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Phytochemical Constituents of Some Medicinal Plant Species Used in Recipe During 'Bohag Bihu' in Assam

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An ethno botanical study has been carried out to focus on medicinal utility of 101 plant species eaten during Bohag Bihu in Assamese society. Amongst 101 species, 25 species are found to have effect on gastrointestinal problem, 18 species effect on skin diseases, 16 species effect on respiratory ailments, 14 species effect as anti diabetic, 7 species effect on gynaecological problems, 6 species effect as blood purifier, 4 species effect on rheumatism, 3 species effect on eye-sight improvement and 2 species effect on jaundice. These plants contain various phytochemicals like saponins, alkaloids, sterols, flavanoids, glycosides, terpenoids which have certain medicinal values. The paper reflects the rich ethno medicinal value of the herbs along with their phytochemical constituents. The further scrutiny and evaluation of the safety parameters of each component of the herb used in the recipe may be investigate to develop a pharmacologically potent lead molecule.

Keyword: Phytoconstituents, Medicinal plants, Bihu, Assam

1. Introduction

Assam is rich in biodiversity. The state is situated from 24°2' - 27°6' N latitudes and 88°8' - 96° E longitudes and covers an area of 78,523 sq. km. The state extends between foothills of eastern Himalayas and the Patkai and Naga Hills and is bordered by Bhutan to the northwest, Bangladesh to the south west and Myanmar to the south. Assam has a humid tropical and subtropical climate as it receives heavy rainfall during monsoon. Assam is inhabited by a number of ethnic tribes belonging to the Mongoloid races, Aryan races and Austric races and dominated by Mongoloid races which includes Bodo, Mishing, Karbi, Dimasha, Rabha, Tiwa, Sonowal Kachari, Ahom, Tai Turung, Tai Khamyang, Deori, Chutia, Kuch, Motok and Moran etc. and most of them are Chinese decedent. Amongst the many festivals in Assam, the Bohag Bihu is one of the most important festival celebrated from 1-7th

April and it is customary to eat rare varieties of 101 species herbs recipe on 1st day of festival. People believe that this special recipe has some medicinal values which keep them healthy for the coming year^[1]. The present study was carried out to enlist the indigenous recipe plant species, phytoconstituents they bear and their medicinal values.

2. Materials and Methods

The study was undertaken during 2011-12 in Jorhat and Sibsagar district of Assam. The two districts were considered as four zones and study was carried out in the areas. During investigation, elderly people or village heads man or herbal practitioners were interviewed, discussed and information was gathered and species collected and identified (table-1). The local name of the species was collected from Assamese magazine 'Prantik¹' and "Basundhara²". The species were

identified with the help of literature available at the library of Dibrugarh University. The species are alphabetically arranged followed by family,

common names, plant part use as food and their medicinal values.

