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**Shibabrata Pattanayak**

Asst. Director, ARD  
(Microbiology), Institute of  
Animal Health & Veterinary  
Biologicals(R&T), 37, Belgachia  
Road, Kolkata 700037, West  
Bengal, India.

**Tapan Kumar Mandal**

Professor, Department of  
Veterinary Pharmacology &  
Toxicology, West Bengal  
University of Animal & Fishery  
Sciences, 37, Belgachia Road,  
Kolkata- 700037, West Bengal,  
India.

**Susanta Kumar Bandyopadhyay**

Director of Medical Education  
and Research, Government of  
West Bengal, Swastha Bhavan,  
Kolkata, West Bengal, India.

**Correspondence**

**Shibabrata Pattanayak**

Asst. Director, ARD  
(Microbiology), Institute of  
Animal Health & Veterinary  
Biologicals(R&T), 37, Belgachia  
Road, Kolkata 700037, West  
Bengal, India.

## A Study on Use of Plants to Cure Enteritis and Dysentery in Three Southern Districts of West Bengal, India

**Shibabrata Pattanayak, Tapan Kumar Mandal, Susanta Kumar Bandyopadhyay**

### Abstract

Enteritis and dysentery are common health problems among the rural people of West Bengal, India. Information related with use of various plant parts for correction of these problems were collected from three southern districts of West Bengal, India with different agro-climatic conditions viz. Paschim Medinipur, Purba Medinipur, and Murshidabad. A total of fourteen plants were identified and practiced methods of their uses with dose are documented and with the help of available literatures, the previously reported uses of these medicinal plants are analyzed in that perspective.

**Keywords:** Enteritis, Dysentery, Medicinal plants, Traditional use, West Bengal, India.

### 1. Introduction

India is one of the world's leading bio-diversity centers with the presence of over 45,000 different plant species<sup>[1]</sup>. Over 6000 plants in India are in used in traditional, folklore and herbal medicine. The Indian system of medicine has identified 1500 medicinal plants of which 500 are commonly used<sup>[2]</sup>. Around 5000 species have specific therapeutic value among 250000 higher plant species on earth<sup>[3]</sup>. Traditionally, ethno medicines are extensively used in India and elsewhere due to their low cost, easy accessibility to everyone and perceived fewer side effects<sup>[4]</sup>. According to reports of the World Health Organization, 80% of the world's population relies mainly on traditional therapies which involve the use of plant extracts or their active substances<sup>[5]</sup>.

Rural people, especially the ethnic communities of India, traditionally use the plant resources for their food, shelter and health care. In this regard, a biological relationship is framed out and traditional uses of plants as medicine are in practice. Such knowledge, mostly oral, is passed on to generations and thus appears to be eroding owing to the gradual changes in the life style of these communities. Even after identification of many plants used in Indian system of medicine, a large number of plants or uses of plant are yet to be documented, particularly which are confined among the people of rural areas<sup>[6]</sup>.

In the present study, attempts are being made to document such folk practices commonly used in enteritis and dysentery.

### 2. Materials and Methods

#### 2.1 Study area

The present study was performed in three districts of the southern part of West Bengal state of India having different agro-climatic conditions. First one was Paschim Medinipur district, where the soil is mostly sandy lateritic type. A good portion of that district is covered by forest. The inhabitants of that area are mainly of tribal origin (Santhal and Lodha). The representative blocks are Gopiballavpur I and Narayangarh. The second district was Purba Medinipur, where the soil is clay-rich, and commonly water lodge in some areas during monsoon. The representative blocks are Moyna and Mahishadal. The third district was Murshidabad, which is having mainly new alluvial loamy soil. The representative blocks are Raninagar I and Berhampur. The blocks of the concerned districts were selected arbitrarily basing on remoteness, representation of agro-climatic conditions of the districts in question and uses of different plants as medicine by the people. Name of the villages from where the samples were collected were also documented. The medicinal uses of the plants listed are not

common in every place of the study area. The plant specimens were always collected from an area of its use, though same types of uses were found in some other places of the study areas also.

## 2.2 Methods of Study

The investigation was performed by face to face dialogue with the medicine men and medicine women of the study area. Information was collected from both tribal people as well as from non-tribal people of different castes and religions. The knowledge and practice of those people were noted and no modification has been performed during presentation of the information.

