

## Medicinal plants use for home remedies in Sri Lanka: A Review

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### ABSTRACT

Sri Lankan home gardens are rich in variety of medicinal plant species. Almost all the parts of the plant have medicinal value hence they are used in traditional Ayurvedic practices. However, leaves, roots, flowers, bark, fruits and rhizome have more medicinal value compared to other plant organs. The present review identifies twenty-five common medicinal plant species that can be easily found in home gardens of Sri Lanka while discussing their applications as home remedies. These plant species could be used to treat stomach pain, diabetes, fever, asthma, constipation, piles, dysentery, menstrual disorders, snakebite and skin diseases due to their biologically active ingredients and medicinal qualities related to antioxidant, antibacterial, anti-inflammatory, antiproliferative, antiviral and anti-cancer.

**Keywords:** Anti-inflammatory, anti-oxidant activity, home remedies, medicinal plants

### INTRODUCTION

Medicinal plants have been recognized for their use in traditional medicine practices since prehistoric times. The potential of plant products in therapeutic and curative ability have been identified back to over five thousand years past, because there is evidence of its use in the treatment of many diseases in Sri Lankan, Chinese, Indian, Egyptian, Greek and old Roman civilizations as well. In Sri Lanka, many medicinal plants have been used as ayurvedic herbs as well as home remedies (Mahesh and Satish, 2008; Nanayakkara and Ekanayake, 2008). Usually, plants synthesize thousands of metabolites (phytochemicals) for their physiological and functional purposes such as defense against diseases, insects, fungi, and many higher animals. These phytochemicals have the potential to establish biological activities which is useful in medicinal purposes. Previous studies showed the potential of medicinal plants to be used as home remedies due to their antioxidant, anti-inflammatory, anti-bacterial, antiviral, antibacterial, antifungal and anthelmintic, properties (Singh, 2015; Samy and Ignacimuthu, 2000; Palombo and Semple, 2001; Kumarasamy *et al.*, 2002; Bylka *et al.*, 2004). For thousands of years, they have been used to treat and prevent many types of diseases along with epidemics conditions. Some medicinal plants are utilized as pleasant condiments to flavor and colour conserve foods. Further, medicinal

plants are used in pharmaceutical, cosmetic and agricultural and food industries (Bamola *et al.*, 2018; Arseculeratne *et al.*, 1985; Nanayakkara and Ekanayake, 2008; Perera, 2012).

Sri Lanka is one of the biodiversity hotspots in the world with a highest biodiversity per 10,000 square kilometers in Asia (Merritt *et al.*, 2019). Traditional medicine has been practiced in Sri Lanka for 3,000 years (Fernando, 1993). At present, four traditional medical systems can be found in Sri Lanka including Ayurveda, Siddha, Unani and Deshiya Chikitsa (Sri Lankan traditional treatment) (Perera, 2012; Fernando, 1993; Kankanamalage *et al.*, 2014). The present article reviews medicinal properties and chemical constituents of twenty-five commonly grown pot herbs, medicinal plants, shrubs and climbers that belong to different families which are considered as ingredients for home remedies in Sri Lanka.

### HOME REMEDIES

Home remedies can be explained according to medicinal definition as ‘simply prepared medication or tonic often of unproven effectiveness administered without prescription or professional supervision’. Home remedies also named as “folk remedy” can be identified as traditional therapy often utilizing natural products as nutritional supplements or as physical measures. Home remedies come with their effectiveness supported by familial, local, or

culturally accepted stories or rituals (Mahesh and Satish, 2008; Fernando, 1993). Common home grown medicinal plants such as ginger, turmeric, centella, moringa, sugar cane, ash plantain, ash pumpkin, amla are widely used as remedies (Fernando, 1993; Jayaweera, 1980). Also, known common herbs *Mimosa pudica*, *Gymnema sylvestre*, *Plectranthus zatarhendi*, *Hemidesmus indicus*, *Phyllanthus debilis*, *Tinospora cordifolia* are often used as home remedies (Singh, 2015; Fernando, 1993). Migraine, pimples, prickly heat, worm diseases, toothaches, headaches, fever, cold, muscle cramps like many common diseases are treated using home remedies by Sri Lankans (Fernando, 1993; Bamola *et al.*, 2018; Ediriweera, 2010).

