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RESEARCH ARTICLE

Ethno-botanical study at the Village Pondit Para under Palash Upazila of Narsingdi District, Bangladesh

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Abstract

Ethno-botanical investigation by the local people at Pondit Para Village under Palash Upazila of Narsinghdi district, Bangladesh was recorded. Frequent field trips were made during March 2013 to July 2014 to record ethno-botanical data by interviewing local people of various age groups, mostly ranging between 20 to 70 years, including medicinal healers (herbalists/hakims). A total of 68 plant species under 60 genera of 41 families have been documented which are used for the treatment of 78 diseases/ illness. Out of these plants species, 24 belonged to herbs, 27 trees, 8 shrubs, and 9 climbers. In majority cases, leaves of the medicinal plants were found leading in terms of their use followed by whole plant, stem, bark, latex, leave bud, pulp, petiole, fruits, rhizome, seed, root, calyx and peduncle. For each species scientific name, local name, habit, family, ailments to be treated, mode of treatment and part(s) used are provided.

INTRODUCTION

In 1895, at a lecture in Pennsylvania, Dr. John Harshberger first used the term "ethnobotany" to describe his field of inquiry, which he defined as the study of "plants used by primitive and aboriginal people." In 1896, Harshberger published the term and suggested "ethnobotany" be a field which elucidates the "cultural position of the tribes who used the plants for food, shelter or clothing" (Harshberger, 1896).

Ethnobotany, in its totality, is virtually and old field with new dimension of research. And if this field is investigated thoroughly and systematically, it will yield results of great value missing the ethnologists, archaeologists, anthropologists, plant-geographers, ethnobotanists, botanists and linguists and ultimately to pharmacologists and phytochemists. It will appear to be a bridge between botany and medicinal plants, but in fact it is much more. It starts as step before ever botany in the sense supplies the 'idea' and the basic material for botanical research and study. It then takes us to the usefulness of medicinal plants. It goes a step further to help us in the application of the knowledge about the medicinal plants among the primitive people by rapport through the medicine men (Jain, 1996).

The work on ethnobotany in Bangladesh is very recent. Several medicinal plants and ethno-botanical studies in Bangladesh have been carried out. Alam (1992, 1996) documented the ehtnobotanical information and medicinal plant use by Marma. Several work also done by Chakma (2003), Khan (1998), Khan and Huq (1975), Hasan and Huq (1993), Tripura (1994), Yusuf et. al. (1994, 2006, 2009), Ghani (1998), Hassan (1988), Choudhury and Rahmatullah (2012), Faruque and Uddin (2014), Uddin et al. (2004, 2006, 2008, 2012), Khisha (1996), Rahman et. al. (2008a, 2008b), Rahman et al. (2010), Rahman et. al. (2012), Rahman (2013a, 2013b, 2013c, 2013d, 2013e, 2013f, 2013g, 2013h, 2013i, 2013j), Rahman et. al. (2013a, 2013b, 2013c, 2013d), Rahman and Khanom (2013), Rahman and Akter (2013), Rahman et al. (2014a, 2014b, 2014c), Rahman and Parvin (2014), Rahman and Gulshana (2014), Rahman and Rahman (2014), Rahman and Rojonigondha (2014), Rahman (2014) and Anisuzzaman et al.

(2007). The aim of the present study was to first record ethno-botanical knowledge of medicinal plants used by the local people living in Narsingdi district of Bangladesh.

Materials and Methods

In the present ethno-medicinal survey, a total of 68 species belonging to 60 genera and 41 families were collected and identified. Data of medicinal use of plants were collected through interview with local herbal practitioners (kabiraj/Boidya), headmen and elderly persons in the community using, semi structured questionnaire at different locations (Alexiades, 1996). Data collections from one person were verified with others by asking the same questions. Most of the medicinal plants were identified in the field and in case of unknown, plant specimens were collected. These specimens were brought to Rajshahi University Herbarium and processed by traditional herbarium techniques. These were examined and identified by comparing herbarium specimens and also consulting literatures. Threats to medicinal plants and their habitats were also noted from the field observations. Herbal plants referred by these people were authentically identified with the help of Hooker (1961), Prain (1963), Khan and Huq (1975), Kirtikar and Basu (1987), Rahman et al. (2012, 2013) and Ahmad et al. (2010), Ahmed et al. (2007). The voucher specimens are stored at Rajshahi University Herbarium (RUH) for future reference.

Ethno-botanical Enumeration

The species have been arranged alphabetically following their botanical name, local name, and family name. Parts used, traditional uses and mode of administration have been presented respectively.

***Albizia procera* Benth.**
Local name: Koroi
Family: Mimosaceae
Habit: Tree
Part(s) used: Leaves, Bark
Ethno-medicinal Uses: The leaves are insecticidal; made into poultice they are applied to ulcer. Bark-boiled water with table salt is prescribed to expel threadworms; bath with the same is given for scabies. Barks are used in toothache.

***Alternanthera philoxeroides* (Mart.) Griseb.**
Local name: Helencha
Family: Amaranthaceae
Habit: Herb
Part(s) used: Whole plant
Ethno-medicinal Uses: Whole plant is used for hazy vision, night blindness, malaria, post natal complaints, diarrhea, dysentery and puerperal fever.

***Annona squamosa* L.**
Local name: Ata
Family: Annonaceae
Habit: Tree
Part(s) used: Leaves, Bark, Fruits, Seeds
Ethno-medicinal Uses: The juice of bark is given in one teaspoonful doses in diarrhea. Ripe fruit is a good tonic, cooling, maturant, laxative and anthelmintic; lessens burning sensation and sedative to the heart.

***Artocarpus heterophyllus* Lamk.**
Local name: Kathal
Family: Moraceae
Habit: Tree
Part(s) used: Young leaves, Seeds, Roots
Ethno-medicinal Uses: The young leaves are used in skin diseases. The seeds are diuretic, aphrodisiac and constipating. Roots are used in diarrhea.

***Artocarpus lacucha* Buch.-Ham.**
Local name: Deua
Family: Moraceae
Habit: Tree
Part(s) used: Seeds, Bark

Ethno-medicinal Uses: Seeds are popular as a purge. In case of breast-feeding babies, 3-4 seeds are made into paste and mixed with mother's milk, and administered to cure constipation. An infusion of the bark is applied for small pimples and cracked skin. The bark finely powdered is applied to sores to draw out the purulent matter.

