

## **Ethno-medicinal Significance of Few Naturally Grown Plants Practices for Hepatitis in Sivasagar District of Assam, India**

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### **Abstract:**

*Having significant ethno-medicinal value, few naturally grown plants in Sivasagar district of Assam have to be economically explored. The paper is to highlight certain naturally grown plants of the district practices by reputed ethno-medicine practitioners for all forms of hepatitis ailments. During 2008-2009, an ethno-medicinal survey cum investigation was conducted in 27 sample community villages of the district and recorded 94 plants from ethno-medicinal practitioner's sources. Voucher specimens were identified with the help of relevant literature of Kanjilal, et al., 1934-1940; Islam, 1996; Borah, 2003 and Dutta, 2004. The study reveals out of the total recorded plants, 9 naturally grown plants are confidently uses by reputed hepatitis practitioners in therapeutic drug doses for various forms of hepatitis including HBV+. Considering one or two of the reported plants as base therapeutic plants, practitioners formulated raw drugs at certain therapeutic ratio along with the mixture forms of certain edible plant parts and products with following by basic ethno-medicinal norms. Ethno-medicinal therapeutic drugs and supplements have strong faith among all section of people for its effectiveness and less adverse effect on health. Practitioners of the region perform their health care services on humanitarian ground. The reported plants have agro-economic and pharmaceutical prospects.*

**Key words:** Naturally grown plant, Ethno-medicine, Hepatitis, Sivasagar, Assam

## **Introduction:**

Ethno-medicines are those alternative and complementary medicines associated with biotic and a-biotic components of nature and closely linked with culture and traditions of people. The basic sources of ethno-medicinal raw materials are flora, fauna, mineral and metal base things of nature. Most of the ethno-medicinal therapeutic drugs and supplements are formulated by practitioners with raw plant parts and products. World Health Organization (WHO) has identified and enlisted over 100 forms of different practices of the world, along with ethno-medicine (Mirchandni, 2002). Written evidence of herbal remedies dates back over 5,000 years, to the Sumerians, who created lists of plants. A number of ancient cultures wrote on plants and their medical uses (Nunn, 2002). The Rig Veda, dating between 3500 B.C to 1800 B.C. seems to be the earliest record available on medicinal plants (Ahmed, *et. al.*, 2003). It has been estimated that out of 2,000 drugs that have been used in curing human ailments in India, only about 200 are animal origin and a similar number of mineral origin, the rest is about 1,500 are plant origin (Jain, 2001).

Hepatitis is an inflammatory liver disease, caused mainly by a group of viral infections. As per WHO report-2013, there are five major types of viral hepatitis: hepatitis A, hepatitis B, hepatitis C, hepatitis D, and hepatitis E. Hepatitis A, hepatitis B and hepatitis C are the most common types of viral hepatitis found in the United States. Hepatitis viruses A, B, C, D and E can cause acute and chronic infection and inflammation of the liver that can lead to cirrhosis and liver cancer.

Hepatitis is going to be a serious health problem in the world. The 21st century has seen a paradigm shift towards

therapeutic evaluation of herbal products in liver disease models by carefully synergizing the strengths of the traditional systems of medicine with that of the modern concept of evidence-based medicinal evaluation, standardization and randomized placebo controlled clinical trials to support clinical efficacy (Thyagarajan, *et. al.*, 2002). In spite of the availability of more than 300 preparations for the treatment of jaundice and chronic liver diseases in Indian systems of medicine using more than 87 Indian medicinal plants, only four terrestrial plants have been scientifically elucidated while adhering to the internationally acceptable scientific protocols (Saleem, *et. al.*, 2010).

As per Indian Council for Medical Research (ICMR) reported –2011, that Northeast India has highest incidence of hepatitis in the country. Highest percentage of Hepatitis C was recorded in Manipur, followed by Nagaland and Mizoram. Current research on natural molecules and products primarily focuses on plants since they can be sourced more easily and be selected on the basis of their ethno-medicinal use (Verpoorte *et. at.*, 2005). In Assam hepatitis virus infection is more than hepatitis C. Hepatitis remains a group of diseases that are largely unknown and undiagnosed.

