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THERAPEUTIC USES OF TULSI (OCIMUM SANCTUM) IN ORAL LESIONS

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ABSTRACT Since ancient times, plants have been used for various medicinal purposes in treating various diseases. Oral diseases are among the major public health problems and the most common of the chronic diseases that affect mankind. The application of natural products for the control of oral diseases is considered an interesting alternative to synthetic antimicrobials due to their lower negative impact. Ocimum sanctum (Tulsi) is a plant with enormous properties for curing and preventing diseases through its greater medicinal value. This article reviews the therapeutic role of Tulsi (Ocimum sanctum) in various oral lesions.

KEYWORDS

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INTRODUCTION :-

God has created medicinal marketers in the name of herbs for human beings. The understanding of medicinal plants has been gathered over many centuries [1]. Many medicinal plants have gained importance in the field of dentistry [2]. Tulsi is famous for its strictness and sacredness, and in a long way, it is a giant job [3]. Due to their reduced cost and fewer side effects, natural products had an advantage over alloplasts [4]. This review summarizes the therapeutic uses of tulsi among various oral lesions.

HISTORICAL BACKGROUND OF TULSI :-

Ayurveda is one of the systems of traditional medicine that employs the use of medicinal plants in treating various diseases [1]. Tulsi is also known as "Holy Basil," and in Sanskrit it was mentioned as `the incomparable one," and it was referred to as the `Queen of Herbs ` [2, 5]. Tulsi belongs to the genus "Ocimum," and it is an erect, soft, hairy, aromatic herb shrub of the Labiatae family. There are two types of tulsi, named Sri tulsi and Krishna tulsi. Sri tulsi has green leaves, while Krishna tulsi has purple leaves. The whole parts of Ocimum sanctum (tulsi), such as leaves, stems, roots, stems, and flowers, are used in traditional medicine. [6]. Tulsi is considered an economic herb, and it exhibits various activities like antimicrobial, analgesic, immunomodulator, antifungal, antiemetic, antiasthmatic, and anticancer activities that make it an effective tool in treating various diseases due to its cost effectiveness and lack of side effects [7].

MECHANISM OF ACTION OF TULSI :-

1. ANALGESIC EFFECT :-

The extract of tulsi acts as a COX-2 inhibitor due to the presence of eugenol (1-hydroxy-2-methoxy-4-allylbenzene) [2,6].

2. ANTIMICROBIAL PROPERTY :-

Due to the presence of components like carracrol and tetpene, it has a strong antibacterial effect. [2,6]. The antimicrobials cause cell wall damage in the microbes, followed by cell death due to leakage of cellular potassium [8].

3. ANTIFUNGAL EFFECT :-

The fundamental oils present in the extract of tulsi deliver a counter-parasitic action over the fungal infections [3]. The anticandidal activity of tulsi is due to the presence of methyl chavicol and linalool [9].

4. ANTICANCER EFFECT :-

The extract of tulsi inhibits the multiplication, migration, and invasion of tumor cells. This anticancer activity is due to the presence of strong components like eugenol, which induces apoptosis [10]. By increasing immunocompetent cells like T lymphocytes, macrophages inhibit the metastasis of cancer cells, resulting in the prevention or delay of carcinogenesis [11].

5. ANTIOXIDANT EFFECT :-

Tulsi neutralizes the free radicals produced by various oral lesions through the presence of antioxidants like vitamins A, E, and C [11]. The antioxidant effect of tulsi is due to the presence of phenolic components like cirsilineol, circimaritin, rosameric acid, and apigenin, which are yielded from the extract of tulsi [12].

6. IMMUNOMODULARTORY EFFECT :-

Tulsi strengthens the human body`s immune system by increasing interferon, interleukin-4, and T-helper cells by acting as an immunomodulator [12, 13].

VARIOUS THERAPEUTIC USES OF TULSI IN ORAL LESIONS :-

1. DENTAL CARIES :-

The most important global oral health burden was considered to be dental caries among most of the children. Oral microorganisms such as Streptococcus mutans play an important role in the development of dental caries. 4% extract of tulsi shows effective antimicrobial action through a wide zone of inhibition in brain-heart infusion agar media inoculated with Streptococcus mutans. The presence of eugenol in the tulsi extract provides an antimicrobial effect against microbes producing dental caries [5].

2. DENTAL PLAQUE :-

Dental plaque is considered to be one of the most important etiological agents causing periodontal inflammation due to the presence and progression of Actinobacillus actinomycetemcomitans species. At 6% concentration, the ethanolic extract of Ocimum sanctum showed a

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wide zone of inhibition (25mm) in TSBV agar plates [8].

