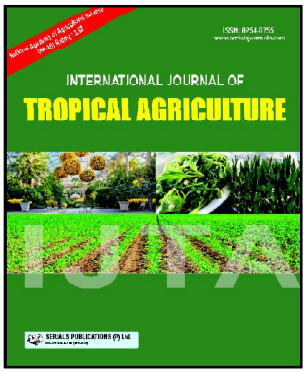

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Diversity of Under-utilized Plants for Nutrition and Health from Bahraich (UP), India

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Abstract: Our interactions with plants and animals go back to prehistoric days when early man used his wits to survive in a hostile environment. First and foremost, he had to feed himself and his family. He had to distinguish which plants were safe to eat from those that were non-edible and poisonous. The behaviour of animals naturally provided many hints. However, what is edible to an animal is not necessarily safe for humans. Thus early man probably tried the non-edible and the poisonous in his quest for food and also encountered plants that caused strange and wonderful sensations, sometimes accompanied by colorful visions. By trial and error he learned which plants were palatable and edible. These were eaten either raw or cooked. Those that were poisonous or caused undesirable and strange reactions were avoided. As his familiarity with plants increased, he naturally identified those that could sooth or heal wounds and those that could cure illnesses. Twenty eight families were found to be represented by thirty six genera of thirty eight plant species with under utilized plant category. Moraceae was found to be represented by four; Myrtaceae, Amaranthaceae, Caesalpiniaceae, Anacardiaceae, Lamiaceae, Myrtaceae and Combretaceae with two plant species each where as rest twenty families viz., Averraceae, Bombocaceae, Euphorbiaceae, Nyctagenaceae, Capparidaceae, Apocyanaceae, Ebenaceae, Asteraceae, Flacourtiaceae, Sapotaceae, Passifloraceae, Portulaceae, Malvaceae, Molluginaceae, Acanthaceae, Pappilionaceae, Trapaceae, Aizoaceae, Rhamnaceae and Sapindaceae with single plant species each. Ficus and Terminalia were found to be represented by two plant species each.

Keywords: Bahraich, nutrimental ethnomedicinal, vegetables, wild fruits

INTRODUCTION

We cannot survive without plants. We depend on plants for food directly in the form of grains, roots and tubers, fruits, vegetables, spices, oil and beverages. Much of our food also comes indirectly form plants. We get our meat and milk from animals

that are dependent on plants for food. Plants provide fuel, either as firewood or in the form of fossil fuel, to cook our food, keep us warm, run our machinery and light up our homes and cities. We also depend on trees for construction materials to build our houses and to craft our furniture. From cotton and flax we get fibres for our clothes. Plant dyes color our clothes, at least before synthetic dyes were developed. In cities and towns, trees provide shade and shelter, and their flowers brighten the surroundings, Plants in parks and gardens contribute to the serene and peaceful environment, making such places favorites retreats "Chin [1]". The knowledge of utilizing wild plants was painstakingly passed on from generation to generation database of valuable information of the plants around him. It is natural to assume that certain members of the tribe were gradually entrusted with such knowledge. These were variously known as shamans, bomohs, healers or witchdoctors. As communications between settlements was then poor, it is likely that such knowledge developed independently in different locations "Chin [1]". The primitive man, through his trial and error, has selected many wild fruits which are edible and subsequently domesticated them which played a very vital part in supplementary diet knowingly or unknowingly. Although due to the ignorance of modern generation the importance of wild plants were recently have been decreasing yet many people specially in rural areas still use them extensively as a supplementary to their basic food requirement. A scientific study of wild fruits is important for the potential sources which are protective foods. The nutrients/pigments present in the fruits prevent different derivative/ageing process in our body and thus via restoring health offer longevity "Singh [2]". These wild fruits would be utilized at the time of scarcity or cultivated as a source of food material for ever increasing population "Rashid *et al.* [3]". India is located to the north of an equator, lies between 8° 4' and 37° 6' north latitude and 68° 7' and 97° 25' east latitude, measures 3214 Km from south to north and 2933 km from east to west, the total land area being 32,87,263 Km^2. India is the one of the twenty mega biodiversity countries of the world lying in between Tropic of Capricorn and Tropic of Cancer, has two of the world's eight hottest hot spots out of thirty eight biodiversity hot spots with four in India i.e., Western *Ghat*, North East, Himalaya and Indo Burma. The top mega diversity spots of India is located in the Western Ghats and in the Eastern Himalayas. The Himalaya rise as a virtual wall beyond the snow line, above the alluvial plain lies the *Tarai* strip, a seasonally marshy zone of sand and clay soil. The *Tarai* region has higher rain fall than the plains, and downward rushing rivers originating from the Himalaya slow down and spread out in the flatter *Tarai* zone depositing fertile silt and reproductive means during the monsoon season and receding in the dry season. The *Tarai*, as a result has high water level and is characterized by moist subtropical conditions and a luxuriant turnover of green vegetation all the year around. The climatologically and topographical conditions favour the luxuriant growth and development of foliicolous fungi. This North *Tarai* Region of UP is next only to Eastern and Western Ghats, as one of the hottest spots for biodiversity in general and the diversity of fungal organism inhabiting plant in particular offers an ideal opportunity for the morpho-taxonomic exploration of the fungal organism, survey and documentation of ethno-medicinal plants due to presence of significant tribal number in side forest villages as well as around the forests. People conserve what they love. They love what they understand and they understand what they are taught. Nature has provided a complete store house of remedies to cure ailments of mankind. About 80 per cent of the world population depends wholly or partially on traditional medicine for its primary healthcare. Herbal medicines as the major remedy in traditional medical systems have been used in medical practice for thousands of years and have made a great contribution to maintain human health. The plants which are used for

medicinal purposes have some chemical constituents or secondary metabolites, the potential source of medicines and essential oils of therapeutic importance. The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability. Keeping the above views in mind, the present study was undertaken for the diversity of wild edible fruits and vegetables of district Bahraich (U.P.) India.

MATERIALS AND METHODS

The present study is based on the field survey of Bahraich district of Uttar Pradesh. For the purpose the voucher specimens of nutrimental and ethno-medicinal importance were collected and documented with their nutrimental and ethno-therapeutic data. The information was collected from herbal practitioners or local healers and other experienced persons. They were interviewed for local names, plant part used, method of preparation of medicine, dosages and their mode of administration. The available literature about the plants were also consulted and presented in the enumerations. The specimens were collected, pressed, dried, preserved and mounted as described by "Jain and Rao [4]'and identified through the available taxonomic literature, manuals and floras "Hooker [5] and Duthie [6]". The specimens were deposited at the Herbarium of the Postgraduate Department of Botany, Kisan PG College, Bahraich.

RESULTS AND DISCUSSION

Aegle marmelos Linn. Correa; *Bael*, Sirphal. (Rutaceae): It is a medium sized deciduous, armed tree. Leaves trifoliate, flowers yellowish-white, fruit large globose.

Ethnobotanical potentiality: *Bael* is one of the most important tree species used in various indigenous system of medicine in India, China, Burma, and Sri Lanka. *Bael* is used in all *tridosa*- vista (air), *Pitta* (phlegm) and *kapha* (cough). Out of more than 66 ethnobotanical uses of bael, 48 are exclusively for medicinal purposes. Almost all parts of *bael* are used in preparing medicine. **Leaf:** Abscess, backache, eye complaints, abdominal disorders, vomiting, cut & wounds, ulcer, destroy, beriberi, weakness of heart, cholera, diarrhea, cardio tonic, blood sugar, injuries caused by animals, nervous disorders, hair tonic, acute bronchitis, child birth, veterinary medicine for wounds, killing worms, fodder for sheep, goat and cattle, stimulation of respiration and contraction of de-nervosed nictitating membrane in anaesthetized cats. **Fruit:** Astringent, diarrhea, gastric troubles, constipation, laxative, tonic, digestive, stomachic, dysentery, brain & heart tonic, ulcer, antiviral, intestinal parasites, gonorrhea, epilepsy. **Root:** Dog bite, gastric troubles, heart disorders, intermittent fevers, ant amoebic, hypoglycemic, rheumatism. Bark**:** Stomach disorders, intermittent fevers, heart disorders. **Seed:** Febrifuge. **Flower:** Expectorant, epilepsy. **Whole Plant:** Abdominal pain, abscess, astringent backache, dog bite, breast pain, cholera constipation, convulsions, cramp, diabetes, diarrhea, dysentery, fevers, eye complaints, gastric trouble, abdominal disorders, jaundice, laxative, nausea night fever, heart disorders, snakebite, stomach disorder, vomiting tonic, cut & wounds. **Root bark:** Fish poison. **Seed mucilage:** Plaster for walls. **Seed oil:** Laxative. **Wood:** Beads worn by low caste, special couches for rheumatic patients. **Gum around seed: To** improves adhesive strength of water paints. **Unripe fruit rind, Bark:** Yellow dye. **Stem:** Pestles of oil and sugar mills. The medicine is prepared in the form of pills, powder and paste. Ayurvedic practitioners commonly use the roots of bael as an ingredient of dasmula (ten roots), which is useful in recovering the loss of appetite and use fruits in the preparation of Chawanprash. *Bael* fruits regarded as an astringent are frequently used by various ethnic communities for the treatment of diarrhea, dysentery, constipation, stomachache, intestinal ulcer, diabetes, dyspepsia, heart diseases and

