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MURAL VEGETATION AND THEIR TRADITIONAL MEDICINAL USES DWELLING IN NALBARI DISTRICT OF ASSAM, INDIA

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ABSTRACT

Mural vegetation is a very fascinating group of plants that can tolerate stress and are capable in thriving in nutritionally deficient substrates and can withstand different types of abiotic stresses like intense light, heat, cold, drought etc. Wall creates opportunities and shelter for assemblage of different plant mural species. Nalbari district is situated in lower Assam which is a rural area with a district headquater town Nalbari. The town area has lots of walls, bridges and other concrete structures which are conducive for the growth of mural vegetation and in villages, mural vegetation occurs in the shady backyards where sunshine is less and the places are continuously drenched with water. Mural vegetation thrives in moist and humid condition. Mural vegetation often prove damaging to buildings, walls, bridges and other concrete structures. Mural vegetation has ecological significance in being pioneer species which build up substrata and thus pave the way for ecological succession. This study highlights plant assemblages that are found on walls and other places within the Nalbari district. Decay and deterioration of walls and other structures provides a conducive environment for the first footholds of mural flora. In the present study, a total of 77 plant species are observed, out of which 7 species are pteridophytes, 58 species are dicotyledons and only 12 species are monocotyledons. A total 66 genera comprising 39 families are documented. The Compositae, Gramineae and Euphorbiaceae are the dominant families of the wall flora. Herbs and shrubs are dominant growth forms on the walls whereas climbers and trees are least observed in walls. Majority of the species were observed in winters and rainy season of the year. Local people used most of the plant species in the treatment of wound healing, fever, skin disease, urinary problems, dysentery etc. Mural flora thrives during rainy season and is less during winter and dry season.

INTRODUCTION

Walls are extensive urban ecosystems that serve as unique habitat for a range of different species thereby supporting plant colonization, establishment and persistence. Walls are regarded as simulated habitats which symbolize a specific environment. Generally, cracks and crevices found in walls are partly similar to rocks and rock fissures (Woodell, 1979). Adaptation to the environmental conditions found in walls and similar habitats is one important factor that determines what species will be found there. Organisms have been adapting to natural walls, cliffs and rock for millions of years but its presence in artificial walls found in both urban and rural areas are a relatively new phenomenon. Floristic composition of the wall habitats in India and abroad has been studied broadly (Salisbury,1920; Varshney,1967;Varshney,1971;Singh *et al.,* 1975). The walls having cracks and crevices provides minimal condition for growth of plant by storing water, act as stage for landing of seeds and excretion of seeds by birds besides storage of seeds by ants. Moreover, the component rocks of stone walls are the natural substrates for living organisms. But in spite of this, little attention has been given to study of flora and fauna grown on walls from a biological perspective, particularly their medicinal potential. Scientific investigations of medicinal plants have been initiated in different parts of our country but nothing much has been done in regard to medicinal plants growing in walls. The tribal and rural people of various parts of India are highly depending on medicinal plant for treatment of different ailments. Walls also have the potential to be ecologically engineered to encourage a greater diversity and supports broad range of species which includes algae, fungi, lichens, moss, ferns besides angiospermic species. This colonization of plant communities in mural habitats depends on various factors which include nature of the substrate,

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availability of water, light conditions, nutrient availability and also vegetation of the surrounding area. Many of these plants play an important role in weathering process of walls due to growth of their roots, chemical and mechanical actions excreted by them (Ceneva & Rachardi,1989).

Study Site: Nalbari district, a North Eastern region of India is an important area of Indian mega-diversity hotspot centre with diverse tribes and traditions along with rich cultural heritage. It extends from 26°830431^{0}N latitudes and from 91.411608°E longitudes. Nalbari is one of the 33 districts in Assam state in north-eastern India. It was carved out of the erstwhile undivided Kamrup district and covers an area equivalent to the area of 627.18 sq. km but as per latest census report, the area is 1150.13sq.km. The district is bounded by river Brahmaputra on the north, Bhutan hills on the south, on the east Kamrup (Rural) on the west Barpeta district. Climate of the district is sub-tropical with semi dry summer and cold in winter. Ranges of annual rainfall are between 1500-2600 mm. The temperature ranges from 7°C-38.5°C.For present study, different sites are selected in Nalbari town and the villages.