## 2.3 Collection and identification of Medicinal Plants

The plants used by the inhabitants are all locally grown. Samples were collected and branded at local name. Subsequently these were identified by Taxonomist and the specimens were preserved in herbarium. Photographs of areal parts of living plants are added for easy identification of the plants, though some other parts of the plants (like root or stem bark) of some plants are actually used for medicinal purposes.

## 3. Results and Discussions

The result of the study is described briefly indicating the species of the plants with family, vernacular names, collection number, place of collection along with a brief statement on their medicinal uses against enteritis and/or dysentery. Important previous observations are also provided along with proper references. As many of the problems related with enteritis and dysentery are actually some external expressions of many internal conditions, the principal reported uses of the plants documented previously are also stated. This may help in searching correlation of possible expression of physiological effects of the concerned plant under discussion.

### 1. *Aegle marmelos* Corr.

**Family:** Rutaceae

Col No. 37 (PM).

**Bengali:** Bail, **Hindi:** Bel, **English:** Bengal quince.

Collected from: Nayabasan, Gopiballavpur, Paschim Medinipur.

**Uses:** The ripe fruit of bail tree (bail) is eaten during the spring and summer months as a protective and curative agent for various types of problems related with digestive tract. In chronic dysentery, the drinks made with the Bail fruit and sugar is regularly fed by the people at afternoon. A preparation (Morabba) of unripe bail fruit is preserved and eaten for the same purpose during the months when ripe fruit is not available.

**Previous reports:** Fruits are used as/in diarrhea, dysentery, gastric troubles, constipation, laxative, tonic, digestive, brain and heart tonic, ulcer, intestinal parasites, gonorrhoea, epilepsy [7]. Fine powder of unripe fruit can be an alternative medicine to cure intestinal parasites [8]. Various parts of this plant possess Antidiabetic, antiulcer, antioxidant, antimalarial, anti-inflammatory, anticancer, radioprotective, antihyperlipidaemic, antifungal, antibacterial, antiviral properties [9].

### 2. *Amaranthus spinosus* L.

**Family:** Amaranthaceae

Col. No.11 (M).

**Bengali:** Kantanotee, **Hindi:** Kanta nutiya, **English:** Thorny amaranth.

**Collected from:** Rentua, Gopiballavpur, Paschim Medinipur.

**Uses:** A small piece (1-2 grams) of the root of this plant is used as oral medicine for chronic dysentery. The root paste is taken with water after mixing with some sugar and salt. The treatment continued for 5-7 days.

**Previous reports:** This plant is used as/in digestive, bronchitis, appetizer, biliousness, galactagogue, haematinic, stomachic, nausea, flatulence, anorexia, blood diseases, burning sensation, leucorrhoea, leprosy and piles [10].

A wide spectrum of pharmacological actions of this plant have been explored which include antidiabetic, antitumor, analgesic, antimicrobial, anti-inflammatory, spasmolytic, bronchodilator, hepato-protective, spermatogenic, antifertility, antimalarial, antioxidant properties [10], antipyretic [11], anti peptic ulcer activity [12].

### 3. *Andrographis paniculata* Nees.

**Family:** Acanthaceae

Col No. 26 (M).

**Bengali:** Kalmegh, **Hindi:** Kirayat, **English:** Green chirayta.

Collected from: Ramchandrapur, Moyna, Purba Medinipur.

**Uses:** The leaves of this plant are used in various digestive problems. For treatment of chronic dysentery, half teaspoonful of the succulent leaf-extract is fed regularly at empty stomach at morning for two to three days every week for a few months. Alternatively, small pellets are made with the paste prepared by pressing the leaves of this plant and preserved after drying under sunlight. This pellet is also fed instead of leaf-juice.

**Previous reports:** Traditionally the plant is used for treatment of influenza, dysentery, dyspepsia, malaria, cancer [13]. In China, India, Thailand, and Malaysia, this plant has been widely used for treating sore throat, flu, and upper respiratory tract infections [14].

Extracts and pure compounds of the plant have been reported for its efficacy in/as anti microbial, antiprotozoan, antiinflammatory, antioxidant, antidiabetes, anti infective, angiogenic, hepato-renal protective, sex hormone modifier, liver enzyme modulation and immunostimulant effects [13]. Andrographolide, a major bioactive chemical constituent of the plant, has shown anticancer potential in various investigations [14].

### 4. *Ayapana triplinervis* (M. Vahl) R. King & H.R.

**Family:** Eupatorieae

Col. No. 14 (P).

