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LEAFY VEGETABLES IN CHAPAI NAWABGANJ DISTRICT OF BANGLADESH FOCUSING ON MEDICINAL VALUE

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Keywords: Assessment; Leafy vegetable taxa; Indigenous uses; Chapai Nawabganj District; Bangladesh.

Abstract

Leafy vegetables in Chapai Nawabganj district of Bangladesh was studied from January to December 2019. A total of 111 species belonging to 59 genera under 30 families were recorded, out of which, 52.25% species were wild and 46.84% species were cultivated in this study. Status of occurrence has been recorded for proper conservation management and sustainable utilization of the taxa resulting in 81.98% to be common, 17.11% as rare and 0.90% are found as vulnerable in the study area. A total of 93 medicinal plants have been documented with their uses for the cure of more than 53 diseases. The study showed that the people of Chapai Nawabganj district use leafy vegetables to treat their diseases. Therefore, the documented leafy vegetables should be further investigated for their efficacy and safety to be integrated into conventional medicine. Further more these leafy vegetables need to be conserved for their sustainable utilization.

Introduction

Leaf vegetables, also called potherbs, greens, or leafy greens, are plant leaves eaten as a vegetable, sometimes accompanied by tender petioles and shoots. Nearly one thousand species of plants with edible leaves are known (Rashid, 1999). Leaf vegetables most often come from short-lived herbaceous plants, such as lettuce and spinach. Woody plants of various species (*Moringa oleifera*, *Murraya koinigii*, *Morus alba*, *Toona cilliata* etc.) also provide edible leaves (NRC, 2015). They constitute a major portion of our diet and play an important part in alleviating malnutrition. FAO (2012) has estimated that about 870 million people are chronically undernourished in the period 2010-12 representing 12.5% of the global population, or one in eight people. In order to arrest the undernourished situation, much attention has been paid on the exploitation and utilization of unusual plant materials for food (Kawatra *et al*., 2001). Indigenous (traditional) vegetables are best defined as species that are locally important for the sustainability of economics, human nutrition and health, and social systems. Over the last decade, many studies have shown that fresh vegetables constitute important functional food components by contributing vitamins, iron, folic acid, mineral, biologically active compounds and photosysthetic pigments (Kmiecik *et al*., 2001; Su *et al*., 2002; Kimura and Rodriguez-Amaya, 2003). Vegetables also contain antioxidants which offer protection against many chronic disease including heart disease and certain types of cancer (Saxena, 1999).

In Bangladesh, people have a long heritage of taking leafy vegetables. However, very little attempt has been made to study the leafy vegetables of Bangladesh although they constitute a large proportion of the daily diet of the rural dweller of the country (Ali *et al*., 1977; Sarker and

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Hossain, 2009; Hassan, 2010, Rahman *et al.*, 2015; Khatun *et al.*, 2013; Rashid 1999). Despite the importance of leafy vegetables in the present day human lives, no systematic work has been carried out in the study area to identify and document the plant species. In view of potential beneficial attributes of leafy vegetables, there is a need to explore, identify and document the leafy vegetables of Chapai Nawabganj district, Bangladesh.

Materials and methods

Study area

Chapai Nawabganj is located on the north-western part of Bangladesh. It is a part of the Rajshahi Division and known for its special tone of local dialect. The north and west part of Chapai Nawabganj is bounded by Malda and Murshidabad district of India, east is by Naogaon District, and south-east is by Rajshahi District (BPC, 2001).

Data collection

The work is based on fresh materials collected during twenty three visits to Chapai Nawabganj distict, Bangladesh from January to December 2019 to cover the seasonal variations as well. The visits covered all types of habitats, particular river bank, slope, village grove, fruit gardens and roadsides of the study area. Medicinal information was obtained through semi-structured interviews with knowledgeable people such as local 'Kabiraj'(local herbal doctor) and elderly people. A total of 161 informants having an age rangeing from 21 to 69 years were interviewed using semi-structured interviewed method (Alexiades, 1996). Plant parts with either flower of fruits collected using traditional herbarium techniques to make voucher specimens for documentation.

Plant identification

Collected specimens have been critically examined, studied and identified. Identifications have been confirmed by consulting standard literatures (Hooker, 1877; Prain, 1903) and Herbarium of Rajshahi University (HRU). Nomenclature has been updated following recent literature (Ahmed *et al*., 2008-2009; Huq, 1986, and Pasha and Uddin, 2013).

Results and Discussion

Documentation of leafy vegetable taxa in Chapai Nawabganj district of Bangladesh was investigated. Out of 111 species, 106 belong to angiosperms, and 5 to pteridophytes. Among the angiospermic taxa Magnoliopsida is represented by 96 taxa and Liliopsida is represented by 10 taxa (Table 1). Distribution of leafy vegetables in the families shows variation. Cucurbitaceae is the dominant family represented by 16 species, followed by Amaranthaceae (13 species), Brassicaceae (9 species), Fabaceae (8 species), Araceae (8 species), Solanaceae (7 species), Convolvulaceae (7 species), Malvaceae (4 species) and Polygonaceae (4 species) (Table 1; Fig. 3). A single species is represented by 9 families while 2 to 3 species is represented by 12 families. Out of recorded species, 52.25% species were wild and 46.84% species were cultivated in the study area (Fig. 2). Status of occurrence has been recorded for proper conservation management and sustainable utilization of the taxa resulting in 81.98%) to be common, 17.11% as rare and 0.90% are found as vulnerable in the study area (Fig. 1).

