

AN INVENTORY OF MEDICINAL PLANTS USED IN TRADITIONAL HEALTHCARE PRACTICES IN BUXAR DISTRICT OF BIHAR, INDIA

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ABSTRACT

This paper presents the results of a study on traditional healthcare practices of local herbal healers known as Vaidhy and other knowledgeable people of Buxar district of Bihar. Since knowledge of traditional uses of various medicinal plants is limited to mostly traditional herbal healers, it is of extreme importance to compile and document this heritage for coming generations. In the present study, 65 plant species belonging to 36 families are used traditionally for the curing of more than 35 ailments and diseases. Among all the plant species, herbaceous plants found to be most dominant (37%) followed by tree (35%), shrubs (19%) and climbers both annual and perennials (9%). The highest number of medicinal plants were recorded in three families viz., Caesalpiniaceae (5 species), Euphorbiaceae and Solanaceae (4 species). The traditional medicinal plants were, mostly used to cure dysentery, diarrhoea, fever, skin diseases, wounds, rheumatism, piles, and digestive disorders, etc.

KEYWORDS : Traditional Healthcare Practices, Buxar, Vaidhy, Medicinal Plants, Knowledgeable People, Traditional Uses

Plants, since times immemorial, have been used virtually in all the cultures as a source of medicine. The widespread use of herbal remedies and healthcare preparations from traditionally used plants, as those described in ancient texts such as the Vedas and the Bible, has been traced to the occurrence of natural products with immense medicinal properties in the cure of human diseases and in the development of different types of medicines for public health. The importance of traditional medicine as a source of primary healthcare was first officially recognized by the World Health Organization (WHO) in the Primary Health Care Declaration of Alma Ata (1978) and has been globally addressed since 1976 by the Traditional Medicine Programme of the WHO. That Programme defined traditional medicine as: The sum total of all the knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing.

Plants and plants based medicaments have been employed since the dawn of civilization for prolonging life of man by combating various ailments. Ancient ethnic communities around the world have learnt to utilize their neighborhood herbal wealth for curative purpose. Indian subcontinent is being inhabited by over 54 million tribal people dwelling in about 5000 forest dominated villages spreading across the country comprising 15% of the total geographical area, their knowledge of plants developed

often of the cost of their life in their natural dwellings through centuries old experience could not be perfectly documented due to the lack of literacy and it had rather descended from one generation to another as a domestic practice (Nath and Khatri, 2010). They comprise one of the unique treasure and rich source of diversified ethno-botanical wealth. Traditional herbal remedies have always played a key role in the healthcare systems all over the world. In India, the native people still exploit a variety of medicinal plants for curing various types of ailments and disorders related to human and animal healthcare. It is estimated that about 80% of people worldwide rely mainly on traditional healthcare practices and especially on plants based medicines (Farnsworth and Soejarto, 1991; Pei, 2002).

The contribution of medicinal plants to the health of rural especially tribal people in Buxar is extremely important because most of the population still believe in traditional healthcare systems. Traditional knowledge of herbal medicines is gradually being lost, although some traditional herbal healers (Vaidyas, Ojhas) are still practicing an indigenous system of healthcare systematically and effectively. Primitive people have acquired knowledge about medicinal properties of plants by trial and error, and have made an outstanding contribution to the origin and evaluation of many traditional herbal therapies in the Buxar District of Bihar. Documentation of indigenous knowledge and evaluation of the use of plants for a various purposes for greater significance, not just to retain

