

Growing tulsi (*Ocimum basilicum*) in green house for energy – an effective plant for various common diseases and oxidative DNA damage.

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ABSTRACT

Tulsi or Organic Basil has been valued for centuries as a medicinal herb. Its botanical name is *Ocimum basilicum*. It has benefits for the mind, body, and spirit. Holy basil is a powerful antioxidant with demonstrated antibacterial, antifungal, and anti-inflammatory properties. In Ayurvedic medicine, holy basil has been used to treat a variety of conditions - everything from the common cold to bronchitis to fever to certain digestive complaints, including ulcers. It also acts against oxidative DNA damage and mutagenesis that results in diseases like carcinoma. Organic Basil being a powerful medicinal plant, should be grown in the environment of greenhouse to get focused sunlight and prevent it from adverse factors.

Keywords: Organic basil, medicine, greenhouse, reduction of stress, DNA damage.

INTRODUCTION

Accordingly Hindu mythology, tulsi or organic basil or sweet basil embodies the Goddess Lakshmi, the wife of God Vishnu (Claus et al., 2003). She is one of the most important deities of Hindu religion. The herb has been valued for centuries. It has benefits for the mind, body, and spirit. But while its history is deeply rooted in religion and mythology, it has also been used in several ancient systems of medicine including Ayurveda, Greek, Roman, and Siddha for thousands of years (Simoons, 1998). Medicinal plants can be a natural way for people to fight the signs of aging, boost their immune systems, reduce stress, combat depression and prevent the progression of aging and related neurological disorders and has anti-genotoxic potential (NIIR, 2014).

MATERIAL AND METHODS

Growing the plant: Sweet basil is a bushy annual, 300 to 600 mm high. They have glossy opposite leaves and spikes of white flowers. Plant seed outdoors when frosts are over and the ground is warm, start indoors in individual pots, or buy bedding plants. If you start plants indoors, heating cables are helpful, since this is a tropical plant that does not take kindly to cold. Plant in full sun, in well drained soil enriched with compost, aged manure, or other organic materials. Space large leaved cultivars, like ‘Lettuce Leaf’, 450 mm apart. Small leaved types like ‘Spicy Globe’ 300 mm apart. Basil needs ample water. Mulch to retain moisture after the soil has warmed. Pinch plants frequently to encourage bushy growth. Pinch off flower heads regularly so plants put their energy into foliage production.

Building mini Greenhouse:

Build a mini greenhouse on the roof top. It is an inexpensive, easy, low technology way to start gardening earlier in spring and to extend the gardening season well into fall. This greenhouse uses a hoop house design. It can be covered with plastic, row cover material or shade cloth. These make a versatile and useful addition to the garden. The greenhouse takes under an hour to construct. It uses materials that are available in any hardware store. One can choose to use either PVC or flexible copper tubing. To make the hoops, cut the plastic or copper tubing into three 2 m long sections with a hack saw. A greenhouse on the roof top is shown in Fig.1.



Fig. 1: A design of greenhouse constructed for growing Tulsi (Organic Basil)

RESULTS AND ANALYSIS

Benefits of Greenhouse for medicinal plants

The greenhouse industry could benefit greatly by applying this ancient knowledge to modern greenhouse settings. First ensure that the medicinal plants grown in the controlled environments are safe and effective. The plant is often the most neglected part of herbal medicine. Because, people really don't pay attention to the botany, the physiology or the genealogy. A full understanding of the medicinal plants themselves is required to produce a high quality product (Rai et al, 2011).

Brain development and prevent against genotoxicity

Organic Basil is a plant that has been used for thousands of years in sacred cultural and spiritual practices in house patio. Nowadays, it has a more clinical function. Research has shown that Tulsi, along with many other plants called "*Brain Tonic*", can provide sufficient energy to improve brain functions (Preeti et al, 2012). Some medicinal plants can give sufficient energy to fight neurological diseases like Alzheimer.

If the greenhouse industry starts growing these plants to become part of a regular diet, it could be a really positive thing. Enthusiasm of people in holistic lifestyle is increasing rapidly. They are starting to wake up to grow medicinal plants in greenhouse.

When a content of medicinal plant is drawn from the phytochemicals, then it releases as a natural repellent or defense against insects and other predators (Rai et al, 2010). But in a natural field setting, no two plants are chemically identical. That means the amount of a desirable medicinal compound could vary widely among the plants.

