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## Ethno-medicinal herbs: A pharmaceutical prospect of hepatitis drugs

DWIJEN NATH

### ABSTRACT

An ethno-medicinal investigation was carried out on herbs used for hepatitis treatment in Sivasagar District of Assam during 2008-2009. 57 herbs were recorded so far from 42 reputed ethno-medicine practitioners and 245 users. 14 species are effectively used by reputed practitioners for all forms of hepatitis including HB+V. 31(54.4%) are frequent, 26(45.6%) are occasional, 13(22.8%) are cultivated and 40(71.7%) are naturally grown. 24(42.15%) herbs are threatened for several anthropogenic causes. 45(78.94%) reported herbs are traditionally used by communities and tribes as recipe during hepatitis. Anti-hepatitis therapeutic drugs have strong social reliability among the all section of people in the District. The species are conservation oriented and has agro-economic and pharmaceutical prospect.

**Key words :** Ethno-medicine, Herbs, Hepatitis

### INTRODUCTION

Ethno-medicines are those alternative medicines, practices by ethnic communities and tribes in a particular geographical area or region with biotic and abiotic components of nature for prevention and control of diseases and illness of human, animals, cultured crops and other purposes. Such practices are inherent linked with folk-culture and tradition. The chief source of ethno-medicines is plants and its different parts and products. Medicinal plant bio-resources have played a significant role in ethno-medicinal health care system. It fulfilled the basic health care needs of large section of rural masses of the world with providing vitamins, minerals, anti-oxidants and other essential phyto-molecules. It is one of the many service systems that have emerged to facilitate fulfillment of individual as well as social goals (Fulop.1986).

Liver inflammatory diseases are common in all areas of the world, especially in the industrial areas. Hepatitis is an inflammatory liver disease, caused by bacteria, virus and other factors. Out of different forms of hepatitis, HB+V is serious and lead to chronic liver diseases and cancer. As per World Health Organization report, 2003, 5000 people die each year in U.S.A due to HB+V. As per Center for Disease Control and Prevention (CDC) report-2003 that 1.25 million people in U.S.A have chronic HB+V. Indian Journal of Medical Research reported in 2008 that over 184000 people died from HBV in India. In Indian

Ayurvedic systems of medicine uses over 100 native plant species for control and prevention of liver inflammatory diseases. 57 anti-hepatitis herbs were recorded so far from the reputed practitioners and users sources in Sivasagar District. Few anti-hepatitis drug doses of the area have strong social reliability for their effectiveness and less adverse effect on health. Considering significant ethno-medicinal value of herb bio-resources in the District, an attempt has been made in this paper to highlight the anti-hepatitis herbs with the following objectives - i. to explore the medicinal herbs used traditionally by ethno-medicine practitioners and users for hepatitis treatment in Sivasagar district of Assam and their present status; ii. to examine the agro-economic and pharmaceutical prospect of herbs in the District.

The study is of significance for pharmacologist, nutritionist, botanists, bio-technologist, environmentalist, medical geographers, economist, agricultural scientist, planners and decision makers of government of Indian and scholars of relevant fields in the realistic formulation of strategy and need based plan for effective economic utilization and management. Anti-hepatitis herb bio-resources of the area could be utilized in pharmaceutical and nutritional industries of the country for quality base drugs and medicinal supplements production with proper clinical and pharmaceutical studies. Such integrated studies will be helpful for the millions of hepatitis patients of the world and contribute a new concept in pharmaceutical

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research.

A perusal of literature reveals that in different part of India, ethno-medicinal herbs have been explored from traditional health care sources and enumerated their utility by Kanjilal *et al.* (1934-1940); Sharma (1978); Jain and Rao (1990); Islam (1996); Sankar and Ved (2003); Baruah (2006); Sarma (2007); Nath and Phukan (2008).