Table 1: The name of the plants used as recipe in Bohag Bihu

S. No	Scientific Names	Family	Vernacular name	Part used as food	Medicinal value
1	<i>Adhatoda vasica</i> Nees.	Lamiaceae	Titabahak	Leaf and Shoot	Leaf and root decoction is taken in cough & cold
2	<i>Alpinia nigra</i> (Gaertn.) Burt.	Zingiberaceae	Tora	Rhizome, Shoot	Rhizome paste is used in bronchitis, gastric disease. Shoot extract is antihelmenthic in nature
3	<i>Altemanthera sessilis</i> L.	Amaranthaceae	Matikanduri	Leaf	Paste is applied on wound
4	<i>Amaranthus viridis</i> L.	Amaranthaceae	Khutura	Leaf	Taking as vegetable is said to improve eyesight
5	<i>Amaranthus hybridus</i> L.	Amaranthaceae	Moricha sak	Leaves, Stem	Taking as vegetable is said to improve eyesight
6	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Matikhutura	Leaf	Root juice is given in Diarrhoea. Taking as vegetable of tender shoot is useful as galactogue to nursing mothers
7	<i>Amorphophallus paeonifolius</i> (Dennst.) Nicolson	Araceae	Ol kochu	Tender shoot, corm	Tender shoots used as vegetables is said to cure sinusitis. Boiled corm is used in the treatment Dysentery and Rheumatism.
8	<i>Asparagus recemous</i> Wild.	Liliaceae	Satmul	Shoots and tuberous root	Root decoction is used as health tonic. It is diuretic, ophthalmic, galactagogue, and carminative
9	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees	Acanthaceae	Kal megh	Leaf	Decoction of leaf kills intestinal worms. It is hepatoprotective.
10	<i>Azadirachta indica</i> L.	Meliaceae	Neem	Leaf	Paste of leaves is use in Small pox, Skin problems
11	<i>Bacopa moneirra</i> L.	Scrophulariaceae	Brahmi sak	Leaf	Eaten as vegetable is said to cure epilepsy, anxiety and depression, anaemia
12	<i>Bambusa balcooa</i> Roxb.	Poaceae	Bholukabah	Young shoot	The outer green layer is scrapped off, powdered and applied on fresh wound for quick healing.
13	<i>Basella alba</i> L. var. <i>alba</i>	Basellaceae	Puroi sak	Leaves, Stem	Leaves stem and fruits are largely used as Vegetable, considered good for anaemia patient.
14	<i>Basella alba</i> L. var. <i>rubra</i> (L.) Stewart.	Basellaceae	Ronga Puroi sak	Leaf, Stem	Leaves stem and fruits are largely used as Vegetable, considered good for anaemia patient.

15	<i>Beta vulgaris</i> L.	Chenopodiaceae	Pirali paleng	Root	The decoction prepared from the leaf is use as purgative and in burns.
16	<i>Brassica juncea</i> L.	Brassicaceae	Laisak	Leaf	Eaten cooked is said to be anti diabetic
17	<i>Brassica nigra</i> (L.) Koch.	Brassicaceae	sariah	Seeds, Leaf	Seeds eaten cooked is antihelmenthic in nature
18	<i>Caesalpinia bonduc</i> (L.)Roxb.	Caesalpinaceae	Letaguti	Seed	Decoction of seed is given in pneumonia
19	<i>Calamus erectus</i> Roxb.	Arecaceae	Betgaj	Tender shoot, Rhizome	Taking as vegetable is said to purify Blood
20	<i>Cassia sophera</i> L.	Caesalpinaceae	Medeliwa	Leaf	Leaf decoction is applied on ringworm, scabies and insect bite.
21	<i>Chenopodium album</i> L.	Chenopodiaceae	Jilmil sak	Leaf	Boiled tender shoot is used in constipation.
22	<i>Chromolina odorata</i> (L.) King et Robin.	Asteraceae	Jarmani bon	Leaf	Leaf paste is applied as antiseptic to cuts and wounds
23	<i>Cissampelos Pareira</i> L.	Menispermaceae	Tubuki lota	Leaf, roots	Powdered dried root is given in diarrhoea. Leaf paste is applied on forehead in fever.
24	<i>Clerodendron Colebrookianum</i> Walp.	Verbenaceae	Nephaphu	Tender leaf	Decoction of tender leaf is given to cure hypertension.
25	<i>Clerodendrum indicum</i> (L.) O. Kuntze	Verbenaceae	Akalbih	Leaf	Leaves are used as vegetable, it is quite bitter in taste. Increase digestion.
26	<i>Clerodendron serrartum</i> (L.)Moon	Verbanaceae	Nangalbhangga	Leaf	Root decoction is given in dysentery. Crushed leaves are applied to cuts and wounds.
27	<i>Clerodendron viscosum</i> Vent.	Verbenaceae	Dhopat tita	Leaf	Infusion of leaves is said to cure malaria
28	<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	Kunduli	Root, Leaf	Leaf and root juice is given in Diabetes.
29	<i>Corchorus capsularis</i> L.	Tiliaceae	Morapat	Leaf	Taking as vegetable is said to improve eyesight.
30	<i>Corchorus olitorius</i>	Malvaceae	Mithamora	Leaf	Leaf decoction is used as demulcent and diuretic and Antioxidant.
31	<i>Crateva magna</i> (Lour.) DC	Capparaceae	Barun	Leaf	Root paste is use in dysentery
32	<i>Cucurbita maxima</i> Duch.	Cucurbitaceae	Rongalao	Fruit	Regular taking of fried seeds is said to increase the sexual vigour.
33	<i>Curcumis sativa</i>	Cucurbitaceae	Tioh	Leaf	Leaf paste is given in skin diseases
34	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Duboribon	Whole plant	Paste of whole plant is applied to cuts and Wounds to stop bleeding. Decoction is given in leucorrhoea
35	<i>Desmodium gyrans</i>	Fabaceae	Lorbaruah	Leaf	Leaf paste is applied as antiseptic to cuts and wounds. Antimicrobial in nature.

