



## Ethnomedicinal Plants Used for the Treatment of Diarrhoea and Dysentery by the Lushai Community in Bandarban District, Bangladesh

Md. Salah Uddin<sup>1\*</sup>, Vashkar Chowdhury<sup>1</sup>, Shaikh Bokhtear Uddin<sup>1</sup>, Mohammad Sajid Ali Howlader<sup>2</sup>

<sup>1</sup> Department of Botany, University of Chittagong, Chittagong-4331, Bangladesh.

<sup>2</sup> Department of Biosciences, University of Helsinki, PO Box 64, Helsinki, Finland.

\*Corresponding author: Md. Salah Uddin, E-mail: [sohailmsu@gmail.com](mailto:sohailmsu@gmail.com)

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### ABSTRACT

Diarrhoea and dysentery are the most common illness for people around the developing countries. This study presents ethnomedicinal practices of some plants to cure that illness are often used by the Lushai community from Bandarban district in Bangladesh, whereas modern medicine and hospital are still unavailable within their home range. Result this survey includes 53 ethnomedicinal plants of 49 genera belonging to 34 families are featured in popular antidysentery and anti-diarrhoeal activities, which may save millions of life from those deathly outbreak. Among which 37 plant species were used for diarrhoea, 40 for dysentery, and 24 for both diarrhoea and dysentery. Binomial scientific name, family, local name, parts used, and ethnomedicinal uses of the plant are reported briefly. Collected plants were identified using available literatures, and voucher specimens were deposited in the herbarium of Botany department, University of Chittagong.

**Keyword:** Ethnomedicine, Diarrhoea, Dysentery, Medicinal plants, Lushai, Bandarban.

### INTRODUCTION

Diarrhoea is said to be an endemic disease in many of developing Asian countries, considered one of the major public health concern that leads epidemic cause of high degree of morbidity and mortality in rural communities [1]. It is one of the most common diseases for all age groups with a symptom of having 3 or more loose or liquid bowel movements per day or more frequently than normal for the individual [2]. Diarrhoea is a condition of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms and infection spreads through contaminated food or drinking water, or from person to person as a result of poor hygiene [2]. In every year, many children in developing countries are suffering from malnutrition caused by this serious epidemic disease [3]. According to World Health Organization (WHO), diarrhoea causes 4% of all deaths, 5% of health loss to disability and kills around 2.2 million people globally each year, mostly children in developing countries [4]. Whereas, dysentery is an intestinal inflammation causing diarrhea with blood, i.e. *Shigella* sp. (bacillary dysentery) or *Entamoeba histolytica* (amoebic dysentery) are most often cause for dysentery in which the loose or watery stools contain visible red blood [5]. Amoebic dysentery is more severe state than bacillary dysentery [6]. There were about 15% of all deaths from dysentery [7]. Importance of the traditional indigenous medicines greatly emphasized by WHO, as these medicines are being used by a large number of rural people in the developing countries for the first safety in health care till now [8]. A diarrhoeal disease control

programme, including indigenous medical therapy along with evaluation of health education and prevention approaches, has recently been launched by WHO [9]. There is sufficient support of national and international organizations for the studies on treatment of diarrhoeal diseases where medicinal plants are becoming hopeful source of anti-diarrhoeal drugs [3, 10, 11, 12, 13]. Therefore indigenous medicinal plants are playing significant alternative role to antibiotic. This certain aspect of using medicinal plants as a remedy or home cure for diarrhoea is applied in our study.

The Lushai community in Bandarban district depends on plant resource mainly for herbal medicine, food, forage, construction of dwellings, making household implements for their living. They have a sound knowledge of herbal medicine [14]. Lack of sanitation, and safe drinking water, the incidences of dysentery and diarrhoea are being dominant among the community. However the modern medicines are still unreachable for their living, and herbal medicines are the only available option to them for the treatment, as it provides cheap alternative without any known side effects. They have profound knowledge of herbal preparations used to treat diarrhoea and dysentery.

There are very few numbers of dedicated ethnobotanical studies in Bandarban including Lushai community have been published so far [14-20]. Some studies those have served to document ethnomedicinal plants used to treat or prevent diarrhoea and dysentery in Bangladesh [21] and some other parts of the world [6,

7, 9, 10, 11, 12, 13, 22-34]. This study is therefore a pioneering work among the Lushai community in Bangladesh. In the drop of the above facts, the present study aims to document the different plants used in diarrhoea and dysentery. Documentation of traditional ethnomedicinal knowledge, indigenous herbal preparation for diarrhoea and dysentery could help in preserving knowledge and creating awareness regarding the need for conservation of biological resources.

