An Ethno botanical survey in Ati Bazar keranigonj Area In Dhaka Region of Bangladesh

B.pharm (Hon's Project Report)

A dissertation submitted to the Department of Pharmacy, Daffodil International University for the partial fulfillment of Bachelor of Pharmacy Degree

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APPROVAL

This Project, **An ethno botanical survey** submitted by **Achhia Khanam ID: 111-29-260** to the Department of Pharmacy, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

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Certificate

This Is to Certify that the results of the investigation that are embodied in this project are original and have not been submitted before in substance for any degree or diploma in any university the entire present work submitted as a project work for the partial fulfillment of the degree of bachelor of pharmacy, is based on results of author's (Achhia Khanam ; Id 111-29-260) own investigation.

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Date : May,2015 The Author

Dedicated
To
My Beloved
Parents
And
Supervisor

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ABSTRACT

Traditional source of medicinal plants is an important way for daily curative uses in rural area throughout Bangladesh. Such knowledge is continuing from generation to generation without documentation. An ethno botanical investigation was conducted through focus group discussions and households' survey accompanied by field observation to document the indigenous knowledge of herbal medicines being used by the rural communities of Ati bazaar region in Dhaka District in Bangladesh. Ethno botanical survey in AtiBazaar ,kranigonj of Dhaka district has revealed a total of 22 species used as medicinal plants. People names, parts used as medicine and diseases to be treated with each plant have been presented. A number of threats to medicinal plants and their habitats have been identified and some measures have also been recommended for the conservation of medicinal plants and their habitats. Plants identified by herbarium specimens brought to Bangladesh National Herbarium for complete identification. A total of 38 plants were collected out of which 22 plants were identified, which are belongs to 20 families and 18 plants remain unidentified. It was observed that the Kaviraje of the village surveyed used whole plants and plant parts like leaves, stems, barks, roots, flowers, fruits, seeds, and tubers in their treatment of various ailments. Unlike most other parts of Bangladesh, whole plants were used the most, constituting 45.45% of the total uses. This was followed by whole plant (65%)leaves (59%), roots (13.63%), seeds (4.45%), fruits (31.81%), stems and barks (13.63% each), inner bark (4.45%), and flowers (12.8%) wood .(4.45%) Plant resources are used to treat 36 different individual ailments claimed to be cured by plant or plant parts include Rheumatic pain, (2 species) Arthritis (3 species) Uterine Irritation, Insect bite, gout, Tooth pain, Fever(7 species), Inflammation(3 species) ,Carries (2 species),Asthma, Womb problem, Uterine pain, Intestinal disorder, Gastric problem, High Blood Pressure, Diarrhea, Acne, Skin disorder, Constipation, Piles , Diabetes , Jaundice.

Chapter -1

Introduction

1.1 Introduction to Ethno botany

The term Ethno botany comes from the Greek word Ethnos, which means 'people', and Botany which means 'herb', so literally it would be translated as 'the study of people and herbs', which usually is generalized as **'the study of people and plants'**. It was coined in 1895 by American taxonomic botanist John W. Hershberger as 'the study of the utilitarian relationship between human beings and vegetation in their environment, including medicinal uses' (Hershberger, 1896).

Ethno botany is the study of how people of a particular culture and region make of use of indigenous plants.

Ethno botanists explore how plants are used for such things as food, shelter, medicine, clothing, hunting, divination, cosmetics, dyeing, textiles, construction, tools, currency, literature, rituals, social life, and religious ceremonies.

Ethno biology is the study of the relationships between humans and their biological worlds. The purpose of Society is to gather and disseminate knowledge of ethno biology, and to foster an ongoing appreciation for the richness of ethno biology worldwide.

The focus of ethno botany is on how plants have been or are used, managed and perceived in human societies.

Ethno botany and botany

The educational objective of the ***Ethno botany Track*** is to provide a unique learning environment in which biological and social science theories' are integrated to train Trans disciplinarily.

Ethno botany has its roots in botany, the study of plants. Botany, in turn, originated in part from an interest in finding plants to help fight illness. In fact, medicine and botany have always had close ties. Many of today's drugs have been derived from plant sources.

Ethno botany is multidisciplinary

Ethno botanists help us to understand the frightening results which loss of the rain forests would bring not only in terms of consequent loss of knowledge about tropical plants, but the consequent damage brought on by the loss of native cultures in their entirety, as well as the damage to the earth's ecological health.

This multidisciplinary approach gives ethno botanists more insight into the management of tropical forest reserves in a period of tremendous environmental stress.

Ethno botany and other science

Ethno botany is connected in such areas as: archaeology, chemistry, ecology, anthropology, linguistics, history, pharmacology, sociology, religion and mythology.

Ethno botanists work respectfully with shamans within the native culture, examining that culture's concepts of disease.

Ethno botany into the Future

Field ethno botanists have not yet received the same level of support and respect, primarily because interest in this field has only just re-emerged.

New scientific journals and societies have begun to disseminate the studies of the ethno botanist's to peers, other scientists, and policy makers worldwide.

Due to increased public interest and policy making in conservation, companies are looking to plants for new approaches to food, medicines, and energy sources. University departments are opening positions for interdisciplinary-trained ethno botanists. The future looks promising for these dedicated scientists in a fascinating and vital field of research.[1]

Ethno Botanical Drug Development:

Once the plants have arrived at the company's research site, processing the plants for medicinal purposes begins. The plants are tagged with the information from the field study. The plants are processed and tested in studies completed by ethno pharmacologists, using state of the art laboratory equipment (which may include High Pressure Liquid Chromatography studies and in vivo transgenic animal studies). The objective is to screen the plants metabolites to determine how relevant they are to the therapeutic areas of interest. The most promising initial plant compounds are fractionated to obtain pure samples in milligram amounts. These natural pure compounds are compared to the best available therapeutics by in vitro testing. If the bioassay is successful, the compound is structurally characterized and is subject to a confirmatory biological test.

Promising compounds are scaled up to provide gram quantities for animal testing to determine safety and efficacy, Pharmacologists with backgrounds in metabolism, pharmacokinetics, medicinal chemistry and formulation design experiments to determine whether the selected compounds have activity. After this testing is completed, the samples are compared with the best available marketed therapeutics. The scale up process occurs again and hundreds of grams of selected compounds are provided for further studies which will, it is hoped, eventually lead to an effective, marketable drug suitable for human consumption. This new product is the reward for all the time and effort of many individuals.

Ethno botany includes-

1. Useful plants: Formerly of primitive people but expanding to include western and non-western cultures.

2. Cognition of plants: Folklore, linguistics and ethno science, world view and social communication- gender, ethnicity, class.

3. Ecology: Community interactions and human behavior conservation, genetic preservation.

Many people lives in Bangladesh. these different Hindu family have different life style, and culture. On the basis of their traditional knowledge, they use different medicinal plants for their primary healthcare and for purposes. We have a rich and diverse ethnic groups throughout scattered the country. Through ethno botanical research, various uses of herbal, spices, oil, fiber, gum, dye, food, timber and other known or unknown or even little known plants can be pinpointed for further exploitation and scientific improvement.

The main objective of this ethno botanical investigation is the identification and documentation of the arouse plants and how they are used hi the traditional life and culture of rural community from keranijong in the Dhaka district in Bangladesh.[2]

1.2 Traditional medicine

The term "traditional medicine" refers to ways of protecting and restoring health that existed before the arrival of modern medicine. As the term implies, these approaches to health belong to the traditions of each country, and have been handed down from generation to generation. Traditional systems in general have had to meet the needs of the local communities for many centuries. China and India, for example, have developed very sophisticated systems such as acupuncture and ayurvedic medicine. In practice, the term "traditional medicine" refers to the following components: acupuncture, traditional birth attendants, mental healers and herbal medicine.

Over the years, the World Health Assembly has adopted a number of resolutions drawing attention to the fact that most of the populations in various developing countries around the world depends on traditional medicine for primary health care, that the work force represented by practitioners of traditional medicine is a potentially important resource for the delivery of health care and that medicinal plants are of great importance to the health of individuals and communities.

Through its Traditional Medicine Programmer, the World Health Organization (WHO) supports Member States in their efforts to formulate national policies on traditional medicine, to study the potential usefulness of traditional medicine including evaluation of practices and examination of the safety and efficacy of remedies, to upgrade the knowledge of traditional and modern health practitioners, as well as to educate and inform the general public about proven traditional health practices.

A genuine interest in various traditional practices now exists among practitioners of modern medicine and growing numbers of practitioners of traditional, indigenous or alternative systems are beginning to accept and use some of the modern technology. This will help foster teamwork among all categories of health workers within the framework of primary health care. The reasons for the inclusion of traditional healers in primary health care are manifold: the healers know the sociocultural background of the people; they are highly respected and experienced in their work; economic considerations; the distances to be covered in some countries; the strength of traditional beliefs; the shortage of health professionals, particularly in rural areas, to name just a few.

A large proportion of the population in a number of developing countries still relies on traditional practitioners, including traditional birth attendants, herbalists and bone-setters and on local medicinal plants to satisfy their primary health care needs. WHO estimates that traditional

birth attendants assist in up to 95% of all rural births and 70% of urban births in developing countries.

Traditional medicine has maintained its popularity in a number of Asian countries, such as China, India, Japan and Pakistan. In China, for example, traditional medicines (herbal preparations) account for 30% to 50% of the total medicinal consumption. In 1993, the total sales of herbal medicines amounted to more than US$ 2.5 billion. In Japan, from 1974 to 1989, there was a 15-fold increase in Kampoh ("Chinese method") medicinal preparations in comparison with only 2.6-fold increase in the sales of mainstream pharmaceutical products. The Japanese per capita consumption of herbal medicine appears to be the highest in the world.

During the last decade, there has also been a growing interest in traditional and alternative systems of medicine in many developed countries. One-third of American adults have used alternative treatment and 60% of the public in the Netherlands and Belgium, and 74% in the United Kingdom are in favour of complementary medicine being available within the framework of the National Health Service. A survey among Member States of the European Union in 1991, identified about 1400 herbal drugs used in the European Economic Community.

Medicinal plants are the oldest known health-care products. Their importance is still growing although it varies depending on the ethnological, medical and historical background of each country. Medicinal plants are also important for pharmacological research and drug development, not only when plant constituents are used directly as therapeutic agents, but also when they are used as basic materials for the synthesis of drugs or as models for pharmacologically active compounds.

Legislative controls in respect of medicinal plants have not evolved around a structured control model. There are different ways in which countries define medicinal plants or herbs. As a result, different approaches have been adopted with regard to licensing, dispensing, manufacturing and trading in order to ensure the safety, quality, and efficacy of medicinal plant preparations.

Herbal medicines are assuming greater importance in the primary health care of individuals and communities in many developing countries and there has been an increase in international trade in herbal medicines. However, in most countries the herbal medicines market is not adequately regulated, and the products are therefore unregistered and often not controlled by regulatory bodies.

WHO has compiled a list of medicinal plants which are widely used in primary health care. In July 1996, a WHO scientific group involving 100 experts from various countries around the world adopted the list which includes 28 monographs of 28 medicinal plants originally prepared by the WHO Collaborating Centre for Traditional Medicine in Chicago, Illinois, United States of America.[3]

1.3 Area of Study :

Historical Events:

The very name Ati bazaar , Keraniganj was taken from the "KORRANI" Rulers, who took shelter in our area after being defeated by the Mugals. East India Company changed the name from 'KORRANI-Ganj' to Keraniganj. During the war of liberation, the Pak army set on fire many houses in Konakhola, Basta, Brahmankirtha, Goalkhali and Khagail Kholamora villages. The freedom Fighters later on conducted extensive guerilla attack on Pak army.

Geography:

Keraniganj is located at 23°41′00″N 90°18′45″E / 23.6833°N 90.3125°E / 23.6833; 90.3125 . It has 94765 units of house hold and total area 166.87 km².

Demographics:

As of the 1991 Bangladesh census, Population 530174; male 54.6%, female 45.4%; Muslim 89.46%, Hindu 10.5% and others 0.04%.

Religious institutions: Mosque 473, temple 151, tomb 1 and Eidgah 60, most noted of which is the tomb of Adu Pagla.

