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A study on diversity of medicinal plant usage by folk medicinal practitioners in different villages of Dhunat Upazila, Bogra district, Bangladesh

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Abstract

Medicinal plants are invaluable natural resources of Bangladesh. Several studies were conducted in different region of Bangladesh about the medicinal plants and its benefit. In this study, data were collected from the 24 different kavirajes of Dhunat Upazila of Bogra district in the division of Rajshahi about the traditional medicinal plant which they used in the treatment of many ailments. Practitioners of this region use more-than 74 plants for their traditional medicinal practice that are distributed into 51 families. The objective of our present study was to show the importance of medicinal plants, there uses and the importance of documentation of the information as well as to help the regional people to get knowledge about these types of plants which are available in their surroundings nature for using these as primary treatment. Among these 74 plants, 14 plants were used for treatment of gastrointestinal disorders, 21 plants were used for male and female sexual problems; 11 were used in asthma and skin diseases. Beside these, 7 plants were used to cure kidney diseases, 5 plants were used to overcome mental depression, 4 plants were used for hypertension and diabetes and three plants were used for ailment of heart disease. Additionally, these plants were used to treat many other diseases. For the country like Bangladesh medicinal plants is a vital asset and has significant role in people health care system. So the awareness towards the conventional use of medicinal plants needs to be increased among the local people. Proper and developed cultivation process must be needed for improving and maintaining the quality and growth of these indigenous medicinal plants. Additionally, proper research should be conducted for using these medicinal plants in new drug design and many other pharmaceutical benefits.

Keywords: Folk medicine, medicinal plants, ailment, Dhunat upazila, Bangladesh

1. Introduction

Bangladesh is a south Asian country resides on the Bay of Bengal about 144,000 km² and a population of more than 150 million. It is a developing country with a majority of rural population, who lack access to modern healthcare or cannot afford the cost of allopathic drugs. A sizeable section of the population is below the poverty level. As a result, malnutrition and diseases arising from malnutrition and poor hygienic conditions of living are prevalent [1]. The primary health care of the rural population and a substantial section of urban population are provided by traditional medicinal practitioners, who possess considerable expertise on medicinal plants [2]. For treatment of various ailments, the rural population of Bangladesh mostly relies on local traditional medicinal practitioners, known as “Kavirajes” or “Vaidyas” and “Hekims”, whose medicinal formulations are generally based on Ayurvedic or Unani principles [3, 4]. Each Kaviraj tends to keep his or her knowledge of medicinal plants within the family and which is passed from generation to generation. Over time, this knowledge becomes unique to the Kaviraj and his successor [5, 6]. The medicinal plants utilized by the Kavirajes are usually kept secret and so can vary considerably between Kavirajes of various regions or tribes. The use of medicinal plants to cure various ailments goes back thousands of years and is spread over all regions of the world populated by human beings [7]. In fact, even as of this date, a number of modern drugs have their roots in the plants used by indigenous people [8]. It has been estimated that about 64% of the total global population still remain dependent on traditional medicine for their health care needs [9]. As part of the Indian subcontinent, Bangladesh has a long history of using medicinal plants for cure of diseases [10]. Medicinal plants or plant parts form the major basis of various decoctions, pastes, and ointments formulated by these practitioners. Each population has its own medicinal practitioners, who usually combine in one person the priest, the exorcist, and the expert on medicinal plants [11].

The Kavirajes used medicinal plants for treatment of many chronic ailments like paralysis, tuberculosis, endocrinological problems, tract disorders, hepatic disorders, disorders of the spleen, diabetes, sexual disorders, gall bladder problems, allergy, teeth problems, disorders of the ear, pain, snake bite, dog bite, and chicken pox [12-15]. Along with the progress of human civilization and the accumulation of knowledge, people have become more concerned with their eating habits. A concept of 'functional food' has taken place, which denotes food that not only serves to provide nutrition but also can be a source for prevention and cure of various diseases. In other words, these foods provide health benefits beyond their nutritive values. This is not totally a novel concept for even in ancient times people added spices to their dietary items not only to impart color, taste or flavoring, but also for their health benefits [16]. Functional foods are often also termed 'food supplements' or 'nutraceuticals'. The medicinal plants have some significant roles in the nutraceuticals [17]. A number of plants or plant products have been demonstrated in scientific studies that they can be classified as functional foods. These include both medicinal plants and commonly consumed plants or plant products. The traditional medical systems use turmeric for a number of ailments like wounds, rheumatism, gastrointestinal disorders, helminthiasis and rhinitis [18]. Leaf extracts of some medicinal plants showed notable levels of total phenolics and flavonoids and demonstrated good anti-oxidant activities [19]. Many studies suggested that the medicinal plants can serve the function of a food supplement for a greater number of people. Overall, there is a growing realization about medicinal plants that quite a number of them can serve as functional foods and so can be utilized in both nutritionally and medicinally. Since the tribal population of Bangladesh in their densely forested abodes lack access to modern medicinal facilities, the medicinal

