

Traditionally Used Medicinal Plants for Treatment of Stomach Disorder in West Bengal, India: A Scrutiny and Analysis from Secondary Literature

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ABSTRACT The state of West Bengal is on the eastern bottleneck of India. It is rich with high value medicinal plants on which a large number of communities depend for their medicinal needs. The present documentation has gathered information from published literature on plant based traditional medicine used by the dependent communities along with their traditional way of treating different stomach related diseases/disorders recorded from different regions of the state. The researchers found a total of 118 plant species which were used to treat different stomach diseases/disorders. Tree species dominated the list. Leaves/foilage of 44 species was dominantly used followed by roots. Common stomach diseases/disorders treated were dysentery, ulcer and stomach ache. Administration of medicine was either oral or external in the form of infusion, decoction, paste and latex either as a sole formulation or in combination with other species. The collected evidence/data can be useful to scientific community for further evaluation and recommendations to the practicing communities.

INTRODUCTION

Plants are important for pharmacological research and drug development, not only when plant constituents are used directly as therapeutic agents, but also as starting materials for the synthesis of drugs or as models for pharmacologically active compounds (Mukherjee 2003). Traditional medicines are valuable resource for the development of new pharmaceuticals (Kinghorn and Balandrin 1993; Iwu 1994). Within a period between 2005 and 2010, nineteen natural product based drugs were approved for marketing worldwide (Mishra and Tiwari 2011). The exploration and utilization of ethnobotanical resources, its identification, documentation and conservation is need of the time which is essential for restoration and preservation of traditional and indigenous knowledge (Gokhale et al. 2011; Reddy 2012; Payyappallimana and Fadeeva 2013; Reang et al. 2016). The acquired knowledge about these plants is very essential to be used in near future for ever increasing population (Narzary et al. 2013). The digestive system disorders particularly diarrhoea was the fifth leading cause of global mortality as approximately 100 million people died worldwide in 2012 due to this disease (World Health Statistics 2014). Stomach disorder is one of the most common

illnesses in all age groups. It is the major cause of morbidity and mortality in both rural and urban communities (Gairola et al. 2013) resulting from pathogenic and parasitic infection of the digestive tract (Neamsuvan et al. 2012).

Common gastrointestinal disorders are stomach/abdominal pain, indigestion, constipation, ulcer, diarrhoea, dysentery, gastric and vomiting (WHO 2008). In the developing countries poor sanitation is the main cause of these infections leading to mortality (Tuite et al. 2011). Outbreaks of diarrhoea, dysentery, and cholera caused by contaminated drinking water have claimed millions of lives worldwide, mainly infants and children (Ryan 2011). Such outbreaks were reported from Ethiopia (Bartels et al. 2010), Haiti (Tuite et al. 2011), Vietnam (Anh et al. 2011), Zimbabwe (Fisher 2009), and Nepal (Bhandari et al. 2009). Use of medicinal plants to treat various gastrointestinal disorders ranging from simple types such as vomiting to more complex problems like peptic ulcer were reported (Lama et al. 2001; Rajbhandari 2001). Since traditional knowledge are possessed by older generation and transmitted orally, there is gradual disappearance of the knowledge generation after generation following the death of the older (Kim and Song 2008). In many regions local knowledge is underutilized due to its often fragmented record

in disparate sources (O'Neill et al. 2017). The aim of this study is to record the cross analysis of traditional knowledge about treatment of stomach disorder for the state of West Bengal in India. Specifically, we collected information on the plant species used to treat for gastrointestinal disorders in West Bengal, India along with information on plant parts, plant types and therapy.

MATERIAL AND METHODS

Study Area

The state of West Bengal is situated in eastern part of the country between 21°20' and 27°32' N latitude and 85°50' and 89°52' E longitude with the Tropic of Cancer running across it. The total area of the state is 88,752 sq km which is 2.7 percent of the total area in the country. The estimated population of West Bengal in 2009 was 87.8 million and has become 91.3 million as per the latest census of India carried out in 2011 (WBSAPCC 2011). The climate of the state is tropical and humid except in the northern hilly region which is close to the Himalayas. The temperature normally varies between 24°C to 40°C during summer and 7°C to 26°C during the winter. The average rainfall is about 1750 mm with considerable variation among the districts ranging between 1234 mm and 4136 mm (WBSAPCC 2011). Considerable proportion of population in the state especially the indigenous communities like Gonds, Kol, Santal, Oraon, Munda, Lodha, Mech, Bedia, Bhumij and Mahali inhabiting in and around a forest are highly dependent communities on plant resources for their primary health care.

METHODOLOGY

The present documentation is a collection of ethnomedicinal information on stomach disorders from different available scientific literature (journals and books) related to West Bengal. Research articles from last 15-20 years were mostly consulted for the purpose. References which were field based ethno-medicinal surveys reporting first-hand information on ethnomedicinal plants used to treat human ailments by indigenous communities were considered. Information on botanical names, vernacular names,

plant part used, ailment treated and mode of application was collected from the selected literature and were pooled together. There were many species, for which different synonyms were used in the literature, but we used only the valid botanical names and synonyms were merged with the valid botanical name. Each species is listed with their botanical name, local name, family, part used, different ailments of stomach disorder, its mode of application for different treatments and plants habitat (Gairola et al. 2013; Reang et al. 2016).

RESULTS AND DISCUSSION

Composition of Plants

Bio-culture knowledge provides valuable insight into ecological processes and can guide conservation practitioners in local contexts (O'Neill et al. 2017). The ethnobotanical plant species reported in published literature and enlisted from region to region in West Bengal varied considerably from 21 to 125 species (Chakraborty and Bhattacharjee 2006; Bandyopadhyay and Mukherjee 2009; Bose 2011; Mondal and Rahaman and Karmakar 2012; Shukla and Chakravarty 2012; Sinhababu and Banerjee and Banerjee 2013; Mondal and Samanta 2014; Bose et al. 2015; Biswakarma et al. 2015). The researchers enlisted a total of 118 species (represented by 105 genera and 54 families) which were used to treat various stomach related disorders (Table 1). The researchers' list was dominated by trees (50 species) followed by herb (44 species), shrubs (19 species), climber (5) and the least by a single species of creeper. Dominant families in the list are Fabaceae (11 species), Malvaceae (7 species), Asteraceae (6 species), Euphorbiaceae (5 species) and Lamiaceae (5 species) (Table 2). The dominant genus is *Ficus* represented by 3 species (Table 3).

