

Current Status of Medicinal Plants in the Bokaro District of Jharkhand

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Abstract- Local inhabitants in rural areas of Jharkhand rely on traditional medicine as their primary form of health care, yet they are in danger of losing both their knowledge and the plants they have used as medicines for millennia. The study was conducted in the rural areas of Bokaro District. The aim of this study which included an ethnobotanical survey was to assess the current level of knowledge about medicinal plants and to analyze and catalogue such knowledge based on relative frequency citation (RFC) and use value (UV).

Index Terms- Ethnobotany, Medicinal Plants, Quantitative Analysis, Jharkhand

I. INTRODUCTION

Documentation of plants used for medicinal purpose is not new in India. There are many traces of this in ancient literature as they are essential for human survival [1,2]. The process has continued till date for various reasons. Botanists and local healers have preserved the knowledge about the local medicinal plants. There have been many surveys and documentation in different regions of India pertaining to existing status of medicinal plants. The state of Jharkhand lies in the eastern part of India spreading over an area of 7.97 million hectares, with a population of over 2,69,09428. Out of this total population, 28% belongs to the schedule tribes. The state is geographically known as Chhotanagpur Plateau, which forms the north eastern portion of peninsular plateau of India (Bhatt 2002). 29% of the total geographical area is occupied by forest. The huge forest cover signified the name Jharkhand which literally mean “the region of forest.” A number of plants are used by the tribals in some form or other for the treatment of their various ailments. Haines (1925) in his book referred the local uses of plants. Hoffman (1950) in his “Encyclopedia Mundarica” and Bressers (1951) in his “Botany of Ranchi Districts” have

mentioned the tribal uses of various plants of Chotanagpur. Ghosh (1971) in his floristic study of “Ranchi District” and Sahu (1986) in his “Ethnobotanical and ethnomedicobotanical studies of some plants of Santhal Pargana and Chotanagpur” have mentioned various uses of plants. A comprehensive investigation has been carried out in the area and the medicinal uses has been correlated with the uses in various parts of the country (Jain 1991;

Badoni 1995). More than 70% of the total population of the state is exclusively dependent on the herbs and traditional healers for maintaining a reasonable level of health (Tomar, 2002). The state is rich in biodiversity of medicinal plants and their traditional uses (Mairh et.al 2010, Lal and Singh, 2012)

The present study examined whether (i) local inhabitants are knowledgeable about the medicinal use of these plants (ii) the local inhabitants continue to practice herbal medicine in the treatment of sickness within their home (iii) names of the plants used for the treatment of various diseases (iv) the quantitative analysis of the knowledge of medicinal plants.

To our knowledge no ethnobotanical exploration had previously been conducted in this area. The information gained from this study may help in conducting further studies and projects aimed at documenting herbal knowledge in communities and supporting continued practice and sustainability of traditional herbal medicine in this area of Jharkhand and elsewhere.

II. STUDIED AREA

Bokaro district lies in the eastern portion of the state of Jharkhand in India (Plate 1 & 2). It is bounded by Giridih District in the North, West Bengal in the South, Dhanbad in the East, and Hazaribagh in the West. The total geographical area of the district is 2,861 sq. km. There are 9 blocks in the district.



Plate – I – Showing map of India



Plate – II – Showing map of Jharkhand (Bokaro District)

III. ETHNOMEDICINAL DATA COLLECTION AND ETHNOGRAPHIC COMPOSITION

The field data was collected during the period July 2013 to August 2014. It was started in rainy season and collections were repeated every two months of the year. Field work consisted of data documentation, plant collection and photography. A combination of focus group, individual interviews, field – walk / discussions and one local market survey was conducted with a tertiary educated translator present at each session. A total of 35 men 25 women and 5 vaidyas (traditional healers) were interviewed. Most of the informants belonged to an age between 50 and 70 years. The selection of informants was mainly based on their rich indigenous knowledge and long term experience of utilization of plants.

The informants were asked various questions about their traditional knowledge, plant use, disease treated, part used and the method of preparation and administration.

During the field visit the survey of data collection was made in different places i.e. waste lands, bare lands, play ground, road side, agricultural farms and near other localities. The collected samples of plants were brought to the department for identification. The serial number, vernacular name, botanical name, family, part used, life form and their medicinal uses were noted. The identification of plant material was carried out with the help of Hains, Flora (1925).