plants can form a primary mode of health-care for treatment of their occasionally infective medical condition [20]. It was the objective of the present study to conduct an ethnomedicinal survey among the Kavirajes of different areas in Dhunat upazila, Bangladesh to obtain information on medicinal plants used by them for treatment of diverse ailments and to find a comprehensive picture of the medicinal plants in our country. Our surveys focused on village kavirajes whom are the habitation units of that area. Obtaining such information is important because traditional medicinal practices and medicinal plants both traditionally and even in recent times have been a good source of modern allopathic drugs. The knowledge of indigenous people can be quite extensive including the climate, ecosystem and the local flora and fauna. A further objective of the study was to determine which plant or plant part can be used as functional foods. The criteria for judging whether a medicinal plant can serve as a functional food were history of long-term edibility without any side-effects or toxicities, nutritive value of the plant, and whether the plant has been used by the Kavirajes for considerable lengths of time for treatment of single or multiple ailments. It is expected that such studies can make the particularly poorer sections of the people more conscious about consuming plants that can serve as functional foods and so can be effective in providing nutrition and be of preventive as well as curative values to people who can ill afford the cost of food and medicine. Overall, the plants present considerable potential for further research, which can lead to the discovery of lead compounds of newer drugs. The aim of the present study was to determine whether the treatment given by the Kavirajes was to any extent influenced by other traditional medicinal practices.

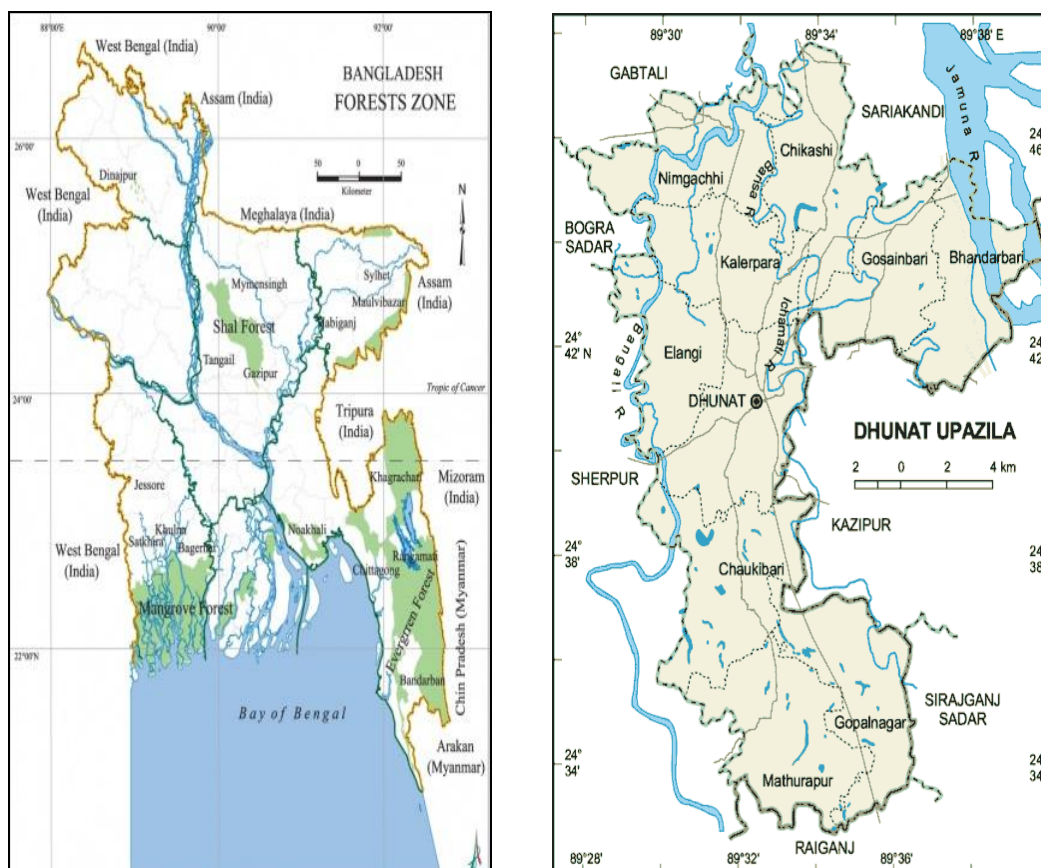


Fig 1: Location map of survey area, Dhunat Upazila of Bogra district, Rajshahi division, Bangladesh