Plant Part Used

Various plant parts with different preparation were used for curing stomach diseases/disorders. Different therapies were reported for the disease. Some are taken as direct raw oral consumption of the plant while others after preparation of formulations either orally or externally.

Table 1 : Reported species, habitat and their mode of application

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Abrus precatorius</i> Fabaceae Kawet	Herb leaves	Abdominal pain	Aqueous leaf extract helps in abdominal pain	Rahaman, Karmakarand Karmakar 2015; Mitra and Mukherjee 2009 Ghosh 2008	In Karnataka, leaf paste is used to cure stomach pain (Siddalinga and Vidyasagar 2013)
<i>Abronia augusta</i> Malvaceae Ulatkambal	Tree, root	Blood dysentery and diarrhea	Taken as juice		
<i>Abutilon indicum</i> Malvaceae Petari	Shrub root	Dysentery	Root paste given with honey to cure dysentery	Ghosh et al.2013; Mitra and Mukherjee 2009	In Karnataka, leaf decoction is used to cure stomach pain (Siddalinga and Vidyasagar 2013). In Tamil Nadu, root extract is used to cure piles (Shanmugam et al. 2012). In Kerala, fresh leaf juice drink used to cure piles (Prasad et al. 2013). In Ahmednagar, leaves used are for dyspepsia and piles (Abhang et al. 2015). In Jawadah hills of Tamil Nadu, malyali tribes and traditional healers leaf extract is used to cure piles and stomach ulcer (Salai et al. 2014). In Jawadhu hills of Tamil Nadu, Malyali tribes used fruit and bark to treat dysentery (Salai et al. b 2014). In Sonebhadra Dist. of U.P, heartwood and bark is used for diarrheaaand dysentery (Singh and Dubey 2012). In Alirajpur Dist. of M.P, tribal communities use bark of the tree in chronic diarrhea (Thakur and Iqbal 2015). In Dehradun Dist. of U.K, Boxa community use leaves and bark for dysentery and diarrhoea (Gairola et al. 2013)
<i>Acacia catechu</i> Fabaceae Khoyer	Tree, stem	Stomach ache	Aqueous extract of fresh stem bark with lime water in empty stomach	Mitra and Mukherjee 2009	
<i>Acacia leucophloea</i> Fabaceae Arimed	Tree, bark and latex	Food poison	Juice in food poisoning	Mitra and Mukherjee 2012; Ghosh 2008	
<i>Achyranthes bidentata</i> Amaranthaceae Chorokanta	Herb, leaves	Emesis	Leaf juice	Ghosh et al. 2013;	In Sonebhadra Dist.of U.P, fruit, leaf and bark are used to treat constipation, diarrhoea, dysentery, gastrictroubles and other stomach disorders (Singh and Dubey 2012)
<i>Aegle marmelos</i> Rutaceae Bael	Tree, fruit	Indigestion, Constipation Dysentery	Pulp of fruit are taken	Ghosh 2003; Bose et al. 2015; Mitra and Mukherjee 2009	In Mayurbanj dist. of North Orissa, ripe fruit pulp is used to cure digestion (Rout et al. 2009). In Hoshangabad area of M.P, bark is used to treat Diarrhoea (Upadhyay 2013). In Shadol Dist. of M.P, fruit is used to cure stomach disorder (Sandya and Sandya 2013). In Tikamgarh Dist.of M.P, fruit is used to treat stomach disorder (Shakya and Ahirwar 2015)

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Ageratum conyzoides</i> Asteraceae Uchanti	Herb, leaves	Dysentery	Leaf extract given with honey to cure dysentery	Bose et al. 2015; Mitra and Mukherjee 2009; Saha et al. 2013	
<i>Alangium sabtilifolium</i> Alangiaceae Ankar	Tree, root	Dyspepsia	Dried root powder taken with luke warm water for dyspepsia	Ghosh 2008; Mitra and Mukherjee 2009	
<i>Allium cepa</i> Amaryllidaceae Piyaz	Herb, bulbs	Dysentery	Young bulb extract with a salt helps in dysentery.	Ghosh 2008; Mitra and Mukherjee 2009; Bose et al. 2015	In Kumoan Himalaya, seeds are used to treat diarrhoea (Jalal and Garkoti 2013)
<i>Aloe barbadensis</i> Asphodelaceae Ghrita Kumara	Herb, leaves	Constipation	Leaf extract with sugar molasses and a glass of lukewarm water	Bose et al. 2015; Mitra and Mukherjee 2009.	
<i>Alstonia scholaris</i> Apocynaceae Chhatim	Tree stem, bark, leaves and latex	Antidysenteric, ulcer, acidity and child constipation	Crushed bark and leaf paste applied on affected area. Latex prevents acidity and child constipation	Saha et al. 2013; Biwas and Das 2010; Bose et al. 2015; Sinhababu and Banerjee and Banerjee 2013	In Sonbhadra Dist. of U.P, bark is used for diarrhea and ulcer (Singh and Dubey 2012)
<i>Annona squamosa</i> Annonaceae Aata	Tree, leaves	Infestation and Vermifuge	Leaf extract taken in empty stomach in vermifuge	Ghosh et al. 2013; Mitra and Mukherjee 2009	In Sonbhadra Dist. of U.P, seed, leaf, bark, fruit is used for diarrhoea and dysentery (Singh and Dubey 2012)
<i>Azadirachta indica</i> Meliaceae Nim	Tree, leaves	Stomach ache, acidity, intestinal worms	Leaf sap for acidity	Sarkhel 2013; Ghosh et al. 2013; Biswas, Dasand Das 2010; Bose et al. 2015; Ghosh 2003; Sinhababu and Banerjee and Banerjee 2013; Mitra and Mukherjee 2009; Mitra and Mukherjee 2012	In Tharu tribe of Himalayan region, bark extract is used to treat dysentery (Bajpai et al. 2016). In Jawadah hills of Tamil Nadu, leaves are used to treat stomach ache (Salat et al. 2014)
<i>Bauhinia purpurea</i> Fabaceae Kanchan	Tree bark and flowers	Diarrhea, laxative	Bark used in diarrhea, flowers laxative	Saha et al. 2013	In Jaipur district of Kaladera region the decoction of the flower buds is taken orally in constipation (Pareek and Trivedi 2011)