**Bengali:** Ayapan, **Hindi:** Ayapan, **English:** Ayapana tea.

Collected from: Narikeldah, Moyna, Purba Medinipur.

**Uses:** Extract taken out from 4-5 succulent leaves is fed to the patients daily after mixing some sugar and water with it to cure dysentery and bloody enteritis.

**Previous reports:** Traditionally this plant is used as antiseptic, antineoplastic, antitussive, anti ulcerous, astringent, cardio tonic, cicatrizant, depurative, diaphoretic, emollient, hemostat, hepatoprotector, laxative, stimulant, tonic and vulnerary agent [15].

### 5. *Blumea lacera* Dc.

**Family:** Asteraceae

Col. No. 63 (P).

**Bengali:** Kuksima/Kukursunga, **Hindi:** Janglimuli/Kakronda, **English:** Blume.

Collected from: Ramchandrapur, Moyna, Purba Medinipur.

**Uses:** The root of this plant is fed to the patients to cure dysentery. The roots (2-3 grams) are collected, cleaned, made paste, added with a little amount of sugar and a glass of water and fed at morning.

**Previous reports:** It is described in Ayurveda as bitter,

astringent, acrid, thermogenic, anti-inflammatory, styptic, ophthalmic, digestive, antihelminthic, liver tonic, expectorant, antipyretic, diuretic, stimulant antioxidant<sup>[16]</sup>, haemostatic<sup>[17]</sup> properties. The juice of the whole plant is used on wounds of animals<sup>[6]</sup>.

Root paste is taken with honey three times daily to check diarrhea<sup>[18]</sup>.

### 6. *Bryophyllum pinnatum* (Lam.) Oken.

**Family:** Crassulaceae

Col. No. 74 (M).

**Bengali:** Patharkuchi, Hindi: Patharchur, English: Cathedral Bells/Air Plant.

Collected from: Sitanagar, Raninagar 1, Murshidabad.

**Uses:** The leaf of this plant is used to cure enteritis, particularly bloody enteritis. 2-3 tea spoons full of leaf extract is mixed with a little amount of common salt and water and fed to the adult patients thrice daily for that purpose.

**Previous reports:** The plant parts are used as/in bitter tonic, astringent, analgesic, carminative; used in diarrhea and vomiting, earache, burns, abscesses, gastric ulcers, insect bites, lithiasis, smallpox, otitis, cough, asthma, palpitations, headache, convulsion, general debility, edema of legs, wound dressing, haematemesis, hemorrhoids, menorrhagia, discolourations of the skin, boils, ophthalmia, scalds, corn, to facilitate the dropping of the placenta, treatment of hypertension, pulmonary infections, rheumatoid arthritis, antifungal, antihistamine, anti-allergic activity.

It acts as a refrigerant, emollient, mucilaginous, haemostatic, vulnerary, depurative, constipating, anodyne, disinfectant, antitonic, hepatoprotective, antiinflammatory, immunomodulatory, muscle relaxant<sup>[19]</sup>.

### 7. *Centella asiatica* (Linn) Urban.

**Family:** Apiaceae

Col. No. 16 (P).

**Bengali:** Thankuni, Hindi: Mandukaparni, English: Marsh pennywort.

Collected from: Ramchandrapur, Moyna, Purba Medinipur.

**Uses:** The leaves of this plant are used from a very ancient days by the villagers as a 'medicine' which can be eaten as such by chewing, preparing an extract or after preparing a 'curry' of its leaves to cure chronic dysentery. The dose is 4-5 leaves or leaf extract daily at empty stomach for 7-10 days or a curry of about 20 gram of leaves daily for 10-15 days.

**Previous reports:** It is used traditionally in asthma, skin disorders, ulcers, body aches, elephantiasis, gastric catarrh, kidney troubles, leprosy, leucorrhoea, urethritis, for improving memory, as a nervine tonic, dropsy, maternal health care and stomach disorders<sup>[20]</sup>.

It is reported to possess pharmacological properties like antimicrobial, anticancer, wound healing, neuroprotective, immunomodulatory, anti-inflammatory, hepatoprotective, insecticidal and antioxidant activity<sup>[21]</sup>.

### 8. *Curcuma angustifolia* Roxb.

**Family:** Zingiberaceae

Col. No. 10 (PM).