## COMMONLY GROWN HOME-GARDEN MEDICINAL PLANTS IN SRI LANKA

### 1. Ginger (*Zingiber officinale*; Family-Zingiberaceae)

Ginger is a mostly used medicinal plant in Ayurvedic, Chinese, Unani medicines and as home remedies for many ailments such as pain, inflammation, diarrhea, gastrointestinal disorders, stomach aches, vomiting and diarrhea (Srinivasan, 2017). It is commonly grown in many areas of Sri Lanka. Its rhizome is used for the purpose. Many experiments showed that ginger and its active components, 6-gingerol and 6-shogaol, showed anticancer activities against gastro-intestinal cancers (Prasad and Tyagi, 2015; Imo and Za'aku, 2019). The small amount of dry ginger and salt paste is used to increasing appetite. Ginger along with lime and honey is used to treat cough (Fernando, 1993). For diarrhea and colic, a liquid extract of raw ginger, Iriveriya (*Plectranthus zatarhendi*) and Undupiyaliya (*Desmondium triflorum*) mixed with a tablespoon of lime juice and bee honey is used as a remedy. Also, sipping hot ginger tea is a popular and effective sore throat home remedy among many Asians. Ginger and coriander together is used as a remedy for inflammation of the throat and cold. (Malu *et al.*, 2009; Kumar Gupta and Sharma, 2014).

### 2. Turmeric (*Curcuma longa*; Family-Zingiberaceae)

Turmeric is used as a spice and/or food coloring agent by Sri Lankans. Its rhizome is used for the

purpose. Its possible mechanism of action was examined by many researchers. Variety of biological activities including anti-inflammatory, hepatoprotective, antimutagenic and antineoplastic properties due to its phyto-chemical compounds curcuminoids (curcumin and closely related substances) (Tilak, 2004; Hay *et al.*, 2019) were documented may researchers. Turmeric is commonly used to treat skin diseases, fungal infections, pimples and other skin enhancement therapies. For skin diseases, turmeric and neem (*Azadirachta indica*) leaves are boiled together and water extract is used to wash the infected areas. For the fungal infections of the skin, ground raw turmeric and Aththora (*Cassia alanta*) past is applied. A mixture of ground turmeric along with undupiyaliya (*Desmondium triflorum*) is applied for pimples. Also, turmeric's anti-inflammatory, antiseptic and expectorant properties give the ability to fight against cold and chest ailments speedily (Verma *et al.*, 2018; Fernando, 1993).

### 3. Tulsi/Iriweriya (*Plectranthus zatarhendi*; Family-Lamiaceae)

*Plectranthus zatarhendi* is a plant found in many parts of the country and a common herb in Sri Lankan home gardens. It is a semi-shrubby aromatic perennial (Jayaweera, 1981). Its active compounds are hexatriacontane, lupeol, tannins and oleananes, which are antioxidants and volatile. It has a pleasant aroma when crushed. Its leaves, roots, stems are used. Due to its aromatic qualities, it is used in many remedies for fever, vomiting, diarrhea, excessive thirst and tarantula bites. Dip Iriweriya (*Plectranthus zatarhendi*) roots in water and mix with bee honey and use it to treat diarrhea is a common remedy in Sri Lanka. Further, the oil extracted from *Plectranthus zatarhendi* could be used as hair oil which has aromatic as well as the cooling effect in addition to its ability in hair growth (Fernando, 1993; Lukhoba *et al.*, 2006).

### 4. Red onion (*Allium ascalonicum*; Family-Alliaceae)

The famous folk remedy to keep raw onions in the room when you are sick with cold or fever is very popular for a long time. The bulbs are used. The main active constituents in red onion are phytonutrients like flavonoids, fructo-oligosaccharides, and thiosulfates and other sulfur

compounds (Slimestad *et al.*, 2007) which may facilitate its medicinal properties like anti-inflammatory, detoxifying, antioxidant. Previous studies have shown that the effect of onion on fasting blood sugar and its antioxidant activity on many health benefits (Lukhoba *et al.*, 2006). However, red onion is used for many detoxifying remedies for centipede bites, spider bites, some aches, pains etc. Furthermore, red onion is used in many food recipes in Sri Lanka. Even red onion is a popular ingredient in many home remedies for nausea, stomach pain, and other health issues (Jayaweera, 1980; Fernando, 1993; Kumar *et al.*, 2010).

