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ETHNOMEDICINAL USES OF PLANTS BY SANTAL TRIBAL PEOPLES AT NAWABGANJ UPAZILA OF DINAJPUR DISTRICT, BANGLADESH

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Keywords: Medicinal plants; Traditional knowledge; Nawabganj; Dinajpur; Bangladesh.

Abstract

Ethnobotanical investigation on traditional medicinal plants used by Santal tribal people of Nawabganj upazila of Dinajpur district, Bangladesh was documented. Frequent field trips were made during January to December 2018 to record ethnobotanical data by interviewing Santals of various age group, mostly ranging between 20-76 years, including the traditional healers. A total of 105 plant species under 97 genera belonging to 57 families were recorded which are used by the Santals for the treatment of 67 ailments. Out of these plant species 44% belonged to herbs, 28% trees, 18% shrubs, 10% climbers. In herbal formulations, leaves were found to be mostly used (29%) followed by roots (12%), fruits (12%), whole plant (10%), seeds (9%), barks (9%), stems (5%), flowers (4%), latex (2%), rhizomes (2%), petioles (2%), gums (2%), bulbs (1%), tubers (1%), pods (1%) and buds (1%). The Santal medicinal wealth have been presented with scientific name, family, Bangla name, Santal name, part(s) used, ailments to be treated and formulations. This study also provides data on diversity, distribution and habitats for conservation and prioritization of the medicinal plants.

Introduction

The use of plants and animals as source of medicine and food is as old as humanity. Health and diseases are coeval with life. By necessity man has undoubtedly always been concerned with the question of health and survival and has sought within the framework of his knowledge, solution to problem of illness (Rubin, 1960). The herbal occupied a distinct place in the life right from the primitive period to today and the primitive or ethnic populations have their own medical lore, and some of their therapeutic practices have found place in today's medical knowledge (Jain, 1995). This traditional knowledge is useful to develop new food sources. Exploration of natural resources and documentation of traditional knowledge is necessary.

Even today, traditional medicine is still the predominant means of health care in developing countries where about 80% of their total population depends on it for their well being. Plants are the basis for the development of modern drugs and medicinal plants have been used for many years in daily life to treat disease all over the world. However, the knowledge of medicinal plant is rapidly dwindling due to the influence of Western lifestyle, reducing in number of generations to carry on the use of plant species in traditional medicine which has increased the interest throughout the world. World Health Organization estimates that 80% of populations from many countries are using traditional of folk medicine to cure various ailments (WHO, 1991).

Over the past two decades several medicinal and ethno-botanical studies in Bangladesh have been carried out by Alam (1992); Alam *et al.* (1996); Anisuzzaman *et al.* (2007); Choudhury and Rahmatullah (2012); Faruque and Uddin (2014); Khan (1998); Khisha (1996) and Yusuf *et al.* (2006, 2009). However, the studies on traditional knowledge of medicinal plants of this country is

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very incomplete. The tribal people of Nawabganj, Dinajpur mostly rely on traditional medicines directly based on plant materials (Ali, 1980). The present work is an attempt to explore the traditional knowledge of medicinal plants in Nawabganj upazila of Dinajpur district, Bangladesh. In this study the local uses of plants recorded from the traditional practitioners to cure different diseases in Nawabganj upazila of Dinajpur district, Bangladesh are described.

Materials and Methods

Study area:

Nawabganj is an upazila of Dinajpur district which is one of the northern districts of Bangladesh. Total area of this upazila is 314.68 sq km, located in between 25°14' and 25°34' north latitudes and in between 88°58' and 89°13' east longitudes. It is bounded by Parbatipur upazila on the north, Ghoraghat and Hakimpur upazilas on the south, Pirganj (Rangpur), Mithapukur and Badarganj upazilas on the east, Birampur and Phulbari upazilas on the west. Here annual average highest temperature 33.5^{o} C and lowest 10.5^{o}C and annual rain fall 2,536 mm. (BPC, 2001).

