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Research Article

PLANTS USED TO CURE PROBLEMS OF FLATULENCE AND CONSTIPATION IN THREE SOUTHERN DISTRICTS OF WEST BENGAL, INDIA

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ABSTRACT: Chronic flatulence and constipation are two very important problems related with digestive system. 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 six plants and three plant combinations involving another six new plants were identified, 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: Flatulence, Constipation, Medicinal plants, Traditional use.

INTRODUCTION

India is one of the world's leading bio-diversity centers with the presence of over 45,000 different plant species. India's diversity is unmatched due to the presence 16 different agro climetic zones, 10 vegetation zones, 25 biotic provenances and 426 biomass (Asthana *et al.*, 2012). 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 (Agarwal and Tyagi 2015). Traditionally, ethno medicines are extensively used in India and elsewhere due to their low cost, easy accessibility to everyone and perceived fewer side effects (Rathee *et al.*, 2006). 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 (WHO 1993). Rural people, especially the ethnic communities of India, traditionally use the plant resources for their food, shelter and health care. In this regard, a

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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 (Pattanayak *et al*., 2012).

In the present study, attempts are being made to document such folk practices commonly used for problems of flatulence and constipation.

MATERIALS AND METHODS

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, West Bengal, India 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) (Pattanayak *et al.*, 2015a). 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 Mahisadal. 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 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.

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 related with the use of plant parts to cure problems of flatulence and constipation were noted and no modification has been performed during presentation of the information. The plants they use 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 mainly 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 (Fig.1).

OBSERVATION

The result of the study is described briefly as gathered information indicating the species of the plants with family, vernacular names, collection number, place of collection (village/ block/district) along with a brief statement on their medicinal uses. Important related previous observations were also provided along with proper references. As many of the problems related with flatulence and constipation are actually some external expression of many internal conditions which are dependent on many other factors, 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.*Acacia nilotica* (Linn) Delile.(F. Fabaceae).
Col. No. 41(P).

Bengali: Babla/Babul, Hindi: Babhul, English: Babul tree.

Collected from: Uttampur, Moyna, Purba Medinipur.

Uses: Immature leaf bud (2-3 gms) are added with a little amount of common salt, pressed and fed at empty stomach to get relief from chronic flatulance.

Previous reports: Various parts of this plant is used as/in anti-cancer, anti tumours, antiscorbutic, astringent, anti-oxidant, natriuretic, antispasmodial, diuretic, Intestinal pains and diarrhea, nerve stimulant, cold, congestion, coughs, dysentery, fever, hemorrhages, leucorrhea, ophthalmia and sclerosis (Saini 2008).

The immature leaves are eaten as degestive stimulator (Pattanayak *et al.*, 2015b). The leaves and pods are an excellent fodder with antiinflammatory properties, rich in protein. The pods have molluscicidal and algicidal properties (Malviya *et al.*, 2011). The leaves are used as gargle for sore throat, tonic to liver, enriches blood (Manoj Kumar 2015).

2. *Aegle marmelos* Corr. (F. Rutaceae).
Col No. 37 (PM).

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

Collected from: Nayabasan, Gopiballavpur, Paschim Medinipur.

Uses: The ripe fruit is eaten during the spring and summer months as a protective and curative agent against chronic constipation and flatulence. 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, gonorrhea, epilepsy (Ohashi *et al.*, 1995). Fine powder of unripe fruit can be an alternative medicine to cure intestinal parasites (Trivedi *et al.*, 1978).

Various parts of this plant possess Anti-diabetic, anti-ulcer, anti-oxidant, anti-malarial, anti-inflammatory, anti-cancer, radioprotective, anti-hyperlipidaemic, anti-fungal, anti-bacterial, anti-viral properties (Patel *et al.*, 2012).

3. *Cassia fistula* L. (F. Fabaceae).
Col. No. 52(M).

Bengali: Bundaralati/Sondal, Hindi: Amultus, English: Golden Shower.

Collected from: Tenka-Raipur, Raninagar 1, Murshidabad.

Uses: The seeds of this plant remain inside some thick pulpy material. 4-5 matured seeds with pulp (of ripe fruit) are kept in lukewarm water at night and the extract is fed to the patients of habitual constipation continuously for 5-7 days at 15 days intervals.