IV. SOCIO-ECONOMIC CONDITION OF THE DISTRICT

Some cities of the district have access to modern health facilities due to industrialization and the associated modern culture. They have access to hospitals. However the population

of local inhabitants (tribals and non-tribals) uses traditional medicine due to the relatively low cost of traditional medicine, belief in their cultural practices and difficult access to modern health facilities. Even in cities/small towns where modern health services are more accessible and specialized, many people go to traditional healers showing the cultural acceptability of such practices.

V. QUANTITATIVE ETHNOMEDICINAL DATA ANALYSIS

Relative Frequency Citation (RFC)

The collected ethnomedicinal information was quantitatively analyzed using an index of relative frequency citation (RFC) as;

$$RFC = FC/N \quad (0 < RFC < 1)$$

This index shows the local importance of each species and it is given by the frequency of citation (FC, the number of informants mentioning the use of the species) divided by the total number of informants participating in the survey (N), without considering the use-categories.

Use Value (UV)

The Use Value (UV) demonstrates the relative importance of plants known locally. It was calculated using the following formula

$$UV = \sum U_i/N$$

Where U_i is the number of uses mentioned by each informant for a given species and N is the total number of informants.

VI. RESULTS AND DISCUSSION

Medicinal plant diversity and part used

A total of 99 plant sps. belonging to 90 genera of 51 families were recorded with traditional uses as herbal medicine against various diseases. The most encountered medicinal plant families were Euphorbiaceae (8 sps.), Lamiaaceae (6 Sps.) Moraceae (5 sps.), Catharanthaceae (4 sps.), Caesalpinaceae (4 sps.), Rutaceae (4 sps.) and Fabaceae (4 sps.) each.

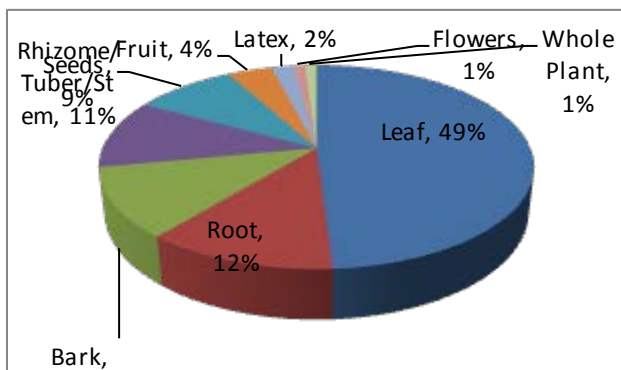


Fig-I : Showing % of plant parts used

The parts of the plant primarily used are the leaves (49%), Roots (12%), Bark (11%), Rhizome / tuber / stem (11%), Seeds (9%), Fruit (4%), Latex (2%), Flowers (1%) and whole plant (1%) are also frequently used. (Fig. I)

It was found that the highest number of plant species are used against stomach ache (12 sps.), followed by Rheumatism (11 sps.), Worms (10 sps.) for diarrhea and dysentery (8 sps.) for treatment of Jaundice (7 sps.), as a tonic and for skin diseases (6 sps.) each, for cold and fever, asthma and menstrual problems (5 sps. each) for teeth problems, snake bite and eye problems (3 sps. each) while for sore throat, pneumonia, epilepsy and brain disorders, typhoid, scorpion and insect sting as well as for hypertension (2 sps.) each are used.

The traditional healers diagnose ailments by their signs and symptoms rather than specific laboratory tests as this knowledge run through generations.

