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A COMPREHENSIVE ETHNOMEDICINAL DOCUMENTATION OF MEDICINAL PLANTS OF ISLAMIC UNIVERSITY, REGION, BANGLADESH

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ABSTRACT: An ethnobotanical survey was carried out through semi-structured questionnaire and the guided field-walk method in Islamic University, Kushtia, Bangladesh to document the utilization of medicinal plants by local people for general ailments. A total of 87 species belonging to 51 families with their local names, useable parts and mode of application were recorded for their usages for curing at least 70 ailments. Ethnomedicinally most important families are Asteraceae, Combretaceae, Moraceae, Solanaceae, Apocynaceae. These plant species are utilized by local peoples against various ailments such as dysentery, fever, cough, sexual debility, asthma, skin disease, diarrhea, indigestion, wound healing, toothache, malaria, etc. Indigenous knowledge of Kavirajes or knowledgeable local persons have great contributions in formulating applicable strategy for the development of various medicine using plants as either fresh or raw sources or both. These scattered, selective, fast eroding and highly valuable knowledge needs proper documentation.

INTRODUCTION: The fundamental rights of mankind are treatment, food, clothing, education and abode. Traditional medicinal practices exist in a number of countries of the world including Bangladesh, India and Pakistan, because most of the people, here cannot face their health service demand, principally treatment, because health service present in the elementary level and poor economy. Medicinal plants offer alternative remedies with tremendous opportunities to generate income, employment and foreign exchange for developing countries¹.

The World Health Organization (WHO) shows that more than half of the world's population does not have access to adequate health care services². Alternative innovative approaches are needed to mitigate this problem that will ensure adequate health care service.

From the dawn of human civilization, many herbal plants are being used as traditional healing by the rural peoples which are the indispensable part of their daily life. The WHO estimates that more than 80% of the world's population rely either solely or largely on traditional remedies for health care². Over a period of thousands of years, especial systems Ayurveda and Unani were developed when peopled learned to use a variety of plants for different ailments³. It is estimated that around 70,000 plants species from lichens to towering trees, have been used for medicinal purposes⁴.

The present study was conducted at Islamic University campus region- a rich flora of medicinal plant located in Kushtia, Bangladesh. The local Kavirajes and the beneficiary local people are largely dependent on this region to fulfill their need of raw medicinal plants to treat their common ailments and disorders.

Albeit this region is found to be a rich source of a variety of medicinal plants, no systematic study conducted yet. The purpose of the current study was to identify the local medicinal plants and document them in a scientific way.

MATERIALS AND METHODS: We invited three Kavirajes to check the plant out that is it a medicinal plant namely, Shree Nipendro Kobiraj from Jainta Pur, Bador Kabiraj practicing in Sheikh Para Bazar, Kalachan from Tribeni these have notched fame up for their good hand including gardener of Applied Science and Technology Faculty, Khalada Zia Girls Hostel and BSRM Hall also two knowledgeable local persons helped us to pile up data and perform this ethnomedicinal survey. The collection of data through interviews of Kavirajes, Gardeners and Locals were conducted with the help of a semi-structured questionnaire and the guided field-walk method^{5,6}.

Briefly, in this method, the Kavirajes and others took the interviewers on field-walks to campus where they usually collected their medicinal plants, pointed out the plants and described their uses. All provided information was double-checked with them in later evening sessions. Plant specimens were collected, sampled and sent identified by the Bangladesh National Herbarium. Information obtained from the Kavirajes, Gardeners and other folk medicinal practitioners during daytime field-walks were cross-checked in evening meetings with the practitioners and any other interested person of the village present at those meetings.

RESULTS AND DISCUSSION: The present survey documented 87 plant species distributed into 51 families that are being traditionally used for treatment of various diseases (**Table 1**). Major families contributing plant species towards treatment of various diseases included the Asteraceae, Combretaceae, Moraceae, Solanaceae, Apocynaceae, Araceae, Rutaceae, Rubiaceae families. Some plant families including Araceae, Cyperaceae, Meliaceae, Sapotaceae contributing lower number of plant species (**Table 2**).

