# Evaluation of Plants Used in Traditional Medicine in Bishnupur District of Manipur, Northeast India

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# ABSTRACT

A survey was undertaken to collect information from 90 traditional healers on medicinal plants from 15 villages located in Bishnupur district, Manipur. During the survey, the indigenous knowledge of local traditional healers and their native plants for medicinal purposes were collected through questionnaire surveys and personal interviews. The investigation found the traditional healers used 112 species of plants belonging to 55 families and 105 genera and 11 plant's parts for treatment of 44 different types of ailments. 4 life forms of medicinal plants species like herb (54%), tree (26%), shrub (16%) and climber (4%) were observed. The majority of the plants (57%) grows in wild and cultivated, 24% grows in wild and 19% were found cultivated. It was observed that the elderly and poor people were still dependent on medicinal plants at least for the treatment of primary healthcare because of their belief in traditional medicines and inability to meet the expenses of modern healthcare facilities like well-equipped hospitals. The traditional healers are decreasing in number because modern allopathic medication are replacing their treatment methods. The younger generations are not interested in carrying on this tradition because of their modern and busy lifestyles. Because of urbanization and development there is a great threat of disappearing the traditional knowledge of using medicinal plants for the treatment of ailments. Incorporating scientific methods in traditional treatment, documentation and conservation of traditional medicinal plants will help in the revival of this traditional knowledge of using medicinal plants.

Keywords: Traditional healers, Medicinal plants, Bishnupur district, Diseases, Ailments, Treatment

# INTRODUCTION

Traditional herbalism is one of the most common methods of treating diseases since ancient times. This is one of the readily available and cheap methods for treating many diseases. The use of medicinal plants to cure diseases is an age-old practice that has developed in recent years (Jaadan *et al.*, 2020). The practice of herbal medicine is the oldest form of healthcare used for decades in developing and developed countries. Primitive people have depended on nature for food, shelter, clothing and medicine to cure ailments. These humans distinguished useful herbs with beneficial effects from inactive or literature, approximately 50,000 plant species have medicinal properties (Barboza *et al.,* 2009). Thus, the basis of modern medicinal drugs such as aspirin, morphine, digitoxin and quinine were synthesized through scientific validation of herbal medicine (Wachtel-Galor and Benzie, 2011; Pal and Shukla, 2003). Today herbal medicine is still the primary healthcare system for about 80% of the world's population, especially in developing countries (Kunle *et al.,* 2012; Okigbo *et al.,* 2009; Kamboj, 2000). Over the years, traditional medicine has provided us with valuable formulas on the selection, preparation and application of herbal remedies. The same vigorous method

toxic ones (Kunle et al., 2012). According to

clinically and scientifically must be implemented to verify the effectiveness and safety of curative products, to be viable alternatives to western medicine (Pal and Shukla, 2003).

Herbs were dominant in preparing and serving primary healthcare and therapeutic indication due to their medicinal properties (Bahadura et al., 2020). About 80% of the human population and 90% of livestock is believed to be dependent on traditional medicine and most of this comes from plants (Aragaw et al., 2020). In pharmacy, the relationship between the human community and medicinal plants has long been established (Yeung et al., 2020). Ethnobotanical research studies the region's plants and their practical uses through the traditional knowledge of local culture and people. The documentation of traditional knowledge, particularly on the therapeutic uses of plants, has provided many significant modernday pharmaceuticals since its inception (Dey et al., 2021).

Documenting traditional knowledge through ethnobotanical studies is important for conserving and utilising biological resources. Manipur state in India is known for its richness in biodiversity, including endemic flora and fauna, varied topographic and climatic features, cultural heritage, etc. The abundance in the diversity of the forests and its resources is attributed to the state's ideal location in the junction of two world's hot spots of biodiversity, the India-Myanmar hot spot and the Himalayan hot spot of biological diversity. Out of 34 hot spots across the globe, India has four, and out of the four, Manipur has two - Himalayan and the India-Burma hot spot. The state of Manipur is the storehouse of biological diversity, which includes 4000 angiospermic plants species, 430 medicinal

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plants species, 34 edible fungi species, 500 orchid species and 55 species of bamboo 40 endemic rice cultivars, 160 fish species and 21 species of migratory aquatic birds. An environment rich in biological diversity offers the broadest array of options for sustainable economic activity. The state's forests have six major Forest Types and 10 Subtypes. The major forest types include Tropical Wet Evergreen Forest, Tropical Moist Deciduous Forests, Sub-Tropical Pine Forest, Tropical Dry Deciduous Forest, Montane Wet Temperate and Sub-alpine Forest. However, the state of Manipur is now facing the problems of biodiversity degeneration due to varied reasons. The loss of biodiversity often reduces the productivity of ecosystems, thereby shrinking nature's baskets of goods and services, from which we constantly draw (Singh, 2016).