### MATERIALS AND METHODS

The study was conducted for collection of ethnomedicinal information against diarrhoea and dysentery from the Lushai community in Bandarban district. Bandarban is a part of the Chittagong Hill Tract (CHT) with an area of 4,502sq.km. It is situated in the southeast of Bangladesh and located between 21°48'N and 92°24'E [17]. Bandarban is one of the richest areas in terms of flora compare to any other areas in Bangladesh [35].

Ethnobotanical survey was carried out to get maximum information. The ethnomedicinal data was collected through questionnaire, series of interviews and discussions among the local people, experienced aged rural folk, traditional medicine practitioners and local herbal drug sellers. The traditional healers were specifically asked about the plants used for the treatment of diarrhoea and dysentery along with local name, methods of preparation, mode of application, parts used and dosage of the prescribed medicine.

The plant samples used by the traditional health practitioners were collected. All collected voucher specimens preserved in the Chittagong University Herbarium (CTGUH). Specimens were identified using several literatures and guides [36–46]. All enlisted scientific names presented here verified with the world's updated database of "The Plant List (www.theplantlist.org)" [47].

### RESULTS AND DISCUSSION

Total 53 ethnomedicinal plants of 49 genera belong to 34 families used by the Lushai community for the treatment of diarrhoea and dysentery. Scientific names arranged alphabetically, followed by family, local name, illness treated, parts used and ethnomedicinal uses (Table 1). Amaranthaceae, Fabaceae and Malvaceae were the most frequently used families in context to the number of species used by the Lushai Community for diarrhoea and dysentery. The other important families of medicinal plants are Moraceae, Poaceae, Zingiberaceae, Araceae, Mimosaceae, Myrtaceae, Rutaceae and Anacardiaceae respectively (Table 2). According to life form (plant habit), the numbers of plant species were 23 tree, 18 herb, 8 Shrub and 4 climbers respectively (Fig. 1).

The herbal formulation for diarrhoea and dysentery prepared with using leaf, root, fruit, stem bark, and other parts of the plant. Fruit and leaf were most common utilized plant parts for the preparation of folk medicine which are 25.81% , 22.58% of plant species used respectively (Fig. 2). The traditional health practitioners (THPs) and local people of this community collected the medicinal plants from their natural habitats at different seasons and prepared the herbal products. The plant parts directly and processed plant parts taken for the treatment of diarrhoea, dysentery.

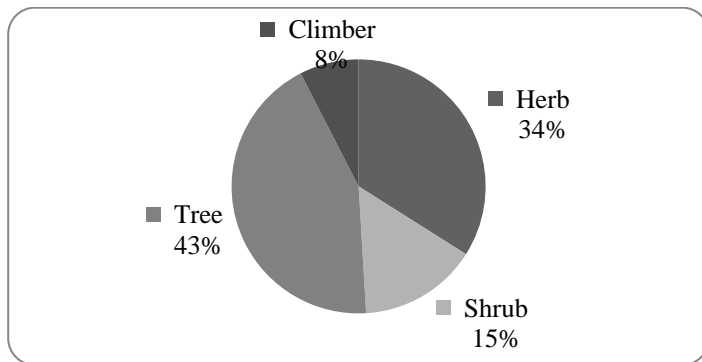


Fig. 1: Percentage of life form (plant habit).

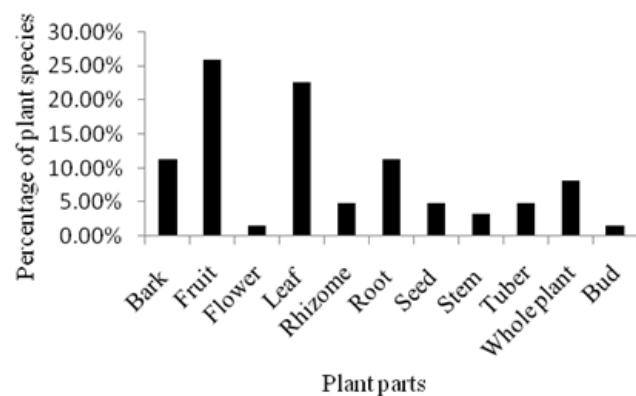


Fig. 2: Plant parts used to cure diarrhoea and dysentery.

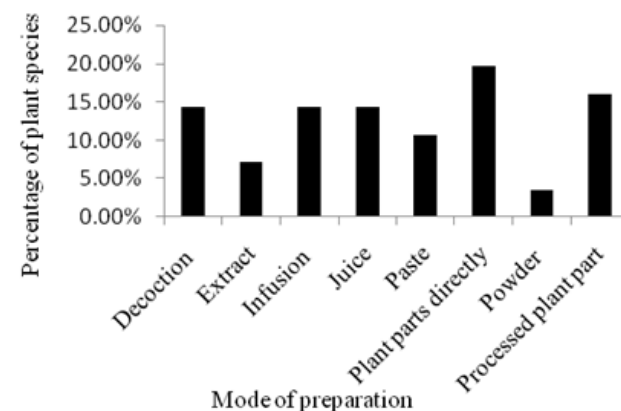


Fig. 3: Mode of preparation followed.