#### 5. Garlic (*Allium sativum*; Family- Alliaceae)

Garlic is quite well-researched herbal remedy which holds a unique position in history, traditionally used for treating infections, heart disease, colds, diabetes and many other disorders. The bulbs are used. Clinically, garlic has been proven for lowering blood pressure, cholesterol, glucose concentrations (Tsai *et al.*, 2012; Imo and Za'aku, 2019). *Allium sativum* is generally attributed to its rich content of sulfur-containing compounds, alliin, g-glutamyl cysteine, and their derivatives (Tsai *et al.*, 2012). It is used to flavor foods as well as treating swellings, detoxifying and reduce cholesterol levels. Garlic is grinding together with curry leaves (*Murraya koenigii*) and Goraka (*Garcinia zeylanica*) until it becomes a paste and adding it to the meal is a commonly used home remedy for cholesterol among Sri Lankans. Garlic is also used as a gastric stimulant agent that aids the digestion and absorption of food. With mustard, garlic is used to treat paralytic and rheumatic affections. *Allium sativum* bulbs are even recommended for high blood pressure. Among many common remedies consuming 5-6 garlic cloves with boiled milk, turmeric and jiggery is known to be a treatment for long-term cold and cough. In addition to that, applying garlic with butter can heal wounds and consuming garlic with sugar syrup helps to treat cough and provides effective relief for cough, nasal congestion and sore throat. (Fernando, 1993; Jayaweera, 1980; Imo and Za'aku, 2019).

#### 6. Curry leaf tree (*Murraya koenigii*; Family- Rutaceae)

Curry leaf is a popular medicinal plant easily found in Sri Lankan home gardens used for many

home remedies. The leaves, roots, bark, stalks and flowers all parts have medicinal values (Fernando, 1993; Jayaweera, 1982). Its active phytochemicals are oxygenated monoterpenes which have antioxidant and anti-inflammatory properties. All parts of the plant are used to de-poison snake venom along with some other herbs. Especially the bark and the roots are used as a stimulant by the physicians externally to cure eruptions and the bites of poisonous animals (Singh, 2014). It is used as a treatment for nausea, coughs and fever (Jayaweera, 1982). Curry leaves (*Murraya koenigii*) with Goraka (*Garcinia zeylanica*) paste is used to reduce blood cholesterol (Fernando, 1993; Jayaweera, 1982). Further more, it is used to treat for diarrhea, dysentery, indigestion, peptic ulcers, diabetes and weight loss. *M. koenigii* leaves are used to flavor curries. Also, due to its presence of iron content in leaves, they have found to be solving some problems of anemia. Even curry leaves are used in fresh, dry, paste, or oil form in skin and hair care remedies. *Murraya koenigii* oil is a very popular hair growth-promoting oil among Sri Lankans (Jayaweera, 1982; Singh *et al.*, 2014)

#### 7. Ballon plant (*Cardiospermum halicacabum*; Family- Spindaceae)

*Cardiospermum halicacabum* is an annual herb that can be found as plenty of wiry, smooth, climbers in Sri Lankan home gardens. It is intensively used by the Sri Lankans to make herbal porridge (*Kola kanda*). It shows good results on allay pains, abnormal suppression of menses and other fertility problems of humans. Leaves, roots, fruits are used. The leaves are used as a poultice for skin eruptions. A paste of *Cardiospermum halicacabum* leaves can be used as a dressing for wounds and sores (Fernando, 1993; Jayaweera, 1982). Also, it is used to treat dysentery, rheumatoid arthritis, back pain and hernia and even has been used in traditional medicine for nervous diseases (Jayaweera, 1982).

#### 8. Castor (*Ricinus communis*; Family- Euphorbiaceae)

Leaves, roots, bark, seeds are used for various purposes.. The plant is 3.5-13.5m tall with hollow stems. Seeds are used to extract oil which contains a higher proportion of fixed oil with active components of ricin and an alkaloid ricinine. This chemical ricinine is found in leaves and stems

appear to be non-toxic though the seed is poisonous. Castor is used in many traditional medicinal preparations (Ahmed and Urooj, 2010; Jena and Gupta, 2012). Leaves are used externally for headaches and stomachaches as a boil and rheumatism. The paste of castor roots are applied for toothaches. The root bark is found to be purgative and used as a remedy for skin diseases, burns and sores. A poultice of *R. communis* leaves applies externally to women breast to increase the secretion of milk. The bark is used for dressing sores (Jayaweera, 1980).

