

# Anti-Entero Bacterial Activity of Herbal Extracts for Management of Diarrhoea

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**Abstract:** *Diarrhoea is a clinical symptom marked by rapid and frequent passage of semisolid or liquid fecal material through the gastrointestinal tract. Secretory diarrhea occurs when an imbalance between absorption and secretion in the small intestine occurs. Various causes can explain this condition including virus, parasites and bacteria. Enteric or diarrheal infections are major public health problems in developing countries. WHO estimates that diarrhoeal diseases inclusive of those caused by enteric pathogens account for about 2.2 million deaths each year, the primary victims being infants and young people. Enteric bacteria including Salmonella species, Shigella species, Proteus species, Klebsiella species, Escherichia coli, Pseudomonas species, Vibrio cholerae, Staphylococcus aureus are the major etiological agents for the sporadic and epidemic spread of diarrhoea both in adults and in children.(1)*

**Keywords:** herbs, diarrhoea

## 1. Introduction

Plants and their products have been used by humans from ages unknown for their various uses. One among these uses is their role in the field of medicine. Plants and their products have been used by humans as sources for effective treatment of various diseases. Traditional medicine, also known as indigenous or folk medicine comprises knowledge that developed over generations within various societies before the era of modern medicine. (2) Many readily available plants in India are used in traditional folklore medicine for the treatment of gastrointestinal disorders such as cholera, diarrhoea and dysentery.(3) It is estimated that 25% of modern medicines are directly or indirectly derived from higher plants. (4)

## 2. Picralima Nitida

Picralima nitida Stapf (PN) (Apocynaceae) is an entirely glabrous shrub of 3–10 m high, found in African forest region, spanning from Ivory Coast to Zaire and Uganda.(5) It has been shown to possess anti-trypanosomic, anti-inflammatory, anti-pyretic and anti-plasmodial and anti-diarrhoeal properties. (6) According to a research done by Laure Brigitte Mabeku Kouitcheu, Joseph Lebel Tamesse and Jacques Kouam, it was found that the methanol (M) extract of Picralima Nitida had anti-microbial activity on 11 out of 17 microorganisms tested amongst S. dysenteriae type 1, which was found to be resistant to all antibiotics from the beta-lactam family used in the study.(7)

## 3. Mondia Whitei

Mondia whitei is a wood climber with a large tuberous root stock from the Periplocaceae family. It is widely distributed in tropical Africa from Guinea through Cameroon to East Africa. The roots are either used as spices, aphrodisiacs or for the treatment of urinary tract infection, jaundice and headaches, while the whole plant is used to treat diarrhoea.(8)(9) The extracts of Mondia whitei are found to have good anti-microbial activity against Escherichia coli and Salmonella typhi which are among the most common

bacteria associated with diarrhoea.(10) Medicinal use of Mondia whitei does not have any adverse effects.(11)

## 4. Sebastiania Chamalea

Sebastiania chamaelea, a herbal medicinal plant that belongs to the family Euphorbiaceae. Leaves of this plant contain a number of medically important phytochemical compounds.(12) The whole plant decoction in ghee is given as tonic and applied to the head in vertigo. The juice of the plant is astringent and is used as a remedy for syphilis and diarrhoea.(13,14) In accordance to a study by K.S. Shanthi sree, N. Yasodamma and C.Alekhyia, the aqueous and methanolic leaf extracts of S.chamaelea at the doses of 100 and 200 mg/kg exhibited significant anti-diarrhoeal activity upto 90%, which may be due to the presence of tannins, which may form protein tannate which causes an astringent action and may result in effective antidiarrhoeal activity and also due to the presence of caffeic acid may act as anti-inflammatory agent.(15)

## 5. Picrorrhiza Kurroa

Picrorrhiza kurroa royle ex. Benth belonging to the family Scrophulariaceae is a small perennial herb that is widely distributed in the north – West India on the slopes of Himalayas between 3000 and 5000mts. (16,17) Picrorrhiza kurroa is an important herb in the traditional Ayurvedic system of medicine and has been used to treat liver and biliary problems. Other traditional uses include treatments of dyspepsia, bilious fever, chronic dysentery and scorpion sting. The most important active constituents of Picrorrhiza kurroa are the cucurbitacin glycosides, apocyanin, drosin, iridoid glycosides, picosides and kutkin.(18,19) A study by A.RAJANI, M.VISHNU VARDHAN REDDY, SK.ARIFA BEGUM, K.HEMAMALINI, reveals that the methanolic extract of Picrorrhiza kurroa rhizomes showed significant anti-diarrhoeal activity in a dose dependent manner(20)

## 6. Celosia Argentea

Celosia argentea belonging to the family Amaranthaceae, is a herb that possesses many medicinal values. It has laxative,

anti-oxidant, anti-inflammatory and anti-viral and anti-bacterial activity.(21) *Celosia argentea* has been noted to have exhibited anti-bacterial activity against many bacterial species. A study by Praveen Sharma et al has revealed the anti-diarrheal activity of the alcoholic extract of *Celosia argentea*. The underlying mechanism is believed to be spasmolytic and an anti-enteropooling property by which the extract produced relief in diarrhoea. The tannin present in the plant extracts is believed to be responsible for the anti-diarrhoeal activity.(22)

