1.1 INTRODUCTION

In ancient Indian philosophy, four religious books were practiced, these are called Vedas. There are four Vedas, Rigveda, Atrhveda, Samaveda and Yujarveda. Ayurveda is considered as upaveda i.e. auxiliary knowledge (supplements) to the Rigveda or Atrhveda. It was believed that ayurveda was received by Dhanvantari Divodasa from God Brahma. The text for ayurveda was rewritten by sage Agnivesh, who was the student of sage Bhardwaja. The Ayurveda is divided into three text books such as Charaka Samhita, Sushruta Samhita and Bheda Samhita. The most important text among these is Charaka Samhita, which is considered as primary text. It is estimated that Charaka Samhita is written 100 BCE, Whereas Shushruta Samhita is written in 3rd or 4th century. The Bheda Samhita is believed to be written in the early 6th century. The medical portion of Bheda Samhita i.e Bower Manuscript is practiced during the Maurya period. In the latest part of a Gupta period, two more text was in practice these are Kasyapa and the Harita Samhita.

There are three ancient systems used for the treatment of diseases. These are Ayurveda, the Chinese medical system and Greece medical system. Ayurveda includes Yoga, whereas in Chinese system acupuncture is incorporated. The ancient medical system contains formulations based on plants, animals and minerals. Mostly plant materials are commonly used. Greek physician Galen (129AD-200AD) devised the first pharmacopoeia describing the appearance, properties and use of many plants of his time [1]. There are some major problems, now a day with ayurvedic preparations. The lack of first hand information is one of them. The people rely on the second hand accounts of value and use of botanical plants. It should be noted that a long period is required to prove the medicinal property of a formulations with proven...
safety profile. The discovery of new drugs from natural product depends on the efforts of chemist, analyst, pharmacologist, microbiologist and biochemists. The development of new drugs on the basis of above fact is due to several reasons which include emergence of drug resistance micro-organism, side effects of modern drugs and new diseases, where no medicine are available.

1.1.1. Mahabhuta

Much like the medicine of classical antiquity, Ayurveda has historically taken the approach of enumerating bodily substances in the framework of the five classical elements mahapanchbhuta viz. earth, water, fire, air, and ether, considering the seven “tissues” dhatu of plasma (rasa dhatu), blood (rakta dhatu), flesh (mamsa dhatu), adipose (medha dhatu), bone (asthi dhatu), marrow (majja dhatu) and reproductive (sukra dhatu).

1.1.2. Dosha

Ayurveda stresses a balance of three elemental substances (dosa ), analogous to classical humorism: Vayu / vata (air & space – “wind”), pitta (fire & water – “bile”) and kapha (water & earth –“phlegm”). One ayurvedic theory asserts that each human possesses a unique combination of dosas that define that person's temperament and characteristics. Each person has a natural systems state or natural combination of the three elements and should seek balance by structuring their behavior or environment to provide more of the element they lack. Another view also present in the ancient literature, asserts that humoral equality is identical to health and that persons with preponderances of humours are proportionately unhealthy and this is not their natural temperament.
1.1.3 Guna

In ayurveda there are 20 fundamental qualities (guna) inherent in all substances, arranged in ten pairs of antonyms: heavy/light, cold/hot, unctuous/dry, dull/sharp, stable/mobile, soft/hard, non-slimy/slimy, smooth/coarse, minute/gross, and viscous/liquid.

Ensuring the proper functions of channels (srotas) that transport fluids from one point to another is a vital goal of ayurvedic medicine, because the lack of healthy srotas is thought to cause rheumatism, epilepsy, autism, paralysis, convulsions and insanity. Practitioners induce sweating, which is termed as Svedana and prescribe steam-based treatments as a means to open up the channels and dilute the dosas that cause the blockages and lead to disease. Prakriti is an important concept in Ayurveda.

Ayurvedic practitioners approach diagnosis by using five senses. Hearing is used to observe the condition of breathing and speech. The study of the lethal points or marman marma is of special importance. Ayurvedic doctors regard physical and mental existence together with personality as a unit, each element having the capacity to influence the others. One of the fundamental aspects of ayurvedic medicine is to take this into account during diagnosis and therapy. Concepts of Dinacharya are followed in Ayurveda. Practices like oil pulling are practiced.

Ayurveda stresses the use of plant-based medicines and treatments. Hundreds of plant-based medicines are employed, including cardamom and cinnamon. Some animal products may also be used, for example milk, bones and gallstone. In addition fats are used both for consumption and for external use. Minerals including sulphur, arsenic, lead, copper sulphate and gold are also consumed as prescribed. This practice of adding minerals to herbal medicine is known as rasa shastra.
1.1.4. Panchakarm

The practice of panchakarma is a therapeutic way of eliminating toxic elements from the body. Panchakarma includes Vamana, Virechana, Basti, Nasya and Raktamokshana.

1.1.5. Diagnosis

Diagnosis has 8 ways of diagnosis. They are Nadi (Pulse), Mootra (Urine), Mala (Stool), Jinvha (Tongue), Shabda (Speech), Sparsha (Touch), Druk (Vision), kruti (Appearance).

1.2. SIDDHA SYSTEM

Siddha Medicine is one of the oldest medical systems known to mankind. Contemporary Tamizh literature holds that the system of Siddha medicine is originated in Southern India, in the state of Tamil Nadu. The Siddha system of medicine is considered one of the most ancient traditional medical systems.

"Siddhargal" or Siddhars were the premier scientists of ancient day Siddhars, mainly from Southern India laid the foundation for this system of medication. Siddhars were spiritual adepts who possessed the ashta siddhis or the eight supernatural powers. Sage Agathiyaris considered the guru of all Sidhars, and the Siddha system is believed to have been handed over to him by Lord Muruga, son of the Hindu God – Lord Shiva and Goddess Parvathi. So, the Siddhars are followers of Lord Shiva. "Agathiyar" was the first Siddha.

