Original Article

Bulletin of Pure and Applied Sciences.
Vol.37 B (Botany), No.2. Jul-Dec 2018: P.137-142
Print version ISSN 0970 4612
Online version ISSN 2320 3196
DOI 10.5958/2320-3196.2018.00021.6

Value of Ethnomedicinal Plants and Their Effects Due to Climate Changes in Saran District (Bihar)

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Received on 10.03.2018,
Accepted on 31.07.2018

Abstract

Ethnomedicinal plants play a very important role in the life of human beings. Bihar is a state where 80% people depend on plants and plants part for their diseasesand their treatment. The studies indicate the value of traditional system of medicines, economically useful plants and possible effects of climate changes on medicinal plants.It is true that climate changes are causing noticeable effect on life cycles and distribution of the plant species in Saran district. Medicinal plants are widely used at present. A large no. of people in Bihar is directly dependent on the healthcare treatment by medicinal plants that is why it is a matter of concern in Bihar. It is very necessary to improve our understanding about the effects on medicinal plants by various researched and stems in present article. To know the present condition of medicinal plants and the effect of climatic changes on them in Saran district, Bihar.

Keywords: Local medicinal plants, Climate changes effects, Droughts/ floods etc.

INTRODUCTION

A medicinal plant is a plant whose one or more than one part contain substances that can be used for therapeutic purposes or which are precursors for synthesis of useful drugs. Nowadays people are interested in floral drugs for curing diseases whereas it started in the very beginning of human civilization. The villagers maintain traditional knowledge of medicinal plants that they use for first aid remedies. Medicinal plants serve as therapeutic agent as well as an important raw material for manufacturing of traditional and modern medicines. The ethno-medicinal system is safe and is a low cost therapy for treating various ailments. Climatic changes have a large effect on the production and distribution of ethno-medicinal plants. The changes affect plants e.g. Droughts, heat, wave effect the process of photosynthesis, respiration, transpiration etc. Because of climatic changes some medicinal plants of higher latitude become extinct. The climatic changes effect plants around the whole world. The cultivation of medicinal plants varies in different parts of the Saran district, Bihar. People use

different types of medicinal plants to treat different disease. Climatic changes are one of thecauses forthe loss of medicinal plants in Saran district. The region is also being negatively affected by the exploitation of land and also because of rapid population growth.

METHODS AND MATERIAL

Medicinal plants,because of climatic changes in Saran district are assessed based on the field observation, plants' sample collection, questionnaire , survey and formal and informal dialogue among the respondents in the selected area.

Bihar state is situated between 27°-31'-15" N latitude and between 88°-17'-40" E longitude and is the third largest state of India. It is located in the eastern part of the country. The Geographical area of Bihar is 9359.57 thousand hectares out of which 6.6% is forest area, 14.2% is land area and net sown area is 57% while cropping intensity is 1.37%.

Land use pattern in Bihar exhibits substantial variation due to different agro-climatic zones. Bihar is the traditional home of a lot of medicinal plantsof different varieties however; planned medicinal plant cultivation is not in practice till late.

Conservation and sustainable use of medicinal plants are today's need as their base is shrinking day by day. The cultivation of these plants is a potential provider of returns to the cultivator i.e., the farmers. Because of lack of awareness among farmers, they are unaware of the potential of these herbal and medicinal plants.

Agriculture is the chief sector of the state. Over 67% of its population is directly or indirectly dependent on agriculture. The state is rich in herbal plants biodiversity. However, the commercial cultivation of the same has not started at large scale. Of late, efforts have been made to make people aware of the uses and importance of medicinal plants.

Medicinal plantscan be an extremely potential producing sector in Bihar state due to availability of suitable climate, right type of soil, water and other inputs, latest crop production technology and enthusiastic and labourious cultivators. Large scale cultivation of herbal plants will bring prosperity, generate employment, and provide raw materials for plant -based medicines which are in high demand in domestic as well as in global market, besides conservation of our precious environment.

Large scale cultivation will also attract setting up of pharmaceutical industries in the state. Among the available options, the need is to develop a sustainable agro-economy growth strategy with a viable technology development. Medicinal plants are high potential area in this regard.

