
AN ANALYSIS OF MEDICAL PROPERTIES OF TULSI

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ABSTRACT

Chronic diseases caused through poor lifestyle choices are primary cause of morbidity & mortality globally, & many of them may be addressed with Ayurveda's emphasis on good living practises & frequent use of adaptogenic herbs. most significant herb in Ayurveda is tulsi (Ocimum sanctum Linn), & contemporary research is now demonstrating its health advantages. Tulsi appears to offer a one-of-a-kind combination of pharmacological actions that might help with metabolic, physical, psychological & physiological stress. It has found safeguarding organs & tissues from numerous physical & chemical stress produced through heavy metals & industrial pollutants, along with physical stress induced through extended physical exertion, ischemia, physical limitation, cold, & excessive noise. It has shown to aid with metabolic stress through reducing blood sugar, blood pressure, & cholesterol levels, a log with psychological stress through boosting memory & cognitive function & serving as an anti-depressant & anxiolytic. Its antibacterial activity, that includes action against a number of animal and human ailments, suggests that it could be used as hand sanitizer, mouthwash, & water filter, & in animal husbandry, tissue damage, preservation of food, & passenger's health. Tulsi herb growth is both spiritual & economical, as it connects producer to nature's creative energies, & organic agriculture offers solutions to food security, rural poverty, starvation, destruction of environment, & climate variability. Tulsi's use in daily life reflects Ayurveda wisdom & serves as instance of prehistoric wisdom providing solution for modern difficulties.

KEYWORDS: Ayurveda, Ocimum Sanctum L, Science, Technology, Tulsi.

1. INTRODUCTION

Despite numerous marvels of science & technology, contemporary life is stressful. Mobile devices & internet have accelerated speed of life to point where many people believe y are sinking in ever-increasing ocean of data, whereas industrial farming has increased our exposure to unhealthy processed & packaged foods a log with a slew of pesticides, food packaging materials, & o—r poisonous industrial substances. In addition, city residents confront rising income disparity, water social isolation, excessive air noise, , , & soil pollution, & loss connection to nature. While industrialization has resulted in longer life spans & huge enlargements in human populaces, it's widely acknowledged that world's leading causes of mortality & illness are avoidable chronic diseases linked to lifestyle(1). Modern lifestyles, with its accompanying lack of physical exercise, excessive consumption of fatsugar, alcohol , salt, , & cigarettes, & acquaintance to deadly cocktail

of industrialized chemicals, are causing a worldwide pandemic of fatness, diabetes, dementia, cancer, depression, & other chronic illnesses. As a result, answers to present health problems are more likely to be discovered in people's homes & habits compared to clinics, hospitals, or pharmacies (2).

1.1 Ayurveda & lifestyle medication:

Ayurveda, world's eldest medicinal system & science of life, takes a holistic approach to health & illness, emphasizing importance of maintaining & fostering good health & avoiding disease via healthy lifestyle habits. Ingestion of fresh, negligibly processed food, using Rasayanas to prevent getting old & disease, sophisticated decontamination practice, & daily ingestion of adaptogenic herbs to improve body's ability for maintaining equilibrium in face of variability of stressors are all examples of these practices (3). Use of medicinal & culinary herbs in Ayurveda relies on India's great biodiversity, offering a range that no other medical system can match; never less, none of the plants employed has the same significance as tulsi or holy basil.

1.2 Tulsi: Potent adaptogen

It is a scented plant of Lamiaceae (tribe Ocimeae) basil family which is natural to eastern hemisphere tropics & is said to have originated in north central part of India. It is acknowledged in Ayurveda as "Incomparable One," "Mother Medicine of Nature," & "Queen of Herbs," & is considered a "elixir of life" with unparalleled medicinal & spiritual properties. Tulsi is used in spiritual rituals & lifestyle practices in India for centuries, & it has a variety of fitness aids which are now being established through modern science. Recent study on tulsi supports early Ayurveda knowledge through indicating that it is tonic for mind, body, & spirit that may aid with a range of modern-day fitness conditions (4).