2. Materials and Methods

This study was conducted in Dhunat Upazila of Bogra District in the division of Rajshahi, Bangladesh, with a total area of 247.73 square kilometres (95.65 sq. mi.). It lies on the west bank of the Jamuna River. It borders Gabtali and Sariakandi upazilas to the north, Sirajganj district to the east and south, and Sherpur and Shajahanpur upazilas to the west. According to the 2011 Bangladesh census, Dhunat Upazila had 75,897 households and a population of 555,014, 7.8% of whom lived in urban areas. Dhunat is located at 24°41' N and 89°32' E. Dhunat Upazila is divided into Dhunat Municipality and 10 union parishads. Dhunat Municipality is subdivided into 9 wards and 16 mahallas and the union parishads are subdivided into 90 mauzas and 207 villages (Fig. 1). A number of visit (21, each visit consists 1-2 days) were made in Dhunat upazila. We have collected data from randomly selected 24 different kavirajes and some aged people of this area. From them 18 were male and the rest 6 were female. We conducted the survey based on semi structured questionnaire and the guided field-walk method of Martin [21] and Maundu [22]. We asked many questions on their traditional medicinal practice and their choice of medicinal plants. We also asked them about their age, educational status, number of family members, income source and monthly income, food habit and what they know about the disease as well as medical preference. The purpose of the interview was carefully explained and consent was obtained from the Kavirajes that they have no objections to providing the names of plants and the ailments that were used for treatment and no objection to the information being disseminated in publication or any other form of presentation form both within the country as well as internationally. The interview was conducted in Bengali language and both the Kavirajes and interviewers were spoken in Bengali. The interviews were taken through forest regions from where they collected their plants and the same time they showed the plants, and mentioned their local names and uses. Plant specimens were brought and identified at the Bangladesh National Herbarium at Dhaka.

3. Results and discussion

3.1. Plants and their distribution into families

In this survey, it was found that the kavirajes of Dhunat upazila area used more than 74 plants. They used these plants to treat diverse types of diseases. The collected plants are distributed into 51 families. The Fabaceae family provided the

largest number of species followed by Rutaceae, Araceae, Liliaceae families provide 4 plants. The Lamiaceae and Cucurbitaceae families provided 3 plants each. The Piperaceae, Apocynaceae, Musaceae, Verbenaceae, Asteraceae, Lauraceae, Lythraceae, Anacardiaceae and Moraceae families provided 2 plants each. Rest of the families provided only one plant. Plants were obtained from both wild and cultivated area. Several plants were cultivated for home consumption of fruits; the fruits were also sold commercially.

3.2. Uses of plant parts for ailment of diseases

Various plant parts are used in the treatment of diseases. These parts include leaves, flowers, stems, barks, rhizomes, roots, fruits, seeds, tubers, wood, shoot, spikes etc. Total 160 uses were found in the present survey, where leaves formed the most frequently used plant part (26.87%), followed by fruits (18.12%), seeds (16.25%), roots (13.75%), stems (11.25%), flowers (6.25%), barks (5%) and partial plant (3.5%) (Table 2). The percentage of whole plant used in treatment was 2.5%. For human ailments, whole plant or plant parts were either orally administered or topically applied. It was also observed that the particular plant parts are used by the practitioners in several ways.

3.3. Medical Applications

Fourteen plants were used for treatment of gastrointestinal disorders, suggesting that this is the most common ailment suffered by the village population. Twelve plants were used for treatment of fatigue or weariness. Twelve plants were used for male sexual problems such as – lacking of sperm, liquidness of semen, sexual instability and nine plants were used in female gynecology diseases, such as—irregular menstrual cycle, painful menstrual cycle, leucoria etc, to treat piles. Eleven plants were used in asthma and skin diseases, seven plants were used to cure kidney diseases, five plants were used to overcome mental depression, four plants were used for hypertension and diabetes and three plants were used for ailment of heart disease. Additionally, many of these plants were used also to treat worm, infection, infertility, gout, malaria, skin problem, abdominal pain, allergy, cancers, dementia, dyspepsia, cut, burn, rheumatism etc. Several plants obtained in the present survey have been scientifically studied for their pharmacological activities.