36	<i>Dillenia indica</i> L.	Dilleniaceae	Outenga	Fruit	Fleshy calyx eaten raw as well as cooked is anti diabetic
37	<i>Dioscorea alata</i> L.	Discoreaceae	Kath Alu	Tubers	Taken as vegetable is said to cure Anaemia
38	<i>Diplazium esculentum</i> (Retz.)	Athyriaceae	Dhekia	Fronnd	Regular taking of cooked frond is said to increase the sexual vigour
39	<i>Drymaria cordata</i> L.	Caryophyllaceae	Laijabori	Leaf	Paste of whole plant is applied on tongue in fungal infection, juice is given in sinusitis
40	<i>Eclipta alba</i> (L.) Hassk	Asteraceae	Kehrajbon	Leaf	Leaf paste applied on snake bite, leaf juice is taken in jaundice and root extract is applied in cut & wound
41	<i>Enhydra fluctuans</i> Lour.	Asteraceae	Heloshi	Leaf	Taken as vegetable is said to be useful as laxative
42	<i>Eryngium foetidum</i> L.	Apiaceae	Man dhania	Leaf	Leaf juice is given in flatulence and stomach trouble
43	<i>Erythrina stricta</i> Roxb.	Leguminosae	Madar	Leaf	Juice of the tender leaves is given to kill intestinal worms
44	<i>Eupatorium cannabinum</i>	Asteraceae	Tongloti	Leaf	Detoxifying herbs for fevers, cold, flue and viral conditions.
45	<i>Flemingia strobilifera</i> L.	Fabaceae	Makhioti	Leaf	Root decoction is given in menstrual irregularities
46	<i>Ficus racemosa</i> L.	Moraceae	Dimoru	Fruit	Decoction of bark is antidiabetic,antidysenteric in nature
47	<i>Hibiscus subdarifa</i> L.	Malvaceae	Tenga mora	Leaf	Leaves are used as medicine in dysentery
48	<i>Hiptage-benghalensis</i> L.	Malpighiaceae	Madhoilota	Flowers	Juice of flower is used in ear pain
49	<i>Houttuynia cordata</i> Thunb.	Saururaceae	Mosondori	Leaf	Young shoots and leaf (roasted by wrapping with banana leaf) is taken in diarrhoea and dysentery
50	<i>Hydrocotyl rotundifolia</i> Lamk.	Apiaceae	Soru manimuni	Whole plant	Juice of the whole plant is given to kill intestinal Worms. Decoction is given in diarrhoea and dysentery.
51	<i>Ipomoea batatas</i> (L.) Lamk.	Convolvulaceae	Mitha Alu	Tuberous roots, tender leaf	Tender leaves are also used as vegetable which increase digestion
52	<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	PaniKolmou	Tender Shoot, Leaf	Taken as a vegetable is said to be useful in diabetes and as galactagogue to nursing mother
53	<i>Kalanchoe pinnata</i> (Roxb.) Pers.	Crassulaceae	Dupar tenga	Leaf	Decoction of leaves is used in cough and wound healing.
54	<i>Lagenaria siceraria</i> (Molina) Standl.	Cucurbitaceae	Jatilao	Leaf	Juice of flower is applied to burn injury
55	<i>Lasia spinosa</i> (L.) Thw.	Araceae	Chengmora	Leaf	Boiled rhizome is prescribed for irregular Menstruation and juice of the same is given in Leucorrhoea.

