

Gastrointestinal disease management through ethnobotanical approach by Malayali tribes of Javadhu Hills, South India

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Abstract

Objective: The present study was aimed at recording the usage of herbals for gastrointestinal diseases by Malayali tribes in Javadhu Hills of Tamil Nadu.

Methods: A field survey in four villages of Javadhu Hills was systematically conducted. Eleven Malayali tribal healers of the study area were interviewed through structured questionnaire for their knowledge on the utilization of herbals for gastrointestinal diseases.

Results: A total of 31 species of ethnomedicinal plants (herbals) belonging to 22 families, comprising 27 Dicotyledons and 4 Monocotyledons were found to be used by Malayali tribes in Javadhu Hills. The Malayali tribes possess an appreciable knowledge on the usage of herbals for gastrointestinal diseases when compared to their counterpart in Gingee Hills, Villupuram district.

Conclusion: Investigation of this kind will help in augmenting herbal research in various dimensions of human healthcare, besides documenting the traditional knowledge from oblivion.

Keywords: Ethnobotany, Malayali tribes, Javadhu Hills, Herbal plants, Gastrointestinal diseases.

1. Introduction

Mankind depends on plants and plant products from time immemorial [1, 2]. The practice of Indian medicinal systems in India goes back to the pre Vedic period. Rigveda, Yajurveda and Samveda too mention about a good number of herbals and drug administrations [3]. The plant medicines are widely used because of increase in the price of allopathic medicines and their side effects [4]. Almost 80% of world population depends on plant medicines for primary healthcare [5]. Plant based traditional knowledge has become a new source of drugs and nutraceuticals [6]. Hence it is important to document the knowledge and experience of the traditional systems of medicine [7]. This paper records the knowledge of Malayali tribes on the ethnomedicine treatment for gastrointestinal diseases in Javadhu Hills of Tiruvannamalai District, Tamil Nadu, South India. Further, the herbals used by the tribal healers of Javadhu Hills to cure gastrointestinal problems are compared with those of Gingee Hills of Villupuram district, Tamil Nadu.

2. Methodology

2.1. Study area

The study area, Javadhu Hills, is located in Tiruvannamalai district, Tamil Nadu, between "78° 35 and 79° 35" East longitude and "12° 24 and 12° 55" North latitude respectively and has an area of 2405 square Km [8]. It is bounded by Polur and Chengam taluks of Tiruvannamalai district on the southeast and Thiruppathur and Vaniyampadi taluks of Vellore district on the northwest. Javadhu Hills contain high rising peaks and ravines, with the highest peak point at 2500 feet above mean sea level [9]. There are about 229 villages present around the hills [9]. The study area consisting of four villages surrounding the hills was surveyed during September 2012 to August 2013 for a comprehensive study on the ethnobotanical plants and their usage by Malayali tribes.

2.2. Survey Instrument

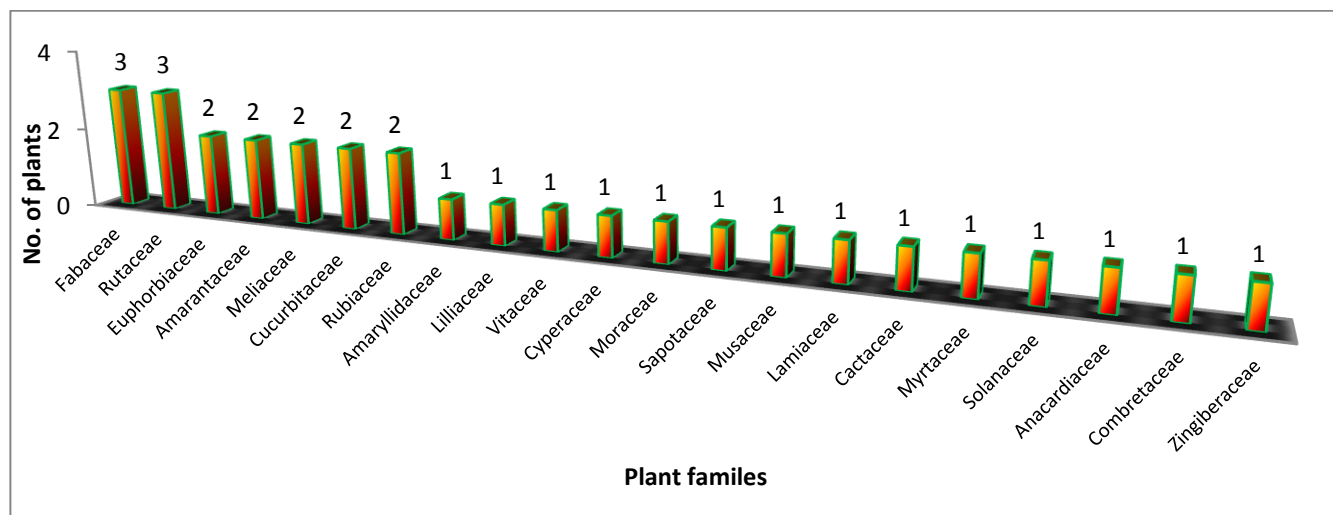
Eleven tribal healers were interviewed using a structured questionnaire during the survey period. A survey instrument was used to elicit information from the Malayali tribes on the different herbals used by them for curing various gastrointestinal diseases like dysentery, diarrhoea, constipation, piles, stomach ache and indigestion for