Previous reports: This plant is used in tumors of the abdomen, glands, liver and throat cancer. It is also used to cure burns, constipation, convulsions, diarrhea, dysuria, epilepsy, leprosy, skin diseases, and syphilis. Pharmacological activities include antibacterial, antidiabetic, antifertility, anti-inflammatory

antioxidant, hepato-protective, antitumor and antifungal activities (Anitha and Miruthula 2014).

4. *Cyperus rotundus* L. (F. Cyperaceae).

Col. No. 8 (P).

Bengali: Muthaghas, Hindi: Koreti-jar, English: Nut Grass.

Collected from: Romipur, Raninagar 1, Murshidabad.

Uses: A drink prepared from the paste made from 5 - 6 gms of rhizomes of this plant is fed at morning as a curing agent for habitual flatulence and constipation.

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, ascitis, 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 (Mona *et al.*, 2014).

5. *Piper betle* L. (F. Piperaceae).

Col. No. 12 (M).

Bengali: Pan, Hindi: Pdn/Tambul, English: Betel.

Collected from: Asnan, Moyna, Purba Medinipur.

Uses: Extract of 'Pan', made with the leaves of this plant and some small pieces of 'Supari' (Areca nut, *Areca catechu* Linn., Family : Arecaceae), a little amount of 'Chuna' (Calcium hydroxide), and a few Panmouri (*Foeniculum vulgare* Mill. described in Sl. No. CC 3). According to the belief, chewing and drinking the extract of 'Pan' with these additives after taking meal can render protection from flatulence and help in easy evacuation of bowels.

Previous reports: The leaves of this plant are used to treat alcoholism, bronchitis, asthma, leprosy and dyspepsia (Chakraborty and Shah 2011). It is having antifungal, hypotensive, respiratory depressant, antihelminthic, cardiotonic, antiplatelet, antifertility, antitumour, antiulcer and antibacterial activities (Manigauha *et al.*, 2009).

6. *Tinospora cordifolia* (Willd) Hook.F.Thoms. (F. Menispermaceae).

Col. No. 81(M).

Bengali: Gulancha, Hindi: Guduchi, English: Tynospora.

Collected from: Tenka Raipur, Raninagar, Murshidabad.

Uses: The stem of this plant is cut into pieces and fed to the patients along with a piece of pan (*Piper betle*) to cure habitual constipation and flatulence.

Previous reports: This plant can be used as an immunomodulatory or immunostimulatory, anti-tumor, cognition, anti-inflammatory, anti-neoplastic, anti-hyperglycemia, anti-hyperlipidemia, antioxidant, anti-tuberculosis, gastrointestinal and hepatoprotection, anti-osteoporotic, anti-angiogenic, anti-malarial, anti-allergic and side effects prevention of the cancer chemotherapy (Pandey *et al*., 2012).

Combinational Use A.

CA 1. *Syzygium cuminii* (Linn) Skeels. (F. Myrtaceae).

Col. No. 89 (P).

Bengali: Kalojam, Hindi: Jamun, English:

Jambul.

Collected from: Nayabasan, Gopiballavpur, Paschim Medinipur.

Previous reports: The bark of this plant is used as/in astringent, refrigerant, carminative, diuretic, digestive, anthelmintic, febrifuge, constipating, stomachic and antibacterial (Saravanan and Pari 2008).

CA 2. *Terminalia arjuna* (Roxb.) Wight & Arn. (F. Combretaceae).

Col. No. 88 (MP).

Bengali: Arjun, Hindi: Arjun, English: Arjun tree.

Collected from: Nayabasan, Gopiballavpur, Paschim Medinipur.

Previous reports: The bark of this tree has been used in cardiac disorders in Ayurveda (Seth *et al*., 2013). The bark is used for treatment of angina and heart disease, relieving excessive menstrual bleeding, leucorrhea, diarrhea, dysentery, tubercular cough, asthma, earache, cleansing sores, ulcers and syphilitic infection, skin disorder (Chandan Kumar *et al.*, 2013). Stem bark is also used in/as Aphrodisiac, styptic, Spermatorrhoea, intrinsic hemorrhage, liver problems (Paarakh 2010).

