

## PLANTS USED FOR TREATMENT OF DIARRHEA: AN AYURVEDIC PROSPECTIVE

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### ABSTRACT

**Ethnomedicinal relevance:** In developing countries, diarrhoea becomes a major health problem leading to morbidity and mortality in rural communities. In the present article we have tried to enumerate simple and single herbal remedies helpful in curing diarrhoea.

**Materials and methods:** literature survey was conducted with help of several important Ayurvedic text to collect information on plants used for treating diarrhoea.

**Results and conclusions:** 140 single herbal preparations were reported in the present article. The study has supplied information on many medicinal plants and their method of uses. Such simple preparations may helps to the traditional healers in management of diarrhoea in initial stage. Moreover, these user friendly methodologies may contribute in initiation of advance investigation for discovery of new compounds and formulation from these potential plants.

**Keywords:** Diarrhoea, *Nidan*, *Purva rupa*.

### INTRODUCTION

Diarrhoea has long been recognized as an important health problem in all age groups and is a major cause of morbidity and mortality in rural communities of socio-economically backward and developing, third-world countries. It may be infectious or non-infectious [1] with increase in frequency of passage of liquid faeces and alteration in stool character (amount and consistency). Infectious causative organism (virus, parasite or bacterium) spreads through contaminated food or drinking-water or from person to person as a result of poor hygiene [2] while different toxins, chronic diseases or antibiotics are contributed in non infectious diarrhoea [3]. Clinically it involves both an increase in the motility of the gastrointestinal tract, along with increased secretion and reduced absorption of fluid and loss of electrolytes (particularly sodium) and water [4] in the small and/or large intestine resulting in profuse watery stool output [5]. Globally, diarrhoea accounts for more than 5-8 million deaths annually, majority of whom are infants and children below 5years old especially in developing countries [6-8]. 88% of diarrhoea-related deaths are caused by inadequate sanitation along with poor hygiene and clinically due to dehydration, which results from the loss of electrolytes in diarrhoeal stools [9]. Economically, diarrhoea is one of the major health challenges to humans as it causes loss of productive life due to premature mortality, disability and increased health-care costs [10].

Usually, the treatment Approach toward diarrhoea is non-specific, with the goal of reducing the distress and trouble of recurrent bowel movements [11, 12]. Oral rehydration therapy (ORT) is first line of treatment, when acute diarrhoea not control with ORT intravenous maintenance of fluid and electrolyte balance, antisecretory agents (bismuth compounds and octreotide); probiotics; anti-infectives (ciprofloxacin or levofloxacin) spasmolytic (loperamide, atropine, hyoscine) or other antidiarrhoeal agents ( $\alpha$ 2-adrenergic receptor antagonists e.g. clonidine; calmodulin inhibitors e.g. zaldaride maleate) are used [13-15]. A global diarrhoeal disease control programme was constituted by the WHO [16]. Along with modern drugs, the programme includes treatment based on indigenous practices as well as the evaluation of health education and prevention approaches. Many national and international organizations are supporting this program but still it remains a

challenge before doctors. It is therefore important to identify available natural drugs as well as explore documented traditional medicinal knowledge, indigenous herbal preparation. So that it may prove an alternatives to currently used anti-diarrhoeal drugs, which are not always free from adverse effects [17-19].

### Ayurveda view of diarrhoea

**Diarrhoea** is described in Ayurvedic classics with the name of "Atisara". *Atisara* term is made up of two terms "ati" (excessive) and "sara" (passing of liquid matter through anus). It means excessive flow of watery stool through anus [20-22]. *Dalhana* on his commentary on *Sushruta samhita* stated that passing of watery stools in increased quantity is a characteristic feature of *atisara* [21].

### *Nidan* (Etiology)

Different etiological factors have been mentioned in *Ayurvedic* classics [20-22]. Various *ahara janya* (dietary) factors viz. *Guru* (heavy to digest), *atisnigdha* (fatty or greasy diet), *atiruksha* (rough or dry diet), *atiushna* (pungent/hot in nature), *atidrava* (excessive liquid diets), *atisthula* (bulky diet), *atisheeta* (cold diet), *atimatra* (excess quantity), *ati-ambupana* (excessive intake of water), *virudha-ashna* (incompatible diets), *vishama-bhojana* (incompatible or improper cooked foods), *krisha-shushka mamsa* (unhygienic fat free meat intake), *asatmya* (intolerable food) and *anurit bhojan* (intake of raw oily and germinating seeds), *dushita jala* (polluted water) are described in texts. *Vihar janya* causative factors include *madyatipana* (excessive intake of alcoholic beverages), *atijalakrida* (excessive swimming), *vega vighata* (suppression of natural urges), *ati vyavaya* (excessive sexual indulgence), *vishaprayoga* (intake of poisonous substances), *bhaya* (fright), *shoka* (grief), *ritu viparyaya* (sudden change in season). It may caused by improper use of *sodhana* therapy (body purification treatment) or secondary to some other diseases like *krimi doshas* (intestinal worm infestations), *arsha* (piles); *shosa* (tuberculosis) [20-23].