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Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Bauhinia tomentosa</i> Fabaceae/Rakta kanchan	Tree root	Amoebic dysentery	Decoction of fresh root	Mitra and Mukherjee 2009	In Jawadah hills of Tamil Nadu, flowers juice is used to treat diarrhoea, Dysentery, Stomach Disorders. (Salai et al. 2014)
<i>Bischofia javanica</i> Phyllanthaceae Kainjal	Tree root	Dysentery and throat pain	Root paste with black pepper seed helps in dysentery	Saha et al. 2013; Mitra and Mukherjee 2009	
<i>Blumea lacera</i> Asteraceae/Randoi	Herb, leaves	Vermifuge	Leaf juice taken in empty stomach helpful in vermifuge	Rahaman, Karmakar and Karmakar 2015; Bose et al. 2015; Mitra and Mukherjee 2009	In Sonbhadra dist of U.P. leaves are used to treat piles (Singh and Dubey 2012)
<i>Boerhavia rapens</i> Nyctaginaceae Purnanaba	Herb whole plant and seed	Constipation	Dried seed powder with honey and a glass of lukewarm water and also whole plant paste with luke warm water is also helpful in constipation	Mitra and Mukherjee 2009	
<i>Bombax ceiba</i> Malvaceae/Simul	Tree root, latex, gums, flowers and shoots	Blood dysentery, amoebiasis, diarrhea	Root used in blood dysentery. Latex used in amoebiasis. Petiole paste with honey and water helps in diarrhea	Bose et al. 2015; Saha et al. 2013; Mitra and Mukherjee 2009; Mitra and Mukherjee 2012	In Sonbhadra Dist. of U.P. bark is used for ulcer (Singh and Dubey, 2012). In Sahajanpur Dist. of U.P. bark is used in constipation and dysentery (Sharma et al. 2010). In Dehradun Dist. of U.K. calyx powder and gum is used to treat stomachache, diarrhea and dysentery (Gairola et al. 2013)
<i>Borassus flabellifer</i> recaceae/Tal	Tree, leaves	Gastric and dyspepsia	Juice of leaf stalks and young roots is good for gastric and dyspepsia.	Rahaman, Karmakar and Karmakar 2015; Sinhababu, Banerjee and Banerjee 2013 Ghosh 2003	
<i>Bryophyllum pinnatum</i> Crassulaceae Pathar-kuchi	Herb, leaves	Hyperacidity and indigestion.	Tender leaves are crushed along with a pinch of rock salt		

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Butea monosperma</i> Fabaceae/Palash	Tree, seeds	Intestinal worms	Seed powder with water is taken for intestinal worms.	Rahaman, Karmakar and Karmakar 2015; Ghosh et al. 2013; Mitra and Mukherjee 2012; Mitra and Mukherjee 2009	
<i>Calotropis gigantea</i> Asclepiadaceae Akana	Shrub, leaves	Ulcer	Leaves are used	Biswas, Das and Das 2010; Saha et al. 2013; Rahaman, Karmakar and Karmakar 2015; Sarkhel 2013; Ghosh et al. 2013; Saha et al. 2013	In Sonebhadra district of U.P, seed, flower, bark, leaf are used in stomach vermifuge (Singh and Dubey 2012)
<i>Cannabis sativa</i> Cannabaceae Ganja	Herb, leaves	Stomach ache, indigestion, diabetes	Crushed leaf		
<i>Capparis zeylanica</i> Capparaceae Hurhure	Shrub, root	Dyspepsia	Root bark extract mixed with water and honey help in dyspepsia	Mitra and Mukherjee 2012; Mitra and Mukharjee 2009	In Arunachal Pradesh, leaves are used in stomach disorder (Khongssai et al. 2011)
<i>Careya arborea</i> Lecythidaceae Paik	Tree, bark	Blood dysentery	Bark extract used in blood dysentery.	Bose et al. 2015	In Bellary Dist. of Karnataka, fruit are used for indigestion and constipation (Siddalinga and Vidyasagar 2013). In Medak district of Andhra Pradesh, fruits are used for indigestion (Reddy et al. 2010)
<i>Cassia auriculata</i> Fabaceae Thankuni	Tree whole plant	Diarrhea, and dysentery	Whole plant extract helps to cure	Mitra and Mukherjee 2009	
<i>Cassia fistula</i> Fabaceae/Amaltus	Tree, leaves, fruit and seeds	Laxative, constipation, amoebiasis, diabetes, tonic in ringworm and ulcers	Leaf extract and fruit pulp are used as laxative and used as tonic in ringworm. Seed powder used in amoebiasis	Saha et al. 2013; Sinhababu and Banerjee 2013	
<i>Centella asiatica</i> Apiaceae/Thankuni	Herb, whole plant	Tonic, antibacterial, diabetes, dysentery and constipation	Whole plant extract used for treatment	Ghosh et al. 2013; Saha et al. 2013; Bose et al. 2015; Bose 2011; Mitra and Mukherjee 2012	In Jaipur district of Kaladera region whole plant is used for constipation (Pareek and Trivedi 2011). In Sonebhadra district of U.P, leaves, fruits and seeds are used to treat constipation and vermicide (Singh and Dubey 2012). In Sahajanpur Dist. of U.P seed used for constipation (Sharma et al. 2010). In Dehradun district of U.K fruit pulp is used as a remedy in dysentery and diarrhoea (Gairola et al. 2013)

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Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Cinnamomum glanduliferum</i> Lauraceae Malagiri	Tree, seed and wood	Antibacterial, dyspepsia and diarrhoea	Seed and wood extract are used in treatment	Saha et al. 2013	In Kumaon Himalaya, whole plant juice is used in dispels of worms (Jalal and Garkoti 2013). In Jawadhu hills of Tamil Nadu, malyali tribes used whole plant dried powder to cure gas trouble (Salai et al. 2014). In Arunachal Pradesh Adi tribes of Dehang-Debang biosphere reserve use whole plant extract in stomach ache (Kagyung et al. 2010). In Arunachal Pradesh plant extract mixed with water is taken as healthy tonic against dysentery (Khongsai et al. 2011)
<i>Cissampelos pareira</i> Menispermaceae Gorumara	Climber leaves and roots	Laxative, dyspepsia, ulcers and dysentery	Leaves and roots used in treatment	Saha et al. 2013; Mitra and Mukherjee 2009	
<i>Citrus medica</i> Rutaceae Lebu	Tree, fruits	Indigestion and dysentery	Fruit used for treatment	Saha et al. 2013	
<i>Clerodendron fragrans</i> Lamiaceae Jingsing Phang	Shrub, root	Stomach ache	Root bark prevents the stomach ache.	Bose et al. 2015	
<i>Coccinia grandis</i> Cucurbitaceae Tala Kachu	Shrub, root	Indigestion	Root extract used as digestive	Sinhbabu and Banerjee 2013	
<i>Colebrookea oppositifolia</i> Lamiaceae Dhursuli	Shrub, leaves and roots	Gastric	Leaves and root extract used in gastric trouble	Saha et al. 2013	In Jawadhu hills of Tamil Nadu, malyali tribes used leaf juice to cure ulcer (Salai et al. 2014)
<i>Corchorus capsularis</i> Malvaceae Pat	Shrub, seed	Stomach ache	Seed powder with sugar molasses	Mitra and Mukherjee 2009	
<i>Coriandrum sativum</i> Apiaceae Dhoney	Herb, fruits	Digestion, vomiting	Fruits used as digestive stimulant and anti vomiting agent	Bose et al. 2015	
<i>Costus speciosus</i> Costaceae Keu	Creeper, rhizome	Stomach ache	Rhizome used in treatment	Bose et al. 2015; Saha et al. 2013	
<i>Crinum amoenum</i> Amaryllidaceae Astachatur	Herb root	Diarrhoea	Root extract used to treat	Bose et al. 2015	