1.3. UNANI SYSTEM

Unani medicine is a form of traditional medicine widely practiced by Muslims. It refers to a tradition of Graeco-Arabic medicine [2], which is based on the teachings of Greek physician Hippocrates and Roman physician Galen developed into an
elaborate medical System by Arab and Persian physians, such as Rhazes, Avicenna, Al-Zahrawi and Nafis.

Unani medicine is based on the concept of the four humours: Phlegm (Balgham), Blood (Dam), Yellow bile (Safra) and Black bile though the threads which comprise Unani healing can be traced all the way back to Ancient Iranian Medicine, the basic knowledge of Unani medicine as a healing system was developed by Muslim scholar Hakim Ibn Sina (known as Avicenna in the west) in his medical encyclopedia Canon of Medicine. The time of origin is thus dated at circa 1025 AD, when Avicenna wrote, The Canon of Medicine in Persia. While he was primarily influenced by Greek and Islamic medicine, he was also influenced by the Indian medical teaching of Sushruta and Charaka.

Unani medicine first arrived in India around 12th or 13th century with establishment of Delhi Sultanate (1206AD-1527AD) and Islamic rule over north India and subsequently flourished under Mughal Empire. Alauddin Khilji (1296AD-1316AD) had several eminent Unani physicians (Hakims) in his royal court. In the coming year this royal patronage meant development of Unani practice in India, but also of Unani literature with the aid of Indian Ayurvedic physians [3].

1.4. HOMEOPATHY

Homeopathy comes from the Greek word homios- "like" pathos -"suffering" is a system of alternative medicine originated in 1796 by Samuel Hahnemann, based on his doctrine of similia similibus curentur ("like cures like"), according to which a substance that causes the symptoms of a disease in healthy people will cure similar symptoms in sick people. It is widely considered a Pseudoscience [4].
Hahnemann believed that the underlying causes of disease were phenomena that he termed miasms and that homeopathic remedies addressed these. The remedies are prepared by repeatedly diluting a chosen substance in alcohol or distilled water, followed by forceful striking on an elastic body called succession. Each dilution followed by succession is said to increase the remedy's potency. Dilution usually continues well past the point where none of the original substance remains [5]. Homeopaths select remedies by consulting reference books known as repertories, considering the totality of the patient's symptoms as well as the patient's personal traits, physical and psychological state and life history.

1.5. ALLOPATHY

Allopathy is the modern method of treatment of diseases. Although, the base of allopathy lies in the ancient medicine system. Many diseases are treated with modern medicine i.e. allopathy, but it has side effects such as toxicity of pharmaceuticals and resistance. The discovery of drug in allopathy is though lengthy, but is effective. Before coming to the commercial market, a drug undergoes various trials and tests on animals and healthy human volunteers. These are called clinical trials, during which all the side effects are recorded. The quality of pharmaceutical drug is monitored by Drug Authority of Central Govt. Different pharmacopeical methods are developed to estimate the drug present in different dosage forms.

1.6. REVIEW OF LITERATURE

In India and throughout world, large numbers of researchers are working on exploring the world of plant kingdom for the benefit of humans. Several papers appeared in the last few decades which describe the phytochemical and medicinal use of plant. In the following paragraphs few of them are discussed.
The Chavre B. W. et.al [6] gathered important information of 16 plants belonging to 13 different families. An ethnobotanical survey was carried out in the Beed district and information is collected about antidiabetic plants. All the species includes are widely grown. This traditional knowledge is very valuable source for the research and discovery of new pharmaceutical drug. The plants Annona reticulate, Cassia auriculata, Cassia accidentalis, Catharanthus roseus, Cocos nucifera, Diospyrous melanoxylon, Enicostemma axillare, Gymnema sylvestre, Momordica charantia, Murraya koenigii, Phyllanthus embica, Pithecellobium dulce, Syzygium cumini, Tragia plukenetii, Woodfordia fruticosa plants of various families used by local people to cure diabetes. Different plants parts such as root, leaves, bark, fruit, flower, seeds etc. are administered with other products such as milk, water etc. while making treatment on diabetes.

The indigenous knowledge of local traditional healers about the native plants used for medicinal purposes was collected through a questionnaire by Singh E.A.et.al. [7] interview during field visits. A forest walk with the healers enabled plant collection and documentation relation to the remedial information of plants used against snake bite and scorpion bite. They show plant species belonging to different families used by the tribal people against snake bite and scorpion bite are documented. They show that the thaker tribes of Raigad district still continue to depend on medicinal plants for treatment of these bites. Different parts of plants such as Aegle marmelos, Cassytha filiformis, Commicarpus chinensis, Costus speciosus, Cuscuta reflexa, Cyphostemma auriculatur, Radermachera xylocarpa, Tinospora cardiofolia and Bombax ceiba are used for snake bite. In case of scorpion bite different parts of plants such as Abrus precatorius, Achyranthes aspera, Brassica
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The communities like Mahadeo Koli, Thakar, Ramoshi, Bhils generally used medicinal plants for four important ailments like jaundice, asthma, mouth ulcer and teeth disorder. They have a strong belief in traditional system of medicine prescribed by local healers [8].

Maharashtra state flora abounds in medicinal plants which can be called as storehouse as it covers varied geographical areas, phytogeographic region. The medicinal plants used for various diseases from common cold to dreaded diseases like a variety of cancers. Some of the medicinal plants are believed to cure practically every human disease from head to toe. Natural drugs better safe than synthetic therefore people are returning to the field of traditional plants. Different parts of plants of different families such as Veronica cinerea, Eclipta prostrata, Spilanthes paniculata, Tridax procumbens, Plumbago zeylanica, Enicostema axillare, Catharanthus roseus, Nerium indium, Calotropis procera, Gymnema pergularia Henriderms indicus, Merremia disseeta, Withania somnifera, Solanum virginionum are for malarial fever, alternative in leprosy, chronic skin diseases, jaundice, panda, scabies, brain tonic, hepatoprotective, toothache, headache, dysentery, cuts, wounds, blood pressure, diarrhea, skin diseases, diabetes, cancers, scorpion sting, snake bite, asthma, rheumatic swelling, inhealing of wounds, chest pain, dysuria and stone in bladder, gonorrhea [9].