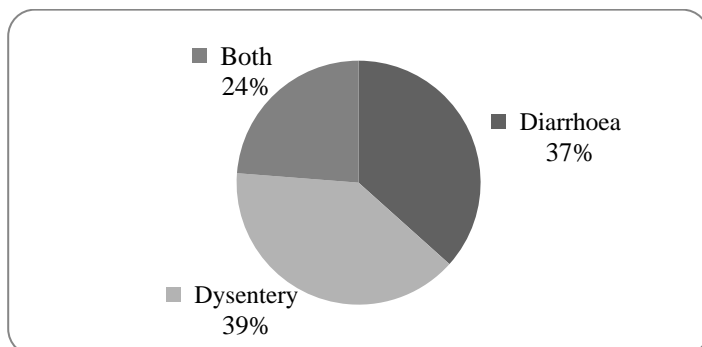


Fig. 4: Percentage of plant species used to treat diarrhoea and dysentery.

Table 1. Ethnomedicinal plants used by the Lushai community for the treatment of diarrhoea and dysentery.

| Botanical name   | Family        | Local name    | Illness treated            | Parts used  | Ethnomedicinal uses   |
|--|---------------|---------------|----------------------------|-------------|---|
| <i>Abelmoschus esculentus</i> (L.) Moench              | Malvaceae     | Dheros        | Diarrhoea, dysentery       | Fruit       | Fruits are boiled and taken to treat diarrhoea and dysentery.   |
| <i>Abelmoschus moschatus</i> Medik.                    | Malvaceae     | Mushakdana    | Dysentery                  | Fruit       | The fruit is cooked and taken to treat dysentery.   |
| <i>Achyranthes aspera</i> L.                           | Amaranthaceae | Apang         | Dysentery                  | Leaf        | The leaf juice is taken to treat dysentery.   |
| <i>Acorus calamus</i> L.                               | Araceae       | Bach          | Diarrhoea, dysentery       | Rhizome     | The decoction of rhizome is taken to treat diarrhoea and dysentery.   |
| <i>Adiantum lunulatum</i> Burm. f.                     | Adiantaceae   | Goyalelata    | Dysentery                  | Whole plant | The whole plant is taken to treat dysentery.  |
| <i>Aegle marmelos</i> (L.) Corrêa                      | Rutaceae      | Bel           | Diarrhoea, dysentery       | Fruit, leaf | The ripe fruit is taken to treat diarrhoea and dysentery.<br>The leaves are eaten with chili and salt to treat diarrhoea and dysentery. |
| <i>Alpinia conchigera</i> Griff.                       | Zingiberaceae | Konchi elachi | Diarrhoea, dysentery       | Rhizome     | The rhizome juice is taken to treat diarrhoea and dysentery.  |
| <i>Amaranthus spinosus</i> L.                          | Amaranthaceae | Katanotey     | Dysentery                  | Root        | The root juice is taken to treat dysentery.   |
| <i>Amaranthus viridis</i> L.                           | Amaranthaceae | Khudmaira     | Diarrhoea                  | Leaf, stem  | Decoction prepared from the leaves and stems of the plant is taken to treat diarrhoea.  |
| <i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson | Araceae       | Oi Kachu      | Diarrhoea                  | Tuber       | The tuber is cooked and taken to treat diarrhoea.   |
| <i>Anacardium occidentale</i> L.                       | Anacardiaceae | Kajubadam     | Diarrhoea, dysentery       | Bark        | The decoction of the bark is taken to treat diarrhoea and dysentery.  |
| <i>Annona reticulata</i> L.                            | Annonaceae    | Nona Ata      | Diarrhoea, dysentery       | Fruit       | The ripe fruits are taken to treat diarrhoea and dysentery.   |
| <i>Artocarpus heterophyllus</i> Lam.                   | Moraceae      | Kanthal       | Diarrhoea                  | Root        | Paste prepared from the roots is taken to treat diarrhoea.  |
| <i>Butea monosperma</i> (Lam.) Taub.                   | Fabaceae      | Palas         | dysentery                  | Bark, seed  | The paste prepared from bark and seed of the plant is used to treat dysentery   |
| <i>Carica papaya</i> L.                                | Caricaceae    | Pepe          | Diarrhoea                  | Fruit       | The unripe fruit is boiled and taken to treat diarrhoea.  |
| <i>Catharanthus roseus</i> (L.) G.Don                  | Apocynaceae   | Nayantara     | Dysentery                  | Leaf        | Infusion of leaves is taken to treat dysentery.   |
| <i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.      | Asteraceae    | Assam lata    | Dysentery                  | Leaf        | The paste prepared from leaves is mixed with tablespoonful water and taken to treat dysentery   |
| <i>Cocos nucifera</i> L.                               | Arecaceae     | Narikel       | Diarrhoea, dysentery       | Fruit       | Water of unripe fruit is used to treat diarrhoea and dysentery.   |
| <i>Coix lacryma-jobi</i> L.                            | Poaceae       | Tasbi         | Dysentery                  | Whole plant | Plant juice is taken to treat dysentery.  |
| <i>Curcuma caesia</i> Roxb.                            | Zingiberaceae | Kalahaldi     | Diarrhoea, blood dysentery | Rhizome     | Decoction of rhizome is taken to treat diarrhoea and blood dysentery.   |
| <i>Cynodon dactylon</i> (L.) Pers.                     | Poaceae       | Durba ghas    | Diarrhoea                  | Whole plant | The plant is used in diarrhoea.   |
| <i>Cyperus rotundus</i> L.                             | Cyperaceae    | Mutha         | Darrhoea, dysentery        | Tuber       | Infusion of tubers is taken to treat dysentery.<br>Powder prepared from the tubers of the   |