The large number of plant species used for treatment of diseases testified to the Kavirajes' knowledge of the medicinal properties of plants growing within the surveyed area. It was documented that most of the plant were short lived with 54.02% are commonly used as a medicinal plant (**Table 3**). It can be said that most of the medicinal plant is naturally occurring because the report in the surveyed area showed 63.22% (**Table 3**).

Among the selected species ethnomedicinally the maximum contribution was recorded for herb with 33 species (36.78%) and the lowest contributor was recorded for climber with 5 species (6%) (**Figure 1**). It was observed that virtually all parts of plants were used for treatment. Whole plant constituted the plant part most frequently used, forming 39% of total uses. Whole plant was followed by leaves at 25% and fruits at 16% while barks formed 6% of total uses. Other plant parts used included stems, flowers, seeds, gum, rhizome and latex (**Figure 2**).

TABLE 1 ETHNOMEDICALLY IMPORTANT SPECIES IN STUDY AREA

S. No.	Scientific Name	Family Name	Local Name	Location	Habit	Part used	Duration	Origin	Ailments
1	<i>Abroma augusta</i> L.	Sterculiaceae	Ulot kombol	Fallow land	S	Whole plant	SL	W	Root bark juice - dysmenorrhoea; leaf & stem - dysentery, weakness.
2	<i>Abutilon indicum</i> L.	Malvaceae	Potari	Un ploughed land	S	Whole plant	SL	W	Whole plant - fever, cough, piles, stones in bladder.
3	<i>Acacia nilotica</i> L.	Mimosaceae	Babla	Road side	T	Whole plant	LL	P	Bark-cough, bronchitis, gum - sexual debility; leaf- eucoderma, gonorrhoea.
4	<i>Achyranthes aspera</i> L.	Amaranthaceae	Apang	Un ploughed land	H	Whole plant	SL	W	Root- given with water to treat snake bites; flowering spikes or seed - paste with water used in night blindness and cutaneous diseases.
5	<i>Adhatoda vasica</i> N.	Acanthaceae	Basak	Fallow land	S	Whole plant	SL	W	The root, bark & leaf - cough, asthma; fresh flower - ophthalmia.
6	<i>Ageratum conyzoides</i> L.	Asteraceae	Fulkuri	Untilled land	H	Whole plant	SL	W	Leaf - boils as a poultice; leaf & stem - skin disease; flower buds cure cancerous growth.