The Nandurbar region is inhibited by tribal communities like Bhils, Valvi, Gavil, padvi, Mawchi, Konkani, Dhank, Tadvi etc. They use the plants for different ailments. Different parts of different plants such as Bombax ceiba, Contella asiatica, Celosia argentia, Cassia auriculata, Cassia fistula, Holarrhena pubescens, Sterculia
urens, Echinops echinatus, Fagonia cretica, Ficus religiosa, Ensete superb, Rubia cordifolia, Tribulus terrestris, Thespesia populnea, Wrightia tinctoria, Ziziphus rugosa are used for Leucorrhea, jaundice, kidney stone, to raise sperm count in men, dental caries, to get relief from itching, mouth ulcers, cough and throat disorder [10].

Historically plants have played an important role in medicine. The observation and experimentation by Mohd Mazid, et. al. [11] human beings have learnt that plant promote health and well-being. The use of these herbal remedies is not cost effective but also safe and almost free from serious side effects. The village elders and tribals have tremendous knowledge about for health reason started thousands of years ago and is still part of medicinal practices by folk of various regions of Indian sub-continents as well as several other countries including china Middle East. The plants Zinger officinale, Corinadum sativum, Butea monosperma, Alangium salvifolium Mentha arvensis, Carica papaya, Azardirachita indica, Aloe barbedensis, Allium sativum is used to cure different diseases as diarrhea, dysentery, stomach pain, vomiting, constipation, scabies, bacterial skin infections, ring worms, sore wounds, Eczema, dry skin abscess.

Plants are used for prevention and cure of various diseases of human beings. Here list of some plants that have wound healing properties and are as well as used traditionally in Washim district. These are known for curative properties for various ailments apart from their use as wound healers. The different parts of plants such as Acacia catechu, Acalypha indica, Achyranthes aspera, Aloe vera, Annona squamosa, Argemone maxicana, Azardirachita indica, Butea monosperma Bomnax ceiba Brassica juncea, Bryophyllum calycinum, Caesalpinia procera, Carica papaya, Colocasia esculenta, Commiphora mokul, Costus speious, Curcuma longa, Daucas
carota, Erythrina varaegata, Euphorbia hirta, Ficus religiosa, Gloroissa superb, Jatropa gossypifolia, Lantana camara, Lawsonia innnermis, Mimosa pudica, Nerium indicum, Ocimum sanctum, Phyllanthus emblica, Punica granatum, Ricinus communis, Semecarpus anacardium, Tridax procumbens, Trigonella foenum graecum, Withania somnifera, Zingiber officinal are used as wound healers [12].

An ethnobotanical survey was carried out by Jain D. L. et.al. [13] on the use of medicinal plants in Satpuda region of Dhule and Jalgaon districts of Maharashtra. The information was collected from Pawara, Bhils, and Pardhi tribes. Some medicinal plant species of different families are used to cure their diseases and disorder in Satpuda forest region still depend on these plants. The plants as Acacia Arabica, Acacia chundra, Acharanthes aspera, Adhatoda vesica, Aegle marmelos, Ageratum conyzoides, Allium sativum, Amaranthus viridis, Anogeissus latifolia and other some plants are used to cure ailments as, dysentery ulcer, snake-bite, asthma, cough, diarrhoea, diabetes, stomach disorder, brain tonic, skin trouble, heart trouble and digestive agent.

The flowers and young leaves of Sesbania cannabina are edible and are often used as a vegetable to supplement meals. Tender pods may also be eaten as string beans. The dried leaves of Sesbania cannabina are used in some countries as a tea which is considered to have antibiotic, anti-helminthic, anti-tumour and contraceptive properties. Bark exudates and seed endosperm gums are produced by many species of Sesbania, but are not seen as an alternative to gum Arabic [14] can also be used as shade trees for coffee, tea and cocoa as well as living trellises for pepper and as windbreaks for citrus, bananas and coffee. The crude protein content of the leaves is high (25–30% of dry matter) and they contain little tannin and other polyphenolics. Sesbania is thus a useful source of protein for ruminant diets. Neutral-detergent fiber
(NDF), in vitro true digestibility, lignin, insoluble proanthocyanidins, and soluble phenolics.

**Sesbania cannabina** resorted to be aperient, diuretic, emetic, emmenagogue, febrifuge, laxative, tonic, agati is a folk remedy for bruises, catarrh, dysentery, eyes, fevers, headaches, smallpox, sores, sore throat and stomatii. Bark, leaves, gums and flowers are considered medicinal. The astringent bark was used in treating smallpox and other eruptive fevers. The juice from the flowers is used to treat headache, head congestion or stuffy nose. As a snuff, the juice is supposed to clear the nasal sinuses. Leaves are poulticed onto bruises. Rheumatic swellings are poulticed or rubbed with aqueous decoctions of the powdered roots of the red-flowered variant. In India the flowers are sacred to Siva, representing both the male and female sex organs; their use as aphrodisiacs, believing the fruits to be alexiteric, laxative and intellectually stimulating, prescribe them for anemia, bronchitis, fever, pain, thirst and tumors; the flowers, aperitif and refrigerant, for biliousness, bronchitis, gout, nyctalopia, ozoena and quart an fever; the root for inflammation, the bark as astringent; leaves, alexiteric, anthelmintic, for epilepsy, gout, itch, leprosy, nyctalopia and ophthalmic. Yunani consider the tonic leaves useful in biliousness, fever and nyctalopia.