cholera due to its digestive and carminative properties. *Bael* is highly valued in Ayurvedic medicine for the treatment of chronic diarrhea and dysentery and as brain tonic. *Bael* possesses antiviral, anti-helminthes anti-inflammatory, anti-bilious, anti-parasitical, anti-pyretic, anti scorbutic, aromatic, astringent, digestive, febrifuge, haemostatic, anti-diarrheal, laxative and nutritive properties. Ripe *bael* fruit is sweat, aromatic and nutritive, whereas fresh fruit is stringent and has laxative properties. *Bael* fruit powder exhibits anti-cancerous and anti-proliferative activities. The combinations of five parts of *bael* such as, fruit, leaf, bark, root and flower is assumed to be effective for certain mental disorders. Unripe fruits pulp mixed with boiled rice water is taken twice a day co cure vomiting in pregnancy. Unripe fruits pulp mixed with sugar is taken with milk twice daily for curing urino genital disorders. Half roasted unripe fruit pulp mixed with equal quantity of sugar is taken twice a day to cure dysentery. Unripe fruit pulp powder is taken twice daily to cure abscess. *Bael* leaf extract is taken twice a day to remove the intestinal worms. Leaf poultice is used as remedy in ophthalmic problems and ulcer. Leaf juice is reported to have multiple medicinal uses, including controls of diabetes. Cooling delicious drink prepared from fruit pulp along with sugar and tamarind diluted with water is useful for health. Bael root decoction is given twice daily to cure fever and cold. Extract of *Bael* root, pyaz *(Allium cepa* Linn.*),* and *Haldi* (*Curcuma domestica* Valeton) mixed in equal proportion is put in the ears to relive earache and secretion from ears. Root decoction is used in the treatment of intermittent fevers and heart palpitation. Root and stem bark decoction is used in the treatment for fever and various types of heart disorders. *Bael* root is used in the treatment of abdominal pain, heart palpitation and urinary troubles. *Bael* tea is good for health and is used for flatulence, gastrointestinal problems, cough and chronic intestinal diseases in children. For Hindus, the *Bael* is sacred tree, which they dedicate to the lord **Shiva** by offering of *Bael* leaves. Bael is considered to be extremely auspicious and cultivated around most of the Hindu temples "Kala [7]".

A. marmelos has been reported to contain several phyto constituents mainly marmenol, marmin, marmelosin, marmelide, psoralen, alloimperatorin, rutaretin, scopoletin, aegelin, marmelin, fagarine, anhydromarmelin, limonene, a-phellandrene, betulinic acid, marmesin, impertorin, marmelosin, luvangentin and auropetene "Rahman and Parvin [8]", Due to the presence of various phyto constituents the plant has antidiarrhoeal, antimicrobial, anticancer, antipyretic, antigenotoxic, antifertility, anti inflammatory antidibetic and diuretic activities. The essential oil isolated from the leaves of *A. marmelos* tree has proved to have antifungal activity against animal and human fungi like *Trichophyton mentagrophytes*, *Trichophyton rubrum*, *Microsporum gypseum*, *Microsporum audounii*, *Microsporum cookie*, *Pidermophyton floccosum, Aspergillus niger, Aspergillus flavus* and *Histoplasma capsulatum.* The leaf extracts and fractions have fungicidal activity against various clinical isolates of dermatophytic fungi. Various extracts of *A. marmelos* leaves, roots ad fruits have been reported to be active against many bacterial strains.

Bael fruits are edible, contain high protein and are used in making tasty aromatic cold drinks and jam. Its fresh juice is better and pungent. In Myanmar, *Bael* fruits are used in making paints. Fruits are also used as a substitute for soap, as source of essential oils and perfumes. The mucilage of bael seed is good cementing material. *Bael* wood is used in building houses, making carts, agricultural implements, pestles, handles of tools and combs. A yellow dye is obtained from the rind of unripe fruits and is used in calico printing. An essential oil is also distilled from the rind. Dried fruit after removing the pulp are used as pill boxes for keeping valuable medicines and sacred ashes. Bael stem yields gum, which is used for improving the adhesive potency of water paints. Its wood is suitable for making charcoal.

Alternanther paronychioides A. St.-Hil Smooth chaff flower (Amaranthaceae)**:** The plant is a small herb; branch lets erect or ascending. Leaves oblong-lanceolate, obtuse or acute, entire or toothed. Flowers in axillary spikes. Fruit an utricle, enclosed in the perianth. **Ethnobotanical potentiality:** The whole plant is used. Leaves are slightly sweet in taste, Improves beauty. It is very effective in the treatments of eye diseases, cough, ulcers, difficulty in urination, and swelling. Regular consumption of this green herb also benefits those with hemorrhoids, skin conditions like scabies and eczema. The leaves of this plant have been used as a poultice for the skin treatments, such as for pimples and burns. Water extracts from its roots and leaves have been used as a diuretic.

Amaranthus spinosus Linn. Pigweed, spineamaranth (Amaranthaceae)**:** It is an annual, erect, spines cent herb, up to 1.2 m tall, with many branches from the base, stem terete, with 2 straight spines, 1.2 cm under leaf axils. Leaves 3-5 x 1.5-3.0 cm, ovate, oblong or elliptic, base cuneate, long petioled, petiole slender, equaling the blade or shorter, tip obtuse or retuse with a distinct mucro, cuneate or alternate at the base. Flowers small, usually green, in auxiliary clusters and long dense or lax-fid pseudo-spikes, 1.5-6.5 cm long. Fruit an utricle, with a thickened 2- toothed top, rogues, 1.6-2.0 mm long. Seeds biconvex, compressed, black, shining, minutely reticulate, 1.0-1.2 x 0.8-1.0 mm. Phenology Throughout the year. It grows in waste places, roadsides, crop fields and gardens. The distribution is throughout India.

Ethnobotanical potentiality: Root Juice, extracted by rubbing in stone, is mixed with rice water and taken orally after vomiting. It is also used to treat abdominal pain, chicken pox, dysentery, dysurea, fever (high),hysteria, ill health, lipoma (tumor), malaria, mania infantum, menopause, painful micturation, remittent fever, stomachache, tonsilitis and vomiting "Uddin [9]"; boils, burns, eczema, gonorrohea, leucorrhoea, menstrual flow and menorrhagia "Ghani [10]"; chest pain "Uddin *et al.*[11]"; boils, menstrual problem and rheumatic pain "Partha and Hossain [12]"; malarial fever and stop bleeding from nose and mouth "Rahman *et al.*[13]" and bronchitis, boils, burns, burning sensation, constipation, eczema, flatulence, dysentery, gonorrhea, hallucination, leprosy, leucorrhoea, menstrual problem, piles and toothache "Yusuf *et al.* [14]". Young stems are used as vegetables in many parts of the country. The plant boiled with pulses and fed to cattle to increase the yield of milk. Locally common and mostly found along riverbanks and near the agricultural field. People do not take any measure to conserve this species.

Artocarpus heterophyllus J.R. & G. Katahal, Jackfruit. (Moraceae): Jackfruit is evergreen deciduous medium sized tree. Tree bark grayish black peeling off irregular chips, laticiferous, leaves 10-20 cm, elliptic or obviate, entire, cuspidate, glabrous, dark green and glossy above, paler beneath. Flowers at first enclosed within two very, leathery stipules usually on special branchlets from trunk. Seeds 2-3 cm oblong, enclosed in the enlarged, flesh perianth. **Ethnobotanical potentiality:** Ripe fruit contains high levels of carbohydrate, proteins, starch, minerals like calcium, iron, sodium, zinc, Vitamins, flavonoids, phenolic contents and other essential nutrients. Jackfruit has diverse medicinal uses especially anti-oxidant, anti-inflammatory, anti-microbial, anti-microbial, anti-cancer and anti-fungal activities "Vazhacharickal *et al.*[15].