It is among most well-acknowledged in stances of Ayurveda's holistic method to wellness. It is a spicy, bitter herb that is believed to enter deep tissues, dry tissue secretions, & balance kapha & vata energies. It is believed to help with illness prevention, overall health, wellness, & longevity, along with coping with pressures of everyday life. Tulsi is said to improve appearance of skin, sweetness of voice, & development of attractiveness, intellect, stamina (5). It has long been utilized to make Ayurvedic preparations aimed at treating influenza, bronchitis, & asthma. Colds, sneezing noses, coughs, malaria, & dengue fever are frequently treated with a hot mixture of Tulsi leaves. Biological efficacy of OS against diabetes, hypertension, malignancies, respiratory illnesses, arthritis, different bacteria, & parasites is discussed in this article. Tulsi extracts & its different bio-organic components have shown to have antioxidant, anti-arogenic, anti-aging, immunomodulatory, anti-inflammatory, anti-stress, help to safeguardive, radio safeguardive, antihelminthic, repellent, & larvicidal properties.

Tulsi has sole mix of pharmacological impacts which enhance wellness & flexibility, making it a powerful adaptogen. While term "adaptogen," or a herb that aids in stress adaptation & homeostasis, isn't commonly used in Western medicine, Western research has shown that tulsi does actually have numerous pharmacological impacts that accomplish this goal. Hundreds of scientific research, including in vitro, animal, & human trials, have looked into therapeutic qualities of tulsi. (6). These pharmacological impacts assist body & mind in dealing with a variety of chemical, physical, infectious, & emotional stressors, along with restoring physiological & psychological function. Many of tulsi's physiological advantages may be linked to its capacity to help with internal housekeeping & to safeguard body from toxin-induced harm. Tulsi's high phenolic content & antioxidant qualities are frequently ascribed to these activities, with Krishna tulsi (black/purple type) having greater phenolic content & antioxidant capacity compared to white Vana (wild) tulsi. Numerous experimental investigations have shown tulsi's capacity to defend against harmful impact of different toxicants. These studies show that tulsi can safeguard liver, kidneys, & brain from pesticides, medicines, & industrial toxins through guarding against genetic,

immunological, & cellular damage. Tulsi has found to safeguard against harmful impacts of popular pesticides comprising rogor, chlorpyrifos, endosulfan, & lindane, along with industrial pollutants like butylparaben, copper sulfate, carbon tetrachloride & ethanol(7)..

1.3 Safeguard ion & detoxification:

Tulsi aids in prevention of malignancies produced through harmful chemicals through decreasing damage to DNA & apoptosis in precancerous & cancerous cells, which lowers tumour formation & increases lifespan. Moreover, tulsi not only provides safeguard ion against harm produced through toxic mixtures, whereas assists body in more effic & eliminating m through him proving activity of liver detoxifying enzymes like cytochrome P450 enzymes, which neutralize toxic chemicals & enable m to be securely removed from body. While all these actions are important to safeguard against natural toxins produced through body, animals, or plants, y may be even more important in today's world for safeguarding against variety of pollutants, pesticide residues, pharmaceuticals, toxic metals, radio waves, & or advanced manufacturing toxicants produced through human activity.

1.4 Toxicant stress: Chemicals, heavy metals & radiation:

Numerous experimental investigations have shown tulsi's capacity to defend against harmful impact of different toxicants. These studies show that tulsi can safeguard liver, kidneys, & brain from pesticides, medicines, & industrial toxins through guarding against genetic, immunological, & cellular damage. Tulsi has found to safeguard against harmful impacts of popular pesticides comprising rogor, chlorpyrifos, endosulfan, & lindane, along with industrial pollutants like butylparaben, copper sulfate, carbon tetrachloride & ethanol. Tulsi has found to safeguard against harmful impacts of a variety of medicines, including, haloperidol meloxicam, paracetamol, & antitubercular medications. Tulsi has proven to acetaminophen safeguard against harmful impacts of heavy metals such as lead, arsenic, cadmium, chromium, & mercury, along with toxic impacts of radiation, in addition to hazardous compounds. Tulsi reduces oxidative cellular & chromosomal destruction caused through radiation through scavenging free radicals & decreasing oxidative cellular & chromosomal damage, minimizing organ damage & improving post radiation survival in experimental mice.