generating baseline data on the herbals used in gastrointestinal diseases. The questionnaire was used to collect data, on local name, botanical name, plant part(s) used, drug preparation type, etc. [10].

2.3. Ethnomedicinal plants

The local Malayali tribal healers were found using herbal sources either for self treating or for curing other diseased local people [1]. Ethnobotanical data were collected and analysed [11]. The medicinal plants were identified using the floras [12, 13]. The voucher specimens were prepared and deposited in the Presidency College Herbarium, Chennai.

Figure 1. The different plant families and the number of plants used in gastrointestinal diseases by Malayali tribes of Javadhu Hills, Tamil Nadu, South India.



3. Results and Discussion

A total of 31 plant species comprising 27 dicot and 4 monocot species were found used to cure gastrointestinal problems of the people in and around Javadhu Hills of Tiruvannamalai district, Tamil Nadu. They were listed alphabetically by their botanical names followed by family names, part(s) used, and drug preparation type (Table 1).

The 31 medicinally useful species belonged to 22 families with the highest representation of 3 species each from Fabaceae and Rutaceae, followed by 2 species each from Euphorbiaceae, Amaranthaceae, Meliaceae, Cucurbitaceae and Rubiaceae. The remaining 15 families contributed one species each to the list of herbals used in gastrointestinal diseases (Figure 1). The plant part(s) used against gastrointestinal diseases varied from leaves, bark, stem, root, seed, endosperm and rhizome. However, the frequently used plant part was found to be the leaves of 12 medicinal plants (Table 2).

Of the 31 plants species, majority of the ethnomedicinal preparations were in the form of paste (from 10 plants), followed by raw drugs (7 plants), juice (5 plants) and decoction (4 plants) (Figure 2). The plant species contribution to cure various gastrointestinal diseases was analysed. Ulcer, diarrhoea, indigestion, stomach ache, gas trouble, worm infestation, constipation, and piles were found effectively managed by 8, 5, 4, 4, 4, 3, 2 and 1 plant species respectively (Figure 3). When the results of this study was compared with that of the ethnomedicinal plants used in Gingee Hills of Villupuram district, it revealed that the gastrointestinal problems like, dysentery, indigestion, stomach ache, diarrhoea, constipation and piles were treated using 11, 6, 5, 3, 2, and 2 ethnomedicinal plants respectively[1]. While ulcer had cure from a maximum of 8 plants in Javadhu Hills, dysentery was cured by a maximum of 11 plants in Gingee Hills. Dysentery is usually attributed to unhygienic food habits, and ulcer to irregular and improper food habits, a characteristic feature of today's fast life.

The Malayali tribes of Javadhu Hills, compared with the tribes of Gingee Hills [1], are in possession of better knowledge on the usage of medicinal plants for gastrointestinal diseases. *Citrus acida*, *Cyperus rotundus*, *Jatropha curcus*, *Opuntia dillinii*, and *Psidium guajava* were the 5 plants used by Malayali tribes to cure diarrhoea. Whereas *Ficus benghalensis*, *Lannea coromandelica* and *Ximenia americana* were used by the tribes of Gingee Hills to cure the same. The antimicrobial and antioxidant activity of several medicinal plants have been proved by recent studies [14-19]. Hence, the medicinal plants used in gastrointestinal diseases will be a great source for further research on their active principles and antimicrobial activities [20-30].

