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Review Article

Urdwajaturu Vikara

Pharmacological Profile of Yashtimadhu in Urdwajaturu Vikara - A Synergistic View of Ayurveda and Modern Science

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In present era, traditional medicines are gaining global recognition for their significant therapeutic potential and holistic approach to healing. There are many plants having great therapeutic significance. Yashtimadhu (Glycyrrhiza glabra Linn.) is a significant and widely utilized classical herbal medicinal plant, extensively referenced in the Vedas and Samhitas for its broad therapeutic applications. It possesses numerous phytochemical constituents such as glycyrrhizin, glycyrrhetinic acid, asparagine, isoflavones, and triterpenoids, which exhibit potent pharmacological effects. These constituents contribute to its efficacy in managing various diseases, particularly those affecting the head and neck region, Renowned for its Rasayana (rejuvenating) properties, Yashtimadhu plays a multifaceted role in promoting the overall health of organs located above the clavicle. The primary active component of Yashtimadhu, glycyrrhizin, constitutes about 2–9% of the root, while glycyrrhetinic acid is present in concentrations ranging from 0.5–0.9%. Other important constituents include flavonoids, chalcones, coumarins, sterols, amino acids, amines, lignans, gums, and volatile oils. These phytochemicals offer a broad spectrum of pharmacological actions, such as anti-ulcer, wound healing, anti-inflammatory, antioxidant, anti- tussive, and cognitive function enhancing activities, along with benefits in managing eye disorders.[1] This study endeavors to provide conceptual and analytical review of efficacy of Yashtimadhu in Urdhwajatrugata Vikaras by drawing insights from various Ayurvedic literature source as well as contemporary scientific perspectives to highlight its therapeutic potential.

Keywords: Yashtimadhu, Urdhwajatru, Glycyrrhizin, Rasayana

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Introduction

Nature has endowed us with rich botanical diversity, with a wide range of plant species cultivated across different regions of the world. *Glycyrrhiza glabra* L. (GG) known as *Yashtimadhu* according to *Ayurveda* is a widely used medicinal plant recognized for its extensive range of pharmacological properties. Eye drop containing glycyrrhizin 2.5% instilled for 28days yielded good results in moderate dry eye syndrome**[2]** in *Vedic* literatures and *Samhitas*. Glabridin inhibited activation of ERK1/2 and the p38 MAPK pathway in retinal pigment epithelium cells invitro, protecting them against oxidative stress and apoptosis. Glabridin substantially reduced retinal damage invivo by halting retinal degeneration and lowering the accumulation of deposits on the RPE layer caused by NaIO3. Glabridin, according to electroretinogram (ERG) studies, aided in maintaining normal retinal function and is having protection against retinal degeneration diseases**[3]** *Yashtimadhu* has been used to treat variety of ailments concerning to disease above clavicle.

More than 1250 formulations containing *Glycyrrhiza glabra* are mentioned in the ancient *Ayurvedic* literature. In 50 *Mahakashyas* (group of 10 drugs for specific disease) told by *Charaka*, *Glycyrrhiza glabra* is one of the most repeated drugs which reflects its wide application in *Ayurveda.***[4]**

The *Glycyrrhiza* genus comprises over 30 species distributed across various regions of the world. The name is derived from the Greek words glykys (meaning "sweet") and rhiza (meaning "root").**[5]**

Similarly, in *Ayurveda* literature *Yashtimadhu* has a synonym called *Madhuka* which means having sweet taste (*Madhura Rasa*). *Glycyrrhiza glabra* has been utilized in traditional Chinese medicine for about 4000years. Oldest reference to this medicinal plant may be found in code of Hammurabi (2100 BC). It was also highlighted in ancient Assyrian herbals around 2000 BC as one of most important herbs. Hippocrates (400 BC) recommended it for treating ulcers and relieving thirst. Renowned ancient scholars like Theophrastus and Dioscorides also mentioned its medicinal values.**[6]**

In traditional *Siddha* medicine, *Glycyrrhiza glabra* is utilized for its properties as a demulcent, expectorant, anti-tussive, laxative and natural sweetener.**[7]**

Potential of this drug is still unknown to its full extent , just few evaluations on this plant have been recorded & published, particularly in terms of its *Ayurvedic* value. Goal of this review was to look at *Ayurvedic* literature as well as current scientific information on *Glycyrrhiza glabra* to see whether there was any ancient- modern concordance.

Objectives

To evaluate the efficacy of *Yashtimadhu* in *Urdhwajatru Vikaras* through both ancient and modern science perspective.