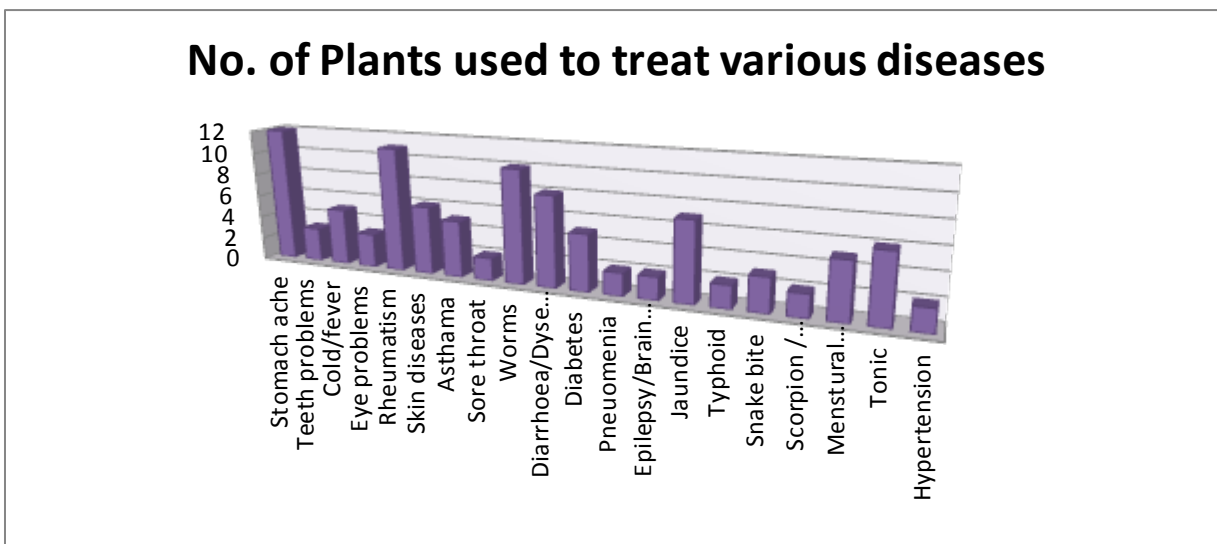


Fig-II : Showing number of plants used to treat various diseases

Data on Quantitative ethnomedicinal uses

Quantitative value indices were calculated in this study to analyse the ethnomedicinal information. There were 16 most cited plants known by a majority of the informants for medicinal uses *Emblica officinalis* ranked first (92.3%) in RFC, followed by *Ocimum sanctum*, *Maduca indica* (90.7%), *Terminalia chebula*, *T. behera* (89.2%) ranked third. These positions correspond to the fact that these plants were reported by highest

number of informants mentioning the use of this plant. The value of RFC ranges from 30 percent to 92 percent in the medicinal use of these plants / herbs. The former is linked to *Butea monosperma* from the family *Fabaceae* while the latter is associated with *Emblica officinalis* from family *Euphorbiaceae*. However on overage the relative frequency of citation is 66%.

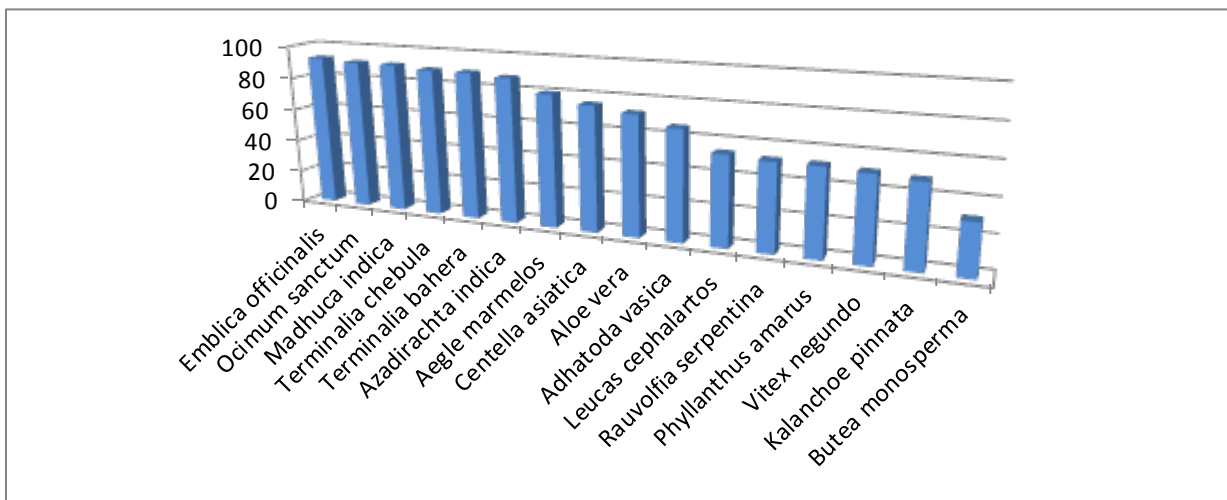


Fig-III : showing plant species with highest Relative Frequency of citation (RFC).