The present work aims is to explore and document the medical remedies of some ethnomedicinal plants dwelling in walls which are used by the rural people living in Nalbari district of Assam, India.

MATERIALS AND METHODS

An extensive field study was conducted during the session of 2016-2017 to record the vascular wall flora growing on the walls of the selected studied sites of Nalbari district (M), Assam. One visit was made after every two months to study the seasonal appearance of plants and also their ethno-medicinal uses. The authors used a structured questionnaire that includes age of the respondents, their educational status and medicinal plants used by them. The walls surrounding the Nalbari town, and the villages were studied in the present study. Plants growing on walls were collected, processed for herbarium preservation and finally identified following standard methods involving dissection, description and reference to literature. The families and genera of different angiospermic plants are according to Bentham and Hooker's system of classification (1862-1883) and the families of pteridophytic species are arranged after Pichi Sermolii (1977,1982) with slight modifications.

For preparation and preservation of plant specimens, the herbarium techniques as suggested by Jain and Rao (1977) are followed. The authentic specimens are preserved and maintained in the Department of Botany, Nalbari college, Nalbari.

The information and data used in the present study are taken from diverse sources which include community consultations, individual interviews, field observations, literature review, group discussions, unpublished literature, field investigations and internet databases.

In the present investigations, the wall so observed in different sites not only differs in ages and sizes but also differs in chemical composition and other ecological conditions. Although the identification of rock/stone types and chemical analysis of wall substrates is beyond the scope of the present investigation, general observations in regard to substrate is made and accordingly, different types of walls are found which are categorized as follows:

a)Brick wall with cement as binding material(**BW**).

b)Stone wall with cement as binding material(**SW**)

c)Brick Mortar wall with mortar as cementing material(**BM**)

We explored the diversity and co-existence of different plant growth forms, assessment of habitat conditions, and relationship between habitat factors and vegetation occurrence. Nearly, 50different walls with notable plant colonization in specific sites of the district were studied. Analysis of substrata found in different sites in regard to pH is also done after collecting samples (substrata) from different sites.

The study was mainly restricted to the vertical wall tops, wall bases (vertical surface up to 30 cm above ground) and vertical side walls. Data on flora and substrata were collected from different walls having varied chemical composition.

RESULTS AND OBSERVATIONS

The present study revealed that 77 plant species (70 of angiospermic and 7 of pteridophytic plants) of 66 genera belonging to 39 families were found in the different walls of Nalbari district (M). These plants possess medicinal values and are used by rural communities to cure various ailments like diarrhoea, diabetes, asthma, fever, jaundice, rheumatism, wounds, cuts, stomach problems, cough, cold, poisonous bites etc. Compositae is represented by the highest number of species (13 species) followed by Gramineae (5 species), Euphorbiaceae (5 species), Commelinaceae (3 species),Amaranthaceae(3 species) and Labiatae(3 species). 9 families were represented by 2 species, and 23 by 1 species. The medicinally important plants used by the villagers of Kamrup district(M), with their family name and local name is given in the Table 1.

The study reveals that the Compositae and Graimineae are the dominant families of the wall flora of Nalbari district,Assam. Many other studies also suggest that Compositae and Gramineae families are dominant on walls (Brandes,1995; Chhetri,2008,Nedelcheva,2011). Thus, the present study also supports that Compositae, Gramineae and Euphorbiaceae are the dominant families of the wall flora of study area which is given in the Fig.1 It is also observed that mostly members of Compositae colonize the walls in winter season while the members of Gramineae colonize the walls in Monsoon. Contrary to these, members of Euphorbiaceae observed to colonize the walls in summer season.

The villagers which include both traditional healers and households of Nalbari district used herbal therapies prepared from 77 plants growing in the walls to treat more than 30 different illnesses. The name of the disease and the plants used to treat respective disease is given in the Table 2. Regarding the plant parts used, leaf is the mostly used plant part to treat a particular disease followed by whole plant and roots. Fruit, seed, rhizome, stem and tuber are the least used parts by the villagers as shown in Fig 2.Earlier ethno-botanical studies also confirmed that leaves are the major portion of the plant used in the treatment of diseases(Ayyanar *et al*, 2008).