7	<i>Aegle marmelos</i> L.	Rutaceae	Bel	Road side	T	Fruit	LL	P	Fruit pulp - orally in diarrhoea and dysentery.
8	<i>Aloe barbadensis</i> M.	Aloaceae	Gheeto kumari	Hall premise	H	Leaf	SL	p	Leaf juice - orally in lung disease and stomach disorders with sugar; leaf - skin burns.
9	<i>Alstonia scholaris</i> L.	Apocynaceae	Chatim	Road side	T	Stem	LL	P	Stem - swellings of mouth, scurvy.
10	<i>Andrographis aniculata</i> (Burm.F.)	Acanthaceae	Kalo megh	Fallow land	S	Whole plant	SL	W	Whole plant - liver complaints, colic, constipation, diabetes.
11	<i>Anthocephalus chinensis</i> (Lam.)	Rubiaceae	Kodom	Pond side	T	Leaf	LL	W	Leaf - leaf juice orally in fever.
12	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Kathal	Road side	T	Gum	LL	P	Gum - dry cracked heels, hemorrhoids.
13	<i>Areca catechu</i> L.	Arecaceae	Supari	Road Side	T	Root	LL	P	Root paste - toothache; nut - used for fever and rheumatism; fruit - with coconut oil on burns.
14	<i>Averrhoa carambola</i> L.	Oxalidaceae	Kam ranga	Road side	T	Fruit	LL	P	Fruit pulp - cold, cough, dandruff.
15	<i>Azadirachta indica</i> A. Juss.,	Meliaceae	Neem	Road side	T	Whole plant	LL	P	Leaf - to treat scabies; young stem - tooth problems; fresh leaf - control of sugar level.
16	<i>Bacopa monnieri</i> (L.)Pennel	Scrophulariac eae	Braham	Fallow land	H	Whole plant	SL	N	Plant juice - orally as diuretic, cardiac tonic and memory enhancer.
18	<i>Borreria articularis</i> (L. F.) F. N. Will.	Rubiaceae	Madnabat a	Untilled land	H	Whole plant	SL	W	Whole plant - inflammation of eye, diarrhoea, dysentery.
19	<i>Borassus flabellifer</i> (L.)	Arecaceae	Tal	Pond side	T	Fruit	SL	W	Fruit juice - coughs and pulmonary affection.
20	<i>Buettneria pilosa</i> Roxb..	Sterculiaceae	Harjora	Fallow land	C	Stem	SL	W	Stem - fractured bones; Leaf & stem - wound healing.
21	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Noyon tara	Un ploughed land	H	Leaf	SL	W	Leaf - diabetes, Cancer, taking 2-3 leaves orally with water daily can control blood sugar.
22	<i>Centella asiatica</i> L.	Apiaceae	Thankoni	Untilled land	H	Whole plant	SL	W	Leaf & steam - skin diseases, leprosy, and mental disorder; leaf juice- orally in indigestion.
23	<i>Calotropis gigantean</i> (L.) W.T	Asctopiadace ae	Akand	Campus Road side	S	Whole plant	LL	W	Extracts of roots & leaf - abdominal tumors, cancers; flower - stomathic, digestive and tonic.
24	<i>Convolvulusob scurus</i> L.	Convolvulace ae	Ban Kalmi	Untilled land	C	Leaf	SL	W	Leaf juice - aphthous affection.
25	<i>Carica papaya</i> L.	Caricaceae	Papa	Pond side	S	Latex	LL	P	Latex -fever, blood dysentery; unripe fruit - dysentery; ripe fruit - fever.
26	<i>Citrus limon</i> (L.) Burm. f.	Rutaceae	Labu	Field	S	Fruit	LL	P	Fruit juice - dandruff, expel intestinal worms.
27	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Durba gash	Field	H	Whole plant	LL	W	Plant paste - cuts and wounds; plant juice - eardrop in earache.
28	<i>Cyperus rotundus</i> L.	Cyperaceae	Mutha gas h	Field	H	Tuber	LL	W	Tuber paste - orally in dysentery, diarrhoea and indigestion with salt.
29	<i>Cissus quadrangulari</i> s L.	Vitaceae	Harjod	Untilled land	S	Whole plant	LL	W	Whole plant - bone fracture, wound healing.
30	<i>Clitoria ternatea</i> L.	Fabaceae	Aparajita	Untilled land	S	root	SL	W	Root paste - pimple; Leaf juice - digestive problem.
31	<i>Coccinia</i>	Cucurbitacea	Telakachu	Untilled land	C	Leaf	SL	W	Leaf juice - hypertension, diabetes,