|   |                |              |                      |                  |   |
|---|----------------|--------------|----------------------|------------------|---|
|   |                |              |                      |                  | plant is mixed with <i>Zingiber officinale</i> juice and a little amount of honey then taken for dysentery.<br>A fresh juice extracted from tubers is taken for the treatment of diarrhoea. |
| <i>Dalbergia sissoo</i> DC.                 | Fabaceae       | Sisu         | Dysentery            | Leaf             | The leaf extract is taken to treat dysentery.   |
| <i>Daucus carota</i> L.                     | Apiaceae       | Gajor        | Dysentery, diarrhoea | Root             | The extract of root is taken to treat dysentery.<br>Decoction prepared from the root is taken for diarrhoea.  |
| <i>Dillenia indica</i> L.                   | Dilleniaceae   | Chalta       | Diarrhoea, dysentery | Fruit            | The fruits are taken to treat diarrhoea and dysentery.  |
| <i>Dioscorea bulbifera</i> L.               | Dioscoreaceae  | Ratalu       | Diarrhoea, dysentery | Tuber            | The tuber is boiled and taken internally to treat dysentery and diarrhoea.  |
| <i>Elaeocarpus floribundus</i> Blume        | Elaeocarpaceae | Jalpai       | Diarrhoea, dysentery | Fruit            | The fruit is taken to treat dysentery and diarrhoea.  |
| <i>Entada rheedii</i> Spreng.               | Mimosaceae     | Gilla        | Diarrhoea            | Root             | The paste prepared from root is taken orally to treat diarrhoea.  |
| <i>Erythrina variegata</i> L.               | Fabaceae       | Madar        | Dysentery            | Bark, leaf       | The paste prepared from leaves and bark is taken to treat dysentery.  |
| <i>Ficus benghalensis</i> L.                | Moraceae       | Bot          | Diarrhoea, dysentery | Bud, bark, leaf  | Infusion of young buds is taken for the treatment of diarrhoea and dysentery.<br>Infusion of stem bark is used for dysentery.<br>Leaf infusion is taken internally for diarrhoea.           |
| <i>Ficus racemosa</i> L.                    | Moraceae       | Jagadumur    | Diarrhoea, dysentery | Fruit            | Curry prepared from fruits of the plant is taken to treat diarrhoea and dysentery.  |
| <i>Flacourtia jangomas</i> (Lour.) Raeusch. | Falcourtiaceae | Paniala      | Diarrhoea            | Fruit            | The ripe fruit is taken to treat diarrhoea.   |
| <i>Glinus oppositifolius</i> (L.) Aug.DC.   | Molluginaceae  | Gima-Sak     | Diarrhoea, dysentery | Whole plant      | The plant is cooked and taken to treat diarrhoea and dysentery.   |
| <i>Hibiscus rosa-sinensis</i> L.            | Malvaceae      | Joba         | Diarrhoea            | Flower           | Juice prepared from the flowers of the plant is taken for diarrhoea.  |
| <i>Hibiscus sabdariffa</i> L.               | Malvaceae      | Latmesta     | Diarrhoea, dysentery | Fruit            | The fruits are taken to treat dysentery and diarrhoea.  |
| <i>Mangifera indica</i> L.                  | Anacardiaceae  | Aam          | Diarrhoea            | Bark, leaf, seed | Infusion of bark and young leaves are taken to treat diarrhoea.<br>Paste prepared from the seeds of the plant is mixed with <i>Zingiber officinale</i> juice then taken for diarrhoea.      |
| <i>Mimosa pudica</i> L.                     | Mimosaceae     | Lajjaboti    | Dysentery            | Root             | Root extract is taken in dysentery.   |
| <i>Momordica charantia</i> L.               | Cucurbitaceae  | Korolla      | Diarrhoea, dysentery | Leaf             | Infusion of leaves is taken to treat diarrhoea and dysentery.   |
| <i>Murraya koenigii</i> (L.) Spreng.        | Rutaceae       | Chotokamin i | Diarrhoea, dysentery | Leaf             | The leaves of the plant are used in diarrhoea and dysentery.  |
| <i>Musa paradisiaca</i> L.                  | Musaceae       | Aittakola    | Dysentery            | Fruit            | Green fruits are cooked and taken to treat dysentery.   |
| <i>Neolamarckia cadamba</i> (Roxb.) Bosser  | Rubiaceae      | Kadam        | Diarrhoea            | Bark             | Infusion of bark is taken to treat diarrhoea.   |
| <i>Ocimum americanum</i> L.                 | Lamiaceae      | Ban Tulshi   | Diarrhoea,           | Leaf             | Infusion of leaves is taken orally to treat   |