The composition and style of wall construction have a profound effect on the distribution of colonizing organisms. Soil or organic matter that accumulates in wall crevices, mortar courses or near the base of the wall forms yet another important

substrate which invites different vascular plants. Although some lichens, particularly crustose type and mosses grow in these microhabitats, yet vascular plants frequently gain upper hand in most walls and eventually dominate in such areas in due course of time. Since lichens are very sensitive to air pollution, particularly different gases and aerosols, they have been used as indicators of environmental quality (Gries,1996). As such, they are mostly absent in the most urban walls due to air pollution. Mosses act as pioneers species particularly in the cracks and crevices of walls which is slightly moist and as such they are frequently preceded by the establishment of vascular plants. Mosses also show some sensitivity towards to air pollution and as a result, they fail to establish in some walls resulting to the dominance of vascular plants.

The most commonly visible angiospermic flora on the walls of the study area includes are *Peperomia pellucida, Amaranthus spinosus, Pouzolzia zeylanica, Commelina benghalensis, Tridax procumbens, Ficus hispida, Ficus racemosa, Ficus religiosa* etc.(Fig. 3).Along with the angiosperms, the common pteridophytes particularly ferns such *Drynaria quercifolia, Pyrossiaadnascens, Pteris vitata, Adiantum philippense, Adiantum caudatum, Microlepia speluncae, Diplazium esculentum* makes its appearance in different microhabitats of the wall during the process of succession.

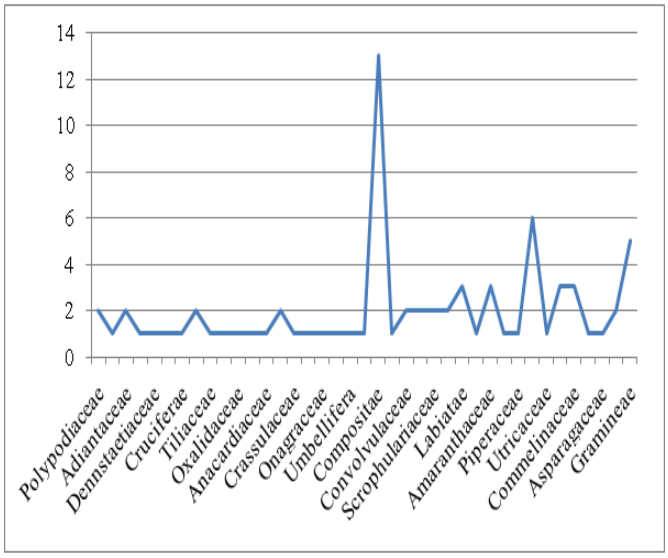

Fig. 1. Distribution pattern of recorded ethnobotanical plants into different families.

Table 1. List of vascular plants and their ethno-medicinal uses found in walls of Nalbari district, Assam

Sl. No.	Name of the species	Family	Part(s) Used	Medicinal Use
1	*Drynaria quercifolia* (L.) J.Smith	Polypodiaceae	Rhizome, leaves, whole plant	Fever, skin disease, stomach disorder
2	*Pyrossiaadnascens* (Swartz)Ching	Polypodiaceae	Rhizome	Cough and cold
3	*Pteris vitata* Linn.	Pteridaceae	Leaves	Wounds, burns
4	*Adiantum philippense* L.	Adiantaceae	Fronds, Rhizome	Fever, dysentery, asthma, leprosy, ulcers
5	*Adiantum caudatum* Linn.	Adiantaceae	Fronds	Wound healing
6	*Diplazium esculentum* (Retz.) Sw.	Woodsiaceae	Fronds	Asthma, tumour, urinary complain
7	*Microlepia speluncae* (Linn.)	Dennstaetiaceae	Root	Respiratory complain
8	*Argemone mexicana* L.	Papavaraceae	Whole plant, root, leaves, flowers	Leprosy, skin disease, worm infestation
9	*Rorippaindica*(Linn.) Hiern	Cruciferae	Whole plant, Seeds	Leprosy, Diuretic
10	*Cleome rutidosperma*DC Prodr.	Capparidaceae	Roots	Wound healing, fever, inflammation
11	*Cleomeviscosa* L.	Capparidaceae	Leaves	Ulcers, headache, diabetes
12	*Triumfetta r*homboidea Jacq.	Tiliaceae	Leaf, flower, fruit	Diuretic
13	*Portulacaoleraceae* Linn.	Portulaceae	Whole plant, Stem, Leaves	Scurvy,, kidney and liver problem
14	*Oxaliscorniculata* Linn.	Oxalidaceae	Whole plant, leaf, young shoot	Dysentery, stomach disorder, scurvy,
15	*Caryatia trifolia* (L.)Domin.	Vitaceae	Leaf	Menstruation,
16	*Mangifera indica* L.	Anacardiaceae	Leaf(Juice)	Gastric problems, ulcers, diarrhoea
17	*Desmodiumtriflorum*(L.) DC	Fabaceae	Leaves	Dysentery
18	*Crotolaria juncea* L.	Fabaceae	Seeds, leaves, roots	Anaemia
19	*Kalanchoe pinnatum* (Lamk.)Pers.	Crassulaceae	Leaf	Insect bite