**9. Aloe (*Aloe vera*; Family – Asphodelaceae )**

*Aloe vera* is a bushy herb with short, thick and fleshy leaves, remedy for skin burns, sunburns and pimples. Leaves/ inner gel are used. Applying Aloe gel on dehydrated skin is commonly practiced. Raw Aloe gel is used to treat gastritis and abdominal pains. *Aloe vera* is used to produce many cosmetic products (Reynolds, 2004; Bamola, 2018). Its active compounds are Vitamin A, C, E, Carotenoids which provide antioxidant, antibacterial, anti-inflammatory effect. Anti-inflammatory and wound healing characters of *Aloe vera* have been scientifically tested (Udupa *et al.*, 1994; Davis and Maro, 1989). Aloe is used for coughs, constipation, asthma and nervous diseases in traditional medicine. The fresh gel of the leaves has cathartic and cooling ability and use for various eye diseases. To reduce swellings and promoting granulation in ulcers, the dried Aloe juice along with lime is applied as a remedy. It is mixed with milk and given for dysentery and pains in the kidney. *Aloe vera* gel also applied as a remedy for preventing hair loss and cure baldness, to avoid dryness in the skin as a natural moisturizer (Debjit, 2019; Jayaweera, 1981; Reynolds, 2004; Bamola, 2018).

**10. Indian sarsaparilla (*Hemidesmus indicus*; Family- Peripolocaceae)**

Indian sarsaparilla is a twining slender prostrate or semi-erect shrub commonly found in home gardens. The whole plant is used for medicinal purposes and active ingredients are alkaloids and glycosides, which have anti-inflammatory properties. The root is used to treat a wide variety of illnesses. This root of the herb can treat patients with chronic skin disease and other conditions such as cough, genitourinary disease, and rheumatism. *Hemidesmus indicus* has the potential to increase

appetite, reduce body heat, resolve urine problems etc. This herb is so far identified as a remedy for face skincare (Das and Sigh Bisht, 2013). *Hemidesmus indicus* whole herb is boiled with water and washing out the skin is practiced (Fernando, 1993). This herb is also used to make herbal drinks, tonics and congees as well. *Hemidesmus indicus* is an ingredient for preparations for edema, skin rashes, coughs, asthma and piles (Jayaweera, 1982).

**11. Pepper (*Piper nigrum*, Family -Piaparaceae)**

Pepper is a climbing perennial commonly found in Sri Lankan home gardens mainly used as a spice. Its active phytochemical is piperine. However, it is used for many remedies including treating dry cough, wheeze and sneezing. Its leaves, root and seeds are used for the purposes. People use black pepper for arthritis, asthma, upset stomach, bronchitis, bacterial infections cause diarrhea / cholera, colic, depression, gas/bloating, headache, menstrual pain, stuffy nose, sinus infection, dizziness, discolored skin (vitiligo), weight loss and cancer conditions (Takooree *et al.*, 2019; Fernando, 1993). Pepper is an ingredient in many traditional medicines. For cough, pepper and sour orange (*Citrus aurantium*) extract or pepper powder along with sugar and bee honey is used (Fernando, 1993) Furthermore, for many remedies for colds, asthma, worm infections and fever includes pepper can be found as a valuable ingredient (Jayaweera, 1982; Fernando, 1993).

**12. Sour orange (*Citrus aurantium*; Family- Rutaceae)**

*Citrus aurantium* is an under cultivated tree in Sri Lanka. A tree about 10 m tall bears sour juicy fruits. Fruits and leaves are used for the purposes. It is a well-known remedy for acidity and bloating drinks. Extracted juice of sour orange fruit together with sugar or bee honey is used for cough and cold (Suryawanshi, 2011; Fernando, 1993). *Citrus aurantium* is a popular treatment for inflamed glands and tonsils, chronic cough and scorbutic conditions. Furthermore, the fruit of sour orange is used in various herbal medicines as a stimulant and appetite suppressant. Even sour orange has found effective for various diseases such as aid in digestion and relieves cardiovascular health, anti-cancer, treatment for strokes etc. (Jayaweera, 1982; Fernando, 1982; Suryawanshi, 2011). Many health

professionals recommend dried sour orange peel (1-2g) simmered for 10 to 15 min in a cup of water daily as detoxifying drink and appetizer (Suryawanshi, 2011).