Medicinal plant use in ethno-medicines for hepatitis treatment is part of culture and traditions of ethnics in Assam. It is observed that few naturally grown medicinal plants are confidently uses by reputed ethno-medicine practitioners in Sivasagar district of Assam for hepatitis treatments in the form of therapeutic drugs and supplements. Few naturally grown plants have significant hepato-protective value. The chief sources of the plants are homeland garden (Bari) of communities and tribes. In Sivasagar district of Assam, 42 locally grown edible herbs are confidently used by communities and tribes for hepatitis, while 17 herbs are effective for all forms of hepatitis (Nath, 2011). Medicinal plants have directly fulfilled the basic health care needs to large section of people in

the developing world with providing necessary vitamins, minerals and other essential phyto-molecules.

Due to wide spread used and popularity of aliphatic medicine, ethno-medicine practices have been losing its attention among the communities and tribes. Still all section of people of the district has faith on hepatitis drugs for its effectiveness and less side effect on health. The medicinal plant hot-spot region Sivasagar has been silently converted to a warm spot region for several anthropogenic and ecological factors. It is observed that the plants species having significant ethno-medicinal value will be extinct if not properly identified and propagated.

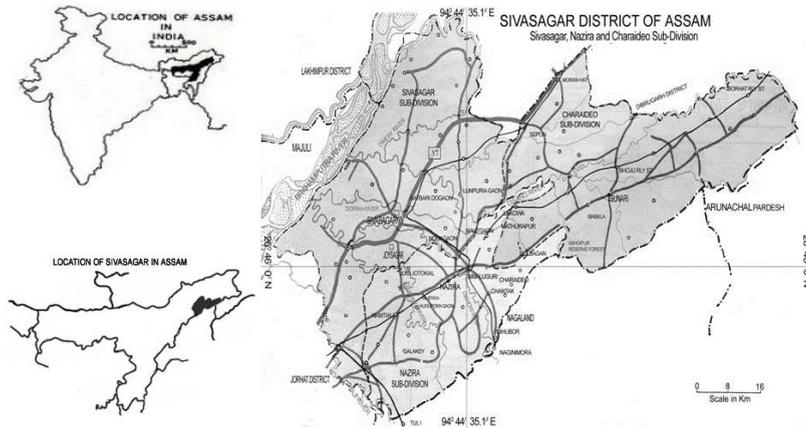
Review of relevance literature reveals that in different geographical regions of India researchers have explored hepato-protective ethno-medicinal plants. In one ethno-botanical literature survey conducted by Nikita Rajlaxmi Rana, Pushpendra Goswami and Shilpa Subhedar, Swami Vivekanand College of Pharmacy and Central India Institute of Pharmacy, Indore, M.P. of India, 2011 on hepato-protective herbal drugs, where they mentioned the main reasons why herbal hepato-protective drugs are mostly preferred by medical practitioners. They redefine the use of important herbal hepato-protective drugs like *Tinospora Cordifolia*, *Terminalia Arjuna*, *Plumbago Zeylanica* and *Berberis Aristata* that consist of specific chemical constituents and have their specific hepato-protective activity. These herbal drugs have shown the ability to maintain the normal functional statues of the liver with or without fewer side effects.

An important study was conducted by Prabhat Kumar Rai and H. Lalramnghinglova in 2011 on ethno-medicinal plant resources of Mizoram of North east India and reported 302 plants from 96 families. They found that ethno-medicinal plants of the state are threatened for anthropogenic activities. In concluding remark they stated that deforestation and up growing popularity of modern health care services are the chief

factors for which medicinal plants are losing its attention in the state. Darshan Sankar, 2006 stated that, field tested participatory methodology is important for rapid assessment of the community's therapeutic use of medicinal plants. It will be helpful to revitalize the community's folk healing practices in India. Researchers have contributed lots of research works in ethno-medicinal health care sector. A study was conducted by V.T. Hiremath, M.M. J. Vijaykumar and T.C. Taranath (2010) on ethno medicinal Plants of Jogimatti Forest in Chitradurga District, Karnataka, India, and reported 40 medicinal plants belonging to 36 families used for 42 diseases either in single or in combination with some other ingredients, for the treatment of various ailments like eye ailments, joint pains, paralysis, urinary infection, eczema, fever, rheumatic complaints, inflammations, leprosy, cough and cold, herpes, ring worms, asthma, wound/burns, renal pain etc. Still many people of the district are depend on medicinal plants for primary health care. Hepatitis is a global problem. Viral hepatitis is important pathogens causing liver diseases in India. In 2008, a study was conducted by Ashis Mukhopadhyaya, Department of Gastroinal Science, Christian Medical College, Velloor, India on Hepatitis C infections. They reported that, Hepatitis C is an emerging infection in India responsible for liver diseases in various regions of the country.