Indians apply the roots in rheumatism, the juice of the leaves and flowers for headache and nasal catarrh. Mixed with stramonium and pasted, the root is poultice onto painful swellings. Flower juice is squeezed into the eye to correct dim vision. The bark is used in infusions for smallpox. Cambodians consider the flowers emollient and laxative, the bark for diarrhea, dysentery and paludism. Malayans apply crushed leaves to sprains and contusions. The gargle of the leaf juice cleans the mouth and throat. In small doses, the bark is used for dysentery and sprue, in large doses, laxative, in still larger doses, emetic. Pounded bark is applied to scabies.
Philippines use the pounded bark for hemoptysis. The powdered bark is also recommended for ulcers of the mouth and alimentary canal. In Java, the bark is used for thrush and infantile disorders of the stomach. Leaves are chewed to disinfect the mouth and throat.

The proximate composition *Sesbania bispinosa* are found to contain high content of crude protein. The seed samples contain relatively high content of crude lipid. Various processing methods such as soaking followed by cooking and enzymatic treatment to reduce / eliminate the levels of oligosaccharides. The presently studied tribal pulses exhibit high level of nutrients, besides in *vitro* protein digestibility and low level of antinutritional factors. After conducting toxicological animal feeding experiments, these little known tribal pulses may be recommended for large scale consumption Asian alternative potential source of protein.

Legume seeds are valuable source of protein, oil, carbohydrates, minerals and vitamins. They are playing an important role in human nutrition mainly in developing countries [15]. *Sesbania bispinosa* shows high content of crude protein (31.08 %) *Sesbania bispinosa* the essential amino acids such as cysteine, methionine and threonine were found to be deficient when compared with FAO / WHO (1991) requirement pattern. Linoleic and linolenic acids are the most important essential fatty acids required for growth, physiological functions and maintainance. Dhaincha (*Sesbania bispinosa*) contain galactomannan gum. This gum is water soluble, produces a smooth, light-colored, coherent, and elastic film useful for sizing textiles and paper, as well as for stabilizing the mud used in oil drilling [16]. Galactomannan gum is also used as a stabilizer and thickener in food products such as ice cream, bakery mixes, and salad dressings. Guar is grown for gum production in India and the southwestern United States. The plant is hardy and very drought resistant and grows...
well on alluvial and sandy loams [17]. Dhaincha can be grown in a rotation scheme for soil improvement, to provide fiber for paper pulp, for fodder and has ornamental value. Dhaincha appears to produce well on a large scale with little care or investment and survives well on saline or wet soils.

*Sesbania grandiflora* (L.) Pers. is a soft wooded tree belonging to the family *Papilionaceae*. Flowers are rich in nutrients and are used as vegetables in rural area. Bark is used in treating small pox and other eruptive fevers. The juice from the flower is used to treat headache, head congestion or stuffy nose. The powdered bark is also recommended for ulcers of the mouth and alimentary canal and infantile disorders of the stomach [18]. Leaves are considered to be excellent sources of vitamin C and calcium, the later is utilized to the same extent as the calcium in milk, the utilization factors being 0.74% iodine content of the leaves is reported to be 2.3 g/100g. Pectin present in the leaves (1.5%) is of medium jelly quality. The saponins present in the leaves on hydrolysis gave an acid. Besides saponins, the leaves contain an aliphatic alcohol [19]. The leaves are used as aperients, diuretic and tonic in form of poultice and they are applied to bruises. The barks of the plant are used as astringent, febrifuge and tonic and its infusion in small-pox. Besides the root juice along with honey is used as expectorant (Dhiman and nutritionally important flowers were used for the antioxidant activities).

*Sesbania grandiflora* (*Fabaceae*), popularly known as “Basna”, is an ornamental plant and is found in the plains of western Himalayas to Sri Lanka [20]. The bark is reported to cure diarrhoea, dysentery, paludism, snake bite, malaria, smallpox, eruptive fever, scabies, ulcer and stomach disorders in children; in highdosis it causes vomiting and mild diarrhoea. Due to the large use of *S. grandiflora* in folk
medicine in India, the objective of the present study was to investigate the antiulcer activity of its bark ethanolic extracts when administered by the oral route in rats.

The crude extracted solution of *Sesbania grandiflora* flowers had higher microbial inhibition due to higher flavonoids contents. Moreover, the crude extracted solution of these flower had the highest anti-microbial activity against *Staphylococcus aureus*, which is one type of food poisoning bacteria. In addition, the crude flavonoids extracted from these flower also had the similar anti-microbial activity to the extracted solution. The flowers and young leaves of *Seabania grandiflora* are edible and are often used as a vegetable to supplement meals. Tender pods may also be eaten as string beans. The dried leaves of both *Sesbania grandiflora* and *Sesbania Sesbania* are used in some countries as a tea which is considered to have antibiotic, anti-helminthes, anti-tumours and contraceptive properties. Bark exudates and seed endosperm gums are produced by many species of *Sesbania*, but are not seen as an alternative to gum Arabic.

The ethanol extracts of flowers, young bud, mature leaves and stems of *Calotropis procera* (*Asclepiadaceae*) of different parts of the plant extracts had large quantity of carbohydrate and tannin in flower while young buds had higher amount of phenolic compounds and oil. Mature leaves showed maximum activity against all the bacterial strain used in the study. The extracts of mature leaves showed highest activity of 100% mortality at 2000 ppm after 48 hours of incubation against larvae of *A. stephansi* [21].

The ethnobotanical exploration, identification, concerns and future potentialities of the wild edible plant species consumed by the tribal communities inhabiting in the hilly areas of Akole tahasil of Ahmednagar district fall in Maharashtra state. A total of 31 plant species belonging to 23 families were reported
from the study area. **Amaranthaceae** was the dominant family with 4 taxa, while **Papilionaceae** followed with 3 taxa. **Asclepiadaceae** and **Bignoniaceae** represented by 2 taxa each. The four major life forms were climbers, herbs, shrubs and trees. Herb makes up the highest proportion of the edible species followed by trees, shrubs and climbers. The plant species are divided into two class-vegetables and raw [22].