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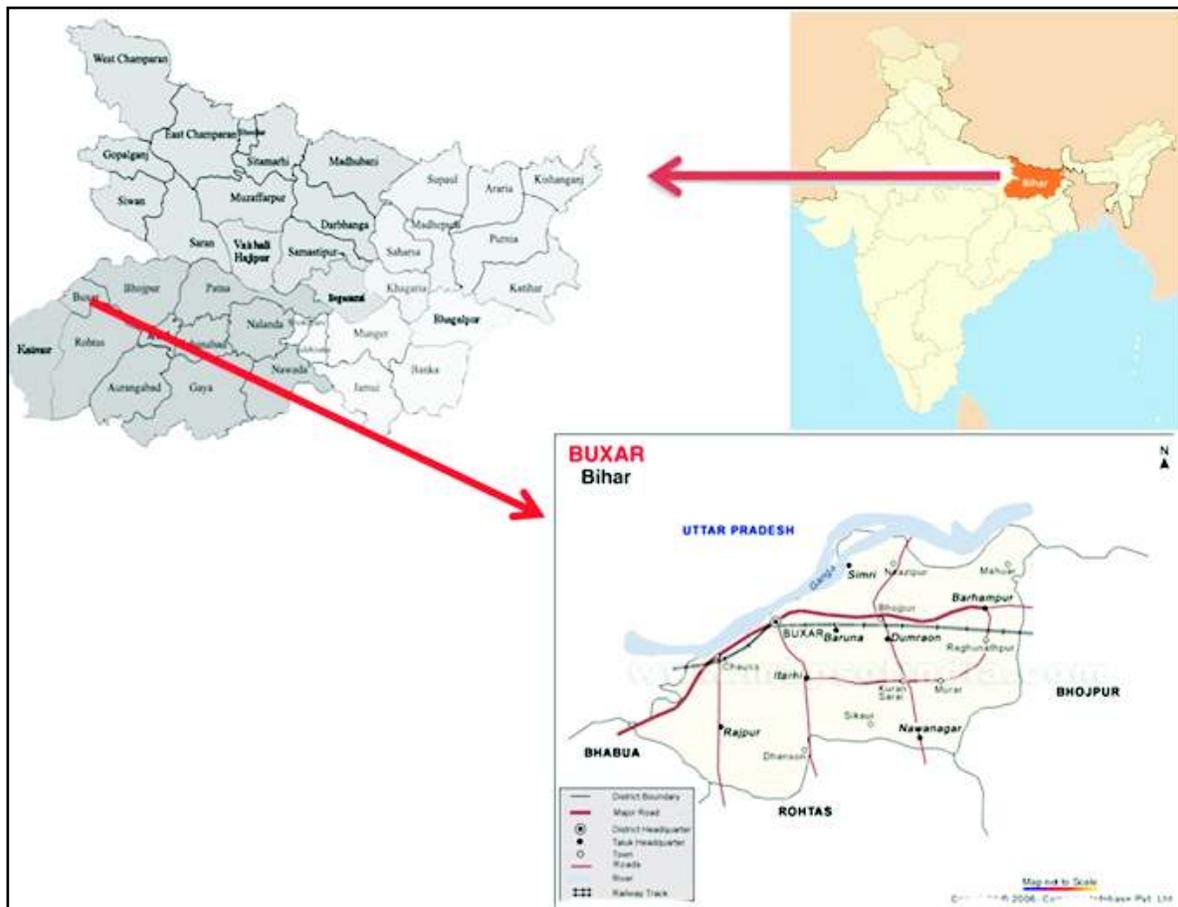


Figure 1 : Map of Study Area (Source: www.mapsofindia.com)

it, but also to keep it alive and make it available for future use because of rapid socio-economic and cultural changes that are taking place across the traditional community of the region.

MATERIALS AND METHODS

Description of the Study Area

The study area is the city Buxar which is the district headquarters of the district Buxar. The river Ganga and Karmanasa divide it from Uttar Pradesh. Total area occupied by the city Buxar is 24.7 km². It is located at 25°34' North and 85°34' East. It has an average elevation of 56 meters (186 feet) above the sea level. The rivers flowing through the city are Ganga and Karmanasa. River Ganga forms the border in North and in the West the Karmanasa. The soil form is low lying alluvial plane of river Ganges and her tributaries- Thora and Karmanasa. The

present district of Buxar consists of areas under Buxarsadar and Dumraon Subdivision of the old Bhojpur district and came in existence in the year 1991. Buxar district is bounded on the north by Ballia district of Uttar Pradesh, on the south by Rohtas district, on the west by Ghazipur and Ballia districts, and on the east by Bhojpur district (Figure 1).

Sampling Procedure and Data Collection

In-Depth Interview and Discussions Based Approach

Present study is based on two year extensive exploration of area with the help of tribal people and village medicine-men known as vaidhya and ojhas. Excursions were undertaken at regular intervals in different seasons in different parts of the area to collect and observe different ethnomedicinally important angiospermic plants. Information regarding ethnomedicinally important plants of the area was collected through interviews with several

persons aged between 45 and 75, who had the traditional knowledge of plants. The information regarding the medicinal usages of the plants available in the local areas for treating ailments and diseases was collected by various direct meetings/discussions and semi-structured interviews with tribal and medicine-men like vaidhy and ojhas of district as described by Cotton (1996) and Jain and Goel (1995). Oral consent was sought out from each informant before the start of the discussion and interview. Interview and discussion were conducted in both Hindi and local Bihari language. Each informant was interviewed separately and advised not to discuss with each other so that they could provide independent information. The questions were asked in stepwise manner by first asking about their age, address, level of education and occupation. Following that, informants were asked to share their traditional knowledge on the medicinal utilization of plants. This included local name of medicinal plants used, habitat, ailments treated, mode of administration and dosage.