**Bengali:** Palo, Hindi: Tikhur, English: East Indian Arrowroot.

Collected from: Belda, Narayangarh, Paschim Medinipur.

**Uses:** The roots are pressed, mixed with water, filtered, washed and the minute grains are preserved after drying. These grains are mixed with water and fed at empty stomach at morning to the patients of enteritis and chronic dysentery.

**Previous reports:** It is used in gastrointestinal disorders, applied on skin to soothe the painful, inflamed mucous

membrane, used as weaning food, to treat stomach ache and curing worm infestation<sup>[22]</sup>. Used in peptic ulcers, dysentery, tuberculosis and bronchitis<sup>[23]</sup>.

### 9. *Cynodon dactylon* Pers.

**Family:** Poaceae

Col. No. 46 (P).

**Bengali:** Durba ghas, Hindi: Doob/Hariali, English: Creeping panic grass/Couch grass.

Collected from: Asnan, Moyna, Purba Medinipur.

**Uses:** A drink made by filtering the plant paste made from 10-12 grams of whole plant is fed at empty stomach at morning to cure bloody enteritis and dysentery with blood. The drink is given for three consecutive days at first and then repeated at three day's intervals, if required.

**Previous reports:** It is used in folk remedy for anasarca, calculus, cancer, carbuncles, convulsions, cough, cramps, cystitis, diarrhea, dropsy, dysentery, epilepsy, headache, hemorrhage, hypertension, hysteria, insanity, laxative, measles, rubella, snakebite, sore stones, tumors, urogenital disorders, warts, wounds. It is reported to be alterative, antiseptic, aperients, astringent, cyanogenetic, demulcent, depurative, diuretic, emollient and vulnerary<sup>[1]</sup>.

### 10. *Cyperus rotundus* L.

**Family:** Cyperaceae

Col. No. 8 (P).

**Bengali:** Motha ghas, Hindi: Koreti-jar, English: Nut Grass.

Collected from: Romipur, Raninagar 1, Murshidabad.

**Uses:** A drink prepared from the paste made from 5 - 6 grams of rhizomes of this plant is mixed with 2-3 grams of common salt, mixed with water and fed to the patients to cure enteritis.

**Previous reports:** In some Asian countries rhizomes of this plant are used as folk medicine for the treatment of spasms, stomach disorders, bowel disorders and inflammatory diseases. In Chinese pharmacopoeia, it was described as an agent to regulate circulation, normalize menstruation, and relieve pain. In Sudan the tubers are used in stomach disorders and bowel irritation, dyspepsia, diarrhea, dysentery, ascites, vomiting, cholera, fevers and as anthelmintic. A poultice of the fresh tubers is used to cure wounds, ulcers and sores and also applied to the breast to promote the flow of milk<sup>[24]</sup>.

### 11. *Oxalis corniculata* L.

**Family:** Oxalidaceae

Col. No. 67 (M).

**Bengali:** Amrul Shak, Hindi: Amrul, English: Creeping woodsorrel.

Collected from: Tenka, Raninagar 1, Murshidabad.

**Uses:** A curry is prepared with leaf (20 -25 grams) of this plant and fed for 5-7 days to cure enteritis and dysentery.

**Previous reports:** It is used traditionally in/as appetizer, anemia, wounds, burns, sprains, cancer, piles, skin eruptions, influenza, fever, urinary tract infection, diarrhoea and snake bites<sup>[25]</sup>. It is a good source of vitamin C, niacin and beta carotene. It acts as antibacterial, antifungal, antimicrobial, anticancer, anti- diabetic, anti-inflammatory, astringent, depurative, diuretic agent<sup>[26]</sup>.

### 12. *Paederia foetida* Linn.

**Family:** Rubiaceae

Col. No. 83 (M).

**Bengali:** Gandal/Gandha-bhadulia, Hindi: Gandhaprasarini, English: Stinkvine/Chinese flower plant.

Collected from: Jhautala, Mahishadal, Purba Medinipur.

**Uses:** A curry is prepared with the leaf (15-20 grams) of this

plant and fed to the patients of enteritis and dysentery for 10-15 days.

**Previous reports:** The aqueous paste of this plant is traditionally used for treatment of rheumatoid arthritis, hepatic disorders, piles, diabetes, asthma, coughs, body ache, itches, wounds, stomach-ache, diarrhea, dysentery, flatulency and toothache. It is having antibacterial Cytotoxic, anthelmintic, antihyperglycemic, hepato-protective, anti-fungal, anti-ulcer, antioxidative and anti-diarrhoeal effects [27].