Table 1: Medicinal plants used by the folk medicinal practitioners of different villages at Dhunat Upazilla in Bogra district, Bangladesh

Serial no.	Scientific name	Family	Local name	Plant types	Part (s) used	Ailment	Formulation and Dosage
1	<i>Abroma augusta</i>	Sterculiaceae	Olotkambal	Strangling shrub	Roots	Many gynecology diseases, such as-irregular menstrual cycle, painful menstrual cycle, leucoria etc, to treat Piles	Liquid extract of the juvenile roots to be used 3 times daily.
2	<i>Berberis aristata</i>	Berberidaceae	Daruhoridra	Tree	Roots and stems	Itching in the anus, constipation	Tablets are made from powder of dried Roots and stems. To be taken 4 times daily.
3	<i>Adhatoda vasica</i>	Acanthaceae	Bashok	Bushy shrub	Leaves	Remove the storage cough, dry catarrh, asthma, bronchitis	Juvenile leaves are mashed, tablet is made, then dry. 3 tablets to be taken per day.
4	<i>Adiantum caudatum</i>	Adiantaceae	Mayurshikha	Herb	Leaves	Fever and Diabetes	Leaves are expectorant and antipyretic. Leaves juice

							is used in coughs and other chest affections.
5	<i>Boerhaavia repens</i>	Nyctaginaceae	Punornova	Herbaceous	Roots, stem, leaves	Gout, dropsy, kidney disorder.	Leaves and juvenile stems are mashed and tablets are made from the mashed product. To be taken 3 times daily.
6	<i>Aloe vera</i>	Liliaceae	Gritakumari	Xerophytic perennial herb	Internal part of stems	Remove the physical weakness, gout and pain, sexual stimulant both for male and female, constipation, gastrointestinal disorders	Internal portion of the leaves or stem is separated which is whitish in color and as like as jelly (turbid, Semisolid). To be taken as juice.
7	<i>Alstonia scholaris</i>	Apocynaceae	Satim	Evergreen tree	Barks	Remove fever, gastrointestinal disorders	Tablets are made from powder of dried barks. To be taken 3 times daily.
8	<i>Andrographis paniculata</i>	Acanthaceae	Kalomegh	Annual herb	Leaves and roots	Hypertension, obesity, Hypercholesterolemia	Roots and leaves are mashed and tablets are made from the mashed product. 2 tablets daily.
9	<i>Calotropis gigantea</i>	Asclepiadaceae	Akanda	Large Shrub	Stems, leaves	Male sexual diseases	Tablets are produced from the mashed product of dry leaves. To be taken 3-4 times daily.
10	<i>Artocarpus heterophyllus</i>	Moraceae	Kanthalgachh	Large sized tree	Fruits and seeds	Provides vitamins and minerals, remove malnutrition and maintain body temperature.	Fruits and seeds are directly consumed.
11	<i>Asarum europaeum</i>	Aristolochiaceae	Shugandhabala	Herb	Leaves	Remove many gastrointestinal diseases; increase the power of stomach and liver	Leave extracts (liquid) to be used or tablets are made from powder of dried leaves, to be taken 4 times daily.
12	<i>Cassia angustifolia</i>	Caesalpiniaceae	Sonapata gach	Shrubby plant	Leaves	Many skin disease, bruise, itching	Tablets are made from the mashed leaves. To be taken 4 times daily.
13	<i>Asparagus racemosus</i>	Liliaceae	Satamuli	Stout strangling climber	Roots, stems, leaves	Many sexual disease of male	Tablets are made from the mashed of leaves, root and young stem. To be taken 4 times daily.
14	<i>Centella asiatica</i>	Apiaceae	Thankuni	Herb	Leaves, young stems	Remove itching of eye, Many diseases of respiratory tracts	Liquid extract of leaves to be used in eye. In another cases, green leaves are mashed, then tablet are made from it. To be taken 3 times per day.
15	<i>Azadirachta indica</i>	Meliaceae	Nim	Tropical tree	Leaves	Different kinds of skin disease, gastrointestinal disorder, remotic fever, pimple and pierce	Liquid extract of leaves to be taken.
16	<i>Bacopa monnieri</i>	Serophulariaceae	Brammi	Low herb	Leaves and whole plant	Many nerve and brain disease	Leaves and whole plant are mashed and tablets are made from the mashed product. To be taken 2 times daily.
17	<i>Bauhinia purpurea</i>	Caesalpiniaceae	Rakta kanchan	Medium sized tree	Leaves	Removes skin disease, pimple, and bruise of skin	Tablets are made from powder of dried leaves. To be taken 2 times daily.