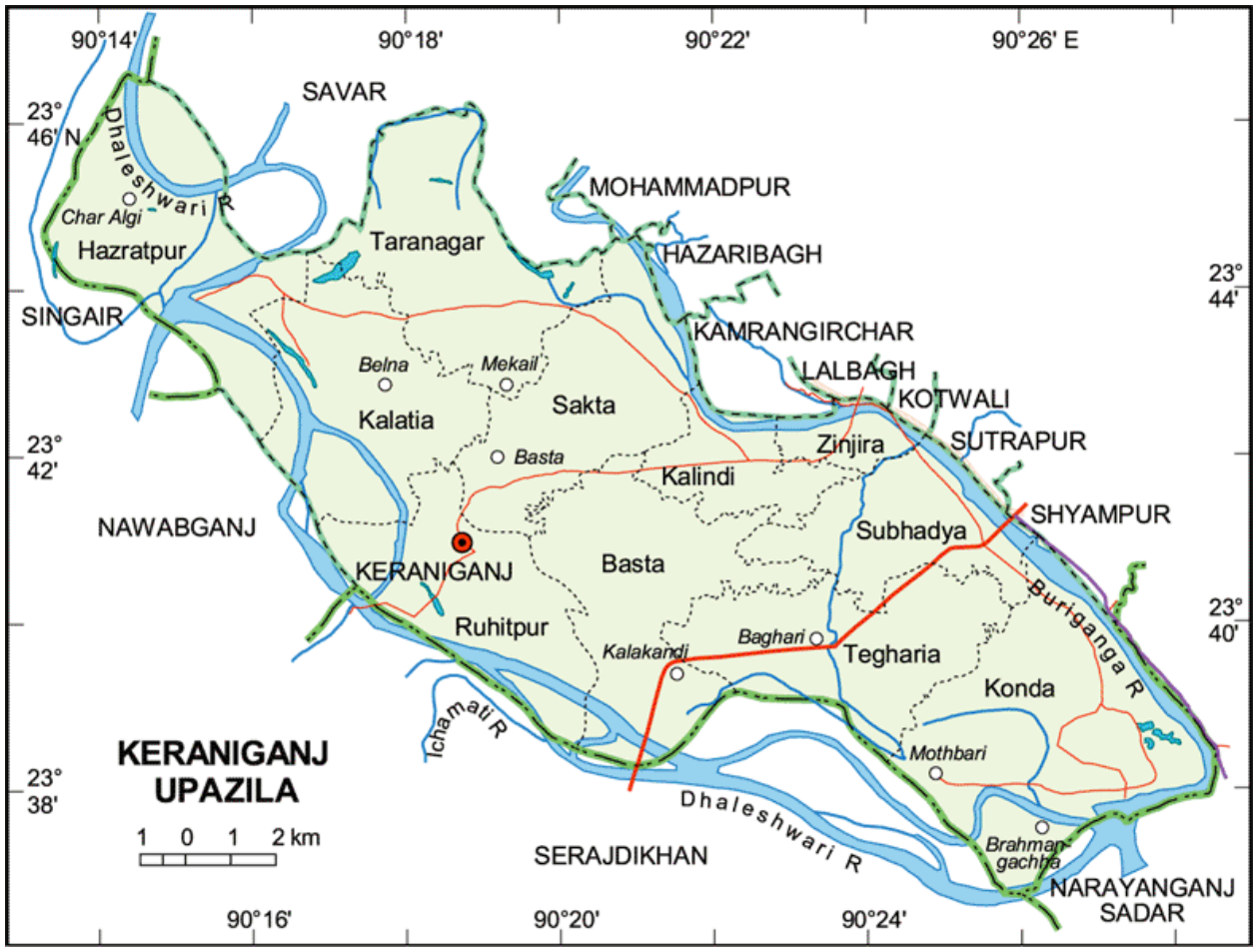


Fig : Map of kranigonj

Literacy and educational institutions:

Average literacy 37.7%; male 43.9% and female 30%.

Educational institutions: college 8, high school 18, junior high school 2, Madrasa 11, government primary school 102, non-government primary school 10.

Cultural organizations Club 8, cinema hall 5.

Administrative:

Keraniganj has 12 Unions/Wards, 123 Mauzas / Mahallas, and 399 villages.

Others:

Main occupations Agriculture 10.37%, agricultural laborer 7.05%, wage laborer 5.63%, commerce 26.26%, service 17.68%, construction 3.1%, fishery 1.02%, industry 1.78%, hawker 1.07%, transport 7.38%, house renting out 1.23%, and others 17.43%.

Land use Total cultivable land 9307.97 hectares; fallow land 7388.1 hectares, single crop 36.95%, double crop 60.87% and treble crop land 2.18%. Cultivable land under irrigation 35.30%.[4]

Chapter 2

Methodology

2.1 Methodology:

Survey was conducted in the villages of Ati bazaar (kranigonj district) Bangladesh. , Ati bazaar (kranigonj district) falls in the northern part of north Dhaka city corporation.The main occupation of the rural population in both districts is agriculture and agricultural laborer. Modern medical facilities are absent in the villages. The nearest city with any modern medical facilities is Mirpur .The rural population of village was found to visit Kaviraje for treatment of both common ailments as well as complicated ailments, which are difficult to treat with modern medicines. Interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method of Martin (1995) and Maundu (1995). In this method, the Kaviraje took the interviewers to places from where they collected their medicinal plants, pointed out the plants, and described their uses. Plant specimens as pointed out by the Kaviraj were collected and dried and brought to Dhaka for complete identification. Plant identification was done by,

ex-Curator and Principal Scientific Officer of the Bangladesh National Herbarium at Dhaka. Interviews were conducted in Bengali, the language being spoken by both interviewers and Kavirajes alike.

Ethno botany is sometimes interpreted as the mere nothing of folk medical uses of some herbs. The term of medico botany is also used. Ethno botany is a multidisciplinary science. It is totally, the subject involves anthropology, sociology, botany and of course, medicinal and economic botany. Among the chief lines and tools of research in ethno botany, relevant traditional medicine:

> Field work.

> The herbarium specimen.

2.2 Field work:

The exploration tips were planned in different way so as to cover the selected areas in different seasons in a year. Each field tour was of 25-30 days, durations, covering 3-4 hailer pockets in two adjacent districts. In each area 5-7 were spent. The first 2-3 days in each village were utilized for gathering information on local customs, beliefs taboos, religious rites, food habits, agricultural practices etc. from the village hailers and local people and these were cross-checked, critically analyzed and documented. The next 2-3 days were mint for gathering information on medicinal uses of plants used by the local hailer and priests, the method time of collation, ingredients used, and mode of application, dosage and duration were recorded. Every attempt was made to locate these plants and voucher specimens, pictures were collected. During the field work, special care was taken to record data on phonology, habit and habitant, frequency of distribution and very attempt was made to collect the plant in both flowering and fruiting stages.

They were pressed and herbarium specimens were prepared according to the conventional methods.

2.3 The Herbarium Specimen:

A good herbarium specimen consists of a dried pressed section of plant containing well-preserved vegetation and reproductive (flower, fruits) structures. Plant specimens are mounted for permanent storage on sheets of standard bond paper measuring 11 by 16 inch. In the bottom right hand corner of the sheet is a label containing information on the plant, a description of its appearance, and the area where it was collected. A small paper pouch attached to the herbarium sheet used to keep small pieces of the specimen that might have become dislodged with time as well as extra flowers or fruits purposely collected. Herbarium sheets may also include maps of collection area and handwritten annotations by taxonomists.

2.4 Materials

There are some materials which are necessary for field work. These are as follows:

- Presser
- Cutting plus
- Jute rope
- Polithin bag
- Tag
- Sample carry bag
- Costep
- Forsake
- Newspaper
- Digital camera
- Extra battery & memory card,
- Torch light
- Notebook, pen, pensile,
- Knife
- Card-reader , pen drive, laptop (if possible)
- Brush for cleaning

2.5 Procedure

Choosing the right sample:

The sample chosen for pressing should be representative of the size, variation and general appearance of the plant or population being studied. Usually three sets are needed.

One class set for reference, one set for the student and for the library. Whenever possible, the whole plant should be collected and pressed in between pages of newspaper. Before pressing herbaceous plant, shake the roots or wash them to remove any mud or sand. Please note that collecting plants in national state parks is illegal, some states have various laws on plant collecting, check with your authorities.

Labeling and processing primarily:

Each specimen should be labeled with masking tape or a paper tag with its respective collection number. All samples of the same collection should be carefully bundled and gently pushed to the bottom of a collection bag. Delicate plants plant parts, as well as loose material should be placed separately in labeled bags. Plants collected in a plastic bag should be pressed as soon as possible.

Taking proper and adequate field notes:

Field notes should include the following information:

- Area of collection or exact location
- Habitat and vegetations
- Topography and soil
- Identification
- Plant description

o Habit

o Height

o Stem characteristics

o Architecture\branching

o Flowers and fruits

Have the students draw the plant as it's appears in nature focusing on the above mentioned characteristics.

Processing the sample for further experiment:

Correctly the specimen in the newspaper is very important ; dry specimens are brittle, and their parts cannot be arranged without breaking off. Place the specimen over the newspaper and cut excess length or fold the stem to insure a portionof the base is intact. Both surface of the leaves and reproductive structures should be visible, so atleast one leaf and one flower should be turned over. Some flowers should be pressed open, some closed. If possible, one flower should be dissected to show internal structures.

Necessary precautions added:-

Do not leave any plant part projecting out of the newspaper, these will break off when dry, parts that may not stay flat can be held in place dry strips of newspaper that is taped to the paper and not the plant.[5]

2.6 Questionnaire of Ethno botanical Data Collection

- Serial No.
- Area from which plant specimen was collected (village/thana/ upazilla/district)
- Name ,profession and address of informant
- Local name of plant
- Characterization of plant (tree, shrub, herb, weed, grass, bamboo). Color of plant leaf, flower, where does the plant grow?
- Part of the plant used in medicine. Description of how the medicine is prepared; how it is taken or applied; whether other plants are used in preparation of the medicine and if so, which parts of other plants; when the medicine is taken; any precaution or side-effect of medicine
- Disease including symptoms for which the medicine is used. How was the the disease classified?
- Identification number of plant photograph on film
- Scientific name of plant and Herbarium accession number (11/16inch sheet)
- Name and contact phone number of the collectors
- Date of collection
- Any other information
- Patient report (if possible). How long is the patient taking the plant? Is he satisfied with the results?
- Has he taken this plant before? For what symptoms or disease? Was it cured?
- Has he visited this kaviraj/ Vaidya/practitioner before? For what disease/symptom? What plant did the Kaviraj prescribe? Was he cured?

Chapter-3

Literature Review

3.1 Literature Review:

1. Title: Use of Ethnomedicinal Plants by the People Living around Indus River.

Authors: Sakina Mussarat,1 Nasser M. AbdEl-Salam,2 Akash Tariq,1 Sultan Mehmood Wazir,3 Riaz Ullah,4 and Muhammad Adnan;

Abstract: The objective of present study was to document and preserve ethnomedicinal knowledge use to treat different human ailments by traditional healers of Dera Ismail Khan region, Pakistan. Field work was conducted between February 2012 and January 2013 using semistructured questionnaires. Data was collected from 120 traditional healers through questionnaire survey. Traditional healers in the study area use 70 plant species mostly herbs (57%) for ethnomedicinal and other purposes. The highest FIC values (0.80) were obtained each for gastrointestinal and kidney problems followed by respiratory infections (0.72) and skin infections (0.73). There was a significant correlation between the age and traditional knowledge of respondent. Direct matrix ranking indicated Morus alba and Dalbergia sissoo as highly multipurpose and threatened species in the study area. The results showed high dependency of local inhabitants on medicinal plants in meeting their primary health care needs. Moreover, the traditional knowledge has been restricted to elder people. Protection measures should be taken in order to conserve precious multipurpose species that are facing overexploitation. Medicinal plants treating major ailments in the region may be subjected to phytochemical and pharmacological investigations for the identification of bioactive compounds.

2 Title: Medicinal plants used by folk medicinal practitioners in three villages of Natore and Rajshahi districts, Bangladesh

Authors: Mohammed Rahmatullah, Md. Ariful Haque Mollik, Md. Abu Jilani, Mohammad Arman Hossain, Mohammad Shahadat Hossain, Md. Mahbubur Rahman, Dilruba Nasrin, Zubaida Khatun, Farhan Israt Jahan, Farhana Jamal, Mst. Afsana Khatun, Rownak Jahan: Medicinal plants used by folk medicinal practitioners in three villages of Natore and Rajshahi districts, Bangladesh:

Abstract: Folk medicinal healers (Kavirajes) form the primary health-care providers to the predominantly rural population residing in over 86,000 villages throughout Bangladesh. The Kavirajes treat various ailments with whole plants or plant parts from which they make simple decoctions or pastes, which are administered orally or topically. Their mode of treatment is simple, yet considerable variations exist between Kavirajes of even adjoining villages as to the species of plant chosen for treatment of any given ailment. The objective of the present study was to conduct a survey on folk medicinal use of plants in the village of Islampur in Natore district, Bangladesh and the villages of Itaghati and Ataibidir in Rajshahi district, Bangladesh,

which areadjoining districts. Informed consent was obtained from the Kavirajes and surveys were carried out with the help of a semi-structured questionnaire and the guided field-walk method, where the Kavirajes pointed out medicinal plants during field-walks with the interviewers and pointed out their uses. A total of 87 medicinal plants distributed into 44 families were observed to beused by the Kavirajes of the three villages surveyed.The Fabaceae family contributed the highest number of plants (9), followed by the Solanaceae family (7) andthe Euphorbiaceae family with 5 plants. Whole plants onstituted the majority of uses (27.0%), followed respectively, by leaves (22.7%), roots (14.9%), seeds (9.2%), and fruits (8.5%).

3 Title: **An Ethno medicinal Survey of Dhamrai Sub-district in Dhaka District, Bangladesh**

Authors: Mohammed Rahmatullah, Anuj Kumar Das, Md. Ariful Haque Mollik, Rownak Jahan, Mujib Khan, Taufiq Rahman, Majeedul H. Chowdhury; An Ethnomedicinal Survey of Dhamrai Sub-district in Dhaka District, Bangladesh.