1.5 Physical stress:

same activities that guard against toxic impacts of chemicals & radiation assist to mitigate toxic consequences of a variety of physical stresses. Physiological & metabolic stress is induced through prolonged physical effort, physical constraint, & disclosure to cold, & unnecessary noise, all of which disrupt homeostasis. Maladaptation occurs when ability to adjust to certain stresses is surpassed, resulting in harm to metabolic pathways, organ function, & health. Adaptogenic herbs like tulsi may safeguard against this harm through increasing numerous cellular & physiological adaptive processes. Tulsi has found to be impactful against a variety of animal diseases, leading to its usage in animal husbandry to decrease infections in several animals. Tulsi's antimicrobial activity against waterborne & foodborne microorganisms indicates that it may be utilized to preserve food & herbal raw materials.

1.6 Metabolic stress:

It is a common characteristic of contemporary lives, with "metabolic syndrome" affecting up to a third of population. "deadly quartet" of hypertension centripetal obesity, high cholesterol, & impaired glucose control, acknowledged as "prediabetes" or "Syndrome X," is linked to chronic inflammation & advanced risk of diabetes, & stroke heart disease. Though precise causes of metabolic condition are being disputed, there is evidence of tulsi may help with many of symptoms & impacts of metabolic syndrome. Tulsi has proven to have antidiabetic impacts in many test tube & animal studies, along with human clinical trials. Tulsi has proven to lower blood glucose, rectify

aberrant lipid profiles, & safeguard liver & kidneys from metabolic damage caused through high glucose levels in diabetic experimental animals. Tulsi has found to enhance lipid profiles, prevent weight gain, hyperglycemia, hyperinsulinemia, hypertriglyceridemia, & insulin resistance in experimental animals given high-fat diets, along with safeguard organs & blood vessels against atherosclerosis. Similarly, tulsi has proven in human clinical studies to lower glucose levels, improve blood pressure & lipid profiles, & alleviate many diabetic symptoms in people with type 2 diabetes.

Tulsi has a number of metabolic benefits, including safeguarding kidneys liver, & pancreatic islet cells from free radical damage, increasing liver bile acid synthesis while decreasing liver lipid synthesis, improving insulin secretion & action, lowering cortisol levels, & reducing inflammation. Anti-inflammatory properties of tulsi are ascribed to its eugenol & linoleic acid content, along with suppression of both cyclooxygenase & lipoxygenase routes of arachidonic acid metabolism. This allows tulsi to have anti-inflammatory properties similar to nonsteroidal anti-inflammatory medications including phenylbutazone, ibuprofen, naproxen, aspirin, & indomethacin.

1.7 Infection safeguard ion:

Tulsi contains antibacterial, antiviral, & antifungal action, according to modern research, which comprises action against a variety of microorganisms that cause human illnesses. Tulsi has found to improve immunological responses in non stressed & stressed animals along with healthy people, boosting defenses against infectious threats. Although no human trials have been conducted, there is preliminary proof that tulsi may aid in treatment of urinary tract infections, skin & wound infections, typhoid fever, cholera, tuberculosis, gonorrhoea. Tulsi has found to be impactful against a variety of animal diseases, leading to its usage in animal husbandry to decrease infections in several animals. Tulsi's antimicrobial activity against waterborne & food borne microorganisms indicates that it may be utilized to preserve food & herbal raw materials, along with for water purification & hand sanitization. Tulsi's wide range action, which includes activity against *Streptococcus mutans*, bacteria that causes tooth decay, indicates that it may be used as a herbal mouthwash to treat foul breath, gum disease, & mouth ulcers. This has been shown in clinical studies, which show that rinsing with tulsi is equally efficient as 0.2 percent Chlorhexidine & Listerine in lowering *Streptococcus mutans* levels, & that a herbal mouthwash containing tulsi is favored for its flavor & convenience.