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Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Cucumis sativus</i> Cucurbitaceae Sasha	Herb, fruit	Indigestion	Consumed raw fruit to prevent cancer and indigestion	Ghosh 2008; Ghosh et al. 2013	
<i>Cyperus rotundus</i> Cyperaceae Muthaghas	Herb, bulb	Dysentery	Tuber paste with honey helps in dysentery	Biswas and Das 2010; Mitra and Mukherjee 2009	
<i>Datura metel</i> Solanaceae Datura	Herb, seeds	Stomach ache	Seed powder with honey to cure stomach ache	Ghosh 2008; Sarkhel 2013; Rahaman and Karmakar 2015; Saha et al. 2013; Mitra and Mukherjee 2009	In Karnataka, rhizome powder with butter milk is taken to cure dysentery (Siddalinga and Vidyasagar 2013). In Sivagangai distt of T.N tuber paste is used to cure stomach-ache (Shanmugum et al. 2012)
<i>Datura stramonium</i> Solanaceae Dhatura	Herb, seeds	Gastric and indigestion	Seeds and fruits are used	Bose et al. 2015; Saha et al. 2013	
<i>Dillenia indica</i> Dilleniaceae Chalta	Tree, leaves	Stomach ache	Extract leaves	Saha et al. 2013	
<i>Dioscorea alata</i> Dioscoreaceae Chuprialu	Vegetable, tubers	Anthelmintic	Tubers are used for treatment	Saha et al. 2013	
<i>Dioscorea bulbifera</i> Dioscoreaceae Ban-alu	Vegetable, tuber	Stomachic and dyspepsia	Tubers are used for treatment	Bose et al. 2015; Saha et al. 2013	In Dehang-Debang dist of A.P, fleshy calyx is used for stomach ache (Kagyung. 2010)
<i>Dolichos lablab</i> Fabaceae Shim	Vegetable, seed	Vomiting and abdominal pains	Crushed seed are used for the treatment	Ghosh et al. 2013	
<i>Drosera burmannii</i> Droseraceae Surya sisir	Herb, whole plant	Blood dysentery	Whole plant paste to cure blood dysentery	Mitra and Mukherjee 2009	In Sivagangai distt of T.N boiled fruit is taken to cures ulcer (Shanmugum et al. 2012). In Sonebhadra dist of U.P, tuber for dysentery and piles (Singh and Dubey 2012)
<i>Eclipta prostrata</i> Asteraceae Keshute	Herb whole plant	Ulcer and stomach ache	Whole plant extraction used for ulcer. Whole plant extract with lime water helps in stomachache	Saha et al. 2013; Bose et al. 2015; Sinhbabu and Banerjee et al. 2013; Mitra and Mukherjee 2009	
<i>Eupatorium cannabinum</i> Asteraceae Kalobannara	Shrub, roots and leaves	Emetic	Roots and leaves used	Saha et al. 2013	

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Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Euphorbia hirta</i> Euphorbiaceae Barokheruie	Herb, latex	Dysentery	Root paste with honey helps in dysentery	Bose et al. 2015; Saha et al. 2013; Bose 2011; Mitra and Mukherjee 2009 Saha et al. 2013	In Sahajampur dist of U.P leaf paste is applied for piles (Sharma et al. 2010)
<i>Euphorbia pulcherrima</i> Euphorbiaceae Lalpata	Shrb., leaves and flowers	Laxative	Leaves and flowers used for treatment	Saha et al. 2013	
<i>Ficus benghalensis</i> Moraceae Bat	Tree, root	Diabetes, ulcers, vomiting, dysentery	Prop root cap fried with ghee and given to the patient dysentery.	Saha et al. 2013; Banerjee 2013; Ghosh 2003; Sinhababu and Vidyasagar 2013), Saha et al. 2013	In Karnataka, fresh plant extract is used to cure piles (Siddalinga and Vidyasagar 2013); In Dehradun dist of U.K leaf juice is used to cure dysentery. (Gairola et al. 2013)
<i>Ficus benjamina</i> Moraceae Bargad	Tree, leaves	Ulcers	Leave used for treatment	Saha et al. 2013	In Himalayan Terai region, aerial root in dysentery is used (Bajpai et al. 2016). In Ahmednagar district latex is used to treat dysentery and diarrhoea (Abhang et al. 2015) In Mayurbhanj district or Orissa leaf extract is used for dysentery (Rout et al. 2009).
<i>Ficus religiosa</i> Moraceae Aswatha	Tree, whole plant	Laxative, diarrhea, ulcers and vomiting,	Bark is laxative. Bark used in blood dysentery, diarrhea. The latex is good agent for blood dysentery	Sinhababu and Banerjee 2013	
<i>Foeniculum vulgare</i> Apiaceae Mouri	Her, fruit	Indigestion, flatulence	Fruit decoction helps in indigestion an dflatulence	Mitra and Mukherjee 2009	
<i>Fumaria indica</i> Papaveraceae Bandhania	Her, whole plant	Dysentery	Whole plant extract helps in dysentery	Mitra and Mukherjee 2009	In Karnataka, leaves are used to cure stomach pain (Siddalinga and Vidyasagar 2013)
<i>Gynocardia odorata</i> Achariaceae Chalmogra	Tree, fruits and seeds	Ulcers	Fruits and seeds used for treatment	Saha et al. 2013	
<i>Helicteres isora</i> Malvaceae Mochra	Tre, whole plant, fruit	Jaundice, stomach ache	Extract used to treat jaundice. Ripe fruits boiled in mustard oil and gently rubbed in children for stomach ache	Bose et al. 2015; Mitra and Mukherjee 2009	