Data collection:

A total of twenty nine field trips were completed for the documentation of medico-botanical knowledge during January to December 2018. During the field interview, the information was noted in the documentation data sheet. All the information regarding plant species, biological forms, habitat, local names and uses were documented. Medicinal information was obtained through semi-structured interviews with knowledgeable Santals, such as Kabiraj and elderly persons. A total of 134 informants having age range of 20–76 years were interviewed using semi-structured interview method. Professionally they were peasant, day labor, farmer, betel leaf cultivators, house wives, medicine men, small shop keepers etc. Among them 58 were female and rest 76 were male. Plant specimens were collected with flowers and fruits and processed using standard herbarium techniques (Alexiades, 1996).

Identification:

The collected specimens were identified and described up to species with the help of Hooker (1872-1897); Prain (1903); Kirtikar and Basu (1987); and Ahmed *et al.* (2008-2009). For plant nomenclature including the Bangla names, Huq (1986) and Pasha and Uddin (2013) were consulted.

Results and Discussion

A total of 105 plant species under 97 genera belonging to 57 families were recorded which are used for the treatment of 67 disease/ailments. Out of these plant species, 44% belonged to herbs, 28% trees, 18% shrubs and 10% climbers (Fig. 1). Leaves were (29%) the mostly used plant parts in herbal formularies followed by roots (12%), fruits (12%), whole plant (10%), seeds (9%), barks (9%), stems (5%), flowers (4%), latex (2%), rhizomes (2%), petioles (2%), gums (2%), bulbs (1%), tubers (1%), pods (1%) and buds (1%) (Fig. 2). The use of these medicinal plants by the Santals for the treatment of various disease are shown in Table 1.

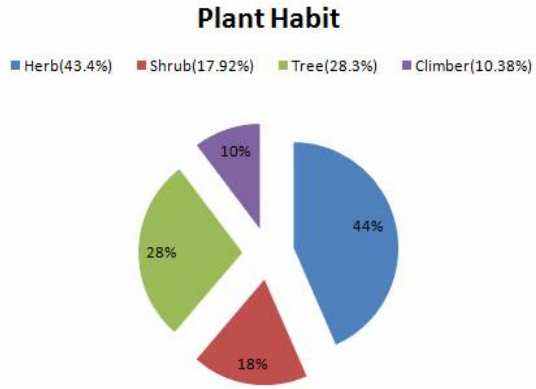

Fig. 1. Recorded plant habit in the study area.

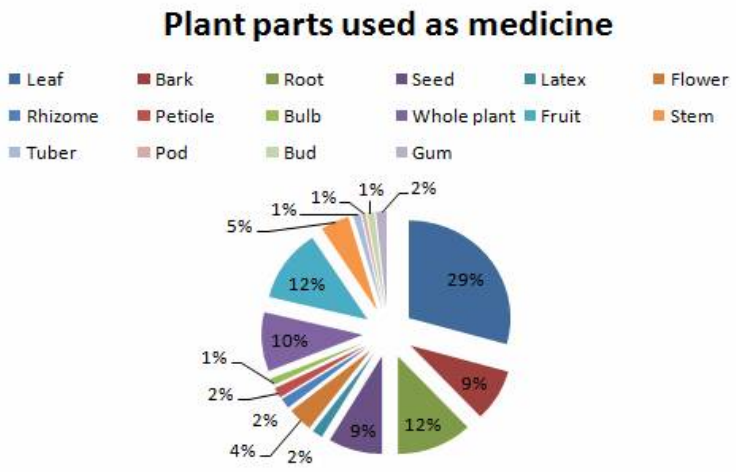

Fig. 2. Recorded plant parts used as medicine.

