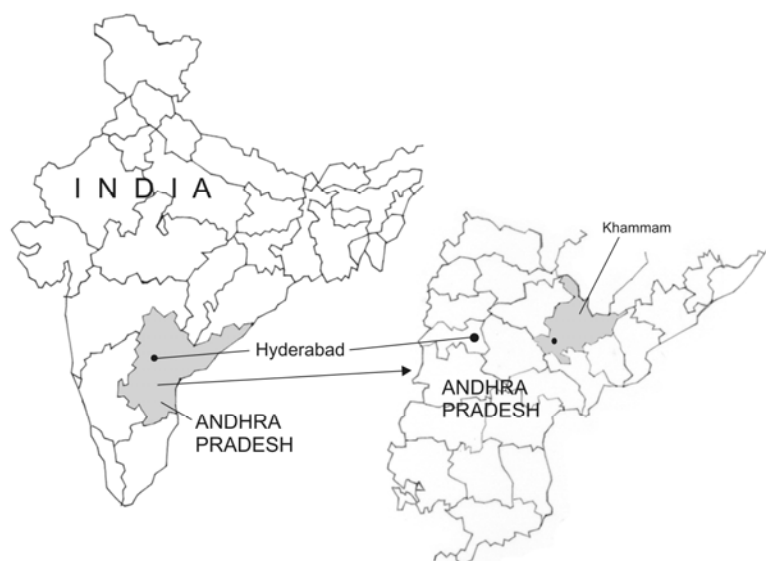


Fig. 1 Location Map of Khammam District, Andhra Pradesh

rural population. Achuthapuram, Aswaraopet, Bhadrachalam, Chintoor, Edugaraallapalli, Kalleru, Kunavarum, Moddulagudem, Mothugudem, Palwoncha, Reddigudem, Sattupalli, Sukkumamidi and Vinayapuram areas were covered.

Half of the land in Khammam district is under forests and most of it is of reserve category. The district has five forest divisions, North and South Bhadrachalam, Khammam, Kothagudem and Paloncha. The region receives a rainfall between 800-1200 mm with the altitude varying from 100-800 m. The mean temperature is 15°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) ethnic 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 Khammam district by the local tribal inhabitants and herbal prac-

tioners is presented under alphabetically arranged scientific names of plants (those marked with asterisk are new records), name of the family (within parentheses), vernacular name in Telugu (also the language of the Koyas and Konda Reddis), and the place of collection/practice, and ethnomedicinal uses. All the plant collections are deposited at Kakatiya University Herbarium (KUH).

1 *Aegle marmelos* (L.) Correa (Rutaceae)

Vernacular name: *Maredu*. Mothugudem.

Ethnomedicinal uses: Fruit pulp (1 teaspoon) administered twice daily for 2 days by *Konda Reddis*.

2 \**Ailanthus excelsa* Roxb. (Meliaceae)

Vernacular name: *Pedda maanu*. Chintoor.

Ethnomedicinal uses: Stem bark extract (50 ml) administered once daily for 3 days by local Vaidyas. Stem bark powder is mixed with *kadugu* (in rice wash) by *Koyas*.<sup>3</sup>

3 \**Allophylus cobbe* (L.) Raeusch. (Sapindaceae)

Vernacular name: *Gaju chettu*. Vinayapuram.

Ethnomedicinal uses: Root decoction (12 ml) administered daily thrice for two days by *Koyas*.

4 *Andrographis paniculata* (Burm.f.) Wall. ex Nees (Acanthaceae)

Vernacular name: *Nelemu*, *Kandu vepa*. Achuthapuram.

Ethnomedicinal uses: Roots crushed with that of *Avu sugandhipala* (*Hemidesmus indicus* L. (Each 10 gm) and 2 garlic cloves (*Allium sativum*), made into

pills (seed size of Jowar) and administered 3 times a day by *Konda Reddis*.

5 \**Anogeissus acuminata* (Roxb. ex DC.) Guill. & Perr. (Combretaceae) Vernacular name: *Pasi, Paachi chettu*. Chintoor.

Ethnomedicinal uses: Tender shoots (about one dozen) chewed and the sap swallowed by *Koyas*.