**13. *Phyllanthus amarus* Linn.**

**Family:** Phyllanthaceae

Col. No. 16 (PM).

**Bengali:** Bari amla, Hindi: Bhui aonla, English: Carry me seed.

Collected from: Rantua, Gopiballavpur, Paschim Medinipur.

**Uses:** A small piece (1-2 gram) of fresh root of this plant is fed to the patients for 3-5 days for treatment of enteritis and dysentery.

**Previous reports:** It is used in diarrhea, dysentery, dropsy, colic, jaundice, intermittent fever, pain, urogenital disorders, kidney and urinary bladder problems, diabetes, gonorrhea, scabies and various skin problems, wounds. The root extract is used to cure stomach pain [28].

**14. *Tamarindus indica* Linn.**

**Family:** Caesalpiniaceae

Col. No. 51 (P).

**Bengali:** Tentul, Hindi: Imli, English: Tamarind.

Collected from: Ramchandrapur, Moyna, Purba Medinipur.

**Uses:** The sour fruit pulp is kept in a covered earthen pot for at least three years with occasional sunlight treatment so that a portion of it becomes semisolid or liquid. That liquid pulp is fed to the patients to cure chronic dysentery. 4-5 ml of it is

mixed with boiled rice and taken orally daily at noon for one month for that purpose.

**Previous reports:** It is used as/in laxative, abdominal pain, diarrhea, dysentery, peptic ulcer, spasmolytic, cancer, antimicrobial, antiparasitic, antifungal, antiviral, antinematodal, anti-inflammatory, antioxidant, anti-diabetic, liver protective, cardiovascular protective, wound healing agent [29]. Used in Unani system as demulcent, cardiac tonic, stomachic, carminative, digestive, laxative, antiscorbutic, antibilious and antiseptic [30].

It appears from the study that along with the use of modern medicine, a segment of rural people residing in West Bengal are still in practice to use various parts of locally available plants to cure varieties of problems rated with enteritis and dysentery.

Among the fourteen plants identified, six plants are used against dysentery alone, two against enteritis alone and six against both enteritis and dysentery.

Among the plants, succulent leaf of leaf extract of six plants; root or root extract of three plants; leaf with succulent stem of one plant; rhizome of two plants; fruit of one plant and fruit pulp of one plant are used. Except the fruit pulp of *Tamarindus indica* and rhizome of *Curcuma angustifolia*, all the plant parts are used at succulent condition on the day or within a few days of collection.

In a previous report, twenty eight plants were listed for their anti dysentery and anti enteritic properties [31]. Among them, only two plants (*Centella asiatica* and *Phyllanthus amarus*) are common with the present list. In another report, a total of thirty five plants were listed for their reported use in diarrhea and dysentery [18]. Among these plants, only two plants (*Blumea lacera* and *Centella asiatica*) are common with the present observation.



1. *Aegle marmelos*



2. *Amaranthus spinosus*



3. *Andrographes paniculata*



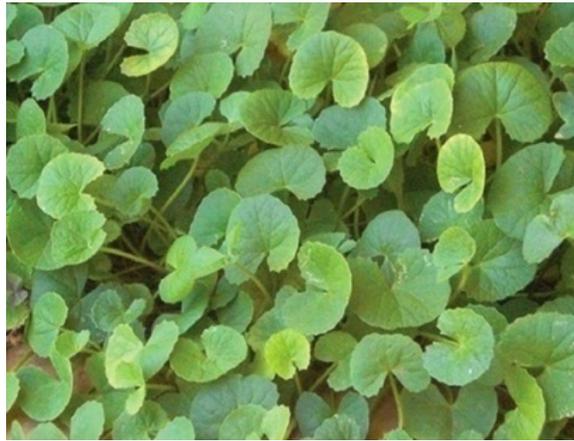
4. *Ayapana triplinervis*



5. *Blumea lacera*



6. *Bryophyllum pinnatum*



7. *Centella asiatica*



8. *Curcuma angustifolia*



9. *Cynodon dactylon*



10. *Cyperus rotundus*



11. *Oxalis corniculata*



12. *Paederia foetida*

13. *Phyllanthus amarus*14. *Tamarindus indica*

Fig 1: Plants used to cure enteritis and dysentery.