The state started the cultivation of medicinal plants by the participation of some innovative farmers and their fast-growing demand in the market. For increasing demand of herbal and medicinal plants, it is essential to develop Ayurvedic system of therapy. Companies that produce herbal and medicinal plants-based product should be given full priority in the domestic market. Bio- partnership between certified farmers and Ayurvedic Pharmaceutical companies like Himalaya, Naturals, Dabur, Jhandu, Baidyanath, and Patanjali should be encouraged. These companies should be given priority to settle in domestic market of Bihar as these companies aregrowing fast.

In Bihar, ample opportunities exist for diversified sustainable agriculture in different agro eco-systems. The systematic cultivation of high value medicinal and herbal plants under prevailing agro-ecological conditions is one of the sincere efforts in the direction of sustainable development.

Data collection

Since deforestation environmental pollution modern civilization and migration of traditional medicinal healer to other jobs knowledge connect to ethno medicinal treatment are being seriously depleted and that could ultimately result in the rapid erosion of this rich knowledge.

Moreover the knowledge of traditional practice of medicinal plants has been passed from generation to generation.

Sampling of Informants

From June 2014 to August 2015, the ethno -pharmacological survey was conducted in the study area. Five days were given per field visit. Different community's interviewees were selected for the study purpose. The primary observation suggested that a number of distinct groups of people are involved in the cultivation of medicinal plants and they use medicinal plants to cure diseases. The traditional healing process in the study area is as follows:

- People of study area who traditionally use medicinal plants by their indigenous knowledge gained from their previous generation.
- Local traditional health practitioners, who have practical and empirical knowledge of medicinal plants.
- A group of people or health practitioners having no formal education such as Bede, Sapure /Ojha, and Dome etc. most of them are Hindus.

Determination of Sample Size

In order to get appropriate result of the study, potentially significant group was sampled according to a sampling plan to that type of population. In this study, sample size refers to the number of subjects. These were sampled according to 95% confidence intervals using a Population Proportionate to Size (PPS) stratified plan considering study subjects. This suggested a sample size of the present study. On the basis of PPS, sample size was allocated in various categories and the sample was re-distributed to ensure the minimum sample size required for a group. For fulfilling this purpose, total 55 people were chosen from the selected group were interviewed. Gender, age, educational background and experience of the use of traditional medicinal plants were taken into consideration during the selection of informants. Here, the ehno-graphic data were also collected on the basis of observation, formal and informal dialogue and third person listening techniques. The formal interviews were prearranged, but informal interviews were taken at times and places were the participant's interest could be obtained and retained.

Ethno-Medicinal Data Collection

In this study the explanation and the written consent were obtained by interviewers. The people who are familiar with traditional healers and who could communicate with local communities were considered as participating. To ensure confidentiality, each informant was interviewed singly among them. To collect the knowledge about medicinal plants in the study area, a number of FGDs were also organized; in which 13 to 20 people participated by consent. Open- ended and semi -structural questionnaire were used for the purpose. The recorded questionnaires used demographical information such as age, sex, educational qualification and experience of the healing related to medicinal plant and their practice including the local name of the plants, plants parts used, the methods of preparation, nature of plants'materials, relative abundance at the area, habitat of the plant species, mode of applications and medicinal use of particular plants. Informants were asked to collect the plants they use for the treatment of various ailments. These specimens were pressed, preserved and later identified. Some ethno- medicinal data were collected from research articles, books and some were also studied. The compounds that were frequently found in the reported plant species were also documented.

RESULT AND DISCUSSION

Informants

About 65 interviews were done in the study area where most of the informants were male. 48.8% informant's age was about 55-65. They were followed by informants of 45-55. All of them lived in the rural region and majority of them had no formal education. The rate of literacy of those people was

lower 32.5%. Majority of the respondents had 10 – 25 years of practical or empirical knowledge of the medicinal plants 'use and practice.

Medicinal Plants Recorded

During the study, a total of 85 plant species belonging to 46 plant families were identified with medicinal values used by subject population in the study area. The Asteraceae family represents highest number of species more than 7, followed by Apocynaceae family that represents only 6 species and Euphorbiaceae and Fabaceae only 5 species.

Medicinal Plants Habitat of the Study Area

In the current survey, 34% species were herbs, 20.42% were shrubs and 17.86% were trees. Among these plants 36.1% species grew in Plain land and crop land and 20.83% species were grown in surroundings.