The study area, Sivasagar District of Assam is a unique part of Upper Brahmaputra Valley Agro-Climatic Sub-Region of East Himalayan Zone (Zone-2), extends from 26°45' North to 27°15' North latitude and 94°25' East to 95°20' East longitude (Survey of India, 2004). Temperature ranges from 8°C-38°C, average rain fall is 260 cm and relative humidity is above 86%. Humid-monsoon climate with wet-summer and dry-winter, vast alluvial plain topography with occasionally hills, hillocks and wetlands; tropical deciduous with semi-evergreen and evergreen forest; seven reserved forest with one bird sanctuary, three major tributaries *viz.*, Dehing, Desang and Dikhow, with eleven sub-tributaries are the significant physiographic character of the District. Rich diversity of plant species at eco-system level is another significant character. As per 2001 census, schedule cast and schedule tribe population of the district was around 7% of total population. Near about 40% of the total population is Tai-Ahom, followed by other communities and tribes. With diverse socio-cultural background and ethno-medicinal herbs used knowledge of rural communities and tribes, Sivasagar District is a unique part of Assam.

## MATERIALS AND METHODS

The entire study has been done on the basis of primary data/information collected from 42 reputed practitioners (family level, village level and district level) and 245 users (common and occasional) from 27 sample villages of 9 developmental blocks of the district, during 2008-2009. Respondents were interviewed directly with specially designed questionnaire cum schedule, considering their intellectual property rights. Sample villages were selected in such a way that it represents all the communities and tribes. During village selection, attention has been given on geographical location and population size of the communities and tribes. Respondent were selected on the basis of the information of villagers, followed by own exploratory method and techniques. Intensive interaction has been done for such study, as the innocent practitioners has already exploited by researchers for their own benefits. Socially reputed practitioners and experienced users were specially considered for ethno-medicinal data/information collection. Photographs as well voucher specimens were

collected along with the field tour and compared with ethno-botanical literatures. During field work the basic ethno-medicinal norms were carefully observed, which has strong scientific base. Eco-climacteric characteristics of the selected villages, folk-culture and changing health care utilization behaviors of communities and tribes were noted down to understand the reality.

## RESULTS AND DISCUSSION

From the studies based on investigation, 57 anti-hepatitis herbs were recorded from the respondents, while 14 herbs are effectively used by reputed practitioners in ethno-medicinal drugs (Table 1). The species are *viz.*, *Achyranthus aspera* L., *Alternanthera sessilis* L., *Argemone mexicana* L., *Boerhavia diffusa* L., *Drymaria cordata* Nees., *Eclipta alba* L. Hassk., *Euphorbia pilulifera* L., *Hedyotis diffusa* Roxb., *Hydrocotyle asiatica* L., *Hydrocotyle sibthorpioides* Lamk., *Impatiens glandulifera* Royle., *Lindernia crustacea* (L.) F. Muell., *Oxalis corriculata* L. and *Sida rhombifolia* L. The reported herbs are commonly used by reputed practitioners for all forms of hepatitis treatment. In HBV+ drugs formulation; these species have played an effective role in combination of other plant drugs. During raw drugs formulation and administration reputed practitioners follows certain basic norms of ethno-medicine like toxic free sites selection, hormonal balance situation during collection of plants and their parts, maturity of the plants, knowledge on inter-mixing of raw plant drugs, inter-mixing of plans drugs with base filling materials like sugar, salt, alcohol etc., standardization of raw drug doses, disease diagnosis, administration of raw drugs etc. The basic sources of the reported herbs are home land garden (Bari) of communities and near by village forest, which are the store house of quality base herbs. Most of the practitioners performed their practices as social service. Experienced and knowledgeable persons cared their family members and relative with their traditional knowledge based experience. 45(80.0%) recorded herbs are specially used by the local communities and tribes as medicinal and nutritional recipe during hepatitis. Rural women are knowledgeable in herbs collection and medicinal recipe preparation. Practitioners belong to different communities and tribes are knowledgeable on herbs used with their own methods and techniques, for which standardization drug doses vary from practitioners to practitioners and time to time, for which literate section have less faith on such alternative practices having their significant therapeutic value. It is observed that, except for few anti-hepatitis drugs, no any ethno-medicinal drugs have social reliability, as the practice is