Floristic Inventory Based Approach

Almost all the plants were collected in flowering and fruiting period with the help of experienced rural people. While collecting the individual plant species thorough observations were made regarding their natural habitat. Every such plant was kept in vacuum and studied for its identification. The plants specimens after identification were subjected to drying between old newspapers or filter papers and kept in wooden plant press. The old newspapers or filter papers were changed daily for first week to prevent folding of soaked plants. The pressed specimens were some time kept to close to artificial heat to prevent dampness. The herbarium sheets of the identified plant were by fixing the plants with the help of a transparent cello tap. Each herbarium sheet contained information pertaining of Botanical Name, Local Name, Family, Date and Place of Collection. The sample of the plant species were identified with the help of local and regional flora (Duthie, 1903-20; Kanjilal, 1982; Kirtikar and Basu, 1999; Hooker, 1872 to 1896; Raizada, 1976; Dubey, 2004; Hains, 1925; Bor, 1960; Mishra & Varma, 1992; Saini et al., 2010 etc).

RESULTS AND DISCUSSION

The inhabitants of Buxar Districts use a number of medicinal plants for treatment of various ailments and diseases. A total of 65 plant species in 36 families are used traditionally with various plant parts and their combination for the treatment of more than 35 ailments and diseases in the studied area (Table. 1). Similarly, Phondani et al., (2010) reported 86 species distributed in 43 families are used for treatment of 37 common ailments among the Bhotiyatribal communities of Niti Valley in Central Himalaya, India. Methods of using these plants vary according to the nature of ailments and diseases; the decoction of leaves, stem and root was the dominant form for treatment followed by powder and paste of bark and root, juice of leaves, and seed powder. Among all the plant species, herbaceous found to be the most dominant (37%) followed by trees (35 %), shrubs (19%) and climbers both annual and perennial (9%) Figure 2). The highest number of medicinal plants (Figure 3) were recorded in four families Caesalpiniaceae (5 species), followed by Euphorbiaceae and Solanaceae (4 species). Acanthaceae, Asteraceae, Combretaceae, Papilionaceae, Rutaceae, Liliaceae, Apocynaceae, Asclepiadaceae, Asclepiadaceae, Convolvulaceae, Cucurbitaceae, Malvaceae, Mimosaceae, Moraceae contribute 2 species. Rest of the reported families contributes one species each.

The study found that different parts of the medicinal plant species were used as medicines or any crude forms namely root, stem, stem bark, leaves, flowers, fruits, seeds, whole plant and gum and latex, while most commonly used plant part was leaves (22 species) followed by roots (14 species), fruits (13 species), whole plants (11 species), stem bark (9 species), seeds (8 species), flowers (7 species), gum and latex (6 species) and stem (3 species) (Table 2 and Figure 4).

The present investigation revealed that ethno-medicinal plants are being used to treat the various ailments and diseases like diarrhea and dysentery, cough and cold, fever (viral/malarial), skin diseases, digestive disorders, boils and blisters, snake bite and scorpion sting, arthritis and joints pain, rheumatism, diabetes, piles, teeth complaints, asthma, jaundice, bone fracture, headache, pyorrhea, throat sore, urinary disorders etc. by the local especially rural