The preclinical studies in modern medicine suggest that there are strong antioxidant properties of *Terminalia arjuna* and reduction of ischemic perfusion injury. It also causes attenuation of oxidative stress and antifibrotic activity (Seth *et al*., 2013).

CA 3. *Acacia nilotica* (Linn) Delile. (described in Sl.No. 1)

Collected from: Uttampur, Moyna, Purba Medinipur.

Combinational Use: Approximately 10 gms of stem bark is collected from each tree, the outer scaly rough portion is taken off and are pressed together to some extent and kept in hot water at night. Extract of it is taken out by manual pressing of the material at the next morning and given to the patients to drink to cure problems of chronic flatulence and constipation. The treatment is continued for three consecutive days each week for one month.

Combinational Use B.

CB 1. *Hemigraphis hirta* T. And. (F. Acanthaceae).

Synonym: *Ruellia hirta*, *Ruellia sarmentosa*.

Col. No. 90 (P).

Bengali: Musakani, Hindi: Muskan, English: Hairy Hemigraphis.

Collected from: Ramchandrapur, Moyna, Purba Medinipur.

Previous reports: It is used in/as shigellosis, abdominal pain, glossitis, stomatitis, wound healing, anthelmintic, diarrhea, dysentery and urolithiasis (Alam *et al*., 2002).

CB 2. *Ruellia tuberosa* L. (F. Acanthaceae).

Col No. 91 (P).

Bengali: Chatpatey/Patpati, Hindi: Chatakni Phali, English: Minnie Root.

Collected from: Ramchandrapur, Moyna, Purba Medinipur.

Previous reports: Various parts of this plant is used as/in diuretic, antipyretic, antidiabetic, antidotal, thirst-quenching agent and analgesic and anti-hypertensive activity, gonorrhea and ear diseases, stomach cancer, emetic, bladder stones, Bronchitis, anthelmintic, joint pain and strained muscles. It has been experimentally proved to possess antioxidant, antimicrobial, anticancer, gastroprotective, antinociceptive, and anti-inflammatory activity (Reddy *et al*., 2013).