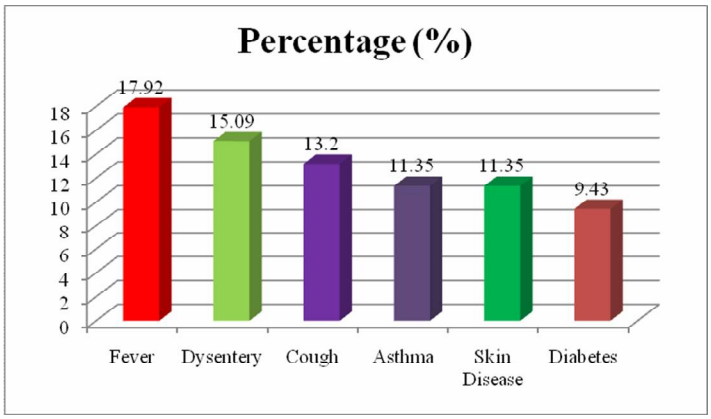

Fig. 3. Recorded dominant diseases in the study area.

Table 1. Investigated Medicinal Plants used by Santals at Nawabganj upazila of Dinajpur District, Bangladesh.

Scientific name & family	Bangla name	Santal name	Parts used	Ailments	Formulations
Abelmoschus esculentus (L.) Moench (Malvaceae)	Dherosh	Dheross	Fruit	Constipation, Hair fall	Raw fruit is taken internally, Paste is taken externally
Abroma augusta L. (Sterculiaceae)	Ulotkambel	Maskundor	Seed	Stomach pain	Seed paste is taken internally
Amomum subulatum Roxb. (Zingiberaceae)	Alach	Alach	Seed	Nausea and Cough	Seed powder is taken internally
Achyranthes aspera L. (Amaranthaceae)	Apang	Chorchori	Leaf	Tonsillitis	Juice of leaf is taken internally
Acalypha indica L. (Euphorbiaceae)	Muktajhuri	Muktajhuri	Leaf	Snake bite	Leaf paste is applied externally
Acacia nilotica (L.) Willd ex Del. (Mimosaceae)	Babla	Jeponi	Leaf, Bark	Bronchitis, Leucoderma	Bark juice is taken internally, Decoction of leaf is taken internally
Alstonia scholaris (L.) R. Br. (Apocynaceae)	Chatim	Chatar	Root, Gum	Ulcer, Cancer	Juice of gum is taken internally Root juice is taken internally
Aloe vera L. (Liliaceae)	Ghrito kumari	Ghrito kumari	Leaf	Paralysis, Skin cure	Decoction leaf is taken internally Leaf paste is taken externally
Allium cepa L. (Liliaceae)	Piaj	Piajdari	Bulb	Cold and Cough, Headache	Warm bulb juice is taken externally
Allium sativum L. (Liliaceae)	Rasun	Rasundari	Bulb	Blood pressure	Bulb is taken internally
Alocasia macrorrhizos (L.) G. Don. (Araceae)	Mancachu	Mancachu	Prtiole, Rhizome	Fever, Snake bite	Eaten raw after cooked, Paste of petiole is taken externally
Amaranthus spinosus L. (Amaranthaceae)	Katanotey	Katanotey	Leaf	Acidity and Dysentery	Juice of leaf is taken internally
Amaranthus viridis L. (Amaranthaceae)	Shaknotey	Lotashakda	Leaf	Acidity and Leprosy	Leaf juice is taken internally
Annona squamosa L. (Annonaceae)	Shorifa	Leoadari	Leaf	Wound	Leaves paste is applied externally
Ananas comosus (L.) Merr. (Bromeliaceae)	Anaros	Anaros	Fruit	Fever, Abortion	Raw fruit is taken internally
Andrographis paniculata (Burm. f.) Nees. (Acanthaceae)	Kalomegh	Mohatita	Leaf	Headache, Diarrhea, Cholera, Fever	Leaf juice is taken internally
Artocarpus heterophyllus Lamk. (Moraceae)	Katal	Kanta	Root, Leaf	Diarrhea, Skin disease	Decoction of root is taken internally Young leaf paste is taken externally
Argemone mexicana L. (Papaveraceae)	Sheyalkata	Kantajhunj	Latex	Tumor and cancer	Latex is taken internally
Areca catechu L.(Arecaceae)	Supari	Guya	Seed, fruit	Dyspepsia	Fruit juice is taken internally
Azadirachta indica A. Juss. (Meliaceae)	Neem	Sinje	Leaf	Skin disease, Chicken pox	Leaf paste is taken externally
Basella alba L. (Basellaceae)	Puishak	Pure ara	Leaf	Burning sensation	Leaf paste is taken externally

Table 1 (contd.)

