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A BRIEF REVIEW ON DIFFERENT PLANT PARTS USED AS IMMUNITY BOOSTING AGENT

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ABSTRACT

A strong immune system is essential to keep a person healthy. Every person should incorporate specific food items into their diet that can strengthen their immune system. Mother Nature has a bag full of plants and trees whose different parts contain different ingredients that can act as immune boosters. Tulsi is a small herb, found in many parts of India and can be grown in our homes too. The leaves of Tulsi have different properties like antimicrobial, antipyretic, anti-inflammatory, and many more. 5-6 leaves of Tulsi daily help to build our immune system. Giloy is an herbaceous vine found in the tropical regions of different Indian subcontinents. The heart-shaped leaves and reddish fruit of Giloy have many active ingredients like alkaloids, glycosides, phytosterols, etc. which help to attain anti-inflammatory, antipyretic, antioxidant properties. 2-3 tablespoons of Giloy juice daily helps to boost our immune system and increase the ability of our body to fight various infectious diseases. Garlic is used in a variety of dishes we cook garlic bulb is a great supplement known to boost the immune system functioning. Active compound present in garlic helps to reduce blood pressure improve cholesterol levels and can also lower the risk of heart diseases. Garlic bulbs can also reduce cold and flu symptoms. The various vitamins present in garlic also add more effect to its immunity-boosting property. Citrus lemon is found primarily in the north-eastern part of India, China or Myanmar, Italy, Spain. It has various phytochemicals such as terpenes, tannins, polyphenols, etc. is considered a rich of all essential vitamins to enrich our immune system and also provide therapeutic benefits

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INTRODUCTION

Viral infection is currently a major threat towards human beings as well as animals which significantly impacts worldwide. Anti-viral medication in humans, as well as veterinary, may help to increase the therapeutic efficacy, but due to unavailability, cost-effectiveness, and complexity treatment which increases patient compliance day by day. Researchers are still finding the proper molecules of antiviral category from plants sources to provide immense potential and effectiveness towards diseases and reduce adverse effects. Various sources are available to identify the newer molecules such as fungi, marine fauna and flora, bacteria, and plants to the enhancement of therapeutic efficacy, improvement of ethnopharmacological knowledge to provide proper healing. Ayurveda is the most suitable approach for modern in-vitro assays. Anti-viral drugs normally break the cellular metabolism through specific metabolism pathways to stop virus replication but marketed drugs are not targeting specific metabolic pathways to breaking the parasite chain and increasing the adverse effects which increase patient compliance.

The adverse effects of these medications can be overcome by natural ayurvedic medicines or traditional plant medicine which increases the attention of researchers to develop and designing of drugs acting to the particular metabolism pathway to kill or break the virus replication chain. Traditional drugs in the treatment of microbial infections are noted in Ayurvedic books such as “Krimighna Dravyas”. *Ocimum sanctum* as Tulsi is a wonderful medicated plant named “The incomparable one”, “Mother Medicine of Nature”, as well as also called “The queen of herbs” and “Elixir of Life” based on medicinal properties to treat various diseases. Recently several active moiety sources such as flavonoids, alkaloids, glycosides, polyenes, proteins, peptides, sulfides, lignans, saponins, coumarins, and furyl compounds for targeting viral infections, and some culinary herbs, spices, and herbal trees are high potency to treat viral infections [1]. All medicinal plants provide therapeutic benefits because of the presence of some secondary metabolites and provided fewer side effects [2].

TULSI

Synonyms: - Sacred basil, Holy basil.

Superorder: -Asteranae.

Order: - Lamiales.

Kingdom: - Plant.

Family: - Liliaceae-mints, menthes.

Genus: - *Ocimum* L. - basil.

Species: - *Ocimum tenuitiorum* L. – holy basil

Physiology of Tulsi:-

Tulsi is a small branch herb, with a height range of 75-130 cm and leaves are mainly green in color and slightly pungent taste with aromatic favor. Flowers of Tulsi are mainly purplish, nutlets are slightly compressed with pale brown or red. The seeds of Tulsi are mainly reddish black. All the parts of the herb are used as medicine, especially leaves or dried leaves [3].

Geographical Source:- Plant Tulsi found all over India.

Use: -

Tulsi is a strong immunity booster, anti-microbial agent, antipyretic agent, and also use in the treatment of the muscular system especially muscle pain, digestive as well as respiratory system, etc.

Tulsi for the common cold, cough

Tulsi is abundantly used in the treatment of respiratory diseases like cold, cough and is also involved in the treatment to relieve inflammation and fungal infections. [4].

How to use: -

Tulsi, honey, and turmeric mixed with hot water once a day.

Tulsi for an anti-stress agent

Fresh Tulsi leaves act as ‘adaptogen’ or anti-stress agents. It also helps to keep blood pressure under control and prevent stress [5].