Combinational Use: The leaves along with

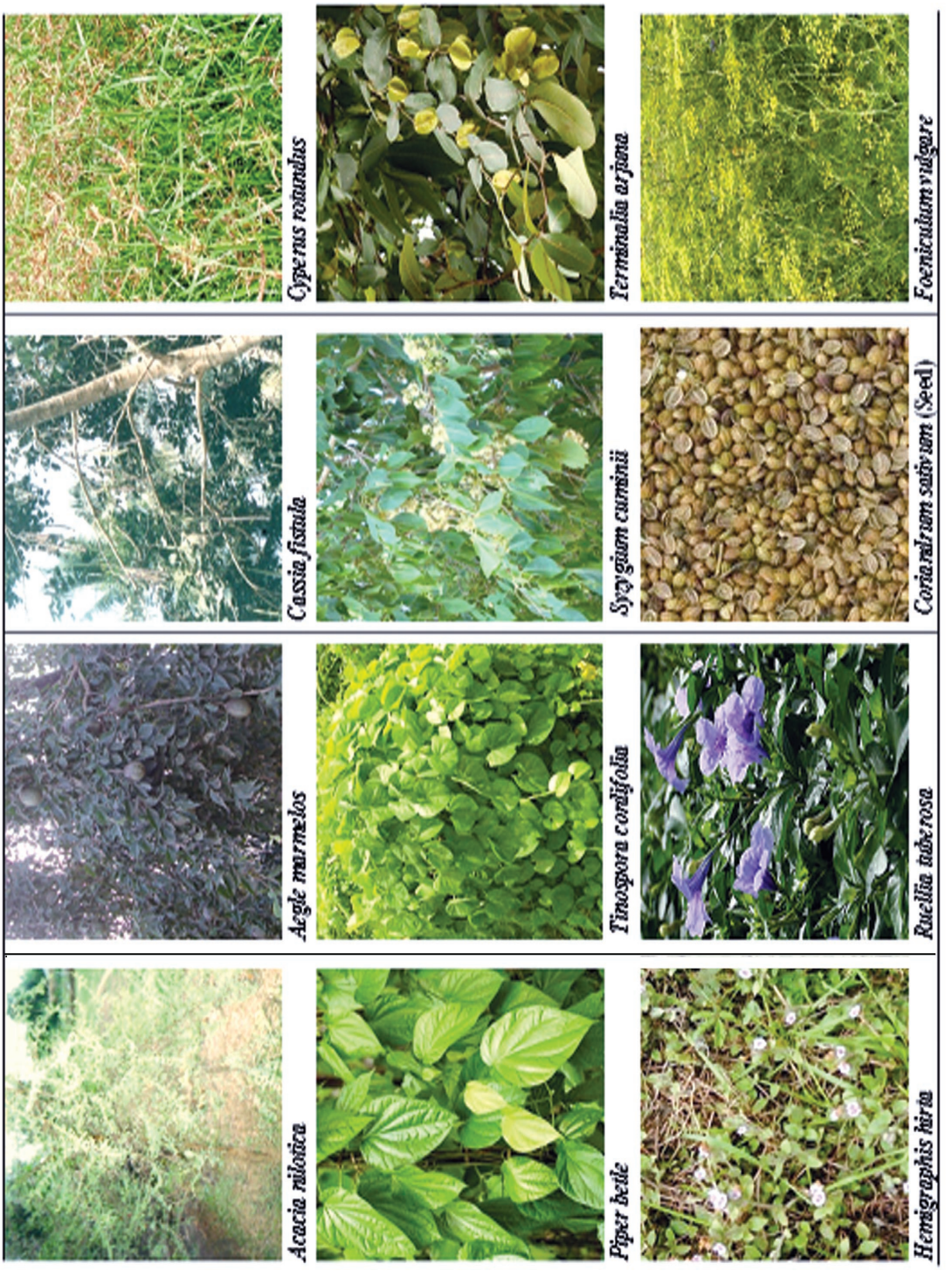

Fig. 1. Plants used to treat flatulence and constipation in three southern districts of West Bengal, India.

succulent stems of *H. hirta* and root of *R. tuberosa* are used together. 2-3 grams of each is taken and pressed together. The extract is taken out after mixing it with water and fed at empty stomach to the patients of habitual flatulence. The medicine is given daily for consecutive three days at each week for 5-6 weeks.

Combinational Use C

CC 1.*Coriandrum sativum* L.(F. Apiaceae).

Col. No. 93 (P).

Bengali: Dhoney, Hindi:Dhania, English: Coriander.

Collected from: Uttampur, Moyna, Purba Medinipur.

Previous reports: It is used in gastrointestinal complaints such as anorexia, dyspepsia, flatulence, diarrhea, griping pain and vomiting. Coriander fruit act as refrigerant, tonic, diuretic and aphrodisiac and the oil is considered useful in flatulent colic, rheumatism, neuralgia, etc. It is having anti-edemic, anti-inflammatory, antiseptic, emmenagogue, anti-diabetic, anti-hypertensive, lipolytic and myorelaxant, and possess nerve-soothing property (Jabeen *et al.*, 2009).

CC 2. *Cyperus rotundus* L. (described in Sl.No. 4).

Collected from: Uttampur, Moyna, Purba Medinipur.

CC 3. *Foeniculum vulgare* Mill. (F. Umbelliferae).

Col. No. 92 (P).

Bengali: Panmouri/Mouri, Hindi: Bari saunf, English: Common fennel.

Collected from: Uttampur, Moyna, Purba Medinipur.

Previous reports: It is used for the treatment of a number of diseases like abdominal pains, anti-emetic, aperitif, arthritis, cancer, colic in children, conjunctivitis, constipation, depurative, diarrhea, dieresis, emmenagogue, fever, flatulence, gastralgia, gastritis, insomnia, irritable colon, kidney ailments, laxative, leucorrhoea, liver pain, mouth ulcer, and stomachache (Abdossi *et al*., 2015). Compiled data indicate its efficacy as anti-microbial, anti-viral, anti-inflammatory, anti-mutagenic, anti-nociceptive, anti-pyretic, anti-spasmodic, anti-thrombotic, apoptotic, cardiovascular, chemomodulatory, antitumor, hepatoprotective, hypoglycemic, hypolipidemic, galactagogue and memory enhancing property (Badgujar *et al*., 2014).

CC 4. Ash made from complete burning of cow dung.