Scientific name & family	Bangla name	Santal name	Parts used	Ailments	Formulations
Bambusa bambos (L.) Voss. (Poaceae)	Bash	Maa-t	Green part	Stop bleeding	Upper green part is taken externally
Boerhaavia diffusa L. (Nyctaginaceae)	Punornova	Ohoy	Root	Diuretic	Root paste is taken internally
Bombax ceiba L. (Bombacaceae)	Shimul	Aledari	Root	Male weakness	Root juice is taken internally
Brassica napus L. (Brassicaceae)	Sorisha	Turi	Seed	Hair treatment, Skin crack	Seed oil is taken externally
Butea monosperma (Lam.) Taub. (Fabaceae)	Palash	Palash Baha	Flower	Body toxin, Urinary tract	Flower is taken externally, Flower juice mixed with milk is taken internally
Cajanus cajan (L.) Millsp. (Fabaceae)	Arhohor	Rahir	Leaf,Seed	Milk secretion	Decoction of leaf and seeds are taken internally
Carica papaya L. (Caricaceae)	Pepe	Pepedari	Fruit	Constipation, Digestive	Ripe fruit juice is taken internally
Catharanthus roseus (L.) G. Don. (Apocynaceae)	Nayontara	Nayontara	Whole plant	Child's leukemia	Whole plant juice is taken internally
Celosia cristata L. (Amaranthaceae)	Morogful	Kukruchu	Seed	Eye infection	Seed juice is taken internally
Calotropis procera (Aiton) W. T. Aiton. (Asclepiadaceae)	Akondo	Akondo	Leaf, Gum	Arthritis, Rheumatism	Warm leaves are taken externally Gum mixed with mustard oil is taken internally
Capsicum frutescens L. (Solanaceae)	Morich	Akali,Jhal	Leaf	Night blindness	Leaf juice is taken internally
Cassia fistula L. (Fabaceae)	Badarlati	Nuridari	Leaf	Ringworm	Leaf juice is taken internally
Chenopodium album L. (Chenopodiaceae)	Bathua	Bothe shak	Leaf	Hepatic disorders	Crushed leaves is taken internally
Cissus quandrangularis L. (Vitaceae)	Harjora	Harjora	Stem	Heals fractured bone	Stem paste is applied externally
Cinnamomum tamala (Buch.-Ham.) T. Nees & C.H. Eberm. (Lauraceae)	Tejpata	Tejpata	Leaf, Bark	Diabetes and Cold cough, Bronchitis	Raw leaf and leaf juice are taken internally
Clerodendrum viscosum Vent (Verbenaceae)	Vat	Vati	Leaf	Anti-helminthic, Cough	Juice is taken internally
Clitoria ternetea L.(Fabaceae)	Oporajita	Oporajita	Leaf,Root	Headache, Swelling,	Leaf paste is taken externally
Calocasia esculenta (L.) Schott. (Araceae)	Kachu	Seru	Leaf, Petiole	Cancer, Tumors, Stop bleeding	Leaf juice is applied externally Petiole juice is taken externally
Coriandrum sativum L.(Apiaceae)	Dhonepata	Dhonia	Whole plant	Fever, Asthma, Cold	Juice of whole plant is taken
Citrus aurantifolia (Christm.) Swingle (Rutaceae)	Lebu	Kagji	Fruit	Digestive, appetite, Balanced diet	Fruit juice is taken internally Fruit juice is taken externally
Coccinia grandis (L.) Voigt (Cucurbitaceae)	Telakucha	Telakucha	Leaf	Hypertension, Fever and vomiting	Juice of leaf is taken internally

Table 1 (contd.)