**Table 1 : Enumeration of recorded herbs with their botanical name, family, local name, relative abundance and parts used**

Sr. No.	Botanical name and family of the plant species	Local Name	Relative abundance	Parts used for traditional recipes during hepatitis	Parts used for ethno-medicinal therapeutic drug
1.	<i>Achyranthus aspera</i> L. Amaranthaceae	Ubhotkata	O,N	Not used	Whole herb with roots
2.	<i>Alternanthera sessilis</i> L. Amaranthaceae	Matikaduri	F, N	Twigs of plant	Roots, Leaves
3.	<i>Amaranthus philoxeroides</i> (Mars.) Grsep Amaranthaceae	Panikhutara	F, N	Twigs of plant	Twigs of plant
4.	<i>Amaranthus spinosus</i> L. Amaranthaceae	Hatikhutara	F, N , Th	Young plant	Roots
5.	<i>Aloe vera tournex</i> L. Liliaceae	Salkuwari	O ,Cu, Th	Not used	Whole plant
6.	<i>Alpinia nigra</i> (Gaertn.) Burt. (=A. allughas.Retz.) Rosec.) Zingiberaceae	Tora	F, N	Young plant	Young plant
7.	<i>Amaranthus viridis</i> L. Amaranthaceae	Jatikhutara	F, N and Cu	Twigs, young plant	Leaves
8.	<i>Andrographis paniculata</i> Ness. Acanthaceae	Kalmegh	O, Cu,Th	Not used	Leaves,
9.	<i>Argemone mexicana</i> L. Papaveraceae	Sial-kata	O, N , Th	Not used	Leaves
10.	<i>Bassica nigra</i> Koch. (=B.campestris L.) Brassicaceae	Kola- sorioh	F, Cu	Young plant	Not used
11.	<i>Boerhavia diffusa</i> L Nyctaginaceae	Punonowa	O, N , Th	Not used	Whole plant
12.	<i>Bromelia comosa</i> L. Bromeliaceae	Matikothal	F, Cu	Ripen fruits	Young leaves
13.	<i>Cassia tora</i> L. Caesalpiniaceae	Horu-Medelua	F, N	Leaves	Leaves
14.	<i>Chenopodium album</i> L. Chenopdiaceae	Jilmil Sag	F,N and Cu	Twigs of young plant	Not used
15.	<i>Colocasia esculenta</i> Schoot. Arceae	Kolakosu	F, N	Young Leaves	Not used
16.	<i>Commelina benghalensis</i> L. Rubiaceae	Konasimalu	F, N	Twigs	Leaves
17.	<i>Curcuma amada</i> Roxb. Zingibereaceae	Amada	O ,Th,Cu	Modified roots	Modified roots
18.	<i>Desmodium. latifolium</i> DC. (=D. lasiocarpum DC.) Papilionaceae	Byonisabota	F, N ,Th	Leaves	Roots, leaves
19.	<i>Drymaria cordata</i> Nees. Convolvulaceae	Laijabori	F, N,	Whole plant	Whole plant
20.	<i>Eclipta alba</i> (L.) Hassk. Asteraceae	Keharaj	F, N , Th	* One or two twigs	Roots, twigs
21.	<i>Eleusine indica</i> Gaerin Poaceae	Bobosabon	F, N	Not used	Whole plant
22.	<i>Endydra fluctuans</i> Lour Asteraceae	Helosi Sag	F, N , Th	Twigs	Not used
23.	<i>Euphorbia Pilulfera</i> L. (=E. hitra) Euphorbiaceae	Gakhiroti Bon	F, N , Th	*One or two twigs	Whole plant
24.	<i>Fragaria indica</i> Andr. Rosa Rosaceae	Gorukhis	F, N	Leaves	Leaves
25.	<i>Hedyotis corymbosa</i> (L.) Lamk (=Oldenlandia corymbosa L.) Rubiaceae	Bonjaluk	O , N ,Th	Whole plant	Whole plant
26.	<i>Hedyotis diffusa</i> Roxb. Rubiaceae	Bonjaluk	F , N	Whole plant	Whole plant
27.	<i>Heliotropium indicum</i> L. Heliotropiaceae	Hatisur	O , N , Th	Not used	Leaves
28.	<i>Hydrocotyle asiatica</i> L. Apiaceae	Bormanimuni	F, N	Whole plant	Whole plant
29.	<i>Hydrocotyle sibthorpioides</i> Lamk (H. roundifolia DC.) Apiaceae	Sorumanimuni	F, N	Whole plant	Whole plant
30.	<i>Houttuynia cordata</i> Thunb. Saururaceae	Mosondo	O, Cu,Th	Leaves	Not used