Table 1 : Database of Medicinal Plants of Buxar District of Bihar

S.N.	Scientific name	Family	Habit	Part used	Ailments
1.	<i>Abrus precatorius</i> L.	Papilionaceae	Perennial Climber	Leaves and roots	Snake bite and memory enhancer
2.	<i>Abutilon indicum</i> K. Mart.	Malvaceae	Herb	Whole plant	Piles, boils and fever
3.	<i>Acacia nilotica</i> (L.) Del.	Mimosaceae	Small tree	Bark and gum	Pyorrhoea, mouth ulcer, gum and dental care
4.	<i>Achyranthus aspera</i> L.	Amaranthaceae	Herb	Whole plant	Asthma, liver disease and scorpion sting
5.	<i>Acorus calamus</i> L.	Araceae	Perennial herb	Root	Stammering (haklana)
6.	<i>Adhathoda vasica</i> Nees	Acanthaceae	shrub	Leaves	Bronchial asthma, chronic cough
7.	<i>Adina cordifolia</i> (Roxb.)	Rubiaceae	Tree	Stem bark and buds	Rheumatism and body pain
8.	<i>Aegle marmelos</i> L.	Rutaceae	Small tree	Roots and fruit	Dysentery, heat stroke and fever
9.	<i>Ageratum conyzoides</i> L.	Asteraceae	Annual herb	Whole plant	Wounds and chronic dysentery
10.	<i>Albizia lebbek</i> (Roxb.) Benth.	Mimosaceae	Tree	Fruits	Snake bite and scorpion sting
11.	<i>Allium cepa</i> L.	Alliaceae	Biennial herb	Bulb	Cholera
12.	<i>Aloe vera</i> Mill.	Liliaceae	Herb	Leaf juice and pulp	Headache, wounds and cuts, burn, and Indigestion
13.	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Medium size tree	Bark and latex	Eye infection and malarial fever
14.	<i>Andrographis paniculata</i> (Burm. f) ex Nees	Acanthaceae	Annual herb	Whole plant	Malarial fever, gastric disorder
15.	<i>Annona squamosa</i> L.	Annonaceae	Small tree	Root	Abortion
16.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Under shrub	Root	Health tonic and galactagogue
18.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Annual herb	Root	Urinary disorders
19.	<i>Bambusa arundinaceae</i> L.	Poaceae	Woody perennial herb	Stem and leaves	Skin allergy (Sheet ubharna)
20.	<i>Bombax ceiba</i> L.	Bambacaceae	Large deciduous tree	Bark and flowers	Labour pain and uterine disorder
21.	<i>Butea monosperma</i> (Lamk.) Taub.	Caesalpiniaceae	Medium size deciduous tree	Leaves, flower and Gum	Dyspepsia, worms and vitality
22.	<i>Caesalpinia bonduc</i> Roxb.	Caesalpiniaceae	Prickly climber	Seeds	Cough and cold and skin disease
23.	<i>Calotropis gigantean</i> (L.) R. Br.	Asclepiadaceae	Shrub	Flowers	Dizziness and vertigo
24.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Small tree	Leaves, bark, fruit and pod	Constipation, cough, insect bite and repellent

25.	<i>Cassia tora</i> L.	Caesalpinaceae	Annual herb	Seeds	Asthma and respiratory disease
26.	<i>Lageneria vulgaris</i> Ser.	Cucurbitaceae	Climbing annual herb	Fruit	Headache and obesity
27.	<i>Curcuma longa</i> L.	Zingiberaceae	Perennial herb	Rhizome	Swelling in body, dysentery, skin disease and pain reliever
28.	<i>Cuscuta reflexa</i> L.(Roxb)	Convolvulaceae	Perennial climber	Whole plant	Joints pain and muscle pain
29.	<i>Cyperus rotundus</i> L.	Cyperaceae	Perennial grass	Leaves and root	Headache, skin disease
30.	<i>Dalbergia sissoo</i> Roxb.	Papilionaceae	Medium to large size tree	Leaves	Jaundice, liver disorder, dysentery and headache
31.	<i>Datura stramonium</i> L.	Solanaceae	Shrub	Leaves and fruit	Rheumatism, arthritis and wounds
32.	<i>Eclipta alba</i> L.	Asteraceae	Herb	Whole plant	Eczema, dermatitis, hair loss
33.	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Medium sized tree	Leaves, fruits	Colitis, dysentery, burns, menorrhage and gonorrhoea
34.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Annual herb	Leaves	Scorpion sting
35.	<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Annual herb	Whole plant	Cooling medicine, cuts and wounds
36.	<i>Feronia limonia</i> L.	Rutaceae	Large tree	Leaves	Leucorrhoea and menorrhage
37.	<i>Ficus bengalensis</i> L.	Moraceae	Large tree	Fruits	Cough and cold
38.	<i>Ficus religiosa</i> L.	Moraceae	Large tree	Bark	Boils and blisters
39.	<i>Flacourtia indica</i> Burm. f.) Merr.	Flacourtiaceae	Small tree	Leaves and root	Jaundice and diuretic
40.	<i>Hemidesmus indicus</i> (L.) Schultes	Asclepiadaceae	Twining shrub	Roots	Gout, cough and skin disease
41.	<i>Hyptis suaveolens</i> (L.) Poir.	Lamiaceae	Herb	Leaves	Worms, blood purifier
42.	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Under shrub	Roots, leaves and seed	Leprosy, eczema, joints pain and skin disease
43.	<i>Lawsonia inermis</i> L.	Lythraceae	Deciduous shrub	Leaves	Burning sensation, cooling
44.	<i>Madhuca indica</i> J.F. Gmel.	Sapotaceae	Large deciduous tree	Flowers	Loss of appetite
45.	<i>Mamordica indica</i> Roxb.	Cucurbitaceae	Annual climber	Fruit juice	Diabetes, joints pain and jaundice
46.	<i>Moringa oleifera</i> Lamk.	Moringaceae	Small tree	Leaves, fruits and seed	Joints pains and health tonic
47.	<i>Mucana pruriens</i> (L.)DC.	Papilionaceae	Climber	Roots and seeds	Less sperm count (spermatorrhoea), early ejaculation