Combinational use: 5 gms of seed/rhizome of each plant is taken and pressed to some extent. Then 5 gms of cow-dung ash is also taken and all are kept in water for overnight. The cow dung ash is removed and the extract made from the other plant parts is fed to the patients at empty stomach to cure chronic flatulence and constipation for seven days continuously at every month.

DISCUSSION

The present documentation indicates the use of locally available plants used to cure the problems of chronic constipation and flatulence. Among the twelve plants, six plants are used singly and others are used in combination. Among these plants, leaf or leaf extracts of two plants; fruit of two plants; stem and rhizome of one plant each; stem bark of three plants in combination; leaf and stem of two plants in

combinations and seeds of two plants in combination are used.

Some of the previous study reports show direct relation with our present observations. Some other reports may have some indirect correlation with the problems under study. Previously reported use of plant parts as an anti-inflammatory agent or use in abdominal pain may have such effect. Pattanayak *et al* (2013) enlisted 33 plants for having purgative and anti flatulent properties, among which only three plants (*Aegle marmelos*, *Cassia fistula* and *Coriandrum sativum*) are common with the present observation. Some typical and perhaps novel type of use of plant parts are documented during the study. Eating or drinking of immature leaf and leaf bud of *Acacia nilotica*; typical hot water extract of the seed and pulp of *Cassia fistula*, drink prepared from the succulent rhizomes of *Cyperus rotundus* and the typical watery extracts made from the plant combinations are some examples.

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REFERENCES

Abdossi V, Ghahremani A, Hadipanah A, Ardalani H, Aghaee K (2015) Quantitative and qualitative responses in chemical composition of three ecotypes of fennel (*Foeniculum vulgare* Mill.) cultivated in Iran climatic conditions. J Biodiv Envir Sci 6(3): 401- 407.

Agrawal M, Tyagi T (2015) Therapeutic Efficacy of *Centella asiatica* (L.) and *Momordica charantia*: As Traditional Medicinal Plant. J Plant Sci, Spl Issue: Medicinal Plants. 3(1-1): 1-9.

Alam AHMK, Rashid MHR, Rahman MAA, Baki A, Sadik MG (2002) Chemical constituents of *Hemigraphis hirta* T. anders (Acanthaseae). Pak J Biol Sc 5(11): 1264 - 1266.

Anitha J, Miruthula S (2014) Anti-inflammatory and phytochemicals analysis of *Cassia fistula* Linn. fruit pulp extracts. Int J Pharmacognosy. 1(3): 207-215.

Asthana A, Anil Kumar , Gangwar S, Dora J (2012) Pharmacological Perspectives of *Cynodon dactylon.* Res J Pharmaceut Biol Chem Sci 3(2): 1135-1147.

Badgujar SB, Patel VV, Bandivdekar AH (2014) *Foeniculum vulgare* Mill: A Review of Its Botany, Phytochemistry, Pharmacology, Contemporary Application, and Toxicology. Bio Med Res Internat 2014: 1-32.

Chakraborty D, Shah B (2011) Antimicrobial, antioxidative and anti-hemolytic activity of *Piper betle* leaf extracts. Int J Pharmacy Pharmaceut Sci 3: 192-199.

Chandan Kumar, Raj Kumar, Shamshun N (2013) Phytochemical properties, total antioxidant status of acetone and methanol extract of *Terminalia arjuna* Roxb. bark and its hypoglycemic effect on Type-II diabetic albino rats. J Pharmacogn Phytochem 2(1): 199 -208.

Jabeen Q, Bashir S, Lyouss, B, Gilani H (2009) Coriander fruit exhibits gut modulatory, blood pressure lowering and diuretic activities. J Ethnopharmacol 122: 123-130. Cited in: Darughe F, Barzegar M, Sahari MA (2012) Antioxidant and

anti-fungal activity of Coriander (*Coriandrum sativum* L.) essential oil in cake. Int Food Res J 19 (3): 1253-1260.

Malviya S, Rawat S, Kharia A, Verma M (2011) Medicinal attributes of *Acacia nilotica* Linn. - A comprehensive review on ethnopharmacological claims. Int J Pharm Life Sci 2(6): 830-837.

Manigauha A, Patel S, Ali H, Chandy A, Uma Maheshwari M (2009) Study the effect of phytochemical constituents of *Piper betle* leaves extracts on liver disorders by *in vivo* model. J Pharmacy Res 2: 353–356.