6 *Artocarpus heterophyllus* Lam. (Moraceae)

Vernacular name: *Panasa*. Jack fruit. Bhadrachalam.

Ethnomedicinal uses: Unripe fruits eaten as recommended by local *Vaidyas*.

7 \**Barringtonia acutangula* (L.) Gaert. (Barringtoniaceae)

Vernacular name: *Niru kanki*. Achuthapuram.

Ethnomedicinal uses: Leaf juice (2 glasses) administered orally by *Nayaks* for dysentery in cattle.

8 \**Bauhinia racemosa* Lam. (Caesalpiniaceae)

Vernacular name: *Are, Chinna are*. Edugaraallapalli.

Ethnomedicinal uses: Stem bark (10-12 gm) paste administered twice a day by *Konda Reddis*.

9 *Bixa orellana* L. (Bixaceae)

Vernacular name: *Jabaru kaya*. Aswaraopet.

Ethnomedicinal uses: Seed pulp (2 gm) administered twice a day by local *Vaidyas*.

10 \**Bridelia airy-shawii* P.T. Li (*B. retusa* (L.) Spreng.) (Euphorbiaceae) Vernacular name: *Anepu chettu, Kora maddi, Kora manu, Kora matta chettu, Kummari chettu*. Murmooru.

Ethnomedicinal uses: Stem bark crushed with those of *Terminalia bellerica* (equal proportions) and the prepared is paste administered (of red gram size) once daily for 3 days by *Koyas*.

11 \**Canthium parviflorum* Lam. (Rubiaceae)

Vernacular name: *Balsu*. Kunavarum.

Ethnomedicinal uses: Unripened fruits eaten as recommended by local *Vaidyas*. Root bark decoction (a spoon a day for 3 days) for dysentery in infants is given by *Jatapus* and *Savaras*.<sup>3</sup>

12 \**Cassia auriculata* L. (Caesalpiniaceae)

Vernacular name: *Tangedu*. Palwoncha.

Ethnomedicinal uses: Anthers (5 gm) is administered twice daily for 2 days by *Koyas*.

13 *Cassia fistula* L. (Caesalpiniaceae)

Vernacular name: *Rela*. Kunavaram.

Ethnomedicinal uses: Stem bark (25 gm) crushed with 5 pepper grains and the prepared extract is administered once daily for 3 days by local *Vaidyas*.

14 \**Ceiba pentandra* (L.) Gaertner (Bombacaceae)

15 Vernacular name: *Tella buruga*, Kapok. Palwoncha.

Ethnomedicinal uses: Stem bark extract (4 teaspoons) administered twice daily for two days by *Koyas*.

16 *Celosia argentea* L. var. *cristata* (L.) O. Kuntze (Amaranthaceae) Vernacular name: *Seetamma jeda*. Moddulgudem.

Ethnomedicinal uses: Seed decoction (3-4 teaspoons) is administered twice daily for 2 days.

17 \**Commelina diffusa* Burm.f. (Commelinaceae)

Vernacular name: *Adavi enaadri*. Sukkumamidi.

Ethnomedicinal uses: Leaf decoction (two teaspoons) is administered twice daily for 2 days by *Konda Reddis*.

18 \**Diospyros melanoxylon* Roxb. (Ebenaceae)

Vernacular name: *Tuniki, Tunnika chettu*. Chintoor.

Ethnomedicinal uses: Tender shoots (10 Nos) are chewed and the sap is swallowed by *Koyas*.

19 \**Erythroxylum monogynum* Roxb. (Erythroxylaceae)

Vernacular name: *Devadari*. Edugaraallapalli.

Ethnomedicinal uses: Stem bark paste (4 g) administered daily twice for two days by *Koyas*.

20 \**Hedyotis corymbosa* (L.) Lam. (Rubiaceae)

Vernacular name: *Tikka chettu*. Achuthapuram.

Ethnomedicinal uses: Whole plant decoction (4 teaspoons) is administered thrice a day by local *Vaidyas*.

21 *Helicteres isora* L. (Sterculiaceae)

Vernacular names: *Adavi chamanthi, Guba tada, Naara chamanthi, Nul tada* Kalleru.