***Azadirachta indica* A. Juss**
Local name: Neem
Family: Meliaceae
Habit: Tree
Part(s) used: Leaves, Fruits, Dry Nuts, Kernels
Ethno-medicinal Uses: The strong decoction of the fresh leaves is a slight antiseptic and is used in ulcers and eczema. Fruit is purgative and anthelmintic; cures urinary discharges, skin diseases, tumors, piles, and toothache. The dry nuts possess, almost the same medicinal properties as the oil, but they require being bruised and mixing with water or some other liquid before use. About 250 gm of leaves are boiled in 1 liter of water until reduced to 250 ml and is used as a gargle which cures swollen gums, pain and pyorrhea. Pills made from the leaf paste are given to cure scabies along with bath with the leaf boiled water. The leaf juice is given in jaundice.

***Averrhoa carambola* L.**
Local name: Kamranga
Family: Oxalidaceae
Habit: Tree
Part(s) used: Fruits
Ethno-medicinal Uses: Fruits are tonic, refrigerant and antiscorbutic; eaten for jaundice. Green fruits are astringent to the bowels. The ripe fruit is a good remedy for bleeding piles, particularly for internal piles.

***Aegle marmelos* (L.) Correa**
Local name: Bel
Family: Rutaceae
Habit: Tree
Part(s) used: Ripe Fruits, Unripe Fruits
Ethno-medicinal Uses: Fruits are digestive, tonic and is belived to be an invaluable remedy in obstinate cases of chronic diarrhea and dysentery and in loss of appetite. Unripe fruit is used in diarrhea, dysentery and ripe fruit for constipation. Dried slice of unripe fruit is regarded as astringent, digestive and stomachic, and is prescribed in diarrhea and dysentery.

***Allium cepa* L.**
Local name: Piaj
Family: Liliaceae
Habit: Herb
Part(s) used: Bulbs, Leaves
Ethno-medicinal Uses: Regular use of onion (50g/day) reduces insulin requirement of a diabetic patient from 40 to 20 units a day. Continuous consumption of onion for 5 months (80g/day) decreased serum cholesterol below normal in healthy human.

***Allium sativum* L.**
Local name: Rosun
Family: Liliaceae
Habit: Herb
Part(s) used: Bulbs, Leaves
Ethno-medicinal Uses: Bulb extract is taken for the treatment of abdominal flatulence. Paste prepared from bulb is applied to forehead for the treatment of headache. Paste prepared from leaf mixed with cow or goat's milk, slightly heated in a steel plate and taken one tea spoonful twice daily for four-five days to treat cough in children.

***Asparagus racemosus* L.**
Local name: Satamuli
Family: Liliaceae
Habit: Herb
Part(s) used: Whole plant
Ethno-medicinal Uses: It improves appetite of the children. It is used in the treatment of impotency and acidity; with sesame oil as hair tonic and cooling.

***Aloe vera* (L) Burm. f.**
Local name: Gritakumari
Family: Aloeaceae
Habit: Herb
Part(s) used: Whole plant
Ethno-medicinal Uses: Warmed leaf is applied in affected area for the treatment of rheumatism, swelling and paralysis. Extract prepared from boiled leaf is taken to treat paralysis.

***Annanas sativus* Schult. f.**
Local name: Anaros
Family: Bromeliaceae
Habit: Herb
Part(s) used: Leaves, Flowers, Fruits
Ethno-medicinal Uses: Extract prepared from young leaf is taken to stop of vomiting. Young flower extract is taken for the abortion of women.

***Basella alba* L.**
Local name: Puishak
Family: Basellaceae
Habit: Herb
Part(s) used: Leaves, Roots
Ethno-medicinal Uses: The juice of the leaves is used in constipation, particularly in children and pregnant women. Root chewed for toothache.

***Benincasa hispida* (Thunb.) Cogn.**
Local name: Chalkumra
Family: Cucurbitaceae
Habit: Climber
Part(s) used: Fruits, Seeds
Ethno-medicinal Uses: Curry made from fruit is used in tonic, nutritive, diuretic, antiperiodic,
constipation, heart disease, tuberculosis, colic pain and aphrodisiac. Fried seeds are used in tapeworm, lumbrici and diuretic.

***Bauhinia acuminata* L.**
Local name: Kanchan
Family: Caesalpiniaceae
Habit: Tree
Part(s) used: Leaves, Barks
Ethno-medicinal Uses: Decoction of the bark or leaves is used in biliousness, bladder stone, leprosy and asthma. It improves digestion. Decoction of root boiled with oil and applied to burns. Barks and leaves are used in dropsy.

***Borassus flabellifer* L.**
Local name: Tal
Family: Arecaceae
Habit: Tree
Part(s) used: Leaves
Ethno-medicinal Uses: The juice of the young leaves mixed with water is given in cases of dysentery.

***Bambusa arundinacea* (Retz.) Willd.**
Local name: Bansh
Family: Poaceae
Habit: Herb
Part(s) used: Barks, Leaf bud
Ethno-medicinal Uses: Thin green layer of the bark is used to arrest bleeding. The roots are used to treat joint pains and general debility. Decoction of the leaf bud is administered to encourage free discharge of menses or lochia after delivery.

***Carica papaya* L.**
Local name: Pepe
Family: Caricaceae
Habit: Shrub
Part(s) used: Latex

Ethno-medicinal Uses: Milky juice of the fruit and plant contains 'Papain' which is digestive and anthelmintic; used in dyspepsia, intestinal irritation and ringworm. The latex is applied externally to speed the healing of wounds, ulcers, boils, warts and cancerous tumours. Latex of green fruit induces abortion.

***Coccinia cordifolia* (L.) Cogn.**

Local name: Telakucha
Family: Cucurbitaceae
Habit: Climber
Part(s) used: Whole plant, Fruit, Leaves, Roots, Stem
Ethno-medicinal Uses: Curry made from young fruits is used in diabetes, aphrodisiac, biliousness and disease of the blood. Juice of whole plant is used in diabetes, anorexia, asthma, fever, dropsy, catarrh, epilepsy and gonorrhea. The whole plant has the reputation effect in reducing the among of sugar in the urine of patients suffering from diabetes mellitus. Fresh juice of leaves, stem and root produces no reduction sugar in the blood or urine of patients suffering from glycosuria. The fruit and leaves are prescribed in the treatment of snake-bite.

***Cucumis melo* L.**

Local name: Bangi
Family: Cucurbitaceae
Habit: Climber
Part(s) used: Fruits, Seeds
Ethno-medicinal Uses: The ripe fruit is used in kidney diseases, cooling, flattening, tonic, laxative, aphrodisiac, biliousness and diuretic and acute eczema. The seeds are diuretic, cooling, nutritive, and beneficial to the enlargement to prostate gland.

***Cucumis sativus* L.**

Local name: Sasha
Family: Cucurbitaceae
Habit: Climber
Part(s) used: Leaves, Fruits, Seeds
Ethno-medicinal Uses: Fruit is direct used in demulcent. Fried seeds are used in cooling, tonic, diuretic and anthelmintic. Leaves along with cumin seeds administrated in throat affections.