Ashoka is the most ancient tree of India, generally known as a “ashok briksh”, botanist known as **Saraca asoca** (Roxb.), De.wild or **Saraca indica** belonging family **Caesalpinaceae**. Medicinal herbs are moving from fringe to mainstream use with a great number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals. **Saraca asoca** is reported to contain glycoside, flavanoids, tannins and saponins. It is used as spasmogenic, oxytocic, uterotonic, antibacterial, anti-implantation, anti-tumour, anti-progestational, antiestrogenic activity against menorrhagia and anti-cancer [23].

**Aegle marmelos** (L.) Corr. Serr is one of the important plant with several medicinal and nutraceutical properties. **A. marmelos** is commonly known as wood apple plant. **A. marmelos** is belonging to **Rutaceae** family, the family of flowering plants. **A. marmelos** is known for various medicinal properties in traditional medicinal system and use to cure a variety of diseases. In last few decades, **A. marmelos** is extensively studied for its medicinal properties by advanced scientific techniques and a variety of bioactive compounds have been isolated from the different part of plant and were analyzed pharmacologically. The medicinal properties of this plant represent it as a valuable source of medicinal compound [24].

**Terminalia belerica** Roxb. is growing widely throughout the Indian subcontinent, Sri Lanka and South eastern Asia. In the Traditional system of medicine like Ayurveda, Siddha and Unani, medicinal uses have been described as it is works
in disease of every system. Glucoside, Tannins, Gallic acid, Ellagic acid, Ethyl galate, Gallyl glucose, Chebulanic acid are mainly believed to be responsible for its wide therapeutic actions. It is used as antioxidant, antimicrobial, antidiarrheal, anticancer, antidiabetic, antihypertensive and hepatoprotective agent [25].

In traditional medicine most of the diseases have been treated by administration of plant or plant product. Neem (Azadirachta indica A. Juss) is the most useful traditional medicinal plant in India. Each part of the neem tree has some medicinal property. During the last five decades, apart from the chemistry of the neem compounds, considerable progress has been achieved regarding the biological activity and medicinal applications of neem. It is now considered as a valuable source of unique natural products for development of medicines against various diseases and also for the development of industrial products. This review gives a bird’s eye view mainly on the biological activities of the neem and some of the compounds isolated, pharmacological actions of the neem extracts, clinical studies and plausible medicinal applications of neem along with their safety evaluation [26].

Ficus religiosa Linn is a large evergreen tree found throughout India, wild as well as cultivated. It is popular indigenous system of medicine like Ayurveda, Siddha, Unani and Homeopathy. In traditional system of medicine, various parts such as stem bark, root bark aerial roots, vegetative buds, leaves, fruits and latex are used in diabetes, vomiting, burns, gynecological problems, dysentery, diarrhea, nervous disorders, tonic and astringent. Phytochemical of plant barks, showed the presence of tannins, saponins, flavonoids, steroids, terpenoids and cardiac glycosides. According to Ayurvedic system of medicine, F. religiosa (Peepal tree) is well known to be useful in diabetes [27].
Acacia catechu, commonly known as catechu, cachou and black cutch is an important medicinal plant and an economically important forest tree. The methanolic extract of this plant was found to have antimicrobial activities against six species of pathogenic and non-pathogenic microorganisms: Bacillus subtilis, Staphylococcus aureus, Salmonella typhi, Escherichia coli, Pseudomonas aeruginosa and Candida albicans. The maximum zone of inhibition (20 mm) was found to be exhibited against S. aureus. For this organism the minimum bactericidal concentration (MBC) of the crude extract was 1,000 µg/ml. The extract was found to be equally effective against gram positive and gram negative bacteria. The antimicrobial activity of the extract was found to be decreased during purification The composition of A. catechu extract had shown major components of terpene i.e. camphor (76.40%) and phytol (27.56%) along with other terpenes in minor amounts i.e. camphor (76.40%) and phytol (27.56%) along with other terpenes in minor amounts which are related with their high antibacterial and antifungal properties [28].

The antimicrobial activity of Adhatoda vasica were reported in solvents like methanol, ethanol, acetone, chloroform, diethyl ether and water against different pathogens. The plant extract of Adhatoda vasica showed higher activity for different clinical pathogens in the order of Klebsiella pneumoniae > Staphylococcus aureus > Proteus vulgaris > Pseudomonas aeruginosa > Streptococcus Pyogens [29].

Mangifera indica L. (Anacardiaceae), a medicinal plant traditionally used in tropical regions. Mangiferin, a major C-glucosylxanthone from M. indica stem bark, leaves, heartwood, roots and fruits occurs widely among different angiosperm families and ferns. The reported pharmacological activities of mangiferin include antioxidant, radio protective, antitumor, immunomodulatory, anti-allergic, anti-inflammatory, antidiabetic, lipolytic, antibone resorption, monoamine oxidase
inhibiting, antiviral, antifungal antibacterial and antiparasitic properties, which may support the numerous traditional uses of the plant [30].

The stem-bark extracts of *M. indica* have antimicrobial activity against *S. aureus*. Methanol extracts showed the highest inhibition zone diameter of 25 mm, followed by ethyl acetate, water and hexane extracts with inhibition zone diameter of 22 mm, 14 mm and 10 mm, respectively. The antibacterial activities of different extracts are concentration dependent, in agar and broth dilution methods. Phytochemical screening of the extracts revealed the presence of phyto-compounds such as alkaloids and tannins which are known to inhibit bacterial growth by different mechanisms from those of synthetic drugs. These phyto-constituents may be responsible for the *M. indica* antibacterial activity [31].