Identification of medicinal plants Systematic classification of medicinal plants in Indian sub-continent, especially in Assam done by Kanjilal *et. al.*, 1934-1940; Sharma, 1978; Gogoi, 1981; Jain, *et. al.*, 1990; Islam, 1996; Jain, 2001; Borah, 2003 and Duta, 2004 are helpful for the study. Exploration of ethno-medicinal knowledge from practitioner's sources with protecting Intellectual Property Rights (IPR) of practitioners is most important for ethno-medicine researchers. Most of the time researchers have been exploiting the reputed ethno-medicine practitioners in the developing world for which many of the reputed practitioners do not express their proper

formulations. With personal knowledge and experiences on ethno-medicine practice and field investigation an attempt has been made in this paper is to highlight few commonly use naturally grown of the district.



**Fig 1: The Study Area Sivasagar District of Assam.**

The study area, Sivasagar district of Assam is an important part of Upper Brahmaputra Valley Agro-Climatic Sub-Region of East Himalayan Zone (Zone-2). It extends from 26°3' N to 27°15' N latitude and 94°23' E to 95°23' E longitude. Total Geographical area of the district is 2,668 sq. km. Temperature ranges from 8°C-38°C, average rain fall is 2600 mm. to 3200 mm. and relative humidity is above 86%, elevation varies from 86 -150 meters from mean sea level. As per 2011 census, population of the district was 1150253, density of population was 431 people per sq. km. and literacy rate was 83.36 percent. Near about 40 percent of population of the district is Tai-Ahom, followed by other communities and tribes. Major part the district is covered with new and old alluvial soil. Rich diversity of medicinal plants at various eco-system level and their

traditional uses for various ailments is a significant character of the district.

### **Purpose of the Study:**

Having significant anti-hepatitis ethno-medicinal value of few naturally grown plants, the plants are still to be economically explored in the region. With intensive study and developmental works the ethno-medicinal plants would be utilized in pharmaceutical industries for therapeutic drugs and supplements. The study is significance for the botanists, biotechnologist, pharmacologist, nutritionists, environmentalist, geographers, economist, agricultural scientist, planners and decision makers of Government of Indian and scholars of other relevant fields in the realistic formulation of strategy and need base plans for sustainable utilization and management of the plants. The study will certainly be helpful for ethno-medicine researchers of the country for exploration of new hepato-protective herbal drugs. Again it will be helpful for create awareness among local people for conservation and agro-economic utilization. It will indirectly helpful for revitalization of ethno-medicinal health care system of ethnics.

### **Methodology:**

During 2008-2009, an intensive ethno-medicinal survey cum investigation was conducted in Sivasagar district of Assam. Based on the personal hepato-protective drugs and supplements used knowledge and experiences, a study were conducted among the ethno-medicine practitioners of the district for exploration of hepato-protective plants used knowledge. Review of relevant literature especially ethno-medicinal plant used knowledge for hepatitis was searched from various national and international sources. The problem was studied in context of Sivasagar district of Assam in general

(sub-division wise) and sample community village level in particular. For this study, 27 sample community villages were selected from the three sub-divisions viz. Nazira, Sivasagar and Charaideo, on the basis of population size of ethnic communities and tribes. Reputed hepatitis practitioners and knowledgeable users (knowledgeable person who have vast knowledge on ethno-medicinal supplement preparations) were considered for interview and interaction. From each sample village and its nearby villages, at least 10 respondents were selected. With purposefully designed questionnaire cum schedule, data/information was collected, considering Intellectual Property Rights (IPR) of practitioners. During survey, 287 respondents (42 reputed hepatitis practitioners and 245 knowledgeable users) were interviewed and interacted personally and recorded 94 plants.