56	<i>Leucas plukenetii</i> (Roth) Spreng.	Lamiaceae	Durun	Leaf	Plant juice is instilled in nose in sinusitis and tonsil
57	<i>Manihot esculenta</i> Crantz	Euphorbiaceae	Simolualu	Tuberous roots, tender leaf	Eaten cooked is useful in diabetes
58	<i>Melastoma malabathricum</i> L.	Melastomaceae	Phutkala	Leaf	Paste is applied to cuts and wounds. Decotion of root is antidiarrhoel
59	<i>Meliosma pinnata</i> Roxb.	Sabiaceae	Mamoi	Leaf	Taken as vegetable is said to be anti-diabetic
60	<i>Mentha spicata</i> L.	Lamiaceae	Podina	Leaf	Leaf decoction is useful as Carminative, Expectorant.
61	<i>Momordica charantia</i> L.	Lamiaceae	Titakerela	Whole fruit, Leaf	Eaten as vegetable in diabetes. Decotion of leaf is used in skin problems
62	<i>Monochoria hastata</i> (L.) Sloms.	Pontederiaceae	Bhat meteka	Leaf	Leaf juice is given as digestive.
63	<i>Moringa pterygosperma</i> Lam.	Moringaceae	Sojina	Fruit	Seeds and flowers are use as Antipyretic. Leaves are used in scurvy. Roots are used in snake bites.
64	<i>Murraya koenegii</i> L.	Rutaceae	Narasingha	Leaf	Curry is used as tonic, stomachic, stimulant and carminative.
65	<i>Natsiatum herpeticum</i> Buch.-Ham.	Icacinaceae	Oupat	Leaf, tender shoot	Leaf paste is applied to cut and wounds for quick healing
66	<i>Nyctanthes arbortristis</i> L.	Oleaceae	Sewali phul	Flower	Leaf infusion is taken for malaria, fried flower is taken with meal for intestinal worm, diabetes and cough.
67	<i>Oscinum basilicum</i> L.	Lamiaceae	Bontuloshi	Leaf	Leaf paste is given in skin diseases.
68	<i>Oxalis corymbosa</i> L.	Portulacaceae	Bor tengeshi	Leaf	Decoction is given in dysentery and diarrhoea
69	<i>Paederia scandens</i> (Lour.)	Portulacaceae	Bhedailota	Tender leaf and shoot	Decoction of plant is given in dysentery, diarrhoea, abdominal pains.
70	<i>Peperomia pellucida</i> Ruiz	Piperaceae	Pononuwa	Leaves, Stem	The leaves along with stem are used in Urinary disorder, fever.
71	<i>Phlogacanthus thyriformis</i> (Hardw.) Mabb.	Acanthaceae	Tita phool	Flower	Pounded flower is used in indigestion, fried flower is take in cough
72	<i>Phyllanthus nirruri</i> Hook. f.	Euphorbiaceae	Bon amlokhi	Leaves. Seeds	Root juice is given in jaundice. Shoot decoction is prescribed for dysentery
73	<i>Piper longum</i> L.	Lamiaceae	Pipoli	Fruits, Roots	The fruits and the roots are eaten in the respiratory disorders, epilepsy .
74	<i>Piper nigrum</i> L.	Piperaceae	Zaluk	Fruits	The fruits are consumed in indigestion, Body-ache and in the post labour ailment as well as in the bone fractures.
75	<i>Plantago erosa</i> Wall.	Plantaginaceae	Singapat	Leaf	Leaf paste is applied to cut and wounds, Diuretic