18	<i>Cichorium intybus</i>	Asteraceae	Kashni	Herbaceous plant	Roots, seeds	Gastrointestinal and kidney diseases	Tablets are made from powder of dried roots and seeds combined, to be taken 4 times daily.
19	<i>Vitex negundo</i>	Verbenaceae	Nishinda	Shrub or small tree	Leaves	Remove gout	Tablets are made from the mashed leaves. To be taken 6 times daily.
20	<i>Valeriana officinalis</i>	Valerianaceae	Tagar	Herb	Flowers	Remove the weakness of heart and liver, physical and mental weakness	Tablets are made from powder of dried flowers. To be taken 4 times daily.
21	<i>Tinospora cordifolia</i>	Menispermaceae	Goloncha	Herbaceous /climbing shrub	Roots and leaves	Removes disease of urinary tracts, fatigue, physical and mental weakness.	Roots and leaves are mashed and tablets are made from the mashed product. To be taken 3 times daily.
22	<i>Terminalia chebula</i>	Combretaceae	Hortoki	Deciduous tree	Fruits	Remove dysentery, blood dysentery, diarrhea, stomach disorder, increase activity of liver.	Powder are made from dried fruits, the powder is to be taken 4 time daily.
23	<i>Terminalia belerica</i>	Combretaceae	Bohera	Large Deciduous tree	Fruits	Many gastrointestinal disorders	Powder are made from dried fruits, the powder is to be taken 3 time daily.
24	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Tree	Barks	Many heart diseases	Cutting pieces of bark is dipped into water overnight, and then the water is consumed daily.
25	<i>Sida acuta</i>	Malvaceae	Bonmethi	Shrub	Areal parts, seeds Roots	Used to treat demulcent and diuretic, rheumatic affections, gonorrhea and chronic dysentery	Leaves juice are used to treat demulcent and diuretic, Infusion of roots with ginger is given in intermittent fever and chronic boil complaints.
26	<i>Senna alata</i>	Fabaceae	Datmardan	Shrub	Leaves	Many skin disease, bruise.	Tablets are made from the mashed leaves. To be taken 4 times daily.
27	<i>Saraca asoca</i>	Caesalpiniaceae	Ashok gach	Tree	Bark	Many gynecology Diseases, increase the power of the uterus of woman	Tablets are made from powder of dried barks, to be taken 4 times daily.
28	<i>Santalum album</i>	Santalaceae	Sada-chandan	Evergreen tree	Stems	Body pain, gout, gastrointestinal disorders	Stems are mashed and tablets are made from the mashed product. To be taken 3 times daily.
29	<i>Rauwolfia serpentina</i>	Apocynaceae	Sharpagandha	Herb	Bark of roots	Hypertension, obesity, insomnia and high level cholesterol of blood.	Tablets are made from powder of dried bark of roots. To be taken 4 times daily.
30	<i>Pterocarpus santalinus</i>	Fabaceae	Rakta-chandan	Tree	Stems, leaves	Gout, many skin disease and gastrointestinal diseases	Leaves and stems are mashed and tablets are made from the mashed product. To be taken 4 times daily.
31	<i>Phyllanthus emblica</i>	Euphorbiaceae	Amloki	Medium sized tree	Fruits	Loss of hair, diseases of mouth, gastrointestinal diseases.	50 g juice obtained from crushed leaves is mixed