Scientific name & family	Bangla name	Santal name	Parts used	Ailments	Formulations
Cuscuta reflexa Roxb. (Convolvulaceae)	Sarnalata	Aloklata	Stem,Leaf	Constipation, Liver disorder,	Decoction of stem is taken internally
Cynodon dactylon (L.) Pers. (Poaceae)	Durba	Dubi ghash	Whole plant	Stop bleeding	Paste of whole plant is applied externally
Cyperus rotundus L. (Cyperaceae)	Mutha	Mutha	Root	Fever, Diarrhea	Decoction of root is taken internally
Dalbergia sissoo Roxb. (Fabaceae)	Sisso	Gidra	Leaf	Gonorrhea, Dysentery	Decoction is taken internally
Datura metel L. (Solanaceae)	Dhutura	Dhutra	Leaf	Earache, Asthma	Raw leaf is smelled
Diospyros malabarica (Desr.) Kostel. (Ebenaceae)	Gaab	Gaabdari	Leaf, Fruit	Dyspepsia, Cough	Fruit paste is taken internally Leaf juice is taken internally
Eclipta alba (L.) Hassk (Asteraceae)	Kalokeshi	Kalokeshi	Leaf	Hair treatment	Leaf paste is taken externally
Enhydra fluctuans Lour. (Asteraceae)	Helencha	Helenchada	Whole plant	Fever	Eaten raw after cooked
Erythrina variegata L. (Fabaceae)	Madar	Gogo	Leaf	Joints pain	Paste of leaf is applied externally
Euphorbia hirta L. (Euphorbiaceae)	Dudhia	Dudhgaga	Whole plant	Bronchitis, Edemas	Decoction of whole plant is taken
Feronia limonia L. (Rutaceae)	Kotbel	Kotbel	Fruit	Heart disease, Digestion	Fruit juice is taken internally
Ficus benghalensis L. (Moraceae)	Bot	Bot	Bud	Malaria	Decoction of young bud is taken
Ficus hispida L.f. (Moraceae)	Khoksha	Sar-haa	Fruit	Diabetes, Jaundice	Decoction of fruit is applied internally
Ficus religiosa L. (Moraceae)	Pakur	Hesa	Fruit	Asthma, Malaria	Raw fruit is taken. Eaten raw after cooked
Ficus racemosa L. (Moraceae)	Jagdumur	Loya	Fruit	Diabetes, Asthma	Raw fruit id applied internally
Glinus oppositifolius (L.) Aug. DC. (Molluginaceae)	Ghima shak	Ghimma shak	Leaf	Pain, Fever, Earache	Juice of leaf is taken internally Raw leaf is eaten. Leaf paste applied externally
Hibiscus rosa –sinensis L. (Malvaceae)	Joba	Jobabaha	Flower	Burn, Hair treatment	Flower paste applied externally
Heliotropium indicum L. (Boraginaceae)	Hatisur	Hatisur	Leaf	Insects bite, Dog bite	Leaf juice applied externally
Ipomoea aquatica Forssk. (Convolvulaceae)	Kolmilota	Kolumshak	Whole plant	Fever, Leprosy, Jaundice	Eaten raw after cooked Leaf paste is taken internally
Ipomoea batatas (L.) Lam. (Convolvulaceae)	Mistialu	Shekalu	Leaf, Tuber	Dysentery, Skin disease, Edema	Tuber juice is applied internally Leaf paste is taken externally
Justicia gendarussa Burm.f. (Acanthaceae)	Bijtarop	Bijtarop	Leaf	Headache	Leaf paste is applied externally

Table 1 (contd.)