Table 1 contd...

Contd... Table 1

31.	<i>Impatiens glandulifera</i> Royle. Balsaminaceae	Damdeuka	O , N , Th	* One or two leaves	Roots
32.	<i>Leucas aspera</i> (Willd.) Spreng. Lamiaceae	Dorunbon	F, N	Young plant	Whole plant
33.	<i>Lindernia crustacea</i> (L.)F.Muell Scrophulariaceae	Kasidoria bon	O,N,Th	Leaves	Whole plant
34.	<i>Mimosa pudica</i> L. Mimosaceae	Lajuki Bon	F,N	Not used	Whole plant
35.	<i>Musa balbisiana</i> Colla. (=M. <i>sapientum</i> var. <i>Pruinosa</i> King. Ex Cowan) Musaceae	Bhim kol	F, Cu	Ripen fruits and young plant	Young plant
36.	<i>Musa velutina</i> Wendl.&Drude. Musaceae	Malbhug kol	O, Cu	Ripen fruits and young plant	Young plant
37.	<i>Neptunia oleraceae</i> Lour Mimosaceae	Pani-jaluki	O, N ,Th	Leaves	Leaves
38.	<i>Ocimum sanctum</i> L. Lamiaceae	Kola-Tulshi	F, Cu	Not used	Leaves
39.	<i>Oxalis corriculata</i> L. Oxalidaceae	Sorutengashi	O, Th	Whole plant	Whole plant
40.	<i>Oxalis corymbosa</i> L. Oxalidaceae	Bortengashi	O, N ,Th	Whole plant	Whole plant
41.	<i>Physalia minima</i> L Solanaceae	Kapalphuta	O, N ,Th	Leaves	Leaves
42.	<i>Phyllanthus fraternus</i> Webster. (=P. <i>niruri</i> L.) Euphorbiaceae	Bon-amlakhi	O,N, Th	Whole plant	Whole plant
43.	<i>Plantago erosa</i> Wall Plantaginaceae	Singabon	O, N,Th	Leaves	Leaves, roots
44.	<i>Polygonum caespitosum</i> Bl. Polygonaceae	Modhusulang sag	O, Cu,Th	Twigs	Not used
45.	<i>Portulaca oleracea</i> L. Portulacaceae	Mallbhug Sag	O,N,Th	Whole Plant	Not used
46.	<i>Pouzolzia indica</i> Gand. Urticaceae	Boralibokua	O, N	* one or two twigs	Leaves
47.	<i>Raphanus sativus</i> L. Brassicaceae	Mula	F,Cu	Young leaves	Not used
48.	<i>Rumex vesicarius</i> L (=R. <i>acetosa</i> L.) Plyponaceae	Suka-sag	O , Cu,Th	Young plant	Not used
49.	<i>Sida rhombifolia</i> L Malvaceae	Saru-sunborial	F, N	Not used	Leaves, roots
50.	<i>Stellaria media</i> (L.) Vill. Caryophyllaceae	Morolia Sag	F, N	Whole Plant	Not used
51.	<i>Solanum nigrum</i> L. Solanaceae	Laskosi	O,N	Leaves	Not used
52.	<i>Solanum ferox</i> L. (=T. <i>Indicum</i> L.) Solanaceae	Kotahibengana	O,N	Not used	Roots,seed,
53.	<i>Sphenoclea zeylainca</i> Gaertn. W. Sphenocleaceae	Pani-leheti Sag	F, N	Leaves	Leaves
54.	<i>Spinacia plerace</i> L. Chenopodiaceae	Mitha paleng	O, N and Cu	Whole Plant	Not used
55.	<i>Spermacoce ocymoides</i> Burn. Rubiaceae	Soru Gahori Bon	F, N , Th	Leaves	Leaves
56.	<i>Xenthium strumarium</i> L. Compositae	Agora	F, N	Young Plant	Leaves
57.	<i>Zigiber officinal</i> Rose. Zingiberaceae	Moranada	O, Cu,Th	Modified Roots	Modified Roots