Tamarind (*Tamarindus indica*, *Fabaceae*), a tropical fruit found in Africa and Asia is highly valued for its pulp. Tamarind fruit pulp has a sweet acidic taste due to a combination of high contents of tartaric acid and reducing sugars. The pulp is used for seasoning, in prepared foods, to flavour confections, curries and sauces and as a major ingredient in juices and other beverages. Commercial tamarind-based drinks are available from many countries. Vitamin B content is quite high; carotene and vitamin C contents are low. Presence of tannins and other dyeing matters in the seed testa make the whole seed unsuitable for consumption, but they become edible after soaking and boiling in water. Tamarind kernel powder is an important sizing material in textile, paper and jute industries. Seeds are gaining importance as an alternative source of proteins and are besides rich in some essential minerals. Seed pectin can form gels over a wide pH range. Leaves and flowers can be eaten as vegetables and are prepared in a variety of dishes. They are used to make curries, salads, stews and soups. Tamarind leaves are a fair source of vitamin C and carotene, mineral content is
high, particularly P, K, Ca and Mg. Anti-oxidant, anti-inflammatory, anti-microbial and anti-fungal activity has been documented from several plant parts. Tamarind is also extensively used in traditional medicine. The traditional uses, its phytochemistry and pharmacognosy is reviewed to provided with a particular orientation to its value in sub-Sahara Africa [32].

To increase the understanding of the ethnopharmacology of a single species, elaboration of dispersed primary data is required. *Tamarindus indica* L. (Fabaceae), or tamarind, is a common tree, especially in West Africa, with a good potential to contribute to affordable local healthcare based on traditional medicine. The fruits are used as laxative or febrifuge throughout the Sahel and Soudan ecological zones. Tamarind bark and leaves are often involved in the treatment of wounds, especially in central West Africa. While the bark is used to treat diarrhoea in West Africa, the leaves are also used for this purpose in East Africa [33].

*Syzygium cumini* (L.) Skeels (jambolan) is one of the widely used medicinal plants in the treatment of various diseases in particular diabetes. The existing data on the information on botany, phytochemical constituents, traditional uses and pharmacological actions of *S. cumini* (L.) Skeels (jambolan). The plant has been viewed as an antidiabetic plant since it became commercially available several decades ago. During last four decades, numerous folk medicine and scientific reports on the antidiabetic effects of this plant is available. The plant is rich in compounds containing anthocyanins, glucoside, ellagic acid, isoquercetin, kaemferol and myrecetin. The seeds are claimed to contain alkaloid, jambosine and glycoside jambolin or antimellin, which halts the diastatic conversion of starch into sugar. Identification of such active compounds is useful for producing safer drugs in the treatment of various ailments including diabetes. Jamun is a very common, large
evergreen beautiful tree of Indian subcontinent. The scientific name of Jamun is *Eugenia jambolana* Lam or *Syzygium cumini* Linn belongs to the family *Myrtaceae*. The seed of *Syzygium cumini* is considered as an antidiabetic in folklore medicine[34].

*Ziziphus mauritiana* (Rhamnaceae) is an extremely drought hardy and native fruit of India, found wild and cultivated. It is useful as food, fodder, nutrient, medicine, construction material and fuel. *Z. mauritiana* having tremendous medicinal properties, attributed by a diverse group of secondary metabolites such as alkaloids, flavonoids, terpenoids, saponin, pectin, triterpenoid acids and lipids. Jujubosides (saponin) isolated from *Ziziphus* reported to have haemolytic, sedative, anxiolytic and sweetness inhibiting properties. Whereas, cyclopeptide alkaloids found to have sedative, antimicrobial, hypoglycemic, antiplasmodial, anti-infectious, antidiabetic, diuretic, analgesic, anticonvulsant and anti-inflammatory activities. In spite of the fact that *Z. mauritiana* having medicinal properties, it is neither considered as important medicinal plant nor utilized for medicinal use in mainstream therapeutics [35].

Traditional medicines derived from medicinal plants are used by about 60% of the world’s population. Diabetes is an important human ailment afflicting many from various walks of life in different countries. In India it is proving to be a major health problem, especially in the urban areas. Though there are various approaches to reduce the ill effects of diabetes and its secondary complications, herbal formulations are preferred due to lesser side effects and low cost. These plants include *Allium sativum*, *Eugenia jambolana*, *Momordica charantia*, *Ocimum sanctum*, *Phyllanthus amarus*, *Pterocarpus marsupium*, *Tinospora cordifolia*, *C. indica*, *Helicteres isora*, *Stevia rebaudiana*, *Gymnema sylvestre*, *Enicostemma littorale* Blume [36].
Herbal drug product has a special place in the world of pharmaceuticals. *Terminalia chebula* is a deciduous tree, used in traditional medicines. It is reported to contain various bio chemical compounds such as tannins, chebulinic acid, ellagic acid, gallic acid, punicalagin, flavonoids etc. It has been reported as antioxidant, antidiabetic, antibacterial, antiviral, antifungal, anticancerous, antiulcer, antimutagenic, wound healing activities etc [37].