The collected information is comparable with the result of other studies in Bangladesh and abroad. In Bangladesh, 186 species were recorded as leafy vegetables (Khatun *et al*, 2013). A total of 24 species belonging to 22 genera and 16 families were collected and identified in Bogra district (Rahman *et al*, 2015). Narayanan and Kumar (2007) in India recorded a total of 102 wild edible leaves in Paniya, Kattunaikka and Kuruma tribes, but families consume 88, 43 and 21,

Table 1. Diversity of leafy vegetables in Chapai Nawabganj district, Bangladesh.

Scientific name	Bangla name	Family	Status of occurrence	Flowering time	Voucher number
Acalypha indica L.	Muktajhuri	Euphorbiaceae	Common	Mar-Oct	MK 91
Amaranthus blitum L.	Notiya shak	Amaranthaceae	Common	Jan-Dec	MK 29
Amaranthus gangeticus L.	Lal shak	Amaranthaceae	Common	Jun-Aug	MK 124
Amaranthus lividus Roxb.	Gobranotey	Amaranthaceae	Common	Jan-Dec	MK 31
Amaranthus oleracea L.	Data shak	Amaranthaceae	Common	Jan-Dec	MK 122
Amaranthus polygonoides L.	Notey shak	Amaranthaceae	Common	Jan-Dec	MK 33
Amaranthus spinosus L.	Katanotey	Amaranthaceae	Common	Jan-Dec	MK 120
Amaranthus tricolor L.	Lal shak	Amaranthaceae	Common	Jan-Dec	MK 35
Amaranthus viridis L.	Notey shak	Amaranthaceae	Common	Jan-Dec	MK 118
Alternanthera sessilis (L.) R. Br.	Sachishak	Amaranthaceae	Common	May- Oct	MK 37
Alternanthera philoxeroides (Mart.) Griseb.	Malancha	Amaranthaceae	Common	Mar-Jun	MK 116
Alternanthera bettzickiana L.	Malancha	Amaranthaceae	Rare	Mar-Jun	MK 39
Azadirachta indica A. Juss.	Nimpata	Meliaceae	Common	Mar-Apr	MK 93
Alocasia indica Schott**.**	Mankochu	Araceae	Common	Aug-Oct	MK 117
Amorphophalus bulbifer (Roxb.) Blume	Olkochu pata	Araceae	Common	Jul- Aug	MK 36
Allium cepa L.	Piaj.	Liliaceae	Common	Feb-Apr	MK 125
Allium sativum L.	Rasun.	Liliaceae	Common	Feb-Apr	MK 28
Angiopteris evecta (Forst.) Hoffm.	Dhekishak	Angiopteridaceae	Rare	Jan-Dec	MK 127
Argemone mexicana L.	Sialkata	Papaveraceae	Common	Jan-Dec	MK 133
Basella alba L.	Puishak	Basellaceae	Common	Nov-Feb	MK 110
Benincasa hispida (Thunb.) Cogn.	Chalkumra.	Cucurbitaceae	Common	May-Sep	MK 57
Boerhaavia repens L.	Punarnava	Nyctaginaceae	Common	Jan-Dec	MK 130
Brassica alba Hook.	Sada sorisha shak	Brassicaceae	Common	Mar- May	MK 80
Brassica campestris Roxb.	Sorisha shak	Brassicaceae	Common	Mar- May	MK 75
Brassica juncea L.	Rai sorisha	Brassicaceae	Common	Mar- May	MK 78
Brassica napus L.	Kalo Sarisha	Brassicaceae	Common	Mar- May	MK 77
Brassica oleracea L. var. *botrydis*	Fulkopi	Brassicaceae	Common	Dec-Feb	MK 76
Brassica oleracea L. var. *capitata*	Badhakopi	Brassicaceae	Common	Dec-Feb	MK 79
Brassica oleracea L. var. *gangyloides*	Olkopi	Brassicaceae	Common	Dec-Feb	MK 74

(Contd.)

Table 1 contd.