Tulsi is helpful in wound healing because of its unique mix of antibacterial, antioxidant, anti-inflammatory, & analgesic properties. Tulsi has proven to enhance injury breaking strength & speed healing in animals, according to scientific data. Tulsi has found to have antiulcer & ulcerhealing properties in a variety of models of animal, containing domethac in aspirin, alcohol, reserpine histamine, serotonin, meloxicam acetic acid, pyloric ligation, & cold constraint stress-induced ulceration. Multiple activities are ascribed to this antiulcer activity, including decrease of offensive factors like acid pepsin production & lipid peroxidation, along with increase of gastric defense factors like mucin secretion, cellular mucus, & mucosal cell lifespan.

1.8 Divine tulsi:

Tulsi is cherished & considered holy in Hinduism, & every component of tulsi plant, containing seeds leaves, flower stem, root, & oil, is respected & considered sacred. Even surrounding soil, which has lately shown to contain helpful endophytic fungus, is seen to have a heavenly feature. As a result, no Hindi home is complete without a tulsi plant, which is usually kept in an elaborate clay pot in a courtyard & serves both utilitarian & ceremonial functions. Tulsi, for example, has a unique clove-like fragrance that helps to connect householder to divine while simultaneously repelling mosquitoes, flies, & other undesirable insects due to its high eugenol concentration. Evening & morning rituals, along with spiritual & purifying activities that may include eating tulsi leaves or drinking tulsi tea, further incorporate Tulsi into everyday life. Tulsi is used

ceremonially in Hinduism & certain Greek Orthodox churches to produce "holy water," in addition to sanctifying house. Tulsimalas, which are strings of beads used to assist mind concentrate during meditation, chanting, & devotional activities & before ceremonially link mind, body, & spirit, are made from tulsi wood or seeds. Tulsi has utilized to fight air pollution in cities, with hundreds of millions of tulsi plants placed around Taj Mahal in Agra to help preserve famous marble structure from pollution damage.

1.9 Tulsi as a vehicle of consciousness:

One of most significant advantages of tulsi in contemporary world is its worldwide distribution, which is based on its production utilizing ethical, fair trade, organic, & ecological agricultural methods. There is a growing recognition that a transition in agriculture from a "green revolution" to an "ecological intensification revolution" is required to address problems such as food security, rural poverty, hunger, environmental degradation, & climate change. This is emphasized in a recent United Nations statement titled "Wake Up Before It's Too Late," which urges international community to support & push for local solutions to toxicity, food insecurity, & poverty, such as adoption of organic & small-scale farming over GMOs & monocultures. While organic farming techniques are not exclusive to tulsi, Organic India Pvt. Ltd. has successfully adapted them to tulsi production. It has long utilized to make Ayurvedic preparations aimed at treating influenza bronchitis, , & asthma. Colds, sneezing noses, coughs, malaria, & dengue fever are frequently treated with a hot mixture of Tulsi leaves. biological efficacy of OS against diabetes, hypertension, malignancies, respiratory illnesses, arthritis, different bacteria, & parasites is discussed in this article. Tulsi extracts & its different bio-organic components have shown to have antioxidant, anti-arogenic, anti-aging, immunomodulatory, anti-inflammatory, anti-stress, hepatoprotective, radio-protective, antihelminthic, repellent, & larvicidal properties.

2. LITERATURE REVIEW

Yamani H et al. discussed Antimicrobial activity of Tulsi in which they explained how Due to growing development of resistance through microbes, experts across globe have recently discovered that any antimicrobial agent's impactful life span is limited. As a result, many research have carried out in order to discover novel antimicrobial compounds, particularly from plants. goal of this study was to look into antimicrobial characteristics of essential oils distilled from *Ocimum tenuiflorum* (Tulsi) cultivated in Australia, to quantify volatile components found in flower spikes, leaves, & essential oil, & to look into chemicals responsible for any action. minimum inhibitory concentration (MIC) of Tulsi essential oil against certain microbiological pathogens was determined using broth microdilution(8).