							with 20 g sugar and taken twice daily for 2 weeks.
32	<i>Ocimum sanctum</i>	Labiatae	Tulshi	Sub-shrub	Leaves	Diseases of respiratory tract, many kinds of skin disease, pimple, and pierce	Liquid extract of leaves is taken about 5 times daily.
33	<i>Nigella sativa</i>	Ranunculaceae	Kalogira gach	Herb	Seeds	Cough, catarrh, and asthma, cold, many sexual problems of male	Seed oil to be used.
34	<i>Menthe viridis</i>	Lamiaceae	Pahari Pudina	Perennial Herbaceous plant	Leaves	Treatment of hiccup, bilious vomiting, flatulence, dysentery and cholera	Mashed leaves are used directly or the liquid extract of leaves juices to be used regularly.
35	<i>Ipomoea alba</i>	Convolvulaceae	Dudhi kalmi	Herb	Leaves	To treat snakebites	Leaves are applied to boils and wound
36	<i>Hiptag madablota</i>	Malpighiaceae	Madhobilata	Woody perennial climber plant	Flowers	Many diseases of gastrointestinal tracts	Tablets are made from powder of dried flowers. To be taken 4 times daily.
37	<i>Glycyrrhiza glabra</i>	Liguminosae	Josthi modhu	Perennial Herbaceous plant	Leaves, stems	Cough, dry catarrh, hopping cough, asthma, malnutrition and constipation	Leaves and young stems are consumed directly.
38	<i>Gloriosa superba</i>	Liliaceae	Olatchandal	Tall Herb	Leaves and flowers	Use in many gynecology Diseases, to treat pails.	Tablets are made from powder of dried leaves and flower. To be taken 3 times daily.
39	<i>Ephedra vulgaris</i>	Ephedraceae	Shemakalpata	Shrub	Leaves and juvenile stems	Remove cough, cold, catarrh, asthma, hopping cough, bronchitis, breath problem, inflammation of larynx, throat pain	Leaves and juvenile stems are mashed and tablets are made from the mashed product. To be taken 4 times daily.
40	<i>Cydonia oblonga</i>	Rosaceae	Bihi dana	Deciduous tree	seeds	Remove dry catarrh, hopping cough, increase the lung activity	Powders are made from dry fruits and seeds. Powder with water to be taken 3 times per day.
41	<i>Justicia gendarussa</i>	Acanthaceae	Bish jaron	Branched shrub	Leaf	Bone fracture, rheumatic pain	Leaf juice is taken thrice daily (1 cup amount); alternately crushed leaves are applied to affected areas.
42	<i>Polyalthia longifolia</i>	Annonaceae	Devdaru	Tree	Leaf, bark	Coughs, many gastrointestinal and skin disorders	Crushed leaves and bark are taken during coughs and mucus formation. Crushed leaves and bark are applied to affected areas of skin during skin disorders.
43	<i>Holarrhena pubescens</i>	Apocynaceae	Kurchi	Shrub	Bark.	Asthma, respiratory problems, coughs	Bark is soaked in water followed by drinking of the water in the morning and evening; alternately, dried bark is chewed.
44	<i>Enydra fluctuans</i>	Asteraceae	Helench	Sub-shrub	Leaf, stem	Malnutrition, cholera	Leaf and stems are cooked and eaten.
45	<i>Cuscuta reflexa</i>	Cuscutaceae	Shomo lota	Herb	Vine	Gastrointestinal disorders	Juice from 8-9 vines is taken twice daily (1 cup amount) for 7 days.
46	<i>Mimosa pudica</i>	Fabaceae	Laal lojjaboti	Perennial herb	Leaf	Pain in body, teeth, pain of gout, bad headache	Tablets are made from dried and mashed

							leaves. To be taken 3 times daily.
47	<i>Leucas aspera</i>	Lamiaceae	Dondo-kolosh	Annual herb or undershrub	Leaf	Scabies, skin infections.	Leaves are crushed along with garlic and mustard oil and applied to affected areas for 14 days.
48	<i>Hyptis suaveolens</i>	Lamiaceae	Tukma	Sub-shrub	Seed	Constipation and many gastrointestinal disorder	Seeds are soaked in water for some time and taken on an empty stomach.
49	<i>Lagerstroemia speciosa</i>	Lythraceae	Jarul	Tree	Young leaf, bark	Purgative, stimulant, induces sleep	Powdered of leaf and bark is taken twice daily on an empty stomach.
50	<i>Solanum torvum</i>	Solanaceae	Pahari baegun,	Shrub	Seed	Tooth infections, skin diseases and inflammation	Powder of the seeds is applied in the affected area.
51	<i>Cynodon dactylon</i>	Poaceae	Durba ghas	Climbing herb	Whole plant	Cuts and wounds, infections	Juice from whole plant is applied to affected areas.
52	<i>Moringa oleifera</i>	Moringaceae	Sajina	Tree	Leaf	Sex stimulant, headache, coughs, mucus	Leaves are fried with garlic, cinnamon, cloves and taken.
53	<i>Lawsonia inermis</i>	Lythraceae	Mehedi	Tall shrub or small tree	Leaves	Hair loss, leprosy	Mashed leaves are directly applied to overcome hair loss.
54	<i>Carica papaya</i>	Caricaceae	Pepe	Tree like plant	Fruits	Fever, blood dysentery, constipation, acidity	Fruit juice is taken twice daily for 5 days. Green pepe can be consumed as vegetable.
56	<i>Hemidesmus indicus</i>	Apocynaceae	Anantomool	Semi-erect shrub	Root	To increase sperm, alleviation or prevention of respiratory, stomach and hepatic problems, to induce sweat, diuretic, to increase strength, acidity, loss of appetite, all types of skin diseases, skin allergy, antidote to mercury poisoning	Tablets are prepared from the powder of dried and mashed root. To be taken 4 times daily in empty stomach.
57	<i>Clitoria ternatea</i>	Fabaceae	Aparajita	Perennial herbaceous plant	Flower	Astringent, acidity, to increase intelligence and memory, loss of sexual desire, eye relaxant, leprosy, urinary disorders, dysentery, edema, antidote to poisoning	Tablets are prepared from the powder of dried and mashed flowers. To be taken 4 times daily after eating rice.
58	<i>Cinnamomum tamala</i>	Lauraceae	Tejpata	Tree	Leaf	Excessive sexual desire, coughs, bloating, piles, loss of appetite, sexual disorder	Powder is prepared from the dried leaves. To be taken 2 times daily with cloves, honey and cinnamon.
59	<i>Carissa carandas</i>	Apocynaceae	Koromcha	Shrub	Fruit	Diabetes, blood pressure, obesity	Fruits are directly consumed.
60	<i>Coccinia grandis</i>	Cucurbitaceae	Telakuch	Climbing herb	Leaf	Dysentery, burns, leprosy, asthma	Powder of leaf should be taken twice daily.
61	<i>Nyctanthes arbor</i>	Verbenaceae	Shefali	Shrub or small tree	Leaf	Allergy, joint pain, immunostimulant, hepatoprotective, antileishmanial, antiviral and antifungal, arthritis, fevers, and as a laxative.	Tablets are prepared from the dried and mashed leaf. 2 tablets should be taken thrice daily.
62	<i>Syzygium cumini</i>	Myrtaceae	Jaam	Tree	Fruit, seed	Diabetes, dysentery, vitamin C deficiency, malnutrition	Fruit is consumed directly. Tablets are prepared from the dried and mashed