(F= Frequent, O=Occasional, Th-Threatened, N –Naturally grown, Cu-Cultivated)

Source: Based on primary data.

concerted among the unqualified section of people. 50.4% practitioners are below matriculate having little knowledge on modern health care system. Rural masses of the district have well knowledge on medicinal herbs used during hepatitis but the methods and techniques of raw drugs formulation and administration are not known to all.

The reported herbs have protected our liver in many ways with boosting immune system, cleaning the blood bacteria and wash product, maintaining hormone balance,

producing quick energy on demand, helping in production of bile etc. From practice experiences with own formulation and it is observed that, other than active biochemical components of herbs, some other phyto-molecules and a-biotic factors are responsible for hepatitis remedy. From the survey based investigation in the district, it is found that 31(54.4%) reported herb species are frequently available and 26(45.6%) are occasionally available in the district. 13 (22.8%) herbs are found in cultivated forms,

**Table 2 : Educational status of ethno- medicine practitioners in Sivasagar of District, Assam**

Sr. No.	Educational qualification of practitioner	Age Groups						Percentage of total practitioners
		40-50		50-60		60 and above		
		M	F	M	F	M	F	
1.	Graduate and above	1		3				4(9.52%)
2.	Intermediate	2		2			1	5(11.90%)
3.	Matriculate	1		3	1		5	10(23.80%)
4.	Below Matriculate	1		8	1	11	2	23(54.76%)

Source: Based on primary data

while 40 (71.7%) herbs are naturally grown. 24 (42.15%) herbs are threatened in the district for the responsible anthropogenic causes viz., population pressure on land, changing patterns of agriculture and land used pattern, changing traditional food-habits and life style, less awareness of local people on economic potentiality of herbs bio-resources, extension and development of small scale tea cultivation in the high land, drilling of crud oil and related operational activities of ONGC(L) and OIL and pesticide and herbicidal pollution from Tea-Estates.

Moist climate and soil health of the district is favorable for growth and development of medicinal herbs, where quality based phyto-molecules are naturally formed in plants cells. Assam-Arunachal and Assam-Nagaland boarder areas of the district have immense potentiality for few selected herbs cultivation along with tea and social forestry. Few small-scale tea growers of the district have started organic tea and medicinal plants cultivation with the guidance of Assam Agricultural University and RRL of Jorhat, Assam. 45(78.94%) herbs are confidently used by communities and tribes as recipe during hepatitis. These species have immense potentiality in medicinal tea production at very low cost. The vast deforested reserved forest land, village forest land, government organization land and home-land gardens which are lying vacant could be commercially utilized for medicinal herbs cultivation with selected species at favorable space. Considering ethno-medicinal potentialities of the reported herbs, an integrated methodology of research and development is utmost necessary for revitalization, preservation, conservation and need based management with proper pharmacological and clinical tests.

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#### Address for correspondence :

**DWIJEN NATH**  
 Department of Geography,  
 Gargaon College, SIVASAGAR (ASSAM) INDIA  
 E-mail : ethodwijen@gmail.com