Bishnupur district of Manipur has a number of plant species like Acacia fernesiana, Acacia nilotica, Ageratum conyzoides, Alisma plantagoaquatica etc. The traditional healers and many elderly people of the present study villages and districts still depended on the medicinal plants found in the Bishnupur district for the treatment of certain ailments. Though earlier studies have worked on the ethnomedicinal plants there is a gap in reporting its extensive uses and new species of medicinal plants used especially by the traditional healers of new unstudied villages. Further, the present study, which included the lifeform and occurrence of the medicinal plants in the district, is unique in this field of study. Notable work on the traditional uses of medicinal plants have been conducted aboard (Okigbo et al.,2009; Kassa et al., 2020; Ambu et al., 2020) in India (Muthu et al., 2006; Phondani et al., 2009; Panda and Misra, 2011) and in Manipur (Sanglakpam et al., 2012; Das and Tongbram,

2014; Devi et al., 2017). Sanglakpam et al. (2012) reported the use of 19 genera of plants species belonging to 13 families for food and 63 genera belonging to 37 families for medicinal purposes in Bishnupur District, Manipur. Devi et al. (2017) conducted a survey of medicinal plants in 14 villages of Bishnupur District, Manipur and noted 100 species belonging to 55 families and a total of 87 genera of medicinal plants were found to be used by traditional healers and villagers of the district in curing diseases and ailments. Kassa et al. (2020) reported that most of the medicinal plants in Sheka zone used to treat human ailments (77%) and 19% of medicinal plants were used to treat both human and livestock ailments. Bouafia et al. (2021) conducted the ethnobotanical and ethnomedicinal analysis of wild medicinal plants traditionally used in Naâma, southwest Algeria. The present study was undertaken with the objective of documenting extensively the medicinal plants utilised by the traditional healers of 15 newly selected villages of the Bishnupur district for the treatment of various ailments. In this study, the plants species of 15 new villages have been chosen to fill up the research gap and to represent the whole district for assessing the traditional knowledge of healers.

#### **MATERIALS AND METHODS**

#### Study area

Manipur is a small state located in the northeastern region of India. The state lies between 23°83'N and 25°68'N latitude and 93°03'E and 94°78'E longitudes, neighboring Myanmar in the

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east, Nagaland in the north, Assam in the west and Mizoram and Tripura in the south. The state is divided into 16 districts with a total geographical area of about 22,327 sq. km.

Bishnupur district is located in the south-west between 24°10' & 24°45' North latitude and 93° 45' & 93° 52' East longitude covering a total area is 496 sq. km with an average altitude of 822.18 m above m.s.l. It is around 27 km from Imphal, the capital of Manipur. The district is bounded by Senapati and West Imphal districts in the north, Churachandpur district in the west, Chandel in the south-east and Thoubal district on the east (Fig. 1). As per the 2011 census, the total population of the district is 2,40,363. The density of population is 485 persons per square km. Bishnupur has a sex ratio of 1000 females for every 1000 males and a literacy rate of 76.35% (District Census, 2011). The district is the home of large number of different tribal communities including Naga, Kabui, Gangte, Kom, etc. The district experiences fair cold climate during winter and hot in summers. The maximum temperature is 33°C from May to September and the minimum dips down to 4°C in January. In Bishnupur, the wet season is warm, muggy, and mostly cloudy, and the dry season is comfortable and mostly clear. Over the year, the temperature typically varies from 42°F to 85°F and is rarely below 38°F or above 90°F. Based on the tourism score, the best times of year to visit Bishnupur for activities warm-weather are from late from late February to late April and October to mid-November (Indian Ministry of Forests and Environment, 2011).



Fig. 1. Map showing the location of Bishnupur District (Source: Department of Forest, Government of Manipur)

#### **Research design and data collection**

The present study was conducted in the 15 villages (Irengbam, Ishok, Kakyai Langpok, Keinou, Khoirentak Khunou, Laimapokpam, Laimaram, Lourembam, Namoikhul, Ngangkhalawai, Pukhrambam, Saiton, Tengkhal Khunou, Thiyam and Yumnam Khunou) of Bishnupur district represented the whole district (Fig. 1) by interviewing 90 traditional healers using a pre-tested questionnaire. From each village six traditional healers were selected for the interview, totaling to 90 traditional healers which were then interviewed using a research schedule to assess their traditional knowledge regarding the utilisation of medicinal plants for

the treatment of various ailments of the people (Muthu et al., 2006; Benarba et al., 2015; Mahwasane et al., 2013). Eighty males and ten females in the age group of 60-80 years were selected as respondents as this age group knows more about traditional medicine practices. The numbers of female traditional healers were less than males as most of them were confined to household work and did not have enough time to practice traditional healing using medicinal plants. The different types of medicinal plant species used by traditional healers from all 15 villages, their scientific name, family, life form, occurrence, local name, parts used, mode of preparation/ administration, and ailments treated were collected and noted down.