**13. Stone breaker /Pita wakka** (*Phyllanthus debilis*; Family- Euphorbiaceae)

*Phyllanthus debilis* is an annual herb used to treat swellings, wounds, coughs, skin rashes, asthma, gonorrhea, coughs, dysentery, diarrhea, fever, ringworm, jaundice, scabies, sores, bruises, tuberculosis ulcers and liver diseases (Jayaweera, 1980). Drinking finely ground plant mixed with pure fresh cow milk is a common remedy for urine problems (Fernando, 1993). This herb has anti-inflammatory properties and leaf juice taken orally for many remedies. Even the *Phyllanthus debilis* herb has been shown to possess maximum antioxidant activity compared to some other species in the genus *Phyllanthus* (Sarin, 2014; Jayaweera, 1980). Roots and leaves are used for the purposes.

**14. Drumstick plant** (*Moringa oleifera*; Family- Euphorbiaceae)

Seeds, roots, bark and leaves are used for various purposes. It is a tall tree with pinnate leaves which has long pods 18-45 cm long (Jayaweera, 1980; Gandji *et al.*, 2018). Pods are cooked in coconut milk sauce while leaves are added to some other curries and bark is added to pickles. *Moringa* leaves are rich in nutrition. Hence it could be used to fulfill the nutrient requirement of people who are suffering from deficiencies. *Moringa oleifera* reduce in blood sugar and cholesterol level. Its active ingredients are alkaloids and glycosides. *Moringa* has antioxidant, antifungal, antiviral, antidepressant and anti-inflammatory effects and can protect against arsenic toxicity. Bark, seeds, roots and resin are used in medicinal preparations for piles, skin diseases and worm diseases. It helps to increase appetite and the function of the kidneys and heart, good for swelling, parasitic diseases and matures tumors (Liyanaratne, 2003; Coppin *et al.*, 2013; Jayaweera, 1980).

**15. Sensitive plant / Sleeping grass** (*Mimosa pudica*; Family- Mimosaceae)

The whole plant of *Mimosa pudica* used in folk medicines (Fernando, 1993; Dassanayake and Fosberg, 1980) due to its phytochemical mimosine. It contains the toxic alkaloid, mimosine, which has been found to have antiproliferative and apoptotic

effects (Bamola, 2018). It has been used for treating piles, bleeding ulcers, bleeding wounds, swellings and fistula. Some herbal doctors recommend *Mimosa pudica* for bronchitis. All five parts of the plant; leaves, flowers, stems, roots and fruits are used as medicines in traditional health care methods. This sensitive plant is commonly used for bleeding disorders like menorrhagia, dysentery with blood, mucus and piles and used as an ingredient in many remedies that can cure skin diseases and poisons (Jayaweera, 1982; Dassanayake and Fosberg, 1980).

**16. Heart leaved mooseed** (*Tinospora cordifolia*; Family- Cucurbitaceae)

It is a comparatively big climber native to Sri Lanka. It has been used for treating fevers, skin diseases, chronic diarrhea and anemia (Jayaweera, 1980). *Tinospora cordifolia* is used as a remedy to enhance digestion. Stem and roots are used for the purposes. An infusion of its stems is used as an alternative tonic for blood purifying purposes. *Tinospora cordifolia* could be used to reduce diabetes. A drink prepared with bee honey and dried powder of thippili (*Piper longum*) fruit is popular among Sri Lankans (Fernando, 1993). Antiviral infections, anticancer, ant diabetes, the antiseptic activity of *Tinospora cordifolia* are due to presence of alkaloids like Berberine and Choline (Mittal *et al.*, 2014), Diterpenoid Lactones, Steroids and Sesquiterpenoid (Mittal *et al.*, 2014; Modi *et al.*, 2020; George *et al.*, 2016; Jayaweera, 1980).

**17. Centella** (*Centella asiatica*; Family- Apiaceae)

A very common bush or creeping type plant found in Sri Lankan home gardens and often consume as a fresh salad. The whole plant is used for various purposes. *Centella asiatica* is a type of leafy plant traditionally used in Asian cuisines. It has a long history of use in both traditional Chinese medicine and Ayurvedic medicine. It is a perennial plant indigenous to the tropical wetlands of Southeast Asia, where it is commonly used as a herbal juice, tea, or green leafy vegetable (Dassanayake and Fosberg, 1980). *Centella asiatica* is used for infections, for the prevention of Alzheimer's disease and blood clots. Further, it is well known for treating or preventing anxiety, asthma, depression, diabetes, diarrhea, fatigue,

indigestion and stomach ulcers (Fernando, 1993; Jayaweera, 1982; Dassanayake and Fosberg, 1980).