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Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Hibiscus rosasinesis</i> Malvaceae	Trees, flowers	Blood dysentery	Flower bud used to treat blood dysentery.	Ghosh et al. 2013; Bose et al. 2015; Mitra and Mukherjee 2009	
<i>Holarrhena pubescens</i> Apocynaceae	Tree, bark	Dysentery	Bark used to treat dysentery	Bose et al. 2015; Saha et al. 2013; Mitra and Mukherjee 2009	Tharu tribe of Himalayan region used fruit, bark and root in stomach ache, diabetes, diarrhoea and dysentery (Bajpai et al. 2016). In Alirajpur district of M.P. fruit powder is used to treat digestive disorder (Thaquir and Iqbal., 2015). In Dehradun district of U.K., fruit decoction is used to cure dysentery and diarrhoea (Gairola et al. 2013).
<i>Justicia adhatoda</i> Acanthaceae	Herb, leaves, stem	Ulcer	Leaf juice used to treat ulcer	Bose et al. 2015; Saha et al. 2013; Biswas and Das 2010	
<i>Lasia spinosa</i> Araceae	Herb, leaves	Intestinal diseases	Leaves used for intestinal diseases	Saha et al. 2013	In Gajapati district bark is used for diarrhoea (Biswajit et al. 2014)
<i>Leucas plukenetii</i> Lamiaceae	Herb, leaves and flowers	Ulcer and amoebiasis	Leaves and flowers used to treat ulcers. Leaf juice applied externally in chronic amoebiasis.	Bose 2011	
<i>Limonia acidissima</i> Rutaceae	Tree, fruit	Amoebic dysentery	Fruit pericarp mixed with curd and honey to cure amoebic dysentery	Mitra and Mukherjee 2009	
<i>Litsea glutinosa</i> Lauraceae	Tree, stem and bark	Diarrhoea and dysentery	Mucilaginous bark used in diarrhoea, dysentery and decoction of stem bark helps in dysentery	Saha et al. 2013; Mitra and Mukherjee 2009	
<i>Madhuca indica</i> Sapotaceae	Tree, seed	Astringent, inflammations	The oil obtained from seed is used as laxative. Bark used as astringent and good for inflammations.	Sinhbabu and Banerjee 2013	In Himalayan terai region, tharu tribe used fruit in diarrhoea and dysentery (Bajpai et al. 2016)

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Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Mallotus philippensis</i> Euphorbiaceae Sindure	Tree, leaves and fruits	Improving appetite, ulcers, and vermifuge	Leaves and fruit are used for treatment	Saha et al. 2013	In Himalayan terai region, tharu tribe used leaves in diarrhoea and dysentery (Bajpai et al. 2016)
<i>Manihot esculenta</i> Euphorbiaceae Shimultaru	Shrub, root	Ulcer	Root paste used for ulcer	Saha et al. 2013	In Hoshangabad dist of M.P, bark is used to cure diarrhoea (Upadhyay 2013)
<i>Mimosa pudica</i> Fabaceae Sweetlajjabati	Herb, leaves	Ulcer	Crushed leaf	Ghosh 2008; Sarkhel 2013; Saha et al. 2013; Biswas and Das 2010	In Kumoan Himalaya, seeds are used to treat diarrhoea (Jalal and Garkoti 2013)
<i>Mimusops elengi</i> Sapotaceae Bakul	Tree, flowers, fruits and seeds	Ulcers, chronic dysentery and constipation	Flowers are used for preparing a lotion for ulcers. Pulp of ripe fruits are used in chronic dysentery. Seeds are used in constipation.	Sinhbabu and Banerjee 2013	
<i>Momordica charantia</i> Cucurbitaceae Uchehhe	Climber, fruits	Ulcer, stomach worms and dysentery	Fruits are used for treatments	Saha et al. 2013	In Tamil Nadu leaf juice is used to cure piles (Salai et al. 2014). In Mayurbhanj district of Orissa whole plant decoction is used in bleeding piles (Rout 2009)
<i>Morinda angustifolia</i> Rubiaceae Haldikath	Shrub, roots	Ulcers and dysentery	Root tonic used to cure ulcers and dysentery	Saha et al. 2013	
<i>Moringa oleifera</i> Moringaceae Sajina	Tree, seed	Indigestion	Seed powder taken with warm water for indigestion	Sarkhel 2013; Rahaman and Karmakar 2015; Ghosh 2003; Mitra and Mukherjee 2009	In Kumoan Himalaya, fruit decoction is used for digestive disorder (Jalal and Garkoti 2013)
<i>Murraya koenigii</i> Rutaceae Currypata	Leaves	Flatulence	Daily taking of leaflets leaf decoction with salt heels in flatulence	Ghosh 2008; Mitra and Mukherjee 2009	
<i>Musa balbisiana</i> Musaceae Kala	Tree, fruits, stem and roots	Diarrhoea	Fruit, stem and root are used for the treatment	Bose et al. 2015;	In Karnataka, leaf extract is used to cure dysentery (Siddalinga and Vidyasagar 2013)
<i>Mussaenda frondosa</i> Rubiaceae Mussanda	Shrub, leaves, flowers and roots	Ulcers	Leaves and flowers used in external applications for ulcers.	Sinhbabu and Banerjee 2013	In Himalayan terai region, tharu tribe used leaves in diarrhoea and dysentery (Bajpai et al. 2016)