20	*Lawsonia inermis* L.	Lythraceae	Leaves,roots,flowers	Headache, bronchitis, skin diseases
21	*Ludwigiaoctovalvis* (Jacq) P.H.Raven	Onagraceae	Whole plant	Eczema, fever, dysentery, cancer, jaundice
22	*Cocciniagrandis*(L.)Voigt	Cucurbitaceae	Leaf	Skin diseases, leprosy, jaundice, diabetes,
23	*Centella asiatica* (Linn.) Urb.	Umbellifera	Whole plant, leaf	Leprosy, urinary disease
24	*Hedyotis corymbosa* (Linn.) Lam	Rubiaceae	Whole plant, leaf, shoot,	Diuretic, fever, skin disease
25	*Eclipta prostrate*(L.)Linn.	Compositae	Whole plant, leaf, root	Snake bite, jaundice
26	*Mikania micrantha* H.B.K.	Compositae	Leaf	Cut and wound, diarrhoea
27	*Tridax procumbens* Linn.	Compositae	Whole plant	Dysentery, hair loss prevention, wound healing
28	*Synedrella nodiflora*(L.) Gaertn.	Compositae	Leaves	Wound healing
29	*Aegeratum conyzoides* L.	Compositae	Whole plant, leaf, young shoot,	Cuts, wounds, jaundice
30	*Conyza bonariensis*(L.) Cron.	Compositae	Whole plant	Diuretic, checks bleeding, eczema
31	*Emila sonchifolia*(L.) DC	Compositae	Leaves	Fever, malaria , asthma, burns
32	*Chromolaena odorata*(L.) King & Robinson	Compositae	Leaf(Juice)	Wound and cuts, headache
33	*Gnaphalium luteo-album* L	Compositae	Leaf	Diuretic
34	*Parthenium hysterphorus* L.	Compositae	Roots	Skin disorders, dysentery
35	*Spilanthes paniculata* Wall. Ex. *DC.*	Compositae	Inflorescence, leaves	Cough, jaundice, wound healing, toothache, constipation
36	*Sonchus oleraceus* L.	Compositae	Leaves	Wounds,burns,diabetes,bronchitis,jaundice
37	*Vernonia cinera*(L.) Less.	Compositae	Leaf(Juice)	Gynaecological problem
38	*Catharanthus roseus* (Linn.) G.Don	Apocynaceae	Leaf(Paste)	Headache, diabetes
39	*Evolvulus nummularius* (Linn.)Linn.	Convolvulaceae	Whole plant	Burns, cuts, wounds
40	*Merremia vitifolia* (Burm.f.) Hallier.f	Convolvulaceae	Whole plant	Antidote to insect bite
41	*Solanum nigrum* Linn.	Solanaceae	Fruit(Berries),Tender leaf, young shoot	Fever, indigestion
42	*Nicotiana plumbaginfolia* L.	Solanaceae	Leaves	Diuretic, expectorant, relieves swelling and fever,
43	*Scoparia dulcis* Linn.	Scrophulariaceae	Leaf	Jaundice, cough, bronchitis, Irregular menstruation
44	*Lindernia crustacea* (Linn.) F.V.Muell	Scrophulariaceae	Whole plant	Wound healing
45	*Andrographis paniculata*(Burm.f.)Wall	Acanthaceae	Leaves, root	Diarrhoea, fever, malaria, cough
46	*Justicia simplex* D.Don	Acanthaceae	Leaves	Diuretic, anti-helminthic, fever, asthma
47	*Leucas plukenetii* (Roth.) Spreng	Labiatae	Leaf	Stomach trouble,
48	*Ocimum tenuiflorum* L.	Labiatae	Leaf(Juice)	Cold and cough, constipation, gout
49	*Ocimum gratissimum*L	Labiatae	Leaf, young shoot	Cough, asthma
50	*Boerhavia diffusa* Linn.	Nyctaginaceae	Root, whole plant	Jaundice, urinary disease,stomach problem
51	*Amaranthus spinosa* Linn.	Amaranthaceae	Whole plant	Blood disorder, antidote against snake bite, urinary disease