Herbarium of the plant species collected was prepared by following the standard methods (Jain and Rao, 1977). The local names, the specimen of the medicinal plants and their uses as reported by the traditional healers were collected and crosschecked with the published literature (Sinha, 1996 and Singh *et al.*, 2000) and the specimens of the medicinal plants which were collected were

### Table 1. Categorisation of the ailments treated

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identified based on vernacular name, regional floras and published literature (Deb, 1961; Hore, 1998; Jain and Rao, 1977 and Singh *et al.*, 2003). For future reference, the voucher specimens were deposited in the Herbaria of Department of Forestry and Environmental Science, Pandit Deen Dayal Upadhyay Institute of Agricultural Sciences, Utlou, Manipur. For the correct nomenclature of the plant species, International Plant Name Index (IPNI) (http://www.ipni.org) and the Plant List (http://www.theplantlist.org) was followed.

## **Categorisation of the ailments**

The ailments treated were categorized into 7 categories with their corresponding sub-category. The seven categories of the ailments treated were 1) Circulatory system problems 2) External injuries, bites and dermatological problems 3) Head, thermoregulatory and nervous system problems 4) Digestive system and gastrointestinal problems 5) Cancer and musculoskeletal problems 6) Oro-dental and respiratory problems 7) Urogenital, gynaecological and venereal problems as mentioned in Table 1.

Category of ailment	Sub-category of ailment
Circulatory system problems	High blood pressure, Heart problem, Blood in urine, Blood
	circulation, Purification of blood
External injuries, bites and	Boils, Swelling, Hair fall, Skin disease, Cuts, Wounds,
dermatological problems	Snakebite, Burnt in the skin, Grey hair
Head, thermoregulatory and	Diarrhoea, Dizziness, Cold, Sleeplessness, Fever, Malaria,
nervous system problems	Headache
Digestive system and	Piles, Dysentery, Stomach disorder, Constipation, Vomiting,
gastrointestinal problems	Jaundice, Intestinal worms, Indigestion, Typhoid
Cancer and musculoskeletal problems	Gout
Oro-dental and respiratory	Mouth ulcer, Gum problem, Respiratory trouble, Lungs
problems	trouble, Cough, Chest pain, Sinusitis, Toothache
Urogenital, gynaecological	Stone case, Urinary problems, Pain in passing urine, White
and venereal problems	discharge, Diabetes

#### **RESULTS AND DISCUSSION**

A list of plant species used for the treatment of different ailments are presented in Appendix 1. The present study recorded 112 species belonging to 55 families and 105 genera. In terms of the life form of medicinal plants, species used herb with 60 species (54%), the tree with 29 (26%), shrub with 18 (16%) and climber with five species (4%) were observed (Fig. 2). Of the total number of plants used majority of them, 64 species (57%) grows in the wild and are cultivated, 27 numbers of species (24%) grow in the wild and 21 species (19%) were found cultivated (Fig.3). Mir et al. (2014) also reported trees with 53 species (40.5%) were the dominant component followed by 40 (30.5%) herb, 20 (15.3%) shrub, 13 (9.9%) climber and 5 (3.8%) and out of a total number of plants most of them grow in wild (119 species, 90.8%), followed by plants that grow in the wild as well as cultivated (9 species, 6.9%), while only 3 (2.3%) species are exclusively under cultivation.

In the 55 plant's families used for the treatment of different ailments, plant's families belonging to Poaceae, Solanaceae and Zingiberaceae were found to be used in the highest number of 6 species each followed by Cucurbitaceae, Lamiaceae and Rutaceae families, which were five species each (Appendix 1). Among the ailment categories, Head, thermoregulatory and nervous system problems and Digestive system and gastrointestinal problems were treated with the highest number of plant species (24) each followed by Oro-dental and respiratory issues (22), External injuries, bites and dermatological problems (19), Urogenital, gynaecological and venereal problems (13), Circulatory system problems (8). In contrast, the lowest number of plant species treated cancer and musculoskeletal problems (2) (Fig.4). A similar type of study was also conducted by Das and Tongbram (2014).



