

Tribal Medicine of India: Natural Remedies for Good Health

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ABSTRACT

*This chapter elucidates the use of some medicinal plants by tribes. They have a wealth of knowledge regarding using numerous plants or plant components as medicine. According to the World Health Organization (WHO), as much as 80% of the world's population now relies on traditional medicine for their primary healthcare requirements. The tribal people found the therapeutic properties and medical efficacy of wild herbs and treated various ailments, discomforts, and diseases. Herbal medicine has been declining in popularity recently, which could mean that valuable information on medicinal plants is being lost. This chapter encompasses some important plants used as a medicine in tribal areas of India viz., *Dioscorea bulbifera* (Aerial Yam), *Saraca asoca* (Ashoka), *Achyranthes aspera* (Chaff-flower), *Cissus quadrangularis* (Devil's backbone), *Butea monosperma* (Flame of the Forest), *Tinospora cordifolia* (Giloy or Guduchi or Amrita), *Abrus precatorius* (Indian liquorice), *Centella asiatica* (Indian pennywort), *Solanum Indicum* (Indian Solanum), *Hemidesmus indicus* (Indian Sarsaparilla), *Andrographis paniculata* (Kalmegh), *Boerhavia diffusa* (Punarnava) and *Mucuna pruriens* (Velvet bean) and their bioactive compounds and therapeutic value.*

Keywords: Tribal medicine, Medicinal plants, bioactive compounds, Curative properties

INTRODUCTION

Traditional medicine is "the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, used in maintaining health and preventing, diagnosing, improving or treating physical and mental illness" ([World Health Organization http://www.who.int/topics/traditional_medicine/en/](http://www.who.int/topics/traditional_medicine/en/)). There are many different traditional medicine systems, and the environment of the prevailing condition influences the philosophy and practices of each geographic area within which it first evolved ([WHO 2005](#)). However, a common philosophy is a holistic approach to life, equilibrium of the mind, body, and the environment, emphasizing health rather than disease. Generally, the focus is on the individual's overall condition rather than on the particular ailment or illness the patient suffers. The use of herbs is a core part of all traditional medicine systems ([Rajeswara 2015](#)).

Over the past 100 years, the development and mass production of chemically synthesized drugs have revolutionized health care in most parts of the world. However, large sections of the population in developing countries still rely on traditional practitioners and herbal medicines for their primary care ([Kumar and Jnanesha 2017b](#)). In Africa, up to 90% and in India, 70% of the population depend on traditional medicine to help meet their health care needs. Traditional medicine accounts for around 40% of all health care delivered, and more than 90% of general hospitals in China have units for traditional medicine ([WHO 2005](#)). However, the use of traditional medicine is not limited to

developing countries. During the past two decades, public interest in natural therapies has significantly increased in industrialized countries, with expanding use of ethnobotanicals (Rajeswara 2015).

RESEARCH NEEDS ON HERBAL MEDICINE

Research needs in the field of herbal medicines are enormous but are balanced by the potential health benefits and the considerable size of the market. Research into the quality, safety, molecular effects, and clinical efficacy of the numerous herbs in common usage is needed. Newly emerging scientific techniques and approaches, many of which are mentioned in this book, provide the required testing platform. Genomic testing and chemical fingerprinting techniques using hyphenated testing platforms are now available for definitive authentication and quality control of herbal products. They should be regulated to safeguard consumers, but questions of efficacy will remain unless and until adequate amounts of scientific evidence are accumulated from experimental and controlled human trials (Giordano et al. 2005; Evans 2008; Tilburt and Kaptchuk 2008). Evidence for the potential protective effects of selected herbs is generally based on experiments demonstrating a biological activity in a relevant in vitro bioassay or experiments using animal models. In some cases, this is supported by both epidemiological studies and a limited number of intervention experiments in humans (WHO 2001). In general, international research on traditional herbal medicines should be subject to the same ethical requirements as all research related to human subjects, with the information shared between different countries. This should include collaborative partnership, social value, scientific validity, fair subject selection, favorable risk-benefit ratio, independent review, informed consent, and respect for the subjects (Giordano et al. 2005; Tiburt and Kaptchuk 2008). However, the logistics, time, and cost of performing extensive, controlled human studies on the clinical effectiveness of an herb are prohibitive, especially if the focus is on health promotion. Therefore, there is an urgent need to develop new biomarkers that more clearly relate to health (and disease) outcomes. Predictor biomarkers and subtle but detectable signs of early cellular change that are mapped to the onset of specific conditions are needed (Giordano et al. 2005).

Research is also needed to meet the challenges of identifying the active compounds in the plants, and there should be research-based evidence on whether whole herbs or extracted compounds are better. The issue of herb-herb and herb-drug interactions are also important and requires increased awareness and study, as polypharmacy and polyherbacy are common (Canter and Ernst 2004; Cohen and Ernst 2010; Loya et al. 2009; Qato et al. 2008). The use of new technologies, such as nanotechnology and novel emulsification methods, in the formulation of herbal products will likely affect bioavailability and the efficacy of herbal components, and this also needs study. Advances in rapid genetic sequencing, coupled with the manipulation of biosynthetic pathways, may provide a vast resource for the future discovery of pharmaceutical agents (Li and Vederas 2009).

MPs USED AS A TRIBAL MEDICINE

Humans have always relied on nature and its remedies to relieve themselves of bodily and mental discomforts. The primary source of all-natural drugs is traced to medicinal plants and a few microorganisms. From time immemorial, various traditional and folk forms of medicine have appreciated the medicinal plants for their miraculous therapeutic properties that have attracted the interest of modern medicine and industries. Upon extensive studies on the medicinal plants, it has been observed that the presence of low molecular weight compounds of wide structural diversity found in

almost all medicinal plants is responsible for the expression of medicinal properties. These compounds are termed as secondary metabolites, and these compounds are vital for the survival and protection of the plant. The combinations are secreted in small amounts compared to other compounds which are involved in the metabolic and physiological pathways. Still, their involvement in the protection aspect is of utmost importance (Jnanesha and Kumar 2019).