How to use: chewing 10-12 fresh Tulsi leaves daily.

Tulsi for immunity booster

For immune-boosting, Tulsi is a wonderful herb and can be able to protect from several infections such as viruses, fungi, bacteria, protozoa, etc. [6].

How to use:

Recommends according to Ayurveda scripts, daily 5 to 6 Tulsi leaves and also kadha (immunity-boosting drink) prepared using several natural immune-boosting herbs such as Tulsi, ginger, turmeric, black pepper, and cloves can help in boosting immunity [7].

Tulsi for coronavirus disease

Tulsi can protect from several viral infections like Coronavirus to improve immunity. Though there is no such scripted scientifically proof still researchers are giving much more

attention to Tulsi particularly in the treatment of microbial infection [8].

How to use:

5-6 Tulsi leaves daily and kadha of Tulsi once or doubly every day.

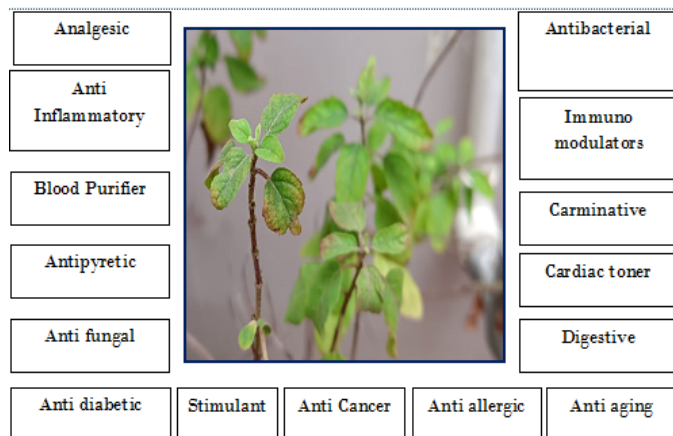


Fig 1- Health benefits of Tulsi

GILOY

In writing, Giloy is considered in a concert of the most effective medication to treat numerous fevers and different conditions [9]. Giloy is the most abundant plant, involved in the treatment and rapid use, giloy is considered as Amrit plant. Amrit means “Root of immortality”. Hence, it’s conjointly known as Amrita Valli or Amrita in the Sanskrit language. The scientific name of Giloy is *Tinospora Cordifolia*, Guduchi (in Hindi). Giloy’s stem is considered more effective due to its high biological process and content and consists of several alkaloids and several secondary metabolites to provide treatment in the medical fields. Giloy conjointly gets its name Heart-leaved vine by its un-subdivided leaves and its cerise fruit [10].

DISTRIBUTION

The plant happens throughout tropical regions of Bharat extending from Kumaon to the state and Burma, Bihar, Konkan to Sri Lanka.

Leaf:

The basal leaves are considered as membranous and cordate. Alternate leaves on long flex nose petioles, 2-4inches long, roundish oval, whole, acute at the tip, smooth and thin. The leaves have a harsh taste and no discernible odor, and when seen in bulk, they appear to be vividly green. The color of mature leaves ranges from yellowish to green [11].

Fruits:

3 or less by abortion brief, stalked, subglobose drupes, generally less. The drupes are pea-sized, ovoid, shiny, succulent, and red. Flowers bloom in the summer and fruits in the winter, with the latter being juicy.

Stem:

Cordifolia has a succulent stem with long filiform branches that have a thick, velvety, warted bark.

Bark:

The bark is creamy white to grey, spirally left, and speckled with huge rosette-like spots in the spaces between.

Giloy is an associate degree in anti-toxin, antipyretic (fever reducer), an anti-inflammatory drug, and inhibitor that enhances immunity and is considered as the best treatment available to date in the field of medical as well as veterinary. Gilroy, also known as *Tinospora Cordifolia*, is a tropical fruit that can be eaten as a powder or cooked into a soup. You can also make giloy juice and drink it every morning. Antioxidant content [12].

Giloy for chronic fever

Giloy is considered a wonderful treatment for chronic, repeated fevers. its associated medicament, an antipyretic herb that helps to spice up your immunity to fight against the infection and additionally helps in early recovery. Giloy features a Javarghana (antipyretic) property to cut back fever.

How to use

Recommended in Ayurveda scripts books, daily 2-3 tablespoons of Giloy juice and an acceptable quantity of water, combine them well and drink this mixture daily within the morning on an associate degree empty abdomen.

Controls blood glucose level

Giloy is called as in Sanskrit “*Madhunashini*” and it means the destroyer of sugar. Giloy helps to boost the assembly of hypoglycemic agents that ultimately control blood glucose levels and is additionally helpful for polygenic disorder complications like ulcers, excretory organ issues.