#### 4. Conclusion

From the present study it reveals that rural people still rely upon the efficacy of medicinal plants for treatment of some common problems of digestive system, enteritis and dysentery. From this study report, further ethno-pharmacological study may be initiated to validate the actual efficacy of the plants at their original form used by the people.

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#### 6. Reference

- Asthana A, Anil Kumar, Gangwar S, Dora J. Pharmacological Perspectives of *Cynodon dactylon*, Res J Pharmaceut Biol Chem Sci. 2012; 3(2):1135-1147.
- Agrawal M, Tyagi T. Therapeutic Efficacy of *Centella asiatica* (L.) and *Momordica charantia*: As Traditional Medicinal Plant, J Plant Sci, Spl Issue: Medicinal Plants. 2015; 3(1-1):1-9.
- Joy PP, Thomas J, Varghese CS, Indumon SS, George D. Medicinal Plants. Kerala Agricultural University, Kerala, India, 1998. Cited in Roy DC, Barman SK, Shaik MM. Current updates on *Centella asiatica*: phytochemistry, pharmacology and traditional uses, Med Plant Res 2013; 3(4):20-36.
- Rathee JS, Patro BS, Hula S, Gamre S, Chattopadhyay S. Antioxidant activity of *Piper betle* leaf extract and its constituents. J Agril Food Chem. 2006; 54:9046-9054.
- World Health Organization (WHO). Summary of WHO guidelines for the assessment of herbal medicines, Herbal Gram. 1993; 28:13-14. Cited in Mamman PH, Mshelia WP, Susbatrus SC, Sambo KW (2013) Antibacterial effects of crude extract of *Azadirachta indica* against *Escherichia coli*, *Salmonella* spp and *Staphylococcus aureus*, Intern J Medicine Medical Sci. 2013; 5(1):14-18.
- Pattanayak S, Dutta MK, Debnath PK, Bandyopadhyay SK, Saha B, Maity D. A study on ethno-medicinal use of some commonly available plants for wound healing and related activities in three southern districts of West Bengal, India, Explor Anim Med Res. 2012; 2(2):97-110.
- Ohashi K, Watanabe H, Ohi K, Arimoto K, Okumura Y. Chemistry let.1995: 881. Cited in: Dutta A, Lal N, Naaz M, Ghosh A, Verma R. Ethnological and ethno-medicinal importance of *Aegle marmelos* (L.) Corr (Bael) among indigenous people of India, Am J Ethnomed. 2014; 1(5):290-312.
- Trivedi VP, Nesamany S, Sharma VK. Ayurvedic herbs: a clinical guide to the healing plants of traditional medicine. J. Res. Ind. Med. YOGA Homeopath. 1978; 28:13. Cited in: Dutta A, Lal N, Naaz M, Ghosh A, Verma R. Ethnological and ethno-medicinal importance of *Aegle marmelos* (L.) Corr (Bael) among indigenous people of India, Am J Ethnomed. 2014; 1(5):290-312.
- Patel AR, Dipak G, Chakraborty M, Kamath JV. *Aegle marmelos* (Linn): A therapeutic boon for human health, Int J Res Ayurv Pharmacy. 2012; 3(2):159-163.
- Rai PK, Jindal S, Gupta N, Rana R. An inside review of *Amaranthus spinosus* Linn: a potential medicinal plant of India, Int J Res Pharmacy Chem. 2014; 4(3):643-653.
- Srinivas B, Ashok Kumar, Lakshman K, Jayaveera KN, Sheshadri Shekar D, Arun Kumar A *et al.* Antioxidant and antipyretic properties of methanolic extract of *Amaranthus spinosus* leaves. Asian Pacific J Tropic Med. 2010, 702-706.
- Ghosh D, Mitra P, Ghosh T, Mitra PK. Anti peptic ulcer activity of the leaves of *Amaranthus spinosus* L. in rats, Mintage J Pharmaceut Med Sci. 2013; 2(3):152-153.
- Okhuarobo A, Falodun JE, Erharuyi O, Imieje V, Falodun A, Langer P. Harnessing the medicinal properties of *Andrographis paniculata* for diseases and beyond: a review of its phytochemistry and pharmacology, Asian Pac J Trop Dis. 2014; 4(3):213-222.
- Jayakumar T, Cheng-Ying Hsieh, Jie-Jen Lee, Joen-Rong Sheu. Experimental and Clinical Pharmacology of *Andrographis paniculata* and its major bioactive phytoconstituent Andrographolide, Evidence-Based Compl Altern Med. 2013; Article ID 846740, 1- 16.
- Sugumar N, Karthikeyan Gowdhami T. Preliminary Photochemical Screening on the Leaf extract of *Eupatorium triplinerve* Vahl, Int J Pharmaceut Biol Archives. 2014; 5(5):141-144.
- Khare CP. Indian Medicinal Plants: An Illustrated Dictionary, Springer-Verlag Heidelberg. 2004: 95. Cited in Khandekar U, Tippat S, Ghongade R. Investigation on antioxidant, antimicrobial and phytochemical profile of *Blumea lacera* leaf, Int J Biol Pharmaceut Res. 2013; 4(11):756-761.
- Pattanayak S, Mandal TK, Debnath PK, Das AK, Bandyopadhyay SK. Comparative haemostatic efficacy of succulent leaf extracts and latex of some wound healing plants on fresh wound of rabbit, Explor Anim Med Res. 2015; 5(1):20-26.