76	<i>Pogostemon benghalensis</i> (B) O.Ktz.	Lamiaceae	Shooklati	Leaf	Leaf paste is applied in burning
77	<i>Polygonum bractiate</i>	Vitaceae	Noltenga	Leaf	Decoction of plant is given in dysentery, diarrhoea, abdominal pains.
78	<i>Polygonum chinense</i> L.	Lamiaceae	Madhu soleng	Leaf	Infusion of tender shoot is useful in Dysentery
79	<i>Portulaca oleracea</i> L.	Portulacaceae	Malbhog saki	Leaf	Decoction of plant is given in dysentery and the paste is applied on wounds and burns.
80	<i>Pteridum aquilinum</i> Kuhn.	Polypodiaceae	Bihlongoni	Leaf	Leaves are used externally as painkiller, antihelmenthic.
81	<i>Raphanus sativus</i> L.	Brassicaceae	Mula	Root	Cooked radish is considered to be an antiseptic, anti rheumatic
82	<i>Rumex acetosa</i>	Polygonaceae	Suka	Leaf	Leaf paste is used for reducing swelling of the nasal passages and respiratory tract.
83	<i>Sesbania grandiflora</i> (L.)Pers.	Fabaceae	Bokphul	Leaf, Flower	Juice is prescribed as gargle in sore throat and mouth
84	<i>Sida rhombifolia</i> L.	Malvaceae	Sonbarial	Leaf	Decoction of tender leaf is given to cure hypertension
85	<i>Smilax macrophylla</i> Roxb.	Liliaceae	Tikoniboriyal	Shoots	The roots are used in urinary troubles and Dysentery.
86	<i>Smilax ovalifolia</i> Roxb.	Smilacaceae	Bagh Achura lota	Leaves	Leave juice is use in skin problem.
87	<i>Solanum indicum</i> L.	Solanaceae	Tita bhekuri	Fruit, Leaf	Eaten in curries or roasted is useful as blood purifier.
88	<i>Solanum melongena</i> L.	Solanaceae	Bengena	Fruit	Various plant parts are used in decoction, as powder or ash for curing ailments such as diabetes, cholera, bronchitis, dysentery.
89	<i>Solanum nigrum</i> L.	Solanaceae	Los kochi	Tender shoot	Eaten in curries is useful in Dysentery. Juice is applied on skin diseases. Useful in diabetes
90	<i>Solanum pimpinellifolium</i>	Solanaceae	Konbilahi	Fruits	Eaten raw or cooked increase blood, cure Rheumatism.
91	<i>Solanum spirale</i> Roxb.	Solanaceae	Titakuchi	Leaf, Fruit	Fruit & leaves are eaten cooked, fruit are also eaten raw. The root is considered medicinal for toothache. Useful as an expectorant, cough and catarrhal affections.
92	<i>Spilanthes paniculata</i> Wall. ex D.C.	Asteraceae	Suhuni bon	Inflorescence	Chewed in sore mouth and tongue, toothache, and also in the inflammation of the throat (The wealth of India, 2004).
93	<i>Spinach oleracea</i>	Amaranthaceae	Paleng	Leaf	Decoction of tender leaf is given to cure Hypertension
94	<i>Stellaria media</i> L	Caryophyllaceae	Morolia	Leaves, stalks	The leaves and the stalks are eaten as vegetables.
95	<i>Stephania hernandifolia</i>	Menispermaceae	Tupurilota	Leaf	Decoction of leaves is anti diabetic and antioxidant in nature