3. DENTAL PAIN

0.7% volatile oil from Ocimum sanctum extract contains 71% eugenol and 20% methyl eugenol, which act as COX-2 inhibitors and provide analgesic effect[2].

4. ORAL MUCOSITIS

Most commonly, chemotherapy and radiotherapy for the various lesions affect the maturity and cellular growth of the endothelial cells and cause them to become ulcerated. Ice cubes containing honey and the extract of tulsi reduced the oral ulcers. Ice cubes result in rapid cooling of the oral cavity, followed by constriction of blood vessels and a decrease in the local cytotoxic activity of these drugs [10].

5. GINGIVITIS :-

Gingivitis is known as gingival inflammation without any loss of periodontal attachment. It is mainly caused by the accumulation of plaque due to poor oral hygiene. On examination, the gingiva appears to be erythematous and shows bleeding on probing. The extract of tulsi shows a marked reduction in gingival inflammation and gingival bleeding [14, 15]. Especially 2% concentration of tulsi gel shows a marked decrease in the gingivitis score [14]. A mouthwash at 4% concentration shows a reduction in the gingival scores [16].

6. PERIODONTITIS :-

Periodontitis is known to be a chronic inflammatory condition in dentistry. It is characterized by loss of periodontal attachment, alveolar bone loss, and periodontal pockets [16]. The etiology of periodontitis is known to be multifactorial. The use of tulsi in the treatment of periodontal disease shows a marked reduction in the progression of the disease through various mechanisms like anti-inflammatory, antimicrobial, antiplaque agents, antioxidants, and immunomodulatory agents at different concentrations [8, 12, 13, 16]. The dried, powdered leaves of tulsi were used for brushing [2, 3].

7. HALITOSIS

Many people, irrespective of age, sex, or social status, suffered from the universal affliction known as halitosis. Tongue coating, gingivitis, periodontitis, postnasal drip, diabetes mellitus, hepatic cirrhosis, gastric ulcers, and carcinoma are known to be causes of halitosis. The release of volatile sulfur compounds (VSCs) due to protein degradation by some bacteria results in halitosis. Use of tulsi mouth rinses shows a marked reduction in the VSCs, organoleptic scores, plaque scores, gingival scores, etc. of tulsi was effective in treating halitosis [7].

8. CANDIDIASIS :-

A common opportunistic fungal infection caused by Candida albicans was known as Candidiasis [17, 9]. Candidiasis most commonly affects immunocompromised individuals. The tulsi leaf extract containing methyl chavicol and linalool shows reduction in candidiasis through their antifungal activity by altering the cell membrane permeability [9]. At 50% concentration, tulsi oil and powder provided marked antifungal activity on Candida albicans [17].

9. ORAL SUBMUCOUS FIBROSIS :-

One of the most common chronic, complex, precancerous conditions of the mouth is said to be oral submucous fibrosis (OSMF). The exact aetiology is unknown but most common due to areca nut chewing. Clinical features include blanching of the oral mucosa, limited mouth opening, restriction of tongue movements, burning sensation, etc. [18, 19]. Through its antioxidant property and immunomodulatory effect, it produced a significant release in the burning sensation when studied clinically [18].

10. ORAL MALIGNANT DISORDERS :-

Oral malignant disorders like oral ulcers, chronic red and white patches, and proliferative growth are the most commonly diagnosed malignant lesions. Patient complaints of burning sensation, difficulty in speech and swallowing, and pain associated with oral mucosal lesions Phytochemicals present in the tulsi leaves modulate the cellular signaling pathways by scavenging free radicals, resulting in the destruction of cancer cells [11].

11. PEMPHIGUS :-

The immune system is strengthened by the tulsi's immunomodulating properties, which support the healing of blisters and sores [2].

12. ORAL LICHEN PLANUS :-

Through its immunomodulating property, tulsi is also said to be useful against oral lichen planus [2].

CONCLUSION ;-

In recent years, there has been increased documentation of the use of natural goods and herbal remedies. They have reportedly been proven successful in the treatment of numerous illnesses. The current research on the therapeutic use of tulsi (Ocimum sanctum) in oral lesions is summarized in this article. Tulsi demonstrates a range of properties, including those that are antibacterial, analgesic, immunomodulator, antifungal, antiemetic, antiasthmatic, and anticancer. Tulsi is used to address a variety of oral issues, including dental plaque, gingivitis, periodontitis, leukoplakia, OSMF, oral lichen planus, and dental cavities, in a variety of forms, including gel, aqueous liquid, powder, and paste.

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