***Cassia fistula* L.**

Local name: Badarlathi
Family: Caesalpiniaceae
Habit: Tree
Part(s) used: Leaves, Pulps, Barks
Ethno-medicinal Uses: Juice of the young leaves is used to cure ringworms. Pulp of the fruit is an agreeable laxative, safe for children and pregnant women; given in liver disorder. Externally the pulp is considered good application for gout, rheumatism and ringworm.

***Cajanus cajan* (L.) Huth.**

Local name: Arhar
Family: Fabaceae
Habit: Shrub
Part(s) used: Leaves, Seeds
Ethno-medicinal Uses: Leaves are used in diseases of the mouth and piles. Juice of leaves is laxative; given in jaundice and pneumonia. Leaves and seeds are also useful in cough, and to check secretion of mother's milk. Infusion of the buds, flowers and the green pods are considered pectoral. Leaf juice is prescribed in jaundice

***Clitoria tarnetea* L.**

Local name: Aprajita
Family: Fabaceae
Habit: Climber
Part(s) used: Leaves, Flowers, Roots
Ethno-medicinal Uses: Leaf juice mixed with the juice of fresh ginger is administered in cases of colliquative sweating in hectic fever and mixed with common salt is applied warm all around the ear in earaches. Flower juice mixed with mother's milk or honey is given for three days to alleviate cough of children. . Roots are used as a contraceptive (White Flowered Variety).

***Chenopodium album* L.**

Local name: Batuashak
Family: Chenopodiaceae

Habit: Herb
Part(s) used: Leaves, Flowers
Ethno-medicinal Uses: Leaves are anthelmintic; given in hepatic disorders and in splenic enlargement; infusion is used for curing intestinal ulcers. Flowers and buds are used in stomach trouble, weakness in children and for fattening.

***Cinnamomum tamala* Nees.**
Local name: Tejpata
Family: Lauraceae
Habit: Small tree
Part(s) used: Leaves, Barks
Ethno-medicinal Uses: Leaves and bark mixed with tea cures cough and colds. Leaf paste is made into pills, and is given twice daily for long time to cure diabetes. Bark is carminative and useful in gonorrhea.

***Croton bonplandianum* Bail.**
Local name: Croton
Family: Euphorbiaceae
Habit: Herb
Part(s) used: Leaves, Seeds, Latex
Ethno-medicinal Uses: Juice of 3-4 leaves is given for 3-4 days to cure cough. Seed paste is applied locally on eczema and ringworm to cure. Latex is used to heal cuts and wounds.

***Citrus aurantifolia* Sw.**
Local name: Kagochilebu
Family: Rutaceae
Habit: Shrub
Part(s) used: Fruits, Unripe Fruits
Ethno-medicinal Uses: Fruits are used against skin irritation and nausea. Salted peel is recommended for indigestion. A glass of warm water with two tea spoonful of honey and juice of the fruit is taken as a remedy of catarrhal fever.

***Citrus grandis* (L.) Osbeck.**
Local name: Jambura
Family: Rutaceae
Habit: Tree
Part(s) used: Leaves, Fruits, Seeds
Ethno-medicinal Uses: Juice prepared from fruit is taken for the treatment of jaundice and fever. Leave smell is sniff to reduce vomiting tendency. Seeds are taken against vomiting.

***Centella asiatica* (L.) Urban.**
Local name: Thankuni
Family: Apiaceae
Habit: Herb
Part(s) used: Leaves, Whole plants
Ethno-medicinal Uses: Leaf boiled in water and the extract is taken for the treatment of conjunctivitis. Extract from whole plant taken four tea spoonfuls twice a daily for two days for the treatment of dysentery, flatulence and tuberculosis. The paste of the whole plant is taken with boiled rice as a remedy for diarrhea, dysentery, and stomach pain. Leaves are used as a memory tonic.

***Colocasia esculenta* (L.) Schott.**
Local name: Kachu
Family: Araceae
Habit: Herb
Part(s) used: Petioles, Leaves
Ethno-medicinal Uses: The pressed juice of the petioles is styptic, stimulant and rubefacient; used in athlet's foot and to stop bleeding from cuts. Leaf juice is used in tumors, ulcerated polyp, cancer of nose and warts. Corm juice is laxative; used in cases of piles, congestion of the portal system and alopecia.

***Cynodon dactylon* Pers.**
Local name: Durba
Family: Poaceae
Habit: Herb

Part(s) used: whole plants, Roots
Ethno-medicinal Uses: Fresh plant juice used in fresh cuts and wounds to stop bleeding. Decoction of the roots is valuable in case of vesical calculus and in secondary syphilis. It is also useful in irritation of the urinary organs.

***Canna indica* L.**
Local name: Kolaboti
Family: Cannaceae
Habit: Herb
Part(s) used: Seed, Rhizome, Root
Ethno-medicinal Uses: Seed juice relieves earaches. Rhizome is used in ringworm

***Curcuma longa* L.**
Local name: Holud
Family: Zingiberaceae
Habit: Herb
Part(s) used: Rhizome, Flowers
Ethno-medicinal Uses: Rhizome paste or powder mixed with hot rice, mustard oil and table salt is taken for 3-4 days to cure dysentery. Rhizome paste mixed with lime is applied as a poultice to get relief from pain of the sprain. Fresh rhizome juice along with salt is prescribed for intestinal worms. Rhizome oil acts as antacid, carminative, stomachic and tonic. Flower paste is used in ringworm and other parasitic skin diseases and also in the gonorrhea.

***Curcuma zeoderia* Rosc.**
Local name: Shathi
Family: Zingiberaceae
Habit: Herb
Part(s) used: Rhizome, Leaves
Ethno-medicinal Uses: Decoction of the rhizome is given in diarrhea. Juice of the leaves is given in dropsy. together with long pepper, cinnamon and honey is given to relieve cough cold, fever and bronchitis. Fresh rhizome checks leucorrhoea and gonorrheal discharges

***Dillenia indica* L.**
Local name: Chalta
Family: Dilleniaceae
Habit: Tree
Part(s) used: Fruits
Ethno-medicinal Uses: The fruit juice is used as a cooling beverage in fevers and as an expectorant in cough mixture.

***Dyospyros perigrina* (Gaertn.) Gur.**
Local name: Gab
Family: Ebenaceae
Habit: Tree
Part(s) used: Fruits, Seeds, Clayx, Peduncle
Ethno-medicinal Uses: The juice of the fruit is used as an application to wounds, ulcers and diarrhea; infusion is used as a gargle in aphthae and sore throat. Seeds are given as an astringent in diarrhea and dysentery. Clayx and peduncle of fruit is used in the treatment of coughs and dyspnoea.