**18. Shoe flower** (*Hibiscus rosa-sinensis*; Family- Malvaceae)

A large flowering shrub with simple alternative leaves bears flowers throughout the year. Its leaves, stems and roots are used for various purposes. Leaves and young flower buds are used as a poultice on boils and swellings. The root is given for fever, cough and venereal diseases. Flowers can be used as poultice to enhance hair moisture and reduce hair damage (Jayaweera, 1982). Remedy for skincare, for example, an extract from the flowers of *Hibiscus rosa-sinensis* has been shown to function as an anti-solar agent by absorbing ultraviolet radiation and for hair care treatments (Nevade *et al.*, 2011; Bamola, 2018; Al-Snafi, 2018; Jayaweera, 1982).

**19. Morning mallow/Gas bavila** (*Sida acuta*; Family- Malvaceae)

*Sida acuta* is a branched shrub distributed all over the country which flowers all year around. The leaves, stems and roots of *Sida acuta* have been used for traditional medicine. This plant contains alkaloids and asparagine. Roots and leaves are decoction and given for hemorrhoids, fevers, impotency and rheumatism. Crushed leaves with gingerly oil are applied for boils. The juice of roots and leaves are used to remove intestinal worms. (Mahmood *et al.*, 2010; Jayaweera, 1982). In addition to that, the root is used as a treatment for bladder irritability and mild cases of fever (Jayaweera, 1982). The pharmacological properties of *Sida acuta* include antimicrobial, antioxidant, anti-plasmodial, cytotoxic activities may be the reason behind these usages and many medicinal values (Karou *et al.*, 2007; Jayaweera, 1982).

**20. Lasia** (*Lasia spinosa*; Family-Araceae)

*Lasia spinosa* is a stout stemmed marshy plant growing up to 4 m in height with a thick spiny creeping stem. Stems and young leaves are edible. Leaves are simple and long-petioled 15-45 cm long. Frequently, it is cultivated in marshy areas of home gardens in Sri Lanka. The leaves, stems and roots are used as a common remedy for piles, dyspepsia, stimulating liver functions (Jayaweera, 1980; Fernando, 1993). It is well-known remedy for constipation. Acongee made out with stem is a popular drank to get rid of constipation

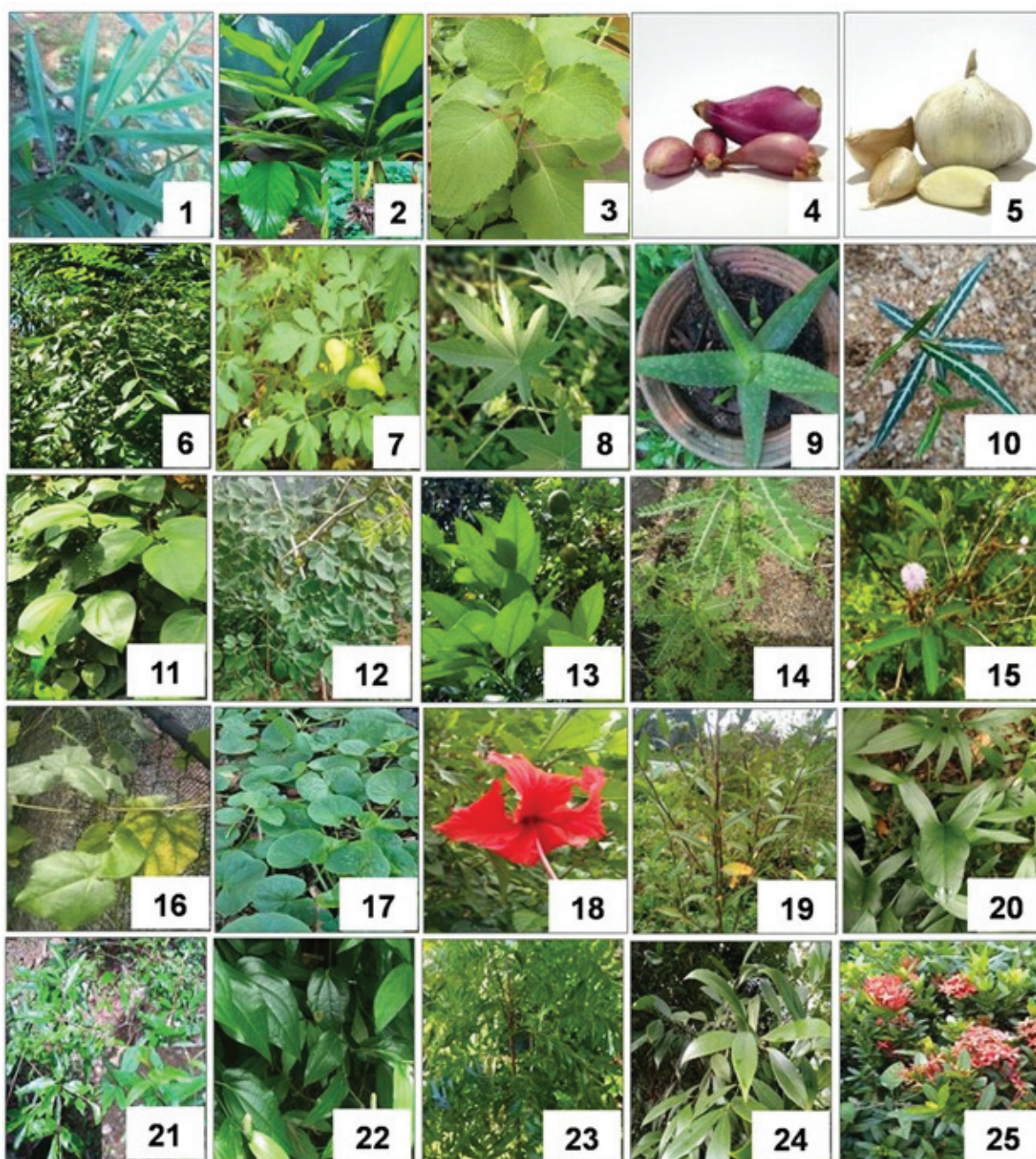
(Liyanaratne, 2003; Tsai *et al.*, 2012; Jayaweera, 1980).