52	*Amaranthus viridis* Linn.	Amaranthaceae	Stem and leaf	Small pox
53	*Alternathera sessilis* (Linn.) D.C.	Amaranthaceae	Stem and leaf(juice)	Snake bite, indigestion, anaemia, dysentery
54	*Mollugo oppositifolia* Linn.	Molluginaceae	Whole plant	Diabetes, skin disease
55	*Peperomia pellucida*(-Linn.).H.B.K.	Piperaceae	Whole plant	Cuts, wounds, headache, fever, antidote to insect bite
56	*Acalypha indica* Linn.	Euphorbiaceae	Leaves	Jaundice
57	*Euphorbia hirta* Linn.	Euphorbiaceae	Whole plant(Juice),-Seed	Cough, dysentery, worm infestation
58	*Euphorbia thymifolia* L.	Euphorbiaceae	Dried leaf and seed	Skin disease
59	*Phyllanthus amarus* Schumach & Thonn.	Euphorbiaceae	Whole plant	Asthma, diuretic, jaundice
60	*Phyllanthus fraternus* Webster	Euphorbiaceae	Fruit, leaf	Fever of infant, jaundice, malaria, dysentery, urinary trouble
61	*Phyllanthus reticulatus* Poir.	Euphorbiaceae	Leaf	Diuretic
62	*Pouzolzia zeylanica*(L.)Benn	Utricaceae	Whole plant	Jointproblem
63	*Ficus religiosa* Linn.	Moraceae	Bark, stem	Dysentery, fever, piles, skin disease
64	*Ficus racemosa* Linn.	Moraceae	Root	Dysentery, diabetes, liver disorder, urinary diseases
65	*Ficus hispida* L.	Moraceae	Fresh fruit(Juice)	Cough, skin disease
66	*Commelina benghalensis* L.	Commelinaceae	Shoot	Snake bite, leprosy, skin inflammation
67	*Commelina paludosa* Blume	Commelinaceae	Shoot(Sap)	Eye disorder,
68	*Tradescantia spathacea* Sw.	Commelinaceae	Leaves, stem	Cold, nasal bleeding,
69	*Colocasia esculenta* (Linn.) Schott	Araceae	Leaves and leaf base	Anaemia
70	*Asparagus racemosa*Will*d*.	Asparagaceae	Leaf, young shoot, root	Kidney stones, rheumatic pain, urinary tract inflammation
71	*Cyperus brevifolius* (Rottb.) Hassk	Cyperaceae	Rhizome	Impotency
72	*Cyperus rotundus*L.	Cyperaceae	Tuber, rhizome	Diarrhoea, diabetes, malaria, stomach disorder
73	*Cynodon dactylon*(L.)Pers.	Gramineae	Leaf(Sap)	Eye infection, irregular menstruation, cuts and injuries, dysentery, headache
74	*Chrysopogon aciculatus*(Retz.)Trin.	Gramineae	Whole plant	Rheumatism, antidote
75	*Dactyloctenium aegyptium* (L.) P. Beauv.	Gramineae	Whole plant	Fever, diuretic, constipation, cough, wound healing
76	*Pogonatherum crinitu*m(Thumb.) Kunth.	Gramineae	Whole plant(Ash)	Skin problems
77	*Imperata cylindrica* (L.) P.BW	Gramineae	Roots	Anthelmintic

Table 2. Name of the diseases and botanical names of the plants used by villagers of Nalbari district