Table 1. Medicinal plants used for gastrointestinal diseases by Malayali tribes of Javadhu Hills, Tamil Nadu, South India.

S.No	Plant name (with Family)	Part(s) used for treatment	Preparation type	Disease
1.	<i>Allium sativum</i> L. (Amaryllidaceae)	Bulb	Roasted bulb	Stomach ache
2.	<i>Aloe vera</i> (L.) Burm.F. (Liliaceae)	Whole Plant	Paste	Ulcer
3.	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC. (Amaranthaceae)	Whole plant	Paste	Ulcer
4.	<i>Amaranthus viridis</i> L. (Amaranthaceae)	Leaves	Raw	Constipation
5.	<i>Azadirachta indica</i> Adr. Juss. (Meliaceae)	Leaves and Bark	Paste	Intestinal worms
6.	<i>Borassus flabellifer</i> L. (Arecaceae)	Endosperm	Raw	Constipation
7.	<i>Cipadessa baccifera</i> (Roth) Miq. (Melieaceae)	Leaves	Paste	Ulcer
8.	<i>Cissus quadrangularis</i> L. (Vitaceae)	Whole Plant	Roasted stem	Piles
9.	<i>Citrus acida</i> L. (Rutaceae)	Fruits and Leaves	Juice	Diarrhoea
10.	<i>Citrus limon</i> (L.) Burm.f. (Rutaceae)	Fruits	Juice	Stomach ache
11.	<i>Cucurbita maxima</i> Duch.ex Lam. (Cucurbitaceae)	Leaves	Decoction	Gastric
12.	<i>Cyperus rotundus</i> L. (Cyperaceae)	Root	Raw	Diarrhoea
13.	<i>Delonix elata</i> (L.) Gamble. (Fabaceae)	Leaves	Paste	Gas trouble
14.	<i>Euphorbia hirta</i> L. (Euphorbiaceae)	Leaves and Root	Powder	Ulcer
15.	<i>Ficus racemosa</i> L. (Moraceae)	Root	Latex	Ulcer
16.	<i>Jatropha curcas</i> L. (Euphorbiaceae)	Leaves	Decoction	Diarrhoea
17.	<i>Limonia acidissima</i> L.(Rutaceae)	Leaves and Fruits	Raw	Gastric problem
18.	<i>Madhuca indica</i> J.Gmelin. (Sapotaceae)	Seed	Oil	Gas trouble
19.	<i>Momordica charantia</i> L. (Cucurbitaceae)	Fruits and Seed	Raw	Ulcer
20.	<i>Morinda tinctoria</i> Roxb. (Rubiaceae)	Leaves and Bark	Paste	Ulcers
21.	<i>Musa paradisiaca</i> L. (Musaceae)	Stem	Juice	Stomach ache
22.	<i>Ocimum canum</i> Sims (Lamiaceae)	Leaves	Decoction	Ulcer
23.	<i>Opuntia dillenii</i> (Ker G.)Haw. (Cactaceae)	Fruits	Raw	Diarrhoea
24.	<i>Psidium guajava</i> L. (Myrtaceae)	Fruits	Raw	Diarrhoea
25.	<i>Psyrax dicoccus</i> Gaertn. (Rubiaceae)	Bark	Bark	Indigestion
26.	<i>Solanum erianthum</i> D.Don (Solanaceae)	Leaves	Decoction	Intestinal worms
27.	<i>Spondias mangifera</i> Willd. (Anacardiaceae)	Leaves	Juice	Indigestion
28.	<i>Tamarindus indica</i> L. (Fabaceae)	Leaves, Fruits and Bark	Paste	Intestinal worms
29.	<i>Tephrosia purpurea</i> (L.) Pers. (Fabaceae)	Leaves and Root	Paste	Stomach ache
30.	<i>Terminalia chebula</i> Retz. (Combretaceae)	Fruit Exocarp	Paste	Indigestion
31.	<i>Zingiber officinale</i> Roscoe (Zingiberaceae)	Rhizome	Juice	Indigestion

Figure 2. The different drug preparation types and the number of plants used for gastrointestinal diseases by Malayali tribes of Javadhu Hills, Tamil Nadu, south India.