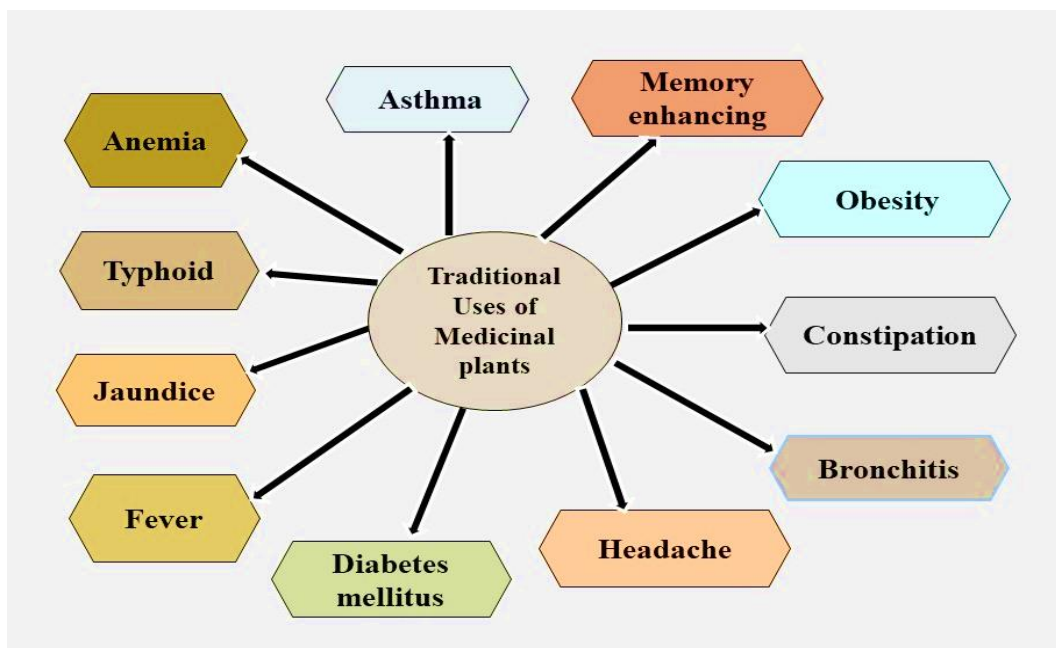


Figure 1: Traditional Uses of Medicinal Plants

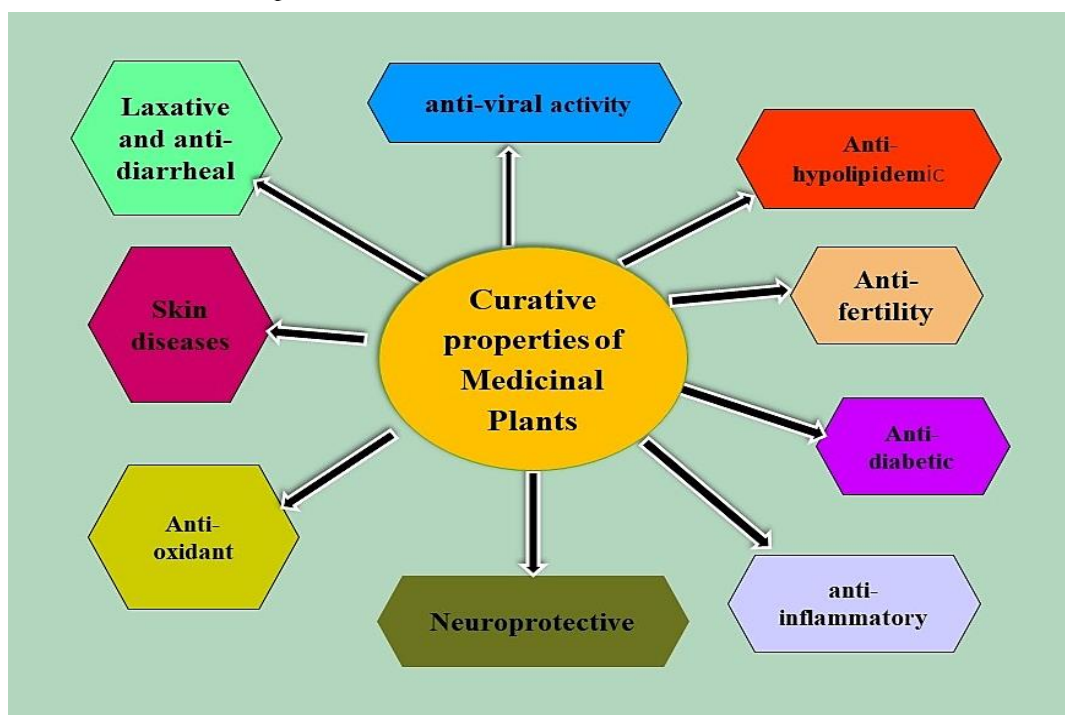


Figure 2: Curative properties of Medicinal Plants

These compounds are involved in many pathways like cellular signalling pathways, either directly or indirectly involved in processes like pollination, repelling insects, or harmful organisms. The names, families, and used parts of the traditional plants are summarized in Table 1. Some important plants used as a medicine in tribal areas of India are *Dioscorea bulbifera* (Aerial Yam), *Saraca asoca* (Ashoka), *Achyranthes aspera* (Chaff-flower), *Cissus quadrangularis* (Devil's backbone), *Butea monosperma* (Flame of the Forest), *Tinospora cordifolia* (Giloy or Guduchi or Amrita), *Abrus precatorius* (Indian liquorice), *Centella asiatica* (Indian pennywort), *Solanum Indicum* (Indian Solanum), *Hemidesmus indicus* (Indian Sarsaparilla), *Andrographis paniculata* (Kalmegh), *Boerhavia diffusa* (Punarnava) and *Mucuna pruriens* (Velvet bean) are effective in tribal human health care (Figure 1-3).

Aerial Yam

The species develops very long vines and produces tubers underground, but the bulbils (aerial tubers) that grow at the base of its leaves are the more important food products. This yam is popular in household gardens mainly because it produces a crop after only 4 months of growth and continues producing for the life of the vine as long as 2 years. Moreover, the bulbils can be easily harvested for eating after boiling at any time. A subtropical or sub-temperate and humid climate with distinct two to three months of cold winters is ideal for the growth of the plant. Sandy loam soil is most suitable for its cultivation and better yield of corm (Kundu et al. 2021).

Botanical Name: *Dioscorea bulbifera* L.

Family: Dioscoreaceae

Indian Name: Ratalu, Pahadi Alu, Ban alu (Hindi); Air Potato, Aerial Yam, Potato yam (English); Varahikanda (Sanskrit); Varahi, Dukarkand (Marathi); Bon Alu (Assamese); Pit Alu (Oriya); Ban Alu (Bengali); Goch-aloo/ Bon-aloo Gosh Alu (Assamese); Ambali Genasu, Kuntagenasu, Negilugonne (Kannada); Pannukkizhangu, Kaattu-k-kaay-Valli (Tamil); Adavi Dumpa (Telugu) (Kundu et al. 2021).

Origin and Distribution

The species is distributed throughout tropical and subtropical areas, up to 1000 m altitude. It is a shade-loving species but grows well in open areas too. About 50 species of *Dioscorea* are found in India (Kundu et al. 2021). A large number among them occur in the wild state. *Dioscorea* species are distributed nearly throughout India except in the dry north-western regions. They are found growing at elevations of 8000-15000 ft. in the Himalayas. In its wild state, it is extremely bitter. Under cultivation, the plant loses its bitterness and is grown for the tubers, roasted and eaten. The tuber is used by the tribal population of central India as a food, particularly in Madhya Pradesh, Chhattisgarh, Jharkhand, and Orissa (Byarugaba et al. 2007).

Traditional Uses

It is also reported to have remedial potential against conjunctivitis, leucoderma, dyspepsia, urinary discharges, jaundice, diabetes, asthma, bronchitis, strangury and Vata biliousness. They are also used against tumour. Bulbils are boiled and used to treat sexual vigour. Paste of the leaves is used to cure skin related infections. Tribes in the Indian state of Telangana use dried tubers cut into pieces early in the morning to cure piles (Byarugaba et al. 2007).

Bioactive compounds

The tuber contains steroidal saponins, diosgenin, bitter and non-bitter terpenes, nonditerpene glucosides, diosbulbinoside D & F, a large number of diosbulbins, diterpene, lactones, phenanthrenes, dihydropyrananthrene, furanoid non-diterpenes, and d-sorbitol. Bulbils also contain diosgenin (Adesanya et al. 1989; Bhandari and Kawabata 2004)

Curative properties

It is used in haemoptysis, epistaxis; pharyngitis; goitre; pyogenic infections, scrofula; orchitis; sprains, and injuries. *Dioscorea* is famous for Indian non-vegetarian Ayurvedic medicine. *Dioscorea* is used in treatment of Vata disorders like loss of strength and hemiplegia etc. Dried *Dioscorea* is known to dissolve toxins, cures carbuncles, scrofula and purulent infections (Bhandari and Kawabata 2004; Azeem et al. 2013).

Ashoka

Asoka is a medium-sized, evergreen tree with beautiful fragrant flowers. Leaves are alternate, paripinnate, copper-red when young, green when mature, and 30–60 cm long. Bark on old stems is dark green in colour, often marked by bluish and an ash white patch of lichens. Ashoka tree has been mentioned in some of the oldest Indian text apart from Ayurveda. Across India, the Ashoka tree is believed to be sacred and apart from Ramayana, the Ashoka tree is mentioned in Buddhism and Jainism. Charaka Samhita, which is believed to have been composed in 1000 BC, describes Ashoka tree and its medicinal benefits (Yadav et al. 2013; Ahmad et al. 2016).

Botanical Name: *Saraca asoca* (Roxb.) de Wilde

Family: Caesalpiniaceae

Indian Name: Kankeli (Sanskrit); Ashoka (Assamese); Ashoka (Bengali); Ashoka (Gujrati); Ashoka (Hindi); Ashokadamara (Kannada); Ashok (Kashmiri); Asokam (Malayalam); Ashok (Marathi); Ashoka (Oriya); Ashok (Punjabi); Asogam (Tamil); Ashokapatta (Telugu) (Devan et al. 2021).

Origin and Distribution

Asoka is distributed throughout India, naturally frequent in South India, Sri Lanka, Orissa, and Assam. The species also occurs in central and eastern Himalayas up to 750 m altitude. It is grown as an avenue tree due to its foliage and fragrant flowers. The tree is found mainly throughout India, especially in West Bengal, Assam, Odisha, Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Meghalaya and Maharashtra. It is also widely distributed across the Western Ghats (both South and Central), the Sahyadri region, and the Himalayas (Devan et al. 2021).

Traditional Uses

The bark of this plant is used in the Ayurvedic and modern herbal medicine systems with a profound application for curing complex gynaecological diseases. It is found throughout India (Ahmad et al. 2015), especially in Konkan, Deccan, Karnataka, Maharashtra, central and north India, and eastern Himalayas up to an altitude of 750 m (Devan et al. 2021; Pradhan et al. 2009). Stem bark of Asoka tree is strongly astringent and a uterine sedative, uterine tonic, and styptic, having a stimulating effect on endometrial and ovarian tissue. The bark is also useful in dyspepsia, fever, and burning sensation. It is also used to treat menorrhagia, leucorrhoea, internal bleeding, haemorrhoids, and hemorrhagic dysentery. Many tribal Women of Chhattisgarh, consumes Ashoka bark after boiling into cow milk to prevent gynecological disturbances (Pradhan et al. 2009; Devan et al. 2021).

Bioactive compounds

The Phytochemical take a look at shows the presence of numerous chemical ingredients of *Saraca indica* plant. Bark carries catechol, sterol, tannins, flavonoids, glycosides, leucopetargonidin and leucocyanidin. The stem includes quercetin, amyryne, ceryl alcohol and beta sterol (Pradhan et al. 2009; Devan et al. 2021). The bark and stem discovered to comprise quercetin, quercetin-3-O- α -l-rhamnoside, kaempferol three-O- α l-rhamnoside, amyryne, ceryl alcohol and β -sitosterol (Yadav et al. 2013). Flower carries oleic, linoleic, palmitic and stearic acids, P-sitosterol, quercetin, kaempferol-3-O-P-D-glucoside, apigenin-7-O-p-D-glucoside, Pelargonidin-three, five- diglucoside, cyanidin-three, leucocyanidin and gallic acid (Yadav et al. 2013). Four anthocyanin pigments are removed from plant life; beta and alpha sitosterol are removed from fixed oil of vegetation (Rastogi and Mehrotra 1999). Seed and Pod incorporate oleic, linoleic, palmitic and stearic acids catechol, (-) epicatechin and leucocyanidin (Yadav et al. 2013).