Gupta N et al. discussed therapeutic uses of Tulsi in which they explained how Traditional medicine practitioners often utilize medicinal plants in their daily practice to treat diversity of illness. Dissimilar parts of Tulsi small herb found all over India, have suggested in traditional systems of medicine for treatment of bronchitis, bronchial asthma, malaria, diarrhea, dysentery, skin diseases, arthritis, painful eye diseases, chronic fever, insect bites, & other ailments. Because of its high therapeutic potential & widespread distribution in India, practitioners of traditional systems of medicine have used *Ocimum sanctum* L. to treat a variety of illnesses; nevertheless, a logical integration of this traditional medical practice with contemporary medicine is limited. Several pharmacological investigations have provided a scientific foundation for use of this plant for medicinal purposes. It has long utilized to make Ayurvedic preparations aimed at treating influenza bronchitis, , & asthma. Colds, sneezing noses, coughs, malaria, & dengue fever are frequently treated with a hot mixture of Tulsi leaves. biological efficacy of OS against diabetes, hypertension, malignancies, respiratory illnesses, arthritis, different bacteria, & parasites is discussed in this article(9).

Upadhyay R discussed tulsi in which they discussed about several properties of tulsi.

medicinal&rapeutic applications of Tulsi plant in traditional medicine are discussed in this review article. Tulsi (*Ocimum sanctum* [OS] Linn.) is a Lamiaceae family fragrant plant. It has long utilized to make Ayurvedic preparations aimed at treating in fluenza bronchitis, , & asthma. Colds, sneezing noses, coughs, malaria, & dengue fever are frequently treated with a hot mixture of Tulsi leaves. biological efficacy of OS against diabetes, hypertension, malignancies, respiratory illnesses, arthritis, different bacteria, & parasites is discussed in this article. Tulsi extracts & its different bio-organic components have shown to have antioxidant, anti-arogenic, anti-aging, immunomodulatory, anti-inflammatory, anti-stress, hepatosafeguardive, radiosafeguardive, antihelmintic, repellent, & larvicidal properties(10).

3. DISCUSSION

Chronic lifestyle-related diseases are primary cause of morbidity & mortality globally, & many of m may be addressed using Ayurveda's emphasis on good living choices & regular consumption of adaptogenic herbs. Tulsi (*Ocimum sanctum* Linn) is most significant herb in Ayurvedic medicine, & current research is demonstrating its healthiness advantages. Tulsi seems to offer distinct set of pharmacological effects that might be used to alleviate, metabolic physiological, psychological, physical& stress. Tulsi has found to safeguard against harmful impacts of popular pesticides comprising rogor, chlorpyrifos, endosulfan, & lindane, a log with industrial pollutants like butylparaben, , copper sulfate, carbon tetrachloride & ethanol. Tulsi has found to safeguard against harmful impacts of a variety of medicines, including, haloperidol meloxicam, paracetamol, , & anti tubercular medications..

It has shown to reduce metabolic stress through diminishing blood sugar, pulse rate, & total cholesterol, & or psychological stress through boosting memory & cognitive function & acting as anxiolytic & antidepressant. Tulsi's wide ranging antibacterial activity, comprises activity against wide range of human & animal ailments, suggests that it might be used as a disinfectant, mouthwash, & water filter, along within animal husbandry, heal wounds, preservation of food, & passenger's health. Tulsi plant production is spiritual a log with economical, linking farmer to nature's creative powers, & organic production gives solutions to food security, rural poverty, hunger, environmental degradation, & climate change. Tulsi's usage in daily activities reflects Ayurvedic knowledge & serves as an example of ancient wisdom offering solutions to modern problems.

4. CONCLUSION

Tulsi is revered in Hindus & Ayurvedic as a plant that may be praised, consumed, brewed into tea, & utilised for medical & spiritual objectives. Modern science research into tulsi exemplifies numerous psychological & physiological advantages of utilising tulsi & serves as a monument to wisdom inherent in Hindu society & Ayurveda, which honour tulsi as plant that can be praised, consumed, & made into tea.. production of tulsi extends beyond offering advantages for people & families to begin to address larger social, economical, & environmental problems through giving emphasis for sustainable ethical, , & ecological agricultural methods that provide living for many farmers.

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