### *Purva rupa* (Prodromal symptoms)

Pricking pain in cardiac region, umbilical region, anal region and abdomen, stool impacting, abdominal distension and other symptom is malaise, retention of flatus, constipation, flatulence and

indigestion has been described as prodromal symptom of *atisara* [21-23].

### Bheda of atisara (Types)

There are broadly six types of *atisara* viz. *vataja*, *pittaja*, *kaphaja*, *sannipataja*, *sokaja* and *amaja atisara* [21] or *vataja*, *pittaja*, *kaphaja*, *sannipataja*, *shokaja* and *bhayaja* [20]. Keeping in with the line of treatment *Caraka* has divided each *atisara* in *ama* and *pakva*. In *amatisara*, the pathology is more dominant in the *pittadhara kala* rather than the *pureeshadhara kala*. Here the vitiation of *pittadhara kala* occurs due to the *nidanasevana* like *guru snigdha ahara*, *dushita ambupana* etc. This pathology is similar to that of the osmotic diarrhoea where even the causes are similar like the excessive intake of carbonated fluids (*dushta ambupana*), non absorbable solutes etc. [24], and the treatment is also similar to that of *amatisara* where *langhana* is indicated i.e., here the diarrhoea comes down by the non intake of food. In *pakwatisara*, the pathology is more dominant in *pureesha dahara kala* i.e., *pakwashaya* is more dominant in *pureeshadhara kala* i.e., *pakwashaya* than *pittadhara kala*. Here the *vata vriddhi* occurs due to *nidana sevana* and this *vriddha vata* hampers the *dosha samshoshna* (*kleda somshoshna*) and it drags the *udakamsha* from the *udakavaha srotas* (*rasa, kapha, meda* etc) in leading to the increased watery stool [20]. The pathology is similar to that of the secretory diarrhoea, where there is the activation of intracellular mediation and water is dragged into the colon [24, 25].

### Samanya Lakshana

#### Amatisara Lakshana

*Amayukta shweta varna mala pravriti*, with bad odour. *Mala* along with pain, *mala* along with sound *admana atopa* due to *ajeerna amma* the vitiated *dosha* will further vitiate the *kosta* and will bring out the feces along with the food and the *mala* will have different colours coming out with difficulty very frequently [20].

#### Pakwatisara Lakshana

Little by little in small quantity of *mala* along with sound, *mala* along with pain *mala* along with froth *mala* along with tearing pain *mala* with nodule horripilation difficulty in breathing dryness in mouth, pain in *kati, uru, trika, janu, parswa*, stricture in anus [20].

In *Astanaga Hrdaya*, it has been told that when the *ama* has been well digested, the *Agni* gets strong and the patient will eliminate feces which is frothy, slimy associated with the pain in little quantity and very frequent [23].

### Management of atisara

*Atisara chikitsa* is planned after seeing the *sama* and *nirama avasta* of the *dosa*. Therapies which are mainly of *deepana*, *pachana* and *langhana* should be adopted in the *ama avasta* of the disease. In the *niramavasta*, the drugs which have *stambhana* properties are to be selected. Acharya *Susruta* [21], *Bhava Prakasha* [26], *Bhaishaja Ratnavali* [27] all have stated that since the treatment of *atisara* is not apart from the treatment of *ama* and *pakva*, hence in all kinds of *atisara* signs and symptoms of *ama* and *pakva* should be determined first [21]. If *atisara* has not reached the stage of incurability, it should be managed with the measures according to dominance of *dosha* and by examining *hetu*, *upashaya* and specific *dosha*. Acharya *Charaka* has separately explained the *chikitsa* of *amavasta* and *pakwavasta*, clearly mentioning the drugs in each condition [20].

### Amatisara chikitsa

In case of *pravruda doshas*, *upekshana* should be done because use of the *sangrahi* or *stambhana* drugs may leads the *doshas* to cause many distresses like *dandaka*, *alaska*, *admana*, *grahani*, *arshas*, *shotha*, *pandu*, *pleeha*, *kusta*, *gulma*, *udara*, *jwara*, etc. caused by *amadosh* [20-23]. If *pravruda doshas* are being expelled with difficulty, then their elimination should be supported by giving *hareetaki*. In case of *madyama pramana dosha*, *deepana-pacana karmas* have to be carried out. When there is *alpadosha*, then *langhana* would be beneficial. Either *upavasa* or *langhana* with *alpa*

*ahara* is advisable. Especially in *amatisara*, *amavatatisara*, *shleshmatiasara* and *pittatisara*, the *langhana* is advised by the author. After complete *amapachana* and *agnideepana*, the *amatisara* attains *pakwavastha*. Then it has to be treated in lines of *pakwatisara*. The expulsion of the *malas* should be stopped by *stambhana karma*.