Voucher specimens were identified with the help of the relevant literature (Kanjilal, et.al.; Islam, 1996; Borah, 2003; Dutta, 2004). For identification of the voucher specimens, consultation has done in the department of botany, Gargaon College, Sivasagar, Assam. During survey, homeland garden (bari) of communities and tribes, wetlands, reserve forests, small scale tea gardens, rural and urban markets of the district were visited to know the present status of the plants. Eco-climacteric characteristics of the sample villages, traditional food-habits, and folk-culture of communities and tribes were noted down during field visits. The present paper reporting 9 naturally grown plants, uses by reputed hepatitis practitioners in their therapeutic drugs.

## **Results and Discussion:**

The study reveals that the plant species viz. *Achyranthus aspera* L., *Boerhavia diffusa* L., *Commelina diffusa* Burm., *Drymaria cordata* Nees., *Eclipta alba* L. Hassk., *Euphorbia Pilulfera* L., *Hydrocotyle asiatica* L., *Impatiens glandulifera*

Royle., and *Plantago erosa* Wall., are confidently uses by reputed practitioners in anti-hepatitis drugs, considering one or two of the plant as base therapeutic plant (Table 1). Practitioners formulated drug doses at certain therapeutic ratio with certain edible plant parts and products for various hepatitis ailments.

During HBV+ treatment practitioner's reputed practitioner uses few other cultivable plants as base therapeutic plants. The commonly use therapeutic plant species are viz. *Cotsus speciosus* (Koen.) Smith., *Euphorbia nerifolia* L., *Oroxylum indicum* (L.) Vent., *Sida rhombifolia* L., *Tinospora cordifolia* (Willd) Hook.f.Th and *Tinospora crispa* (L.)Hook. f.Th.

Practitioners carefully formulated and administrated ethno-medicinal drugs with proper permission of family the members of patients and starts ethno-medicinal treatment along with the allopathic treatment. It is found that reputed practitioners administrated three to five types of therapeutic drug doses and supplements for ten to twenty days and changes the types of their drug doses after twenty days. As treatment of HBV+ is more risky, practitioners generally uses few edible supplements along with the therapeutic drug doses and advices their patients for time to time clinical test.

It was found that only few qualified reputed practitioners of the region practices HBV+. From personal hepatitis practice experiences and knowledge it is observed that to cure HBV+, it takes minimum 3 month. After regular observing the clinical repots of patients, it has seen few therapeutic drugs and supplements has played significant role in HBV+. Local people have strong faith on hepato-protective drugs practices by reputed hepatitis practitioners in the district. Most of the time family members of hepatitis patient come for ethno-medicinal treatment after failing with aliphatic or other treatments. Before therapeutic drugs formulation and administration practitioner advices their patient or family

members for proper clinical test of blood and urine of patients in reputed pathological laboratory. After confirmation of the type hepatitis ailment, practitioners formulated and administrated their raw drugs and supplements for different age groups at certain standardize forms with their previous experiences. Administration of any ethno-medicinal drug is very much risky. Practitioners carefully formulated and administrated raw drug doses for pregnant women and child. Most of the ethno-medicinal drug doses are prepared in liquid forms, generally on sugar base.

During interaction with the reputed hepatitis practitioners of the district it has seen that practitioners follow some basic ethno-medicinal norms during therapeutic drugs formulation and administration, which have strong scientific bases. The basic norms are viz. selection of quality base biotic and a-biotic raw materials collection from nature, selection of toxic free sites, time of raw plants parts and products collection, techniques of collection, amount of raw plant parts collection, methods and techniques of therapeutic drugs formulation, seasonal base plants selection, edible plants selection, base material selection for raw drug doses preparation, standardization of drug doses etc.

It is again observed that therapeutic drugs formulation and administration methods and techniques are varying from practitioner to practitioner and seasons to season, as quality base plant part and products are not availability in all seasons. Therapeutic knowledge of practitioners belonging to different ethnic groups and sub-groups are varying within the district for which some time hepato-protective drugs are less effective. Generally local people of the district go for hepatitis treatments with qualified practitioners.

From the study based on investigations it was found that most of the ethno-medicinal practitioners are under qualified, while 96(42.79%) are primary and below, 67(33.12%) are matriculate, 26(14.87%) are intermediate, 8(3.9%) are

graduate and 5(2.75%) and above and are graduate (Table 2). Along with the anthropogenic and other factors low educational status of hepatitis practitioners (75% practitioners are below intermediate) is the major responsible factor for which the practices have been losing its attention within the region.