|                                     |                 |          |                      |             |  |
|-------------------------------------|-----------------|----------|----------------------|-------------|--|
|                                     |                 |          | dysentery            |             | dysentery and diarrhoea.   |
| <i>Phyllanthus emblica</i> L.       | Euphorbiaceae   | Amloki   | Diarrhoea, dysentery | Fruit       | Dried fruits are used to prepare medicine for diarrhoea and dysentery  |
| <i>Psidium guajava</i> L.           | Myrtaceae       | Piyara   | Diarrhoea            | Fruit, leaf | The unripe fruit is taken to treat diarrhoea.<br>Decoction prepared from green leaves of the plant is taken for diarrhoea. |
| <i>Punica granatum</i> L.           | Punicaceae      | Dalim    | Diarrhoea, dysentery | Bark        | Juice extracted from the bark of the plant is taken for diarrhoea and dysentery.   |
| <i>Saccharum arundinaceum</i> Retz. | Poaceae         | Teng     | Dysentery            | Whole plant | The decoction of plant is taken to treat dysentery.  |
| <i>Syzygium fruticosum</i> DC.      | Myrtaceae       | Puti jam | Dysentery            | Leaf        | The leaf extract is taken to treat blood dysentery.  |
| <i>Tamarindus indica</i> L.         | Caesalpiniaceae | Tetul    | Diarrhoea, dysentery | Fruit       | The infusion of pulp is taken to treat dysentery and diarrhoea.  |
| <i>Tectona grandis</i> L.f.         | Verbenaceae     | Shegun   | Dysentery            | Stem        | Decoction of stem is taken to treat dysentery.   |
| <i>Trema orientalis</i> (L.) Blume  | Ulmaceae        | Chikan   | Diarrhoea            | Root        | Decoction prepared from the root is given to treat diarrhoea.  |
| <i>Tribulus terrestris</i> L.       | Zygophyllaceae  | Gokkhur  | Dysentery            | Fruit       | The decoction of fruits is taken to treat dysentery.   |
| <i>Vigna unguiculata</i> (L.) Walp. | Fabaceae        | Barbati  | Diarrhoea            | Seed        | Powder made from the fried seeds of the plant is taken for diarrhoea.  |
| <i>Zingiber officinale</i> Roscoe   | Zingiberaceae   | Ada      | Dysentery, diarrhoea | Root        | The root is chewed to treat dysentery.<br>Juice extracted from the roots of the plant is taken for diarrhoea.              |

Table 2. Families of the ethnomedicinal plants used for diarrhoea and dysentery with their frequencies.