***Eichhornia crassipes* (Mart.) Sol.-Lau.**
Local name: Kochuripana
Family: Pontederiaceae
Habit: Herb
Part(s) used: Whole plant
Ethno-medicinal Uses: Paste of totri and dorear fena mixed with sap of posari taken half cupful twice a day untill cured from Asthma. For the treatment of goiter the plant juice is given orally and poultice of the plant pulp externally for three months.

***Ficus benghalensis* L.**
Local name: Bot
Family: Moraceae
Habit: Tree
Part(s) used: Young buds, Arial Roots.
Ethno-medicinal Uses: An infusion of the young buds is useful in diarrhea and dysentery. Tips of the hanging roots are given for obstinate vomiting.

***Ficus religiosa* L.**
Local name: Pakur
Family: Moraceae
Habit: Tree
Part(s) used: Fruits
Ethno-medicinal Uses: The dried fruit, pulverized and taken in water for a fortnight removes asthma.

***Feronia limonia* (L.) Sw.**
Local name: Kothbel
Family: Rutaceae
Habit: Tree
Part(s) used: Leaves, Fruits, Seeds
Ethno-medicinal Uses: The unripe fruit is astringent and is used in diarrhea and dysentery. Seeds are used in heart diseases. The leaves are astringent and carminative; good for vomiting.

***Hibiscus esculentus* L.**
Local name: Bhandi
Family: Malvaceae
Habit: Herb
Part(s) used: Fruits
Ethno-medicinal Uses: Fruits are cooling, stomachic, astringent and aphrodisiac; used in chronic dysentery; useful in gonorrhea, urinary discharges, strangury and diarrhea.

***Hibiscus rosa-sinensis* L.**
Local name:Joba
Family: Malvaceae
Habit: Shrub
Part(s) used: Flowers
Ethno-medicinal Uses: The flower buds are cooling and astringent; remove burning of the body, urinary discharges, seminal weakness and piles. Juice of the flower with juice of banana inflorescence cures acute dysentery.

***Kalanchoe laciniata* L.**
Local name: Himsagor
Family: Crassulaceae
Habit: Herb
Part(s) used: Leaves
Ethno-medicinal Uses: Leaf juice is given orally in jaundice. It is also given for indigestion and stomach pain. Pounded leaves soaked in water overnight and the mucilaginous water thus obtained is taken in the next morning in empty stomach for blood dysentery. Juice of the leaves along with sugar is given in gonorrhea.

***Lagenaria siceraria* (Mol.) Stan.**
Local name: Lau
Family: Cucurbitaceae
Habit: Climber
Part(s) used: Leaves, Fruits, Roots, Stem, Seeds
Ethno-medicinal Uses: White pulp of fruit is in jaundice. Warm of tender stem relieves earache. Curry made from fruit is used in cholera cooling, emetic, purgative, diuretic and antibilious. Oil from the seeds is cooling and used to relieve headache. Seeds are nutritive and diuretic. Decoction of leaves mixed with sugar given.

***Lablab purpureus* (L.) Sweet.**
Local name: Sim
Family: Fabaceae
Habit: Climber
Part(s) used: Leaves
Ethno-medicinal Uses: Fresh leaves pounded and mixed with lime are rubbed over ringworms to cure.

***Lawsonia inermis* L.**
Local name: Mehedi
Family: Lythraceae
Habit: Shrub
Part(s) used: Leaves

Ethno-medicinal Uses: Leaves paste is a valuable external application in headache, skin diseases, eczema, leprosy, dandruff and burring of the feet as an emollient poultic. The leaf juice mixed with water and sugar is given as a remedy for spermatorrhoea.

***Litchi chinensis* Sonn.**
Local name: Litchi
Family: Sapindaceae
Habit: Tree
Part(s) used: Roots, Barks, Flowers, Leaves
Ethno-medicinal Uses: The root, bark and flowers, in the form of decoction are used as a gargle for throat affections. The leaves are used as a cure for the bites of animals

***Microcos paniculata* L.**
Local name: Pisla
Family: Tiliaceae
Habit: Shrub
Part(s) used: Leaves
Ethno-medicinal Uses: Leave is used in indigestion, eczema, itch, small-pox, typhoid fever, dysentery and syphilitic ulceration of the mouth.

***Momordica charantia* L.**
Local name: Korola
Family: Cucurbitaceae
Habit: Climber
Part(s) used: Fruit, Root, Leaves, Seeds, Whole plant
Ethno-medicinal Uses: The fruit are considered tonic, stomachic, febrifuge, carminative and cooling, they are used in rheumatism, gout and disease of liver and spleen. The seeds are used in anthelmintic. An alcoholic extract of the whole plant is used in stomachic against colic and fever. Juice of whole plant is used in diabetes. The fruits, leaves and roots have long been as a folk remedy for diabetes mellitus. The fruits and leaves are anthelmintic, useful in piles, leprosy, jaundice and as vermifuge.

***Manilkara achras* (Mill.) Per.**
Local name: Sofeda
Family: Sapotaceae
Habit: Tree
Part(s) used: Leaves, Fruits, Whole plant
Ethno-medicinal Uses: Juice prepared from guava (*Pisdium guajava*) leaf & sofeda's leaf, in addition nut meg (*Myristica fragrans*) is taken one spoonful twice daily for seven days to treat diarrhea. Paste prepared from whole plant and mixed with hot water taken one cupfuls twice daily for three days for the treatment of asthma and cough.

***Mimosa pudica* L.**
Local name: Lajjaboti
Family: Mimosaceae
Habit: Herb
Part(s) used: Leaves, Roots, Whole plants
Ethno-medicinal Uses: Whole plant boiled is in water and the extract is taken to treat body inflammation and pain during urination. Paste prepared from root is taken for the treatment of diarrhea. A paste of the roots is applied to boils; a root extract is taken for dysentery, a paste of the leaves is applied to infected areas to treat insect bites and a paste of the whole plant with *Limnophila repens* is applied to affected areas for the treatment of leucoderma. Extract prepared from root is taken twice a day for one month to treat piles.

***Mangifera indica* L.**
Local name: Am
Family: Anacardiaceae
Habit: Tree
Part(s) used: Leaves, Ripe Fruits
Ethno-medicinal Uses: Decoction of the leaves is used in fever, diarrhea and toothache. young leaves are given in diarrhea. The ripe fruit is astringent and laxative, and therefore very much useful in habitual constipation.