Averrhoa carambola Linn. Kamrakh, star fruit (Averrhoaceae, Oxalidaceae): The word carambola is derived from the Sanskrit word **Karmaranga** meaning food appetizer. *Averrhoea carambola* is a multipurpose, draught resistant evergreen tree.

Ethnobotanical potentiality: It is gaining lot of importance for its therapeutic potentials. Various part of tree has been used in traditional folklore medicine. It is a good source of potassium, copper,

as well as folate and pantothenic acid. The ascorbic acid levels of the star fruit is believed to be responsible for its sweet or sour taste, for a sweet fruit, the ascorbic acid level is around 10.40 mg/100 ml of juice. For a sour fruit, the ascorbic acid level is about15.4 mg/100 ml of juice. Due to presence of such nutritive elements the fruit is beneficial in diabetes, also an efficient immune modulator "Manda *et al.* [16]".

Bombax ceiba DC. Shalmali, Semal, Silk cotton tree (Bombacaceae): It is a large deciduous tree. Leaves digitate, leaflets 5- 7, flowers red or yellowish, capsules ovoid. **Ethnobotanical potentiality:** The silk cotton tree is often reffered to as the **silent doctor** for the host of medicinal benefits that is offers almost each part of the tree, including the bark, flowers, fruits, seed and leaves, gums, thorns have therapeutic potential. A herbal composition made from the bark of the tree, for example is administered for the treatment of male sexual and gastro intestinal disorders like dysentery and diarrhoea. The pharmacological benefits are basically due to the presence of Glycosides and tannins in the root and stem. It has haemostatic properties and is administered during menorrhagia. Silk cotton extracts are used in eve care, tentax forte, achnae pimple cream. The plant is also being used for general debility, diabetes, impotence, spermatorrhoea, urinary stones and liver disorders. Some of the diseases for example diarrhoea, dysentery, asthma, rheumatism, leprosy, leucorrhoea, body pain, wounds are included in anti-inflammatory, analgesic, anti microbial and oxytocic activities of plant as indirect evidence of scientific validation "Jain and Verma [17]".

Bauhinia variegata Linn. Kachnar, mountain ebony (Caesalpiniaceae): It is a well known ornamental tree. It is small medium size tree growing 10-12 m height and 50 cm in diameter Leaves are long, broad, rounded and bilobed at the base and apex. Flowers are very showy which blom when the leaves start falling. The fruit is pod 15-30 cm long containing 10-15 seeds. **Ethnobotanical potentiality:** In India . *Bauhinia variegata* has been widely used as a medicinal plant by the tribals, in Ayurveda, Unani, and homeopathy systems of medicine. It is believed to possess anti tumour, anti microbial, anti inflammatory, anti goitrogenic, hepato protective and heama glutination properties "Gautam [18]". The bark is alterative, astringent and tonic is useful in the treatment of skin diseases, scrofula and ulcers. The bark decoction is used for diarrhea. The overall anti oxidant activity of the plant is due to the presence of flavonoids, phenolic and other phyto chemicals which can be a good source of natural antioxidant agent in preventing oxidative stress related degenerative diseases "Gautam [18]". Paste of leaves and flowers is applied on burn skin twice a day which reduces inflammation as well as cures. The root is used as an antidote to snake poison. A decoction of the root is used to treat dyspepsia. The dried buds are used in the treatment of piles, dysentery, diarrhea and worms. *B. variegata* is rich in phyto-chemicals which are responsible for its ethno medicinal properties. It is a good astringent because of the presence of ascorbic acid. The anti oxidant activity can be attributed to flavonoids, phenolic contents. Besides it protein, carbohydrate, various minerals and Vitamins, natural sugar are present in high content.

Boerhavia diffusa Linn. Punarnava (Nyctaginaceae): This herb is a weed that grows widely in across India. It is a creeper that usually grows up to the height of 2 to 3 meters. It has pink colored flowers and green colored oval shaped fruits. The plant has small fruits which are sticky and grow only a few inches above the ground. **Ethnobotanical potentiality:** *Boerhaavia diffusa* is a flowering plant that rejuvenate or renew the body. The leaves are used as a green vegetable. This widely dispersed plant is found all throughout India. The plant is also used as a fodder for livestock and has the potential for contamination the seeds. The herb had been noticed

by villagers for bringing back life to a dead person thus giving it the name of 'The Renewer'. It is known to rejuvenate the cells of the body and eliminate excessive water from it. These benefits of the *Boerhaavia diffusa* make it advantageous for the kidney and liver. The herbal medicine is used to relieve pain and anti aging supplements arthritis/bone/joint health This medicinal plant is used to improve eye sight. It has diuretic properties which is useful in controlling blood sugar levels in diabetic patients. *Boerhaavia diffusa* has anti bacterial properties mainly against the common Gram negative bacteria.. The extracts obtained from the leaves of the plant are known to contain antioxidants and hepato protective properties. This herb is also an anticancer, immune modulatory antiamoebic and antiestrogenic agent. The ancient use of the plant includes relieving problems like epilepsy, hysteria, gastritis, jaundice, fever, convulsion, asthma, dysentery and diarrhea. It helps in maintaining the functioning of the kidney. maintains health of the urinary tract. It helps in improving the liver functioning and also the respiratory health It supports the body's ability to expel the fluids from the body. It the best known natural management for relieving the problem of weight loss.

Bridelia stipularis (Linn.) Blume (Euphorbiaceae): large more or less scendent evergreen shrub. Leaves 5-20 cm, sub-coracious, elliptic-obovate or orbicular-oblong. Flowers small, in small axillary cluster or long spikes, often subtended by long stipular bracts. Fruits oblong, 12 mm long, seated on the enlarged calyx. **Ethnobotanical potentiality:** Plant is used in pleurisy and exudation, bark decoction is given to children for cough, fever and asthma and a gargle for sores in mouth. Fresh tender leaves are used for the treatment of jaundice, emulsion for anaemia due to pregnancy. Leaf powder and warm leaf poultice are applied to white spots on the skin. Many phytochemicals, proteins, carbohydrate, Vitamins, alkaloids, flavenoids, steroids, phenolic substances, are reported.

Buchanania lanzan Spreng. Chironjee (Anacardiaceae): It is a medium sized deciduous tree, growing to about 50ft tall. It has thick leathery leaves which are broadly oblong. Pyramidal panicles of small bisexual greenish white flowers appear in auxiliary and terminal panicles during early spring. A single panicle bears about 3000-5000 flowers, fruits remain on the tree for quite longer. Fruits are drupe, ovoid or globose, black 8-12mm in diameter with hard stones. Unripe fruit are green in colour having single seed. **Ethnobotanical potentiality:** Chironzee is regarded for its high value kernel, it is a common substitute of almond amongst dry fruits. The kernel yield oil. The oil is useful in curing glandular swellings of the neck. Paste of fruit is excellent skin conditioner. Gum is useful in treating diarrhoea and rheumatic pain, leaves are used in the treatment of skin diseases. Fruits are used in treating cough and asthma, leaves posses cardio tonic properties. Leaf powder is a common cure for wounds. Chiironzee fruits as well as kernels are very nutritious .Its fruits contain 74.3% moisture, 2.2% protein, 0.8% fat, 1.5% fat, 19.5% carbohydrate, 78mg/100g calcium and 28mg/100g phosphorus, its calorific value is 49k- cal/100g. Its kernels contains moisture 3%, protein 19%, fat 59.1%, carbohydrate 12.1%, mineral matter 3%, fibre 3.8%, calcium 279mg/100g, phosphorus 528mg/100g, sulphur 286mg/100g, iron 8.5mg/100g, thiamine 0.69mg/100g, rivoflavin 0.53mg/100g, niacin 1.5mg/100g and Vitamin C 5mg/100g. The calorific value of kernels is 650 k-cal/100g. The kernels also contain 34-47% oil "Gopalan *et al.* [19]".