## References

- [1] Ballal, M. (2005). Screening of medicinal plants used in rural folk medicine for treatment of diarrhoea. Internet: <http://www.Pharmoinfo.net>.
- [2] Palombo, E.A. Phytochemicals from traditional medicinal plants used in the treatment of diarrhoea: Modes of action and effects on intestinal function. *Phytother. Res.* 2006, 20, 717–724.
- [3] Chopra RN, Nayer SL, Chopra IC. Glossary of Indian Medicinal Plants (3rd Edn). Council of Scientific and Industrial Research, New Delhi (India), 1956; pp. 7–246.
- [4] Tona L, Kambu K, Mesia K, Kimanga K, Apers S, De Bruyne T, Pieters L, Totte J, Vlietinck AJ. Reference. In biological screening of traditional preparations in some medicinal plants used as anti-diarrhoeal in Kinshasa, Congo; 1999.
- [5] Adjanohoun JE, Aboubakar N, Dramane K, Ebot ME, Ekpere JA, Enow-Orock EG, Focho D, Gbile ZO, Kamanyi A, Kamsu Kom J, Kieta A, Mbenkum T, Mbi CN, Mbiele L, Mbome IL, Mubiru NK, Nancy WL, Nkongmeneck B, Satabie B, Sofowora A, Tamze V, Wirmum CK: Contribution to Ethnobotanical and Floristic Studies in Cameroon: Traditional Medicine and Pharmacopoeia. Lagos: Technical and Research Commission of Organisation of African Unity (OAU/STRC); 1996:60–61.
- [6] Wosu LO, Ibe CC: Use of extract of *Picalima nitida* bark in the treatment of experimental trypanosomiasis: a preliminary study. *J Ethnopharmacol* 1989, 25:263–268.
- [7] Kouitcheu et al. *BMC Complementary and Alternative Medicine* 2013, 13:211
- [8] Nigro O, Milton AG, Ratnaike RN. Drug associated diarrhea and constipation in older people. *Austral J Hosp Pharm* 2000;30:165-169.
- [9] Thapar N, Sanderson IR. Diarrhea in children : an interface between developed and developing countries. *Lancet* 2004; 363: 641-653.
- [10] Okitoi LO, Ondwasy HO, Siamba DN, Nkurumah D. Traditional herbal preparations for indigenous poultry health management in Western Kenya; 2007.
- [11] Kokwaro JO. Plant species and diseases treated. *Medicinal plants of East Africa*; Ed.2: 42. Kenya literature bureau; 2006.
- [12] K.S. Shanthi sree, N. Yasodamma, CH. Pramageetham. Phytochemical screening and in vitro anti bacterial activity of the methanolic leaf extract: *Sebastiania chamaelea muell. arg.* 5(1): 173-175, 2010.
- [13] Pullaiah T. *Encyclopaedia of world medicinal plants*. Vol.1. Regency publications. New Delhi 2006; 1769 - 1770.
- [14] Thammanna and Narayana Rao. Medicinal plants of Tirumala. Tirumala Tirupati Devasthanams Press. Tirupati 1990; 66.
- [15] K.S. Shanthi sree, N. Yasodamma, C. Alekhya. ANTIDIARRHOEAL ACTIVITY OF *Sebastiania chamaelea* Muell. Arg. Vol(5): 169-171; 2013.
- [16] Hooker J.D, *Flora of British India*, 246-290, 1885.
- [17] Chopra R.N and Ghosh S, Some common indigenous remedies, *Indian journal of Medical Research* 22; 263-264, 1934.
- [18] Weinges K, Kloss P, Henkels WD, Natural products from medicinal plants XVII, Picroside-II; A new vanilloyl catapol from *Picrorrhiza kurroa royle ex benth*, *Justus liebig's ANN Chem*; 759: 173 – 182, 1972.
- [19] Stuppner H, Wagner H, New cucurbitacin glycosides from *Picrorrhiza kurroa*, *Planta Med.*; 55: 559 – 563, 1989.
- [20] A. RAJANI, M. VISHNU VARDHAN REDDY, SK. ARIFA BEGUM, K. HEMAMALINI. EVALUATION OF ANTI-DIARRHOEAL ACTIVITY OF METHANOLIC RHIZOME EXTRACT OF *PICRORRHIZA KURROA ROYLE EX. BENTH*: vol 7: 207-208 ; 2014.
- [21] Olowoyo O.G, Adesina O.A, Adigun A.O, Azike C.K, et al. Pro- and antioxidant effects and cytoprotective potential of vegetables in southwest Nigeria. *J. of med. Food.* 8: 539-544.
- [22] Praveen Sharma, Gali Vidhyasagar, Sunder Singh, Santosh Ghule, Bimlesh Kumar. Anti-diarrhoeal activity of leaf extract of *Celosia argentea* in experimentally induced diarrhoea in rats. 2010 Jan-Mar: 1(1): 41-48