***Musa paradisiaca* L.**
Local name: Kola
Family: Musaceae
Habit: Herb

Part(s) used: Fruits
Ethno-medicinal Uses: Ash prepared from the dried banana fruit shell and ceived, the fine ash mixed with lemon extract and taken single tea spoonful twice daily until cured from splenomegaly of children

***Nelumbo nucifera* Gaertn.**
Local name: Padma
Family: Nelumbonaceae
Habit: Aquatic Herb
Part(s) used: Roots, Leaves, Seeds
Ethno-medicinal Uses: Roots paste are used in ringworms and other cutaneous affections. The tender leaves are cooling; useful in burning sensation of the body. Seeds are given to children as diuretic and to check vomiting.

***Nymphaea nouchali* Burm.f.**
Local name: Sapla
Family: Nymphaeaceae
Habit: Aquatic Herb
Part(s) used: Flowers, Seeds
Ethno-medicinal Uses: Flowers are used in vomiting, giddiness, worms and burning of the skin. Seeds are used as a cooling medicine in cutaneous diseases.

***Phyllanthus emblica* L.**
Local name: Amloki
Family: Euphorbiaceae
Habit: Tree
Part(s) used: Fruits
Ethno-medicinal Uses: The fruits are also said to be beneficial in insomnia, skin problems, gall pain, leucorrhoea and tympanites. *Sherbet* prepared from the fruit along with lemon juice is used for arresting acute bacillary dysentery. Fruits are a valuable component of "Trifala" used in different Ayurvedic preparations.

***Psidium guajava* (L.) Bat.**
Local name: Piyara
Family: Myrtaceae
Habit: Tree
Part(s) used: Roots, Leaves
Ethno-medicinal Uses: Decoction of the root bark is astringent and employed in diarrhea; root paste mixed with water is also used to treat diarrhea and dysentery. Flowers are used in bronchitis and eye sores. Fruits are tonic, cooling and laxative; good for colic and bleeding gums. Leaves are used for wounds, ulcers, worms and as an astringent to bowels; said to relieve toothache when chewed; decoction is used in cholera. Juice of the young leaves is drunk to cure diarrhea.

***Punica granatum* L.**
Local name: Dalim
Family: Punicaceae
Habit: Shrubs
Part(s) used: Fruits, Root barks
Ethno-medicinal Uses: A decoction of the dried fruit rind is drunk for the relief of stomachache and dysentery . Root bark is very astringent; decoction is used specifically for tapeworm.

***Quisqualis indica* L.**
Local name: Madhabilata
Family: Combretaceae.
Habit: Climber
Part(s) used: Seeds.
Ethno-medicinal Uses: Seeds are anthelmintic; given to children to expel the worms.

***Ricinus communis* L.**
Local name: Bherenda
Family: Euphorbiaceae
Habit: Shrub
Part(s) used: Seed, Root, Leaves
Ethno-medicinal Uses: Seed oil is a strong purgative; used externally as a massage for rheumatic pains, joint pain, paralysis and internally for the treatment of constipation. Root bark and leaf also have purgative properties;

decoction is used for rheumatism, inflammations and nervous disorders. . Juice of tender leaves is given with sugar or sugar candy in dysentery.

***Syzygium cumini* (L.) Skeel.**
Local name: Jam
Family: Myrtaceae
Habit: Tree
Part(s) used: Leaves, Barks, Seeds, Ripe Fruits
Ethno-medicinal Uses: Bark juice along with equal amount of fresh milk is taken in the early morning for three days to cure dysentery. The fresh bark juice is taken for stomach pain. Leaves are astringent; juice along with other astringents cures dysentery. Juice of the ripe fruit is general tonic, tonic to the liver, stomachic, carminative and diuretic. Seeds are astringent to the bowels and diuretic; good for diabetes; it is also used for Jaundice

***Tamarindus indica* L.**
Local name: Tetul
Family: Caesalpiniaceae
Habit: Tree
Part(s) used: Leaves, Barks, Pulps
Ethno-medicinal Uses: Drink of pulp lowers blood cholesterol. Gargle with tamarind water is useful in sore throat. Seeds are astringent; used for diarrhea. The poultice of the pounded leaves is applied to reduce inflammatory swellings, sprains, tumors and ringworms. A poultice of the flower is used in inflammatory affections of the conjunctiva; their juice is given internally for bleeding piles. Stem bark is astringent and tonic; used in asthma, amenorrhoea, fever, diarrhea and topically for loss of sensation in paralysis.

***Terminalia arjuna* (Roxb.) Wt. & Arn.**
Local name: Arjun
Family: Combretaceae
Habit: Tree
Part(s) used: Barks.
Ethno-medicinal Uses: Bark is cardiac tonic, astringent, diuretic and febrifuge; useful in diseases of the heart, anemia, excessive perspiration, dysentery, asthma, hypertension, wounds, skin eruptions, menstrual problems, pains and leucorrhoea. It is also used in the treatment of red and swollen mouth, tongue and gums. It stops bleeding and pus formation in the gums.

***Terminalia chebula* (Gaertn.) Retz.**
Local name: Haritaki
Family: Combretaceae
Habit: Tree
Part(s) used: Fruits
Ethno-medicinal Uses: Powdered seeds mixed with honey are used in curing vomiting. Powder is used as a toothpaste ingredient. Powdered seed with amla and bahera (Trifla Churna) useful in gastrointestinal disorders. Powdered seed mixed with ghee and honey is beneficial in dysentery.

***Zizyphus mauritiana* Lam.**
Local name: Boroi
Family: Rhamnaceae
Habit: Tree
Part(s) used: Bark, Roots
Ethno-medicinal Uses: Bark is astringent; used as a remedy in diarrhea; powder of the bark is a domestic dressing to wounds and ulcers. Roots are useful in fever.

***Zingiber officinale* Rosc.**
Local name: Ada
Family: Zingiberaceae
Habit: Herb
Part(s) used: Rhizome
Ethno-medicinal Uses: Pieces from zinger boil in water and make extract. This extract is mixed with honey taken half cup twice daily for five to seven days for the treatment of indigestion and cough. Juice prepared from rhizome is taken with salt for the treatment of flatulence, cold fever and as carminative and digestive. Dry rhizome are also used as mouth wash.

Results and Discussion

In the present ethno-botanical survey, a total of 68 species belonging to 60 genera and 41 families were recorded. For each species scientific name, local name, habit, family, ailments to be treated, mode of treatment and part(s) used are provided (Ethno-botanical information 1-68). Analysis of the data based on habits showed that leading medicinal plant species 39.70% belonged to trees, 35.29% herbs, 11.76% shrubs and 13.23% climbers (Figure-1). Giday (2001) reported that herb is the leading to medicinal species in his article on Zay people of Ethiopia whereas Teklehamymanot and Giday (2007) reported same result among the people of Zegie Peninsula, Northwestern Ethiopia. The present report on leading medicinal species as herb is similar to the above findings.