Capparis decidua (Forsk) Edgew. Ker (Capparidaceae): It is a spreading diffuse thorny shrub. Leaves ovate oblong. Flowers white. Fruits are fleshy berry with ovoid shape. Seeds numerous which remain embedded in pulp. Commonly found on dry places along road sides, railway tracks, river banks, etc. **Ethnobotanical potentiality:** The immature fruits are used for vegetable and picking purposes. They contain glucosinoiates –an acid

principle which imparts un palatability to the ker fruits. After blenching treatment the fruits are made into delicious vegetable. The flower buds are valued as pot herbs. Its ripe fruits are though acrid but they are very well relished "Singh et al.[20]". All parts of this plant have a number of medicinal properties along with its socioeconomic and ecological benefits. The plant is traditionally used to cure toothache, arthritis, asthma, cough, inflammation, intermittent fevers, malaria, rheumatism and swelling. It is also believed to posses laxative, astringent and vermifuge properties. The alcoholic extract of fruit pulp and root bark is claimed to have anthelmintic activity. The fruits and seeds are used to cure cholera, dysentery and urinary purulent discharges and have diuretic and anti diabetic properties. The spicy taste fruits serve as astringent for bowels, a remedy for bad breath and is claimed to cure cardiac troubles. The seed oil is edible and used to cure skin diseases. It has central nervous system sedative, depressed, anti microbial properties (the water and methanol extract has hepatoprotective properties "Zia-ul-Haq *et al.*[21]". The unripe fruits contain protein 14.88 % fat 7.43%, ash5.96% crude fibre 12.32 and digestible carbohydrate 59.41% dry matter. The fruits also contains 5.4 mg beta – carotene, 120 mg ascorbic acid, 90 mg calcium, 179 mg phosphorus, 3.5 mg iron, 1.1 mg copper, 1.6 mg zinc and 1.9 mg manganese 100g edible protein respectively "Chauhan *et al.*[22]". *Capparis decidua* is traditionally known to provide relief is cold, flu cough and heart disease and as laxative.

Callicarpa macrophylla Roxb. Beauty berry, perfumed cherry tree (Lamiaceae): It is a erect shrub, leaves ovate, lanceolate, elliptic, acuminate, stellate, cottony, flowers pink in dense axillary, dichotomous cymes. Fruits are 2-2.5 mm in diameter drupe with spongy succulent with fleshy exocarp and a hard end endocarp, single seeded. It is found frequent as shrub undergrowth in forests of Sub-Himalayan tracts. **Ethnobotanical potentiality:** Beauty berry is a beautiful nutrimental, potent ethno medicinal plant and all the parts of the plant viz., root, bark, leaves, flower fruits and seeds are used in managements of various ailments e g. Stomach disorders, arthritis, mouth and tongue sores, burning sensation, tumor, abdominal pain, cuts, ulcers, colic diarrhoea, diabetes, stomatitis, conjunctivitis skin ailments "Mall and Tripathi,[23]".

Carrisa carandas Linn. Karauda (Apocynaceae): Karonda is an evergreen thorny shrub. **Ethnobotanical potentiality:** It produces sub acidic fruit rich in Vitamin C and minerals. Fruits contain protein, carbohydrate, fat, minerals, fibre and calcium, phosphorus, iron. *C. carandas* have astringent properties, fruit is used to expel intestinal worms, it has anti-microbial and antifungal properties, fruits also used as analgesic and anti-inflammatory. The juice of fruit can applied to relieve any skin problem. Traditionally Karonda has been used to treat anorexia and insanity.

Citrus limon Linn. Nimboo (Rutaceae): It is a small thorny shrub. Leaves ovate, elliptic flowers yellow. Fruits globose. Phenology major parts of the year. **Ethnobotanical potentiality:** Lemons first achieved their healthy claim to fame onboard the ships of early explores to help treat scurvy, a common disease among the sailors. In 1747, James Lind found that lemons and oranges were extremely effective at treated the disease. Which we know was caused by Vitamin C deficiency from months at sea without any fresh produce. Lemons are rarely consumed as a stand-alone fruit due to their intense sour flavour but are extremely popular when used in smaller quantities and in combinations with herbs and spices to lend a wonderful and dynamic flavour to many sauces, salad, dressings, marinades, drinks and desserts. Consuming fruits and vegetables of all kinds has long been associated with reduced risk of many lifestyle related health conditions. According to the American Heart Association eating higher amounts of citrus fruit may lower ischemic stroke risk for women. It is an excellent source of the powerful anti oxidant Vitamin C, Lemons and lemon juice can

help fight the formation of free radicals known to cause cancer. The antioxidant Vitamin C, when eaten in its natural form or applied topically, can help to fight skin damages caused by the sun and pollution, reduce wrinkles and improve overall skin texture. Vitamin C plays a vital role in the formation of collagen, the support system of skin. The risks for developing asthma are lower in people who consume a high amount of certain nutrients, one of these being Vitamin C. Iron deficiency is one of the common nutrient deficiencies in developed countries and leading cause of anemia. Pairing foods that are high in Vitamin C with foods that are iron rich will maximize the body's ability to absorb iron. For example, squeeze lemon juice a top salad with spinach and chickpeas. Lemon is a good source of Vitamin C and other antioxidants which can help the immune system battle germs that cause a cold or flu. Maintaining a healthy diet high in fruits and vegetables is especially important during the winter season when physical activity levels tend to drop. Lemon decreases the risk of obesity, diabetes, heart disease and overall mortality while promoting a healthy complexion, increased energy and overall lower weight. According to the USDA National Nutrient Database, one raw lemon,without peel (about 58 g) provides 17 calories, 0.6g of protein

Diospyros cordifolia Linn. Tendu (Ebenaceae): It is a large shrub or small tree. Leaves ovate-oblong, ovate lanceolate, acute, base cordate or rounded and hirsute on both surface. Flowers pale white in axillary cymes. Fruits globose yellow at maturity. **Ethnobotanical potentiality:** It is of great use for human being. It has commercial value being used in **Bidi** industry as a raw material. Leaves are being used in stupefying fishes. It is being used in several ailments either as a cure or for the well being, viz. used for lever disorders, whooping cough, leprosy, ulcers, gonorrhoea, fever as emetic and anthelmintiic. Alcoholic extract are anti inflammatory, antipyretic and analgesic. It is depressant, spasmolytic producing bradycardia and hypotension. Aqueous extract is being used in critical jaundicised condition. The fruits are consumed because of its juicy and sweet nature by local inhabitants "Mall [24]".

Enydra fluctuans Lour**.** Helechi, helancha, water spinach (Asteraceae): **Ethnobotanical potentiality:** *Enydra fluctuans* is also considered as a wild edible food plant by the tribes. *Enhydra fluctuans* is found to be a supplementary food source and young shoots used as cooked vegetables. The stem of the plant is used in gastric and ulcers and the whole plant is used in the treatment of constipation. It is also considered as a folk medicine where the aerial part of the plant are crushed finely and applied over pimples. for treatment of diabetes, in treating kidney stones by drinking the liquid of boiled leaves mixed with sugar in a prescribed ratio, use the leaf juice in skin diseases and as laxative, and orally prescribe it in liver diseases "Mall and Tripathi [25]". Different extracts of *Enhydra fluctuans* have been tested for the presence or absence of primary and secondary bioactive compounds like carbohydrates, proteins, oils, alkaloids, flavonoids to name a few. It has been found to be a rich source of flavonoids and moderate presence of alkaloids, tannins, phenolics andcarbohydrates have been reported. The plant is also a rich source of â-carotene and was also found to be high on protein content Presence of saponin too has been stated. **Antidiabetic uses & Antimicrobial activity** A study carried out by the Meitei-pangal community of the Thoubalb district of Manipur states that *Enhydra fluctuans* extract can be effectively used as an anti diabetic plant by boiling and cutting it at the nodes. It was also found that the tribal practitioners of the Marakh sect of the Garo tribe living in Mymensingh of Bangla desh uses twelve medicinal plants for treatment of diabetes out of which *Enhydra fluctuans* is one of them. *Enhydra fluctuans* has been found to have potent antibacterial activity against many gram positive as well as gram negative organisms. Some of them are *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus typhi, Staphylococcus*

aureus, Shigella boydii, Bacillus subtilis. The plant has also been found to be possessing significant antifungal activities against selected fungi like *Aspergillus niger*, *Fusarium* spp.and *Aspergillus fumigates*. **Anti-inflammatory activity:** The flavonoid isolated from leaves of *Enhydra fluctuans* shows anti inflammatory activity. Moreover, flavonoid isolated from leaves of *Enhydra fluctuans* exhibits *in vitro* on key enzymes of arachidonic acid cascade involved in the mediation of inflammation. **Anti-oxidant activity:** The antioxidant potential of crude methanol extract of as well as chloro form, ethyl acetate and n-butanol soluble fractions of *Enhydra fluctuans*, which is widely used in indigenous system of medicine for different purposes were studied. The crude extract and all the fractions showed free radical scavenging activity when tested in different models. **Anti-cancer activity:** Flavonoids obtained from *Enhydra fluctuans* (FEF) were screened for anticancer activity. **Anti-diarrhoeal activity:** The methanolic and aqueous extract was evaluated in experimental diarrhoea, Results indicated strong anti-diarrhoeal activity of *Enhydra fluctuans*. **Hepatoprotective activity:** The flavonoid rich ethyl acetate fraction of *E. fluctuans* has significant hepato protective effects. The possible mechanisms of protection include the inhibition of lipid peroxidation and increase in the content of enzymatic defense system, which cause the recuperation of biological parameters and the integrity of the tissue. **Analgesic activity:** The methanol extract of *Enhydra fluctuans,* given orallyt showed promising activity. **Neuroprotective potential:** Identification and characterization of new medicinal plants to cure neurodegenerative diseases and brain injuries resulting from stroke is the major and increasing scientific interest in recent years.In the Indian system of medicine out of the numerous medicinal plants showing promising activity in neuro-psychopharmacology *Enhydra fluctuans* is one of them. **Phagocytic and cytotoxic activity:** The aqueous extract of this plant have showed effective results on neutrophil phagocytic function.