Ethnomedicinal uses: Root paste (5 gm) mixed with 15 ml of water is administered twice daily for 2 days to infants by *Koyas*.

22 \**Madhuca indica* J. Gmel. (Sapotaceae)

Vernacular name: *Ippa chettu*. Edugaraallapalli.

Ethnomedicinal uses: Stem bark along with those of *Bridelia montana, Dalbergia latifolia* and *Oroxylum indicum* (1:1:1:1) crushed and the extract (12 gm) is administered 4 times a day for dysentery in cattle by *Konda Reddis*.

23 \**Manilkara hexandra* (Roxb.) Dubard (Sapotaceae)

Vernacular name: *Pedda pala*. Kalleru.

Ethnomedicinal uses: Stem bark decoction (5 teaspoons) administered twice daily for 2 days by *Konda Reddis*.

24 *Manilkara zapota* (L.) P. Royen (Sapotaceae)

Vernacular name: *Sapota*. Achutapuram.

Ethnomedicinal uses: Unripe fruits eaten as recommended by local *Vaidyas*.

25 *Melochia corchorifolia* L. (Sterculiaceae)

Vernacular name: *Guba tada*. Achuthapuram.

Ethnomedicinal uses: Whole plant decoction (3 teaspoons) administered thrice a day by local *Vaidyas*.

26 \**Musa rosacea* Jacq. (Musaceae)

Vernacular name: *Adavi arati*. Sukkumamidi.

Ethnomedicinal uses: Root extract (2 glasses) is administered orally for dysentery in cattle by local *Vaidyas*.

27 *Oroxylum indicum* (L.) Benth. ex Kurz (Bignoniaceae)

Vernacular name: *Bapana, Naga dundilamu, Pumperna*. Palwoncha.

Ethnomedicinal uses: Root bark (5-6 teaspoons) decoction is administered twice daily for three days by local *Vaidyas*.

28 *Oxalis corniculata* L. (Oxalidaceae)

Vernacular name: *Puli chinta*. Achuthapuram.

Ethnomedicinal uses: Leaf juice (3 teaspoons) is administered twice daily for 2 days by local *Vaidyas*.

29 \**Pavonia zeylanica* (L.) Cav. (Malvaceae)

Vernacular name: *Karu benda*. Achuthapuram.

Ethnomedicinal uses: Root decoction (4 teaspoons) is administered twice daily for 2 days by local *Vaidyas*.

30 *Punica granatum* L. (Punicaceae)

Vernacular name: *Danimma*. Kalleru.

Ethnomedicinal uses: Extract of fruit epicarp (20-25 ml) is administered twice a day by local *Vaidyas*.

31 \**Rumex vesicarius* L. (Polygonaceae)

Vernacular name: *Chukka koora*. Achuthapuram.

Ethnomedicinal uses: Leaf juice (3 teaspoons) is administered once daily, till cure by local *Vaidyas*.

32 \**Strychnos nux-vomica* L. (Loganiaceae)

Vernacular name: *Musti, Vazeedu*.

Ethnomedicinal uses: Stem bark extract (1 teaspoon) is administered with honey twice daily for 2 days for dysentery by *Koyas*.

33 \**Stereospermum colais* (Dillwyn) Mabb. (Bignoniaceae)

Vernacular name: *Golla chettu, Kala gotti, Kala goru*. Reddigudem.

Ethnomedicinal uses: Stem bark paste (2 teaspoons) is administered twice daily for two days by *Konda Reddis*.

34 \**Tacca leontopetaloides* (L.) O. Kuntze (Taccaceae)

Vernacular name: *Adavi kanda*. Kunavarum.

Ethnomedicinal uses: Boiled rootstock (10-15 gm) is administered with jaggery daily thrice a day by *Konda Reddis*.

35 *Terminalia catappa* L. (Combretaceae)

Vernacular name: *Badam*. Chintur.

Ethnomedicinal uses: Stem bark decoction (250 ml) is administered twice a day by local *Vaidyas* for dysentery in cattle.

36 *Terminalia chebula* Retz. (Combretaceae)

Vernacular name: *Karakkaya*.