Use of plant parts as medicine shows variation. Leaves (60.29%) are the leading part used in a majority of medicinal plants followed by 39.71% fruits, 25.00% roots, 19.12% bark, 13.24% whole plant, 2.94% stem, 2.94% latex, 4.41% bulb, 5.88% rhizomes, 30.88% seed, 4.41% pulp, 4.41% leaf bud, petiole, 11.74% flower, 1.47% calyx and 1.47% peduncle. Harvesting leaves for medicinal use has also been reported from Southern Ethiopia (Yirga, 2010). Herbal preparation that involves roots, rhizomes, bulbs, barks, stems or whole plants affects mother plants (Dawit and Ahadu, 1993). In the present study area this threat was minimal as leaves were the leading plants parts used for medicinal purposes.

Distribution of medicinal plant species in the families shows variation. Cucurbitaceae is represented by 6 species, Each of Moraceae and Rutaceae is represented by four species. Three species in each was recorded by six families. A single species in each was recorded by 28 families while two species in each was recorded by four families. The survey indicated that the common medicinal plant families in the study area are Amaranthaceae, Apocynaceae, Araceae, Acanthaceae, Asclepiadaceae, Asteraceae, Caricaceae, Combretaceae, Cucurbitaceae, Liliaceae, Meliaceae, Moringaceae, Moraceae, Rutaceae and Solanaceae. These findings of common medicinal plant families in the study is in agreement with Yusuf et al. (2009) and Ghani (1998).

The survey has also recorded 78 categories of uses of 68 medicinal plants (Table 4). This is the indication of rich knowledge of medicinal uses of plants by the local people in the study area. Among them, 19 species were used to cure dysentery, 16 species for each of diarrhea, 15 species for anthelmintic, 12 species for laxative, 11 species for each of fever and tonic, 10 species for each of diuretic and cough, 9 species for each of skin disease, piles, constipation, digestive and ring worm. Fifty two categories of ailments were treated by two to eight species and other thirteen categories of ailments were treated by only one species. Use of species in different ailments showed also variations. *Momordica charantia* L., *Psidium guajava* (L.) Bat., *Tamarindus indica* L. and *Terminalia arjuna (Roxb.)* Wt.& Arn. has been used for treatment of 15 ailments in each, *Coccinia cordifolia* (L.) Cogn. has been used for treatment of 13 ailments, *Azadirachta indica* A. Juss and *Syzygium cumini* (L.) Skeel. has been used for treatment of 12 ailments in each, *Benincasa hispida* (Thunb.) Cogn. and *Cucumis melo* L.has been used for treatment of 11 ailments in each and each of *Colocasia esculenta* (L.) Schott., *Ricinus communis* L., *Dyospyros perigrina* (Gaertn.) Gur. and *Lagenaria siceraria* for 9 ailments. For treating two to eight ailments 49 species were used. The remaining 6 species of the total were used for the treatment of a single ailment. Among the medicinal use of plants, the survey reported a good number of new uses those were not mentioned in the previous literatures (Yusuf et al., 2009 and Ghani, 1998).

The present findings are probably the new record of ethno-medicinal knowledge for the study area using standard research protocols. The present study may be a preliminary contribution to the ethno-medicine of this area using standard research methods, focusing on medicinal plants and their local uses for the healthcare. This healthcare knowledge transmitted orally from one generation to generation. The study also suggested that the present information on medicinal use of plants by local and ethnic community may be used for botanical and pharmacological research in future for the discovery of new sources of drugs.

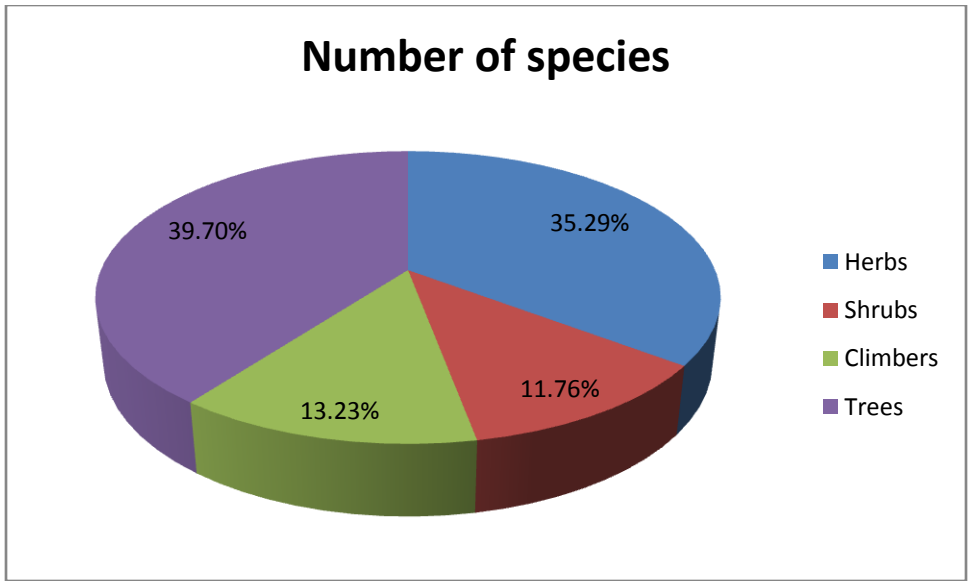

Figure-1: Analysis of the data based on habit showed that leading medicinal plants species.

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References

Ahmad, S., Alam, A.M.S., Rahman, A.H.M.M., Karim, R. and Islam, R. (2010): Biotechnological approach for long term germplasm conservation of *Rauvolfia serpentina* Benth Ex. Kurz. in Bangladesh: A rare medicinal plant for remedy of high blood pressure and others. *Bangladesh Journal of Environmental Sciences.* 19: 25-30.

Ahmed, Z. U., Begum, Z .N. T., Hassan, M. A., Khondker, M., Kabir, S. M. H., Ahmad, M., Ahmed, A. T. A., Rahman, A. K. A. and Haque, E. U.(Eds). (2008-2009): Encyclopedia of Flora and Fauna of Bangladesh. 6-10. Angiosperms; Dicotyledons. Asiat. Soc. Bangladesh, Dhaka.

Alam, M. K. (1992): Medical ethno-botany of the Marma tribe of Bangladesh. Economic Botany. 46(3): 330-335.

Alam, M.K., Choudhury, J. and Hassan, M.A. (1996): Some folk formularies from Bangladesh. Bangladesh J. Life Sci. 8(1): 49-63.

Alexiades, M. N. (Ed). (1996): Selected Guidelines for Ethno Botanical Research: A Field Manual. The New York Botanical Garden, New York. 1996.