	<i>grandis</i> (L.) J. Voigt	e							indigestion.
32	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Sissu	SH hall Road side	T	Leaf	LL	P	Leaf decoction - orally in gonorrhoea, dysentery.
33	<i>Datura metel</i> L.	Solanaceae	Dhutura	Fallow land	H	Whole plant	SL	W	Leaf juice - orally in epilepsy; dried stem & leaf - smoked in asthma.
34	<i>Dillenia indica</i> L.	Dilleniaceae	Chalta	Beside BSMR hall	T	Fruit	SL	P	Fruit - orally with honey and nigella for sex stimulant.
35	<i>Diplazium esculentum</i> (Retz.)	Woodsiaceae	Dheki shak	Un ploughed land	S	Leaf	SL	W	Leaf juice - fever, vegetable; Leaf & stem - weakness.
36	<i>Eichhornia crassipes</i> (M.) Solms	Pontederiaceae	Kochuripana	Mofiz lake	H	Whole Plant	SL	W	Plant juice - orally to treat fever, goiter.
37	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Kesraj	Fallow land	H	Leaf	SL	W	Leaf juice - hair fall, bronchitis, itching, night blindness.
38	<i>Ficus racemosa</i> L.	Moraceae	Dumra	Un ploughed land	T	Fruit	LL	W	Unripe fruit - astringent to the bowels, styptic; ripe fruit -cooling, burning sensation, nose bleeding.
39	<i>Ficus hispida</i> L.f.	Moraceae	Jagadumura	Fallow land	T	Fruit	LL	W	Unripe fruit -leucorrhoea; ripe fruit- burning sensation, fatigue, leprosy.
40	<i>Ficus benghalensis</i> L.	Moraceae	Bot	Road side	T	Gum	LL	W	Gum - kidney pain.
41	<i>Heliotropium indicum</i> L.	Boraginaceae	Hatishur	Waste land	H	Leaf	SL	W	Leaf juice - conjunctivitis.
42	<i>Gastrochilus longiflorus</i> Wall.	Zingiberaceae	Shoti	Untilled land	H	Rhizome	SL	W	Rhizome - fore head to cure cataract; Young leaf - headache.
43	<i>Glycosmis arborea</i> (R.) A. DC.	Rutaceae	Matmati	Un ploughed land	H	Whole plant	SL	W	Leaf juice - fever and liver complaints; root -low fever.
44	<i>Hedyotis corymbosa</i> (L.) Link.	Rubiaceae	Titkuipata	Waste land	H	Whole plant	SL	W	Whole plant - jaundice and liver complaints.
45	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Jaba	Hall garden	S	Flower	SL	P	Flower juice - acute dysentery; cure hair fall.
46	<i>Hyptis suaveolens</i> (L.) Poit	Lamiaceae	Tokma	Un ploughed land	H	Leaf	SL	W	Leaf paste - used in cancer and tumor.
47	<i>Ixora coccinea</i> L.	Rubiaceae	Rangan	Every Hall garden	S	Whole plant	LL	P	Root -fever, gonorrhoea, diarrhoea and dysentery with salt; flower - bronchitis; leaf - diarrhoea.
48	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Patharkuchi	Untilled land	H	Leaf	SL	W	Leaf - bronchial affections, kidney stones; Juice of leaf along with sugar is given in gonorrhoea; leaf with salt for abdominal problem.
49	<i>Lantana aculeata</i> L.	Verbenaceae	Chotra	Waste land	S	Leaf	SL	W	Leaf juice - measles, malaria and tetanus.
50	<i>Menispermum cordifolium</i> Willd.	Menispermaceae	Gulanchara	Un ploughed land	C	Whole plant	SL	W	Whole plant - pimples, gonorrhoea, cough, fever, skin affections.
51	<i>Mimosa pudica</i> L.	Fabaceae,	lajjaboti	Road side	H	Leaf	SL	W	Leaf paste - orally in piles, dysentery.
52	<i>Mimusops elengi</i> L.	Sapotaceae	Bokul	Road side	T	Bark	LL	P	Bark juice - coughs, toothache.
53	<i>Moringa oleifera</i> Lam.	Moringaceae	Sajna gach	Road side	T	Leaf	LL	P	Leaf paste - diabetes, acidity, hypertension; young leaf - general weakness.
54	<i>Nymphaea Nouchali</i>	Nymphaeaceae	Sapla	Mofiz lake	H	Whole plant	SL	W	Flower - cough, bile, vomiting, worms and burning of the skin;