							seeds.3 tablets should be taken daily.
63	<i>Artocarpus lakoocha</i>	Moraceae	Bon kathal	Tree	Fruit	Constipation, loss of appetite, malnutrition	Fruit is consumed directly.
64	<i>Ocimum sanctum</i>	Lamiaceae	Kalo tulshi	Subshrub	Mainly leaf, occasionally seed	Cold, skin disease, cough, catarah, asthma	Juice is prepared from the leaf. 2 table spoon leaf juice should be taken along with honey, 3 times daily.
65	<i>Spondias pinnata</i>	Anacardiaceae	Amra	Tree	Bark, Fruit	Dysentery, diarrhea, vitamin C deficiency	Fruit is consumed directly. 3 table spoon bark juice should be taken 4 times daily.
66	<i>Ipomoea mauritiana</i>	Convolvulaceae	Bhuey kumra	Climbing herb	Rhizome	Dysentery	Juice of the rhizome should be taken 4 times daily.
67	<i>Solanum surattense</i>	Solanaceae	Choroi baegun	Sub-shrub	Fruit	Cough, cold, asthma and such other respiratory tract conditions	Macerated fruits are taken. Note that a small number of fruits should be taken, otherwise serious side effects will develop.
68	<i>Sansevieria trifasciata</i>	Agavaceae	Kali komor	Herb	Root	Paralysis	Several pieces of root are macerated with ginger and peppers and massaged on the body.
69	<i>Mangifera indica</i>	Anacardiaceae	Aam	Tree	Bark, leaf	Diarrhea, dysentery and many other gastrointestinal disorders	Juice is prepared from the bark and leaf. Half glass juice should be taken twice daily for 5 days.
70	<i>Ageratum conyzoides</i>	Asteraceae	Oshoni shak	Herb	Leaf, stem	Insomnia, pain, gout, constipation	Juice from crushed leaves and stems are orally administered.
71	<i>Ananas comosus</i>	Bromeliaceae	Annarhos	Herbaceous perennial	Leaf, fruit	Fever, helminthiasis, allergy jaundice	Fruit is used against fever. Leaf juice is used against helminthiasis and jaundice.
72	<i>Ipomoea fistulosa</i>	Convolvulaae	Dhool-kolme	Sub-shrub	Stem, gum	Antidote to poison.	A combination of gum and stem paste is used as antidote to poison.
73	<i>Catharanthusroseus</i>	Apocynaceae	Noyon tara	Sub-shrub or herbaceous	Leaf	Dysentery, diarrhea, cholera, cough, cold	2 table spoon leaf juice along with ginger should be taken 4 times daily.
74	<i>Momordica charantia</i>	Cucurbitaceae	Korolla	Herbaceous	Leaf	Chicken pox, gastrointestinal disorders, obesity, hypertension cancer prevention, treatment of diabetes, fever, HIV and AIDS, and infections	Juice is prepared from the leaf. Leaf juice should be taken daily in morning at empty stomach.