96	<i>Talauma hodgsonii</i> Hook.f. et Thomson	Magnoliaceae	Borhomothuri	Stipule with bud	Chewed with betel nut and betel leaf is said to strengthen gums and teeth
97	<i>Trigonella foenum- graecum</i> L.	Fabaceae	Methi	Seed	Seeds eaten cooked are ant diabetic in nature.
98	<i>Catharanthus roseus</i> L.	Apocynaceae	Pirali kuwori	Whole plant	Leaf decoction is taken against diabetes
99	<i>Xanthium strumarium</i> L.	Asteraceae	Ogara	Leaf	Saplings, young shoots and leaves are use as vegetable said to increase digestive power
100	<i>Zanthoxylum nitidum</i> (Roxb.)	Rutaceae	Tezmui	Leaf	Root juice is given in pneumonia, and rubbed on the gums in toothache. Stem is used as toothbrush in pyorrhoea.
101	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Ada	Rhizome	Rhizome eaten raw or cooked is said to cure cardiovascular diseases

3. Results and Discussion

One hundred one species were recorded during investigation (Table 1). The species are belonging to 53 families and used in the treatment of human ailments. Amongst 101 species, 25 species are found to have effect on gastrointestinal problem. 18 species effect on skin diseases, 16 species effect on respiratory ailments, 14 species effect as anti diabetic, 7 species effect on gynaecological problems, 6 species effect as blood purifier, 4 species effect on rheumatism, 3 species effect on eye-sight improvement and 2 species effect on jaundice. The investigation revealed that infusion and decoction methods are commonly employed for preparation of herbal medicines.

Analysis of species during studies revealed 25 percent plant species used in treatment of gastrointestinal problems. Among the different species, *Amaranthus spinosus* contain alpha-spinasterol and hentriacontane with high contain of lysine^[3] and is use in the treatment for colic pain^[4]. *Amorphophallus paeoniifolius* use in the treatment of dysentery contain enzyme amylase, betulinic acid, stigmasterol, beta-sitosterol^[3]. *Beta vulgaris* contains betanin^[3] and used as purgative. *Chenopodium album* contains beta-sitosterol, lupeol, 3-hydroxynonadecyl hencosanoate^[5] and use in constipation. *Cissampelos pareira* root contain alkaloid hayatin, hayatinine and

protoberberine^[3] and is given in diarrhoea. Leaves of *Clerodendron serratum* contain alpha spinosterol and flavanoid luteolin^[3] is given in dysentery. Root paste of *Crateva magna* is use in dysentery^[6] which contain lupeol, lupen-3-one, beta-sitosterol^[3]. *Enhydra fluctuans* contain sesquiterpene lactones^[3]. Decotion of bark of *Ficus racemosa* is antidysenteric in nature and contain gluanol acetate, beta-sitosterol, lupeol^[3]. *Houttuynia cordata* is used in flatulence, diarrhoea and dysentery and contain quercetin, methylnoylketone and decanoylketone^[3]. *Hydrocotyl rotundifolia* is used in diarrhoea and dysentery which contain terpenoids containing trans -beta-farnesene, alpha and beta pinene, beta-caryophyllene^[3]. *Melastoma malabathricum* showed the presence of naringenin, kaempferol, kaempferol-3-O-glucoside and kaempferol-3-O-(2"6"-di-O-P-trans-coumarouyl) glucoside^[7]. *Mentha Spicata* is a carminative drug^[8] which contains carvone, 1- limonene, dihydrocarvone and limonene^[3]. *Murraya koenigii* contain kurrum and koenimbine which is used as stomachic^[9]. *Oxalis corymbosa* is given in dysentery and diarrhoea. The leaves contain flavonoids, iso vitexine and vitexine-2"- O- beta - D- glucopyrunoside^[10]. *Paederia scandens* is given in diarrhoea and contain iridoid glycoside and stigma sterol^[3]. *Polygonum chinense* is used in diarrhoea, dyspepsia^[11]. Berries of *Solanum*

nigrum contain solanine a glycoalkaloid¹² and is use in dysentery.