Scientific name	Bangla name	Family	Status of occurrence	Flowering time	Voucher number
Brassica rapa L.	Shalgam	Brassicaceae	Common	Jan-Mar	MK 81
Bacopa monnieri (L.) Pennel.	Brahmishak	Scrophulariaceae	Rare	Jun-Aug	MK 42
Chenopodium album L.	Bathua Shak	Chenopodiaceae	Common	Dec-Feb	MK 128
Chenopodium ambrosoides L.	Bonbothua	Chenopodiaceae	Common	Mar- May	MK 27
Celosia cristata L.	Moragphul	Amaranthaceae	Common	Jan-Dec	MK 114
Centella asiatica (L.) Urb.	Thankuni	Apiaceae	Common	Feb-May	MK 58
Coriandrum sativum L.	Dhaniya.	Apiaceae	Common	Dec-Feb	MK 97
Capsicum frutescens L.	Marich	Solanaceae	Common	Jan-Dec	MK 56
Cicer arietinum L.	Boot	Fabaceae	Common	Jan-Dec	MK 70
Corchorus capsularis L.	Deshipat	Tiliaceae	Common	Mar-Jun	MK 102
Corchorus olitorius L.	Pat shak	Malvaceae	Common	Mar-Jun	MK 98
Coccinia cordifolia (L.) Cogn.	Telakucha	Cucurbitaceae	Common	Mar-Dec	MK 96
Coccinia grandis (L.) Voigt.	Telakucha	Cucurbitaceae	Common	Mar- Dec	MK 59
Cucumis melo L.	Bangi	Cucurbitaceae	Common	Jan-May	MK 94
Cucumis sativus L.	Shosha	Cucurbitaceae	Common	Jan- Dec	MK 61
Cucurbita maxima Duch.	Mistikumra	Cucurbitaceae	Common	Mar- Aug	MK 92
Cucurbita sativus Duch.	Kumra	Cucurbitaceae	Rare	Jan- Dec	MK 63
Cucurbita pepo DC.	Mistikadu	Cucurbitaceae	Common	Mar-Aug	MK 90
Cucurbita moschata Duch.	Mistikadu	Cucurbitaceae	Common	Mar- Aug	MK 65
Colocasia esculenta (L.) Schott	Kachu	Araceae	Common	Dec-Mar	MK 119
Diplazium esculentum Retz.	Dhekishak	Athyriaceae	Frequent	Jan-Dec	MK 26
Diplazium polypodioides Bl.	Dhekishak	Athyriaceae	Frequent	Jan-Dec	MK 129
Digera muricata (L.) Mart.	Boutibon shak	Amaranthaceae	Vulnerable	Feb-Jul	MK 41
Enhydra fluctuans Lour.	Helencha	Asteraceae	Common	Nov-Feb	MK 115
Glinus oppositifolius (L.) Aug. DC.	Gima-sak	Molluginaceae	Common	Jan-Dec	MK 45
Hibiscus cannabinus L.	Mestapat	Malvaceae	Common	Apr-Aug	MK 53
Hibiscus sabdariffa L.	Lalmesta	Malvaceae	Common	Apr-Aug	MK 100
Hygrophila auriculata (Schum.) Heyne.	Puninnya shak	Acanthaceae	Rare	Jan-Dec	MK 113
Ipomoea aquatica Forssk.	Kalmi Shak	Convolvulaceae	Common	Jan-Oct	MK 105
Ipomoea batatas (L.) Lamk.	Misti Alu.	Convolvulaceae	Common	Jan-Dec	MK 48
Ipomoea cairica (L.) Sweet	Rail Lata	Convolvulaceae	Common	Jan-Dec	MK 107
Ipomoea fistulosa (Mart. ex Choisy)	Dholkolmi	Convolvulaceae	Common	Jan-Dec	MK 46

(Contd.)

Table 1 contd.

Scientific name	Bangla name	Family	Status of occurrence	Flowering time	Voucher number
Ipomoea indica (Burm.) Merr.	Kolmi	Convolvulaceae	Rare	Jan-Dec	MK 109
Ipomoea purpurea (L.) Roth.	Beguni Kolmi	Convolvulaceae	Rare	Jul- Sep	MK 44
Ipomoea quamoclit L.	Torulata	Convolvulaceae	Common	Jul-Sep	MK 111
Lasia spinosa (L.) Thw.	Kantakachu	Araceae	Rare	Jan-Dec	MK 34
Lactuca sativa L.	Lettuce	Asteraceae	Common	Jan-Mar	MK 38
Lathyrus sativus L.	Kheshari	Fabaceae	Common	Jan-Mar	MK 23
Lagenaria siceraria (Mol.) Stan.	Lau	Cucurbitaceae	Common	Feb - Apr	MK 88
Luffa cylindrica (L.) Roem.	Dhundol pata	Cucurbitaceae	Common	Jun-Nov	MK 67
Lathyrus hirsutus L.	Bon kheshari	Fabaceae	Common	Jan- Mar	MK 85
Lathyrus sativus L.	Kheshari	Fabaceae	Common	Jan- Mar	MK 68
Lens culinaris Medik.	Musuri	Fabaceae	Common	Jan-Dec	MK 87
Moringa oleifera Lamk.	Sajna	Moringaceae	Common	Jan-Dec	MK 83
Momordica carantia L.	Karolla	Cucurbitaceae	Common	May- Aug	MK 86
Momordica dioica Roxb.	Kakrol	Cucurbitaceae	Common	Jul-Dec	MK 69
Momordica cochichinensis Roxb.	Kakrol	Cucurbitaceae	Common	Mar- Sep	MK 84
Marsilea minuta (L.)Mant.	Susni shak	Marsileaceae	Common	Jan-Dec	MK 24
Marsilea quadrifolia L.	Susni shak	Marsileaceae	Common	Jan-Dec	MK 131
Malva verticilata L.	Napashak	Malvaceae	Rare	Jul-Sep	MK 55
Mollugo pentaphylla L.	Tita shak	Molluginaceae	Rare	Jan-Dec	MK 108
Mollugo spergula L.	Gima shak	Molluginaceae	Rare	Jan-Dec	MK 47
Oxalis europea L.	Amrul	Oxalidaceae	Common	Sep-Mar	MK 60
Oxalis corniculata L.	Amrul	Oxalidaceae	Common	Sep-Mar	MK 95
Portulaca oleracea L.	Baranunia	Portulacaceae	Common	May- Jul	MK 112
Portulaca quadrifida L.	Chotonunia	Portulacaceae	Common	Jan-Dec	MK 43
Pisum sativum L.	Matar.	Fabaceae	Common	Jan-Dec	MK 64
Phyllanthus niruri L.	Vuiamla	Euphorbiaceae	Common	Apr-Sep	MK 62
Paederia foetida L.	Gandhabhaduli	Rubiaceae	Common	Jan-Dec	MK 40
Raphanus sativus L.	Mula	Brassicaceae	Common	Jan-Mar	MK 72
Rumex vesicarius L.	Takpalong	Polygonaceae	Rare	Jul-Aug	MK 106
Rumex dentatus L.	Bon Palong	Polygonaceae	Common	Jul-Aug	MK 49
Rumex maritimus L.	Bon Palong	Polygonaceae	Common	Jul-Aug	MK 104
Rumex sanguineus L.	Bon Palong	Polygonaceae	Common	Jul-Aug	MK 51
Sesuvium portulacastrum L.	Nuna shak	Aizoaceae	Common	Jan-Dec	MK 25
Solanum americanum L.	Tit Begun	Solanaceae	Common	Jan-Dec	MK 99