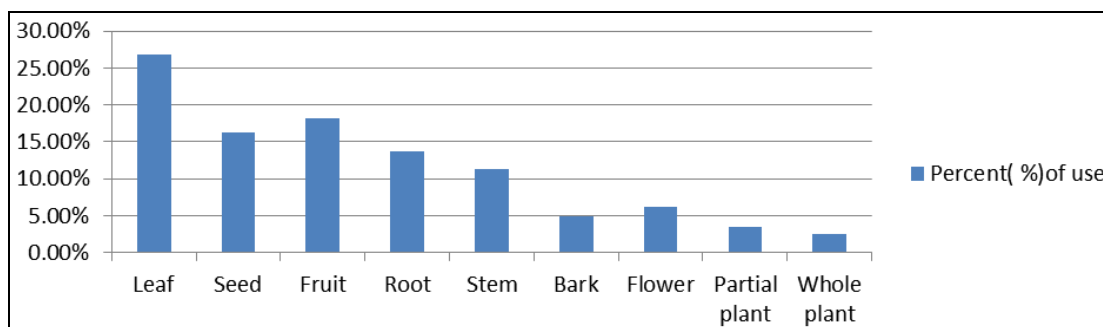
Nowadays our lifestyle is now getting techno-savvy and we are moving away from nature. But we cannot escape from nature because we are part of it. As herbs are natural products they are free from side effects, they are comparatively safe, eco-friendly and locally available. Conventionally there are lots of herbs used for the ailments related to different reasons. Today many types of herbs are used as medicinal plant. These medicinal plants contribute enormously to the health care system of the country. Pharmaceutical companies are conducting their research on medicinal plants and also using it as a source of modern medicine. The use of, and search for, drugs and dietary supplements derived from plants have accelerated in recent years. Pharmacologists, microbiologists,

botanists, and natural-products chemists are combing the Earth for phytochemicals and leads that could be developed for treatment of various diseases. In fact, according to the World Health Organization, approximately 25% of modern drugs used in the United States have been derived from plants [23].

Bangladesh has over 5000 floral species, of which 500–600 are generally considered medicinal plants. In our study we collected 74 medicinal plants from the Dhunat upazila. The different parts of different plants are having different medicinal benefits. Among these various parts, leaves (26.87%) of maximum plants having medicinal benefit (table 2 and figure 2).

Table 2: Percentages of various plant parts used by different traditional healers (Kavirajes) of Dhunat upazila, Bangladesh

Plant part used	Percent (%) of use
Leaf	26.87%
Seed	16.25%
Fruit	18.12%
Root	13.75%
Stem	11.25%
Bark	5%
Flower	6.25%
Partial plant	3.5%
Whole plant	2.5%

**Fig 2:** Percentages of various plant parts used by different traditional healers (Kavirajes) of Dhunat upazila, Bangladesh

This study will help people of this area to gain knowledge about medically beneficial plants. Peoples of this area used these plants for primary treatment of common diseases like fever, cold, coughs, headache, body pain, diarrhea, dysentery, constipation, indigestion, wounds, boils, skin diseases, helminthiasis and urinary troubles. For instance *Aloe vera* leaves are widely used to heal burns, wounds and other skin ailments ^[24]. Bitter gourd (*Momordica charantia*) is used as an agent to reduce the blood glucose level ^[25]. *Phyllanthus emblica* (Amlaki) used against loss of hair, to stop vomiting, scurvy, bruise of mouth and leap, dysentery, blood dysentery, diarrhea ^[26]. Liquid extract of *Ocimum sanctum* (tulsi) is very useful for removing cough, cold, catarrh, many kinds of skin disease, pimple, and pierce ^[27]. Some plants such as *Momordica charantia* has been shown to increase the level and function of natural killer cells in cervical cancer patients undergoing radiotherapy. Extract of this plant has also been reported to reverse cancer multidrug resistance ^[28]. The bark of *Mangifera indica* is used to treat diarrhea with lime water and this plant have some anti-inflammatory effect too ^[29]. In a development country like Bangladesh medicinal plants are vital asset. It has some significant roles in indigenous as well as rural population health care system. The medicinal plants can be also made pharmaceutically benefited by bringing them under scientific research and by extracting possible active ingredients for newer drugs from them. So, the quality and growth of indigenous medicinal plants should be substantially improved by bringing them under planned cultivation process.

4. Conclusion

Modern homeopathic, Unani or Ayurvedic, and allopathic medicine, even as of to date, is largely dependent upon medicinal plants for discovery of newer and better drugs. So, a thorough documentation of the medicinal plant uses that are available in Bangladesh is therefore important. Due to no side effects, the medicinal plants basis traditional treatment system may open a new era of alternatives medicine rather than modern allopathic medicine. The findings of the present survey suggest that the medicinal plants that have been

reported to be used for different diseases and disorders may be scientifically studied for discovering relevant pharmacological effects in order to much effective drug design having less side effect. It is expected that scientific studies conducted with the plants reported may lead to discovery of more efficacious drugs for treatment of this endemic problem. This survey will also help us to conserve the significant rare species medicinal plants.

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