	Burm. F.								filament- pile; seed - cutaneous disease.
55	<i>Musa sapientum</i> L.	Musaceae	Kola	Hall Road side	H	leaf	SL	P	Young leaf paste - diarrhea, diabetes, insect bite.
56	<i>Mentha arvensis</i> L.	Lamiaceae	Pudina	Un ploughed land	H	Leaf	SL	P	Fresh leaf - dizziness, Indigestion.
57	<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Road side	T	leaf	LL	P	Young leaf paste - mixed with salt and massaged on the forehead or eaten as remedy for headache.
58	<i>Nasturtium indicum</i> (L.)	Brassicaceae	Ban sarisha	Un ploughed land	H	Whole plant	SL	W	Whole plant juice - asthma, chronic catarrh, pyorrhea.
59	<i>Nerium indicum</i> Mill.	Apocynaceae	Korobi	Dayna Compound	S	Leaf	LL	P	Leaf decoction - reduce swellings.
60	<i>Nyctanthes arbor-Tristis</i> L.	Oleaceae	Shefali	Road side	T	Whole plant	LL	P	Whole plant - bilious fever, rheumatism.
61	<i>Ocimum tenuiflorum</i> L.	Lamiaceae.	Kalo tulsi	Waste land	H	Whole plant	SL	W	Leaf juice - fever, cough, cold, headache, nausea; leaf powder with honey - orally in diabetics; root juice -with honey for cough.
62	<i>Opuntia elatior</i> Mill.	Cactaceae	Phanimansa	Untilled land	S	Whole plant	LL	W	Whole plant juice - whooping cough, ashma and gonorrhoea.
63	<i>Oxalis corniculata</i> L.	Oxalidaceae	Amrul	Un ploughed land	H	Whole plant	SL	W	Whole plant juice - fever, anaemia.
64	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Amlaki	Road side	T	Bark	LL	P	Bark juice - orally in dysentery, body ache.
65	<i>Polyalthia longifolia</i> (S.) Thwaites(PL)	Annonaceae	Debdaru	Road side	T	Bark	LL	P	Bark paste - dysentery, itch, scabies.
66	<i>Phoenix sylvestris</i> L.	Arecaceae	Khajur	Road side	T	Fruit	LL	W	Fruit Juice- gonorrhoea, cough, fever.
67	<i>Polygonum orientale</i> L.	Polygonaceae	Bishkatali	Waste land	H	Whole plant	SL	W	Whole plant - healing wounds.
68	<i>Physalis micrantha</i> link.	Solanaceae	Phutka	Un ploughed land	H	Fruit	SL	W	Fruit - used in gonorrhoea and spleen disorder.
69	<i>Psidium guyava</i> L.	Myrtaceae	Piyara	Hall ground	T	Whole plant	SL	P	Fruit - diarrhoea and dysentery; young leaf - antifungal properties.
70	<i>Quisqualis indica</i> L.	Combretaceae	Madhabilata	Fallow land	C	Whole plant	SL	W	Whole plant - used to treat ulcers, worms.
71	<i>Ricinus communis</i> L.	Euphorbiaceae	Bherenda	Untilled land	S	Seed	SL	W	Seed oil -anti-cancer properties; seed paste - Jaundice, joint pain.
72	<i>Solanum violaceum</i> O.	Solanaceae	Tit baegun	Waste land	H	Root	SL	W	Root - snake bite, itches.
73	<i>Spondias pinnata</i> (L.F.) Kurz.	Anacardiaceae	Amra	S.H Hall Ground	T	Whole plant	LL	P	Bark - prevent vomiting; root - menstruation; fruit-bilious dyspepsia.
74	<i>Spilanthes calva</i> Dc.	Asteraceae	Marhatitiga	Fallow Land	H	Whole plant	SL	W	Whole plant - dysentery, scabies and psoriasis.
75	<i>Syzygium cumini</i> (L.) Skeels,	Myrtaceae	Jam	Road Side	T	Bark	LL	P	Bark juice - orally in diarrhoea, dysentery, cut and wounds.
76	<i>Tagetes erecta</i> L.	Asteraceae	Gandaphul	Hall garden	H	Leaf	SL	P	Leaf juice given with honey - bheumatism, cold and bronchitis.
77	<i>Tamarindus indica</i>	Caesalpiniaceae	Tetul	Hall garden	T	Fruit	LL	W	Fruit - used in asthma, amenorrhoea, fever, diarrhea.
78	<i>Tectona grandis</i> L. F	Verbenaceae	Segun	Road Side	T	Flower	LL	W	Flower paste - piles, leucoderma.
79	<i>Terminalia arjuna</i> (R.) Wight & Arn	Combretaceae	Arjun	Road Side	T	Bark	LL	P	Bark - asthma, wounds, hypertension, skin eruptions, bark - with sugar to treat heart disease.
80	<i>Terminalia</i>	Combretaceae	Bohera	Road Side	T	Fruit	LL	P	Fruit powder -orally in cough,