Out of the 9 reported plants, 5 are in the path of threatened for several anthropogenic and ecological causes. The identified causes are viz., habitats loss of species for changing patterns of agricultural land-use, extension and development of residential land, changing traditional food habits and life style for globalization, degradation of ethno-medicinal knowledge among the ethnics, lack of interest among the present generation on ethno-medicinal plants for popularity of allopathic system of medicine, losing faith on ethno-medicinal raw drugs among literate section people except hepato-protective raw drugs, large scale deforestation in different ecological sites, extension and development of small scale tea cultivation and reorganization of homeland gardens for mono cropping, lack of research on ethno- medicinal health care sector of medicine and defective conservation and management plans of local government for sustainable economic utilization of the medicinal plants, changing health care utilization behaviors of rural people and concentration of ethno-medicinal health care practices among the unqualified section of people.

The old alluvial soil belt of the district is favorable for cultivation of selective reported species in different ecological habits for economic gain. Evergreen and semi-evergreen hilly areas of Assam-Nagaland and Assam-Arunachal boarder and deforested land which are lying vacant in the district would be utilized for small scale medicinal plant cultivation with proper guidance of medicinal board of India and pharmaceutical companies. The reported species have agro-economic and pharmaceutical prospects in the district. For exploration of naturally grown hepato-protective plants researchers as well as pharmaceutical industries of the country should come forward

for sustainable economic utilization management of the reported plants with considering IPR of hepatitis practitioners.

**Table 1: Enumeration of the recorded naturally grown plants with their botanical name, family, vernacular name, relative abundance, availability in local markets and their part and product use in ethno-medicinal therapeutic drugs and supplements in the study area.**

Sl. No.	Botanical Name of the plant, Family, Relative Abundance and Vernacular Name	Parts Used in Medicinal Supplements	Parts Used in Drugs Forms	Availability in Local Market
1	<i>Achyranthus aspera</i> L. Amaranthaceae Ubhotkata, O, Th	Not use	Whole herb with roots	Not found
2	<i>Boerhavia diffusa</i> L. Nyctaginaceae Punonowa, O, Th	Not use	Whole herb	Not found
3	<i>Commelina diffusa</i> Burm Commelinaceae Kona simolu, F	Twigs	Twigs	Not found
4	<i>Drymaria cordata</i> Nees. Convolvulaceae Laijabori, F	Whole herb	Whole herb	Not found
5	<i>Eclipta alba</i> L. Hassk. Asteraceae Keharaj, F, Th	Not use	Whole herb	Not found
6	<i>Euphorbia pilulifera</i> L. (= <i>E. hitra</i> ) Euphorbiaceae Gakhiroti Bon, F	Not used	Twigs	Not found
7	<i>Hydrocotyle asiatica</i> L. Apiaceae Bormanimuni, F	Whole herb	Whole herb	Found
8	<i>Impatiens glandulifera</i> Royle. Balsaminaceae Damdeuka, O, Th	Not used	Roots with lower part of the herb	Not found
9	<i>Plantago erosa</i> Wall Plantaginaceae Singabon, O, Th	Leaves	Whole herb	Not found

(F= Frequent, O=Occasional, Th-Threatened).

Source: Based on primary data, 2008-2009.

**Table 2: Educational qualification of practitioners and knowledgeable users**

Sl. No.	Qualification of Practitioners	Reputed Practitioners		Total	Knowledgeable Users		Total	P.C of Total
		Male	Female		Male	Female		
1	Primary and Below	3	2	5	43	48	91	96 (42.79%)
2	Matriculate	5	1	6	44	17	61	67(33.12%)
3	Intermediate	3	1	4	19	3	22	26 (14.87%)
4	Graduate	4	0	4	3	1	4	8 (3.9%)
5	Graduate and Above	3	0	3	2	0	2	5 (2.75%)
		18	04	22	111	69	180	202

Source: Primary Data (2008-2009)

### **Conclusion:**

Increasing demand of plant drugs in the world, a clinical trials and pharmacological tests is utmost necessary for sustainable economic utilization of the reported plants. More over necessary steps should be taken by government of Assam and central government of India for in-situ and ex-situ conservation and management of the reported plants through community level campaign, motivating the traditional practitioners and cultivators with proper training, focusing the economic potentiality and viability of the naturally grown plants through mass media and allowing permission to the pharmaceutical companies for sustainable economic utilization of the plants with social justice, so that research findings will be helpful for masses.

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