Anisuzzaman, M., Rahman, A.H.M.M., Rashid, M. H., Naderuzzaman, A. T. M. and Islam, A. K. M. R. (2007): An Ethnobotanical Study of Madhupur, Tangail. *Journal of Applied Sciences Research.* 3(7): 519-530.

Ara, T., Khokan, E. H. and Rahman, A.H.M.M. (2011): Taxonomic Studies on the Family Solanaceae in the Rajshahi University Campus. *Journal of Biodiversity and Environmental Sciences.* 4(1): 29-34.

Chakma, S., Hossain, M.K., Khan, B.M. and Kabir, M.A. (2003): Ethno-botanical knowledge of Chakma community in the use of medicinal plants in Chittagong Hill Tracts, Bangladesh. MFP News XIII (3): 3-7.

Choudhury, A.R. and Rahmatullah, M. (2012): Ethnobotanical study of wound healing plants among the folk medicinal practioners several district in Bangladesh. American-Eurasian Journal of Sustainable Development. 6(4): 371-377.

Dawit, A. and Ahadu, A. (1993): Medicinal plants and enigmatic health practice of North Ethiopia, Berhanina Selam Printing Enterprise, Addis Ababa, Ethiopia.

Dean, J. P. and Whyte, W. F. (1959): How do you know if the informant is telling truth? Human Organization. 17: 34-38.

Faruque, M.O. and Uddin, S.B. (2014): Ethnomedicinal study of the Marma community of Bandarban district of Bangladesh. Academia Journal of Medicinal Plants. 2(2): 014-025.

Ghani, A. (1998): Medicinal Plants of Bangladesh. Asiatic Society of Bangladesh, Dhaka.

Giday, M. (2001): An ethnobotanical study of medicinal plants used by the Zay people in Ethiopia. CBM:s skriftserie. 3: 81-99.

Harshberger, J.W. (1896): The purposes of ethnobotany. Botanical Gazette 21: 146-154.

Hassan, M.A. (1988): Amader Banoushadi Shampad, Hassan Book House, Dhaka.

Hassan, M. A. and Huq, A.M. (1993): Gas Gasra Deeya Chikithsha, Hassan Book House, Dhaka, Bangladesh.

Hooker, J.D. (1961): Flora of British India. Vols.1-7. L. Reeve and Co. Ltd. London, U.K

Jain, S.K. (1996): Glimpses of Indian Ethnobotany, Oxford & IBH Publishing Co. New Delhi, Bombay, Calcutta.

Khan, M. S. and Huq, A. M. (1975): Medicinal Plants of Bangladesh, BARC, Dhaka, Bangladesh.

Khan, M. S. (1998): Prospects of Ethnobotany and Ethnobotanical Research in Bangladesh. In: Banik RL, Alam MK, Pei SJ, Rastogi A (eds.), Applied Ethnobotany, BFRI, Chittagong, Bangladesh. P. 24-27.

Khisha, B. (1996): Chakma Talik Chikitsa. Herbal Medicine Centre Committee, Rajban Bihar, Rajbari, Rangamati. Pp.1-136.

Kirtikar, K.R. and Basu, B.D. (1987): Indian Medicinal Plants. Vol. 1-4. Lalit Mohan Basu, Allahabad, Jayyed Press, New Delhi, India.

Prain, D. (1963): Bengal Plants. Vols.1-2. Botanical Survey of India. Calcutta, India.

Rahman, A.H.M.M., Anisuzzaman, M., Ahmed, F., Islam, A. K. M. R. and Naderuzzaman, A. T. M. (2008a): Study of Nutritive Value and Medicinal Uses of Cultivated Cucurbits. *Journal of Applied Sciences Research.* 4(5): 555-558.

Rahman, A.H.M.M., Anisuzzaman, M., Haider, S. A., Ahmed, F., Islam, A. K. M. R. and Naderuzzaman, A. T. M. (2008b): Study of Medicinal Plants in the Graveyards of Rajshahi City. *Research Journal of Agriculture and Biological Sciences*. 4(1): 70-74.

Rahman, A.H.M.M., Kabir, E. Z. M. F., Sima, S. N., Sultana, R. S., Nasiruddin, M. and Naderuzzaman, A. T. M. (2010): Study of an Ethnobotany at the Village Dohanagar, Naogaon. *Journal of Applied Sciences Research.* 6(9): 1466-1473.

Rahman, A.H.M.M., Gulsan, J. E., Alam, M. S., Ahmad, S., Naderuzzaman, A. T .M. and Islam, A. K. M. R. (2012): An Ethnobotanical Portrait of a Village: Koikuri, Dinajpur with Reference to Medicinal Plants. *International Journal of Biosciences.* 2(7): 1-10.

Rahman, A.H.M.M. (2013a): Assessment of Angiosperm Weeds of Rajshahi, Bangladesh with emphasis on medicinal plants. *Research in Plant Sciences*. 1(3): 62-67.

Rahman, A.H.M.M. (2013b): An Ethno-botanical investigation on Asteraceae family at Rajshahi, Bangladesh. *Academia Journal of Medicinal Plants.* 1(5): 92-100.

Rahman, A.H.M.M. (2013c): Ethno-botanical Survey of Traditional Medicine Practice for the Treatment of Cough, Diabetes, Diarrhea, Dysentery and Fever of Santals at Abdullahpur Village under Akkelpur Upazilla of Joypurhat District, Bangladesh. *Biomedicine and Biotechnology.* 1(2): 27-30.

Rahman, A.H.M.M. (2013d): Ethno-medicinal investigation on ethnic community in the northern region of Bangladesh. *American Journal of Life Sciences.* 1(2): 77-81.

Rahman, A.H.M.M. (2013e): Ethno-medico-botanical investigation on cucurbits of the Rajshahi Division, Bangladesh. *Journal of Medicinal Plants Studies.* 1(3): 118-125.

Rahman, A.H.M.M. (2013f): Graveyards angiosperm diversity of Rajshahi city, Bangladesh with emphasis on medicinal plants. *American Journal of Life Sciences.* 1 (3): 98-104.

Rahman, A.H.M.M. (2013g): Medico-botanical study of commonly used angiosperm weeds of Rajshahi, Bangladesh. *Wudpecker Journal of Medicinal Plants*. 2(3): 044-052.

Rahman, A.H.M.M. (2013h): Medico-botanical study of the plants found in the Rajshahi district of Bangladesh. *Prudence Journal of Medicinal Plants Research.* 1(1): 1-8.

Rahman, A.H.M.M. (2013i): Medico-Ethnobotany: A study on the tribal people of Rajshahi Division, Bangladesh. *Peak Journal of Medicinal Plants Research.* 1(1): 1-8.