Essential oil of Basil and its major component Linalool has been reported to possess antioxidative properties and has strong antigenotoxic potential protecting against oxidative DNA damage (Beric et al, 2008, Gulcin et al, 2007).

Tissue culture helps replicate plants with best characteristics

Through cloning and tissue culture growth within controlled greenhouse environments one is able to select elite individual plants that are found to have the most desirable characteristics. Then, using tissue culture from a root or leaf, one can generate thousands of

genetically identical plants that are then grown in the greenhouses, with each plant producing near-identical amounts of medicinal compounds (Staples and Michael, 1999).

In the environment of a greenhouse, one is able to grow thousands of medicinal plants in 10 to 14 weeks, compared to the one or two years they would require in the field. This is possible by making adjustments to the greenhouse temperature and plants feed to continue growing and harvesting them over the winter months, well outside of their typically short May through August growing season in India. The adjustable environments and control over the growth of plant cycle that they would not have in a natural setting.

Example: If a plant has the maximum amount of a certain medicinal chemical during its flowering stage, they can make changes to the plant's greenhouse environment by manipulating light, temperature, nutrients or carbon dioxide gas to speed up the growth of plant and its medicinal content.

Greenhouse provide optimal growing conditions.

When a plant based medicine claims to be "natural", then it does not mean it is always safe. For example a wild plant that carries a disease or has accumulated toxic metals and is then powdered and processed could be a serious health hazard. But controlled greenhouse environments provide a contamination free and sterile environment where growers can continue to safely and gradually introduce new medicinal plant varieties. Medicinal plants are a big business. It can be very profitable. The key lies in the fact that one needs to introduce novel plants that have been proven safe over a period of time in many cultures and populations with proven benefits.

Try to grow Medicinal Herb Plants **organically**. Do not use synthetic fertilizers, pesticides, or herbicides of any kind. Growing one's own Medicinal Herbal Healing Plants Garden and developing an intimate relationship with these Medicinal Herbs (by harvesting and using what one grow), is a magical process. It is healing, in and of itself. Always use organic methods. It is the best way to insure a sustainable and productive garden and produce healthy, robust nursery stock. The best herbal medicine is made from healthy, organically grown plants, grown in a living soil teeming with microbial life in a garden filled with thriving, beneficial insects, pollinators, and nectar lovers, along with birds and wildlife, including, hopefully, a few reptiles. Most herbs are

inherently pest resistant. Because, they contain high essential oil content in their leaves. Those that have a hole or 2 in a leaf can grow through it and be stronger plants as a result. Realize a diverse garden. It is an abundant garden. Nurture it with a microbial rich soil. It is truly alive. It is the best insurance for our children on this beautiful planet.

Tulsi or Basil combat stress

Stress these days is the root cause of loss of energy in a person to do useful work for the welfare of society. The most compelling data of research suggests that holy basil possesses its greatest potential in the areas of stress relief and relaxation. In the fast paced world in which we live, these research findings may prove to be extremely significant.

Holy basil functions as an adaptogen. It enhances the natural response of the body to physical and emotional stress (Kumar, 2010). Tulsi does not alter mood. But, it helps the body function optimally during times of stress. Research studies examining this property of *Ocimum sanctum* have found that supplementation with various extracts of holy basil decrease stress hormone levels, corticosterone in particular. Lower levels of corticosterone are associated with improved mental clarity and memory. In the longterm, can reduce the risk of age related mental disorders (Preeti and Rai, 2012).

CONCLUSION

In these days of fast life, stress is a normal and natural part of everyday life. Stress occurs when the demands placed upon us exceed the ability of our body to cope. The response of the body to stress is called, "*Flight or Fight*". It enhances the natural response of the body to physical and emotional stress. For the welfare of society a healthy life is an essential component. The life needs youthful energy. It can be procured from medicinal plants. Try to grow Medicinal Herb Plants **organically**. Do not use synthetic fertilizers, pesticides, or herbicides of any kind. Growing one's own Medicinal Herbal Healing Plants Garden and developing an intimate relationship with these Medicinal Herbs is a magical process to generate enough energy to reduce the risk of age related mental disorders. Grow Tulsi in the environment of greenhouse on the roof top.

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