(Contd.)

Table 1 contd.

Scientific name	Bangla name	Family	Status of occurrence	Flowering time	Voucher number
Solanum nigrum L.	Tit Begun	Solanaceae	Common	Jan-Dec	MK 54
Solanum indicum L.	Tit Begun	Solanaceae	Rare	Jan-Dec	MK 101
Solanum tuberosum L.	Alu	Solanaceae	Common	Oct-Feb	MK 52
Solanum villosum L.	Titbegun	Solanaceae	Common	Jan-Dec	MK 103
Solanum filisifolium L.	Titbegun	Solanaceae	Common	Jan-Dec	MK 50
Spinacea oleracea L.	Palong Shak	Chenopodiaceae	Common	Nov-Feb	MK 126
Trichosanthes anguina L.	Chichinga	Cucurbitaceae	Common	Nov-Apr	MK 71
Trichosanthes bracteata Lam.	Makal.	Cucurbitaceae	Rare	Jul-Dec	MK 82
Trichosanthes dioica Roxb.	Potol.	Cucurbitaceae	Common	Apr- Aug	MK 73
Thyphonium trilobatum (L.) Schott.	Ghet Kochu	Araceae	Rare	Jan-Dec	MK 30
Vigna mungo (L.) Hepper	Mashkalai	Fabaceae	Common	Nov-Jan	MK 66
Vigna sinensis (L.) Endl.	Borboti	Fabaceae	Rare	Apr-Jul	MK 89
Xanthosoma atrovirens L.	Moulovikochu	Araceae	Rare	Aug-Oct	MK 121
Xanthosoma sagittifolium L.	Mukhikachu	Araceae	Rare	Aug-Oct	MK 32
Xanthosoma violaceum L.	Dudh kachu	Araceae	Rare	Aug-Oct	MK 123
Xanthium strumarium L.	Ghagra	Asteraceae	Common	Jan-Dec	MK 136

Jan = January, Feb = February, Mar = March, Apr = April, Ma = May, Jun = June , Jul = July, Aug = August, Sep = September, Oct = October, Nov = November, Dec = December, C = Common, Vul = Vulnerable, R = Rare.

respectively. In South Africa, Vorster *et al.* (2007) recorded the following species: *Amaranthus* spp.*; Bidens pilosa; Chenopodium album; Corchorus* spp.*; Cucurbita* spp.*; Momordica balsamina;* and *Vigna unguiculata* as some of the more popular leafy vegetables in areas where they are widespread. In East and West Usambaras, Tanzania, Vainio-Mattila (2000) documented Acanthaceae, Amaranthaceae, Asteraceae, and Brassicaceae as the most important families of wild green leafy vegetables, among 26 reported families. In Kenya and other parts of East Africa traditional leafy vegetables are used by both rural and urban communities and include several families such as Amaranthaceae, Basellaceae, Brassicaceae, Cucurbitaceae, and Tiliaceae (Abukutsa and Onyango, 2005). Further, in Andhra Pradesh, India; Reddy *et al.* (2007) report 69 families of wild food plants, where four families: Amaranthaceae (11 species); Rubiaceae (9 species); Euphorbiaceae (8 species) and Papilionaceae (7 species); have a high number of species, with Amaranthaceae family having the highest number of species. Fleuret (1979) recorded more than 15 species of wild leafy vegetables in her study in the Lushoto district, Tanzania. Woodcook's (1995) studied on indigenous knowledge and forest use in the East Usambaras in Tanzania documents 25 wild leafy vegetable species. So far the information available, no published data recorded on the leafy vegetables in Chapai Nawabganj district, Bangladesh. The present study will also help in identifying the important leafy vegetables for future reference.

Present study demonstrated that there is an urgent need for documentation of traditional knowledge related to the intangible cultural heritage concerning wild vegetables are utilized. The

utilization and cultivation of these vegetables should be promoted to maintain the dietary needs of the household in Chapai Nawabganj district. The study can provide a baseline data that may be helpful for prioritization of conservation through sustainable use and management of the resources.