48.	<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Perennial shrub	Leaves, bark and seed	Vomiting, dysentery, gum and teeth care
49.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Annual herb	Whole plant	Mental stress, headache and fever
50.	<i>Perestrophe bicalyculata</i> (Retz.)Nees.	Acanthaceae	Annual herb	Whole plant	Malarial fever
51.	<i>Phyllanthus niruri</i> Auct.	Euphorbiaceae	Annual herb	Whole plant	Jaundice and liver disorders
52.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Tree	Stem bark and gum	Tuberculosis and asthma
53.	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kruz	Apocynaceae	Under shrub	Root and leaves	Hypertension, dipperepression, snakebite, diarrhoea and dysentery
54.	<i>Sida cordifolia</i> L.	Malvaceae	Annual herb	Leaves	Ulcer and dysentery
55.	<i>Solanum nigrum</i> L.	Solanaceae	Annual herb	Whole plant	Joints pain
56.	<i>Solanum surattense</i> Burn f.	Solanaceae	Annual herb	Roots and flower	Dysentery and Cough
57.	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Large Tree	Fruits	Menorrhage and laxative
58.	<i>Terminalia arjuna</i> (Roxb. ex DC.)	Combretaceae	Evergreen tree	Bark	Heart disease, cough and chronic bronchitis and fracture
59.	<i>Terminalia bellerica</i> (Gaert n.) Roxb.	Combretaceae	Tree	Fruits	Constipation, fever and appetizer
60.	<i>Terminalia chebula</i> Retz.	Combretaceae	Tree	Furits and seeds	Stomachache and cough
61.	<i>Tinospora cordifolia</i> (Willd.) Miers	Menispermaceae	Climbing shrub	Leaves, fruit and seed	Gout, leucoderma and fever
62.	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Annual herb	Leaves and fruit	Renal and urinary disease
63.	<i>Tridax procumbens</i> L.	Asteraceae	Herb	Leaves	Toothache and bruises and cuts
64.	<i>Vitex negundo</i> L.	Verbenaceae	shrub	Twig	Toothache
65.	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Under shrub	Roots	Joints pain, boils and dysentery.