### Pakwatisara chikitsa

Acharya *Sushruta* says, the *stambhana* should be carried out using the *dravyas* [21]. The drugs predominantly of *deepana*, *pachana* quality, *ushna veerya pradhana* and which does *drava soshana* is considered as *grahi dravya* [28]. *Sangrahi dravya* are generally *agni mahabhuta pradhana*, but according to *rasavaisheshika sangrahi dravya* are *prithvi* and *agni mahabhuta pradhana* [29]. The drugs which possess *rooksha* and *sheeta veerya*, *kashaya rasa*, *vatakaraka* and are easy for digestion does the *stambhana* action in the body [28]. Both these actions are termed as *ushna grahi* (*pakwa sangrahaka*) and *sheeta grahi* (*ama sangrahaka*) by *adhamalla*, commentator of *sarangadhara samhita* [29].

### Single drug remedies form Ayurvedic texts

A basin is form around umbilicus by the paste of *Amalaki* (*Emblica officinalis* Gaertn.) and is filled with *Adaraka* (*Zingiber officinale* Rosc.) juice. It is very helpful in checking even severe diarrhoea [30]. *Pippali* (*Piper longum* Linn.) with honey, *Citraka* (*Plumbago zeylanica* Linn.) with buttermilk or only tender fruits of *Bilva* (*Aegle marmelos* Correa.) is very effective in controlling diarrhoea [20]. *Ahiphen* (*Papaver somniferum* Linn.) mixed with the bark of *Kupilu* (*Strychnos nux-vomica* Linn. f.) and honey checks all types of diarrhoea [31].

Equal amount of powdered *Ankot* (*Alangium salviuifolium*) root bark, *Patha* (*Cissampelos pareira* Linn.) and *Daruharidra* (*Berberis aristata*) crushed with rice water and dried under shade is administered with rice water for the treatment of all types of diarrhoea [26, 30].

*Ankot* (*A. salviuifolium*) root powder or *Patha* (*C. pareira*) leaf paste with buffalo's buttermilk is use to cure diarrhoea [32].

*Ativisha* (*A. heterophyllum* Wall.) along with *Bilva* (*A. marmelos*), *Mocarasa* (oleo gum resin obtained from plant *S. malabarica* Schott and Endl.), *Lodhra* (*Symplocos racemosa* Roxb.), *Dhataki* (*Woodfordia fruticosa* Kurz.) and *Amra* (*M. indica*) seed decoction is a effective treatment of severe diarrhoea [26].

Decoction of *Badara* fruits (*Zizyphus jujube*) mixed with jiggery and oil should be taken orally in case of diarrhoea [21, 23].

Steam cooked *Badara* fruits (*Z. jujube*) and *Bilva* (*A. marmelos*) fruits is very helpful in controlling diarrhoea [21].

Bark of *Aralu* (*Ailanthus excelsa* Roxb.) pounded and mixed with *Sunthi* (*Z. officinale*) should be taken with rice water to increase frequency of stool [32].

Bark of *Aralu* (*A. excelsa*) smeared with ghee and heated on steam followed by crushing and mixing with honey may be utilized to check severe diarrhoea [23].

Bark of *Sallaki* (*Boswellia serrata* Roxb. Ex Coleb), *Badri* (*Z. jujube*), *Jambu* (*Syzygium cuminii* (Linn.) Skeels), *Priyala* (*Buchanania lanzan* Spreng), *Amra* (*Mangifera indica* Linn.) and *Arjuna* (*Terminalia arjuna* (Roxb.) W. & A.) mixed with honey and taken with milk checks hemorrhage [30, 33].

Bark of *Tinduka* (*Diospyros peregrina* (Gaertn.) Gurke.) is wrapped with *Kasmari* (*Gmelina arborea* Roxb.) leaves with paste of earth and cooked in mild fire. The juice so extracted is mixed with honey and taken. It destroys all types of diarrhoea [34].

Barks of *Priyal* (*B. lanzan.*), *Salmali* (*S. malabarica*), *Plaksa* (*Ficus lacor* Buch.- Ham.), *Sallaki* (*B. serrata*) and *Tinisa* (*Ougeinia oojeinensis* (Roxb.) Hochr.) are pounded and mixed with honey. Then they are dissolved in milk and taken for diarrhoea with blood [21].

*Bhanga* (*Cannabis sativa* Linn.) and *Jatiphala* (*Myristica fragrans* Houtt.) in equal parts mixed with double amount of *Indrayava* (seed of *Holarrhena antidysentrica* Linn.) and made into linctus. It checks all types of diarrhoea [26].

*Bhanga* (*C. sativa*) mixed with latex of *Udumber* (*Ficus racemosa* Linn.) is made into pills. It checks all types of diarrhoea [35].