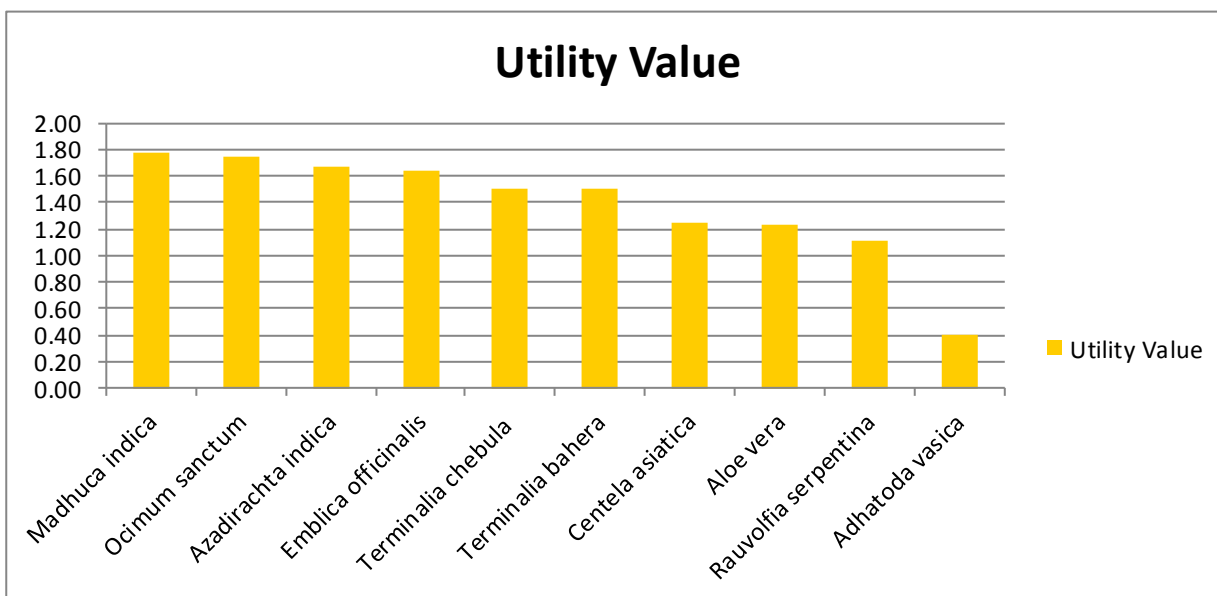


Fig-IV: showing utility value of different plants

Fig.(IV) shows 9 most popular medicinal plants with highest use value reported by the informants. It shows *Madhuca indica* and *Ocimum sanctum* has highest use value (1.76), followed by *Emblica officinalis* and *Azadirachta indica* (1.64) and *Terminalia Chebula* and *T. behera*. *Ocimum sanctum* is extensively used in the treatment of cold and cough, fever and in combination with other plants for the treatment of epilepsy, malaria, an poliomyelitis while *Madhuca indica* is used to control temperature, gas, chicken pox and dandruff besides making alcoholic beverage.

The UV of studied plants ranged from 0.46 to 1.76 which shows least relative importance of *Adhatoda vasica* from family Lamiaceae highest importance to *Ocimum sanctum* and *Madhuca indica* from families Lamiaceae and Sapotaceae respectively. These findings are consistent with that from RFC.

VII. CONCLUSION

This study reports the quantitative ethnomedicinal survey in some selected area of Bokaro District of Jharkhand. Among 99 plants species belonging to 51 families were reported. The families Euphorbiaceae, Lamiaceae and Fabaceae are the most used families in this area. The leaves are the favoured part of the plant. The most popular medicinal plants of this region known by local communities include *Emblica officinalis*, *Ocimum sanctum*, *Madhuca indica*, *Terminalia chedula*, *T. behera*, *Azadirachta indica*, *Aegle marmelos* and *Centella asiatica* based on their highest UV and RFC taken. In this way, we have compiled significant baseline data regarding indigenous knowledge about the native medicinal plants for treating common ailments is now ready to be further investigated phytochemically and

pharmacologically which may lead to natural drug discovery and development.

The medicinal plants of this area threatened by major factors such as by setting up of industries, habitat degradation, grazing and expansion of new agricultural lands.

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