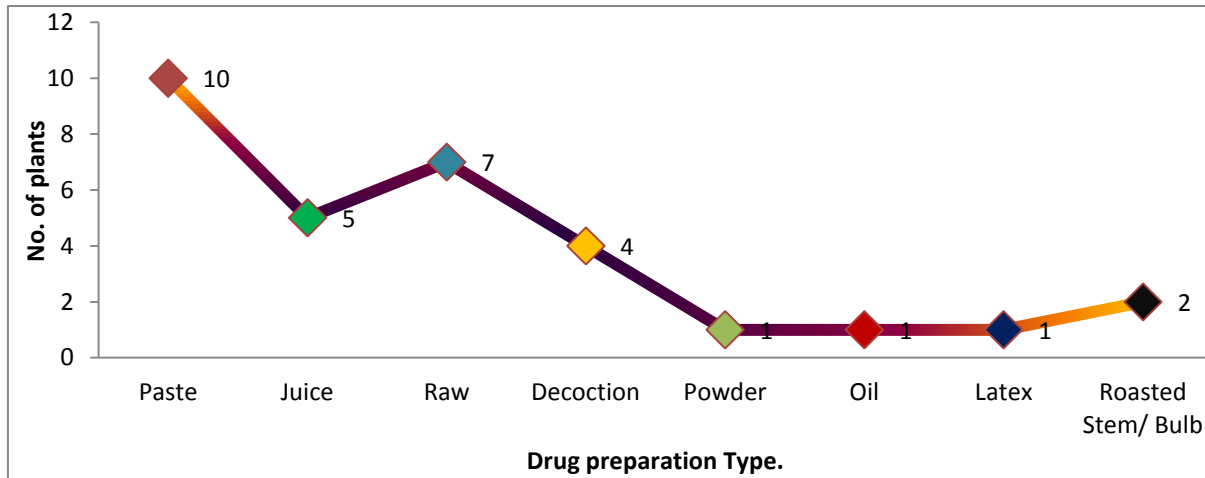
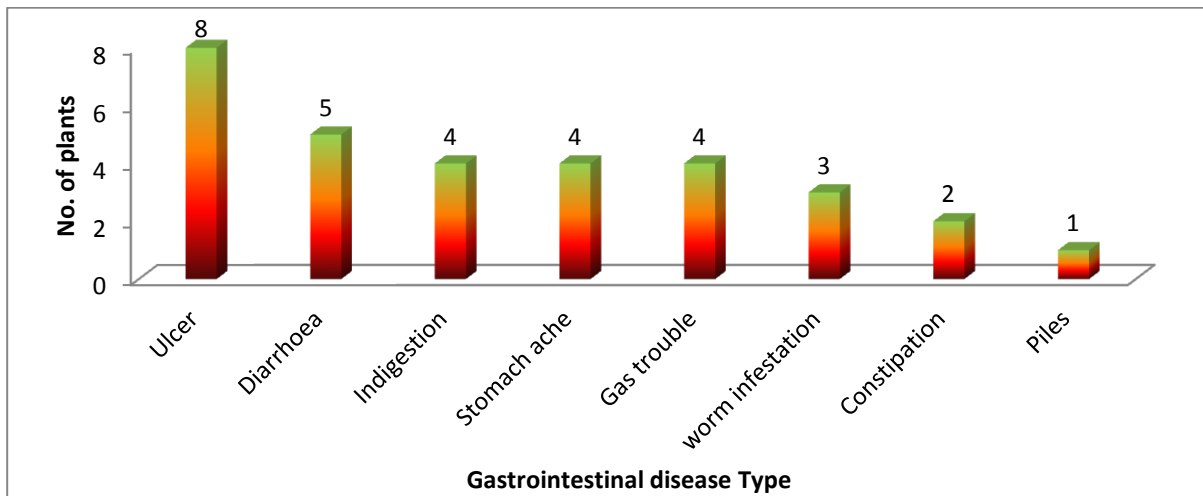


Table 2. The plant part(s) and the number of plants used to cure gastrointestinal diseases by Malayali tribes of Javadhu Hills, Tamil Nadu, South India.