By taking Chandan (*Santalum album* Linn.) combine with sugar and rice water, one become free from burning sensation, thirst, prameha (diabetic) and hemorrhage diarrhoea [20, 23].

By taking Pippali (*P. longum*) with honey, buttermilk with Citraka (*P. zeylanica*) and by eating tender fruits of Bilva (*A. marmelos*) one becomes free from bowel disorder (diarrhoea) [20].

By using the powder of Pippali (*P. longum*) or Marica (*Piper nigrum* Linn.), chronic diarrhoea can be destroyed [23, 33].

Cold infusion of Shalmali (*S. malabarica*) petioles, kept overnight should be taken after adding Madhuka (*Madhuca indica* J.F. Gmel.) and honey [21].

Covering of Amlika (*Tamarindus indica* Linn.) seed, Sunthi (*Z. officinale*) rock salt and Yavani (*Trachyspermum ammi* (Linn.) Sprague) are mixed together and taken with fresh butter milk [31].

Daruharidra (*B. aristata*), Durlabha (*Fagonia arabica*), Bilva (*A. marmelos*), and Raktacandana (*Pterocarpus santalinus* Linn. f.) checks diarrhoea caused by pitta [21].

Decoction made of the crushed tender leaves of Simsapa (*Dalbergia sissoo* Roxb. ex DC.) and Kovidara (*Bauhinia purpurea* Linn.) along with barley and mixed with ghee and milk should be given as slimy enema in discharge of mucus, tenesmus and prolapsed of rectum [23].

Decoction of Bilva (*A. marmelos*) and seed kernel of Amra (*M. indica*) mixed with honey and sugar checks vomiting and diarrhoea [33].

Decoction of Dhanyaka (*Coriandrum sativum* Linn.), Sunthi (*Z. officinale*), Balaka and Bilva (*A. marmelos*) alleviates pain, constipation and acts as digestive and appetizer in diarrhoea patients [33].

Decoction of Indrayava (seed of *H. antidysenterica*) and Patol (*Trichosanthes indica*) mixed with honey and sugar should be used in all types of diarrhoea [28].

Decoction of Kutaja (*H. antidysenterica*) bark and seeds and Musta (*Cyperus rotundus*) added with sugar and hone checks diarrhoea [32, 33].

Decoction of Musta (*C. rotundus*) alone should be taken mixed with honey [21].

Decoction of Palasa fruit (*Butea monosperma* (Lam.) Kuntze.) followed by warm milk should be given according to strength. By this, impurities are eliminated and thus diarrhoea is checked [20, 23].

Decoction of Patola (*T. indica*), Indrayava (seed of *H. antidysenterica*) added with sugar and honey should be taken. It checks vomiting and diarrhoea [33].

Decoction of seed kernel of Amra (*M. indica*) and Bilva (*A. marmelos*) added with sugar controls severe vomiting and diarrhoea [26, 28].

Decoction of Syonaka (*Oroxylum indicum* Vent.) and Kutaja (*H. antidysenterica*) bark alleviates all types of diarrhoea [28].

Decoction of the bark of Dadima (*Punica granatum* Linn.) and Kutaja (*H. antidysenterica*) mixed with honey checks severe diarrhoea with blood immediately [33, 36].

Decoctions of bark of Badari (*Z. jujube*) Arjuna (*T. arjuna*), Jambu (*S. cumini*), Amra (*M. indica*), Sallaki (*B. serrata*) and Vetasa (*Salix caprea* Linn.) mixed with sugar and honey checks diarrhoea [21].

Diarrhea patients are advice to drink medicated processed water. For processing of the water Vacha (*Acorus calamus* Linn.) and Prativisha (*Aconitum bisma* (Ham.) Rapaics.) or Musta (*C. rotundus*) and Parpata (*Fumaria vaillantii* Loisel.) or Haridra (*Curcuma longa* Linn.) and Sunthi (*Z. officinale*) are used [20].

Dirghavrinta [Aralu (*A. excelsa*)] putpaka (juice extracted by closed heating) in diarrhoea [21, 33].

Enema of the petioles or exudation of Salmali (*S. malabarica*) boiled in milk and added with ghee is useful in diarrhoea with tenesmus [20].

For child, modaka (sweet bolus) prepared of dhatki (*W. fruticosa*) flowers, sarkara and parched paddy should be given in diarrhoea [23].

Fried Sunthi (*Z. officinale*) mixed together and pounded with Eranda (*Ricinus communis* Linn.) juice alleviates pain due to amatisara and stimulates digestion and appetite [26].

Fruit pulp of Bilva (*A. marmelos*) and Madhuka (*M. indica*) mixed with sugar and honey and taken with rice water checks diarrhoea caused by pitta and rakta [21].

Ghee and oil mixed together should be given followed by mulched warm milk or that cooked with Eranda (*R. communis*) root or tender fruits of Bilva (*A. marmelos*) [23].