Medicinally Important Leafy Vegetables

Out of 111 species, 93 medicinal plants have been documented with their uses for the cure of more than 53 diseases. The medicinal plants are used by the local people to cure many the diseases, especially for anemia, asthma, burning sensation, blood diseases, bronchitis, cough, chicken pox, constipation, dysentery, diarrhea, diabetes, eczema, fever, headache, itches, jaundice, menstrual disease, paralysis, piles, sex problems, skin diseases, snake-bite, toothache, worm, wound etc. Different plant parts of different species are used as medicine for treating various diseases where;- leaf of 65.76%, fruit of 17.11%, root of 9.90%, stem of 1.80%, seed of 19.81%, bulb of 1.80%, Corm of 2.70%, Flower of 2.70% and whole plant of 18.01% species were used as medicine (Fig. 4). The survey recorded 53 categories of uses of 93 medicinal leafy vegetables (Table 2). Out of 53 categories of ailments, Dysentery, fever, skin disease, cough, inflammation,

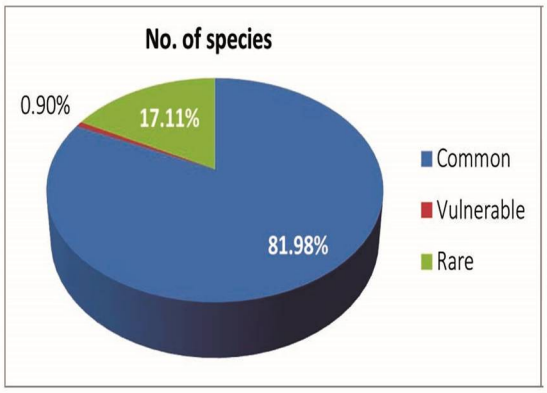

Fig. 1. Recorded status of occurrence in the study area.

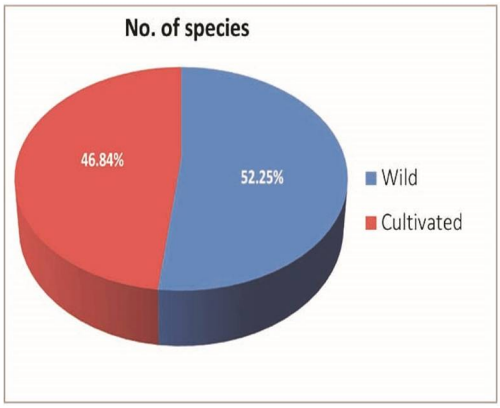

Fig. 2. Recorded wild and cultivated leafy vegetables in the study area

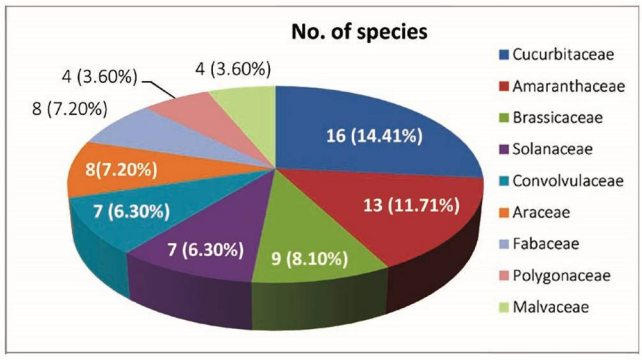

Fig. 3. Recorded dominant vegetable families in the study area

Table 2. Medicinal leafy vegetables are used by local people in Chapai Nawabganj, Bangladesh.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Acalypha indica L.	Euphorbiaceae	Mukta jhuri	Leaf	Skin disease, asthma, wound, pneumonia, bronchitis	Leaf paste is applied externally; Leaf juice taken orally
Amaranthus oleracea L.	Amaranthaceae	Data shak	Leaf	Fever, anemia, kidney disease	Leaf juice taken orally
Amaranthus polygonoides L.	Amaranthaceae	Notey shak	Whole plant	Inflammation, gonorrhea, dysentery	Whole plant juice taken orally
Amaranthus spinosus L.	Amaranthaceae	Kanta notey	Leaf, Root	Burning sensation, eczema, leprosy, piles, bronchitis, leucorrhoea, constipation	Root paste taken externally; Leaf juice taken orally
Amaranthus tricolor L.	Amaranthaceae	Lalshak	Leaf	Cough, dysentery, cholera, worm	Leaf juice taken orally
Amaranthus viridis L.	Amaranthaceae	Noteyshak	Leaf, Root	Burning sensation, leprosy, bronchitis, piles, leucorrhoea	Root paste taken externally; Leaf juice taken orally
Alternanthera sessilis (L.) R. Br.	Amaranthaceae	Sachi Shak	Whole plant	Night blindness, malaria, diarrhea, dysentery	Whole plant juice taken orally
Alternanthera philoxeroides (Mart.) Griseb.	Amaranthaceae	Malancha	Whole plant	Vomiting, constipation, night blindness, malaria	Whole plant juice taken orally
Alternanthera bettzickiana L.	Amaranthaceae	Malancha	Leaf	Anemia	Leaf juice taken orally
Azadirachta indica A. Juss.	Meliaceae	Neem	Leaf, Friut	Skin diseases, itches, lice killer worm, ringworm	Leaf paste taken externally; ripe fruit is eaten
Alocasia indica Schott.	Araceae	Manchu	Whole plant	Influenza, diarrhea, tuberculosis	Whole plant juice taken orally
Amorphophalus bulbifer (Roxb.) Blume	Araceae	Olkochu	Corm	Piles, gonorrhea	Corm juice taken internally
Allium cepa L.	Liliaceae	Piaj	Bulb	Cough, asthma, rheumatism, colic, insect bites	Bulb juice taken internally

(Contd.)