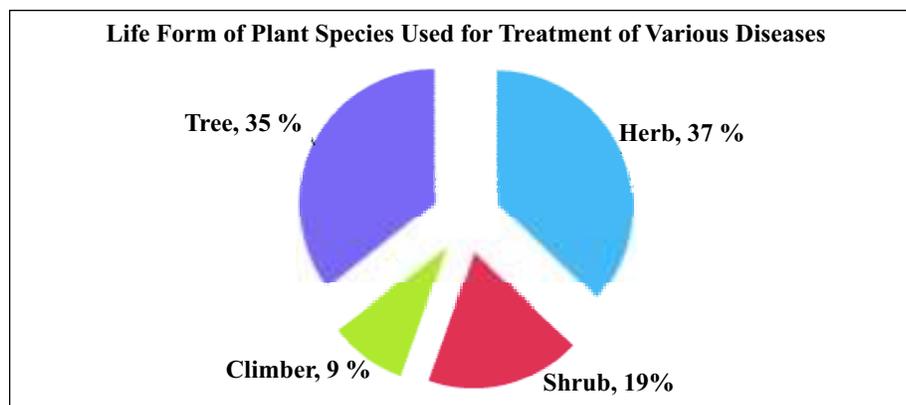


Figure 2 : Life Form of Plant Species Used for Treatment of Various Diseases

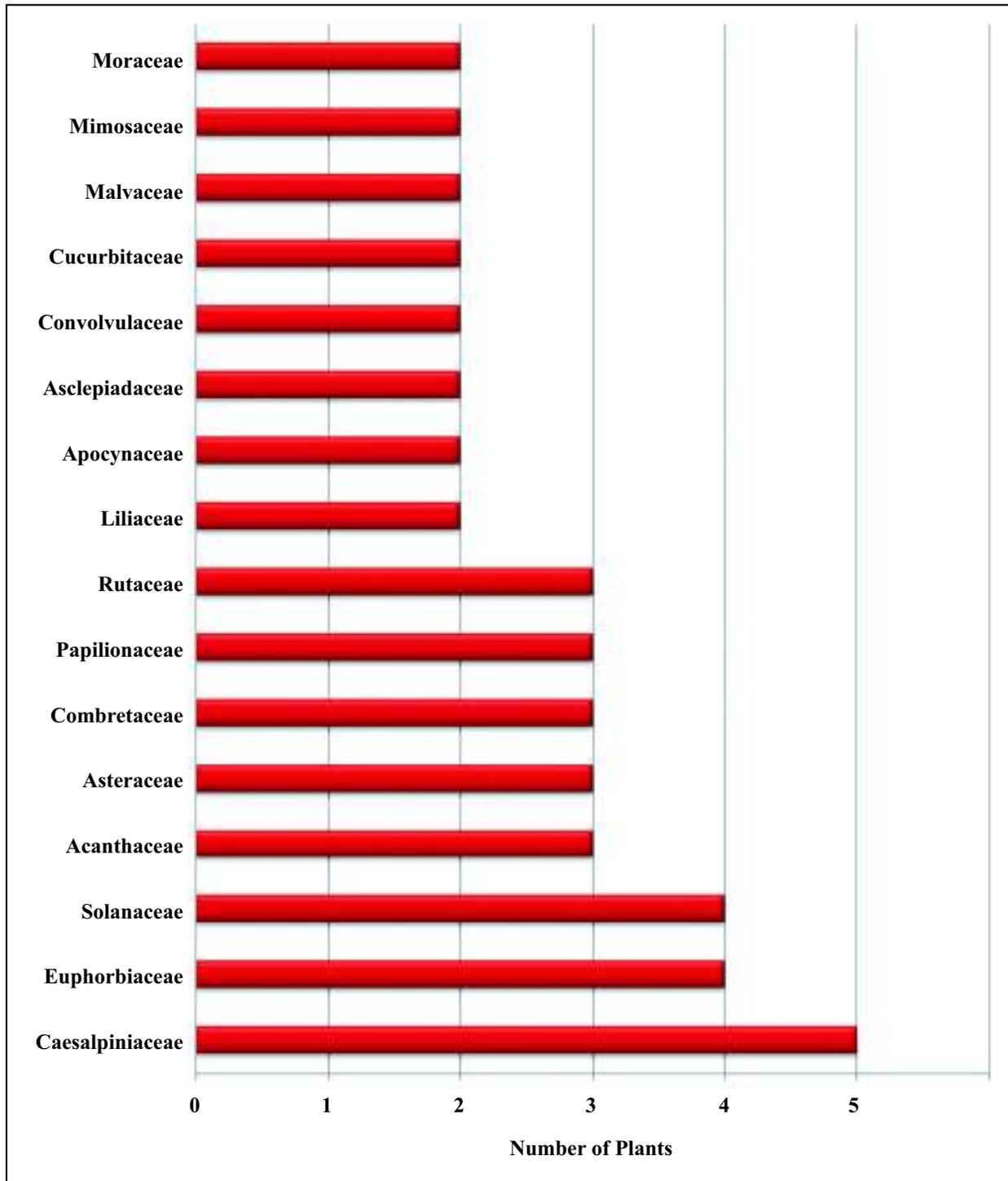


Figure 3 : Families Accounting for More Than 2 Species

Table 2 : Utilization Patterns of Plant Parts for Treatment of Various Types of Diseases

S. No.	Plant Parts	No. of Diseases
1.	Roots	14
2.	Stem	03
3.	Bark	09
4.	Leaves	22
5.	Flowers	07
6.	Fruits	13
7.	Seeds	08
8.	Whole plant	11
9.	Gum & latex	06