Ghee cooked with leaf-buds of Kshirivriksha [Ashvattha (*Ficus religiosa* Linn.), Plaksha (*F. lacor*), Udumbara (*F. racemosa*), Vata (*Ficus benghalensis* Linn.) and Parisha (*Thespesia papulnea* Soland. Ex. Correa)] should be taken with honey and sugar [21].

Ghee processed with four times water and Dhanyaka (*C. sativum*) paste should be given in diarrhoea caused by pitta and associated with pain. It is also act as appetizer and digestive [32].

Goat's milk processed with kamala (*Nelumbo nucifera* Gaertn.), Utpala and Lajjalu (*Mimosa pudica* Linn.) or Mocarasa (Oleo gum resin obtained from plant *S. malabarica*) or Sariva (*Hemidesmus indicus* R. Br.), Madhuka (*M. indica*) and Lodhra (*S. racemosa*) or leaves bud of Nygrodhra (*F. benghalensis*) etc. Mixed with honey and sugar is used for drinking, eating and sprinkling around anus in case of diarrhoea [23].

Gruel prepared with Haritaki (*Terminalia chebula* Retz.) Pippalimula (*P. longum*) and Bilva (*A. marmelos*) act as carminative [23].

Hanging root of Nygrodhra (*F. benghalensis*) pounded with cow's butter milk should be taken. It checks acute diarrhoea [30].

Haritaki (*T. chebula*), Sunthi (*Z. officinale*), Mustaka (*C. rotundus*) and jaggery-these four mixed in equal quantity are made into pills known as catuhsama modaka. It checks all types of diarrhoea [26].

If stool comes out in small quantity and with obstruction or pain, the patient should be use the warm paste of Haritaki (*T. chebula*) and Pippali (*P. longum*) [21].

In boiled goat milk powder of haritaki (*T. chebula*) should be put. The curd so formed should be given in case of dysentery [31].

In case of aggravation of vata, liquid gruel should be processed with Pancamula [20].

In case of dehydration, if digestion is good, the patient should be treated with milk cooked with Bala (*Sida cordifolia* Linn.) and Sunthi (*Z. officinale*) followed by intake of jiggery mixed with oil in the morning [26].

In case of diarrhoea with blood, tender fruits of Bilva (*A. marmelos*) mixed with liquid diarrhoea, honey and oil should be taken. It checks disease immediately [21].

In case of diarrhoea, khada made of Cangeri (*Oxalis corniculata* L.), Cukrika and Dugdika (*Euphorbia thymifolia* Linn.) added with fatty layer of curd, ghee and pomegranate (*P. granatum*) seeds should be given [20].

In case of dysentery, the patient should take diet consisting of vegetables prescribed in constipation, meat soup with profuse fat and processed with curd and pomegranate (*P. granatum*) and sali rice cooked with Sesamum (*Sesamum indicum* Linn.), black gram or green gram [23].

In case of griping, the patient should be given diet with milk boiled with Trikatu [Marica (*P. nigrum*), Pippali (*P. longum*) and sunthi (*Z. officinale*)] and salparni (*Desmodium gangeticum* DC.) [21].

In diarrhoea associated with blood Arjuna (*T. arjuna*) bark mixed with honey should be taken with milk. It checks hemorrhage [33].

In diarrhoea caused by pitta, powder of Bilva (*A. marmelos*), Daruharidra (*B. aristata*) (bark), Hribera (*Coleus vettiveroides*) and Durlabha (*F. arabica*) mixed with honey should be taken along with rice water [20].

decoction prepared with Amra (*M. indica*), Vandaka (*Loranthus longiflorus* Desr.), Virtaru, Brihati (*Solanum indicum* Linn.), Kantakari (*Solanum surattense* Burm.f.), Mudgaparni (*Phaseolus trilobus* Ait.) and Masaparni (*Teramnus labialis* Spreng.) should be given in diarrhoea [21].

Gajapippali (*Scindapsus officinalis* Schott.) sweetened with honey and sugar is advice in diarrhoea with blood and mucus [37].

Paste of Satavari (*Aspergus racemosus*) should be taken with milk followed by on milk diet helps to control diarrhoea with blood, [20, 23, 33].

In diarrhoea with pain and tenesmus, a non-unctuous enema prepared with decoction of Dashmula added with honey and milk is an excellent remedy [21].

In difficult elimination of impurity, Haritaki (*T. chebula*) should be given to expel it [20, 21, 23].

Intake of Bilva (*A. marmelos*) assists in management of diarrhoea with blood. It eliminates pain due to ama and constipation as well as alleviates disorder of bowels [26, 33, 36].

Intake of the juice of Hijjala (*Barringtonia acutangula* (Linn.) Gaertn.) Leaf mixed with honey alleviates amatisara (diarrhoea with mucus). Similarly action is observed with the decoction of Kutaja (*H. antidysentrica*) bark [33].