Curative properties

It is extensively used in the pharmaceutical preparations like asokarishta and asokagirtha. Most of these plant parts like stem, bark, flowers, leaves and fruits are used in Ayurveda for their medicinal properties. The barks are used for the treatment of menorrhagia, uterine infections, rheumatic arthritis, hemorrhoids, dysmenorrhoea and bacterial infections (Pradhan et al. 2009; Misra 2013). During 100 A.D. the name of Ashoka plant was mentioned in Charka Samhita as anodynes in gynecological disorders. All parts of this plant such as Ashoka flower, barks, leaves, roots, and seeds have medicinal value and have been used widely in anticancer, antimicrobial, anti-inflammatory, anti-arthritis, medication (Pradhan et al. 2009; Misra 2013).

Chaff-flower

Chaff-flower is an important perennial medicinal herb found as an herbal weed throughout India. This plant is 0.2-2.0 m high. The base is woody, angular or ribbed, simple or branched; nodes are bulged, often tinged with pink color (Raj et al. 2011).

Botanical Name: *Achyranthes aspera* var. *indica* L.

Family: Amaranthaceae

Indian Name: Prickly Chaff flower, Rough chaff tree, Red chaff tree (English); Aghata (Sanskrit); Latjira, Chirchira (Hindi); Safad Aghedo (Gujarati); Shiru-kadaladi (Tamil); Uttaraene (Telugu); Kadaladi (Malayalam); Kutri (Punjabi) (Raj et al. 2011; Kumar 2019).

Origin and Distribution

Chaff-flower is found on field boundaries, roadsides, wild areas, forests, and waste places as a weed throughout India up to an altitude of 2100 m and in South Andaman Islands. It is most common in the northern plains of India. It is most commonly found to be a medicinal herb in Shivbari sacred groves Indian state of Himachal Pradesh. It is also a weed herb of district Lalitpur, Jhansi, Lucknow, Barabanki, Prayagraj of Uttar Pradesh, India (Neelesh et al. 2019).

Traditional Uses

In the traditional system of medicines, seeds, roots, and shoots are the most important parts which are used for their medicinal properties. In traditional medicines, whole plant ash is used in gaseous distention, gastritis, cough, asthma, and urinary bladder stones; the ash with honey is also used to relieve cough (Luseba et al. 2007; Raj et al. 2011). The herb is mainly prescribed in amenorrhea due to hemostasis, dysmenorrhoea, and irregular menstruation, injuries due to impact, fractures, contusions

and strains, hematemesis, epistaxis, hematuria due to gonorrhoea, gingivitis, laryngitis, and carbuncle. In folk medicine, it is one of the plants used for contraception, and the leaves are traditionally used to treat wounds (Raj et al. 2011). The decoction of leaves and roots is used as a diuretic, and the plant sap is useful in dissipating the corneal opacity.

Bioactive compounds

It contains carbohydrates, alkaloids, proteins, glycosides, flavonoids, saponins, and tannins. Other chemical constituents such as achyranthine, 6-pentatriacontanone, betaine, pentatriacontane, hexatriacontane, and tritriacontane are also present (Luseba et al. 2007; Raj et al. 2011).

Curative properties

This plant has different Curative properties in various plant parts like Antiviral and Anticarcinogenic, Spermicidal, Hepatoprotective, Nephroprotective, Antidiabetic, Antiinflammatory, Immunostimulates, Antimicrobial, Antiparasitic, Anti-allergic, Wound Healing, Antioxidant and Hypolipidemic properties of Chaff-flower which are instrumental in making it potent against infections (Luseba et al. 2007; Raj et al. 2011).

Devil's backbone

Devil's backbone an important medicinal perennial plant is both easy to grow and fast-growing. It is a fleshy, cactus-like liana widely used as a common food item in India. Veldt Grape is a succulent shrubby climber with 4 winged internodes and a tendril at the nodes and reaches a height of 1.5 m approximately. Stem jointed at nodes, internodes are 8 to 10 cm long and 1.2 to 1.5 cm wide (Kumar 2019). Flowering is rare, and flowers are small, greenish-white, bisexual, tetramerous, and opposite the leaves. Fruit globose/obovoid fleshy berries. *Cissus quadrangularis* is propagated by seeds and stem cuttings. It is vegetatively propagated mainly in the month of May to July. It requires warm tropical climate (Kumar 2019; Piyush et al. 2021).

Botanical Name: *Cissus quadrangularis* Linn.

Family: Vitaceae

Indian Name: Veldt grape, Devil's backbone, Adamant creeper (English); Hadasinkuda (Oriya); Harjora (Assamese); Harbhanga, Harjora (Bengali); Hadjod, Hadjora, Jangli-angoor (Hindi); Asthisamhaara, Mangaravalli (Kannada); Cannalamparanta (Malayalam); Chaudhari, Hharsankar, Kandavela (Marathi); Asthisamhari, Asthisamhrta (Sanskrit); Perandai (Tamil); Gudametige, Kokkitayaralu (Telugu) (Piyush et al. 2021).

Origin and Distribution

The plant is native to several hotter regions of India alongside hedges, neighboring countries like Bangladesh, Pakistan, Srilanka, and Malaysia (Kumar 2019; Piyush et al. 2021).

Traditional Uses

The roots and stems are most useful for healing fractures of the bones. The *C. quadrangularis* has been documented in Ayurveda and Siddha systems of medicine to treat various ailments like syphilis, gouts, piles, leucorrhoea, venereal diseases, diarrhea, and dysentery (Kumar 2019; Piyush et al. 2021).

Bioactive compounds

The plant contains calcium oxalate, β -carotene, ascorbic acid, β -sitosterol, and 3-ketosteroids, also flavonoids such as quercetin, and kaempferol. The stem comprises two unsymmetrical tetracyclic triterpenoids, onocer-7-ene-3 α , 21 β -diol and onocer-7-ene-3 β , 21 α -diol, two steroidal principles I and II, δ -amyrin, δ -anyone (Periyasamy 2001).

Curative properties

The plants have medicinal properties like bone healing, antimicrobial, anti-diabetic, anti-inflammatory, anti-obesity, anti-oxidant, bone turnover (Chiesa et al. 2018), cardiovascular, and hepatoprotective activities. The stem juice of the plant is used to treat scurvy, menstrual disorders, otorrhoea, and epistaxis (Ampai et al. 2007).

Flame of the Forest

The Butea is initially grown in all regions of India, thriving in the dry season being a deciduous tree. It grows up to a height of 15 meters, being short and sprouting at a slow pace. The dark green leaves are in pinnate shape, arranged as three leaflets arising from the stems. The flowers of Palash are vibrant orange in color, with many wide petals, aligned in a cluster or raceme form, and are edible, being very bitter. The fruit is a small pod with a sharp, biting taste upon budding (Geeta et al. 2011; Divya and Rao 2015).

Botanical Name: *Butea monosperma* (Lam.) Taub.

Family: Fabaceae

Indian Name: Flame of the forest (English); Kinaka, palas, paras, polashi (Bengali); kakria, kesudo, khakara, khakharo, palasso, phullas (Gujarati); chinchra, dhak, palas, paras (Hindi); brahmavriksha, mathuga, mutthugada mara, muttuga, palasa, plashu, thoras (Kannada); brahmavriksham, mukkappuyam, palas, palasinsamatha (Malayalam); palas, paras, phulas (Marathi); kinjuko, palasa, polas, porasu (Oriya); chachra, dhak, palas (Punjabi); kinsuka, palasa, palasha (Sanskrit); murukkan, palasu, punamuruku, purasu (Tamil); modhugu, moduga, palasamu (Telegu); palash, palashpapra (Urdu) (Divya and Rao 2015).

Origin and Distribution

The plant is commonly called a Palash tree in India. It grows throughout India as well as the South Asian peninsula. Butea tree gets up to 50 ft in height, with stunning flower bunches. The leaves of trees lose with the flowers develop, in the month of January - March. This tree grows in open plains in its natural habitat and is highly drought-resistant and reproduced by seeds and suckers. Natural reproduction starts early in the rainy season. Generally, it grows gregariously on open grasslands and is scattered in mixed forests. Plantations can be raised both on irrigated and drylands (Reddy et al. 2014; Divya and Rao 2015).

Traditional Uses

In the traditional system of medicines, it is used in abdominal enlargement, ascites; biliousness, eye diseases, skin, itch, piles, tumors, ulcers, splenomegaly, and wounds. The Juice from the plant as well as the oil is antiseptic. In tribal medicine of India, the seeds are used for keratitis; piles; urinary discharges, skin ailments, and diseases of the brain, eye, headache, and skin. The powdered seeds are used as a

febrifuge and tonic in bronchitis and whooping cough (Sehrawat and Sultana 2006; Divya and Rao 2015).