Sl.No.	Name of the disease	Name of the plants used
1	Anaemia	Crotolaria juncea,Alternathera sessilis,
2	Asthma	Adiantum philippens,Diplazium esculentum,Emila sonchifolia,Justicia simplex ,Ocimum gratissimum ,Phyllanthus amarus,Colocasia esculenta,
3	Anthelminthic	Argemone mexicana,Justicia simplex ,Euphorbia hirta,Imperata cylindrica,
4	Blood disorder	Hedyotis corymbosa,Amaranthus spinosa ,

5	Bronchitis	Lawsonia inermis,Sonchus oleraceus,Scoparia dulcis,
6	Cancer	Diplazium esculentum,Ludwigia octovalvis,
7	Cold and Cough	Pyrossiaadnascens,Spilanthes paniculata,Scoparia dulcis, Andrographis paniculata,Ocimum gratissimum ,Ocimum tenuiflorum,Euphorbia hirta, Ficus hispida,Tradescantia spathacea,Dactyloctenium aegyptium,
8	Diabetes	Cleomeviscosa,Coccinia grandis,Sonchus oleraceus, Catharanthus roseus,Mollugo oppositifolia,Ficus racemosa ,Cyperus rotundus,
9	Dysentery	Adiantum philippense,Oxalis corniculata,Desmodium triflorum,Tridax procumbens, Parthenium hysterphorus,Alternathera sessilis,Euphorbia hirta,Ficus religiosa,Ficus racemosa ,Cynodon dactylon,
10	Diarrhoea	Mangifera indica,Mikania micrantha ,Andrographis paniculata,Cyperus rotundus,
11	Eczema	Ludwigiaoctovalvi,Conyza bonariensis,
12	Eye infection	Mikania micrantha,Solanum nigrum,Commelina paludosa,Cynodon dactylon,
13	Fever	Drynaria quercifolia,Adiantum philippense,Cleome rutidosperma,Ludwigia octovalvis,Hedyotis corymbosa,Solanum nigrum,Nicotiana plumbaginfolia,Andrographis paniculata,Peperomia pellucida,Phyllanthus fraternus,Ficus religiosa,Dactyloctenium aegyptium,
14	Inflammation	Cleome rutidosperma, Nicotiana plumbaginfolia,Commelina benghalensis,
15	Jaundice	Ludwigiaoctovalvis,Coccinia grandis, Eclipta prostrate,Aegeratum conyzoides,Spilanthes paniculata,Sonchus oleraceus,Scoparia dulcis,Boerhavia diffusa,Acalypha indica,-Phyllanthus amarus,Phyllanthus fraternus,
16	Leprosy	Adiantum philippens,Argemone mexicana,Rorippa indica,Coccinia grandis,Centella asiatica,Commelina benghalensis,
17	Liver problems	Portulacaoleraceae,Ficus racemosa
18	Malaria	Emila sonchifolia,Andrographis paniculata,Phyllanthus fraternus,Cyperus rotundus,
19	Mentruation problem	Caryatia trifolia,Scoparia dulcis,Cynodon dactylon,
20	Poisonous bites	Kalanchoe pinnatum,Eclipta prostrate, Merremia vitifolia,Amaranthus spinosa ,Alternathera sessilis,Peperomia pellucida,Chrysopogon aciculatus,
21	Rheumatism	Synedrella nodiflora,Chrysopogon aciculatus
22	Scurvy	Portulacaoleraceae,Oxalis corniculata,
23	Small Pox	Amaranthus viridis
24	Stomach problem	Oxaliscorniculata,Mangifera indic,Solanum nigrum,Leucas plukenetii ,Boerhavia diffusa,Alternathera sessilis,Cyperus rotundus,
25	Skin disease	Drynaria quercifoli,Argemone mexicana,Lawsonia inermis,Coccinia grandis,Hedyotis corymbosa,Conyza bonariensis,Parthenium hysterphorus,Mollugo oppositifolia, Euphorbia thymifolia,Ficus religiosa,Ficus hispida,Pogonatherum crinitum,
26	Toothache	Spilanthes paniculata
27	Ulcers	Adiantum philippense,Cleome viscosa,Mangifera indica,
28	Urinary disease	Diplazium esculentum,Portulaca oleraceae,Centella asiatica,Boerhavia diffusa,Amaranthus spinosa ,Phyllanthus fraternus,Ficus racemosa ,Asparagus racemosa,
29	Wound Healing	Pteris vitata,Adiantum caudatum,Cleome rutidosperma,Mikania micrantha,Tridax procumbens,Synedrella nodiflora,Aegeratum conyzoides,Chromolaena odorata,Spilanthes paniculata,Sonchus oleraceus,Evolvulus nummularius,Lindernia crustacea, Peperomia pellucida,Cynodon dactylon,Dactyloctenium aegyptium,