Abstract: Primary health-care service is provided to a substantial section of the population of Bangladesh by folk medicinal practitioners known as Kavirajes, who use medicinal plants for treatment of diverse ailments. Since the medicinal plants used by the Kavirajes can vary even between adjoining areas, it was the objective of the present study to conduct an ethnomedicinal survey among the Kavirajes of Dhamrai area, which is a sub district within Dhaka district, Bangladesh. The survey was conducted with the help of a semi-structured questionnaire and guided field-walk method where the Kavirajes pointed out various medicinal plants and described their uses. All plant specimens as pointed out by the Kavirajes were collected and identified at the Bangladesh National Herbarium. Information on a total of 46 plant species distributed into 33 families was obtained. The various diseases treated with these plants included respiratory tract disorders (cough, mucus), fever, gastrointestinal disorders (constipation, bloating, diarrhea, dysentery, stomachache), helminthiasis, pain, tooth infections, cuts and wounds, diabetes, tumor and swellings, eye diseases like conjunctivitis, ear infections, skin diseases, debility, abscesses, insect bites, urinary tract disorders, and hypertension. Two plants were also used to treat cattle diseases along with human ailments. The uses of several of the plants could be validated by available scientific reports. Other plants are of importance in the sense that they can prove to be sources of novel bio-active compounds leading to discovery of new drugs with more efficacy and less side-effects.

4 Title: Traditional medicinal plants used for the treatment of diabetes in rural and urban areas of Dhaka, Bangladesh – an ethno botanical survey

Authors: Soeren Ocvirk Martin Kistler Shusmita Khan, Shamim Hayder Talukder and Hans Hauner

Abstract: the usage of medicinal plants is traditionally rooted in Bangladesh and still an essential part of public healthcare. Recently, a dramatically increasing prevalence brought diabetes mellitus and its therapy to the focus of public health interests in Bangladesh. We conducted an ethnobotanical survey to identify the traditional medicinal plants being used to treat diabetes in Bangladesh and to critically assess their anti-diabetic potentials with focus on evidence-based criteria.

In an ethnobotanical survey in defined rural and urban areas 63 randomly chosen individuals (health professionals, diabetic patients), identified to use traditional medicinal plants to treat diabetes, were interviewed in a structured manner about their administration or use of plants for treating diabetes. In total 37 medicinal plants belonging to 25 families were reported as being used for the treatment of diabetes in Bangladesh. The most frequently mentioned plants were Coccinia indica, Azadirachta indica, Trigonella foenum-graecum, Syzygium cumini, Terminalia chebula, Ficus racemosa, Momordica charantia, Swietenia mahagoni.Traditional medicinal plants are commonly used in Bangladesh to treat diabetes. The available data regarding the anti-diabetic activity of the detected plants is not sufficient to adequately evaluate or recommend their use. Clinical intervention studies are required to provide evidence for a safe and effective use of the identified plants in the treatment of diabetes.

Chapter-4

Significance of Study

4.1 Significance of Study

1) To identify the medicinal plants, their local names, parts used and diseases to be treated

2) To identify the threats to medicinal plants and their habitats

3) To make recommendation for conservation measures.

4)To compare traditional use with their establish medicinal use

5)To justify whether the traditional practitioners maintain the rational use of plants or not.

Chapter-5

Result & Discussion

5.1 Result & Discussion:

A total of 22 plants distributed into 20 families were observed to be used by the Kaviraj for treatment of various ailments. The Fabaceae family contributed the highest number of plants with nine plants, followed by the Solanaceae family with seven plants and the Euphorbiaceae family with five plants. Other important families included the Acanthaceae, Amaranthaceae, Araceae, Combretaceae, and the Vitaceae family. The results are summarized in Table 1. It was observed that the Kaviraj of the villages surveyed used whole plants and plant parts like leaves, stems, barks, roots, flowers, fruits, seeds, and tubers in their treatment of various ailments. Unlike most other parts of Bangladesh, whole plants were used the most, constituting 45.45% of the total uses. This was followed by leaves (59%), roots (13.63%), seeds (4.45%), fruits (31.81%), stems and barks (13.63% each),roots (13.63%), and flowers (2.8%) wood .(4.45%) The Kaviraj uses combination of plants in their treatments. Plant resources are used to treat 36 different individual ailments claimed to be cured by plant or plant parts include Rheumatic pain, (2 species) Arthritis (3 species) Uterine Irritation, Insect bite, gout, Tooth pain, Fever(7 species), Inflammation(3 species) ,Carries (2 species),Asthma, Womb problem, Uterine pain, Intestinal disorder, Gastric problem, High Blood Pressure, Diarrhea, Acne, Skin disorder, Constipation, Piles , Diabetes , Jaundice.

Table-1: List of the medicinal plants commonly utilized in this study areas

Sl. No.	Scientific name	Family name	Local name
1	*Scoparia dulcis*	Scrophulariaceae	Bandhoney
2	*Paederia foetida*	Rubiaceae	Gandhavaduli
3	*Spilanthes calva*	Asteraceae	Nakful
4	*Justicia adhatoda*	Acanthaceae	Basak
5	*Mimosa diplotricha*	Fabaceae	sada-lojjaboti
6	*Santalum Album*	Santalaceae	Chandan
7	*Syzygium fruticosum*	Myrtaceae	Indrojam
8	*Rauvolfia serpentina*	Apocynaceae	Sarpagandha
9	*Terminaliabellirica*	Combretaceae	Bahera
10	*Barleria prionitis*	Acanthaceae	Gukkur kata
11	*Morus indica*	Rosales	Tut pata
12	*Azadirachta indica*	Meliaceae	Neem pata
13	*Vitextrifolia*	Lamiales	Nisinda
14	*Clerodendrum viscosum*	Verbenaceae	Vat pata
15	*Mimosa pudica*	Fabaceae	Lojjabati(red)
16	*Heliotropium indicum* L	Boraginaceae	Hatisur
17	*Phyllanthus niruri*	Phyllanthaceae	Bhui-amla
18	*Leucas Aspera*(Wild)	Lamiaceae	Dam-Kalash

19	*Stephania japonica*	Menispermaceae	Fut pata
20	*Nelumbo nucifera*,	Nelumbonaceae	Lal padda
21	*Hibiscusrosa-sinensis*	Malvaceae	Rakta jaba
22	*Catharanthus roseus*	Apocynaceae	Noyon Tara

Plant's Profile, Description, Photograph and Reported Activities

Plant's profile, description, photograph and reported activities

5.2 Plant serial number -1

Local Name: Bandhoney

Scientific Name: *Scoparia dulcis*

Accession No: 41564

Photo:

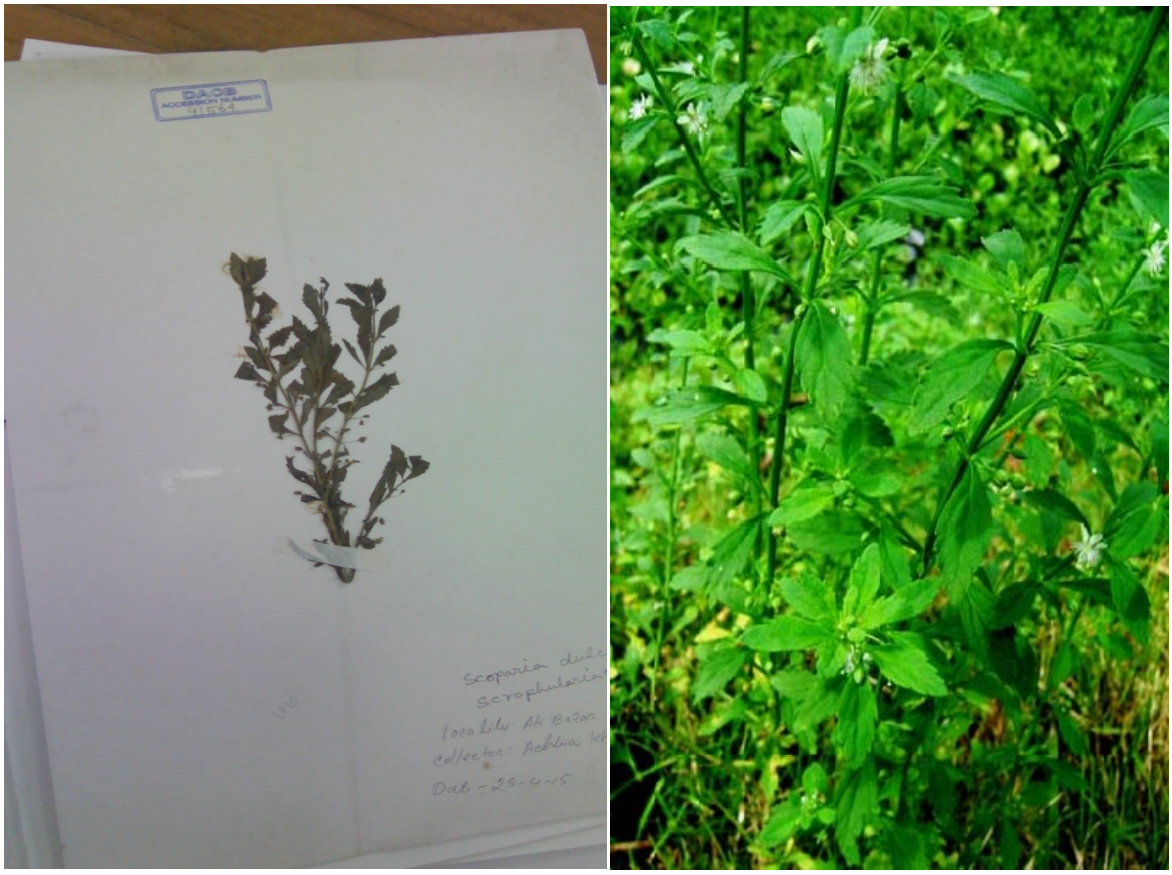


Fig:Scoparia dulcis

Botanical Description:

It is a small, much branched, glabrous, leafy annual herb or under shrub with erect or ascending branches; Leaves opposite and 3-notely whorled, rhomboid, elliptic or elliptic lanceolate, obtuse at apex, base tapering, margins serrate; Flowers many, in terminal panicles, pedicelate, pedicels slender, rigid; Calyx lobes 4, oblong; Corolla white, tube very short, Capsule globose; seeds minute, many., the plant has white flowers, and grows up to 0.7 m in height. [6]

Scientific Classification

- Kingdom: Plantae
- Subkingdom: Tracheobionta
- Superdivision: Spermatophyta
- Division: Magnoliophyta
- Class: Magnoliopsida
- Subclass: Asteridae
- Order: Scrophulariales
- Family: Scrophulariaceae
- Genus: *Scoparia* L.
- Species: *Scoparia dulcis* L. – licorice weed [7]

Chemical Constituents:

The plant contains an alkaloid, an anti-diabetic principle, amellin, diterpenoids, viz., scopadulcic acid A and B, scoparic acid A, B and C, a tetracyclic diterpenoid, scopadulciol, 6-methoxy benzoxazolinone, glutinol and acacetin. An aqueous fraction of the ethanolic extract of the plant has been shown by HPLC analysis to contain both noradrenaline (norepinephrine) and adrenaline (epinephrine) (Ghani, 2003). Hexacosanol, ß-sitosterol and D-manitol are present in root bark.

Ifflaionic acid togeher with 6-methoxybenzoxazolinone have been isolated from roots. Scutellarein, its 7-O-methyl ether and its 7-O-ß-D-glucuronide have been isolated from leaves (Rastogi&Mehrotra, 1993). Root contains a triterpene and mannitol and aerial parts contains dulcitol.

Medicinal uses:

- The effects of an aqueous extract of the plant *Scoparia dulcis* (200 mg/kg) on the polyol pathway and lipid per oxidation were examined in the liver of streptozotocin adult diabetic.
- The diabetic control rates (N = 6) presented a significant increase in blood glucose, sorbitol dehydrogenase, glycosylated hemoglobin and lipid per oxidation markers such as thiobarbituric acid reactive substances and hydro peroxides, and a significant decrease in plasma insulin and antioxidant enzymes such as glutathione peroxides (GPx), glutathione -S-transferase (GST) and reduced glutathione (GSH) compared to normal rats (N = 6). [8]

Useful parts: All parts.

Local Use of Study Area:

- Leaves are used in treatment of fever, cough, bronchitis and dental trouble
- Leaves and stems are used for diabetes.
- The plant is given in the form of a pill. Pills prepared from the plant in combination with cardamom, black pepper in abnormally heavy bleeding at menstruation.