Bioactive compounds

The plant also contains palasitrin and major glycosides as Butrin, butolic acid, cyanidin, histidine, lupenone, lupeol, (-)-medicarpin, miroestrol, palasimide and shellolic acid. The leaves of Butea contains Glucoside, Kino-oil containing oleic and linoleic acid, palmitic and lignoceric acid, barks contains Kino-tannic acid, Gallic acid, pyrocatechol, stem contains Stigma sterol-e-D-glucopyranoside and nonacosanoic acid, 3-Z-hydroxyeuph-25-ene and 2, 14-dihydroxy- 11, 12- dimethyl-8-oxo-octadec-11 enylcyclohexane, flower contains monospermoside (butein 3-e-d-glucoside) and isomonospermoside, chalkiness', aureoles, flavonoids (palasitrin, prunetin) and steroids, triterpene, butein, butin, isobutrin, coreopsis, isocoreopsis (butin 7-glucoside), sulphurein, Gum contains tannins, mucilaginous material, pyrocatechin, seed contains A nitrogenous acidic compound, along with palasonin is present in seeds (Sehrawat and Sultana 2006; Divya and Rao 2015). It also contains monospermoside (butein 3-e-d-glucoside) and so monospermoside, oil (yellow, tasteless), proteolytic and lipolytic enzymes, plant proteinase and polypeptidase, Resin contains from seed coat allophanic acid, Z- Amyrin, e-sitosterone its glucoside and sucrose; lactone-nheneicosanoic acid-delta-lactone, jalaric esters i, ii and laccijalaric esters iii, IV. and Sap contains colourless isomeric flavanone and its glucosides, butrin, chalcons, butein, butin (Sehrawat and Sultana 2006; Reddy et al. 2014; Divya and Rao 2015).

Curative properties

Butea plant has different Curative properties in various plant parts like anti-diarrheal, anti-stress, anthelmintic, antidiabetic, hepatoprotective, aphrodisiac, antifungal, astringent, anti-inflammatory, laxative, and antioxidant qualities. The butea plant flowers and leaves are diuretic, astringent, aphrodisiac, and increase the flow of blood in the pelvic region. The seeds of the tree have purgative, diuretic to stimulate the production of urine and anthelmintic i.e., anti-parasitic properties. The seed powder is used in the case of intestinal parasites. Palash tree bark yields a gum known as kino, which houses astringent properties to treat haemorrhoids (Madhav et al. 1967; Sehrawat and Sultana 2006; Reddy et al. 2014; Divya and Rao 2015).

Giloy or Guduchi or Amrita

Giloy, commonly known as "Amrita" or "Guduchi" a climbing shrub found throughout India. In other words, the fountain of life force is an apt title for this medicinal plant. The stems and roots are an integral constituent of several compound preparations (Khan et al. 2016). The species is endemic to India and is common throughout tropical and subtropical zones at an altitude of 600 m. The plant is found normally deciduous and dry forests. The plant is a large, deciduous plant that grows to 1-meter height and 0.5 meters wide extensively spreading climbing shrub with several elongated twining branches (Kumar et al. 2019b). *T. cordifolia* can be propagated by seeds and also vegetative cuttings. Stem cuttings are the best planting material for raising commercial crop. The cuttings can be obtained from mother plants in May to July (Kumar and Jnanisha, 2017a). The cuttings of the small finger thickness with 6 to 8-inch length long stem having 2 or 3 nodes are used. The healthy plants stem cuttings are sown directly in the ready field. The stem is harvested during autumn when it develops to a diameter of more than 2.5 cm and basal part is left for further growth (Singh et al. 2003).

Botanical Name: *Tinospora cordifolia* (Willd.) Miers.

Family: Menispermaceae

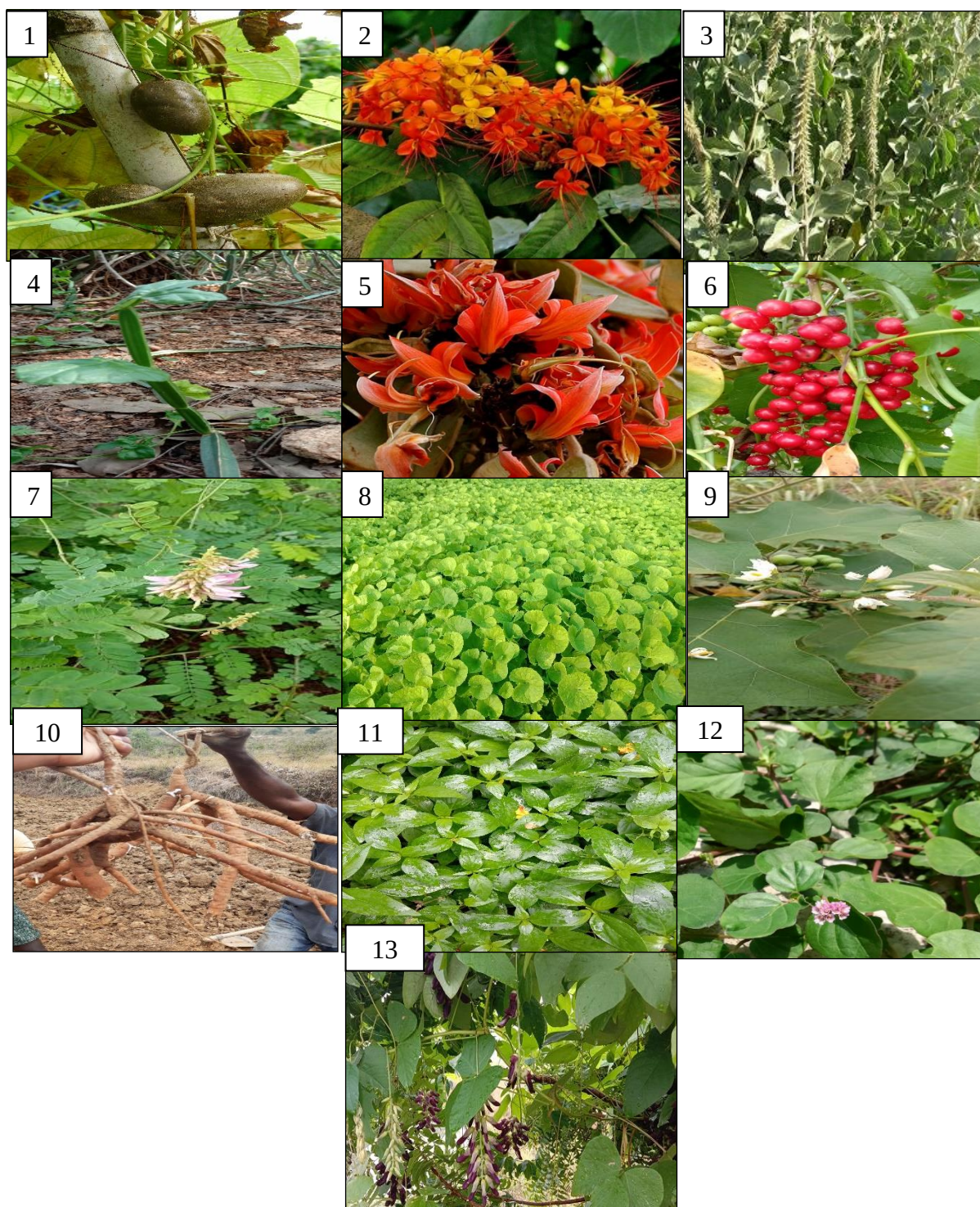


Figure 3: Plants uses as a Tribal Medicine; 1) *Dioscorea bulbifera*, 2) *Saraca asoca*, 3) *Achyranthes aspera*, 4) *Cissus quadrangularis*, 5) *Butea monosperma*, 6) *Tinospora cordifolia*, 7) *Abrus precatorius*, 8) *Centella asiatica*, 9) *Solanum Indicum*, 10) *Hemidesmus indicus*, 10) *Andrographis paniculata*, 12) *Boerhavia diffusa*, 13) *Mucuna pruriens*

Indian Name: Giloy (English); Giloe, Gurcha (Hindi); Guluchi (Oriya); Gulancha (Bengali); Galac, Garo (Gujrati); Amrutaballi (Kannada); Chittamrutu (Malayalam); Gulvel (Marathi); Agnisikha, Amrta, Amrtavallari, Amrtavalli, Guduchi, Jivantika, Vatsahani (Sanskrit); Gilo (Punjabi); Seendal, Seendilkodi (Tamil); Thippateega (Telugu); Gilau, Gulunch, Gurch, Jivantika, Vajra (Urdu) (Saha et al. 2012).

Origin and Distribution

The plant is distributed throughout the tropical region of India up to 1,200 m above sea level from Kumaon to Assam. It is common to grow throughout India, especially tropical areas, mainly in India such as Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Goa, Karnataka, Kerala, Maharashtra, Odisha, Sikkim, Tamil Nadu, Uttar Pradesh, and West Bengal (Hartmann et al. 1997). It is indigenous to India, Myanmar, Sri Lanka, China, Thailand, Philippines, Indonesia, Malaysia, Borneo, Vietnam, Bangladesh, North Africa, and South Africa. It is typically grown in deciduous and dry forests at elevations up to 1000 feet (Kumar et al. 2019).