Scientific name & family	Bangla name	Santal name	Parts used	Ailments	Formulations
Justicia adhatoda L. (Acanthaceae)	Basak	Harbaskosh	Whole plant	Bleeding piles	Whole plant juice is taken internally
Kalanchoe pinnata (Lam.) Pers. (Crassulaceae)	Pathar kuchi	Patthorr kuchi	Whole plant	Bites of insect	Whole plant paste is taken externally
Lagenaria siceraria (Molina) Standl. (Cucurbitaceae)	Lau	Hot-t	Fruit	Dry cough, Piles	Raw fruit is applied internally Fruit juice is taken internally
Lablab purpureus (L.) Sweet. (Fabaceae)	Shim	Malhan	Leaf	Skin disease, Burn	Leaf paste is taken externally
Leucas aspera L. (Lamiaceae)	Shetodron	Dhurup	Leaf, Root	Stomach pain, Rheumatism	Leaf juice is applied internally
Leonurus sibiricus L. (Lamiaceae)	Roktodron	Roktodron	Whole plant	Menstrual disease	Raw whole plant is taken internally
Lawsonia inermis L. (Lythraceae)	Mehedi	Mendi	Leaf	Hair treatment, Skin disease	Leaf paste is applied externally
Mangifera indica L. (Anacardiaceae)	Aam	Uldare	Leaf	Fever, diarrhea, Toothache	Decoction of leaf is taken internally
Mimusops elengi L. (Sapotaceae)	Bokul	Bokul Baha	Flower	Asthma	Raw flower is smelled
Mimosa pudica L. (Mimosaceae)	Lojjabati	Lojjabati	Leaf	Muscular pain	Decoction of leaf is taken externally
Moringa oleifera Lam. (Moringaceae)	Sajna	Munga	Leaf	Diabetes	Leaf juice is taken internally
Momordica charantia L. (Cucurbitaceae)	Korolla	Karla	Fruit	Diabetes	Fruit juice is taken
Musa sapientum L. (Musaceae)	Kola	Kayra	Stem	Stop bleeding	Stem juice is applied externally
Nerium indicum Mill. (Apocynaceae)	Korobi	Korobiara	Leaf	Insect bite, Swelling	Decoction of leaf is taken externally
Nigella sativa L. (Ranunculaceae)	Kalijeera	Kalijira	Seed	Blood pressure, Asthma	Juice of seed is taken internally
Nymphaea nouchali Burm f. (Nymphaeaceae)	Shapla	Upalbaha	Leaf, Rhizome	Dysentery, Burning spot	Rhizome juice is applied internally Paste of leaf is taken externally
Nyctanthes arbor-tristis L. (Oleaceae)	Sheuli	Sheulibaha	Root	Round and thread-worms	Root juice is applied internally
Ocimum sanctum L. (Lamiaceae)	Tulsi	Tulsi	Leaf	Cough, Fever, Bronchitis	Leaf juice is taken internally
Opuntia stricta (Haw.) Haw. (Cactaceae)	Fanimans	Fanimansha	Fruit	Gonorrhea	Ripe fruit is applied internally
Piper betle L. (Piperaceae)	Pan	Pandari	Leaf	Louse killing	Leaf juice is taken externally
Piper longum L. (Piperaceae)	Pipul	Pepol	Leaf	Fever, Dyspepsia , Asthma	Leaf juice is taken internally

Table 1 (contd.)