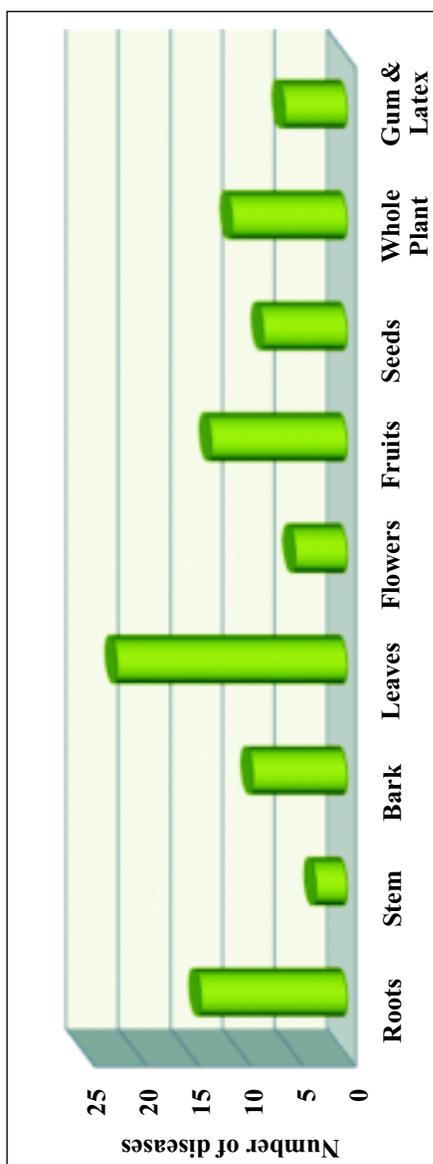


Figure 4 : Utilization Patterns of Plant Parts for Treatment of Various Types of Diseases

Table 3 : Frequency of Plant Species Used for Treatment of Various Diseases

S. No.	Diseases	No. of Plants Used
1.	Arthritis & joints pain	06
2.	Asthma	04
3.	Boils & blisters	01
4.	Bone fractures	01
5.	Bronchitis	01
6.	Burning sensation	02
7.	Cholera	01
8.	Cough & cold	08
9.	Diabetes	01
10.	Diarrhea & dysentery	10
11.	Digestive disorders	05
12.	Eye infection & diseases	01
13.	Fever (viral/malarial)	08
14.	Gonorrhoea	01
15.	Gout	02
16.	Headache	05
17.	Heart diseases	01
18.	Jaundice & liver disorders	06
19.	Leprosy	01
20.	Leucorrhoea	01
21.	Memory enhancer	01
22.	Mouth ulcer	01
23.	Piles	01
24.	Pyorrhoea	01
25.	Rheumatism	02
26.	Skin diseases	06
27.	Snake bite & scorpion sting	02
28.	Spermatorrhoea	01
29.	Stomachache	01
30.	Teeth Complaints & Dental Care	01
31.	Tuberculosis	01
32.	Urinary disorders	02
33.	Uterine disorders	01
34.	Vomiting	01
35.	Wounds & cuts	04

people of Buxar District of Bihar. Maximum number of diseases treated by different plant parts (Table 3 and Fig. 4) are diarrhea and dysentery (10 species) followed by fever, cough and cold (8 species each), skin diseases, jaundice and liver disorders (6 species each), digestive disorders (5 species), wounds/cuts and asthma (4 species), snake bite and scorpion sting (2 species), headache (2 species), stomachache, and piles (1 species) is being prescribed by