5.3 Plant serial number -2

Local Name: Gandhavaduli

Scientific Name: *Paederia foetida*

Accession No: 41565

Photo:

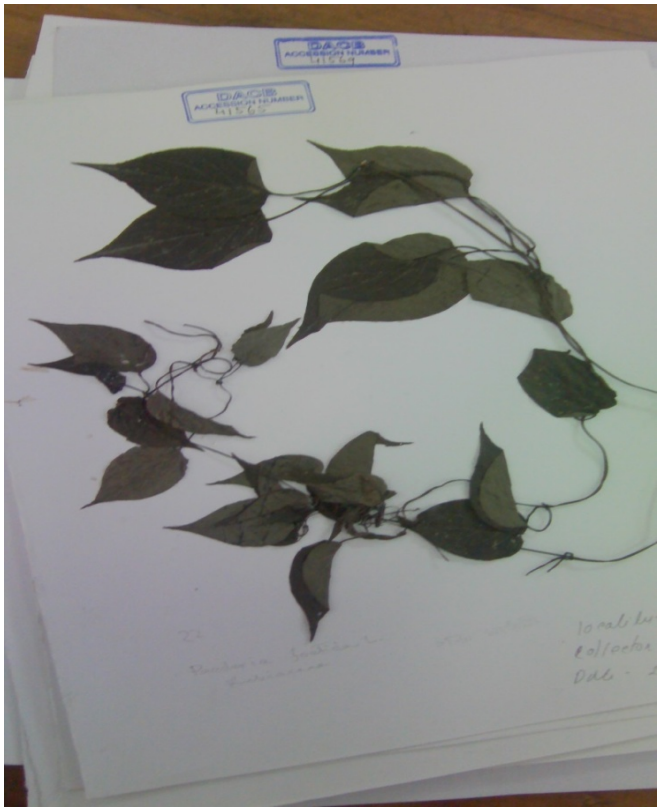


Fig:*Paederia foetida*

Botanical Description:

Perennial twining vine from woody rootstock; stems to 7 m (23 ft) or more, climbing, or prostrate and rooting at the nodes. Leaves opposite (rarely in whorls of 3), with conspicuous stipules; petioles commonly to 6 cm (2.4 in) long; blades entire, oval to linear-lanceolate, 2-11 cm (1-4.3 in) long, hairy or glabrous, often lobed at base; leaves and stems disagreeable odor, especially when crushed. Flowers small, grayish pink or lilac, in broad or long, "leafy," curving clusters, terminal or at leaf axils; corolla densely hairy, tubular with 5 (usually) spreading lobes. Fruit a shiny brown, nearly globose capsule, to 0.7 cm (0.3 in) wide, with 2 black, roundish seeds, these often dotted with white raphides. [9]

Scientific Classification:

- Kingdom — Plantae – Plants
- Subkingdom — Tracheobionta – Vascular plants
- Superdivision — Spermatophyta – Seed plants
- Division — Magnoliophyta – Flowering plants
- Class — Magnoliopsida – Dicotyledons
- Subclass — Asteridae
- Order — Rubiales
- Family — Rubiaceae – Madder family
- Genus — *Paederia* L. – sewer vine
- Species — *Paederia foetida* L. – stinkvine[10]

Distribution:

In most of the district on fences and bushes.

Chemical Constituents:

Leaves are rich in carotene and vitamin C; and also contain high amount of protein consisting of arginine, histidine, lysine, tyrosine, tryptophan, phenylalanine, cystine, methionine and valine. Aerial parts also contain a crystalline keto alcohol paederolone, a keto compound, paederone, β- and δ-sitosterols and two volatile alkaloids, paederine and paederenine. Leaves contain a volatile oil of an offensive odour due to the presence of methyl mercaptan (Ghani, 2003). Hentriacontane, hentriacontanol, methyl mercaptan, ceryl alcohol, palmitic acid, sitosterol, stigmasterol, campesterol, ursolic acid and iridoid glycosides - paederoside, paederosidic acid, scandoside, asperuloside and deacetylasperuloside have also been isolated from leaves and stem.

Medicinal uses:

The main use of the plant is for arthritis and rheumatic disorders. The leaves, in the form of a poultice, are applied to the abdomen to relieve distension due to flatulence and in herpes infections. The roots are used as an emetic and the juice extracted from the roots is given in cases of inflammation of the spleen and for pains in the chest and liver. The fruits are used to prevent toothache. The whole plant shows tonic, astringent and antiphlogistic actions and has been used in tenesmus.Whole plant, leaves, roots.[11]

Useful parts: Leaves

Local Use of Study Area

- A decoction prepared from the extract of Paederia Foetida is used to cure problems of chronic abdominal pain, arthritis, over eating and abscesses. Around one to 2 teaspoons of this mixture must be taken twice a day for this purpose.
- The root of the *Paederia Foetida* is benefiting for treating the problems of colic, contracting rheumatic pain and gout. In this case the half tea spoon juice is to be taken for about a month and have to apply on the body.
- The fruits of the plant are used to treat tooth pain and for whitening blackened teeth.
- Decoction of the Paederia Foetida is applied on the forehead with water for bringing down the temperature in fever.
- Paederiafoetidajuice is with milk is taken for 1 week in sexual problem mainly spam lliqufication.

5. 4 Plant serial number -3

Local Name: Nakful

Scientific Name: *Spilanthes calva*

Accession No: 41566

Photo:

Fig:*Spilanthes calva*

Botanical Description:

An erect annual herb; stem and branches more or less hairy.Leaves opposite, 2.5-5 cm long, ovate, acute or subobtuse, irregularly crenate-serrate, base acute.Heads yellow, 0.6-1.3 cm long, ovoid, solitary or subpanicled; peduncles sometimes reaching 10 cm long.[12]

Scientific Classification:

• Kingdom	Plantae – Plants
• Subkingdom	Tracheobionta – Vascular plants
• Superdivision	Spermatophyta – Seed plants
• Division	Magnoliophyta – Flowering plants
• Class	Magnoliopsida – Dicotyledons
• Subclass	Asteridae
• Order	Asterales
• Family	Asteraceae / Compositae – Aster family
• Genus	*Spilanthes* Jacq. – spilanthes
• Species	*S.calva* L.) L. – para cress

Chemical Constituents:

Aerial parts contain palmitic and stearic acids, tetra-triacontanoic acid, sitosterol, stigmasterol and sitosterolglucoside. Flower heads contain a local anaesthetic amide, spilanthol and three other amides, a sterol, a non-reducing polysaccharide (Ghani, 2003). Acetic, lauric, myristic, linoleic and linolenic acid esters of α- and β-amyrin and myricyl alcohol have also been isolated from the plant.

Distribution: Throughout the country in moist lands.

Medicinal uses:

Flowers head is stimulant and sialagogue; given in toothache, affections of throat and gums and paralysis of the tongue. It is a powerful mosquito larvicide. The decoction of the plant is diuretic and lithontriptic; useful in dysentery and is employed as a bath for rheumatism and as a lotion in scabies and psoriasis. Crushed plant is used as fish poison. It is prescribed for few days to cure glossitis. Juice of the plant and flower head is rubbed in scabies to cure. Roots are used as a purgative. [13]

Useful parts: whole plant

Local Use of Study Area:

A tincture made from flower heads is used as a substitute for the tincture of pyrethrum to treat inflammation of jaw-bones and caries.1 table spoon twice daily for about a week.

5.5 Plant serial number -4

Local Name: Basak

Scientific Name: *Justicia adhatoda*

Accession No: 41567

Photo:


fig:*Justicia adhatoda*

Botanical Description:

Justicia adhatoda.is an evergreen dense shrub, up to 2 m high.Leaves up to 20 x 7.6 cm, elliptic-lanceolate, acute at both ends. Flowers white, 2-liped, in short, dense, axillary pedunculate spikes. Capsule 18 mm long, clavate·

Scientific Classification:

- Kingdom — Plantae – Plants
- Subkingdom — Tracheobionta – Vascular plants
- Superdivision — Spermatophyta – Seed plants
- Division — Magnoliophyta – Flowering plants
- Class — Magnoliopsida – Dicotyledons
- Subclass — Asteridae
- Order — Scrophulariales
- Family — Acanthaceae – Acanthus family
- Genus — *Justicia* L. – water-willow
- Species — *Justicia adhatoda* L. – Malabar nut

.

Distribution: Cultivated throughout Bangladesh.

Chemical Constituents:

Quinazoline alkaloids, l-vasicinone, adhatodine, vasicolinone, vasicoline, vasicolinine, vasicinine, l-vasicine (peganine), l-vasicol, vasicinol, anisotine and 3-hydorxy anisotine have been isolated from the leaves. They also contain adhatodicacid,betaline, visicine, tritriacontane, essential oil, fats, resins, ß-sitosterol and vitamin C. Roots contain vasicine, vasicinol and an essential oil. A novel indole alkaloid, CH12N2O a galactoside, D-galactose and deoxyvasicinone have also been isolated from the roots.

Flowers contain vasicine, vasicinine, kaempferol, quercetin, α- amyrin, tritriacontane and ß-sitosterol and its glucoside. Seeds contain fatty oil consisting of arachidic, behenic, lignoceric, cerotic, oleic and linoleic acids, and sitosterol (Ghani, 2003). Inflorescence contains alkaloids vasicinone, dl-vasicinaone and l- vasicinone (Asolkar et al., 1992).

Medicinal uses:

The root, bark and leaves are useful in cough, asthma, ague and phthisis. The extract or juice of the plant makes sputum more fluid and thereby facilitating its removal and breathing. It is also used in bleeding piles. Root has expectorant, antispasmodic, diuretic, anthelmintic and antiseptic properties. Powdered root is used in the treatment of malarial fever and diphtheria. Leaves are emmenagogue; it has antiseptic and parasiticidal properties; useful in gonorrhoea and rheumatism. The dried leaves made into cigarettes are smoked in asthma. The fresh flowers are used in ophthalmia. Leaves are used in diarrhea.[14]

Useful parts: whole plant mainly leaves

Local Use of Study Area:

Justicia adhatoda juice is used in the to liquefy and removal of cough and reduce breathing problem.

Justicia adhatoda juice with Wihte Pepper, cayenne pepper and ginger juice is given in the treatment of ashma.

5.6 Plant serial number -5

Local Name: Sada-lojjaboti

Scientific Name: *Mimosa diplotricha*

Accession No: 41568

Photo:

Fig:*Mimosa diplotricha*

Botanical Description:

M. diplotricha is a scrambling, strongly branched shrub growing 1-2 m tall, woody at the base with age, with stems stretching to about 6 m long, forming low, tangled masses or climbing on other vegetation with the aid of its spiny stems. The green or purplish tinged stems are 4- or 5-angled in cross-section and covered with abundant sharp, recurved, yellowish spines, 3-6 mm long, The scattered bright-green leaves are finely bipinnate and 10-20 cm long. The leaves consist of 4-9 pairs of pinnae, 3-6 cm long, each with 12-30 pairs of opposite, sessile, lanceolate, acute leaflets, 6-12 mm long and 1.5 mm wide. The leaflet pairs fold together when touched and at nightfall, but they are considered as only moderately sensitive. The rachis is thickened at the base with slender, tapering stipules, and finely hairy with a few prickles along the back. The flowers are pinkish-violet in colour and occur in globose heads about 12 mm in diameter, singly, in pairs or threes on individual stalks originating in the axils of young leaves. The

peduncles are 6-10 mm long and hairy. The corolla is 2 mm long, regular, 4-lobed and green at the tips, with 8 pinkish-violet exserted stamens. The flat, softly spiny, linear, 3-6 seeded pods are 10-35 mm long, 6-10 mm wide, occur in clusters in the leaf axils and break into 1-seeded joints which fall away from unbroken sutures. The seeds are yellow-brown, glossy, flattened, ovate and 2-3.5 mm long. There is a horseshoe-shaped ring on each face. The plant reproduces only by seed.[15]

Scientific Classification:

- Kingdom: Plantae
- Phylum: Spermatophyta
- Subphylum: Angiospermae
- Class: Dicotyledonae
- Order: Fabales
- Family: Fabaceae
- Subfamily: Mimosoideae
- Genus: *Mimosa*
- Species: *Mimosa diplotricha* [16]

Distribution:*M. diplotricha* is native to the neotropics, including much of South and Central America. And found all over Bangladesh.

Chemical constituents:

Several studies have shown several biochemical substances involved in the contractility of the leaves.Fresh tissues give nor-epinephrine, d-pinitol (3-mono-methyl ether of inositol), and b-sitosterol. Leaves contain alkaloids. An alkaloid mimosine has been isolated from the plant. The preliminary phytochemical screening of the leaf extract showed the presence of bioactive components such as terpenoids, flavonoids, glycosides, alkaloids, quinines, phenols, tannins, saponins, and coumarins Phytochemical screening of *Mimosa* leaf extracts.Roots of the plant are indicative of the presence flavonoids, phytosterol, alkaloids, amino acids, tannins, glycoside, and fatty acids. Chromatographic procedures revealed that petroleum ether fraction majorly contains flavonoids, phytosterol, alkaloids, and amino acids. Acetone fraction has confirmed the presence of flavonoids. The chloroform fraction showed the presence of alkaloids. The essential oils and fatty acids were majorly contained in the benzene extract .Detection of constituents in roots of *M. pudica* by chromatographic scheme.The yield of the plant material in various solvents obtained by successive extraction was found out Successive solvent extraction of *Mimosa pudica* Linn. Leaves Crocetin dimethyl ester and tannin have been isolated from the plant. The mucilage from seed is composed of D-xylose and D-glucoronic acid 4-*O*-(3,5-dihydroxybenzoic acid)-b-D-glucoronide. The constituents were separated and purified by column chromatography with macroporous adsorption resin Diaion HP-20, Sephadex LH-20, Tyopearl HW-40, MCI Gel

CHP-20, RP-18, and normal phase silica gel. Their structures were identified on the basis of physical and spectral data. Four compounds were isolated and identified as:

7,8,3',4'-tetrahydroxyl-6-C-[alpha-l-rhamnopyranosyl-(1→2)]-b-D-glucopyranosyl flavone (I); 5,7,4'-trihydroxyl-8-C-[a-l-rhamnopyranosyl-(1→2)]-b-D-glucopyranosyl flavones (II); 5,7,3',4'-tetrahydroxyl-6-C-[a-l-rhamnopyranosyl-(1→2)]- b-D-glucopyranosyl flavone (III); catcher (IV).

Medicinal uses:

M. diplotricha has a woody taproot with nitrogen-fixing nodules on the laterals and its tolerance was frequently used as a cover crop and soil renovator in plantations, adding nitrogen and organic matter. In rubber plantations in Indonesia, *M. diplotricha* is valued as it ousts *Imperata cylindrica*, which is considered a more troublesome weed, and it is rolled back with sticks to keep the boles of the rubber trees accessible.[17]

Used parts: whole plant

Local Use of Study Area:

Decoction of root is used with water to gargle to reduce toothache every morning.