	<i>belerica</i> (G.) Roxb.	e							cold, respiratory problem.
81	<i>Terminalia chebula</i> Retz.	Combretaceae	Horitoki	Road Side	T	Fruit	LL	P	Fruit juice - orally in cough, cold, respiratory trouble.
82	<i>Terminalia catappa</i> L.	Combretaceae	Kath badam	Road Side	T	Leaf	LL	P	Leaf paste - skin disorder.
83	<i>Typhonium trilobatum</i> (L.) Schott.	Araceae	Ghetkol	Waste land	H	Whole plant	SL	W	Whole plant - stomach complaints;
84	<i>Vitex negundo</i> L.	Vitaceae,	Nishinda	Road Side	S	Leaf	LL	P	Leaf juice with honey - orally in cough, cold.
85	<i>Zizyphus mauritiana</i> Lam.	Rhamnaceae	Boroi	Road Side	T	Fruit	LL	W	Ripe fruit - orally in indigestion, stomach problem with little bit of salt.
86	<i>Wedelia chinensis</i> (O.) Merr.	Asteraceae	Kesraj	Fallow land	H	Leaf	SL	W	Leaf powder and juice - cough, skin disease.
87	<i>Xanthium indicum</i> Koenig. L.	Asteraceae	Ghagra	Fallow land	H	Whole plant	SL	W	Whole plant - malaria

*N.B. W-wild, P-planted, SL-short live, LL-long live, H- Herb, S- Shrub, T-Tree, C- Climber

TABLE 2: PLANT FAMILIES AND NUMBER OF PLANTS PER FAMILY

Family	Plants number	Family	Plants number	Family	Plants number	Family	Plants number
Acanthaceae	2	Boraginaceae	1	Malvaceae	2	Pontederiaceae	1
Aloaceae	1	Caesalpiaceae	1	Menispermaceae	1	Rhamnaceae	1
Amaranthaceae	1	Cactaceae	1	Meliaceae	1	Rubiaceae	4
Anacardiaceae	2	Caricaceae	1	Mimosaceae	1	Rutaceae	3
Annonaceae	1	Combretaceae	5	Moraceae	4	Sapotaceae	1
Apocynaceae	3	Convolvulaceae	1	Moringaceae	1	Scrophulariaceae	1
Araceae	1	Crassulaceae	1	Musaceae	1	Solanaceae	3
Arecaceae	3	Cucurbitaceae	1	Myrtaceae	2	Sterculiaceae	2
Apiaceae	1	Cyperaceae	1	Nymphaeaceae	1	Verbenaceae	2
Asctopiadaceae	1	Dilleniaceae	1	Oleaceae	1	Vitaceae	2
Asteraceae	6	Euphorbiaceae	2	Oxalidaceae	2	Woodsiaceae	1
Brassicaceae	1	Fabaceae	3	Poaceae	1	Zingiberaceae	1
Bombacaceae	1	Lamiaceae	3	Polygonaceae	1		

TABLE 3: LIFE SPAN AND PERCENTAGE OF MEDICINAL PLANTS

Serial No.	Life span	Number	Percentage	Rank
1	Short live (one month - one year)	47	54.02%	1
2	Long live (more than one year)	40	45.98%	2
Total		87	100	

TABLE 4: ORIGIN AND PERCENTAGE OF MEDICINAL PLANTS

Serial No.	Plant feature	Number	Percentage	Rank
1	Wild	55	63.22%	1
2	Planted	32	36.78%	2
Total		87	100	