Jatiphala (*M. fragrans*) with Sunthi (*Z. officinale*) rubbed in cold water is given to check diarrhoea and make the stool formed [35].

Juice of Amra (*M. indica*) bark extracted by putapaka (closed heating) is added with oil and taken. It alleviates vomiting and diarrhoea with blood and mucus [31].

Juice of Karpasa (*Gossypium herbaceum* Linn.) and plaksa (*F. lacor*), added with honey is useful [33].

Kapittha (*Feronia limonia* (Linn.) Swingle) Salmali (*S. malabarica*), Phanji (*Ficus carica* Linn.), Vata (*F. benghalensis*), Karpasa (*G. herbaceum*), Dadima (*P. granatum*), Yuthika (*Jasminum auriculatum* Vahl.), Kacchra (durlabha) (*F. arabica*), Slesmataka (*Cordia myxa* Roxb.), Sana, and Cancu these processed with curd are useful in diarrhoea [21].

Khada (a dietary preparation) made of Cangeri (*O. corniculata*), Cukrika, and Dugdhika (*E. thymifolia*) added with fatty layer of curd, ghee and pomegranate (*P. granatum*) seeds should be used [20].

Khada of the tender leaves of Kasmarya (*G. arborea*), Madayanti (*Lawsonia inermis* Linn.) and Yuthika (*J. auriculatum*) should be made added with sour and salt [20] or The dietary preparation Khada made of tender Bilva (*A. marmelos*) fruits, equal quantity of sesamum (*S. indicum*) paste, supernatant layer of curd and added with sour and ghee checks dysentery [20]. These can be a good remedies for diarrhoeal patients.

Khada should be made of the tender leaves of Vetasa (*S. caprea*) etc including Yuthika (*J. auriculatum*) added with ghee, sour, and salt. It acts as an excellent checking diarrhoea [20].

decoction of Kutaja (*H. antidysentrica*), Ativisa (*A. heterophyllum*), Bilva (*A. marmelos*) Balaka and Musta (*C. rotundus*) is very useful in even chronic diarrhoea condition having severe pain and blood [21, 33].

Decoction of Kutaja (*H. antidysentrica*) seeds or bark checks even severe diarrhoea [23, 37].

Lavana-catushama formulation containing Lavanga (*Syzygium aromaticum* (Linn.) Merr. & Perry), Jatiphala (*M. fragrans*), Jiraka (*Cuminum cyminum* Linn.) and tankan (borex) powder. Is administered orally after adding honey and sugar. It act as digestive and provide relief from diarrhoea caused by ama [27].

Overnight immersion of Nygrodhha (*F. benghalensis*) leaf buds, Udumbara (*F. racemosa*) and Asvattha (*F. religiosa*) in hot water followed by heating to make decoction. This decoction is again cooked with ghee, half sugar and ¼ honey. It can stop diarrhoea with blood [20].

A digestive powder prepared with leaves of Aralu (*A. excelsa*), Tinduka (*D. peregrina*), Dadima (*P. granatum*) Kutaja (*H. antidysentrica*) and Sami (*Prosopis specigera* Linn.) is useful in amatisara [21].

Decoction prepared with Leaves of Jambu (*S. cuminii* Linn. Skeels), Dadima (*P. granatum*), Srngataka (*Trapa natans* Linn.), Bilva (*A. marmelos*), Hribera, Musta (*C. rotundus*) and Sunthi (*Z. officinale*) capable of checking of diarrhoea [30].

Linctus of Kutaja (*H. antidysentrica*) bark checks diarrhoea [26, 38].

Linctus prepared with decoction of Kutaja (*H. antidysentrica*) bark and Ativisa (*A. heterophyllum*) improve diarrhoea condition [33].

Liquid gruel cooked with Prispiparni (*Uraria picta* Desv.) is also very useful in controlling diarrhoea with blood [20]. Similarly liquid gruel processed with Ativisha (*Aconitum heterophyllum*) sours and Sunthi (*Z. officinale*) is efficacious in amatisara [20]. Moreover, liquid gruel prepared with Dhatki (*W. fruticosa*) and Sunthi (*Z. officinale*) decoction added with sour pomegranate (*P. granatum*) seed is useful in fever, diarrhoea and abdominal pain [32].

Lonika (*Portulaca quadrifida* Linn.) should be cooked with curd and pomegranate (*P. granatum*) added with profuse ghee taken as vegetable by patient of diarrhoea [20, 23].

Milk cooked with Eranda (*R. communis*) root or tender fruits of Bilva (*A. marmelos* Correa) are effective. [20]. In addition, Ajmoda (*Trachyspermum roxburghianum*), Aralu (*A. excelsa*) and Madhuka

(*Madhuca indica*) cooked with milk added with ghee, honey and sugar, should be taken in diarrhoea associated with pain [21].