5.7 Plant serial number -6

Local Name: Chandan

Scientific Name: *Santalum Album*

Accession No: 41568

Photo:

Fig: *Santalum Album*

Scientific Classification

- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Santalales
- Family: Santalaceae
- Genus: *Santalum*
- Species **:*S. Album*** [18]

Botanical Description:

Sandalwood can be described as the fragrant woods yielded by trees in the genus Santalum. The stem grows 20 to 30 feet high, is heavy and straight-grained and varies in color. It is white when young, and yellow and orange in color when old. Its oval leaves are covered with a whitish bloom; its small flowers are varying in color. The plant species is normally found in the dry peninsular areas of India, right from the peaks of the Vindhya to the southern zones of Tamil Nadu and Mysore. Apart from this, it is also found in some other states within the country, like Madhya Pradesh, Utter Pradesh, Orissa and Rajathan. The species have been utilized since ancient times for curing a number of ailments and diseases. It is very popular as an essential oil and its fragrance is also of great significance. For such reasons, cultivation and trading of this plant species have been done throughout the ages and the species has been exploited to such an extent that it is almost on the verge of getting extinct.

Distribution: Grown primarily in India, and few places of Bangladesh.

Chemical Constituents:

Santalol (a-santalol, b-santalol)

Hydrocarbons (santene, and b santenes and nor-tricycloekasantalene)

Alcohols (teresantalol and santenol)

Aldehydes (nor-tricycloekasantalal and isovaleraldehyde)

Ketones (santalone and l-santenone)

Acids (teresantalic acid and a-and ß-santalic acids)

Medicinal uses:

- Sandalwood is very beneficial for treating gastric irritability and any other kind of gastric ailments. A mixture of about 22 grams of a watery emulsion of the wood with rice water, sugar and honey is used for treating this condition. The wood is also used in the treatment of dysentery.
- Since ancient times, sandalwood paste has been used to relieve headache and control the body temperature during fever.
- The paste is also as a remedy for prickly heat and prevents excessive sweating during adverse environmental conditions. To control profuse sweating, a mixture of dry sandalwood powder and rose water can be applied over the area.
- Sandalwood paste is also used for healing inflamed skin.
- Certain eruptive and inflammatory skin conditions like erysipelas, itchy eruptions like prurigo and certain other inflammatory diseases of the face can be healed by using an emulsion or a paste of the wood.
- Sandalwood oil is very helpful in curing scabies and even for the removal of pimples..[19]

Used Parts: Wood and Oil , leaves bark

Local Use of Study Area:

Wood is ground up with water into a paste and applied to the temples in headache, fevers and local inflammations.

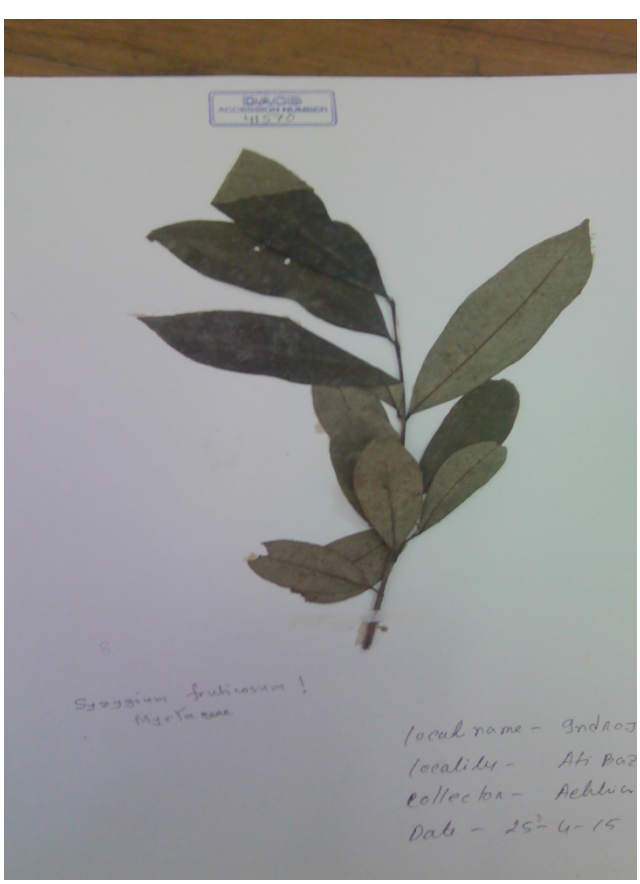
5.8 Plant serial number -7

Local Name: Indrojam

Scientific Name: *Syzygium fruticosum*

Accession No: 41570

Photo:



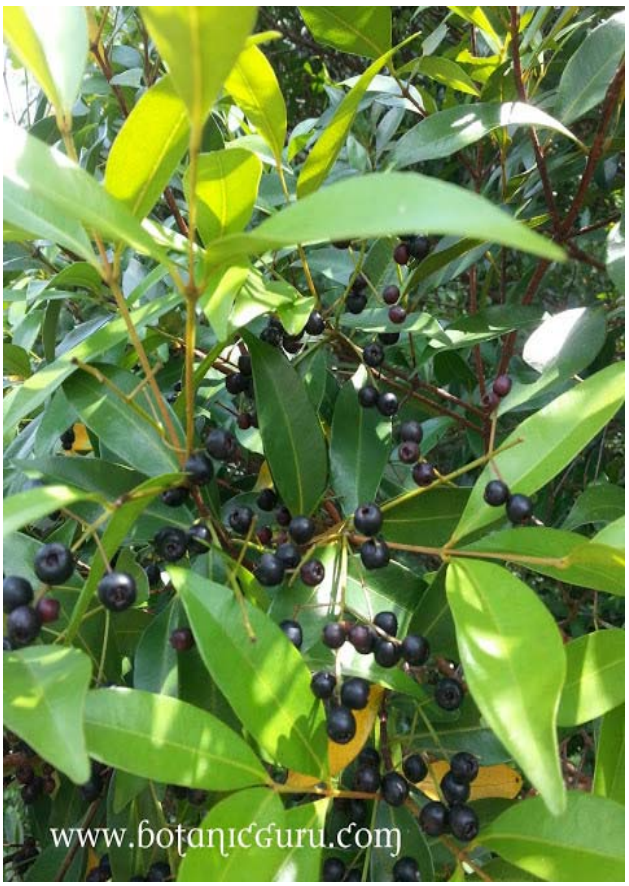


Fig: *Syzygium fruticosum*

Botanical Description:

A small to medium-sized, much branched, evergreen tree. Leaves elliptic-oblong, 5-13 cm long, gradually acuminate, base narrowed to a short petiole, lateral veins closely parallel. Flowers white, small in much branched trichotomouscymes from the scars of fallen leaves. Fruit a globose berry, the size of a pea, black or purple when ripe.[20]

Scientific Classification:

- Kingdom: Plantae
- Order: Myrtales
- Family : Myrtaceae
- Genus: *Syzygium*
- Species : *S.fruticosum*[21]

Distribution:

Chittagong, Chittagong Hill Tract, Cox's Bazar, Comilla, Dinajpur, Gazipur, Tangail and Sundarbans. Occur in the forests outskirts and village shrubberies.

Medicinal uses:

Juice of the tender leaves with rice water is taken in blood dysentery.Juice of the tender leaves with rice water is taken in blood dysentery.[22]

Useful parts: leaves and fruits

Local Use of Study Area:

Soak water of *Syzygium fruticosum* fruit in have to take 3 times a day for the treatment of dracunculiasis.

5.9 Plant serial number -8

Local Name: Sarpagandha

Scientific Name: *Rauvolfia serpentina*

Accession No: 41571

Photo:

fig: *Rauvolfia serpentina*

Botanical Description:

Flowering plant in the family Apocynaceae. Evergreen, glabrous, errect and grows up to a height of 60 cm (rarely more than that). It consist of long irregularly yellowish root.

Macroscopic character:- Leaves:- Simple, opposite, leaves are arranged in whorls of 3 to 4,to 10 cm long and 5 cm broad. Fruits:- Round, 5 cm in diameter, dark, purple or blackish when ripe.

Glabrous, white or pinkish, with deep red peduncle.

Scientific Classification:

- Kingdom: Plantae
- Order: Gentianales
- Family: Apocynaceae
- Genus: *Rauvolfia*
- Species: *R. serpentina*

Distribution:

It is widely distributed from 100-900 m high from sea level of Nepal, Burma and Bhutan.And also found in many places of bangladesh.

Chemical Constituents:

he major chemical constituents are:- Serpentine Reserpine Ajmaline Ajmalicine Ricinnamine Fatty acids Unsaturated alcohol Fumaric acid

Medicinal uses:

- In bowel disorder During fever Constipation Joint pain Hypnotic As anti-hypertensives As sedatives properties As tranquilizer.
- It is used to treat mild to moderate hypertension. These are normally involved in controlling heart rate, force of contraction and peripheral resistance. The effects of reserpine include respiratory inhibition, stimulation of peristalsis ,relaxation of membranes and influence on the temperature regulating centre.[23]

Useful parts: Roots and leaves.

Local Use of Study Area:

As the antidote against the bites of venomous reptiles, insect and animal bites.

Used in the anxiety states.

Traditionally being used in the intestinal disorder.

5.10 Plant serial number -9

Local Name: Bahera

Scientific Name: *Terminalia bellirica*

Accession No: 41572

Photo:

Fig: *Terminalia bellirica*

Botanical Description:

A large tree. Bark bluish-grey, fissured. Leaves simple, ovate-obovate or broadly elliptic, obtuse of emarginated at apex. Flowers cream colored, in auxiliary spikes. Drupes glucose, obscurely 5-angled, brown-tomentose. Occasional in hilly area[24]

Scientific Classification

- Kingdom: Plantae
- Order : Myrtales
- Family: Combretaceae
- Genus: *Terminalia*
- Species: *T. bellirica*[25]

Distribution: Forests of Gazipur, Sherpur, Chittagong, Chittagong Hill Tracts, Cox's Bazar, Tangail and planted elsewhere.

Chemical Constituents:

Fruits contain tannins, which is composed of gallotannic and ellagitannic acids, phyllemblin, ß-sitosterol, mannitol, sugars, hydrocarbons, tirtriacontanone, tetratriacontane, a hexahydroxy diphenic acid ester, ditriacontanol, resins and a greenish yellow oil containing palmitic, stearic, oleic and linoleic acids. Presence of three glycosidal compounds, a saponin, gallic acid, ellagic acid, ethyl gallate, chebulagic acid, mannitol, glucose, galactose, fructose, rhamnose, a new cardenolides type cardiac glycoside (bellericanin) have also been reported in fruits. Heartwood and bark contain ellagic acid; bark also contains substantial amount of oxalic acid.

Seed coat contains gallic acid. The triterpenoids arjungenin, tomentosic acid, belleric acid, bellericagenin, bellericagenin A, bellericagenin B, bellericoside, bellericaside A, bellericaside B and arjunglucoside l have also been isolated from this plant.

Medicinal uses:

Fruits are used in menstrual disorder. Seed oil is used in rheumatism (Chakma).

Dried fruit chewed for treat sore throat and cough until cured (Marma).

Fruit is taken directly twice daily until cured to treat cough and diarrhoea. (Rakhaing).

Decoction of the green fruit is used for cough (Tanchangya).[26]

Useful parts:bark , Fruits,

Local Use of Study Area:

Raw fruit is used in the treatment of gastric problem in this case raw 1 pice Terminalia bellirica fruit is soak in water for about a day then the water have to inake.

5.11 Plant serial number -10

Local Name: Gukkur kata

Scientific Name: *Barleria prionitis*

Accession No: 41573

Photo:

Fig: *Barleria prionitis*

Scientific Classification:

- Kingdom: Plantae
- Order: Lamiales
- Family: Acanthaceae
- Genus: *Barleria*
- Species: *B. prionitis*

Botanical Description: BARLERIA PRIONITIS L. is spine scent bushy shrub, up to 1.5 m high. Leaves up to 10 cm long, elliptic, acuminate, bristle-tipped. Flowers sessile, often solitary in the lower axills, becoming spicate above; corolla 3-4 cm, yellow.

Distribution: Dhaka, Rajshahi, Natore, Jessore, Kustia, Dinajpur, Comilla, in fallow lands.

ChemicalConstituents: Leaves and stems contain iridoids, barlerin and acetylbarlerin, ß-sitosterol. Flowers contain scutellarein-7-rhamnosyl glycosides. The plant is rich in potassium and contains an alkaloid (Ghani, 2003).

Medicinaluses: The plant is heating and appetizer; useful in diseases of the skin, itching, whooping cough and inflammations. The juice of the leaves is generally used in catarrhal affections of children accompanied with fever and much viscid phlegm. Leaves are chewed to relieve toothache. Dried bark is used in cough and juice of fresh bark in anasarca. The root is diuretic and tonic; paste of the root applied to disperse boils and glandular swellings; decoction is used as a mouthwash in toothache.[27]

Usefulparts: Fruit, leaf,whole plant

Local Use of Study Area:

Barleria prionitis is combination with muserd oil is applied in arthritis.

The leaf juice mixed with honey given to children in catarrhal affections and fever.

The dried stem bark is used as an expectorant in whooping cough.