Scientific name & family	Bangla name	Santal name	Parts used	Ailments	Formulations
Psidium guajava L. (Myrtaceae)	Peara	Sapri	Leaf, Root	Diarrhea	Decoction of leaf is taken internally
Persicaria hydropiper (L.) Del. (Polygonaceae)	Bishkatal	Jiyoti	Whole plant	Heals fractured bone, Liver disease, Wound, Epilepsy	Paste of whole plant is applied externally. Juice of whole plant is taken internally
Punica granatum L. (Punicaceae)	Dalim	Dalimdari	Fruit	Dysentery	Decoction of dried fruit is applied internally
Phyllanthus emblica L. (Euphorbiaceae)	Amloki	Amlokki	Fruit	Scurvy, Diabetes	Raw fruit is taken internally
Phyllanthus reticulatus Poir. (Euphorbiaceae)	Chitki	Chitkidari.	Root, Leaf	Diarrhea, Epilepsy	Leaf juice is taken internally Decoction of root is applied internally
Saccharum officinarum L.(Poaceae)	Kushar	Aakh	Stem Juice	Jaundice	Stem juice is taken internally
Saccharum sapontaneum L. (Poaceae)	Kash	Kashia	Root	Anorexia	Root paste taken internally
Saraca indica L. (Caesalpiniaceae)	Ashoke	Ashoke	Bark	Anemia, Abortion	Bark juice is taken internally
Spondias pinnata L. (Anacardiaceae)	Amrha	Amrhadari	Root	Irregular menstruation	Raw root applied internally
Solanum nigrum L. (Solanaceae)	Tutbegun	Tutbegun	Fruit	Ringworm	Paste of fruit is applied internally
Syzygium cumini (L.) Skeels. (Myrtaceae)	Jam	Koot	Seed	Diabetes	Paste of seed is taken internally
Swietenia mahagoni (L.) Jacq. (Meliaceae)	Mehogoni	Mehogoni	Seed	Headache	Seed paste is taken externally
Swertia perennis L. (Gentianaceae)	Chirata	Chirata	Root	Hiccups and Vomiting	Root juice is taken internally
Tamarindus indica L. (Fabaceae)	Tetul	Jojo	Fruit	Diabetes, Fever, Gastritis	Ripe tamarind is applied internally
Tagetes erecta L. (Asteraceae)	Gadaful	Genda	Leaf	Bleeding	Leaf paste is applied externally
Terminalia arjuna (Roxb) W.& A. (Combretaceae)	Arjun	Arjun	Bark	Blood pressure, Heart disease	Bark juice is taken internally
Tinospora cordifolia (Thunb.) Miers. (Menispermaceae)	Guloncho	Gullai	Leaf, Stem	Passing of semen Jaundice, Diabetes	Juices of stem and leaf are taken internally. Leaf paste is taken internally
Tridax procumbens L. (Asteraceae)	Tridhara	Tridhara	Leaf	Bronchitis	Leaf juice is taken internally
Trichosanthes bracteata (Lam.) Voigt. (Cucurbitaceae)	Makal	Kaweranda	Root, Seed	Abortion, Dryness	Seed pills are taken internally Root paste taken externally
Wedelia chinensis (Osbeck) Merr. (Asteraceae)	Mahavringaraj	Mahavringa raj	Leaf	Vomiting, Alopecia, Hair tonic	Leaf juice with salt is taken, Leaf paste is taken externally
Zingiber officinale L. (Zingiberaceae)	Ada	Adhe	Rhizome	Indigestion, Cold-cough	Rhizome powder is taken internally

The survey has recorded 67 categories of uses of 105 medicinal plants (Table 1). This is the indication of rich knowledge of medicinal uses of plants by the Santals in Nawabganj upazila of Dinajpur district. Out of 67 categories of ailments, fever, dysentery, cough, asthma, skin disease and diabetes was dominant diseases in the study area (Fig. 3).

The most frequently used species for the treatment of different disease are shown in Table 1. 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, 2009).

During the survey, the discussion, interviews and field visits with traditional healers, kabiraj, herbalists, medicine men, indicated that they have enough knowledge of medicinal uses of plant species. Traditional knowledge of tribal and local people on human disease is very important to find out new drugs for human health, also the doses and their administration needs to standardization with scientific way. Deforestation, civilization, development projects, modernizations and industrialization etc. are largely depleting the biodiversity and natural habitat of these species as well as the traditional knowledge. Conservation initiatives with *in situ* or *ex situ* conservation activities before these medicinal plant resources lost forever and training of the young generation on use and conservation of these medicinal plants are very necessary. The results of this study will play a role in primary health care of human and be helpful in further ethnobotanical studies.

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