| Family        | Number of species | Family          | Number of species |
|---------------|-------------------|-----------------|-------------------|
| Amaranthaceae | 4                 | Caesalpiniaceae | 1                 |
| Fabaceae      | 4                 | Caricaceae      | 1                 |
| Malvaceae     | 4                 | Cucurbitaceae   | 1                 |
| Moraceae      | 3                 | Cyperaceae      | 1                 |
| Poaceae       | 3                 | Dilleniaceae    | 1                 |
| Zingiberaceae | 3                 | Dioscoreaceae   | 1                 |
| Araceae       | 2                 | Elaeocarpaceae  | 1                 |
| Mimosaceae    | 2                 | Euphorbiaceae   | 1                 |
| Myrtaceae     | 2                 | Falcourtiaceae  | 1                 |
| Rutaceae      | 2                 | Lamiaceae       | 1                 |
| Adiantaceae   | 1                 | Molluginaceae   | 1                 |
| Anacardiaceae | 1                 | Musaceae        | 1                 |
| Annonaceae    | 1                 | Punicaceae      | 1                 |
| Apiaceae      | 1                 | Rubiaceae       | 1                 |
| Apocynaceae   | 1                 | Ulmaceae        | 1                 |
| Arecaceae     | 1                 | Verbenaceae     | 1                 |
| Asteraceae    | 1                 | Zygophyllaceae  | 1                 |

Other most commonly mode of preparation of folk-medicine are infusion, decoction and juice (Fig. 3). They were administered as respective medicine in appropriate doses in the patients. Almost all medicinal remedies were based on the preparation of a single plant, few of them in combination with other plant parts. Among fifty three ethnomedicinal plant 37 species were used for diarrhoea, 40 for dysentery and 24 for both diarrhoea and dysentery (Fig. 4).

Medicinal plants and their uses in the traditional medicine are well known to many indigenous communities in Bangladesh. The recent trend has been to blend the traditional knowledge with modern health care practices to provide effective health care services to a wider population [48]. The basic ingredients in the traditional medicine are the medicinal plants, which are depleting at a faster rate due to increase in consumption and indiscriminate drawl of resources from the wild. With the changing scenario, there is a need to enhance and promote the conservation and

cultivation of these natural resources especially medicinal plants. In addition to the requirement for conservation of medicinal plants it has also become essential to protect and patent the traditional knowledge.

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#### REFERENCES:

1. R. Gupta, M.G. Vairale, P.R. Chaudhari, S.R. Wate (2009). Ethnomedicinal Plants Used by Gond Tribe of Bhandara District, Maharashtra in the Treatment of Diarrhoea and Dysentery. *Ethnobotanical Leaflets*, 2009(7): 7.
2. W.H.O. (2015). World Health Organization. Available at <http://www.who.int/topics/diarrhoea/en/> [accessed 12.03.15].
3. P.K. Mukherjee, K. Saha, T. Murugesan, S.C. Mandal, M. Pal, B.P. Saha (1998). Screening of anti-diarrhoeal profile of some plant extracts of a specific region of West Bengal, India. *Journal of ethnopharmacology*, 60(1): 85-89.
4. W.H.O. (2015). World Health Organization. Available at [http://www.who.int/water\\_sanitation\\_health/diseases/diarrhoea/en/](http://www.who.int/water_sanitation_health/diseases/diarrhoea/en/) [accessed 12.03.15].
5. W.H.O. (2015). World Health Organization. Available at <http://www.who.int/topics/dysentery/en/> [accessed 12.03.15].
6. A. Kar, S.K. Borthakur (2008). Medicinal plants used against dysentery, diarrhoea and cholera by the tribes of erstwhile Kameng district of Arunachal Pradesh. *Natural product radiance*, 7(2): 176-181.
7. R. Krause, E. Schwab, D. Bachhiesl, F. Daxböck, C. Wenisch, G.J. Krejs, E.C. Reisinger (2001). Role of *Candida* in antibiotic-associated diarrhea. *Journal of Infectious Diseases*, 184(8): 1065-1069.
8. M.E. Goleniowski, G.A. Bongiovanni, L. Palacio, C.O. Nuñez, J.J. Cantero (2006). Medicinal plants from the "Sierra de Comechingones", Argentina. *Journal of Ethnopharmacology*, 107(3): 324-341.
9. S. Gairola, J. Sharma, R.D. Gaur, T.O. Siddiqi, R.M. Painuli (2013). Plants used for treatment of dysentery and diarrhoea by the Bhoja community of district Dehradun, Uttarakhand, India. *Journal of ethnopharmacology*, 150(3): 989-1006.
10. L. Tona, K. Kambu, N. Ngimbi, K. Cimanga, A.J. Vlietinck (1998). Antiamoebic and phytochemical screening of some Congolese medicinal plants. *Journal of Ethnopharmacology*, 61(1): 57-65.
11. A.L. Otshudi, A. Vercruyse, A. Foiriers (2001). Antidiarrhoeal activity of root extracts from *Roureopsis obliquifoliolata* and *Epinetrum villosum*. *Fitoterapia*, 72(3):291-294.
12. J. Lin, T. Puckree, T.P. Mvelase (2002). Anti-diarrhoeal evaluation of some medicinal plants used by Zulu traditional healers. *Journal of Ethnopharmacology*, 79(1): 53-56.
13. J.D. Patel, D.K. Patel, A. Shrivastava, V. Kumar (2008). Screening of plant extracts used in traditional antidiarrhoeal medicines against pathogenic *Escherichia coli*. *Scientific World*, 6(6): 63-67.
14. M.S. Uddin, V. Chowdhury, S.B. Uddin, A.A.M. Mazumder, M.S.A. Howlader (2015). Ethnobotanical Survey of Medicinal Plants Used By the Lushai Community in Bandarban District, Bangladesh. *Journal of Advanced Botany and Zoology*, V2I4. DOI: 10.15297/JABZ.V2I4.04
15. M. Rahmatullah, M.S. Hossan, A. Hanif, P. Roy, R. Jahan, M. Khan, T. Rahman (2009). Ethnomedicinal applications of plants by the traditional healers of the Marma tribe of Naikhongchhari, Bandarban District, Bangladesh. *Adv Nat Appl Sci*, 3: 392-401.
16. M.M. Rashid, F.B. Rafique, N. Debnath, A.Rahman, S.Z. Zerin, H. Rashid, M.A. Islam, Z. Khatun, M. Rahmatullah (2012). Medicinal plants and formulations of a community of the Tonchongya tribe in Bandarban District of Bangladesh. *American-Eurasian Journal of Sustainable Agriculture*, 6:292-298.
17. M. Mohiuddin, M.K. Alam, S.R. Basak, M.K. Hossain (2012). Ethno-medico botanical study among the four indigenous communities of Bandarban, Bangladesh. *Bangladesh Journal of Plant Taxonomy*, 19(1): 45-53.
18. M.F. Kadir, M.S.B. Sayeed, N.I. Setu, A. Mostafa, M.M.K. Mia (2014). Ethnopharmacological survey of medicinal plants used by traditional health practitioners in Thanchi, Bandarban Hill Tracts, Bangladesh. *Journal of ethnopharmacology*, 155(1): 495-508.
19. D. Miah, M.S.H. Chowdhury (2003). Indigenous healthcare practice through medicinal plants from forests by the Mro tribe in Bandarban region, Bangladesh. *Indilinga African Journal of Indigenous Knowledge Systems*, 2(2): p-61.
20. M. Mohiuddin, M.K. Alam, S.R. Basak, M.K. Hossain (2012). Ethnobotanical studies of the plant used by the tribals of Bandarban Hill District, Bangladesh. *Indian Forester*, 138(1): 84-89.
21. J. Chowdhury, M.K. Alam, M.A. Hassan (1996). Some folk formularies against dysentery and diarrhoea in Bangladesh. *J. Econ. Taxon. Bot. Additional series 12*, Scientific Publishers Jodhpur (India), pp. 20-23.
22. R.B. Mohanty, S.K. Dash, S.N. Padhy (1998). Traditional phytotherapy for diarrhoeal discharges in India – a review. *Ethnobotany* 10 (1-2): 103.
23. K. Sairam, S. Hemalatha, A. Kumar, T. Srinivasan, J. Ganesh, M. Shankar, S. Venkataraman (2003). Evaluation of anti-diarrhoeal activity in seed extracts of *Mangifera indica*. *Journal of ethnopharmacology*, 84(1): 11-15.
24. V.S. Raju, K.N. Reddy (2005). Ethnomedicine for dysentery and diarrhoea from Khammam district of Andhra Pradesh. *Indian Journal of Traditional Knowledge*, 4(4): 443-447.
25. S.K. Sen, L.M. Behera (2008). Ethnomedicinal plants used by the tribals of Bargarh district to cure diarrhoea and dysentery. *Indian Journal of Traditional Knowledge*, 7(3): 425-428
26. P. Sharma, G. Vidyasagar, S. Singh, S. Ghule, B. Kumar (2010). Antidiarrhoeal activity of leaf extract of *Celosia argentea* in experimentally induced diarrhoea in rats. *Journal of advanced pharmaceutical technology & research*, 1(1): 41-48.
27. D. Laloo, S. Hemalatha (2011). Ethnomedicinal plants used for diarrhea by tribals of Meghalaya, Northeast India. *Pharmacognosy reviews*, 5(10): 147-154.
28. S. K.Panda, N. Patra, G. Sahoo, A.K. Bastia, S.K. Dutta (2012). Anti-diarrheal activities of medicinal plants of