**21. Pomegranate** (*Punica granatum*; Family-punicaceae)

Pomegranate can be considered as a large shrub or small tree with 3-5 m tall and slender angular branches. Its flowers, leaves, fruits, root are bark are used for various purposes. The biological properties of pomegranate extracts (antimicrobial, antioxidant, anticancer, anti-inflammatory, among other properties) have been tested and used in therapeutics, such as in the prevention of infection, inflammation, cancer, among other applications (Miguel *et al.*, 2010; Lansky *et al.*, 2000). It is a remedy for eye infections, worm diseases, asthma and fevers. For eye infections, leaves are boiled in water and washed eyes thoroughly. The root bark is specifically useful for tapeworm and tuberculosis diseases in children. Fruit contains inverted sugar, enzymes, citric acid and malic acids as well as rich in vitamin C and Iron. The fruit is used to treat diarrhea, dysentery and given to cancer patients. Furthermore, the bark of stems is used as a medicine due to its anthelmintic properties (Fernando, 1993; Jayaweera, 1982).

**22. Long Pepper** (*Piper longum*; Family-Piperaceae)

It is a perennial herb or climber with cylindrical spikes with small blackish-green fruits. Immature spikes, roots have medicinal properties are used. Chronic bronchitis, fever, cough, piles can be treated using *Piper longum* as an ingredient in many remedies. (Jayaweera, 1982). Extract of *Piper longum* fruits has been tested for its immunomodulatory, anti-inflammatory and anti-asthmatic properties. Fruit of *Piper longum* contains alkaloids of piperine, volatile oils and resins (Vinay *et al.*, 2012). The fruit is also used with other ingredients to treat enlargements of the spleen and some other abdominal viscera. *Piper longum* fruit is a stimulant for the urethra and rectum and it enhances gastric secretion and improves appetite. Therefore, many remedies to increase appetite include *Piper longum* as an ingredient. The roots are used due to their laxative, carminative and expectorant properties in Sri Lankan traditional medicine (Ali *et al.*, 2007; Khushbu *et al.*, 2011; Jayaweera, 1980).