S.No	Plant part	Number of Plants used
1.	Leaves	12
2.	Fruits	6
3.	Root/ Rhizome	4
4.	Whole plants	3
5.	Bark	2
6.	Stem	1
7.	Bulb	1
8.	Endosperm	1
9.	Seed	1
	total	31

Figure 3. Type of gastrointestinal diseases and the number of medicinal plants under usage for treatment by Malayali tribes of Javadhu Hills, Tamil Nadu, South India.



4. Conclusion

This work is a consolidation of systematic ethnobotanical studies conducted in 4 different areas of Javadhu Hills, Tamil Nadu and South India. A total of 31 plant species against 8 gastrointestinal ailments have been recorded. The remedies and prescription recorded in the study have been well accepted by rural people and appear to be effective as practiced by the local healers. Thus, there are plenty of opportunities to conduct further research development for new and alternate effective medicines. Hence, the findings on ethnobotanical knowledge are considered to be useful for the healthcare of human beings.

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6. References

1. R. Muralidharan, D. Narasimham. Ethnobotanical plants used against gastrointestinal problem in Gingee Hills of Villupuram District, Tamil Nadu. *Journal of Applied Pharmaceutical Science*. 2012; 2(10), 123-125.
2. N. Rama Krishna, Y.N.R. Varma, Ch. Saidulu. Ethnobotanical studies of Adilabad district, Andhra Pradesh, India. *Journal of Pharmacognosy and Phytochemistry*. 2014; 3(1), 18-36.
3. D.K. Bhattacharjya, P.C. Borah. Medicinal weeds of crop fields and role of women in rural health and hygiene in Nalbari district, Assam. *Indian Journal of Traditional Knowledge*. 2008; 7(3), 501-504.
4. S. Muruganandam, V. Kadirvelmurugan, A. Selvaraju, S. Rathinakumar, S. Ravikumar. Ethnomedicinal plants used by the Malayali tribals in Jawadhu Hills of Tiruvannamalai district, Tamil Nadu, India. *Journal of National Product and Plant Resource*. 2014; 4(5), 55-60.
5. V.P. Kamboj. Herbal medicine. *Journal of Current Science*. 2000; 78(1), 35-39.
6. P.P. Sharma, A.M. Mujundar. Traditional knowledge on plants from Toranmal Plateau of Maharashtra. *Indian Journal of Traditional Knowledge*. 2003; 2, 292-296.
7. D.S. Grierson, A.J. Afolayan. An ethnobotanical study of plants used for the treatment of wounds in the Eastern Cape, South Africa. *Journal of ethnopharmacology*. 1999; 67, 327-332.
8. Beverly C. David, G. Sudarsanam. Ethnomedicinal plant knowledge and practice of people of Javadhu hills in Tamilnadu. *Asian Pacific Journal of Tropical Biomedicine*. 2011; S79-S81.
9. A. Ranjithkumar, C.V. Chittibabu, G. Renu. Ethnobotanical investigation on the Malayali tribes in Javadhu Hills, Eastern ghats, South India. *Indian Journal of Medicine and Healthcare*. 2014; 3(1), 322-333.
10. R. Ranganathan, P. Vilayalakshmi, Parameswari. Ethnomedicinal survey of Javadhu Hills in Tamil Nadu. *Asian Journal of Pharmaceutical and Clinical Research*. 2012; 5, 45-49.
11. S.K. Jain, A.K. Goel. A Manual of Ethnobotany. Scientific publishers, Jodhpur, India. 1995; 142-153.
12. J.S. Gamble, C.E.C. Fischer. Flora of the Presidency of Madras. 1956; Vol I-III.
13. KM Mathew. The Flora of the Tamil Nadu Carnatic. 1983; Vol I-III.
14. S. Shanmugam, M. Annaudrai, K. Rajendran. Ethnomedicinal plants used to cure diarrhoea and dysentery in Pachalur hills of Dindigul district in Tamil Nadu, Southern India. *Journal of Applied Pharmaceutical Science*. 2011; 1(8), 94- 97.
15. A. Samundeeswari, C.V. Chittibabu, P. Arumugam. *In vitro* investigation on the antibacterial activities of the leaves of *Naringi crenulata* (Roxb.) Nicols. *International Journal of Current Science*. 2012; 9E, 94-97.
16. A. Samundeeswari, C.V. Chittibabu. *In vitro* evaluation of antioxidant and free radical scavenging activities of *Naringi crenulata*. *International Journal of Current Science*. 2013a; 9E, 92-95.
17. A. Samundeeswari, C.V. Chittibabu. *In vitro* antifungal activities of *Naringi crenulata* (Roxb) Nicols leaf extract. *International Journal of Current Science*. 2013b; 5, 82-85.
18. R. Adhikesavan, C.V. Chittibabu. Antioxidant and antibacterial properties of the tubers of *Gloriosa superba* L. *Journal of Modern Science*. 2013; 5 (2), 40.
19. R. Praveen, C.V. Chittibabu. Phytochemical constituents and antioxidant activity of *Azima tetraacantha* Lam. *Journal of Modern Science*. 2013; 5(2), 33.