5.12 Plant serial number -11

Local Name: Tut pata

Scientific Name: *Morus indica*

Accession No: 41574

Photo:

Fig: *Morus indica*

Scientific Classification

- KingdomPlantae
- Order:Rosanae
- Family: Rosales
- Genus: *Morus*
- Species:*M.indica*[28]

Botanical Description:

Morus indica is woody tree or shrub that can reach 3-10 m in height and 0.5 m in diameter. The bark is gray, thick, with many irregular longitudinal cracks. The ovate winter buds are reddish brown, bearing grayish brown, imbricate bud scales that are coated with hairs resembling those on the twig surface. Ovate or broad ovate, 5-15 cm long and 5-12 cm wide , the leaves are sparsely pubescent along the lower surface veins, with serrate margins, acuminate apices, abruptly acute or obtuse, and rounded or subcordate bases. Pubescent, green unisexual flowers emerge with leaves in April to May, blooming axillarily. Deep purple to red subovate, syncarpous fruits develop from May to August.

Distribution: *Morus indica* is native to central and northern China, and is now cultivated nationwide. Due to its long history of cultivation, the species has many varieties.

Chemical Constituents:

It contains about 1.5% protein, 0.5% fat, 8% carbohydrate, 0.7% malic acid.

the fruit is reported to contain 87.5 g water, 1.5 g protein, 0.49 g fat, 8.3 g carbohydrates, 1.4 g fiber, 0.9 g ash, 80 mg Ca, 40 mg P, 1.9 mg Fe, 174 IU vit. A, 9 ?g thiamine, 184 µg riboflavin, 0.8 mg nicotinic acid, and 13 mg ascorbic acid.

Medicinal uses:.

Theleaves are antibacterial, astringent, diaphoretic, hypoglycemic, odontalgic and ophthalmic. They are taken internally in the treatment of colds, influenza, eye infections and nosebleeds.

They are used in the treatment of rheumatic pains and spasms, especially of the upper half of the body, high blood pressure. The fruit has a tonic effect on kidney energy .

It is used in the treatment of urinary incontinence, dizziness, tinnitus, insomnia due to anemia, neurasthenia, hypertension, diabetes, premature greying of the hair and constipation in the elderly.

The root bark is antiasthma tic, antitussive, diuretic, expectorant, hypertensive and sedative. It is used internally in the treatment of asthma, coughs, bronchitis, oedema, hypertension and diabetes.

The bark is anthelmintic and purgative, it is used to expel tape worms . Extracts of the plant have antibacterial and fungicidal activity.[29]

Useful parts: Fruit; Inner bark; Leaves;

Local Use of Study Area:

Decocted leave without juice is used in the treatment of diarrhea and have to take three times a week.

A tincture of the bark is used to relieve toothache.

5.13 Plant serial number -12

Local Name: Neem pata

Scientific Name: *Azadirachta indica*

Accession No: 41575

Photo:

Fig: *Azadirachta indica*

Scientific Classification

- Kingdom : Plantae
- Order: Sapindales
- Family: Meliaceae
- Genus: *Azadirachta*
- Species: *A. Indica*[30]

Botanical Description: Its huge tree. Its oval leaves are covered with a whitish bloom; its small flowers are varying in color. The plant species is normally found in every parts of Bangladesh ri.

Distribution: Planted all over Bangladesh.

Chemical Constituents: Arious parts of the plant and the Neem oil contain triterpenoid bitter principles, saponins, flavonoids, tannins and alkaloids. The bitter principles include nimbidin, nimbin, nimbinine, 6-descetylnimbinine, nimbidol, nimbolide and bakayanin. In addition to these, the leaves contain azadirachtin, salanin, meliantriol, margosopicrin, paraisine, azadinine, nimbinene, nimbolide, quercetin and its glycosides, ?-sitosterol, n-hexacosanol, nonacosane, ascorbic acid and amino acids. Barks contain nimbolins A, B, organic acids, tannin, margosin, azadarin, kulinone, kulactone, kulolactone and methyl kulonate. Flowers contain essential oil, kaempferol, kaempferol glucoside, nimbosterin and N-nonacosane. Fruits contain resins, tannins, triterpenoids, salanin and azadirachtin, melianone, oil and organic acids.

Medicinal uses:

The bark is bitter, tonic, refrigerant, anthelmintic, maturant, astringent; relieves fatigue, fever, thirst, cough and bad taste in the mouth; useful in some slight cases of intermittent fever and general debility, amenorrhoea; cures ulcers and inflammations.

The root bark is more or less similar in action as stem bark.

Leaves are alexiteric, anthelmintic and insecticidal; good in ophthalmia, biliousness, skin diseases and boils; decoction is good as a gargle in stomatitis and for bad gums.

Seed oil is anthelmintic and alterative; useful in some chronic forms of skin diseases and ulcers and a universal external application for rheumatism. [31]

Usefulparts: Leaves, bark, seeds

Local Use of Study Area:

The paste of *Azadirachta indica* leaves is applied on skin to treat acne.

A decoction prepared from the *Azadirachta indica* roots of and ingested to relieve fever.

Azadirachta indica paste with turmeric paste and mustard oil is used in skin disease.

5.14 Plant serial number -13

Local Name: Nisinda

Scientific Name: *Vitex trifolia*

Accession No: 41576

Photo:

Fig: *Vitex trifolia*

Scientific Classification:

- Kingdom: Plantae
- Order: Lamiales
- Family :Lamiales
- Genus: *Vitex*
- Species: *V. trifolia* [32]

Botanical Description: The plant Vitex trifolia Linn . It is stout aromatic shrub or a small tree growing from 1 to 4 meters in height,sometimes prostate or ascending in habit. The leaves are simple or 3-foliolate. V. negundo closely resembles V. trifolia but can be distinguished by its long-petioluled median leaflet and 3-5 leaflets.Agroforestry Database 4.0 In the prostate form, the leaves are simple, stalkless, oblong to oblong-elliptic, 4 to 7 centimeters long, 1.5 to 4 centimeters wide, pointed at both ends, smooth and shining on the upper surface, and sparsely covered with gray hairs beneath. The flowers are numerous, and borne in terminal, oblong panicles 5 to 10 centimeters in length. The corolla is hairy, and lavender to blue; the tube is about 8 millimeters long; the larger, central lobe of the lower lip has a white blotch at the base: the limb is 12 millimeters in greatest diameter. The fruit is rounded and 4 to 5 millimeters in diameter.

Distribution: Chittagong, Cox's Bazar and other coastal districts.

Chemical Constituents: An essential oil and alkaloids have been isolated from the leaves and bark of this plant. Particularly leaves contain flavones, artemetin and 7-desmethyl artemetin and some non-flavonoid components. The major monoterpenes found in the leaf oil are 1,8-cineole, terpinylacetate, sabinene and α-pinene and the major sesquiterpene is caryophyllene (Ghani, 2003). Leaves also contain friedelin, β-sitosterol, β-sitosterol glycoside, a long chain hydrocarbon.

Medicinal uses: Leaves possess anthelmintic and insecticidal properties; used chiefly in rheumatic pains, inflammation and sprains; infusion of the powdered leaves are given in intermittent fever. Extract of the leaves possesses antitubercular and anticancer activity. Leaves are also used for hydrocele and stomachache in Khagrachari. The flowers are prescribed in fevers accompanied with vomiting and severe thirst. The fruit is emmenagogue; employed in amenorrhoea. Roots are tonic, expectorant and febrifuge.[33]

Useful parts: fruits and leaves

Local Use of Study Area:

In arthritis ½ gm *Vitextri folia* leave powder have to be taken with chill water in afternoon time.

Fruit powder relives the problem of wombs from the body.

Oil in combination with Vitex trifolia have to apply on skin fore about one week to treat skin disease.

5.15 Plant serial number -14

Local Name: Vat pata

Scientific Name: *Clerodendrum viscosum*

Accession No: 41577

Photo:

Fig: *Clerodendrum viscosum*

Botanical Description: A shrub or undershrub, 0.9-2.4 m high. Leaves large, 10-25 cm long, ovate, acuminate, hairy on both sides. Flowers white tinged with pink, on large pubescent, panicles. Fruit, a drupe, 8 mm across, black. [34]

Scientific Classification

- Kingdom: Plantae
- Order: lamiales
- Family: Verbenaceae
- Genus : *Clerodendrum*
- Species: *C. viscosum*

Distribution: Occur along road sides and fallow lands, throughout the country.

Chemical Constituents: The plant contains saponin, flavonoids, alkaloids, a new glycoside, clerodendroside, lupeol, benzoic acid derivatives and ß-sitosterol. The plant also contains clerosterol, clerodolone, clerodone. Leaves contain protein, free reducing sugar, a bitter principle, clerodin a sterol, oleic, stearic and lignoceric acids, tannin, glucuronide and gallic acid.

Roots contain lupeol & ß-sitosterol, the antifungal flavonoids, cabruvin and quercetin. The seeds contain a fatty oil, in which the major fatty acids are palmitic, oleic and linoleic acids. Clerodin and hentriacontane have been isolated from flowers .

Medicinal uses:

The plant is tonic, antipyretic and anthelmintic. Leaves and roots are used in asthma, tumours and certain skin diseases. Infusion of the leaves is used as bitter tonic and antiperiodic in malaria. Expressed juice of the leaves is laxative and cholagogue. Leaves are also used in chest complaint with cough and difficult expectoration. In Rangamati, leaf-boiled water is used as a bath in jaundice by the tribal; Marmas take bath for scabies.

Alcoholic extract of the young leaves possesses strong antibacterial and poor antifungal properties.[35]

Useful parts: Leaves , fruit, root.

Local Use of Study Area:

A paste of the root is applied to affected teeth for dental caries, root extracts are taken with the skin of snakes for the treatment of abdominal pain .

Root extracts are taken against constipation .

5.16 Plant serial number -15

Local Name: Lojjabati (red)

Scientific Name: *Mimosa pudica*

Accession No: 41578

Photo:

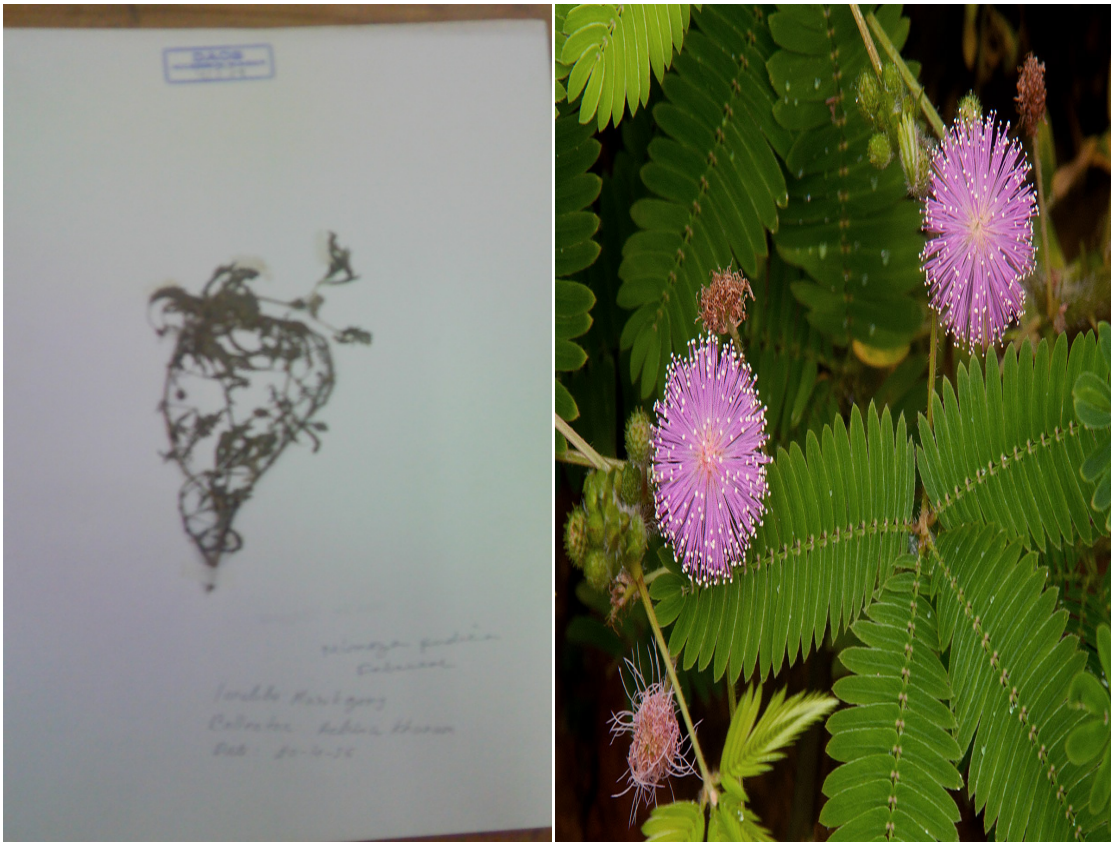


Fig *Mimosa pudica*

Botanical Description: Undershrubs; stems with prickles. Leaves alternate, pinnately compound, sensitive. Flowers in heads, pink. Fruits pods.

Scientific Classification:

- Kingdom: Plantae
- Order: Fabales
- Family: Fabaceae
- Genus: *Mimosa*
- Species: *M. pudica*[36]

Distribution: All over Bangladesh in fallow lands.