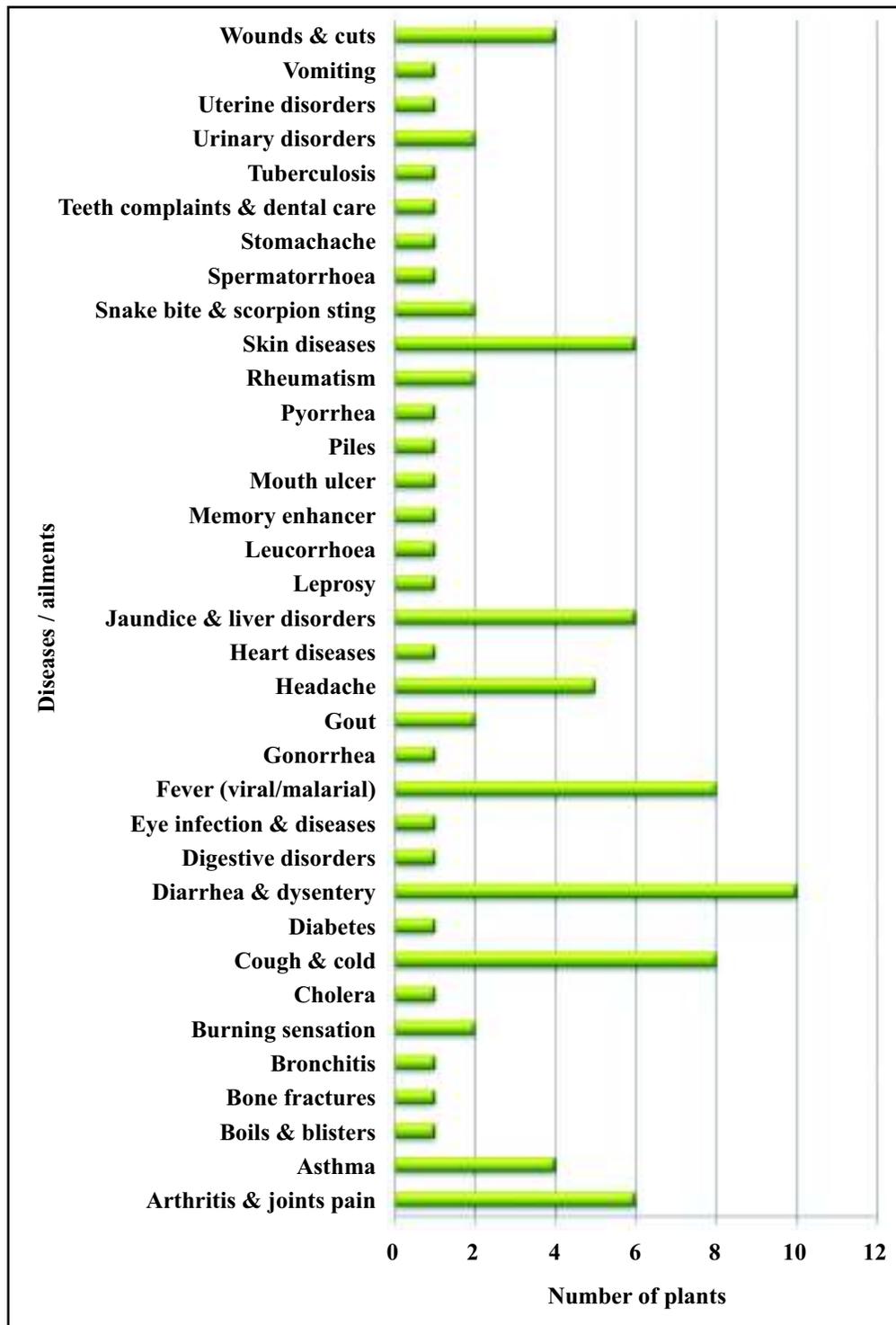


Figure 4 : Frequency of Plant Species Used for Treatment of Various Diseases

the traditional healer and also used by the local people of the area. In this study, frequently prevalent ailments and diseases of the area are diarrhea and dysentery, cough and cold, viral and malarial fever and different skin related disorders, as very poor sanitation facilities are available in rural areas. Hostile climatic conditions favours such type of seasonal disorders also people are not very aware about the health and hygienic related issues. Uses of a large number of species (10) against diarrhea and dysentery by local people of Buxardistrict indicates about the rich oral tradition of transfer of knowledge from generation to generation. Tribals of Mayurbhanj district of North Orissa reported to use 16 medicinal plants to treat diarrhea (Rout et al., 2009). The potential of antidiarrhoeal and antidysenteric activity has been evidenced by the quick relief to sufferers that may be due to the presence of bio active compounds in these formulations (Gerald et al., 2010; Sahu, 1983). Similarly in case of viral and malarial fever, the local inhabitants including traditional herbal healers are being used and prescribed.

CONCLUSION

The knowledge of medicinal plants used is mainly restricted to local healers and it is very important to document this knowledge for future generation, otherwise it will vanish forever. Throughout theregion there is an urgent need to support, safeguard and promote cultural and spiritual values of traditional medicines. Also, to test the scientific validity of the herbal preparation or drugs, clinical studies are required to be conducted. This can establish therapeutic properties of these preparations for safe and longer use. The indigenous knowledge and uses of herbal medicinal plants of a particular area have to be analyzed to develop appropriate management measures of ex-situ and in-situ conservation for best utilization of natural resources. Many developing countries have intensified their efforts in documenting the ethno-medicinal data on medicinal plants and research to find out scientific evidence for claims by tribal healers on Indian herbs has been intensified. Once these local ethno-medicinal preparations are scientifically evaluated and disseminated properly, people will be better

informed regarding efficacious drug treatment and improved health status.

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