Traditional Uses

There are over 400 different tribal and other ethnic groups in India and used giloy in ages for the treatment of fever, jaundice, chronic diarrhea, cancer, dysentery, bone fracture, pain, asthma, skin disease, poisonous insect, snake bite, eye disorders (Singh et al. 2003). The stem is bitter, stomachic, diuretic stimulates bile secretion, causes constipation, allays thirst, burning sensation, vomiting, enriches the blood, and cures jaundice. The root and stem of giloy are prescribed in combination with other drugs as an antidote to snakebite and scorpion sting. Leaves are used in Juice or decoction of leaves is administered orally with honey in fever (Khan et al. 2016).

Bioactive compounds

T. cordifolia contains high fibre (15.9%), sufficient protein (4.5%-11.2%), sufficient carbohydrate (61.66%), and low fat (3.1%). Its nutritive value is 292.54 calories per 100 g. It has high potassium (0.845%), high chromium (0.006%), sufficient iron (0.28%) and sufficient calcium (0.131%) (Hartmann et al. 1997).

Curative properties

This plant has great potential for developing useful drugs. The leaves extract has shown anti-HIV 1 activity. A dry bark of *T. cordifolia* has anti-spasmodic, antipyretic, anti-allergic, anti-inflammatory and anti-leprotic properties (Hartmann et al. 1997). The plant also bears antioxidant, anti-inflammatory, anti-tuberculosis; wound healing, immunomodulatory and immunoprotective, hepatoprotective, anti-osteoporotic, anti-cancer, anti-tumor, anti- malaria, cardioprotective nature and many more properties that make them a topic of great importance and interest (Sonkamble et al. 2015; Khan et al. 2016; Salkar et al. 2017).

Indian liquorice

Indian liquorice has seen growing wild throughout all tropical forests and is propagated through seeds: a woody-stemmed, dextrorse twining herb or climbing herb. The fruit is a legume (pea-shaped pod) about 3 cm long containing hard ovoid seeds (shiny, scarlet, and black in color) about 1 cm long. The seeds are red, with a black spot covering one end. Traditionally, leaves, roots, and seeds are used in tribal medicine (Narendra and Bapoda 2014).

Botanical Name: *Abrus precatorius* L.

Family: Fabaceae

Indian Name: Gunchi, Ganchi, Rati (Hindi); Runji, Gunja (Oriya); Kunni, Guruginia, Guruvenda (Telugu); Gunj (Marathi); Chunhali, Kunch (Bengali); Chanothi, Gunja (Gujarati); Ganji, Gul-Ganju, Guluganji, Madhuka (Karnataka); Liluwani, Raturmani (Assam); Kunnikuru (Malayalam); Chanoti, Gunchi, Gunja (Marathi); Gundumani, Kuntumani (Tamil); Labrigunchi, Ratak (Punjab) (Narendra and Bapoda 2014).

Origin and Distribution

Indian liquorice is a plant that originates from Southeast Asia and is native to India. It grows at altitudes up to 1200 m on the outer Himalayas. It is a common plant in Nigeria. Its plant is found in all the regions of India, from the Himalayas to southern India and Ceylon (Narendra and Bapoda 2014).

Traditional Uses

The parts of the Indian liquorice plant used medicinally in the tribal areas are the root, leaves, and seeds. Indian liquorice is traditionally used to treat tetanus and to prevent rabies. The plant is used in traditional medicine to treat scratches, sores, and wounds caused by dogs, cats, and mice. The herb's leaves are used to cough, cold and cure fever. The roots are used to treat hemoglobinuria bile and jaundice. Paste of roots is used to cure abdominal pains, tumors, and abortion. The root is chewed as a snake bite remedy. Dry seeds of Indian liquorice are used to cure worm infection (Kinjo et al. 1991; Narendra and Bapoda 2014)

Bioactive compounds

Indian liquorice is rich in various bioactive compounds. The leaves of Indian liquorice contain like abrine, trigonelline, abrusoside A, abrusoside B, abrusoside C, abrusoside D, glycyrrhizin and root of contains abrol, abrasive, precasine and precool, quinones-abruquinones A, B, C, D, E, F. Seeds are rich in several essential amino acids like serine, Abrusin, Abrusin-2'-O-apioside, hederagenin, kaikasaponin III, sophoradiol, sophoradiol-22-O-acetate, tryptophan, trimethyl, alanine, amyryl, alpha, ursolic acid, valine and methyl ester (Ali and Malek 1966; Georgewill 2009; Narendra and Bapoda 2014)

Curative properties

This plant is having different Curative properties in various plant parts like neuroprotective, anti-diabetic, anti-oxidative, anti-viral, memory enhancing, anti-convulsant, anti-epileptic, anti-depression, anti-helminthic, anti-serotonin, neuromuscular, immune-modulating, abortifacient, anti-implantation, anti-inflammatory, anti-arthritis, diuretic, anti-microbial anti-yeast and analgesic, anti-cancer, anti-fertility, anti-spermatogenic, antiestrogenic, anti-malarial, anti-allergic, anti-asthmatics, anti-cataract, anti-insecticide, anti-toxicity activity (Kinjo et al. 1991; Narendra and Bapoda 2014)

Indian pennywort

Indian pennywort is a prostrate, stoloniferous, perennial, creeper herb growing up to an average length of 15 cm. Its stem is glabrous, striated, rooting at the nodes, and the plant is propagating vegetatively by runners (stolons). Indian pennywort is one of the chief herbs for treating skin problems, healing wounds, and revitalizing the nerves and brain cells, hence primarily known as a "food for the brain" (Prasad et al. 2019)

Botanical Name: *Centella asiatica* (L.) Urban

Family: Apiaceae

Indian Name: Bemgsag, Brahma-Manduki, Gotukola, Khulakhudi, Mandookaparni (Hindi); Hingotukola (Oriya); Bhekaparni, Bheki, Brahmamanduki, Darduchhada, Divya, Mahaushadhi, Mandukaprnika, Manduki, Mutthil, Supriya, Tvasthi (Sanskrit); Kodagam, Kodangal, Kutakm, Kutannal, Muthal, Muttill, Muyalchevi Kanarese Brahmisoppu, Urage, Vandelagailikiwigidda, Vondelaga (Malayalam); Bekaparnamu, Bokkudu, Saraswataku, Mandukbrahmni, Saraswati (Telugu); Karinga, Karivana (Marathi); Babassa, Vallarai (Tamil); Thankuni, Thunimankuni (Tripura); Thankuni, Tholkuri (Bengal); Manimuni Deccan Vallarai (Assam); Chokiora Meghalaya Bat-maina (Bihar) (Kumar and Gupta 2002).

Origin and Distribution

The plant is native to Southeast Asia. It is a tropical climate plant found in India, Sri Lanka, China, Indonesia, Pakistan, China, Japan, Malaysia, Tropical America, South Africa, and Pacific islands. It is commonly found as a weed in crop fields and other waste places throughout India up to more than 600 m altitudes. In north-eastern hills, it is found up to 2500 m (Prasad 2019).

Traditional Uses

Indian pennywort is a common herbal medicine in India for different ailments like elephantiasis, leprosy, gastric catarrh, kidney troubles, ulcers, urethritis and leucorrhoea. Indian pennyworthas also been used extensively as a traditional remedy for a wide spectrum of ailments such as leprosy, psoriasis, eczema, dermatitis, ulcerous skin, wound burn, scar management, and adaptogenic and cardiotonic agents. Indian pennywort is also a good source of several micronutrients, iron, phosphorus, sodium, vitamin C, vitamin A, carotene, and dietary fiber (Prasad 2019).

Bioactive compounds

Asiaticoside, indocentelloside, thankuniside are the major glycosides responsible for the medicinal properties. The whole plants of *C. asiatica* contained several triterpene acids, saponine and sapogenins viz. brahmic acid, isobrahmic acid, brahmocides and brahminocide, thankuniside, tankunic acid, asiaticoside, Asiatic acid and madecassic acid, isothankuniside and isothankunic acid, madasiatic acid, asiaticosides A and B. The plant has been reported to contain alkaloids, glycosides, sterols, tannins, sugars and inorganic salts. It is said to improve memory and understanding and to cure leprosy, Jaundice and gonorrhea, and fever. Chakradatta directed the fresh Juice of the leaves to be given with milk and liquorice powder as an alternative tonic (Prasad 2019; Sakshi et al. 2010; Zainol et al. 2003)

Curative properties

It's potential antioxidant, anti-inflammatory, antipsoriatic, antiulcer, hepatoprotective, anticonvulsant, sedative, immunostimulant, cardioprotective, antidiabetic, cytotoxic and antitumor, antiviral, antibacterial, insecticidal, antifungal, neuroprotective, antioxidant. For lepra, other activities have been widely claimed in many reports and is very much related to its properties and mechanism of action of the plant's bioactive constituents, namely the triterpenic acid (asiatic acid made cassoside acid), triterpenic saponin (made cassoside and asiaticoside), flavonoids, and other phenolic compounds (Prasad 2019; Suguma et al. 1996; Kumar and Gupta 2002).

Indian Solanum

Indian Solanum is a commonly growing perennial herb, very prickly, diffuses bright green perennial weed with bright green leaves and zigzag stem, and is mostly found in the arid region. The berries are green and white strips when young but yellow when matured. The flowers are purple in colour and bloom in Oct-March of the year. The berries are yellow with many seeds (Varshney and Khan 1971). The plant is xeric in nature and can grow well in shady places and in areas that receive low rainfall. This species may also be inter-cropped in tree plantation sites.