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Mussaenda roxburghii</i> Rubiaceae Dhobi	Shrub flowers and roots	Ulcers	Flowers and root are used for treatments	Bose et al. 2015	
<i>Nyctanthes arbor-tristis</i> Oleaceae Sheuli	Tree, leaves	Vermifuge	Leaf extract is given as vermifuge	Mitra and Mukherjee 2009	
<i>Ocimum gratissimum</i> Lamiaceae Ramtulasi	Shrub, leaves	Constipation	Fresh leaves are used in constipation	Bose et al. 2015; Sinhababu and Banerjee 2013	
<i>Oroxylum indicum</i> Bignoniaceae Sona	Tree fruits, seed and bark	Stomach pain, appetizer, vomiting and dysentery	Paste of hydrated fruits or seed or bark applied in stomach pain, chest pain, used as appetizer	Saha et al. 2013; Bose et al. 2015	
<i>Paederia scandens</i> Rubiaceae Gandai	Herb, leaves and roots	Dysentery and diarrhea	Leaf extract used for dysentery and diarrhea	Bose et al. 2015; Sinhababu and Banerjee 2013	In Himalayan terai region, tharu tribe used leaves and flower in dyspepsia and constipation, seed in piles (Bajpai et al. 2016).
<i>Peltophorum pterocarpum</i> Caesalpiniaceae Radhachura	Tree, leaves	Dysentery	The stem bark is useful in dysentery.	Sinhababu and Banerjee 2013	In Mayurbhanj district of Orissa roots are used to cure stomach trouble (Rout et al. 2009). In Hoshangabad district of M.P root bark is used to cure diarrhoea and dysentery (Upadha 2013.. In A.P seed powder is used to cure dysentery (Khongsai et al. 2011).
<i>Phyllanthus emblica</i> Phyllanthaceae Amla	Tree flower, fruit, seed, bark, leaves, roots, and stem	Indigestion, vomiting, diarrhea, constipation, tonic and laxative	Paste of ripe fruit given to children to treat diarrhea. Infusion of fruit with common salts given to children as gripe. Unripe fruit taken as cooling agent and laxative.	Bose et al. 2015; Saha et al. 2013; Biswas and Das 2010	
<i>Phyllanthus urinaria</i> Phyllanthaceae	Herb whole plant	Constipation and stomachic	Whole plant extract used in constipation and stomachic	Saha et al. 2013	

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Physalis minima</i> Solanaceae Bon tehari	Herb, whole plant	Ulcer	Whole plant used for treatment	Saha et al. 2013; Bose 2011	In Kumoan Himalaya, triphala powder is used to digestion (Jalal and Garkoti. 2013) In Gajapati dist of Odisha fruits are used to cure acidity, purify the blood, benefit the eyes, stimulate hair growth and also cure all stomach problems, In Himalayan terai region fruits are used to cure diarrhoea (Bajpai et al. 2016), In Somebhadra dist of U.P, leaf, bark, fruit used for stomach complaints (Singh and Dube 2012)
<i>Piper nigrum</i> Piperaceae Golomirch	Vine, fruits and seed	Constipation	Powder mixed with a luke warm water for constipation	Ghosh 2008; Biswas and Das 2010; Bose et al. 2015	
<i>Plantago erosa</i> Plantaginaceae Jangli isabgul	Herb roots and leaves	Dysentery	Roots and leaves used for the treatment	Saha et al. 2013	In Somebhadra district of U.P, whole plant is used for stomach complaints (Singh and Dubey 2012).
<i>Plumbago indica</i> Plumbaginaceae Agnichita	Herb, stem	Dysentery	Stem bark decoction to cure dysentery	Mitra and Mukherjee 2009	
<i>Plumbago zeylanica</i> Plumbaginaceae Chita	Shrub Roots	Ulcers	Roots are used against problems.	Mitra and Mukherjee 2009; Saha et al. 2013	
<i>Poinciana pulcherrima</i> Ceasalpinaceae Radhachura	Shrub leaves	Abdominal pain	Juice of leaves are used	Ghosh et al. 2013	
<i>Pouzolzia zeylanica</i> Urticaceae	Herb roots	Dysentery	Roots eaten to cure dysentery	Saha et al. 2013	In Ahmednagar district of M.P whole plant is used for intestinal disorder (Abhang et al. 2015). In Sonebhadra dist of U.P, whole plant is used for diarrhoea, dysentery and indigestion (Singh and Dubey. 2012), In Hoshangapur dist of M.P bark powder is used to cure piles (Upadhyaya 2013)
<i>Psidium guajava</i> Myrtaceae Peyara	Tree leaves and young stem	Diabetes, dysentery, ulcers, diarrhea, toothache, astringent and tonic	Leaf paste is used. Bark used to prevent child dysentery	Ghosh 2003; Bose et al. 2015; Saha et al. 2013; Biswas and Das 2010	
<i>Pterospermum acerifolium</i> Sterculiaceae	Tree, leaves and flowers	Ulcer and tonic	Leaves and flowers used for the treatment	Saha et al. 2013	

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Quinqualis indica</i> Combretaceae Madhabilata	Vine, leaves and seed	Abdominal pain and diarrhoea abdominal pain. Ripe seeds are roasted and given in diarrhoea	Leaves decoction prescribed in	Sinha Babu and Banerjee 2013	In Karnataka, leaves are taken to cure piles (Siddalinga and Vidyasagar 2013). In Himalayan terai region, Tharu tribe used leaves for diarrhoea (Bajpai et al. 2016).
<i>Rhus chinensis</i> Anacardiaceae Bhalay	Tree, fruits	Dysentery, indigestion and diarrhoea	Fruits are used for treatment	Saha et al. 2013	
<i>Ricinus communis</i> Euphorbiaceae Erdom	Tree, seed	Stomach ache	Seed oil is applied on belly	Saha et al. 2013; Bose et al. 2015; Rahaman and Karmakar 2015; Mitra and Mukherjee 2009	
<i>Semecarpus anacardium</i> Anacardiaceae Bhallataka	Tree, bark and fruits	Ulcer and dysentery treatment.	Bark and fruits are used for the	Saha et al. 2013; Mitra and Mukherjee 2009	
<i>Shorea robusta</i> Dipterocarpaceae Sal	Tree, leaves	Diarrhoea and dysentery	Leaf paste used for diarrhoea and dysentery	Ghosh et al. 2013; Saha et al. 2013; Bose et al. 2015 Saha et al. 2013	
<i>Sida cordata</i> Malvaceae	Shrub, leaves	Diarrhoea	Leaves are good for diarrhoea	Ghosh 2008	
<i>Smilax macrophylla</i> Liliaceae Ramdatan	Herb root	Blood dysentery and diarrhoea cure	Juice is taken daily to complete		In Gajapati district of Odisha, oleoresin is used to cure diarrhoea (Biswajit et al. 2014). In Sonebhadra dist of U.P. bark and resin is used in diarrhoea (Singh and Dube 2012). In Mayurbhanj district of Orissa seed powder are used to cure stomach pain (Rout et al. 2009). In Dehradun district of U.K bark decoction is used to cure diarrhoea (Gairola et al. 2013)
<i>Solanum americanum</i> Solanaceae Kalabegun	Herb, whole plant	Vomiting and ulcers	The whole plant and tender shoot is useful	Saha et al. 2013	
<i>Sphaeranthus indicus</i> Asteraceae Chaggal nudi	Herb, root	Stomach ache and flatulence water	Root extract with lime	Mitra and Mukherjee 2009	
<i>Stephania glabra</i> Menispermaceae	Herb, tuber	Diabetes and dysentery	Tuber used for the treatment	Saha et al. 2013	In T.N. leaf juice is used to cures ulcer and stomach pain (Salai et al. 2014)