Manoj Kumar (2015) *Acacia nilotica* Linn. as a phytomedicine: An overview. Int J Drug Discov Herb Res 5(1): 843-848.

Mona SM, Hassan SK, Wadah JAO, Muddathir AK (2014) A review on phytochemical profile and biological activities of three anti-inflammatory plants used in Sudanese folkloric medicine. Am J Pharm Tech Res 4(4): 1-14.

Ohashi K, Watanabe H, Ohi K, Arimoto K, Okumura Y (1995) Chemistry let. 881. Cited in: Dutta A, Lal N, Naaz M, Ghosh A, Verma R (2014) Ethnological and ethno-medicinal importance of *Aegle marmelos* (L.) Corr (Bael) among indigenous people of India. Am J Ethnomed 1(5): 290-312.

Pandey M, Chikara SK, Vyas MK, Sharma R, Thakur GS, Bisen PS (2012) *Tinospora cordifolia*: a climbing shrub in health care management. Int J Pharm Bio Sci 3(4): 612 - 628.

Paarakh PM (2010) *Terminalia arjuna* (Roxb) Wt and Arn. : A review. Int J Pharmacol 6(5): 515-534.

Patel AR, Dipak G, Chakraborty M, Kamath JV (2012) *Aegle marmelos* (Linn): A therapeutic boon for human health. Int J Res Ayurv Pharmacy 3(2): 159-163.

Pattanayak S, Dutta MK, Debnath PK, Bandyopadhyay SK, Saha B, Maity D (2012) 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 2(2): 97-110.

Pattanayak S, Maity D, Mitra S, Debnath PK, Mandal TK, Bandyopadhyay SK (2013) Use of fresh parts of medicinal plants for health and production in livestock – a new concept of farming. Explor Anim Med Res 3(1): 7-16.

Pattanayak S, Mandal TK, Bandyopadhyay SK (2015a) A Study on Use of Plants to Cure Enteritis and Dysentery in Three Southern Districts of West Bengal, India. J Medic Plant Studies 3(5): 277-283.

Pattanayak S, Mandal TK, Bandyopadhyay SK (2015 b) Use of plants as digestive stimulator and tonic in three southern districts of West Bengal, India. Int J herbal Med 3(5): 01-08.

Rathee, JS, Patro BS, Hula S, Gamre S, Chattopadhyay S (2006) Antioxidant activity of *Piper betle* leaf extract and its constituents. J Agril Food Chem 54: 9046-9054.

Reddy VN, Nagarathna PKM, Divya M (2013) Evaluation of anti-cancer activity of *Ruellia tuberosa* on EAC induced solid tumor. Int J Phytopharmacol 4(5): 340-346.

Saini ML (2008) Comparative Pharmacognostical and antimicrobial studies of *Acacia* species (Mimosaceae). J Med Plants Res 2(12): 378-386. Cited in Malviya S, Rawat S, Kharia A, Verma M (2011) Medicinal attributes of *Acacia nilotica* Linn. - A comprehensive review on ethnopharmacological claims. Int J Pharm Life Sci 2(6): 830-837.

Saravanan G, Pari L (2008) Hypoglycemic and anti hyper glycogenic effect of *Syzygium cuminii* bark in Streptozotocin induced diabetic rats. J Pharm Toxicol 3(1): 1-10.

Seth S, Dua P, Maulik SK (2013) Potential benefits of *Terminalia arjuna* in cardiovascular disease. J Preventive Cardio 3 (1):428-432.

Trivedi VP, Nesamany S, Sharma VK (1978). Ayurvedic herbs: a clinical guide to the healing plants of traditional medicine. J Res Ind Med.YOGA Homeopath 28:13. Cited in: Dutta A, Lal N, Naaz M, Ghosh A, Verma R (2014) Ethnological and ethno-medicinal importance of *Aegle marmelos* (L.) Corr (Bael) among indigenous people of India. Am J Ethnomed 1(5): 290-312.

World Health Organization (1993) Summary of WHO guidelines for the assessment of herbal medines. Herbal Gram 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* sp. and *Staphylococcus aureus.* Intern J Med Medical Sci 5(1): 14-18.

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