Ficus heterophylla Linn. Laaksha-vriksha, Chorka-patra (Moraceae): It is an erect straggling, creeping or climbing shrub. Leaves ovate, polymorphus, lanceolate or orbicular ovate, acute, base rounded or sub cordate, Receptacles 1-2 in diameter, pedunculate, solitary axillary, spherical or pyriform warted and whitish when young smooth, dark, orange when ripe. **Ethnobotanical potentiality:** Bark decoction is used for washing ulcers, juice and powdered bark applied to wounds and bruises. Fruits are spasmolytic. Root is used for bladder and visceral troubles "Mall and Tripathi [26]".

Ficus recemosa Linn. Gular, Gular fig, Cluster fig tree, Goolar. (Moraceae): It is big evergreen deciduous tree. Its leaves are ovate, ovate- lanceolate or elliptic, sub acute, entire and petiolate. The plant is propagated by using cuttings of stem and root shakers or by seeds also. The flowers are pollinated by very small wasps. **Ethnobotanical potentiality:** Traditionally it is used in Indian medicinal practice as astringent, carminative, stomachic, vermicide etc. The extract of fruit is used in leprosy, diarrhea, menorrhagia. It is useful in the treatment of leucorrhoea, blood disorder, burning sensation, fatigue, urinary discharge, intestinal worms and as carminative. Leaves are astringent to bowels and good in case of bronchitis, leaves are used in dysentery young tender leaves are used for fair complexion. The decoction of leaves is used to wash the wounds and ulcers. Bark is useful in asthma and piles. The latex or milky juice is administered in chronic infected wounds, haemorrhoids, boils, traumatic swelling, toothache, vaginal disorder, wounds it promote healing very soon. The root sap is used for treating diabetes "Shiksharthi and Mittal [27]". Phytochemical properties : The leaf of this plant contains sterols, triterpenoides (lanosterol) and alkaloids, tannins and flavonoids. Stem bark gives gluanol acetate, β-sterol, lupenol, stigmasterol. Fruit contains gluanol acetate, glucose, tiglic acid, esters of taraxasterol, lupeol acetate and other phytosterols.

Flacourtia jangomas (Lour.) Raeusch.Poniyol, Paniyala.(Flacourtiaceae): It is a thorny, small tree. Leaves ovate lanceolate. Flowers yellowish. Fruits globose purple. **Ethnobotanical potentiality:** The ripe fruits are eaten raw. Fruits are stomachic and digestive, allay thirot, useful in biliousness and fever and relieves nausea. Leaves are diaphoretic, astringent and stomachic, good in diarrhoea, piles, weakness of limbs, bleeding gums, toothache and stomatitis, checks purging. Leaves and young shoots are prescribed in diarrhoea. Decoction of the bark is useful in biliousness, bleeding gums and toothache "Yusuf *et al.*[14]". Bark specially contains tannins, leaves and young shoots are also rich in tannins. Fruits contain soluble carbohydrates, fats, minerals, ascorbic, tartaric acids, proteins, amino acids and phenolic compounds "Ghani [28]", 0.2g of fat 5.4g of carbohydrate including 1.6g of fibre and 1.5 g of sugar, 51% daily Vitamin C needs as well as small amounts of thiamine, rivoflavin, Vitamin B6, pantothenic acid, calcium, iron, magnesium, phosphorus, potassium, copper and manganese.

Glinus oppositifolius (Linn) Aug. DC. Jima**.** (Molluginaceae): It is an annual or perennial sub shrubs, or shrubs, rarely dioecious, glabrous or rarely hairy; Stems erect or prostrate; Stem simple, alternate, rarely opposite; Flowers bisexual, Petals absent or few to many, white, pink, or purple. Fruit usually a loculicidal capsule rarely breaking into two nutlets; Seeds with embryo curved around a hard, starchy perisperm. **Ethnobotanical potentiality:** Traditionaly *Glinus oppositifolius* is used in the treatment of skin disease, increase appetite, cures vata, kapha, piles, leucoderma, tonic to intestine, urinary infections, fever, cough, liver problem "Mall and Tripathi [25]". It is also used as antioxidant due to its excellent potent phyto constituents.

Hygrophila auriculata K. Schum.Hiene Talimakhana (Acanthaceae): The herb is found all throughout India in marshy places and plains. **Ethnobotanical potentiality:** *Hygrophila* stimulates the male genital system and is beneficial in the treatment of sexual debility, premature ejaculation and erectile failure. It is also a potent remedy for kidney stones. The seeds contain large amounts of tenacious mucilage and potassium salts, which are responsible for the diuretic property of the seeds. The leaves and roots of *Hygrophila* have also diuretic properties. The herb is also useful in ailments of the urino genital tract, like dysuria, urinary calculi and cystisis. The seeds are known to increase libido and are beneficial in treating spermatorrhoea. The roots, seeds, and aerial parts of the plant are widely used in the traditional system of medicine for the treatment of jaundice, hepatic obstruction, rheumatism, inflammation, pain, urinary infection, edema, gout, malaria, impotence and as an aphrodisiac. The seeds are used as ingredients in various aphrodisiacs and tonic confections, and in the treatment of blood disorders, biliousness, gonorrhoea, spermatorrhea and fever. The seeds are ground into a paste and given in buttermilk to cure diarrhea. Aksit-Ulimrz, a preparation having Talamkhana (seeds) as one of the ingredients, is used to prevent leukorrhea. The ashes of the plant are also used against dropsy and gravel. A tincture of the whole plant is beneficial in urinary affections, dysuria, and painful micturition. A root decoction are taken to combat rheumatism, gonorrhea, and hepatic obstruction. The leaves are diuretic, sweet, tonic, aphrodisiac, hypnotic and useful in the treatment of cough, diarrhoea, thirst, urinary calculi, urinary discharges, inflammations, joint pain, eye diseases, pains, ascites, anemia, and abdominal disorders. An aqueous extract of the herb is taken orally as diuretic, spasmolytic and hypotensive "Mall and Tripathi [25]". The oil extracted from the whole plant is antibacterial.

Leucas aspera Willd. Guma (Lamiaceae): It is a stout, erect or diffuse annual herb, up to 50 cm tall, hirsute or scabrid. Stem much branched, 4-angled, grooved, hirsute below, more or less woolly above. Leaves opposite, petiolate, petioles 0.5-1.0 cm long, lamina 4-8 x 1.0-1.5 cm, oblong-lanceolate,

often entire or slightly serrate, acute to obtuse, base narrowed into a petiole. Flowers white, terminal and axillary whorls, very dense and many-flowered. Fruit nutlets, 0.2 x 0.1 cm, obovoid-oblong, angular on inner surface, rounded on outer, smooth brownish-black. Phenology Almost throughout the year but abundantly during the winter. Usually grows in dry sandy soil. Sometimes grows around sand heaps and on broken masonry work. **Ethnobotanical potentiality:** Young leaves are cooked as vegetables. Decoction of whole plant is taken orally thrice a day for three days.to cure Stomachache and headache. Whole plant boiled juice mixed with table salt and taken 3-4 times a day up to cure cough. Whole plant juice extracted by boiling with water is aplied in the eye thrice a day up to cure conjunctivitis. The plant is also used in the treatment of asthma, bone fracture, cirrhosis, colic, embryopathy, fever, jaundice, measles, osteo-arthritis, rheumatism, tonsilitis and vertigo "Uddin [9]"; chronic skin eruptions, cold, psoriasis, rheumatism and scabies Ghani [29"] toothache "Rahman *et al.* [13]" ; and chronic rheumatism, psoriasis and skin eruption "Yusuf *et al.*[14]". The plants are believed to be antidote for snake venom.

Madhuca latifolia Roxb. Mahua, Madhuca (Sapotaceae): Madhuca is a large deciduous tree reaching a height up to 20m. Leaves are large and broadly elliptic 12-20cm long. The bark is 1.2 cm thick. Flowers white to cream colour with tubular, fleshy and juicy corolla. Fruit berry, ovoid, green at maturity and turn pinkish yellow when ripe. **Ethnobotanical potentiality:** The madhuca contains protein, carbohydrate, fat, minerals, calcium, phosphorus, iron, carotenes, sugar, Vitamins and many other nutrimental chemical constituents. The bark of Madhuca is used to cure leprosy and to heal wound. The flower decoction is used for headache due to cough and cold. Paste of fresh bark is useful on joint and muscles pain. Whole plant decoction is taken orally which is useful in joint and muscles pain. "Mall and Tripathi [26]".