The potency of *Citrus aurantifolia* (Lime fruit) has investigated against pathogens, in the different forms in which this fruit plant is used locally (juice of the fruit, burnt rind of the fruit commonly known as “epa-ijebu” in the Yoruba dialect) and the oil obtained from steam distillation of the fruit. The antimicrobial activity of “epa-ijebu” in different solvents was also compared. The solvents include palm-wine (a local alcoholic drink tapped from palm trees), Seaman’s Schnapps 40% alcoholic drink, water, ethanol and fermented water from 3 days soaked milled maize known as “ekan-ogi” or “omidun” in the Yoruba dialect. Crude extracts of all solvents used varied in zones of inhibition. The anaerobes and the Gram-positive bacteria were susceptible to all the extracts with minimum inhibitory concentration (MIC) ranging from 32mg/ml–128g/ml. The activity against the fungi showed only the oil extract potent for *A. niger*, while *Candida albicans* was susceptible to all the extracts with MIC ranging from 256 mg/ml–512 mg/ml. The Gram-negatives have MIC ranging from 64 mg/ml–512 mg/ml. Minimum bactericidal concentration (MBC) ranged between 32 mg/ml to 512 mg/ml depending on isolates and extracting solvent. The oil and palm-wine extract of “epa-ijebu” showed greater activity than the other extracts. The killing rate of the schnapps extract on *S. aureus* and *E. coli* was 1 and 3.5 hours respectively [38].
The medicinal plants are widely used by the traditional medical practitioners for curing various diseases in their day to day practice. In traditional systems of medicine, different parts (leaves, stem, flower, root, seeds and even whole plant) of *Ocimum sanctum* Linn (known as Tulsi in Hindi), a small herb seen throughout India, have been recommended for the treatment of bronchitis, bronchial asthma, malaria, diarrhea, dysentery, skin diseases, arthritis, painful eye diseases, chronic fever, insect bite etc. The *Ocimum sanctum* L. has also been suggested to possess antifertility, anticancer, anti diabetic, antifungal, antimicrobial, hepatoprotective, cardioprotective, antiemetic, antispasmodic, analgesic, adaptogenic and diaphoretic actions. Eugenol (1-hydroxy-2-methoxy-4-allylbenzene), the active constituent present in *Ocimum sanctum* L., has been found to be largely responsible for the therapeutic potentials of Tulsi. Although because of its great therapeutic potentials and wide occurrence in India the practitioners of traditional systems of medicine have been using *Ocimum sanctum* L. for curing various ailments, a rational approach to this traditional medical practice with modern system of medicine is however not much available. These pharmacological studies have established a scientific basis for therapeutic uses of this plant [39 ].

*Eclipta Alba* (L.) is small branched annual herbaceous plant with a long history of traditional medicines uses in many countries especially in tropical and subtropical regions. The herb has been known for its curative properties and has been utilized as antitytotoxic, analgesic, antibacterial, anti hepatotoxic, antihaemorrhagic, anti hyperglycemic, antioxidant, immunomodulatory properties and it is considered as a good rejuvenator too. Recent studies showed an antivenom property & corrosion pickling inhibitor action on mild steel in hydrochloric acid. A wide range of chemical compounds including coumestans, alkaloids, flavonoids, polyacetylenes, triterpenes
and their glycosides have been isolated from this species. Extracts and metabolites from this plant have been known to possess pharmacological properties. The potential use of this plant either in pharmaceutics or as an agricultural resource can be evaluated. *Gymnema sylvestre*, an ayurvedic herb, came to be known as "destroyer of sugar" because, in ancient times, Ayurvedic physicians observed that chewing a few leaves of *Gymnema sylvestre* suppressed the taste of sugar. It is used today all over India for controlling blood sugar. Several bio-actives have been isolated from that herb for diabetes cure [40].

*Calotropis procera*, belonging to the *Asclepiadaceae* family, is present more or less throughout India and in other warm, dry places such as, Warizistan, Afghanistan, Egypt, and tropical Africa. Its common names are Akra, Akanal, and Madar. The leaves of *Calotropis procera* are said to be valuable as an antidote for snake bite, sinus fistula, rheumatism, mumps, burn injuries, and body pain. The leaves of *Calotropis procera* are also used to treat jaundice. A study on *Calotropis procera* leaf samples extracted the air-dried leaf powder with different solvents such as petroleum-ether, benzene, chloroform, ethanol and sterile water. Preliminary phytochemical analysis was done long with measurement of the leaf constants, fluorescence characteristics and extractive values. Quantitative estimation of total ash value, acid insoluble ash and water-soluble ash may serve as useful indices for identification of the powdered drug. Histochemical studies which reveal rows of cylindrical palisade cells and vascular bundles may also serve as useful indices for identification of the tissues. These studies suggested that the observed pharmacognostic and physiochemical parameters are of great value in quality control and formulation development of *Calotropis procera* [41].
Since ancient times, plants are being used as medicines, foods, agrochemicals and pharmaceuticals by large number of tribal, rural and urban people. India has more than 300 tribal communities. In Maharashtra, there are 20 major tribes. Though, there has been good research work on tribals of India including Maharashtra, some of the tribes and tribal region of Maharashtra have not received proper attention of researchers. Bhilla tribe is one of them and they are inhabited in Dhule, Jalgaon and Nandurbar districts of Maharashtra. That a total number of 127 plants species belonging to 116 genera and 59 families of flowering plants and ferns are being used by Bhilla tribe for medicinal purposes. Out of 127 species used by them, 27 species are new reports of less known uses of medicinal plants from this region [42].

Bacterial pathogens have evolved numerous defense mechanisms against antimicrobial agents; hence resistance to old and newly produced drugs is on the rise. The phenomenon of antibiotic resistance exhibited by the pathogenic microorganisms have led to the need for screening of several medicinal plants for their potential antimicrobial activity. The antibacterial activity of aqueous, ethanol and acetone extracts of Coriander sativum, Abutilon indicum, Boerhavia diffusa andrographispaniculata, Plantago ovata, Bacopa monnieri, Bauhinia variegata, Flacouratia ramontchi, Embelitgerium Euphorbia ligularia, Zinziber officinale, Terminalia chebula, Azadirachta indica, Ocimum sanctum and Cinnamomum cassia was determined against Proteus mirabilis, Escherichia coli, Proteus vulgaris, Klebsiella pneumoniae, Enterobacter cloaceae, Providencia pseudomallei, Pseudomonas aeruginosa and Klebsiella oxytoca by disc diffusion method. The crude extracts of the selected plants especially the acetone and ethanol extracts exhibited significant activity against pathogens. These plants can be used to discover
natural products that may serve as lead for the development of new pharmaceuticals addressing the major therapeutic needs [43].