Boosts immunity

This herb activated our body's immune system and increased a person's vitality. If you drink Giloy juice or eat kadha twice a day, your immunity will improve.

Giloy can be eaten in powdered form, as a kadha (decoction), or even as juice, according to Ayurveda. It's also accessible in capsules and powder form these days. Giloy was also used

topically as a paste to treat skin issues. Giloy is usually given twice a day, one teaspoon at a time. Depending on the type of health concern, the dose may differ. When eaten daily, the plant can improve your general health [13].

LEMON

Synonyms: Fructuslimonis

Family: Rutaceae

Genus: *Citrus*

Species: *C. Limon*

Bionomical name: *Citrus limon*.

Physiology of lemon: - The lemon is a much-branched small herb and 3-5m in height. Leaves are green in color with aromatic flavor. The flowers are white. Fruits are oval-shaped, bright green color in first but it becomes yellow after ripening. The odor of the fruit is strong and the taste is sour [14].

Geographical source:

The lemon tree is found all over India. It is also found in Italy, Spain, Portugal, and the West Indies.

Use: The lemon is a strong immunity booster, lowering stroke risk, controlling blood pressure, preventing cancer, preventing asthma, etc. [15].

Lemon for controlling blood pressure:

Lemon plays an important role to control blood pressure. It has a powerful blood pressure-lowering effect.

How to use: Drinking lemon juice daily and walking regularly can prove to be beneficial.

Lemon for lowering stroke risk

According to a 2012 study, lemon may help lower the risk of ischemic stroke.

How to use: Drinking lemon juice every day.

Lemon for colds and flu

Lemon is a good source of vitamin C, potassium, calcium. So, it acts splendidly in common cold and flu [16].

How to use: Add lemon juice to hot tea or honey and drink the mixture once every day.

Lemon for immunity booster

Lemons are an excellent source of vitamin C and a natural antioxidant. It improves the body's immune system.

How to use: Lemon water mixed with honey and drink every day.

Lemon for coronavirus disease:

Lemon can improve the immunity system and protect our body from a viral infection like coronavirus infection [17].

How to use: Add lemon juice to hot water and honey once a day.

GARLIC

Garlic (*Allium sativum*) is a bulbous blooming plant belonging to the *Allium* genus of onions [18]. Onion, shallot, leek, chive, *Allium fistulosum*, and Chinese onion are unit close to relatives. It's native to Central Asia and northeastern Asian countries and now all over the world, people are following old ayurvedic scripted medicinal plants in their daily life. Ancient Egyptians were aware of it has been used as both a food flavoring and traditional medicine [19,20].

Scientific name: -*Allium sativum*

Kingdom: - Plantae

Family: -Amaryllidaceae

Flower: -

In late spring and early summer, these thin, curled, vibrantly green stalks are in season, and they're commonly offered by the bunch [21]. The stalks that develop from the bulbs of hard neck garlic plants are known as garlic scapes. When the garlic plant matures, the scapes will eventually bloom flowers if left unharvested.

Leaf: -

Garlic plants can grow up to 60 cm tall (2 feet). Depending on the tracheophyte, the long leaves could arise from a brief laborious stem on top of the bulb or a softer pseudo stem created from overlapping leaf sheaths [22]. The bulb is covered in membrane skin and contains up to 20 edible bulblets called cloves.

Garlic is usually taken empty stomach, functions as a strong antibiotic, according to studies. It works better before breakfast as must be taken empty stomach because the bacteria is exposed and unable to protect itself against its force [23]. Garlic has been proven to help ease some of the symptoms of hypertension in many people.

CONCLUSION

From the above review, we can conclude that not only generic medicines or drugs can act as therapeutic agents against certain diseases or can help to treat various infectious diseases but this work can also be done by natural compounds provided by our mother nature too, just we need to identify them. Better knowledge can help us to create good health. Incorporating

specific plant products or parts in our daily diet may help to strengthen our immunity by improving our immune response. Many researchers or scientists have discovered various plant parts like leaves, fruits, stems, roots, flowers, etc. which can help to boost our immune system. So, in our daily diet, we should include specific food groups that can help to boost our immunity like citrus fruits rich in vitamin C, dark leafy vegetables having anti-inflammatory activity, antioxidants like garlic, ginger, carrots, and fermented food to enhance the growth of good bacteria in our GI tract.

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CONFLICT OF INTEREST

The authors declare no conflict of interest

AUTHOR CONTRIBUTION

Soumyadip Ghosh, Debgopal Ganguly, Madhumita Banerjee, Anasuya Mandal, Sarmistha Panja, and Ananta Choudhury design the work and revisions in the manuscript. Soumyadip Ghosh provided maximum effort in the correction, collect documents, makes proper format. Debgopal Ganguly did a proper literature survey and designed the manuscript. All the authors design the final manuscript.

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