Malva verticelata Linn. Chinese mellow, Mallow (Malvaceae): It is one of the latest trends in healthy supplements is the *Malva verticillata* plant. The plant was originally grown in southern Europe and Asia but now grows from July to September on plains and arable fields all over the world. It is related to the marsh mallow and hibiscus plants and is mainly consumed as a tea. **Ethnobotanical potentiality:** The leaves and seeds can be eaten raw or cooked. Leaves added to salads add a pleasant, mild flavor. The seeds have a pleasant nutty. Mallow has been used as a food and medicine since ancient Greece and Rome. It was considered helpful as an anti-inflammatory agent for the skin, gastrointestinal and respiratory tracts. "Mall and Tripathi [25]". Major uses of mallow are as a tea for dry cough and sore throats, or as a topical, gelatinous application for dermatitis. Mallow is also used for treating renal disorders, retention of fluids, diarrhea and frequent thirst. For people with whooping cough, the root is used to make them vomit. The leaves and stems have digestive properties and are given to women in late pregnancy "Baksh *et al.*[29]".

Morus alba Linn. Shahtut, Mulberry tree (Moraceae): It is a small, deciduous tree, bark rough, grayish- brown, blaze greenish yellow with milky latex. Leaves alternate, ovate, dentate, often lobed, acuminate, base cordateor truncate. Flowers greenish, monoecious on short ovoid spikes, male spike catkin like, female spikes ovoid, purplish black at maturity. This is very common plant throughout near the villages and along the road sides. **Ethnobotanical potentiality:** The plant is of multi functional as we know that it is home for silk warm. Leaves are used as feed for livestock and fruit have been made into a variety of food products, cosmetics and medicines "Mall and Tripathi [26]". Due to the presence of flavonoids as a major constituent mulberry leaves possess various biological activities including anti-oxidant, antimicrobial, skin-whitening, anti-diabetic, anti-obesity, cardio-protective. Fruits are rich in anthocyanins, and alkaloids so have

pharmacological properties such as anti-oxidant, anti-diabetic, anti anaemic, hepato-proctective and immuno- modulator. The root bark contains flavonoids, alkaloids and silbenoids which have antimicrobial, skin whitening and anti-inflammatory properties.

Passiflora foetida Linn. Wild water lemon, Maryo-maryo (Passifloraceae): A slender, foetid climbing herb with simple tendril. Leaves ovate, marginglandular hairy. Flowers white, axillary. Fruits globose. Frequent climbing on bushes along road-sides, railway tracks, forest margins and river banks, Phenology August-December. **Ethnobotanical potentiality:** Young leaves are used as vegetable. Passiflora foetida has been descrived as a passion flower and has been used in treatment of some diseases like as anxiety, insomnia, convulsion, sexual dysfunction, cough and cancer "Patil *et al.* [30]". All the leaves, flower and fruits are being used in preparation of the medicines. This species can be helpful in treating digestive problems, including dyspepsia and diarrhea. It is used in itchy skin. The decoction from the leaves and fruits of this plant is used to treat asthma, biliousness and hysteria. The leaf paste is applied for headache and to treat skin diseases.

Portulaca oleracea L. Purslane (Portulacaceae): *Portulaca oleracea* (common purslane) is an annual succulent.. It may reach 40 centimetres in height. **Ethnobotanical potentiality:** Although purslane is considered a weed , it is eaten as a leaf vegetable. It has a slightly sour and salty taste.The stems, leaves and flower buds are all edible. Purslane may be used fresh as a salad, stir fried,or cooked as spinach and because of its mucilaginous quality it also is suitable for soups and stews. The sour taste is due to malic acid, which is produced through the crassulacean acid metabolism (CAM) pathway that is seen in xerophytes and is maximal when the plant is harvested in the early morning. "Mall and Tripathi [25]". *Portulaca oleracea* is of considerable importance to the food industry and also possesses a wide spectrum of pharmacological properties such as neuroprotective, antimicrobial, antidiabetic, antioxidant, anti-inflammatory, antiulcerogenic, and anticancer activities, which are associated with its diverse chemical constituents, including flavonoids, alkaloids, polysaccharides, fatty acids, terpenoids, sterols, proteins, vitamins, and minerals.

Psidium guajava Linn. Guava, Amrud (Myrtaceae): Guava is a medium sized dicotyledonous evergreen tree, generally 3-10 m high with many branches. The stems are crooked and the bark is light to redish brown, thin smooth and continuously flaking. Root system is generally superficial and extensive. The leaves are simple and opposite, petiole short the flowers are white, incurved petals, 2-3 in the leaf axils they are fragrant with 4-6 petals and yellow anthers, the fruit is small pear shaped greenish yellow when ripe. The fruit contains several small seeds and consists of a fleshy pericarp and seed cavity with pulp. Phytochemicals: Psidium guajava contains broad spectrum of phytochemical including minerals, enzymes, proteins, alcohols and triterpenoide acids, alkaloids, glycosides, steroids, flavonoides, tannins, saponins. Guava is very rich in antioxidants and Vitamins and also high in lutein, zea-xanthine and lycopene. The guava leaves contains several chemical constituents such as limonene, menthol, terpenyl acetate, isopropyl alcohol malic acid, ursolic acid and guayavolic acid essential oil, resins and tannins etc "Shruthi *et al.*[31]" Nutritional value of guava are often included among super fruits being rich in dietary fiber, Vitamin A and C, folic acid, and dietary minerals, potassium, copper and manganese. **Ethnobotanical potentiality:** well known traditional medicinal plant used in various indigenous system of medicine. The leaves and bark of this tree have long history of medicinal uses. It is used as for antiseptic, astringent, anorexia, cerebral ailments, cough, cholera, child birth, convulsions, diarrhoea, dysentery, epilepsy, headache, piles, sores, toothache, nephritis, wounds, etc.

Schleichera oleosa (Lour.) Oken. Kusum **Sapindaceae** (soapberry): It is a monotypic genus belonging to the same family to which the popular fruit 'Litchi' belongs**.** The generic name of kusum, **Schleichera** is derived after the Swiss botanist J.C. Schleicher who first described the tree. The species name **oleosa** is derived from the Latin word 'oleosa' meaning oil, as the seed kernel are rich in oil. Synonymously the tree is also refered as *Schleichera trijuga* Willd.,the word trijuga stands for 'three pairs', based on the presence of three pair of leaflets in a leaf. Kusum is a large forest tree with dense green foliage. Leaves pinnate with three pairs of leaf lets .Inflorescence raceme. Flowers white and fruits small. The fruits are berry shaped, globose or ovoid with a hard skin. The seeds are brown, irregular elliptic, slightly compressed oily and enclosed in a succulent aril. The oil content of the seed is around 59-72% with yellowish green color. Phenology October-November. It occurs in the Indian sub continent and south east asia. There are many trees that are grown for multiple products. They are known as multipurpose trees (MPT_s), a term widely used in agro-forestry. Kusum is also one among the multipurpose trees which has been proved to be useful in numerous ways from times immemorial "Mall and Tripathi [32]". **Ethnobotanical potentiality:** The leaves, twigs and the seed- cake are used as **fodder** to feed cattle. The wood is suitable as **firewood** and makes excellent charcoal. Pressed oil cakes from kusum tree are rich source of crude protein, carbohydrate, fibre and other minerals and serves as **nutritive cattle feed.** The oil extracted from the seed, called as **kusum oil** is used for **culinary** and **lighting** purposes. The kusum oil is being used to cure **itching**, **acne**, **burnr** and other **skin problems**. The oil is used in **rheumatism** by external massage. Kusum oil is used in **hair dressing** as well as for promoting **hair growth**. The pinkish-brown heart wood is very hard, durable and excellent to **make pestles, cartwheels, axles, ploughs, tool handles**, and **rollers of sugar mills** and **oil presses**. Kusum plant is **known for lac cultivation.** It is one of the major host plant commercially exploited for cultivation of the Indian lac insect *(Kerria lacca)* . It supports the kusmi strain of lac insect, which produces good quality, natural, biodegradable and commercially important, light coloured lac resin of demand by lac industry, thus fetching high remunerative prices to lac growers. The lac resins serves as a livelihood support to millions of poor farmers in states like Jharkhand, Chattisgarh, Orissa, Andhra Pradesh and West Bengal. Immature lac insects prefer semi-tender twig of kusum tree for sap sucking and start secreting resins surrounding their body. The resinous coatings of closely settled sessile insects eventually coalesce together to form an encrustation in five to six months. On kusum tree, two lac crops are produced in winter and summer season. About 34-38% of the total lac production of India is shared by the Kusum tree as lac host. There are also other lac hosts but the quality of kusum lac is far superior. The dence foliage of the mature kusum tree provides an additional advantage of supporting brood lac (inoculums stick lac with emerging larvae from the female resin cells viability even during the very hot summer season , otherwise summer mortality of lac insects is a common problem with other host plants like *Butea monosperma* (palas) and *Ziziphus mauritiana* (ber). The seeds of kusum are a very rich source of oil (60-72%) for industrial implications. The seed oil called kusum oil is an important component of the Makassar oil used for **hair dressing and cooling bath oil.** Kusum oil is used in **textile industry** for batik applications and also for **making soap**. The bark of kusum tree produces tannins and dyes that are occasionally used in small-scale industries like **tanning in leather industry**. Young leaves and shoots-raw **cooked in soups** or **steamed** and served with rice. The ripe **fruit is eaten raw** which has a plesant acid flavor. The unripe fruits are **pickeled**. An oil obtained from the seed called macassar oil, is some times used for **culinary purposes**. It contains cyanogenic