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Stephania japonica</i> Menispermaceae Akundi	Snake, vine rhizome	Dyspepsia and diarrhoea	Rhizome used to treat	Bose et al. 2015; Saha et al. 2013; Bose 2011	
<i>Syzygium cumini</i> Myrtaceae Kodedare	Tree, stem, seeds, leaves and fruits	Stomachic, gastric vomiting, diabetes, dysentery and diarrhea	Bark juice is taken orally in stomach problem. Tender leaves are used for vomiting. Fruits and seeds are used in diabetes. Juice of young leaves used in diarrhea.	Mitra and Mukherjee 2009; Rahaman and Karmakar 2015; Saha et al. 2013; Ghosh et al. 2013	
<i>Tephrosia purpurea</i> Fabaceae Bon nil	Herb, root	Stomach ache	Root extract with honey and luke warm water	Mitra and Mukherjee 2009	Dyspepsia and constipation One of the ingredients of the triphala of ayurvedic medicine. Dried fruit used to treat dyspepsia and constipation.
<i>Terminalia bellirica</i> Combretaceae Bahera	Tree, fruits bark and seed	Dyspepsia and constipation	One of the ingredients of the triphala of ayurvedic medicine. Dried fruit use to treat dyspepsia and cpnstofatopm	Bose et al. 2015; Sinhababu and Banerjee 2013; Saha et al. 2013; Bajpai et al. 2016),	In Himalayan Terai region, bark ad seed are used to treat diabetes and dysetry. In A.P. bark decoction is used for diarrhea and dysentery (Khongsai et al. 2011).
<i>Terminalia chebula</i> Combretaceae Hariaki	Tree, fruit	Digestive agent, dysentery and vomiting	Fruits used in stomachic, dysentery and vomiting	Bose et al. 2015; Saha et al. 2013; Biswas and Das 2010; Sinhababu and Banerjee 2013; Sarkhel 2013;	In Shivganga district of T.N root is used to cure stomach ache (Shannugum et al. 2012). In Mayurbhanj dist of Orissa root is used for stomach ache (Rout et al. 2009)
<i>Tinospora cordifolia</i> Menispermaceae Guduchi	Herb, stem and root	Vomiting, acidity and stomach ache	Stem sap used against acidity. Root extract helps in stomach ache.	Bose et al. 2015; Saha et al. 2013; Mitra and Mukherjee 2009	In Kumaon Himalaya, fruit powder is used to treat diarrhoea and dysentery (Jalal and Garkoti 2013), In Himalayan terai region it is one of the ingredient dist of M.P fruit infusion is given to cure diarrhoea (Abhang et al. 2015). In Dehadun district of UK fruits is used to treat dysentery and diarrhoea (Gairola 2013)

Table 1: Contd...

Species scientific Name/Family/Local name	Habitat/Part used	Used against	Mode of application	Studies from West Bengal	Reported use from other parts of India
<i>Toona ciliata</i> Meliaceae Toon	Tree, bark	Dysentery and ulcers	Bark used in dysentery and ulcers	Saha et al. 2013	In Kumoan Himalaya, fruit powder is used to treat diarrhoea (Jalal and Garkoti 2013) In Bellary dist of Karnataka, fruits used for acidity, digestive disorders and indigestion (Siddalinga 2013), In Gajapati dist of Orissa used as ingredient of triphala (Biswajit et al. 2014), In Himalayan region, seed paste used for stomach pain (Bajpai et al. 2016) In Ahmednagar district of M.S stem is used for stomach ache (Abhang et al. 2015), In Kolli hills whole plant juice used in gas trouble (Anjalum et al. 2016)
<i>Trichosanthes cordata</i> Cucurbitaceae Vitechhara	Herb, young twig	Vomiting, dyspepsia and flatulence	The young twig is used in the treatment	Saha et al. 2013	
<i>Typhonium trilobatum</i> Araceae Khakroni	Herb, whole plants	Gastric and ulcer	Rhizome is used with for treatment	Saha et al. 2013	In Himalayan terai region, tharu tribe used bark in dysentery (Bajpai et al. 2016)
<i>Vernonia cinerea</i> Asteraceae Choto Kuksima	Shrub, whole plant, fruit	Dyspepsia and piles	Whole plant extract used to cure asthma, bronchitis and piles. Decoction of fruit with black pepper and common salt is also useful	Mitra and Mukherjee 2009; Sinhababu and Banerjee 2013	
<i>Vitex negundo</i> Lamiaceae Nishinda	Shrub, leaves and flower	Ulcers and diarrhoea	Leaf juice is useful for reducing fat inflammation and ulcers. Flowers are useful in diarrhoea	Bose et al. 2015; Ghosh 2008; Saha et al. 2013; Ghosh 2003	
<i>Wrightia arborea</i> Apocynaceae Khira	Tree, bark	Dysentery	Dried bark is used in dysentery	Saha et al. 2013	
<i>Ziziphus mauritiana</i> Rhamnaceae Kul	Tree, leaves and root	Ulcer, anthelmintic, dysentery and diarrhoea	Leaf paste rubbed on abdomen acts as an astringent, anthelmintic. Root juice is useful for dysentery and diarrhoea	Ghosh 2008; Ghosh et al. 2013; Saha et al. 2013	In Dehradun district of U.K plant infusion and fresh flower is used to cure diarrhoea and dysentery (Gairola et al. 2013)

Table 2: Status of different families with the number of species and genera of the plant species used to treat stomach disorders

Family	No. of species	No. of genera	Family	No. of species	No. of genera
Acanthaceae	1	1	Euphorbiaceae	5	4
Achariaceae	1	1	Fabaceae	11	8
Alangiaceae	1	1	Lamiaceae	5	5
Amaranthaceae	1	1	Lauraceae	2	2
Amaryllidaceae	2	2	Lecythidaceae	1	1
Anacardiaceae	2	2	Liliaceae	1	1
Annonaceae	1	1	Malvaceae	7	7
Apiaceae	3	3	Meliaceae	1	1
Apocynaceae	1	1	Menispermaceae	4	3
Araceae	2	2	Moraceae	3	1
Arecaceae	1	1	Moringaceae	1	1
Asclepiadaceae	1	1	Musaceae	1	1
Asphodelaceae	1	1	Myrtaceae	2	2
Asteraceae	6	6	Nyctaginaceae	1	1
Bignoniaceae	1	1	Oleaceae	1	1
Caesalpiniaceae	2	2	Papaveraceae	1	1
Cannabinaceae	1	1	Phyllanthaceae	3	2
Capparaceae	1	1	Piperaceae	1	1
Combretaceae	3	2	Plantaginaceae	1	1
Costaceae	1	1	Plumbaginaceae	2	1
Crassulaceae	1	1	Rhamnaceae	1	1
Cucurbitaceae	4	4	Rubiaceae	4	3
Cyperaceae	1	1	Rutaceae	4	4
Dipterocarpaceae	1	1	Sapotaceae	2	2
Dilleniaceae	1	1	Solanaceae	4	3
Dioscoreaceae	2	1	Sterculiaceae	1	1
Droseraceae	1	1	Urticaceae	1	1