Musta (*C. rotundus*) rhizomes boiled in milk and water (1:3) reduced to volume of milk taken. It is effective in diarrhoea associated with mucus and pain [21, 23, 38].

In case of acute diarrhoea fruit pulp of Kapittha (*F. limonia*) supplemented with Trikatu (Marica (*P. nigrum*), Pippali (*P. longum*) and Sunthi (*Z. officinale*), honey and sugar or Katphala (Myrica esculenta Buch.-Ham) with honey is effective [20, 23].

Pippali (*P. longum*) with honey or buttermilk with Citraka (*P. zeylanica*) or Bilva fruits (*A. marmelos*) alleviate abdominal disorder (diarrhoea) [20].

One should take boiled Kancata and tender Bilva (*A. marmelos*) fruit mixed with butter in case of diarrhoea with blood and griping [32].

One should take water processed with Vaca (*Acorus calamus*), Ativisa (*A. heterophyllum*), Musta (*C. rotundus*), Parpata (*F. vaillantii*), Hribera (*Coleus zeylanicus*) and Sunthi (*Z. officinale*) for improving appetite and digestion in amatisara [20].

One suffering from diarrhoea should take water boiled with vaca (*A. calamus*) and Prativisa (*Aconitum bisma* Ham. Rapaics) and Parpata (*F. vaillantii*) [20, 23, 37] or Dhatki (*W. fruticosa*), Badari (*Z. jujube*) leaves and Kapittha (*F. limonia*) mixed together with curd [26].

One who defecates frequently with or without stool or with tenesmus should take Sunthi (*Z. officinale*) with jaggery mixed with curd, oil and ghee [23].

In hemorrhage associated diarrhoea, milk processed with Nygrodhadi (group containing *F. benghalensis* and similar drugs) group of plant and mixed with ghee, sugar, honey or butter should be obtained by churning and it should be taken with buttermilk [21].

One who passes blood before or after stool should take milk cooked with tender leaves of Vata (*F. benghalensis*) etc along with ghee, sugar and honey or it may be curdled and the butter taken followed by drink of butter-milk [21].

Paste of black sesamum (*S. indicum*) mixed with 1\5 sugar and taken with goat's milk checks blood immediately [20].

Paste of Durlabha (*F. arabica*) root of the size of Udumbara fruit (*F. racemosa*) should be taken along with the diet of milk processed with the same (Durabha root.) [21].

Paste of Priyangu (*Callicarpa macrophylla* Vahl.) mixed honey and taken with rice water checks bleeding immediately. The patient, during treatment, should be kept on diet of meat soup of wild animals [20, 37].

Paste of the flower-bud of dadima (*P. granatum*) mixed with honey [35] or Paste of tila (*S. indicum*) and mudga (*Vigna radiata* (Linn.) Wilezek) [21] or Paste of tender leaves of Babula (*Acacia arabica* Willd.) [30] checks diarrhoea immediately.

Patha (*C. pareira*) or Amra bark (*M. indica*) pounded with cow's curd alleviates the disorder and burning sensation of diarrhoea immediately [26].

Pieces of Kosakara, a type of sugarcane, fried in ghee and Laja powder mixed with sugar and honey should be taken. It checks diarrhoea with pain and blood [21].

Pill made of Kesraja (*Eclipta alba* (Linn.) Hassk.) with water or powder of Nagakesara (*Mesua ferrea* Linn.) is an excellent drug for diarrhoea associated with mucus, pain, and blood [32].

Powder of Haritaki (*T. chebula*), rocksalt and Sunthi (*Z. officinale*) should be taken with honey and sugar in diarrhoea caused by kapha [37].

Powder of Sunthi (*Z. officinale*) smeared with ghee is wrapped within Eranda (*R. communis*) leaves and cooked in putapaka (closed heating) on mild fire. The powder is taken out and mixed with equal quantity of sugar. It is taken in the morning and thus pacifies all sorts of pain due to amatisara [28].

Putapaka of Aralu (*A. excelsa*) mixed with honey and Mocarasa (Oleo gum resin obtained from plant *S. malabarica*). It act as appetizer and can checks all types of diarrhoea [28].

Putpaka of Jivanti (*Leptadenia reticulata* W. & A.), Mesasringa (*Gymnema sylvestre* (Retz.) Schult.) etc. should be administered [21].

Root of Tanduliya (*Amaranthus spinosus* Linn.) mixed with honey and rice water [32] and sugar or Badari (*Z. jujube*) root should be taken with honey [21].

Seed kernel of Jambu (*S. cumini*), Amra (*M. indica*), Bilva (*A. marmelos*), Kapittha (*F. limonia*) and Sunthi (*Z. officinale*) these should be taken with liquid gruel in case of diarrhoea [20].