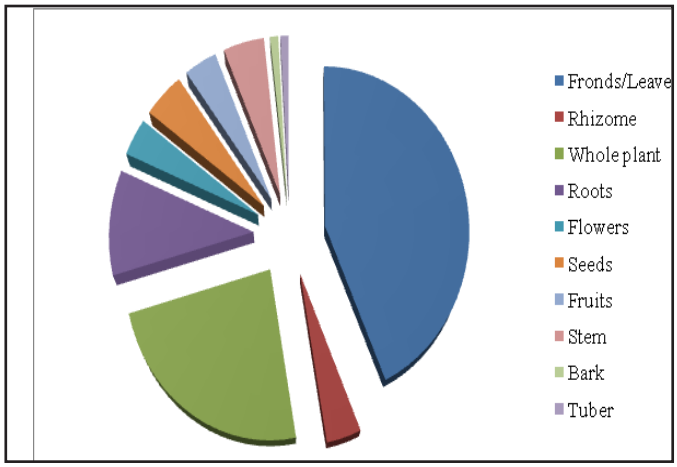

Fig. 2. Utilization pattern of different plant parts used by locals of Nalbari district,Assam

DISCUSSION

The herbal preparations made from the traditional medicinal plants were mostly used for the treatment of wound healing (15 species),, dysentery (10 species), cold (11 species), asthma (7 species)and diarrhoea (4 species each). The study showed that a good number of the collected plants were used for the treatment of multiple diseases. *Scoparia dulcis* (Jaundice, cough, bronchitis, kidney trouble) and *Sonchus oleraceus(*Wounds,diabetes,jaundice,bronchitis) is used for the treatment of four diseases; *Ocimum tenuiflorum* (Cold, constipation, gout), *Solanum nigrum* (Eye problem, fever, indigestion) and *Andrographis paniculata* (diarrhoea, malaria, cough) are used for the treatment of three diseases; other plants used for two diseases and the rest of the plants are used to treat only one disease. Since most of them are herbs, they grow fast and therefore can provide a continuous supply of the medicinal products which can be additional source of income generation. A wide assemblage of species and growth forms having different medicinal potential are found to establish spontaneously on walls. Native species normally outnumber the alien species by a large margin. The alien invasive plant species found to grow in this unique habitat includes *Chromolaena odorata, Argemone mexicana*, *Portulaca oleraceae*, *Aegeratum conyzoides,*. Three climber species found to grow in these walls are *Mikania micrantha,Merremia vitifolia*,*Coccinia grandis* having medicinal potential. The favourable climatic conditions and the composition of walls along with the cementing material used have also contributed to high taxonomic diversity at species, genera and family levels. The walls are mainly situated within urban and rural landscape and so the composition of the wall flora is strongly influenced by the surrounding vegetation type. The growth of trees on the walls causes a strong and negative effect on the consistency and longevity of walls. Most of the plants found on the walls are in fact generalist species, which are not only successful in colonizing and establishment on walls, but they are also found to occur in a variety of other habitats. It is also observed that the successful colonisers of the wall produce large number of reproductive propagules mainly in the form of seeds which are disseminated mainly by the action of winds. Cushion-like appearance of various wall-dwelling flowering plants is another adaptation that faciliates the retention of water (Darlington,1981). Vascular plants living on such habitats frequently possess many xerophytic features which includes thick and fleshy leaves, hairiness, or a waxy cuticle. In addition, some climbers found are well-suited to life on walls because of presence of adhesive nature of their adventitious roots. Thus, these mural plants can be an important source of medicine until their properties are evaluated and their efficacy is experimentally proved.

1(a)*Scoparia dulcis*

1(b)*Cleome rutidosperma*

1(c)Asparagus racemose

1(d) Pouzolzia zeylanica

1(e)Pogonatherum crinitum

1(f)Peperomia pellucida

Fig. 3. Photographic Plate of mural flora, 1(a) to 1(f)

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