A detail literature survey, regarding ethnopharmacological / biological activities of various parts of plants reported earlier researchers are given in table-1.1.

Table-1.1. Biological Activities of Some Plant Extracts.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Biological activity</th>
<th>Plants</th>
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<tbody>
<tr>
<td>1</td>
<td>Antimicrobial activity</td>
<td>Mangifera indica [44], Aegle marmelos [45], Acacia nilotica, Sida cordifolia, Tinospora cordifolia, Withania somnifera, Ziziphus mauritiana [46], Litsea glutinosa L., Vitex peduncularis W., Elephantopus scaber L. 47, Spondias pinnata, Oxalis corniculata and Asparagus racemosus[48], Pereska bleo, Pereska grandifolia, Curcuma aeruginosa Roxb., Curcuma zedoria [49] Argyreia Involucrata [50], S. fruticosa, T. asiatica, T. ciliate [51], Acacia modesta, Syzygium cumui and Olea ferruginea [52], Andrographis paniculata, Asparagus adscendents, Cinnamomum tamala [53], Leptadenia pyrotechnica [54], Solanum khasianum Berries [55], Salvadorap ersica [56], Centella asiatica, Nerium indicum and Cuscita reflexa [57].</td>
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<td>2</td>
<td>Antipyretic activity</td>
<td>Pseudocedrela kotschyi Schweint. Harms [59], Fagonia schweinfurthii hadidi [60], Grewia crenata, Striga hermontheica and Gongronema latifolium [61], Melia azadirachta,</td>
</tr>
</tbody>
</table>
### Introduction

**Tinospora cordifolia** and **Vitex trifolia** [62], **Quisqualis indica** [63], **Chenopodium ambrosioides** L. [64], **Hibiscus sabdariffa** calyces L. [65], **Viola betonicifolia** [66], **Capparis zeylanica** Linn. [67], **Salvinia minima** and **Dactyloctenium austral** [68], **Kleinia Grandiflora** [69], **Marsilea trifolia** Blanco [70], **Vitex nigundo** [71], **Alhgi maurorum** Conyza dioscoridis and **Convolvulus fatensis** [72], **Crataeva magna** [73].

<p>| 3 Antioxidant activity | Terminalia chebula, Mangifera indica, <strong>Terminalia bellerica</strong>, <strong>Punica granatum</strong>, <strong>Ocimum sanctum</strong>, <strong>Cichorium intybus</strong>, and <strong>Camellia sinensis</strong> [74], <strong>Ludwigia octovalvis</strong>, <strong>Vitis thunbergii</strong>, <strong>Rubus parvifolius</strong>, <strong>Lindernia anagallis</strong>, and <strong>Zanthoxylum ntidum</strong> [75], <strong>Camellia sinensis</strong> Linn., <strong>Eugenia caryophyllus</strong> (Spreng.) Bullock and Harrison, <strong>Piper cubeba</strong> Linn., <strong>Zingiber officinale</strong> Roscoe, <strong>Piper nigrum</strong> Linn. <strong>Trigonella foenum graecum</strong> Linn. and <strong>Elettaria cardamomum</strong> (Linn.) Maton [76], <strong>Calotropis procera</strong> Linn., <strong>Hibiscus cannabinus</strong> L., <strong>Parthenium hysterocephorus</strong> L., <strong>Gmelina arborea</strong> Roxb. and <strong>Kigelia pinnata</strong> (Jacq.) DC [77], <strong>Cassia occidentalis</strong>, <strong>Clitoria ternatea</strong>, <strong>Trianthema decandra</strong>, <strong>Capparis zeylanica</strong>, <strong>Anisomeles malabarica</strong>, <strong>Plumbago zeylanica</strong> [78]. |</p>
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<th>Anti-inflammatory activity</th>
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<td></td>
<td>Calluna vulgaris, Corylus avellana, Geum urbanum, Juniperus communis, Polygonum aviculare, Potentilla erecta and Salix caprea [86], Citrullus colocynthis, Hammada elegans and Rhazya stricta [87], Securidaca Longipedunculatafres [88], Maytenus senegalensis, Plectranthus barbatus, Zanthoxylum chalybeum Zanthoxylum usambarense [89], Ruta graveolens Linn. [90], Bombax ceiba [91], Solanum nigrum Linn Berries [92], Basella alba [93], Cratoxylum formosum, Murraya paniculata[94], Chromolaena odorata [95], Helichrysum odoratissimum (L.) Less., Heteropyxis natalensis</td>
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<td>5</td>
<td>Analgesic activity</td>
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<td>Anticancer activity</td>
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<td>Anti-depressant activity</td>
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<td>10</td>
<td>Antiviral activity</td>
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"Physico-chemical and analytical evaluation of some medicinal plants"
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<th>Antithelminitic activity</th>
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<td></td>
<td>Maranthus spinosus, Amaranthus caudatus, Amaranthus viridis [146], Clitoria ternatea Linn., Guazuma ulmifolia Lam. and Madhuca indica Gmel. [147], Acacia nilotica, Ambrosia miratima and Azadirachta indica [148], Jussiaea hyssopifolia G. Don [149], Mentha longifolia [150].</td>
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</table>

**References:**


30. Nathalie Wauthoz, Aliou Balde, Elhadj Saïdou Bald, Marc Van Damme, Pierre Duez, Ethnopharmacology of Mangifera indica L. Bark and Pharmacological


“Physico-chemical and analytical evaluation of some medicinal plants”


140. P. Balasubramaniana, K. Jayalakshmib, N. Vidhy, R. Prasada, A. Khaleefathullah Sheriff, G. Kathiravana, K. Rajagopala and Sripathi M. Sureban, Antiviral activity of