Seventeen percent species are useful in skin diseases such as scabies, ringworm, boils and sores including cut and wounds. *Azadirachta indica* is used by traditional healers for skin disorders¹³ and contain quercetin¹³. The outer green layer of *Bambusa balcooa* is applied on fresh wound for quick healing¹⁴. Leaf of *Cassia sophera* is applied on ringworm, scabies and insect bite and contain 3, 5, 3',4',4',5'-Pentahydroxy-7-methoxyflavon-8-C-L rhamnopyranoside¹³. The leaf of *Chromolaena odorata* is used to heal wounds and contain flavonoid¹⁵. *Cynodon dactylon* is useful in cuts and wounds¹⁶ and contain phyllotoxins, ferulic, syringic, coumaric, vanillic, p-hydroxybenzoic and o-hydroxy phenyl acetic acid¹³. *Desmodium gyrans* showed the presence of flavonoids, phenolic compounds, steroid and alkaloids which are responsible for the wound healing activity¹⁷. *Moringa pterygosperma* is used for skin lesions, chicken pox for having antimicrobial property¹⁸. Roots contain moringine, flowers gave kaempferol, leaves contain aminoacids¹³. The wound healing property of *Kalanchoe pinnata* due to the presence of bufadienolide¹⁹. *Oscinum basilicum* is externally applied for the treatment of skin infections²⁰ which contain 1, 8 cineole, eugenol, limonene, geraniol, citronellol, camphor³. *Plantago erosa* contain flavanoids apigenin, luteolin, nepetin, hispidulin³. *Pogostemon benghalensis* leaf paste is used in burning²¹. *Portulaca oleracea* contains tannins and is use in wound healing activity²². The herb yielded l-noradrenaline, dopamine and l-dopa¹³. The most common use attributed to lung and other respiratory ailments are pneumonia, asthma, bronchitis, cough etc. The leaves of *Adhatoda vasica* contain alkaloid vasicine which is responsible for the small but persistent bronchodilatation²³ and its essential oil is responsible for expectorant action^{24,25}. *Alpinia nigra* contain flavones glycoside astragaloside and kaempferol-3-O-glucuronide²⁶. The seed oil of *Caesalpinia bonducella* is source of anti-inflammatory, antipyretic, analgesic agent and antitussive properties²⁷. Seeds contain alpha,

beta, gamma, delta caesalpins³¹. *Eupatorium cannabinum* contain immunoactive polysaccharide dammaradienyl acetate, stigmasterol, taraxasterol³¹. *Kalanchoe pinnata* is considered a sedative wound-healer, diuretic and cough suppressant which contain quercetin and kaempferol²⁸. *Nyctanthes arbor-tristis* is use in fevers, coughs, analgesic and antipyretic activities^{29,30} and leaves contain beta-amyrin, beta-sitosterol, astragaloside, nicotiflorin³¹. *Rumex acetosa* is use in swelling of the nasal passages and respiratory tract and contain rutin, hyperin and quercetin³¹. *Sesbania grandiflora* contain galactomannans, linoleic acid, β -sitosterol and carbohydrates³¹ and use in sore throat and mouth.

Analysis indicated thirteen percent anti diabetic species are used in recipe during Bohag Bihu. Leaf and root juice of *Coccinia grandis* is given in diabetes^{32,33}. Fleshy calyx of *Dillenia indica* eaten raw as well as cooked is antidiabetic. It contain polysaccharide arabinogalactan³¹. *Ficus racemosa* is used for treating diabetes³⁴. *Ipomoea aquatica* is used to keep diabetes under control by local traditional healers have well documented hypoglycemic properties^{35,36}. *Momordica charantia* eaten as vegetable in diabetes³⁷ and fruit contain momordicine, charantin, polypeptide- p insulin, ascorbigen³⁸. Decoction of leaves of *Stephania hernandifolia* is anti diabetic and antioxidant in nature and contains alkaloid hernandiolin³⁹. *Trigonella foenum-graecum* is anti diabetic in nature and contain disogenin, gitogenin, neogitogenin, homorientin saponaretin, neogigogenin and trigogenin⁴⁰. *Catharanthus roseus* L. is taken against diabetes⁴¹. It contains 150 alkaloids including vincristine, vinblastine, ajmalicine, etc⁴². Leaves of *Solanum nigrum* is use as anti-diabetic agent⁴³.