- Similipal Biosphere Reserve, Odisha, India. *International Journal of Medicinal and Aromatic Plants*, 2(1): 123-134.
29. R.V. Sarin, P.A. Bafna (2012). Herbal antidiarrhoeals: a review. *Int. J. Res. Pharm. Biomed. Sci*, 3(2): 637-649.
  30. H.E. Gangte, G.T. Zomi, N.S. Thoudam (2013). Ethnomedicinal plants used in diarrhoea and dysentery by the Zou tribe in Churachandpur district, Manipur, India. *Asian Journal of Experimental Biological Sciences*, 4: 369-376.
  31. S. Shanmugam, M. Annadurai, K. Rajendran, (2011). Ethnomedicinal plants used to cure diarrhoea and dysentery in Pachalur hills of Dindigul district in Tamil Nadu, Southern India. *Journal of Applied Pharmaceutical Science* 01 (08): 94-97
  32. J.R. Appidi, D.S. Grierson, A.J. Afolayan (2008). Ethnobotanical study of plants used for the treatment of diarrhoea in the Eastern Cape, South Africa. *Pakistan Journal of Biological Sciences*, 11(15): 1961-1963.
  33. G. Johns, S. Beena, V. Kaviyaran (2013). Ethno-botanical survey of medicinal plants used for the treatment of diarrhea and dysentery. *International Journal of Medicine and Medical Sciences* 3 (1): 332-338
  34. V.V. Wagh, A.K. Jain, C. Kadel (2011). Ethnomedicinal plants used for curing dysentery and diarrhea by tribals of Jhabua district (Madhya Pradesh). *India Journal of Natural Product and Resources* 2(2): 256-260.
  35. Banglapedia (2003). *National Encyclopedia of Bangladesh*. Available at: [http://www.banglapedia.net/HT/W\\_0034.HTM](http://www.banglapedia.net/HT/W_0034.HTM), 2, 5.
  36. J.D. Hooker (1872-1897). *Flora of British India*. 1-7, Reeve and Co. London.
  37. D. Prain (1903). *Bengal Plants*. 1 & 2. Govt. press, Calcutta, India.
  38. J.D. Heining (1925). *List of Plants of Chittagong Collectorate and Hill tracts*. Darjeeling, India.
  39. M.A. Hasan (1988). *Traditional Herbal Medicine of Bangladesh* (in Bengali). Hassan Book House, Dhaka, Bangladesh.
  40. Z.U. Ahmed, Z.N.T. Begum, M.A. Hassan, M. Khondker (eds.). (2008). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 6. Angiosperms: Dicotyledons (Acanthaceae-Asteraceae). Asiatic Society of Bangladesh, Dhaka.
  41. Z.U. Ahmed, M.A. Hassan, Z.N.T. Begum, M. Khondker (eds.). (2008). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 7. Angiosperms: Dicotyledons (Balsaminaceae-Euphorbiaceae). Asiatic Society of Bangladesh, Dhaka.
  42. Z.U. Ahmed, M.A. Hassan, Z.N.T. Begum, M. Khondker (eds.). (2009). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 8. Angiosperms: Dicotyledons (Fabaceae-Lythraceae). Asiatic Society of Bangladesh, Dhaka.
  43. Z.U. Ahmed, M.A. Hassan, Z.N.T. Begum, M. Khondker (eds.). (2009). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 9. Angiosperms: Dicotyledons (Magnoliaceae-Punicaceae). Asiatic Society of Bangladesh, Dhaka.
  44. Z.U. Ahmed, M.A. Hassan, Z.N.T. Begum, M. Khondker (eds.). (2009). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 10. Angiosperms: Dicotyledons (Ranunculaceae-Zygophyllaceae). Asiatic Society of Bangladesh, Dhaka.
  45. K.U. Siddiqui, M.A. Islam, Z.U. Ahmed, Z.N.T. Begum, M.A. Hassan, M. Khandaker, M.M. Rahman, S.M.H. Kabir, M. Ahmed, A.T.A. Ahmed, A.K.A. Rahman, E.U. Haque (eds.). (2007) *Encyclopedia of Flora and Fauna of Bangladesh* Vol. 11. Angiosperms: Monocotyledons (Agavaceae-Najadaceae). Asiatic Society of Bangladesh, Dhaka. 399 pp.
  46. Z.U. Ahmed, M.A. Hassan, Z.N.T. Begum, M. Khondker (eds.). (2008). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 12. Angiosperms: Monocotyledons (Orchidaceae-Zingiberaceae). Asiatic Society of Bangladesh, Dhaka.
  47. The Plant List (2010). Version 1. Published on the internet; <http://www.theplantlist.org> [accessed 12.02.15-8.04.15]
  48. C. Bisht, A. Badoni (2009). Distribution and indigenous uses of some medicinal plants in district Uttarkashi, Uttarakhand, India. *Researcher*, 1(6), 38-40.

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