Fig.2. Percentage of life form of plants species



Fig. 3. Percentage of occurrence of plants species used in traditional medicine







Fig. 5. Frequency of plant's part used for the treatment of different ailments

A total of 11 plant's parts (1. Bark 2. Bulb 3. Flower 4. Fruit 5. Whole plant 6. Stem 7. Shoot 8. 9. Seed 10. Rhizome 11. Leaf) were Root recorded to be used by the traditional healers for treatment of different types of ailments (Fig. 5). Similarly, Phondani et al. (2009) also documented the uses of 100 medicinal plant species belonging to 91 genera and 51 families to cure 60 types of different ailments. The use of 44 species of angiosperms against 62 diseases like bronchitis, tuberculosis, asthma, diarrhoea, dysentery, malaria, cholera, ulcerations and measles, typhoid (Pal and Palit, 2011) has earlier been reported. The local people used 48 wetland

plants under 40 genera and 23 families against 47 ailments Panda and Misra (2011). The present study is in agreement with Devi et al. (2017), which comprised of a wide survey of medicinal plants where 100 species belonging to 56 families and a total of 87 genera of medicinal plants were found to be used but in congruence with Thokchom et al. (2015) who recorded 63 plant species belonging to 56 genera and 41 families which were used by Chakpa community to treat over 25 diseases and ailments. Similar observations were reported by Z'ivkovic et al. (2020) who noted that 86 medicinal plants belonging to 43 families were used to treat

gastrointestinal ailments, respiratory problems and skin diseases.

In this study, it was noted that leaf was the most frequently used part of the medicinal plants as they were used for the treatment of 33 ailments, followed by fruit for 23 ailments, rhizome for eight ailments, bark and root for five ailments, seed for four ailments, flower for three ailments, stem and shoot for two ailments and bulb and whole plant each of which was used for the treatment of 1 ailment (Fig. 5). A similar study was conducted by Muthu et al. (2006) where the traditional healers used 85 species of plants distributed in 76 genera belonging to 41 families to treat various diseases like skin diseases, poison bites, stomachache and nervous disorders. Traditional uses of medicinal plants for the treatment of various diseases were also reported in a study by Ambu et al., 2020.

12 methods of preparation of medicinal plants were found for the treatment of ailments. They were crushed, pasted, roasted, soaked, heated, dried, filtered, boiled, grinded, fried, cooked and made into tablets (Appendix 1). These findings were in congruence with the results of Naïve *et al.* (2021). Seven methods such as apply, drink, eat, bath, chew, inhale and insert were used as a mode of administration of medicinal plants (Appendix 1). Such findings were also reported by Dogor *et al.* (2018); Hussain *et al.* (2018); Jadid *et al.* (2020).

It was observed that 11 medicinal plant's species were used for the treatment of cough followed by 9 for fever, 7 for a stomach disorder, 6 for intestinal worms, boils and dizziness, followed by 5 to treat jaundice, piles and dysentery diseases. 4 were used for the treatment of intestinal worms, cough, malaria, high blood pressure,

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urinary problems, swelling, wounds, toothache, skin disease and headache. 2 plants species were used for diarrhoea, gout and indigestion. It was also recorded that one species was used for the treatment of hair fall, cold, mouth ulcer, grey hair, respiratory trouble, lung trouble, heart problem, constipation, sleeplessness, vomiting, snake bite, blood in urine, pain in passing urine, blood circulation, white discharge, sinusitis, purification of blood, typhoid. Overall, 44 different types of ailments were treated using 112 species of medicinal plants. The study is in line with Taid et al. (2014), who recorded 21 species of plants belonging to 16 different families which have been used traditionally to help fight uterus infection, to restore menstruation irregularity, enhance fertility in both males and females, to stop excessive bleeding during menstruation and wound healing, energy stimulants and promote conception by local traditional healers. Another study also recorded 97 medicinal plants belonging to 46 families and 86 genera for the treatment of diseases of the respiratory system, circulatory system etc. (Naïve et al. (2021).

The investigation found that the traditional healers in the Bishnupur district have a rich knowledge of using medicinal plants for the treatment of various ailments. Overall, it was noted that there is still the existence of traditional knowledge in the 15 study villages in the form of using medicinal plants by the traditional healers for treatment of various ailments. The traditional healers used to charge some minimal amount from the people who came to treat them, and hence this profession is an essential part of their livelihood. The elderly persons of the villages are still depending on this treatment method because of their belief in it.

But due to the establishments of the increasing number of modern medical healthcare facilities decline in the traditional uses of medicinal plants is observed. It can be seen that there are some elderly persons and poor people who cannot afford to meet the expenses of modern healthcare treatment are still depending on the traditional healers to get their treatment done at a minimal cost.

## CONCLUSIONS

The traditional healers are on the decline because modern allopathic medicines are replacing their methods of treatment. Urbanization and deforestation, which has been taken on a large scale, are resulting in the destruction of medicinal plants. There is a very high chance that this traditional form of using medicinal plants for the treatment of certain ailments will vanish in the near future. To sustain this knowledge, conservation of medicinal plants and transmitting the knowledge to younger generations are necessary. Hence, the traditional knowledge practice by the traditional healers needs to be conserved, which will help not only in revival of the traditional knowledge of using medical plants but also conserve the surrounding ecosystems. Application of scientific methods in traditional medicinal plants treatment will help in preserving this valuable conventional knowledge.

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