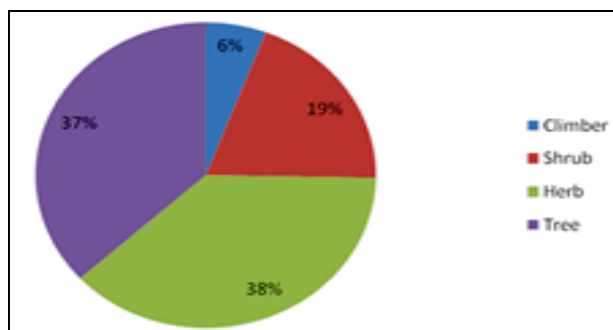


FIGURE 1: LIFE FORM OF PLANTS USED AS MEDICINAL PLANTS

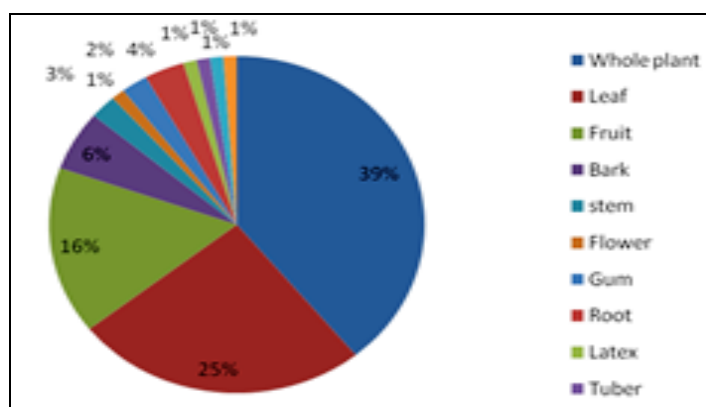


FIGURE 2: PLANT PARTS USED FOR THE MANAGEMENT OF VARIOUS HEALTHCARE

The mode of treatment of the Kavirajes was quite simple. In most cases juice would be extracted from the whole plant or plant part through macerating, crushing or boiling in water followed by administration of the juice either topically or orally, depending on the disease. Skin infections, cuts, wounds, burns or eye diseases usually had topical applications of plant parts; for other diseases, the mode of administration was mostly oral. However, various parts from the same plant were observed to be used to treat different diseases. A single plant part also would be used for treatment of multiple diseases. For instance, leaf juice *Aloe barbadensis* was used for treatment of stomach disorders it also used to treat lung disease even it used by them to cure skin burns. In several cases different parts of different plants were used to the treatment of same disease, leaf juice of *Anthocephalus Chinensis*, latex and fruit of *Carica papaya*, whole plant juice of *Oxalis corniculata* were used to treat fever.

Occasionally plant juice or plant part would be mixed with sugar, salt or honey prior to oral administration, usually to make the juice more palatable, but also sometimes for additional therapeutic purposes. A decoction of leaves of *Aloe barbadensis* was advised to be taken with sugar.

Powder prepared from dried leaves of *Terminalia arjuna* were also advised to be taken with sugar as treatment for heart disease. Fruit of *Dillenia indica* advised to take orally with honey and nigella for sex stimulant. For treatment of abdominal pain, leaves of *Kalanchoe pinnata* were advised to be chewed with salt. Honey is usually considered a medicine by the Kavirajes, and is commonly advised to be taken for cold. The use of honey in this instance can serve a synergistic purpose on top of the effects of the leaf juice in relieving cold. Sometimes Kavirajes advised to patients to take smoke of stem and leaf of *Datura metel* in asthma.

A remarkable thing about the Kavirajes was their claim to have effective treatments for cancer, diabetes, sex stimulant and rheumatism. These are diseases for which allopathic medicine has no easy cure or no cure at all. The Kavirajes had no proper diagnostic procedures for cancer or diabetes. Any unusual or unexplainable swelling of any body part together with gradual wasting away of body was determined to be cancer. Diabetes was usually determined through report of frequent urination and sweet taste of urine. Cancer was treated with three plants, namely, *Catharanthus roseus*, *Hyptis suaveolens* and *Calotropis gigantean*. Diabetes was treated with *Ocimum tenuiflorum*, *Catharanthus roseus*, *Musa sapientum* and *Andrographis paniculata*. Irrespective of the lack of modern diagnostic procedures among the Kavirajes, it is interesting that out of the three plants used by the Kavirajes to treat cancer, scientific research has already shown the anticancer activity present in *Catharanthus roseus*⁷, *Ageratum conyzoides*⁸, *Hyptis suaveolens*⁹. The antidiabetic activities of whole plants or plant parts of *Catharanthus roseus*¹⁰.

The scientific validation of medicinal plant usage by the Kavirajes indicate that folk medicinal knowledge is not only not to be ignored but modern science can benefit a lot through extensive investigation of the plants used by folk medicinal practitioners and their mode of usage.

In the present study, a brief account on ethnomedicinal usages of documented plant species has been verified by Kavirajes, gardeners and knowledgeable local persons, therefore brief pharmacological as well as traditional and toxicological

studies are very much required for sustaining human benefit also cultivation and conservation of these plant species will help to maintain the ecological balance in this University as well livelihood security of local inhabitants.

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