20. B. Selvaraj, C.V. Chittibabu, B. Janarthanam. Studies on phytochemical screening, antioxidant activity and extraction of active compound (Swertiamarin) from leaf extract of *Enicostemma littorale*. *Asian Journal of Pharmaceutical and Clinical Research*. 2014; 7(4), 240-244.
21. R. Pradeep Kumar. Ethno medicinal plants used for oral health care in India. *International Journal of Herbal Medicine*. 2014; 2(1), 81-87.
22. Nitesh Kumar, Ashwani Kumar Jakhar, Rajaram Choya. Traditional uses of some medicinal plants of Hamirpur district of Himachal Pradesh for the treatment of Diabetes. *International Journal of Advanced Research*. 2014; 2(2), 131-138.
23. Sanjeev Kumar, Som Datt Sharma, Nitesh Kumar. Ethnobotanical study of some common plants from district Hamirpur of Himachal Pradesh (India). *International Journal of Advanced Research*. 2015; 3(2), 492-496.
24. N. Ramkrishna, Ch. Saidulu. Medicinal plants used in snake bite and scorpion sting by Gonds and Kolams of Adilabad Dist. Andhra Pradesh. *International Journal of Current Pharmaceutical Research*. 2014; 6(2), 39-41.
25. S Gopalakrishnan, S. Yamini sudha Lakshmi, Fouzia Banu. Comparison of antimicrobial activities of silver nanoparticles synthesized from *Dysoxylum parasiticum*. *Indian Journal of Medicine and Healthcare*. 2015; 4 (2), 1-5.
26. Yamini Sudha Lakshmi, D. Mala, S. Gopalakrishnan, Fouzia Banu, V. Brindha, N. Gajendran. antimicrobial activity of silver nanoparticles from *Swietenia mahagoni*. *Indian Journal of Medicine and Healthcare*. 2014; 3(1), 310-313.
27. J. Josphin Mini, I.VS. Nimal Christudas, Natarajan Gajendran. *In-vitro* anti-inflammatory activity of the fractions Isolated from *Walsura trifoliata* (A.Juss.)Harms. root. *Indian Journal of Medicine and Healthcare*. 2015; 4(3), 1-5.
28. S. Gopalakrishnan, S.Yamini Sudha Lakshmi, Fouzia Banu. Comparison of antimicrobial activities of silver nanoparticles synthesized from *Sphaerostephanos asplenioides* J. Sm. *Indian Journal of Medicine and Healthcare*. 4 (2), 1-6.
29. Sanjeev Kumar, Som Datt Sharma, Nitesh Kumar. Ethnobotanical study of Some common plants from district Hamirpur of Himachal Pradesh (India). *International Journal of Advanced Research*. 2015; 3(2), 492-496.
30. S. Manikandan, G. M. Alagu Lakshmanan. Ethnobotanical survey of medicinal plants in Kalrayan Hills, Eastern Ghats, Tamil Nadu. *International Letters of Natural Sciences*. 2014; 12(2) 111-121.

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