Table 3: Status of different genus with their respective number of the plant species used to treat stomach disorders

1	2	1	2	1	2	1	2	1	2
Abrus	1	Calotropis	1	Dolichos	1	Mimusops	1	Quinqualis	1
Abroma	1	Cannabis	1	Drosera	1	Momordica	1	Rhus	1
Abutilon	1	Capparis	1	Eclipta	1	Morinda	1	Ricinus	1
Acacia	2	Careya	1	Eupatorium	1	Moringa	1	Semecarpus	1
Achyranthes	1	Cassia	2	Euphorbia	2	Murraya	1	Shorea	1
Aegle	1	Centella	1	Ficus	3	Musa	1	Sida	1
Ageratum	1	Cinnamomum	1	Foeniculum	1	Mussaenda	2	Smilax	1
Alangium	1	Cissampelos	1	Fumaria	1	Nyctanthes	1	Solanum	1
Allium	1	Citrus medica	1	Gynocardia	1	Ocimum	1	Sphaeranthus	1
Aloe	1	Clerodendron	1	Helicteres	1	Oroxylum	1	Stephania	2
Alstonia	1	Coccoloba	1	Hibiscus	1	Paederia	1	Syzygium	1
Annona	1	Colebrookea	1	Holarrhena	1	Peltophorum	1	Tephrosia	1
Azadirachta	1	Corchorus	1	Justicia	1	Phyllanthus	2	Terminalia	2
Bauhinia	2	Coriandrum	1	Lasia	1	Physalis	1	Tinospora	1
Bischofia	1	Costus	1	Leucas	1	Piper	1	Toona	1
Blumea	1	Crinum	1	Limonia	1	Plantago	1	Trichosanthes	1
Boerhavia	1	Cucumis	1	Litsea	1	Plumbago	2	Typhonium	1
Bombax	1	Cyperus	1	Madhuca	1	Poinciana	1	Vernonia	1
Borassus	1	Datura	2	Mallotus	1	Pouzolzia	1	Vitex	1
Bryophyllum	1	Dillenia	1	Manihot	1	Psidium	1	Wrightia	1
Butea	1	Dioscorea	2	Mimosa	1	Pterospermum	1	Ziziphus	1

1 – Genus; 2- Number of species

Table 4: Reported plant parts used and diseases cured by respective number of species

<i>Plant part used</i>	<i>No. of species</i>	<i>Disease group</i>	<i>No. of species</i>
Leaves	44	Abdominal pain	1
Root	33	Dysentery	45
Stem	13	Diarrhoea	13
Bark	14	Stomach ache	14
Latex	6	Food poison	1
Whole plant	16	Emesis	1
Fruits	28	Indigestion	13
Bulb	1	Constipation	13
Flower	12	Dyspepsia	10
Gum	1	Ulcer	29
Seed	20	Piles	1
Wood	1	Gastric	5
Twig	1	Vermifuge	4
Rhizome	2	Vomiting	11
Tuber	3	Intestinal worms	2
		Acidity	3

All plant parts are used either singly or as mixture and in some cases whole plants are also used. Leaves/foilage was mostly used as we listed maximum number of plant species (44) whose leaves/foilage was used (Table 4). Roots of 33 species, fruits 28 species, seeds 20 species, bark 14 species, stem 13 species and flowers of 12 species were used. Other plant parts and exudates like latex, rhizome, twigs, gum, bulb, tuber and wood were also used but to a lesser extent and only few plants fall under these groups. Similar documentations on use of plant parts for some other disease were reported from other regions also (Kagyung et al. 2010; Jalal and Garkoti 2013; Sharma et al. 2010; Korkmaz et al. 2016). The most frequently utilized plant parts are bark, leaves, roots, branches, stem, fruits and seeds (Shukla and Chakravarty 2012; Alagesaboopathi 2014; Mondal and Samanta 2014). Additionally, some plant species have medicinal value in their flowers, rhizomes, tubers and heart-wood. In some cases, the whole plant including the roots was utilized (Shukla and Chakravarty 2012; Suresh et al. 2013). Most of the ethnobotanical studies confirmed that the leaves are the major portion of the plant used in the treatment of diseases (Ignacimuthu et al. 2008; Choudhury et al. 2012).

Diseases Cured

The herbal medicines were mostly prepared in the form of decoction, juice and powder and sometimes it is consumed directly. The researchers listed 45 plant species for treatment of dys-

entery only, 29 species for gastro-enteritis (ulcer) and 14 species for stomach ache. Other stomach disorders like dyspepsia, abdominal pain and acidity were also treated but only few species were reported (Table 4). A similar ethnomedicinal study from Turkey also reported use of 107 plant species for intestinal digestive disorders of the gastrointestinal tract (Everest and Ozturk 2005).

CONCLUSION

This documentation on herbal medicines for stomach diseases/disorders indicates that till today traditional practitioners play an important role in health care system among traditional communities of West Bengal and these communities possess a good knowledge of herbal drugs. This compilation on ethnomedicinal information on stomach diseases/disorders ended up with enlisting 118 species of plants which were used to treat stomach diseases/disorders in different parts of West Bengal, India. Some species are commonly used but may not be clinically proven. Medicinal plants play an important role in providing knowledge to the researchers in the field of ethnopharmacology. This compilation might help the researchers for further critical exploration of medicinal plants present in the districts of West Bengal and development of new drugs. Ethnic group has vast knowledge regarding the use of herbal folk remedies. They are well known regarding the multiple uses of same or different species and they know the alternative resources for treating the particular disease.

RECOMMENDATIONS

Clinical trials are needed to ascertain the curative properties of these preparations for safe and longer use. The indigenous knowledge and uses of herbal medicinal plants of a particular area have to be analyzed to develop appropriate management measures (*ex situ* and *in situ* conservation) for best utilization of natural resource.

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