Table 2 contd.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Allium sativum L.	Liliaceae	Rosun	Bulb	Fever, cough, bronchitis, rheumatism, indigestion, heart diseases	Bulb juice taken internally
Angiopteris evecta (Forst.) Hoffm.	Angiopteridaceae	Dheki shak	Bulb	Constipation	Bulb juice taken internally
Brassica juncea L.	Brassicaceae	Rai sorisha	Seed	Arthritis, foot ache, tumor	Seed paste is taken externally
Brassica napus L.	Brassicaceae	Kalo sorisha	Seed	Gout, sciatica	Seed paste is taken externally
Brassica oleracea L. var. *botrydis*	Brassicaceae	Fulkopi	Leaf	Cancer	Leaf juice taken internally
Brassica rapa L.	Brassicaceae	Shalgam	Leaf	Cancer, chronic cough, bronchial catarrh	Leaf juice taken internally
Basella alba L.	Basellaceae	Puishak	Root	Gonorrhea, catarrhal affections	Root juice taken internally
Boerhaavia repens L.	Nyctaginaceae	Punarnava	Leaf, Root	Dysentery, jaundice, anemia, gonorrhea	Leaf and root juice taken internally
Brassica alba Hook.	Brassicaceae	Sada sorisha shak	Leaf	Inflammatory symptoms, rheumatic affections	Leaf juice taken internally
Brassica campestris Roxb.	Brassicaceae	Sorisha shak	Leaf	Inflammatory symptoms rheumatic affections	Leaf juice taken internally
Benincasa hispida (Thunb.) Cogn.	Cucurbitaceae	Chal kumra	Fruit	Epilepsy, heart diseases, tuberculosis, colic pain	Fruit juice taken internally
Bacopa monnieri (L.) Pennel.	Scrophulariaceae	Brammi Shak	Whole plant	Indigestion, diarrhea, epilepsy	Whole plant juice taken internally
Coccinia cordifolia (L.) Cogn	Cucurbitaceae	Telakucha	Whole plant	Diabetes, epilepsy, asthma, fever, dropsy, gonorrhea	Whole plant juice taken internally
Coccinia grandis (L.) Voigt.	Cucurbitaceae	Telucha	Leaf	Diabetes, fever, gonorrhea	Leaf juice taken internally

(Contd.)

Table 2 contd.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Cucumis melo L.	Cucurbitaceae	Bangi	Fruit	Liver and kidney troubles, fever, bronchitis	Ripe fruit is taken
Cucumis sativus L.	Cucurbitaceae	Sosha	Leaf	Throat affection	Leaf juice taken internally
Cucurbita maxima Duch.	Cucurbitaceae	Misti kumra	Leaf	Burns, boils, inflammation	Leaf paste taken externally
Cucurbita sativus Duch.	Cucurbitaceae	Kumra	Leaf	Throat affection	Leaf juice taken internally
Cucurbita pepo DC.	Cucurbitaceae	Mistikodu	Seed	Biliousness and burning sensation	Seed paste taken externally
Cucurbita moschata Duch.	Cucurbitaceae	Mistikodu	Seed	Biliousness and burning sensation	Seed paste taken externally
Chenopodium album L.	Chenopodiaceae	Botua shak	Leaf	Piles, dysentery, anorexia hiccup and intestinal ulcers	Leaf juice is taken internally
Chenopodium ambrosioides L.	Chenopodiaceae	Banbatua	Whole plant	Cholera ulcers, nervous affections	Decoction of whole plant is taken internally
Celosia cristata L.	Amaranthaceae	Morog phul	Flower	Dysentery, cough, diarrhea, excessive menstrual discharges,	Flower juice is taken internally
Corchorus capsularis L.	Tiliaceae	Deshpat	Leaf, Root	Dysentery, tonic, dyspepsia, liver disorders, gonorrhea	Leaf and root juice is taken internally
Corchorus olitorius L.	Tiliaceae	Patshak	Leaf	Dyspepsia, liver disorders	Leaf juice is taken internally
Cicer arietinum L.	Fabaceae	Chola, boot	Seed	Skin disease	Seed paste taken externally
Centella asiatica (L.) Urb.	Apiaceae	Thankuni	Whole plant	Eczema, leprosy, bronchitis, inflammations, fevers	Whole plant juice taken internally
Coriandrum sativum L.	Apiaceae	Doniya	Leaf, fruit	Hiccup, piles, inflammation, jaundice	Leaf juice is taken internally
Capsicum frutescens L.	Solanaceae	Morich	Leaf	Headache, night blindness, bronchitis, cough	Leaf juice is taken internally

(Contd.)