compounds, which may cause giddiness and should be removed if the oil is used for human consumption. The kusum tree is also grown as an **avenue tree** or **wayside tree.** The tree is utilized for multiferous purposes and is a **boon for a subsistence farmer**. The extended foliage and canopy of the kusum tree provides good shade and is therefore, **suitable for mixed farming with other heat susceptible economic plants.** Different plant pars (stem bark, seed, fruit and seed oil) of kusum are used in **traditional medicines.** The seed oil is used by the local Vaids for **curing skin diseases like scabies, itching, and acne.** The bark decoction is also used against **skin inflammation** and **ulcers**. The bark decoction is also infused for **curing malaria**. The fine paste of the bark of Kusum is often used to control **tissue swelling**. The bark is known to contain medically important compounds like lupeol used in preparing **analgesic** and **anti-tumerous** agents like betulin and betulic acids. It balances kaph, **useful in productive cough and asthema**. It **cleanses intestine**. It is used in **bleeding disorders** like **nasal bleeding** and **heavy periods**. The unripe fruits are **absortant**, useful in **diarrhoea, neuralgia, paralysis, constipation and bloating.** The fruit pulp improves **hair strength and promotes hair growth**. The ripe fruit improves **digestion strength**, **improve taste** and **relieves anorexia**. The leaf, seed, oil, and bark are used for treating **rheumatoid arthritis**, **headache**, **myalgia,,skin disease, malarial fever and prophylactic against cholera**. The bark is astringent and is used in fever as **antipyratic**, **useful in pruritus**. The kusum oil is bitter, sour, sweet which **improves strength** and **immunity** and can be taken regularly. It improves taste and **relieves anorexia.** The oil is **digestive, induce mobility**, **causes diarrhea**, **purgative** and **relieves constipation.** The fine paste of the bark which is astringent is mixed with oil is applied **to cure itch** and **acne** and **other skin eruptions.** The oil is useful in **worm infection, skin diseases, in toxic conditions, poisoning, ulcer** and **wounds.** The seed oil is also used for the **cure of itch and acne.** The seed oil is **stimulating and has cleansing applications.** The ripe fruit is often served with salt which **improves digestion, useful in anorexia and nourishing.** The seed is grinded so as to make fine powder. It is mixed with water and given to cattle for removing **worms from the stomach**. The fine powder of the seeds are applied to wounds and ulcers of cattles to **remove maggots**

Spondias pinnata (L.f) Kurz. Amra, Deshiamra, Wild mango. (Anacardiaceae): This is a medium sized deciduous tree, 9-10.5 m high, with a pleasant smell. Leaves imparipinnate, crowded at the end of branchlets 30-45 cm long, leaflets 9-13 pairs, elliptic- oblong, 5-25 cm long, acuminate, entire. Flowers polygamous, small yellowish-green, fruit a drupe, ovoid 4-5 cm long greenish- yellow in colour. **Ethnobotanical potentiality:** The bark is astringent and refrigerant, infusion of the bark is given in dysentery, diarrhoea, and prevent vomiting. Paste of the bark is used as an embrocation for articular and muscular rheumatism. Decoction of the bark is given in gonorrhoea. Gum of the bark is demulcent. Roots are useful in regulating menstruation. The leaves are appetizing and astringent. Fruit possesses anti scorbutic and astringent properties used in bilious dyspepsia. The unripe fruit is good for rheumatism and sore throat, ripe fruit is tonic, aphrodisiac and astringent to the bowels, cures burning sensation. Chemical constituents Arial parts have been found to contain 2,4-methylene cycloartenone, stigmast-4-en-3-one, β-sitosterol, glycoside of β sitosterol and lignoceric acid. Fruits contain water soluble polysaccharides composed of mainly L-arabinose, D-galactose and galacturonic acid "Ghani [28]". Presence of β-amyrin and oleanolic ancid, glycine, cystine, serine, alanine and leucine have also been detected in the fruits of this plant.

Syzygium cumini Skeels. Jamun (Myrtaceae): It is a large evergreen tree with whitish brown bark. Every year the bark is shed off. Its leaves are simple

pointed at the tip, somewhat leathery, oval to rectangular and somewhat shiny. Flowers are mostly white and appear in cluster from axil to leaves. The fruit is berry. **Ethnobotanical potentiality:** The fruit contains 88% moisture, 0.7% protein, 0.1% fat, 19.7% carbohydrate and 0.4% minerals. Fresh fruit had the antioxidants 708 mg/100g AEAC units. The ripe fruit contains anthocyanin pigment "Rao et al.[33]". Syzygium cumini is a well known anti diabetic herb. It is a good immune modulator. It is also used in blood pressure, dysentery, diarrhoea and gingivitis.

Tamarindus indica Linn. Imli, Ambli, Tamarind (Caesalpiniaceae): It is a dicotyledonous plant. **Ethnobotanical potentiality:** Green leaves are rich in energy, proteins and minerals. Tamarind fruit pulp has a sweet acidic taste due to a combination of high contents of tartaric acid and reducing sugars. *Tamarindus indica* is having some reported activities like antidiabetic, hypolipidemic, hepatoprotactive and anti microbial properties "Mehar *et al.*[34]".

Terminalia bellirica Roxb.Bahera, Baheda, Bibhitaki (Commbretaceae): Bahera is a large deciduous tree found throughout India. In areas up to an altitude of 1000, metres, the tree takes a height of 30 meters, while the bark is brownish grey in colour. The alternate broadly elliptic leaves are clustered towards the end of the branches. They are 10-12 cm in length and 7-14 cm in breadth. The simple solitary flowers are in auxiliary spikes with offensive odour. They blossom in the month of May. The fruits are ovoid drupes and kernels are sweet but narcotic. **Ethnobotanical potentiality:** *Terminalia bellirica* is a potent ethno medicinal plant used in various ailments like asthma, astringent and anti diarrheal, boost immunity, controls cholesterol, cough, cold, conjunctivitis, diabetes, premature graying of hair, rheumatism, chronic and acute infective conditions, loss of appetite, wounds, etc. Chemical constituents: Main chemical constituents which are significant for its medicinal values are sitosterol, gallic acid, ellegic acid, chebulagic acid, galloyl glucose, fatty acid, protein,oxalic acid, tannin, palmitic acid, oleic acid, linoleic acid, galactose, glucose, ethyl gallate "Saraswathi *et al.*[35]".

Terminalia chebula Retz. Harad, Herada, Haritaki (Combretaceae): It is medium sized up to 25 m tall, deciduous tree, bark dark brown, leaves alternate or opposite, flowers in axillary 5-7 cm long spikes, simple or sometimes branched, about 4mm across, yellowish – white and unpleasantly scented, fruit an obovoid or oblong ellipsoid drupe 2.5-5 cm long, faintly angular, yellow or orange–brown when ripe glaborous. **Ethnobotanical potentiality:** In Ayurvedic system of medicine Terminalia chebula is considered as **King of Medicine** because it is widely used in various ailments. It has antibacterial, antifungal,antiviral, anioxidant, antiaging and antihyperglycemic activities. It is cardio protective, immunomodulator, effective in gastrointestinal disorders and hepatoprotective. Chemical constituents: In *Terminalia chebula* 33% of the total phytoconstituents are hydrolysable tannins (which may vary from 20-50%) and are responsible for pharmacological activity. These tannins contain phenolic carboxylic acid like gallic acid, ellagic acid, chebulic acid and gallotannins such as 1,6 di-o-galloyl-â-D- glucose, Ellagitannin such as punacalagin, causranin, corilagin, and terchebulin and others such as chebulanin, neochebulinic acid, chebulagic acid, etc."Rathinamoorthy and Thilagavthi [36]".