Chemical Constituents: Leaves and stems have been reported to contain an alkaloid, mimosine. Leaves also contain an adrenaline-like substance. Seeds contain mucilage and roots tannins. The plant also contains turgorins. Mucilage of seeds contains galactose and mannose in ratio.

Medicinal uses:

It is very useful in diarrhea (athisaara), amoebic dysentery (raktaatisaara), bleeding piles and urinary infections.

It arrests bleeding and fastens the wound healing process. It is mainly used in herbal preparations for gynecological disorders.

It has been said to have medicinal properties to cure skin diseases. It is also used in conditions like bronchitis, general weakness and impotence. It is also used to treat neurological problems. The content of M.pudica has a capacity of arresting bleeding and it fastens the process of healing of wounds.

It is recommended in diarrhea, amoebic dysentery and bleeding piles.

It is also used in herbal preparations of gynecological disorders.

Its extract can cure skin diseases. Some herbal doctors recommend it for bronchitis, general weakness and impotence. [37]

Useful parts: whole plant

Local Use of Study Area:

Whole plant boiled is in water and the extract is taken to treat body inflammation and pain during urination .Paste prepared from root is taken for the treatment of diarrhea.

Extract prepared from root is taken twice a day for one month to treat piles.

Boil whole plant in water and reduce the volume up to 33%, sugar is mixed in the extract & taken one glass twice daily until cured from jaundice.

5.17 Plant serial number -16

Local Name: Hatisur

Scientific Name: *Heliotropium indicum* L.

Accession No: 41579

Photo:

Fig: *Heliotropium indicum* L.

Botanical Description:

A coarse somewhat succulent, annual, 15-60 cm high with stout stem and ascending branches, more or less densely hirsute. Leaves 4.5-10 cm long, ovate or ovate-oblong, obtuse or subacute, hairy. Flowers small, pale violet, numerous, sessile, 2-ranked, in simple or rarely forked, usually extra-axillary spikes, 5-15 cm long.

Scientific Classification

- Domain: Eukaryota
- Kingdom: Plantae
- Phylum: Spermatophyta
- Subphylum: Angiospermae
- Class: Dicotyledonae
- Order: Boraginales
- Family: Boraginaceae
- Genus: *Heliotropium*
- Species: *H.indicum*

Distribution: Throughout Bangladesh in fallow lands.

Chemical Constituents: Aerial parts contain pyrrolizidine alkaloids, indicine (principal), echinitine, supinine, heleurine, heliotrine, lasiocarpine, its N-oxide, acetyl indicine, indicinine and anti-tumour alkaloid, indicine-N-oxide. The plant also contains rapanone and lupeol and an ester of retronecine. Roots contain high amount of estradiol.

Medicinal uses: Plants are astringent, emollient, vulnerary and diuretic. It is used as local application for ulcers, sores, wounds, gum boils, skin affections, stings of insects and rheumatism. Leaves are used for ringworm; juice is used in eye disease; decoction is used in fevers and urticaria. Roots are aphrodisiac; used for the cure of night blindness. Decoction of the roots is used in coughs and fevers. Seeds are stomachic. The flowers are considered emmenagogue in small doses and abortifacient in large doses.[38]

Useful parts: whole plant

Local Use of Study Area:

Decoction of leaves is taken in fevers . Decoction of the roots is taken to treat coughs and fevers.

Leaves rubbed on stone and the paste massage to belly for abdominal pain.

Paste prepared from leaf, taken three or four tea spoonfuls twice daily for two days for the treatment of urinary tract infection.

5.18 Plant serial number -17

Local Name: Bhui-amla

Scientific Name: *Phyllanthus niruri*

Accession No: 41580

Photo:

fig: *Phyllanthus niruri*

Botanical Description:

The annual herb is 30-60 cm high, quite glabrous, stem often branched at the base. Leaves: Numerous, sbsessile distichous often imbricating, elliptic oblong obtuse. Stipules present, very acute. Flowers: Yellowish, very numerous, axillary. The male flowers are one to three in number while the female flowers are solitary in nature. Capsules: 2.5mm in diameter, depressed globose, smooth scarcely lobed.[39]

Scientific Classification

- KingdomPlantae
- Order: Malpighiales
- Family: Phyllanthaceae
- Genus: *Phyllanthus*
- Species: *P.Niruri*[40]

Distribution: All over Bangladesh in lower land.

Chemical Constituents: The medicinal plant Phyllanthus niruri Linn. (Euphorbiaceae), its wide variety of phytochemicals and their pharmacological properties. The active phytochemicals, flavonoids, alkaloids, terpenoids, lignans, polyphenols, tannins, coumarins and saponins, have been identified from various parts of P. niruri. Extracts of this herb have been proven to have therapeutic effects in many clinical studies.

Medicinal uses: This herb is effective in the treatment of "jaundice". It is prescribed in Ayurvedic treatment to treat jaundice/Hepatitis and it also takes care of the effective functioning of Liver.

A clinical study with *Phyllanthus niruri*, indicated that it may reduce the levels of urinary calcium. A subsequent study of 150 patients over a 6-month period indicated that an extract of this herb reduces the incidence of stone formation, and concluded, "Regular self-administration of P. niruri after extracorporeal shock wave lithotripsy for renal stones results in an increased stone-free rate that appears statistically significant for lower caliceal location. Its efficacy and the absolute lack of side effects make this therapy suitable to improve overall outcomes after extracorporeal shock wave lithotripsy for lower pole stones. A more recent rat study found that Phyllanthus nirurihas been shown to interfere with many stages of stone formation, reducing crystals aggregation, modifying their structure and composition as well as altering the interaction of the crystals with tubular cells leading to reduced subsequent endocytosis.[41]

Useful parts: whole plant

Local Use of Study Area:

Phyllanthus niruri in combination with Withania somnifera and tamarind seed have paste ends kidney problem.

In jaundice treatment leaves juice in combination with honey have to take for one week.

5.19 Plant serial number -18

Local Name: Dam-Kalash

Scientific Name: *Leucas Aspera* (Wild) Link.

Accession No: 41581

Photo:

Fig: *Leucas Aspera*

Botanical Description:

A diffusely branched, annual herb, 15-45 cm high; branches quadrangular, hispid. Leaves subsessile, 2.5-7.5 cm long, linear-oblong or oblong-lanceolate, obtuse entire or crenate, hairy. Flowers white, sessile or subsessile in terminal and axillary whorls, up to 2.5 cm diam., corolla 1 cm long.[42]

Scientific Classification

- Kingdom: Plantae
- Order: Lamiales
- Family:Lamiaceae
- Genus: *Leucas*
- Species: *L .Aspera*[43]

Distribution: Dhaka, Chittagong and Chittagong Hill Tracts in fallow lands.

Chemical Constituents:

Leaves contain glucosides, tannins, saponins and sterols, α and β-sitosterol. Shoots contain aliphatic 28-hydroxy pentatriacon-7-one, 7-hydroxydotriacontan-2-one, 1-hydroxytetratriacontan-4-one, 32-methyl tetratriacontan-8-ol, 5-acetoxy-triacontane, dotriacontanol and β-sitosterol. Two sterols and galactose have been isolated from the plant. Plant also contains oleic, linoleic, palmitic, stearic, oleanolic and ursolic acids (Ghani, 2003; Rastogi & Mehrotra, 1990).

Medicinal uses:

The plants are believed to be antidote for snake venom; used as an insecticide.The leaves are useful in chronic rheumatism. The juice of leaves is applied in psoriasis and other chronic skin eruption Ethanolic extract of the leaves and stems possess antibacterial properties (Singha *et al*., 1993). Chloroform and ether extract of the plant possesses antifungal activity (Ghani, 2003). Extract of the plant showed antibacterial activity against *Micrococcus pyogenes* and *E. coli.*[44]

Useful parts: Leaves

Local Use of Study Area:

A paste of the leaves is applied to the forehead and body for the treatment of coma following high fever in children

Leaf paste is used in insect bites.

5.20 Plant serial number -19

Local Name: Fut pata, musri pata

Scientific Name: *Stephania japonica*

Accession No: 41582

Photo:

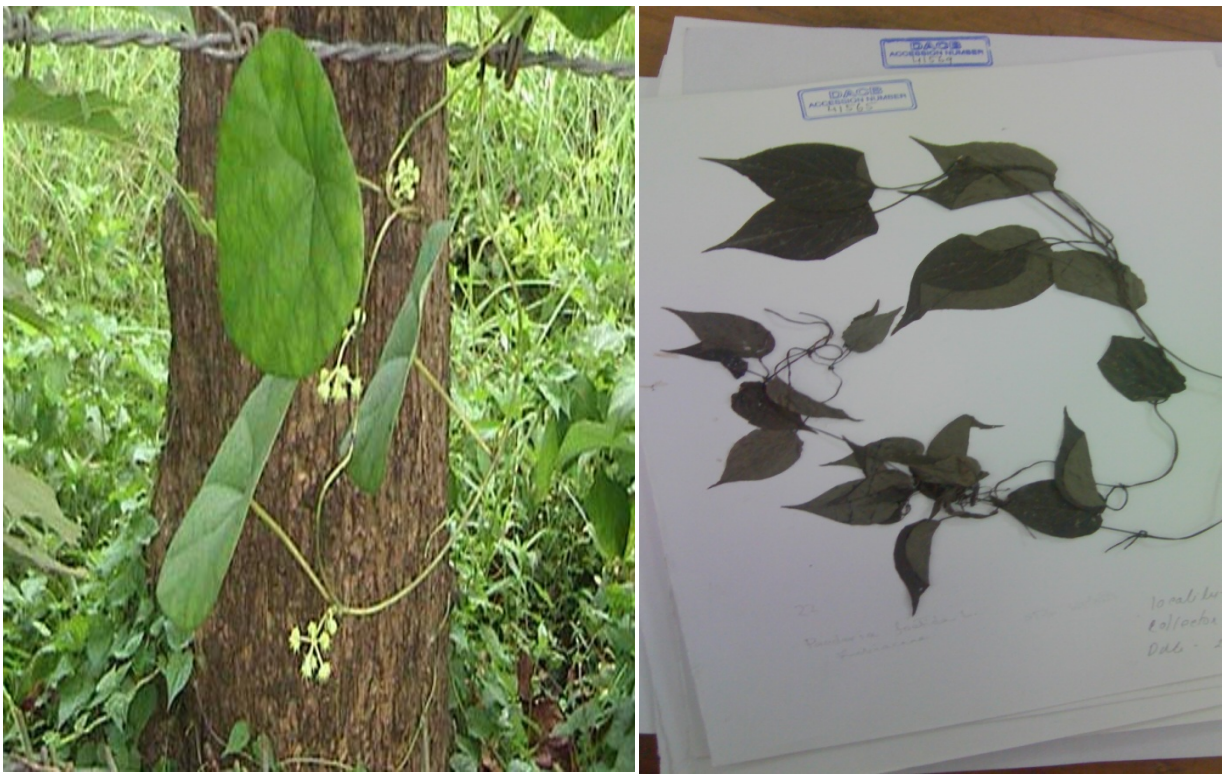


Fig: *Stephania japonica*

Botanical Description:

A slender wiry climber. Leaves peltate, thinly papyraceous, glabrous on both the surfaces, broadly triangular, ovate-acuminate, 3-12 cm long, apex acutely acuminate or obtuse, base rounded, margins entire. Inflorescence axillary, compound, umbelliform cymes, usually single per axil, 3-6 cm long. Flowers small, male flower greenish-white or yellowish. Drupes light yellow to orange red, obovate, glabrous.[45]

Scientific Classification:

- Kingdom:Plantae
- Order:Ranunculales
- Family:Menispermaceae
- Genus:*Stephania*
- Species:*S.japonica*[46]

Distribution:

Throughout the country.

Chemical Constituents: Roots, tubers and leaves contain alkaloids, steroids and fats. Stems contain bis-benzylisoquinoline alkaloids, stephasubine and 3´,4´-dihydro-stephasubine, saponins, steroids and fats. Roots contain the alkaloids, fangchinoline, dl-tetrandrine, d-tetrandrine and d-isochondrodendrine (Ghani, 2003). Aknadinine, epistephanine, hernandifoline and magnoflorine have been isolated from aerial parts. Roots and tubers contain alkaloids - aknadinine, aknadine and aknadicine. A new alkaloid-3-O-dimethylhernandifoline also isolated from the plant.[71]

Medicinal uses: Leaves and roots are bitter and astringent; used in fever, diarrhoea, urinary diseases and dyspepsia. Leaves are mounted on abscess and kept for bursting. Leaves are mecerated in a glass of water and are taken after mixing with molasses to cure urethritis. Leaves are also given for gastritis in Khagrachari. Root paste is taken for vertigo and dysentery; root tuber mixed with root juice of Flemingia stricta is taken for asthma; root paste is warmed and rubbed in hydrocele.[47]

Useful parts: Whole plant

Local Use of Study Area:

1 gm leaves is taken and 1 kg water and the water have to take in after decoction of the leaves in water in uterine irritation.

5.21 Plant serial number -20

Local Name: Lal padda

Scientific Name:*Nelumbo nucifera*,

Accession No: 41583

Photo:

Fig:*Nelumbonucifera*

Scientific Classification:

- Kingdom:Plantae
- Order:Proteales
- Family:Nelumbonaceae
- Genus: *Nelumbo*
- Species: *N.nucifera*[48]

Botanical Description:

A large aquatic herb with slender, elongate, branched, creeping stem. Leaves large, 0.3-0.6 m or more in diam., orbicular, peltate, entire, floating with very long petioles. Flowers solitary, 10-25 cm diam. White or rosy, peduncles very long. Fruit obconical, 5 cm long and 6 cm broad, top flat.[53]

Distribution:

In Bills and Haors of Gajipur, Mymensingh, Bagerhat, Kishoreganj, Naogaon, Nawabganj, Rangpur, Sherpur, Feni and some other districts.