Information Regarding the Preparation of Medicines

Sometimes, whole plants but in many of the cases different parts of the same plants are used to produce medicines. The plant parts such as leaf, bark, root, flower, rhizome, seed, tuber, bulb and fruit are used. Most used part is leaves, about 59%, followed by roots 52%, bark 13.1% and fruits 7.4%. Various preparation methods are used for administering medicinal plants as their traditional practice include infusion, past, pills, syrup, smoke, juice, decoction and raw.

The major mode of preparation is juice 58.6% followed by decoction 37.8%. Infusion is done by suspending plant material in either cold or pre-armed water and decoction is prepared by boiling. Powder is obtained by crushing.

Medicinal Plants and their Utility

In the study area, a large number of medicinal plants have been identified by the ethno - pharmaceutical survey. The medicinal plants found in the study area with their local and scientific names, usable parts and their use in curing diseases have been mentioned.

Formulation of the Medicines and their uses

The study also identified the formulation of the medicines from the medicinal plants and their uses which are helpful for the natural healing process.

Nearly Extinct Medicinal Plants in the Study Area

A number of extinct medicinal plants have been identified in the study area.

Parts of Plants Used in Medicine Preparation

The list of identified medicinal plants in study area, their using parts and their use in curing diseases, scientific name Local name, Parts used to produce medicines. Using those medicine to control diseases *Aegle marmelos,* Bel Fruit; Diarrhea and dysentery, Aloe barbadensis, Ghritokumari Extract of leaves Fever, sexual disease, headache, *Phyllanthus emblica*, Amloki Root of plant and fruit; Scurvy and dandruff, *Glycyrrhiza glabra*, *Shastimadu* Leaf, flower and fruit; Throat pain, ulcer, liver diseases, cold and hormonal disease, Terminaliabelerica, bhera Fruit; Heart disease, piles, gastric, fever, diarrhea and cough, *Swerita chirata*, Chirota Extract of leaf; Stomach disease, *Saraca indica*, Ashok Seeds and bark; Dysentery and blood refining, *Andrographis paniculata*, Kalomegh Whole plants; Metabolic problem, worm killer, strengthen, gastric, fever, liver disease and dysentery, Citrus aurantifolia, Lebu Fruit and extract of leaf; Anti-vomiting, tooth disease and scurvy, *Syzygium cumini*, *Kala jamun* Fruit and seeds; Diabetics and dysentery, *Ocimum sanctum*, Tulsi leaves, sand seed of

plants; Cough, asthma, cold and blood purification, *Azadirachta indica*, Neem's Root and leaves, Anti-vomiting, tooth disease, skin disease, jaundice antiviral *Holarrhena antidysenteria* Kurchi Bark and seeds Diarrhea and dysentery, worm killer and intestinal weakness Asparagus racemosus Sotomuli Leaf and root Fever and dysentery *Centella asiatica* Thankuni Whole plant Metabolic problem, ulcer, chronic dysentery and anti-coughing *Vitex negundo* Nishenda Root and leaf Arthritis, asthma and fever Curcuma longa Holud Root Metabolic problem and skin disease *Terminalia arjuna* Arjun Bark Tuberculosis, piles, and heart disease *Calotropis procera* Akanda Bark, root, leaf and flower Ulcer, tooth pain, dysentery, cold and asthma Daturametal Dhutura Root, leaf and seed Pain killer, worn killer and poisonous *Adhatoda vasica* Basok Leaf and root of plant Cough, asthma, cold blood refine and tuberculosis *Abroma augusta* Ulotkombal Root, bark and leaf Sexual disease, vaginal pain impotence, and snakebite antidote. *Paedaria foetida* Gondhovadule Leaf Arthritis and metabolic disease *Ananas comosus* Anarose Fruit and leaf Jaundice *Cynodon dactylon* Durba Leaf Bleeding control and skin disease

Endangered Plant in the Study Area

There are a number of endangered medicinal plants have been identified in the study area.

CONCLUSION

The loss of medicinal plants species from the effects of climatic changes is the biggest problem of a large number of people who lives in this area. Although, climatic changes are a threat for medicinal plants but the effect of climatic changes on medicinal plants have been studied in some areas of Saran district, although, it did not cover the whole district area as this situation can not be neglected. The improved knowledge of the effects of climatic changes on medicinal plants is needed for development. It required continuous field measurement at respective sites, further research on this field and chemical production efficiency of threatened medicinal plants under climate change effects on medicinal plants under climate changes scenario is helpful to developed technologies for improved quality of cultivation is essential.

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