Table 2 contd.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Colocasia esculenta (L.) Schott.	Araceae	Kochu	Leaf	Tumors, ulcerated polyp, cancer of nose and warts	Curry made from leaf is taken internally
Digera muricata (L.) Mart.	Amaranthaceae	Boutibon shak	Leaf	Biliousness, urinary discharges	Leaf juice is taken internally
Diplazium esculentum Retz.	Athyriaceae	Dhekishak	Frond	Urinary problems and skin diseases	Frond juice is taken internally
Enhydra fluctuans Lour.	Asteraceae	Helencha	Leaf	Skin and nervous affections	Leaf juice is taken internally
Glinus oppositifolius (L.) Aug. DC.	Molluginaceae	Gimashak	Leaf	Diabetes	Leaf juice is taken internally
Hibiscus cannabinus L.	Malvaceae	Mestapat	Leaf	Pains , earache, dysentery, biliousness	Leaf juice is taken internally
Hibiscus sabdariffa L.	Malvaceae	Lalmesta	Leaf	Dysentery and diarrhea	Leaf juice is taken internally
Hygrophila auriculata (Schum.) Heyne.	Acanthaceae	Puninnya shak	Leaf	Diarrhea, dysentery, urinary discharges, inflammation, biliousness, anemia, constipation, cough	Leaf juice is taken internally
Ipomoea aquatica Forssk.	Convolvulaceae	Kalmi Shak	Flower	Leucoderma, leprosy, fever, jaundice, biliousness, bronchitis and liver complaints	Flower juice is taken internally
Ipomoea batatas (L.) Lamk.	Convolvulaceae	Misti Alu	Whole plant	Fever, diarrhea	Whole plant juice is taken internally
Ipomoea cairica (L.) Sweet	Convolvulaceae	Rail Lata	Leaf	Rheumatism, inflammation	Leaf juice is taken internally
Ipomoea indica (Burm.) Merr.	Convolvulaceae	Kolmi	Leaf	Broken bones	Leaf paste taken externally
Ipomoea purpurea (L.) Roth.	Convolvulaceae	Beguni Kolmi	Leaf	Hemorrhage, syphilis	Leaf juice is taken internally

(Contd.)

Table 2 contd.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Ipomoea quamoclit L.	Convolvulaceae	Torulata	Whole plant	Bleeding piles	Whole plant juice is taken internally
Lagenaria siceraria (Mol.) Stan.	Cucurbitaceae	Panilau	Fruit	Muscular pain, dry cough, piles, cholera	Fruit juice is taken internally
Luffa cylindrica (L.) Roem.	Cucurbitaceae	Dhundol pata	Leaf	Skin problems	Leaf paste taken externally
Lens culinaris Medik.	Fabaceae	Mosur	Leaf, Seed	Constipation, intestinal affections.	Leaf juice is taken internally
Lactuca sativa L.	Asteraceae	Lettuce	Leaf	Headache, opthalmia, prevents fall of hairs, inflammation	Leaf juice is taken internally
Lasia spinosa (L.) Thw.	Araceae	Kanta kachu	Leaf	Throat affections, piles	Leaf juice is taken internally
Momordica charantia L.	Cucurbitaceae	Korola	Fruit, Leaf	Body pain, diabetes, urinary disorder, fever, Jaundice	Leaf juice is taken internally
Momordica dioica Roxb.	Cucurbitaceae	Kakrol shak	Leaf	Bleeding piles, urinary complaints, hypertension Diabetes	Leaf juice is taken internally
Mollugo pentaphylla L.	Molluginaceae	Tita shak	Leaf	Asthma, mouth infections, eye diseases	Leaf juice is taken internally
Mollugo spergula L.	Molluginaceae	Gima shak	Whole plant	Sore legs, menstrual discharge	Whole plant juice is taken internally
Malva verticilata L.	Malvaceae	Napashak	Leaf	Disorders of the skin, gastrointestinal tract, respiratory tract	Leaf juice taken internally
Moringa oleifera Lamk.	Moringaceae	Sajna	Leaf, fruit	General weakness, blindness, headache, paralysis and gastric problem	Leaf juice taken internally; fruit curry is taken internally

(Contd.

Table 2 contd.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Momordica cochichinensis Roxb.	Cucurbitaceae	Kakrol	Leaf	Heart disease, ulceration	Leaf juice taken internally
Marsilea minuta (L.) Mant.	Marsileaceae	Susnishak	Whole plant	Cough, respiratory troubles, hypertension, sleeping disorders, headache	Whole plant juice taken internally
Marsilea quadrifolia L.	Marsileaceae	Susnishak	Whole plant	Snakebite, abscesses	Whole plant paste taken externally
Oxalis europea L.	Oxalidaceae	Amrul	Leaf	Boils, abscess	Leaf paste taken externally
Oxalis corniculata L.	Oxalidaceae	Amrul	Leaf	Cough, dysentery, anemia, piles, dyspepsia, fever	Leaf juice taken internally
Portulaca oleracea L.	Portulacaceae	Bororonia shak	Whole plant	Scurvy, diseases of the liver, spleen, kidney gonorrhea, dysentery	Whole plant juice taken internally
Portulaca quadrifida L.	Portulacaceae	Choto noniashak	Whole plant	Piles, swellings, rheumatism	Whole plant juice taken internally
Pisum sativum L.	Fabaceae	Motor	Seed	Burning of the skin	Seed paste taken externally
Phyllanthus niruri L.	Euphorbiaceae	Vuiamla	Whole plant	Liver disease, kidney troubles, spleen disorder	Whole plant juice taken internally
Paederia foetida L.	Rubiaceae	Gondho Vaduli	Leaf	Liver, stomach troubles, diarrhea, dysentery	Leaf juice taken internally
Rumex vesicarius L.	Polygonaceae	Chuka palong	Leaf	Heart troubles, constipation, hiccup, asthma, bronchitis, piles	Leaf juice is taken internally
Rumex dentatus L.	Polygonaceae	Bon Palong	Root	Coetaneous disorders	Root juice is taken internally
Rumex maritimus L.	Polygonaceae	Bon Palong	Leaf, Seed	Ringworms, skin diseases	Fruit juice is taken internally; Seed paste taken externally