Botanical Name: *Solanum Indicum* Linn.

Family: Solanaceae

Indian Name: Vanabharata, Badikateri (Hindi); Putirichunda (Malyalam); TellaMulaka (Telugu); Kandiarivaddi (Punjab); Kateli (Urdu); Kirugullia, Heggulla, (Kannad); Cheru Vazhuthina (Khare 2007).

Origin and Distribution

The species is commonly found throughout the tropical and subtropical India. Indian Solanum grows as a wild plant in many parts of India, particularly in arid regions where annual rainfall ranges from 750 mm to 1500 mm like Odisha, Andhra Pradesh, Telangana, Karnataka, Uttar Pradesh, Bihar, Madhya Pradesh, Manipur, Assam, West Bengal (Parmar et al. 2010).

Traditional Uses

Roots of Yellow berried nightshade are one of the important constituents of Ayurvedic preparation dashmularishta, used as a tonic for lactating mothers (Kumar et al. 2011). Kondh tribes of Dhenkanal district of Orissa, India is, using the hot aqueous extract of the matured fruits as a traditional medicine for the treatment of diabetes mellitus (Parmar et al. 2010). Fruits are used as a folk medicine to treat inflammatory problems as well as throat infections by the local people of Manipur, India. An entire plant is used for treating leprosy, dropsy, and cough by the folklore (Madhavi et al. 2014). Mukunda tribes of Rajasthan, India used the root paste for the treatment of hernia (Pandey et al. 2018). Root poultice used to treat the piles is practiced as a traditional medicine in many villages of South India. Seeds, along with mustard oil fumigation, are used as an excellent remedy for treating dental caries, teeth pain, pus formation, and associated swelling of gums (Panday et al. 2018). Stem, flowers, and fruits are used for relief in burning sensation in feet. Seeds are also used as a remedy for cough and asthma (Rahman et al. 2003).

Bioactive compounds

Plant Contains alkaloids, sterol, saponins, flavonoids and their glycosides, carbohydrates, fatty acids, amino acids, etc. The fruits are found to contain several steroidal alkaloids like solanacarpine and solamargine (Rahman et al. 2003).

Curative properties

This plant has different parts like roots, stem, leaves, fruits, and seeds pharmacological activities include hepatoprotective, cardioprotective, anti-asthmatic and mosquito repellents properties. Fruits are edible and used by the local people as folk medicines in treating throat infections and other inflammatory problems. A decoction of the fruits of the plant is used by tribal and rural people of Orissa, India for the treatment of diabetes (Rahman et al. 2003).

Indian Sarsaparilla

Indian Sarsaparilla has long been used as a folk medicine and found to be an important ingredient in ayurvedic and Unani preparations (Anonymous 1997). It is perennial, diffusely twinning or prostrate semi-erect shrub, a woody rootstock having numerous slender wiry lactiferous branches with purplish-brown bark. This plant is found throughout India growing under mesophytic to semi dry conditions in the plains and up to an altitude of 600 m. It is quite common in open scrub jungles, hedges, and uncultivated soil. It is found in India, Sri Lanka, Pakistan, Iran, Bangladesh, and Moluccas. It's a climbing vine plant found in the Upper Gangetic plain, eastwards to Bengal and Sundarbans and from Central provinces to Travancore and South India (Anonymous 2005). It having wider distribution in the Indian sub-continent, and the supply, mostly from the wild, would have been sufficient to meet the domestic demand for Ayurveda and folk medicine and for preparation of popular beverages like "nannari sherbet" in South India (Jnanesha et al. 2021).

Botanical Name: *Hemidesmus indicus* L. R. Br.

Family: Asclepiadaceae

Indian Name: Anantmool, Sugandhipala (Telugu); Magrabu (Hindi); Ananta (Sanskrit); Nannari (Tamil, Malayalam); Syama (Sanskrit); Namdaberu (Kannada); Sogadaberu (Kannada); sarsaparilla (English) (Aadhan and Anand 2018).

Origin and Distribution

Indian Sarsaparilla is widespread in the Indian Plains and the coast and in the mountains up to a height of 600 m, further beyond not exceeding 1000m. Globally the species is distributed in India, South East Asia, Sri Lanka, Pakistan, Iran, Bangladesh, Afghanistan and Malaysia. In India, it is found in mainly Southern India and Northern India, Sikkim and Peninsular India. This species is globally distributed in Indo-Malaysia. Within India, it is found in moist deciduous forests, scrub jungles, hedges and degraded sites from Upper Gangetic plains of North India to Assam and Peninsular India (Aadhan and Anand 2018).

Traditional Uses

Use of this plant against leucorrhoea at Bargarh district in Orissa and Sattordem Village of Goa has been reported (Sen and Behera 2000; Kamat 2001). Antipyretic use of this plant has also been reported (Singh and Kumar 1999). Siddique et al. (2004) have reported the use of *H. indicus* among the local people and herbal practitioners of Barind Tract of Bangladesh against diarrhea, rheumatism, fever, headache, asthma, eye disease, and wounds. Rajasab and Isaq (2004) have reported the use of *H. indicus* among the tribes of north Karnataka. Ayyanar and Ignacimuthu (2005) have reported traditional uses of Indian Sarsaparilla among the Kani tribals in Kouthalai of Tirunelveli hills, Tamil Nadu. Uses of Indian Sarsaparilla among the Korku tribe of Amravati district of Maharashtra have been reported by Jagtap et al. (2006). The Juice or drink prepared from Indian Sarsaparilla root is locally called as nannari or sugandhapala. The drink is medicinal, which cools the system, gives good appetite and acts as a blood purifier and it is also called as poor man's drink and roots are used for preparation of chutneys and pickles. It is a medicine for food indigestion, constipation and gas troubles. The drink nannari is served especially during special occasions to the people in the Deccan plateau region, and the roots are sold in important pilgrim centres and local shanties at throw-away prices. Decoction of leaves of Indian Sarsaparilla was prescribed by Charaka in a shallow complexion, loss of voice, cough, menstrual disorders and dysentery, whereas entire plant is prescribed for treating asthma, cough, abdominal swelling and aching limbs (Khare 2007).

Bioactive compounds

The roots of Indian Sarsaparilla contain hexatriacontane, lupeol, its octacosanoate, α -amyirin, β -amyirin, its acetate and sitosterol. It also contains new coumarino-lignoid-hemidesminine, hemidesmin I and hemidesmin II, six pentacyclic triterpenes including two oleanenes, and three ursenes. The stem contains calogenin acetylcalogenin-3-O- β -D-digitoxopyranosyl-0- β -D-digitoxopyranosyl-0- β -D-digitoxopyranoside. It also afforded 3-keto-lup-12-en-21 28-olide along with lupanone, 4-methoxy-3-methoxybenzaldehyde, lupeol-3- β -acetate, hexadecanoic acid, and 3-methoxy-4-5-methoxybenzaldehydglycosides-indicine and hemidine. The leaves contain tannins, flavonoids, hyperoside, rutin and coumarin. Leucodermalignoids such as hemidesminine, hemidesmin I and hemidesmin II are rare group of naturally occurring compounds present in leaves (Sethi et al. 2006).

Curative properties

The pharmacological activities includes antioxidant, analgesic activity, anti-arthritis activity, anti-cancerous activity, antipyretic activity, hepatoprotective activity, anti-diabetes activity, antimicrobial activity, antileprotic activity, antiacne activity, antithrombotic activity, antihyperlipidaemic activity, antinociceptive activity, wound healing activity, larvicidal activity, anticonvulsant activity, renoprotective activity, anti-ulcer activity, anti-psychotic activity, nootropic activity, antigenotoxic effect and anti-angiogenic activity. Due to the effective usage of this herb in biomedical science, it is essential to optimize the standard protocols for its propagation and enhancement of bioactive molecules (Sethi et al. 2006).

King of Bitters/Kalmegh

Kalmegh is used in traditional Siddha and Ayurvedic systems of medicine as well as in tribal herbal medicine in India and some other countries for multiple clinical applications. It grows erect to a height of 30-110 cm in moist shady places with glabrous leaves and white flowers with rose-purple spots on the petals (Kumar and Jnanesha 2021).

Botanical Name: *Andrographis paniculata* (Burm. f.) Wall. ex Nees

Family: Acanthaceae

Indian Name: Chirayata, Kalmegh (Hindi); King of Bitters (English); Kariyatu (Gujarathi); Nelaberu (Kannada); Kiriayattu (Malayalam); Olenkiryata (Marathi); Bhuinimba (Oriya); Kalmegh, Mahatita (Bengali); Nilavembu (Tamil); Kalmegha, Bhunimba (Sanskrit); Nilavembu (Telugu) (Farooqui and Khan 1993).

Origin and Distribution

Kalmegh is native to Southeast Asian countries, i.e., India, China, Taiwan and Sri Lanka. The species is cultivated in many parts of India, China, Thailand, the East and West Indies, and Mauritius (Subramanian et al. 2012). It is grown throughout the plains and hills in India, from Uttar Pradesh to Assam, especially in West Bengal and Mizoram. It is also cultivated in the southern part of India and naturally grown in wastelands, and road-sides. It is usually propagated from seeds during the rainy phase of the summer season (Kharif) crop in India (Kumar and Jnanesha 2021).