Trapa natans Roxb. Water chestnut, Pani phal, (Trapaceae): It is an annual floating aquatic plant found in fresh water, wetlands, lake, ponds and sluggish reaches of rivers in India. It has flexuose stem ascending in water, the submerged parts are furnished with numerous opposite pairs of green root-like spreading pectinate organs. Leaves are alternate, crowded on the upper parts of the stem,flowers are few, auxiliary, solitary, pure white.

Fruits obovoid, angular, 2-2.5 cm long and broad, with a spreading flattened very sharp spinous horn at either side. **Ethnobotanical potentiality:** *Trapa natans* is a small herb well known for its medicinal properties. It is important plant of Ayurvedic system of medicine which is used in the problems of stomach, genitourinary, liver, kidney and spleen. It is bitter astringent, stomachic, diuretic and antiseptic. The whole plant is used in gonorrhoea, menorrhagia and other genital affections. It is also useful in diarrhoea, dysentery, ulcers and wounds. This is used in the validated conditions in pitta burning sensations, dipsia, dyspepsia, hemorrhage, intermittent fever, leprosy, fatigue, inflammation, fractures, bronchitis and stomach and heart burning. Its potent medicinal properties are due to the presence of phyto-chemical contents having high quantity of minerals, ions namely Ca, K, Na, Zn and many Vitamins, saponins, phenols, alkaloids, H-donation, flavonoids etc. Fruit and fresh nuts have considerable content of citric acid, protein, carbohydrate, fat, dietary fibre and water "Prafulla *et al.* [37]".

Trigonella balansae Linn. Methi, Bird's foot (Papilionoideae): It grows up to about two feet in height with light green color tri folioliolate leaves and white flowers. It bears long, slender, yellow brown, pods containing about 10-20 golden yellow color seeds. It is very popularly consumed as vegetable. Its seeds are small, hard, and resemble tiny, multi faceted stone pieces. **Ethnobotanical potentiality:** Raw seeds have maple flavor and bitter taste~ however, their taste becomes more acceptable once they gently roasted under light heat. The seeds are rich source of minerals, vitamins, and phyto nutrients. The seeds compose ample amounts of soluble dietary fiber. Soaking them in water softens their outer coat and turns it slimy (mucilaginous). Non starch polysaccharides (NSP) constitute major portion of this fiber content in the seeds. Some important NSP's include saponins, hemicellulose, mucilage, tannin, and pectin. These compounds help lower blood LDL cholesterol levels by inhibiting bile salts reabsorption in the colon. They also bind to toxins in the food and help to protect the colon mucusa from cancers. NSPs (non starch polysaccharides) increase the bulk of the food and speed up bowel movements. Altogether, NSPs assist in smooth digestion and help relieve constipation ailments "Mall and Tripathi[25]". Traditionally, it have been found use to cure digestive problems and to improve breast milk secretion in the nursing mothers and antidiabetic.

Trianthema portulacastrum Linn. Biskhapra (Aizoaceae): It is an annual herb found in tropical and sub tropical region and almost throughout the India as a weed in cultivated and wastelands. Ethnobotanical potentiality: Biskhapra is a well notorious drug in Unani system of medicine for its extensive use in urinary system as diuretic , in ascites, anasarca, cystitis in case of dribbling of urine, in dropsy, edema and ascites. Decoction of herb is used as an antidote in alcohol poisoning, also used in rheumatism and as a vermifuge. It has action like a antidote, expectorant, detergent, carminative, resolvent, diuretic, appetizer and astringent. "Mall and Tripathi [25]".

Ziziphus mauritiana Lam. Ber (Rhamnaceae): *Ziziphus mauritiana* is an extremely drought hardy and native fruit of India, found wild and cultivated. **Ethnobotanical potentiality:** It is useful as food, fodder, nutrient, medicinal, construction material and fuel. *Z. mauritiana* is having tremendous medicinal properties, attributed by diverse group of secondary metabolites such as alkaloids, flavonoids terpenoids, saponin, pectin, triterpenoic acids, and lipids. Jujubosides (saponin) isolated from *Ziziphus* reported to have haemolytic, sedative, anaxiolytic, and weetness inhibiting properties. Whereas, cyclopeptide alkaloids, found to have sedative, antimicrobial, hypoglycaemic, anti-plasmodial, anti-infectious, anti diabetic, diuretic, analgesic, anticonvulsant and anti-inflammatory activities "Goyal *et al.*[38]". In spite of the fact that *Ziziphus mauritiana* having medicinal properties it is neither

considered as important medicinal plant nor utilized for medicinal use in main stream therapeutic. The perusal of enumeration reveals that out of 1027 plant species representing 600 genera of 134 families found in the Flora of Bahraich Twenty eight families were found to be represented by thirty six genera of thirty eight plant species with under utilized plant category. Moraceae was found to be represented by four; Myrtaceae, Amaranthaceae, Caesalpiniaceae, Anacardiaceae, Lamiaceae, Myrtaceae and Combretaceae with two plant species each where as rest twenty families viz., Averraceae, Bombocaceae, Euphorbiaceae, Nyctagenaceae, Capparidaceae, Apocyanaceae, Ebenaceae, Asteraceae, Flacourtiaceae, Sapotaceae, Passifloraceae, Portulaceae, Malvaceae, Molluginaceae, Acanthaceae, Pappilionaceae, Trapaceae, Aizoaceae, Rhamnaceae and Sapindaceae with single plant species each. **Ficus** and **Terminalia** were found to be represented by two plant species each. Plants have always played a key role in treatment of different ailments both for human and animals all over the world. In developing countries more researchers are working on plant and plant products so the recognition of natural products is growing. Herbal medicine is an important part of both traditional and modern system of medicine. Medicinal plants being used in herbalism form the easily available source of healthcare purposes in rural and tribal areas. The wild plants growing in different stress conditions produces more potent secondary metabolites being used to cure several ailments either alone or in combination of two, three or even more plant products. Most of these wild plants are widely distributed. Many Indian plants have been used from time immemorial to treat various diseases and infections in traditional medicinal system. *Terminalia chebula* is one of the most commonly used plant in traditional system of medicine in Indian sub-continent. It is called as the "**King of Medicine**" and is always listed at the top of the list in Ayurvedic Materia Medica due to its extra ordinary power of healing "Rathinamoorthy and Thilagavathi [36]". It has antioxidant and free radical scavenging activities. *Psidium guajava* a well known popular fruit among poors contains important phytoconstituents such as tannins, triterpenes, flavonoids, triterpenoids etc is an important crop and medicinal plants available in tropical and sub-tropical climates, widely used in food and folk medicines around the world. Trapa bispinosa a poor man food contains a great quantity of non-nutritional antioxidants, such as flavonoids, flavones and total phenol contents. Jack fruit has diverse medicinal uses. Jack fruit is considered to be underutilized fruit where most of the fruits get wasted due to ignorance, lack of post harvest technology and gaps in supply chain system. **Bombax ceiba** – the samel a large deciduous tree is called as "**Silent Doctor**" because of its multipurpose ethnomedicinal uses. The over view of the utility of wild fruits as food and ethnomedicinal uses shows the need of awareness to the people so that they may consume when and where available and required. Ethnomedicine and/or Ethnoveterinary medicine is a growing area of research. More and more scientists, medical and/or veterinary practitioners, field workers in developing countries, and livestock owners are becoming interested in medicinal plants. A simplistic definition for ethnomedicine is: local or indigenous knowledge and methods for caring for, healing, and managing human lives and livestock.

The study area has a predominantly humid sub.tropical climate with hot, humid summers, severe monsoons and mild winters. It has always been regarded as an ethnic store house of a variety of unexplored medicinal plants. It harbours significant percent of India's total flora. found predominantly in this region. With its wide range of biological activity and traditional uses as medicines, these plant are considered to be a potent tool for treating a number of diseases. The compilation of data clearly indicates that has abundant applications in treating life threatening diseases like diabetes, cancer, liver problems and even has strong antioxidant, analgesic,

anti-inflammatory, anti-diarrhoeal and anti microbialactivity. The role of certain compounds present in the plants responsible for all its biological activities has been reported. For a better and precise understanding of the medicinal potentials of theses plant, further research needs to be done on elucidating the exact structure of all the active compounds present and their mode of action. Development of agricultural based technique for their large scale cultivation may also prove to be advantageous.

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