(Contd.)

Table 2 Contd.

Scientific name	Family	Bangla name	Parts used	Diseases treated	Formulations
Rumex sanguineus L.	Polygonaceae	Bon Palong	Seed	Pain of back and lumber region, cures gleets	Seed paste is taken externally
Solanum americanum L.	Solanaceae	Tit Begun	Fruit	Hepatitis B	Fruit juice is taken internally
Solanum nigrum L.	Solanaceae	Tit Begun	Leaf fruit	Liver disease, piles, dysentery, fever, diarrhea, bronchitis	Fruit juice is taken internally
Solanum indicum L.	Solanaceae	Tit Begun	Leaf	Diabetes, asthma, dry cough, worms, fever	Leaf juice is taken internally
Solanum villosum L.	Solanaceae	Tit Begun	Leaf	Stomachache, fever, hypertension	Leaf juice is taken internally
Solanum filisifolium L.	Solanaceae	Tit Begun	Whole plant	Spleen diseases, cough	Whole plant juice is taken internally
Spinacea oleracea L.	Amaranthaceae	Palong shak	Whole plant	Fevers, joint pain, inflammations of the lungs and bowels	Whole plant juice is taken internally
Trichosanthes anguina L.	Cucurbitaceae	Chichinga	Whole plant	Boils, skin diseases	Whole plant paste is taken externally
Trichosanthes bracteata Lam.	Cucurbitaceae	Makal	Leaf	Ophthalmia, leprosy	Leaf juice is taken internally
Trichosanthes dioica Roxb	Cucurbitaceae	Potol	Fruit	Dysentery, diarrhea, bronchitis	Fruit juice is taken internally
Thyphonium trilobatum (L.) Schott	Araceae	Bhot kochu	Corm	Tumors, haemorrhoids, piles	Corm juice is taken internally
Vigna mungo (L.) Hepper	Fabaceae	Mash kalai	Leaf	Piles, asthma, leucoderma, paralysis, rheumatism, cough	Leaf juice is taken internally
Vigna sinensis (L.) Endl.	Fabaceae	Borboti	Leaf	Jaundice	Leaf juice is taken internally
Xanthosoma atrovirens L.	Araceae	Moulovi kochu	Leaf	Food allergies	Leaf curry is taken
Xanthium strumarium L.	Asteraceae	Ghagra	Young stem	Diabetes	Young stem curry is taken internally

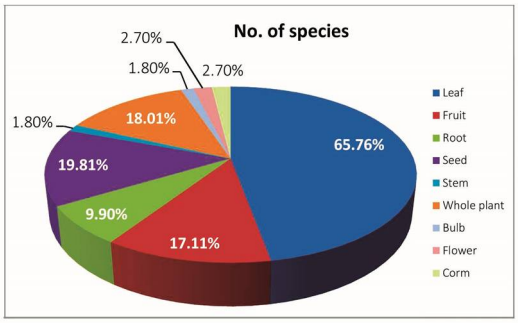

Fig. 4. Recorded plant parts used as medicine.

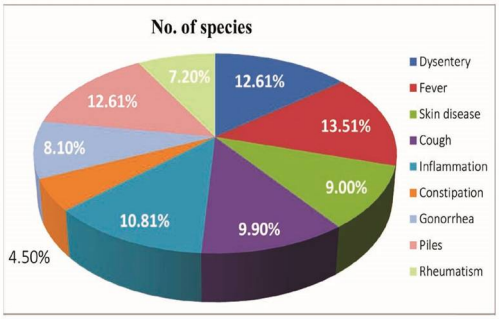

Fig. 5. Leafy vegetables used to treat different diseases recorded from the study.

constipation, gonorrhea, piles and rheumatism was dominant diseases in the study area (Fig. 5). This finding suggests that the leafy vegetables may possibly contain other phytochemical constituents which need to be investigated in future studies. This finding of common medicinal plant families in this study is in agreement with Anisuzzaman *et al* (2007); Ghani (2003); Khan (1998), Choudhury and Rahmatullah (2012), Faruque and Uddin (2014), Uddin and Hassan (2014), Uddin *et al.*, (2015), and Yusuf *et.al* (2006). The present study revealed that medicinal plants still play an important in the primary health care of the rural communities. The information gathered from the local traditional healers are useful for further researchers in the field of ethno-botany, taxonomy and development of new drug from natural resources.

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