Traditional Uses

The leaves are bitter in taste, and it is also called as king of bitter. The chemical components present in it are andrographolide, neoandrographolite, and deoxyandrographolide. Normally, leaves and roots are

used for medicinal purposes. The Plant possesses febrifuge, tonic alterative, stomachic, constipation, cholera, diabetes, general debility, hookworm infestation, piles and stomach disorder. It is also used as a cure for torpid liver and jaundice (Kumar et al. 1993, Farooqui and Khan 1993).

Bioactive compounds

The root contains flavonoids-andrographin, panicolin, apigenin-4' 7-dimethyl ether, mono-O-methyl wightin and 5-hydroxy 7, 8, 2, 3-tetra methoxy flavones and leaves contain β -sitosterol, diterpenoid and sesquiterpenoid-paniculides ABC and andrographolides, neo-andrographolide and 13-labbadien-16, 15 olidel (Farooqui and Khan 1993; Singh et al. 1999).

Curative properties

Andrographolide has been identified as a major antihepatotoxic principle; clinical studies carried out indicate that this may be a beneficial drug in preventing and treating arterial thrombotic disease and it is also having antidiarrhoeal activity against *E-coli* and it also exhibit strong choleretic action. Flavones extracted from the root prevent the formation of thrombi and the development of myocardial infarction (Farooqui and Khan 1993; Zhao and Fang 1991; Singh 1983).

Punarnava

Punarnava is an annual or perennial, erect, ascending, creeping or climbing herb with club-shaped or stalked glands and glandular hairs while its root is spindle-shaped and often woody. The leaves are ovate-lance-shaped, white beneath but sometimes with red marginal glands. The flowers are arranged 1-12 together in cymose panicles. It is widely dispersed, occurring throughout India, the Pacific, and southern United States (Nayak et al. 2016).

Botanical Name: *Boerhavia diffusa* Linn.

Family: Nyctaginaceae

Indian Name: Ranga Punarnabha (Asamese); Hog weed (English); Motosatodo (Gujrati); Gadapurna (Hindi); Sanadika (Kannada); VanjulaPunarnava (Kashmiri); Kahtilla, Sophaghni, Sothaghni (Sanskrit); RaktaPunarnabha (Bengali); XhuvanaTazhtawa (Malayalam); Ghetuli (Marathi); Lalapuiruni (Oriya); khattan Punjabi; Mukurattai (Tamil); Erragalijeru (Telegu) (Nayak et al. 2016).

Origin and Distribution

Punarnava is originated throughout the warmer parts of the country up to an altitude of 2000 metres in the Himalayan region. It is perennial, spreading hogweed, commonly grown abundantly in waste places, ditches and marshy places throughout rains. It grows in dry open localities, pastures, along railroads, wastelands, waysides, on rocks and sand, and in secondary forests (Nandi et al. 1974; Nayak et al. 2016).

Traditional Uses

Among all the parts of the plant, the root part of Punarnava is widely used in the traditional system of medicine. It has been used in the Ayurveda system of medicine for thousands of years. It is used to treat gastrointestinal disorders, and leaves are used to treat dyspepsia, enlarged spleen, and general abdominal disorders. The leaves of Punarnava are often used as green vegetable in many parts of India. It is believed to improve and protect eyesight. It has diuretic properties and is used by diabetics to lower blood sugar. The whole plant is used in the treatment of Biliousness, Jaundice, Internal Inflammation, Constipation, Asthma and Congestion. It has been used as a blood purifier, cardi tonic and a treatment

for Anaemia, Leucorrhoea, Mascara, and as an antidote to snake venom. It has a generally warming effect on the body (Nandi et al. 1974; Nayak et al. 2016).

Bioactive compounds

Bioactive contains found in Punarnava roots diverse class of chemical compounds including phenolic glycoside, terpenoids, organic acids, boeravinones A-J (a group of rotenoids), flavone, isoflavone, flavonol, flavonoid glycoside, xanthone, Lignin, purine nucleoside, sterol, sterol ester, Punarnavine, sitosterol, Boeravinone, palmitic acid, steroids (ecdysteroid), fatty acid, hydrocarbons (Nandi et al. 1974; Nayak et al. 2016).

Curative properties

The plant in whole has a numerous medicinal property like anti-stress, hepatoprotective, anti-oxidant, Antidiabetic, anticonsulant, Anticarcinogenic, antimicrobial, anti-inflammatory, Antibacterial, Antifibrinolytic, Diuretic, Genoprotective, hypoglycaemic, Immunomodulator etc (Nandi et al. 1974; Nayak et al. 2016).

Velvet bean

Since some 50 years ago, farmers in some regions of Latin America have developed and disseminated the use of “Velvetbean” as rotation or associated crop to make a continuous. Mucuna is a popular Kharif crop in India (Rajeshwar et al. 2005). Mucuna thrives well in subtropical, tropical, and semiarid areas receiving 50–75 cm annual rainfall with plenty of sunshine. Mucuna grows better in warm, humid climates, with annual precipitation from 3.8 to 31.5 dm and temperatures between 18.7 and 30 °C; night temperatures of 21 °C promote flowering. The plants are sensitive to frost during the growing season, drought tolerant once established but do not tolerate excess moisture. They grow on various soil types, with pH between 4.5 and 7.7 (Hussian and Manyam 1997).

Botanical Name: *Mucuna pruriens* (L.) DC.

Family: Fabaceae

Indian Name: Cowhage, Kiwanch or Konch (Hindi); Velvet bean or Cowitch (English); Atmagupta or Kapikacchu (Sanskrit); Poonaiikkaali (Tamil), Alkushi (Bengali); Khaajkuiiri (Marathi) (Hussian and Manyam 1997).

Origin and Distribution

In India, the mature seeds of Mucuna bean are traditionally consumed by a South Indian hill tribe, the Kanikkars, after repeated boiling to remove anti-nutritional factors. It is widespread over most of the subcontinent and is found in bushes, hedges, and dry-deciduous, low forests throughout the plains of India. In India, 14 species are found in the foothills of the Himalayas, the plains of West Bengal, Madhya Pradesh, Karnataka, Kerala, Andhra Pradesh, Uttar Pradesh, the Andaman & Nicobar Islands, and Srilanka (Rajeshwar et al. 2005)

Traditional Uses

Mucuna pruriens is a good aphrodisiac and also a nervine tonic. It is used to treat spermatorrhea and diseases of the genitourinary system. It is considered a viable source of dietary proteins due to its high protein concentration (23–35%) and its digestibility, which is comparable to that of other pulses such as

soybean, rice bean, and lima bean. It is therefore regarded as a good source of food (Vermal et al. 2014).

Bioactive compounds

The velvet bean seeds are high in protein, carbohydrates, lipids, fibre, and minerals. The seeds of all *Mucuna* species contain a high concentration of L-dopa; velvet bean seeds contain 7-10% L-dopa. The main plant chemicals found in velvet bean include (Vermal et al. 2014): alkaloids, alkylamines, arachidic acid, behenic acid, beta-carboline, beta-sitosterol, bufotenine, cystine, dopamine, fatty acids, flavones, galactose d, gallic acid, genistein, glutamic acid, glutathione, glycine, histidine, hydroxygenistein, 5-hydroxytryptamine, isoleucine, l-dopa (Hussian and Manyam 1997), linoleic acid, linolenic acid, lysine, mannose d, methionine, 6-methoxyharman, mucunadine, mucunain, mucunine, myristic acid (Majekodunmi et al. 1997), niacin, nicotine, oleic acid, palmitic acid, palmitoleic acid, phenylalanine, pruriénidine, pruriénine, riboflavin, saponins, serine, serotonin, stearic acid, stizolamine, threonine, trypsin, tryptamine, tyrosine, valine, and vernolic acid (Tripathi and Upadhyay 2001).

Curative properties

Mucuna pruriens principal constituents are L-DOPA and the bioactive alkaloids mucunine, mucunadine, mucunidine, pruriénine and nicotine, as well as beta-sitosterol, glutathione, lecithin, oils, venolic and gallic acids. L-DOPA is a neurotransmitter precursor (Hussian and Manyam 1997), an effective drug for relief in Parkinson's disease (Majekodunmi et al. 1997). The seed is a prophylactic against oligospermia and is useful in increasing sperm count, ovulation in women (Verma et al. 2014).

FUTURE ASPECTS

Since ancient times, plants have been used as a source of medicine. Tribal people mostly use plants to treat a variety of ailments and infections. These medications are both safe and non-harmful to the environment. However, tribal communities and their legacy are being eroded due to urbanisation, deforestation, and industrialization. This chapter highlights the importance of a wide variety of plants in tribal medicine, which could be of great interest for research and drug development and the discovery of new bioactive substances that require further investigation. Medicinal plant knowledge gained from tribals would be useful for pharmacognosists and pharmacologists. Hence, more studies and research must be carried out to find out the ethnobotanical knowledge among the tribal groups.

The tribal people mainly rely on plants to cure many diseases and infections. But, nowadays, the tribal communities and their heritage are started to diminish due to urbanization, deforestation, and industrialization. The tribes employ the different parts of plants such as stem, fruits, leaves, bark, latex, root, rhizome, etc. for healing the diseases. The lifestyle of tribes has proven that plants are the potential source for treating many diseases and also for the maintenance of good health. So, the documentation of medicinal plants used by tribal communities will lead the way to acquire knowledge as well as for the development of novel drugs against various life-threatening diseases. Hence, more studies and researches must be carried out to find out the ethnobotanical knowledge among the tribal groups.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this chapter.