Rahman, A.H.M.M. (2013j): Traditional Medicinal Plants Used in the Treatment of different Skin diseases of Santals at Abdullapur Village under Akkelpur Upazilla of Joypurhat district, Bangladesh. *Biomedicine and Biotechnology*. 1(2): 17-20.

Rahman, A.H.M.M. and Khanom, A. (2013): Taxonomic and Ethno-Medicinal Study of Species from Moraceae (Mulberry) Family in Bangladesh Flora. *Research in Plant Sciences*. 1(3): 53-57.

Rahman, A.H.M.M. and Akter, M. (2013): Taxonomy and Medicinal Uses of Euphorbiaceae (Spurge) Family of Rajshahi, Bangladesh. *Research in Plant Sciences*. 1(3): 74-80.

Rahman, A.H.M.M., Kabir, E.Z.M.F., Islam, A.K.M.R. and Zaman, A.T.M.N. (2013a): Medico-botanical investigation by the tribal people of Naogaon district, Bangladesh. *Journal of Medicinal Plants Studies.* 1(4): 136-147.

Rahman, A.H.M.M., Biswas, M.C., Islam, A. K. M. R. and Zaman, A. T. M. N. (2013b): Assessment of Traditional Medicinal Plants Used by Local People of Monirampur Thana under Jessore District of Bangladesh. *Wudpecker Journal of Medicinal Plants.* 2(6): 099-109.

Rahman, A.H.M.M., Sultana, N., Islam, A. K. M. R. and Zaman, A. T. M. N. (2013c): Study of Medical Ethno-botany of traditional medicinal plants used by local people at the village Genda under Savar Upazilla of district Dhaka, Bangladesh. *Online International Journal of Medicinal Plants Research.* 2(1): 18-31.

Rahman, A.H.M.M., Nitu, S.K., Ferdows, Z. and Islam, A.K.M.R. (2013d): Medico-botany on herbaceous plants of Rajshahi, Bangladesh. *American Journal of Life Sciences.* 1(3): 136-144.

Rahman, A.H.M.M. (2014): Ethno-gynecological study of traditional medicinal plants used by Santals of Joypurhat district, Bangladesh. *Biomedicine and Biotechnology*. 2(1): 10-13.

Rahman, A.H.M.M. and Parvin, I.A. (2014): Study of Medicinal Uses on Fabaceae Family at Rajshahi, Bangladesh. *Research in Plant Sciences.* 2(1): 6-8.

Rahman, A.H.M.M. and Gulshana, M.I.A. (2014): Taxonomy and Medicinal Uses on Amaranthaceae Family of Rajshahi, Bangladesh. *Applied Ecology and Environmental Sciences.* 2(2): 54-59.

Rahman, A.H.M.M. and Rahman, M.M. (2014): An Enumeration of Angiosperm weeds in the Paddy field of Rajshahi, Bangladesh with emphasis on medicinal Plants. *Journal of Applied Science And Research*. 2(2): 36-42.

Rahman, A.H.M.M. and Rojonigondha. (2014): Taxonomy and Traditional Medicine Practices on Malvaceae (Mallow Family) of Rajshahi, Bangladesh. *Open Journal of Botany*. 1(2): 19-24.

Rahman, A.H.M.M., Jahan-E-Gulsan, S.M. and Naderuzzaman, A.T.M. (2014a): Ethno-Gynecological Disorders of Folk Medicinal Plants Used by Santhals of Dinajpur District, Bangladesh. *Frontiers of Biological & Life Sciences.* 2(3): 62-66.

Rahman, A.H.M.M., Hossain, M.M. and Islam, A.K.M.R. (2014b): Taxonomy and Medicinal Uses of Angiosperm weeds in the wheat field of Rajshahi, Bangladesh. *Frontiers of Biological and Life Sciences.* 2(1): 8-11.

Rahman, A.H.M.M., Afsana, M.W. and Islam, A.K.M.R. (2014c): Taxonomy and Medicinal Uses on Acanthaceae Family of Rajshahi, Bangladesh. *Journal of Applied Science And Research.* 2(1): 82-93.

Teklehamymanot, T. and Giday, M. (2007): An ethnobotanical study of medicinal plants used by the people in Zegie Peninsula Northwestern Ethiopia. J. Ethnobiol. And Ethnomed. 3, 12 doi 10.1186/1746-4269-3-12.

Tripura, S.L. (1994): Nature and Culture of the Chittagong Hill Tracts. Tribal Culture Institute. Rangamati Hill District. Pp. 1-192.

Uddin, M. Z., Hassan, M. A., Rahman, M. and Arefin, K. (2012): Ethno-medico-botanical study in Lawachara National Park, Bangladesh. Bangladesh J.Bot. 41(1): 97-104.

Uddin, M. Z., Hassan, M. A. and Sultana, M. (2006): Ethnobotanical survey of medicinal plants in Phulbari Upazilla of Dinajpur District, Bangladesh. Bangladesh J. Plant Taxon. 12(1): 63-68.

Uddin, M. Z., Khan, M. S. and Hassan, M. A. (2001): Ethno medical plants records of Kalenga forest range (Habiganj), Bangladesh for malaria, jaundice, diarrhea and dysentery. Bangladesh J.Plant Taxon. 8(1): 101-104.

Uddin, M., Roy, S., Hassan, M. A. and Rahman, M. M. (2008): Medicobotanical report on the Chakma people of Bangladesh. Bangladesh J. Plant Taxon. 15(1): 67-72.

Uddin, S. N., Uddin, M. Z., Hassan, M. A. and Rahman, M. M. (2004): Preliminary ethno-medicinal plant survey in Khagrachari district, Bangladesh. Bangladesh J. Plant Taxon. 11(2): 39-48.

Yirga, G. (2010): Ethnobotanical study of medicinal plants in and around Almata, Southern Tigray Northern Ethiopia. Curr. Res. J. Biol. Sci. 2(5): 338-344.

Yusuf, M., Choudhury, J.U., Wahab, M.A. and Begum, J. (1994): Medicinal Plants of Bangladesh. Bangladesh Council of Scientific and Industrial Research. Dhaka, Bangladesh. Pp. 1-340.

Yusuf, M., Wahab, M.A., Choudhury, J.U. and Begum, J. (2006): Ethno-medico-botanical knowledge from Kaukhali proper and Betunia of Rangamati district. Bangladesh J. Plant Taxon. 13(1): 55-61.

Yusuf, M., Begum, J., Hoque, M. N. and Choudhury, J, U. (2009): Medicinal plants of Bangladesh-Revised and Enlarged. Bangladesh Coun. Sci. Ind. Res. Lab. Chittagong, Bangladesh.