ChemicalConstituents:

Leaves, pedicels and embryo are reported to contain alkaloids, nelumbine and nupharine, nuciferine, *nor*nuciferine, pronuciferine, roemerine, anonaine, 5-methoxy-6-hydroxyaporphine and meratin hyperoside, quercetin, isoquercetin, a quercetin glucoside (quercetin-3-gluco-glucuronide), nelumboside, luteolin and glucoluteolin, dl-armepavine oxalate. Rhizomes and seeds contain resins, tannin, fat, glucose and the alkaloid nelumbine. Raffinose and stachyose have been isolated from rhizome. Seeds contained β-sitosterol, palmitic acid, glucose, oxoushinsunine and N-norarmepavine. Methylcorypalline, neferine, isoliensinine and lotusine have been isolated from embryo.

Medicinal uses: Roots are diuretic; useful in cough, biliousness, throat troubles and spermatorrhoea; in the form of powder it is prescribed for dysentery, dyspepsia and piles as a demulcent; in the form of paste in ringworms and other cutaneous affections. The tender leaves are cooling; useful in burning sensation of the body, thirst, strangury, piles and leprosy. The flowers are considered cardiac tonic, used as an astringent in diarrhoea and cholera, in fever and liver diseases. Stamens are considered aphrodisiac, astringent and cooling and sedative to the uterus; useful in burning sensation of the body, bleeding piles, menorrhagia and diarrhoea; cures ulcers and mouth sores. Seeds are demulcent, refrigerant and form a cooling medicine for skin diseases and leprosy; given to children as diuretic and to check vomiting. *Sherbet* prepared from the plant is refrigerant; given for fever, biliousness, vomiting and strangury; it remove worms and allays thirst.[49]

Useful parts: Flower, leaves, Roots

Local Use of Study Area

One *Nelumbo nucifera* in combination with Hibiscus *rosa-sinensis*,and *Lilium philadelphicum* is decoced together and then three tablets have to make , drid an taken is the treatment of havey mistration.

5.22 Plant serial number -21

LocalName: Rakta jaba

ScientificName: *Hibiscusrosa sinensis*

Accession No: 41584

Photo:

Fig: *Hibiscus rosa-sinensis*

Scientific Classification:

- Kingdom: Plantae
- Order: Malvales
- Family: Malvaceae
- Genus:*Hibiscus*
- Species: *H.rosa-sinensis*[50]

Botanical Description:

An ornamental shrub or small tree.Leaves ovate-lanceolate, more or less acuminate, irregularly and coarsely serrate towards the top. Flowers large, axillary solitary; corolla 7.5 cm diam., tubular below, red.[55]

Distribution: Cultivated in gardens and homestead.

Chemical Constituents:

Leaves and stems contain β-sitosterol, stigmasterol, taraxeryl acetate and three cyclopropane compounds and their derivatives. Flowers contain cyanidin diglucoside, flavonoids and vitamins, thiamine, riboflavin, niacin and ascorbic acid (Ghani, 2003). Quercetin-3-diglucoside, 3,7-diglucoside, cyanidin-3,5-diglucoside and cyanidin-3-sophoroside-5-glucoside have been isolated from deep yellow flowers; all above compounds and kaempferol-3-xylosylglucoside have been isolated from ivory white flowers.

Medicinal uses:

The flower buds are cooling and astringent; remove burning of the body, urinary discharges, seminal weakness and piles. Flowers are refrigerant, emollient, demulcent, aphrodisiac and emmenagogue. Juice of the flower with juice of banana inflorescence cures acute dysentery. Flower with leaves of *Adhatoda zeylanica* is very much beneficial in bleeding piles. Flowers fried in ghee is given in menorrhagia; also used in diseases of the genito-urinary tract. Marma tribe in Chittagong Hill Tracts use to administer decoction of the flower with green betel nut to regulate menstrual cycle. Fresh flowers are mecerated and mixed with water is taken to cure scanty menstruation. Flowers are used in Khagrachari for blood dysentery. Staminal column is diuretic and is used in the treatment of kidney trouble. Leaves are emollient, anodyne and aperient. Roots are valuable in cough.[51]

Useful parts: Leaves, Flowers

Local Use of Study Area:

One Nelumbo nucifera in combination with Hibiscus rosa-sinensis,and Lilium philadelphicum is decoced together and then three tablets have to make , drid an taken is the treatment of havey mistration.

5.23 Plant serial number -22

Local Name: Noyon Tara

Scientific Name:*Catharanthus roseus*

Accession No: 41585

Photo:

Fig: *Catharanthus roseus*

Scientific Classification

- Kingdom: Plantae
- Order:Gentianales
- Family:Apocynaceae
- Genus:*Catharanthus*
- Species:*C.roseus*[52]

Botanical Description:

Catharanthus roseus is a fleshy perennial growing to 32 in (80 cm) high. It has glossy, dark green, oval leaves (1-2 inches long) and flowers all summer long.

The blooms of the natural wild plants are a pale pink with a purple "eye" in their centers. (Magic and Medicine of Plants.1993).

Distribution: Commonly grown in gardens.

Chemical Constituents:

The plant contains more than 100 indole alkaloids which are distributed in all parts, but more concentrated in the roots, the bark of the pink variety contains up to 9% of total alkaloids. These alkaloids include the clinically most important bis-indole alkaloids, vinblastine (vinleukoblastine), vincristine (vinleurocristine), vinleurosine and vinrosidine having leukopenic activity and vincarodine, vincoline, vincathicine, vincubine and the antimitotic alkaloids leurocolombine, vinamidine.

Leaves contain small percentages of leurosine, isoleurosine, perivine, mitraphylline, lochnerine, perosine, sitsirikine, vincamicine, perividine, canvincine, vindolicine, etc. Roots contain more than 24 alkaloids including vincamicine, catharine, vinceine, d-yohimbine (ajmalicine), vincodolicine, vindoricine, vinosidine, lochnerivine, leurosivine, cavincine, lochnericine, alstonine, vincaline I and II and serpentine. The plant also contains two secoiridoid glucosides monoterpene glycosides, ß-sitosterol, ursolic, loganic and oleanolic acids.[53]

Medicinal uses:

The root is considered tonic and stomachic.

The alkaloids isolated from plant possess anticancer properties, among them vincristine and vinblastine are successfully used against leukemia and Hodgkin’s disease.

Alkaloids also possess hypotensive, sedative and tranquillizing properties.

They also cause relaxation of plain muscles and depression of the central nervous system.

Alcoholic extract of the leaves exhibited significant antibacterial activities against Vibrio cholera. .[54]

Useful parts: Bark, leaves, flower

Local Use of Study Area:

Decoction of Catharanthus roseus in one table spoon have to be taken twice a day to treat diabetis for about 8/10 days.

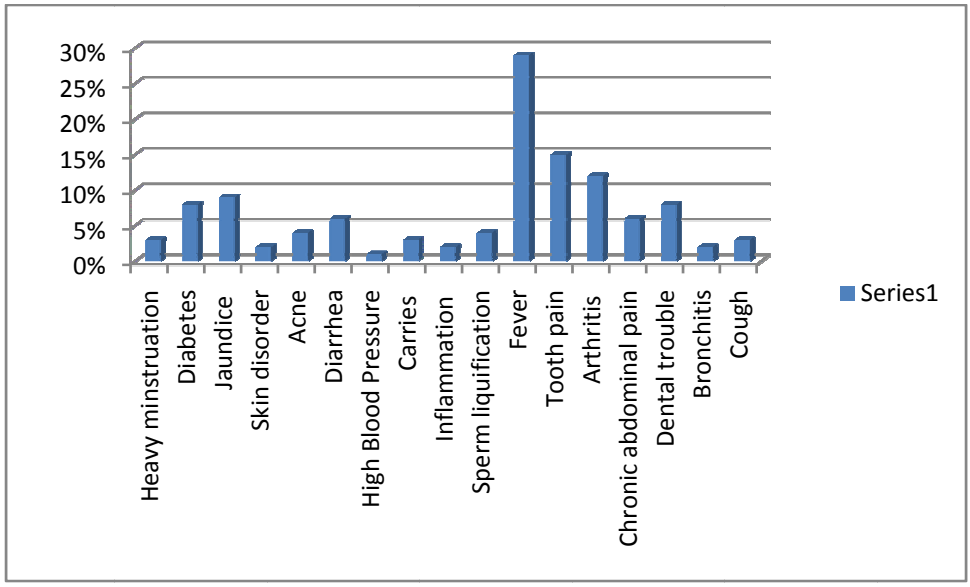
Table-2: Comparative analysis of ailments treated by the Kavirajes

Name of disease	Number of plants in use																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Cough	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Bronchitis	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dental trouble	+	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-
Chronic abdominal pain	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arthritis	-	+	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
Over eating Absecss	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rheumatic pain	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Gout	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Tooth pain	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fever	+	-	-	-	-	+	-	-	-	+	-	+	-	-	-	+	-	+	-	-	-	-
Sperm liquification	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inflammation	-	-	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Carries	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Asthma	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Womb problem	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Uterine pain	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Intestinal disorder	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Gastric problem	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
High Blood Pressure	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diarrhea	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-
Acne	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Skin disorder	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
Constipation	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Piles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-

Jaundice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
Urinary tract infection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
Kidney problem	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Insect bite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
Uterine Irritation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Diabetes	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Heavy menstruation	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-

A positive (+) sign indicates that the particular ailment was treated by the particular plant.

Fig-1: Percentage of commonly treated diseases by plants



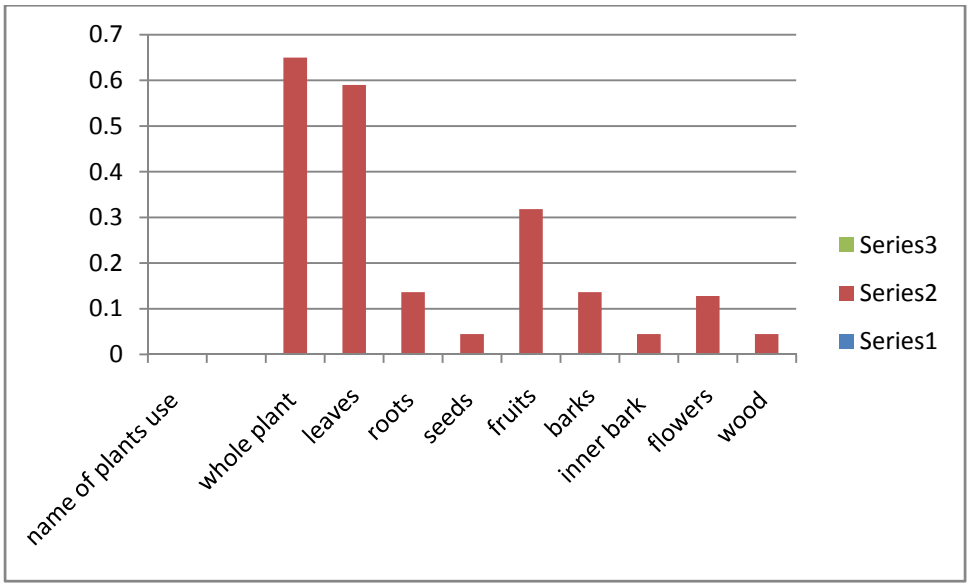
6.24 Plant parts Used:

Use of plant parts as medicine shows variation. Leaves are the leading part used in a majority of medicinal plants followed by 45.45% of the total uses. This was followed by leaves (59%), roots (13.63%), seeds (4.45%), fruits (31.81%), stems and barks (13.63% each), roots (13.63%), and flowers (2.8%) wood .(4.45%) .In the present study area this threat was minimal as leaves were the leading plant parts used for medicinal purposes'. I am grateful that the collection of bark as medicinal part from the wild were not sustainable. According to local people, this type of activity is carried out by the collectors related to illegal trade of medicinal plants.

Table-3: List of the number of plant parts commonly utilized by the kaviraj

Parts name	Useful%
All parts	45.45%
leaves	59%
roots	13.63%
seeds	4.45%
fruits	31.81%
stems and barks	13.63%
roots	13%
flowers	2.8
wood	4.45%

Fig-2: List of the number of plant parts commonly utilized by the kaviraj



Fig, 24 : Number of plant parts used for medicinal purpose.

Chapter 6

Conclusions

6.1 Conclusions:

The people of the keranigonj region are highly dependent on these plants for medicinal and other ethnobotanical purposes. The people of the region have tremendous traditional knowledge regarding the utilization and preparation of various ethno medicinal remedies. Moreover, they are using some medicinal plants for multipurpose and posing great pressures on certain medicinal plants *Azadirachta indica* like and *Clerodendrum viscosum* . Hence, natives should be educated regarding the sustainable usage of medicinal plants. The persistence of traditional knowledge is more among old age people; however, as a matter of concern, young people are taking less interest in such knowledge due to multiple reasons. As such, studies on the documentation of ethno medicines may be extended to other areas for the protection of traditional knowledge. Further phyto chemical analysis, pharmaceutical application, and clinical trials are therefore recommended in order to evaluate the authenticity of ethno medicines to scientific standards.[55]

Chapter 7

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