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Table1: List of Indian medicinal Plants used as a medicine by Tribal communities

Indian name	Scientific name	Family	Part (s) used	Traditional Uses	Curative properties	References
Aloe	<i>Aloe vera</i>	Liliaceae	Leaves	Liver complaints, vomiting, bronchitis, asthma, jaundice and ulcers. Relieves constipation, maintains a good gastric pH, helps in inflammatory bowel diseases, non-ulcer dyspepsis, gastric and duodenal ulcer	Anti-inflammatory, antifungal, antibacterial, anticancer, antioxidant, cytoprotective, antidiabetic and immunomodulatory activities	Rajasekaran et al. (2006)
Asthma Weed	<i>Euphorbia hirta</i>	Euphorbiaceae	Whole plant	female disorders, respiratory ailments (cough, coryza, bronchitis, and asthma), and worm infestations in children, Dysentery, Jaundice, Pimples, Gonorrhoea, Digestive problems, and Tumors	Antibacterial, Antimalarial, Anti-inflammatory, Galactogenic, Antiasthmatic, Antidiarrheal, Antioxidant, Antifertility, Antiamoebic, Antifungal	Kumar et al. (2010)
Arjun	<i>Terminalia arjuna</i>	Combretaceae	Bark	Cardiovascular diseases (CVD), ulcers, diabetes, cough, excessive perspiration, asthma, tumor, inflammation and skin disorders	Cooling, aphrodisiac, urinary astringent, fractures, cirrhosis of liver, hypertension	Amalraj and Gopi (2007); Singh et. al. (1999)
Bala	<i>Sida Cordifolia</i>	Malvaceae	Bark; Seeds, Roots	Diarrhea, dysentery, gastrointestinal and urinary infections, malarial and other fevers, childbirth and miscarriage problems, skin ailments, cardiac and neural problems	Antimicrobial, anti-inflammatory and analgesic, hepatoprotective, cytotoxic, cardioprotective, antitubercular, antioxidant, antidiabetic and antiobesity	Dindaa et al. (2015)
Babul	<i>Acacia arabica</i>	Legumes	Leaves; bark; flowers; pods:	Diarrhoea, dysentery, diabetes, astringent, anthelmintic, in	Anti-Microbial, Anti-bacterial, Anti-fungal, Anti-diarrheal, Anti-viral,	Chatterjee and Pakrashi (2002)

			gum	skin diseases, cough and bleeding piles; gonorrhoea and as an antiasthmatic, diuretic, leprosy, leucoderma, bronchitis, seminal weakness, utero-vesical disorders	Anti-inflammatory, Antibiotic, Anti-oxidant, Antispasmodial	
Black pepper, white pepper, green pepper	<i>Piper nigrum</i>	Piperaceae	Fruit	Used in food products, like syrups, jams, preserves, pickles, snacks, biscuits, and candies, treat chronic bronchitis, asthma, constipation, gonorrhea, paralysis of the tongue, diarrhea, cholera, viral hepatitis, respiratory infections, stomachache, bronchitis, cough and tumors	Antimicrobial, antioxidant, antihypertensive, antidiabetic, anticonvulsive, antifungal, antiviral, hypolipidemic, anticarcinogenic, chemoprotective, and prebiotic activities	Kumar et al. (2011)
Chebolic Myrobalan	<i>Terminalia chebula</i>	Combretaceae	Dried immature fruits	Useful in ophthalmia, hemorrhoids, dental caries, bleeding gums, ulcerated oral cavity	Antioxidant, laxative, astringent, anti-bilious and antidyentery	Jokarab et al. (2016)
Elephant Creeper	<i>Argyria nervosa</i>	Convolvulaceae	Whole plant	Treatment of gonorrhoea, strangury and chronic ulcers. A preparation "Fortege" made from this plant along with several other ingredients is used to cure sexual disorders in males.	Antiulcer, antitumour, antidiabetic, antifilarial, antiviral, antibacterial, antifungal, antifertility, antimicrobial and root useful in digestive, aperient, purgative, carminative and nervine	Anonymous (1995); Sing et al. (2000)
Five-leaved chaste tree	<i>Vitex negundo</i>	Lamiaceae	Leaves; seeds; roots	Chronic bronchitis, Nirgundi decoction is used for steam bath for arthritis, joint pains and sciatica. The dried leaves when	Astringent, febrifuge, sedative, tonic and vermifuge, inflammatory swelling of the joints formed due	Tandon and Gupta (2006); Khan (1993)

				smoked are said to relieve headache. Decoction of leaves is an effective gargle in stomatitis and sorethroat.	to rheumatism, hydrocele and splenic enlargement	
Gorakhbuti	<i>Aerva lanata</i>	Amaranthaceae	Whole plant	cure and prevention for Scurvy, Diarrhoea and Dysentery, strengthens stomach tissues and good for digestion	Anti-oxidant properties, nephroprotective values, hepatoprotective properties anti lithiatic activities (increased urinary excretion of calcium, oxalate and uric acid crystals), anti-diabetic/hypoglycaemic activities, and anti-cancer properties	Agrawal et al. (2013); Husain (1993)
Guggul	<i>Commiphora wightii</i>	Burseraceae	Resin	Cholesterol lowering effect, used to treat cardiac disorders	Hypolipidemic activity, anti-Inflammatory, antifertility, antioxidant activity, cardioprotective and antiarthritic Activity	Verma et al. (2010); Nohr et al. (2009); Ojha et al. (2008); Sing et al. (2000)
Indian madder	<i>Rubia cordifolia</i>	Rubiaceae	Roots	Arthritis, cephalalgia, cough, diabetes, discolouration of the skin, dysmenorrhoea, emmenagogue, general debility, hemorrhoids, hepatopathy, intermittent fevers, jaundice, leucorrhoea, neuralgia, pectoral diseases	Antiseptic, styptic, anodyne, depurative, urino-genital disorders	Prajapathi and Kumar (2003)
Indian borage	<i>Coleus amboinicus</i>	Lamiaceae	Leaves	Leaves of used in fever, hepatopathy, renal and vesicle calculi, cough, chronic asthma, hiccough, bronchitis, anthelmintic, colic	Antimicrobial, Antibacterial, Respiratory Disorders, Antiepileptic, Antitumorigenic, Anti-Inflammatory and Wound	Hullatti and Bhattacharjee (2011)

				and convulsions	Healing Activities	
Musk okra	<i>Abelmoschus moschatus</i>	Malvaceae	Whole plant	Useful in ophthalmopathy, cardiac debility, hyperdipsia, burning sensation, nausea, dyspepsia, ptyalism, vomiting, flatulent colic, diarrhea, strangury, asthma, bronchitis, calculi, halitosis, pectoral diseases leukoderma and general debility	antihysterical, baked products, stimulating and antispasmodic properties	Pawar and Vyawahare; (2017); Husain (1993)
Red lucky seed	<i>Adenanthera pavonina</i>	Fabaceae	Leaves	Asthma, boil, diarrhoea, gout, inflammations, rheumatism, tumour and ulcers, and as a tonic, blood disorders, arthritis, rheumatism, cholera, paralysis, epilepsy, convulsion, spasm and indigestion	Antidiabetic, antibacterial, antifungal, cytotoxicity, antioxidant, analgesic, anticonvulsant, depressant, and anti-inflammatory activity	Sophy et al. (2015); Sing et al. (2000)
Salai guggul	<i>Boswellia serrata</i>	Burseraceae	Gum; Resin	Chronic inflammatory diseases including chronic ulcerative colitis, rheumatoid arthritis, crohn's disease, and bronchial asthma; in addition to its anti-depressive and beneficial effects in brain tumor patients	Anti-inflammatory, anti-arthritis, anti-rheumatic, anti-diarrheal, anti-asthmatic, anti-microbial anti-fungal, anti-complementary	Shah et al. (2017)
Vasaka	<i>Adhatoda vasica</i>	Acanthaceae	Leaves; seed	Cough, colds, asthma, to liquefy sputum, as a bronchodilator, bronchial catarrh, bronchitis, and tuberculosis. A number of parts of	Antibacterial, antifungal, hepatoprotective, antimutagenic, antitussive, anti-inflammatory and antiulcer,	Gulati et al. (2021)

				the plant are commonly used in the forms of decoctions or powders. The juice from the leaves is also frequently used.		
Vajradanti	<i>Barleria prionitis</i>	Acanthaceae	Leaves; roots	Pacifies vitiated vata, pitta, gingivitis, stomatitis, burns, dental caries, inflammations ascites, edema, wounds, nocturnal ejaculation and cracking heel	Antimicrobial activity, anthelmintic activity, antidiarrheal activity, antioxidant activity, antifertility activity, anti-diabetic activity, anti-inflammatory and antinociceptive activity	Banerjee et al. (2020); Husain (1993)
Vishnukantha	<i>Evolvulus salsinoides</i>	Convolvulaceae	Whole plant	Neurodegenerative diseases as brain tonic, amnesia and asthma, epilepsy and as a hepatoprotective	Antimicrobial, Antimicrobial, Antimicrobial, Antioxidant	Harshavardhini et al. (2021)