Ethnomedicinal uses: Fruit powder (12 gm) is administered twice a day by *Konda Reddis*.

37 \**Trichosanthes anguina* L. (Cucurbitaceae)

Vernacular name: *Potla kaya*. Sattupalli.

Ethnomedicinal uses: Root decoction (3 teaspoons) is administered with sugar thrice daily for 2 days by local *Vaidyas*.

38 \**Ziziphus oenoplia* (L.) Miller (Rhamnaceae)

Vernacular name: *Pariki, Mulla rengu*. Kunavarum.

Ethnomedicinal uses: Fruits are eaten by local tribes. Use of stem bark decoction (5 teaspoonful a day till cure) for dysentery by *Konda Reddis* and *Valmikis* has also been recorded earlier.<sup>3</sup>

## 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 *Cephaelis ipecacuanha* (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.

*Ethnogastronomy* 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.<sup>7</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.<sup>8</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 antidysentrics from the eastern Ghats of Andhra Pradesh have been reported earlier.<sup>3</sup> Six *Magnoliophyta* (*Asparagus racemosus*, *Byttneria herbacea*, *Clitoria ternatea*, *Dioscorea bulbifera*, *Mimosa pudica* and *Ziziphus oenoplia*) were reported as the ethnoveterinary medicine for dysentery from the adjacent Warangal district of Andhra Pradesh<sup>4</sup>. Later, 58 plant species for dysentery and 70 plants for diarrhoea in animals have been reported.<sup>5</sup>

In the present study, 37 *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. with that of *Bridelia montana* Willd., *Dalbergia latifolia* Roxb. and *Oroxylum indicum* Vent.). The medicines have come from stem bark (11), roots (7), fruits (7), leaves (4), whole plant (2), tender shoots (2), seeds (2), root bark (1) and flower (1). Plant species represent: 34 genera, 33 *Magnoliopsida* (25 dicot families) and 4 *Liliopsida* (3 monocot families), 28 native species and 9 exotics, and 21 trees (4 small), 9 herbs, 6 shrubs and 1 climber. The tribes depend (57%) on trees for their herbal drugs. The ethnic region still has relatively less dis-

turbed forests with minor exodus from the exotic invasions. Besides, there are 23 plant species recorded here which were not listed in *Ethnobotany Desk Reference*<sup>1</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.<sup>9</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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#### References

- 1 Johnson T, *CRC Ethnobotany Desk Reference*, (CRC Press, Washington, DC.), 1999.
- 2 Otshudi A L, Vereuyse A & Foriers A, Contribution to the ethnobotanical, phytochemical and pharmacological studies of traditionally used medicinal plants in the treatment of dysentery and diarrhoea in Lomela area, Democratic Republic of Congo (DRC), *J Ethnopharmacol*, 71 (2000) 411.
- 3 Ramarao N & Henry A N, *The Ethnobotany of Eastern Ghats of Andhra Pradesh, India*, (Botanical Survey of India, Calcutta), 1996.
- 4 Reddy K N, Bhanja M R & Raju V S, Plants used in ethnoveterinary practices in Warangal district, Andhra Pradesh, India, *Ethnobotany*, 10 (1998) 75.
- 5 Jain S K, (Assisted by S. Srivastava), *Dictionary of Ethnoveterinary Plants of India*, (Deep Publications, New Delhi), 1999.
- 6 Reddy K N, *Ethnobotany in Khammam District of Andhra Pradesh, India*, (PhD Thesis, Kakatiya University, Warangal), 2002.
- 7 Fabricant Daniel S, Farnsworth N R, The value of plants used in traditional medicine for drug discovery, *Environ Health Perspectives*, 109 (1) (2001) 69-75.
- 8 Cáceres A, Fletes L, Aguilar L, Ramirez O, Figueroa L, Taracena A M & Samayoa B, Plants used in Guatemala for the treatment of gastrointestinal disorders. 3. Confirmation of activity against enterobacteria of 16 plants, *J Ethnopharmacol*, 38 (1993) 31.
- 9 Ong H C & Nordiana M, Malay ethno-medico botany in Machang, Kelantan, Malaysia, *Fitoterapia*, 70 (1999) 502.