Analysis revealed seven percent species are use for gynaecological problems. *Asparagus recemosus* is galactagogue. It contains steroidal saponins⁴⁴. *Flemingia strobilifera* is given in menstrual irregularities. It contains quercetin, rutin, quercimeritin, leptosidin, leptosin, phloridzin and naringin, chalcones, n-triacontane, sitosterol, 3,6, dihydroxy 2,4,5,4

tetramethoxychalcone^[45,46,47]. *Piper nigrum* fruits are consumed in the post labour ailment and contain piperine and piperidine alkaloid^[3]. Boiled corm of *Amorphophallus paeoniifolius* is used in the treatment of rheumatism. It contain enzyme amylase, betulinic acid, stigmasterol, beta-sitosterol palmitate, lupeol, triacontane and amino acids^[3]. *Piper longum* is used for rheumatism^[48] and root contain alkaloid piperine, piperlongumine, sesamin^[3].

Andrographis paniculata as well as one of its constituents, namely andrographolide are well documented^[49]. *Eclipta alba* contains phytosterol, β -amyirin, triterpenes such as ecalbatin, echinocystic acid, ursolic acid, and flavones such as luteolin and coumarin such as wedelolactone including hepatoprotective activities^[50]. Lignin's phyllanthin and hypophyllanthin present in *Phyllanthus nirruri* have been reported to be antihepatotoxic^[51].

The studies revealed six percent species use in recipe during Bohag Bihu are prescribed as blood purifier and three percent use in eye-sight improvement. Some of the species are use in treatment of fever, malaria epilepsy, antihelmenthic. Beta sitosterol^[52] isolated from leaves of *Peperomia pellucida* possesses potent antiinflammatory and antipyretic activity^[53]. *Clerodendrum viscosum* has been reported for its anti malarial activities because of the presence of a bitter principle^[54]. *Basella alba* is considered good for anaemia patient. Plant contain provitamin A and carotenoids^[3]. Seeds of *Brassica nigra* is antihelmenthic in nature. Seeds contain brassicasterol^[3]. *Pteridium aquilinum* is use as painkiller, antihelmenthic. Aerial parts give kaemferol-3-beta -D glucopyranoside, beta-sitosterol, quercetin, rutin^[3]. *Sida rhombifolia* is given to cure hypertension. Leaves contain small quantities of both ephedrine and pseudoephedrine^[55]. *Spinacia oleracea* is very rich in the flavanoids such as querecetin, myricetin, kampeferol^[56]. Stem of *Zanthoxylum nitidum* is used as toothbrush in pyorrhoea. The alkaloid present were identified 2,4-dihydroxypyrimidine, syringic acid, 2,6-dimethoxy-1,4- benzoquinone, 4 hydroxybenzoic

acid, ethylparaben, (Z)- 3-(2,3,4-trimethoxyphenyl) acrylic acid, 5,6,7-trimethoxycoumarin, stigmasterol-9(11)-en-3-ol, daucosterol and beta-sitosterol^[57].

4. Conclusion

Assam is a place of rich cultural heritage where different type of ethnic group resides. Different recipe gives a unique cultural identity. So people of a certain region search that kind of ingredient that gives them energy and good health. As a part of moist tropical weather, Assam is an area of different seasonal epidemics and a good number of medicinal and nutritious foods available. Every plant bears some phytoconstituents that can boost the immunity and are medicinally significant. The significance of preparing this kind of recipe on the first day is that due to consumption of 101 plants containing good number of phytoconstituents will help to prevent diseases for rest of the year. The people of Assam acquired the knowledge of using these plants in the recipe since time immemorial. The knowledge that ethnic people of Assam used for plants gives a clear idea about the crude botanical preparation of traditional sources of medicinal plants. The claims incorporated in present study can be extended for future scientific investigation in the area of core pharmacology and photochemistry to unveil hidden novel entity for safe therapeutic uses.

5. References

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