**Fig. 1:** 1- *Zingiber officinale*; 2- *Curcuma longa*; 3-*Plectranthus zatarhendi*;4- *Allium ascalonicum*; 5- *Allium sativum*; 6- *Murraya koenigii* 7-*Cardiospermum halicacabum*; 8- *Ricinus communis*; 9- *Aloe vera*; 10-*Hemidesmus indicus*; 11- *Piper nigrum*; 12- *Citrus aurantium*; 13-*Phyllanthus debilis*; 14- *Moringa oleifera*; 15- *Mimosa pudica*; 16-*Tinospora cordifolia*; 17-*Centella asiatica*; 18- *Hibiscus rosa-sinensis*; 19-*Sida acuta*; 20-*Lasia spinosa*; 21-*Punica granatum*; 22- *Piper longum*; 23-*Azardirachta indica*; 24- *Garcinia zeylanica*; 25-*Ixora coccinea*

**23. Neem/Margosa (*Azardirachta indica*;**  
Family- Meliaceae)

Neem is a large perennial tree with spreading branches having natural antiseptic characteristics (Jayaweera, 1982). Its active phytochemicals are nimbin, nimbinin, nimbidin and nimbidol which

provide aseptic, antibacterial, anti-microbial effect. Leaves, bark and seeds are used for various purposes. It is an ingredient in many remedies for fever, skin ailments, wounds, coughs and some worm diseases (Jayaweera, 1982; Ahmad *et al.*, 2019). Neem oil is the extract from the seed of the

neem tree. It has a strong odor and bitter taste due to volatile sulphur compounds and toxic fatty acids such as nimbin, nimbinin, nimbidin and nimbiol (Biswas *et al.*, 2002). In many Asian countries, including Sri Lanka, external application of this oil has been used as a traditional remedy. Neem leaves and turmeric are used for many skin diseases and skin care remedies. Fresh leaves' antiseptic properties are commonly utilized for washing wounds, ulcers, and baths for patients recovering from chicken fox and childbirth. Even the juice of fresh neem leaves is given with rock salt to control intestinal worms as a remedy (Fernando, 1993). Further, *Azadirachta indica* is a useful insecticide for integrated pest management in organic farming systems.

#### **24. Brindle berry/Goraka (*Garcinia zeylanica*; Family- Clusiaceae)**

*Garcinia zeylanica* is an endemic glabrous tall tree with dark-colored bark and spreading branches. Fruit, leaves and bark are used. Seeds are embedded inside a soft juicy acidic fruit. In Sri Lanka, sun dried and smoked fruits of *Garcinia zeylanica* are extensively used as culinary spices. In indigenous medicinal practices, *Garcinia zeylanica* is used in many remedies for weight loss, cholesterol control, fractures and wounds (Jayaweera, 1980). Phenols, flavonoids, alkaloids, saponins, steroids are found in *Garcinia zeylanica* (Hewageegana *et al.*, 2018; Patil and Appaiah, 2015) which may facilitate those medicinal properties. People take *Garcinia zeylanica* as a remedy for weight loss, exercise performance, joint pain, bloody diarrhea, to increase bowel movements, and for treating worms and parasites. Several health claims are made about *Garcinia zeylanica* extracts among Sri Lankan people such as diabetes, cancer, ulcers, diarrhea, and constipation (Jayaweera, 1980; Hewageegana *et al.*, 2018). Extracts of the plant have been used in various folk medicines such as remedies against helminthic, protozoal and bacterial infections due to its unique composition and antimicrobial properties (Hewageegana *et al.*, 2018; Jayaweera, 1980; Nirasha *et al.*, 2020).

#### **25. Jungle geranium/ *Ixora* (*Ixora coccinea*; Family – Rubiaceae)**

*Ixora coccinea* is a small shrub about 2-6 m tall which bears flowers in inflorescences with few branches. Flowers, fruits and bark are used for

various purposes. Flowers are red, pinkish, or white. The fruit is edible while leaves, bark and flowers have medicinal properties. Traditionally *Ixora* is found to be useful for many common ailments such as hepatic disorder, pains, cancer and microbial infection. Various medicinal properties of this plant are documented and have been reported to possess different classes of chemical compounds including triterpenoids, aromatic acrid oils, tannins, saponins, carbohydrate, fatty acids, flavonoids and sterols (Dontha *et al.*, 2015). *Ixora* is used for treating skin diseases, eye diseases, candida infections (Jayaweera, 1982). Several *Ixora coccinea* species are used as astringent and to treat dysentery and tuberculosis. An infusion of the leaves or flowers of several species is administered to treat fever, headache and colic. Further, the decoction of the roots is used as a sedative. The external applications are based on *Ixora* plant's astringent and antiseptic properties. Its flowers are used to enrich medicinal baths/ Ayurveda baths along with red sandalwood (*Pterocarpus santalinus*), veniwal (*Coscinium fenestratum*) or with neem leaves by Sri Lankans (Fernando, 1993; Jayaweera, 1982).

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