Seeds and bark of Kutaja (*H. antidysenterica*) should be pounded with honey and Ativisa (*A. heterophyllum*) and taken with rice water. It checks diarrhoea caused by pitta [20].

Slimy enema made of Salmali (*S. malabarica*) petioles by closed heating should be given [21].

Soup of Mulaka (*Raphanus sativum* Linn.) [20] or Shati (*Hedychium spicatum* Ham. Ex Smith.) [23] is efficacious in diarrhoea.

One who takes Indrayava (seed of *H. antidysenterica*) decoction in water keeping on diet of meat soup overcomes diarrhoea caused by pitta [20, 33].

Tender Bilva (*A. marmelos*) fruit is cooked while being wrapped with the leaves of Jambu (*S. cumini*), Dadima (*P. granatum*) Sringata and Patha (*C. pareira*). It should be kept overnight and then taken with jaggery and Sunthi (*Z. officinale*). It checks all types of diarrhoea and alleviates severe grahami [30].

Tender fruits of Bilva, (*A. marmelos*), jaggery, oil, Pippali (*P. longum*) and Sunthi (*Z. officinale*) all these together should be taken in condition of obstructed vata, pain and tenesmus [33].

Tender leaves of Cavika, Svetamuka (sveta) and Kshirivriksa [Ashvattha (*F. religiosa*), Plaksha (*F. lacor*), Udumbara (*F. racemosa*), Vata (*F. benghalensis*) and Parisha (*T. papulnea*)] should be pounded and given with oil [31].

The dried vegetable of Lonika and Patha (*C. pareira*) cooked with curd and pomegranate (*P. granatum*) and added with profuse fat should be given in food [20].

The intake of the root bark of Ankot (*A. salviuifolium*) [30] or Tender leaves of Amra (*M. indica*) and Kapittha (*F. limonia*) fruit with rice water in case of diarrhoea [32].

Juice extracted from ripe fruit of Dadima (*P. granatum*) [28] or Syonaka (*O. indicum*) [30] after heating in a closed vessel checks all types of diarrhoea.

The linctus of Kutaja (*H. antidysenterica*) mixed with drugs of ambasthadi (group having *C. pareira* and similar astringent drugs) and Pippalyadi groups (group having *P. longum* and similar pungent drugs) and honey destroy chronic diarrhoea having profuse mucus and blood [21, 23].

Local application of the paste of Jatiphala (*M. fragrans*) on the navel is helpful in checking diarrhoea [27].

The patients are advised to take soup of Badara fruits (*Z. jujube*) cooked with curd, pomegranate (*P. granatum*) and sufficient ghee [20]. Furthermore, milk cooked with only Eranda (*R. communis*) is also effective.

Moreover, gruels processed with Vata (*F. benghalensis*) alleviating and appetizing drugs should be served [21].

The decoction of Sunthi (*Z. officinale*) and Kadamba (*Anthocephalus chinensis* Lamk.; A. Rich. Ex Walp.) bark for three days alleviate diarrhoea [31].

The root bark of Ankota (*A. salviuifolium*) taken with buffalo's buttermilk [32] or soup of Kasmarya (*G. arborea*) fruits added with sugar [20, 23] is an efficacious remedy for diarrhoea.

Powder of six herbs viz. Tila (*S. indicum*), Mocarasa (Oleo gum resin obtained from plant *S. malabarica*), Lodhra (*S. racemosa*), Samanga (*M. pudica*), Kamala (*N. nucifera*) and Utpala all combined together should be mixed with honey and taken with rice water. It is useful in diarrhoea caused by pitta [20].

In case of diarrhoea with blood, Indrayava (seed of *H. antidysenterica*) with barley scum fried with ghee followed by intake of liquid gruel [20].

Trayamana (*Gentiana kurroo* Royle.) and Palasa (*B. monosperma*) may be used in diarrhoea [20, 23].

Vegetable of any of Shati (*H. spicatum*), Jivanti (*L. reticulata*) or dried vegetable of Lonika (*P. quadrifida*) and Patha (*C. pareira*) cooked with curd and pomegranate (*P. granatum*) with ample ghee should be given include in diet [20].

Water processed with Dhanyaka (*C. sativum*) and Balaka should be given to those who suffering from thirst, burning sensation and diarrhoea [26].

Processed drinking water prepared with Hribera (*C. vettiveroides*) and Sunthi (*Z. officinale*) should be given to diarrhoea patients [20].

Mustaka (*C. rotundus*) kshirpaka is prepared with equal amount of milk and reduced to ¼<sup>th</sup> amount. This kshirpaka is effective in controlling diarrhoea with mucus and blood [31].

Curd prepare from processed milk is very useful in diarrhoea. First Mustaka (*C. rotundus*) is crushed and boiled with ¼<sup>th</sup> milk letter add water to maintain volume equal to volume of milk used. This processed milk is filtered and curd is prepared with this processed milk [31].

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