18. Sen SK, Behera LM. Ethnomedicinal plants used by the tribals of Bargarh district to cure diarrhea and dysentery, *Ind J Traditional Knowledge*. 2008; 7(3):425-428.
19. Afzal M, Kazmi I, Khan R, Singh R, Chauhan M, Bisht T *et al.* *Bryophyllum pinnatum*: A review, *Int J Res Biol Sci*. 2012; 2(4):143-149.
20. Singh S, Gautam A, Sharma A, Batra A. *Centella asiatica* (L.): A plant with immense medicinal potential but threatened, *Int J Pharmaceut Sci Rev Res*. 2010; 4(2):9-17.
21. Roy DC, Barman SK, Shaik MM. Current Updates on *Centella asiatica*: phytochemistry, pharmacology and traditional uses, *Med Plant Res*. 2013; 3(4):20-36.
22. Sharma A. Traditional processing of Shotti (*Curcuma angustifolia* Roxb.) – a rhizome based ethnic weaning food, *Ind J Traditional Knowledge*. 2012; 11(1):154-155.
23. Doble B, Dwivedi S, Dubey K, Joshi H. Pharmacognostical and Antimicrobial activity of leaf of *Curcuma angustifolia* Roxb., *Int J Drug Discov Herb Res*. 2011; 1(2):46-49.
24. Mona SM, Hassan SK, Wadah JAO, Muddathir AK. A review on phytochemical profile and biological activities of three anti-inflammatory plants used in Sudanese folkloric medicine, *Am J Pharm Tech Res*. 2014; 4(4):1-14.
25. Kathiriyai A, Das K, Kumar EP, Mathai KB. Evaluation of antitumor and antioxidant activity of *Oxalis corniculata* Linn. against Ehrlich ascites carcinoma on mice, *Iran J Cancer Prev*. 2010; 4: 157-165. Cited in: Gupta A, Sahai R, Sheikh S, Gupta S. Nutritional composition of value added products prepared from the underutilized Indian Sorrel leaves (*Oxalis corniculata*), *Int J Agril Food Sci*. 2014; 4(1):1-5.
26. Kataki M, Saikia MK. Screening ADME-Toxicity Test of *Oxalis corniculata* for its Potential Antibacterial Activity, *World J Biol Med Sci*. 2015; 2(2):82-97.
27. Senapati MR, Behera PC, Bisoi PC, Maity A, Parija SC. HPTLC finger print analysis of phytophenols of *Paederia foetida* under different extraction regimen, *the bioscan*. 2013; 8(2):603-609.
28. Verma S, Sharma H, Garg M. *Phyllanthus Amarus*: A Review, *J Pharmacognosy Phytochemistry*. 2014; 3(2):18-22.
29. Pinar Kuru. *Tamarindus indica* and its health related effects, *Asian Pac J Trop Biomed*. 2014; 4(9):676-681.
30. Tariq M, Chaudhary SS, Rahman K, Hamiduddin, Zaman R, Imtiyaz S. (2013) *Tamarandus Indica* : an overview, *J Biol Scientific Opinion*. 2013; 1(2):128-131.
31. Pattanayak S, Maity D, Mitra S, Debnath PK, Mandal TK, Bandyopadhyay SK. Use of fresh parts of medicinal plants for health and production in livestock – a new concept of farming, *Explor Anim Med Res*. 2013; 3(1):7-16.