Materials and Methods

Classical textbooks of *ayurveda* and other compilatory treatises are reviewed for documenting the information on *Yashtimadhu*. A thorough review of the published literature using online scientific search engines.

General description of *Yashtimadhu*

Yashtimadhu, scientifically known as *Glycyrrhiza glabra* Linn., belongs to the Fabaceae family. It is a perennial herbaceous plant that typically grows between 1 to 2 meters in height. The plant is characterized by a strong primary taproot about 15 cm long, which branches into 3 to 5 secondary roots, each extending up to 1.25 meters. It also produces several horizontal woody stolons, which can grow up to 8 meters in length. The plant generates new stems annually, which are sturdy, erect, and branched either from the base or higher up. These stems tend to be rough near the top. The leaves are alternate, pinnately compound, measuring 10 to 20 cm in length, and typically consist of 3 to 8 pairs of leaflets. The stipules are small and drooping. *Yashtimadhu* bears axillary inflorescences that are upright and spike-like, ranging from 10 to 15 cm long. The individual flowers are 1 to 1.5 cm in length, bluish to pale violet in color, and attached by short stalks. The calyx is short, bell-shaped, and covered with glandular hairs. Its fruit is a flat, erect pod measuring 1.5 to 2.5 cm in length and 4 to 6 mm in width, featuring thick sutures and a smooth, slightly netted surface. Each pod typically contains 3 to 5 brown, kidney-shaped seeds. Originally native to the Mediterranean region, *Glycyrrhiza glabra* is now widely cultivated in India, particularly in Punjab, Jammu & Kashmir, and parts of South India.**[8]**

Properties and Actions[9]

Rasa (Taste): *Madhura* (Sweet)
Guna (Qualities): *Guru* (Heavy), *Snigdha* (Unctuous)
Virya (Potency): *Shita* (Cooling)
Vipaka (Post-digestive effect): *Madhura* (Sweet)

Karma: Yashtimadhu is known for its wide range of therapeutic effects:

- *Vata-Pittahara*: Pacifies aggravated *Vata* and *Pitta doshas*
- *Chakshushya*: Promotes eye health and enhances vision
- *Balya:* Strengthens the body and boosts immunity
- *Varnakara*: Improves skin complexion and radiance
- *Shukrala*: Acts as an aphrodisiac; enhances the quality and quantity of semen
- *Keshya*: Nourishes hair and promotes hair health
- *Swarya*: Improves the voice quality
- *Vranashothahara*: Aids in wound healing and reduces inflammation
- *Vishaghna*: Helps neutralize toxins and poisons
- *Chardighna*: Relieves nausea and vomiting
- *Trishnahara*: Alleviates excessive thirst
- *Glanihara*: Reduces fatigue and exhaustion
- *Kshayahara*: Beneficial in managing wasting and degenerative conditions

Part Used: Root

Phytochemical Constituents of *Glycyrrhiza glabra* Linn[10]

Glycyrrhizine, prenylated biaurone, licoagrone; 7-acetoxy- 2- methyl- isoflavone, 7- methoxy- 2-methylisoflavone and 7- hydroxy- 2 methyl isoflavone; 4- methyl coumarin, liqcoumarin; isoflavone, glyzaglabrin (7,2′-dihydroxy 3′,4′- methylenedihydroxy isoflavone); quercetin, quercetin-3-glucoside, kaempferol, astragalin, liquiritigenin and transisoliquiritigenin- 4′-β-D-glucopyranoside (isoliquiritin) and trans- isoliquiritigenin- 4-β-Dglucopyranoside (neoisoliquiritin); isoliquiritigenin (root). Other constituents reported include flavanone rhamnoglucoside, Chalcone glucosides, 7-hydroxy-4′- methoxyisoflavone (formetin), licuraside, liquiritoside, rhamnoliquiritin, triterpenoid, liquoric acid, 11-deoxoglycyrrhetic acid, liquiritic acid, isoglabrolide, glabrolide, deoxoglabrolide, glycyrrhizic acid, glycyrrhetol, 21α- hydroxy- 11- deoxyglycyrrhetic, and 24- hydroxyglycyrrhetic acids, 18α-hydroxy glycyrrhetic acid, olean -12- en-3β-ol-30 oic, olean-11, 13 (18)-dien-3β-ol-30 oic acid, glabranine (5,7-dioxy-8-3 (3′, 3′- dimethylallyl- flavanone), pinocembrin, prunetin, 4- hydroxy chalcone, liquiritigenin, licoflavonol (6- γ-γ- dimethylallylkaempferol), kumatakenin, glycerol, licoricone, glabridin, glabrol, liqurazid, liquiritin, 3-hydroxyglabrol, 4′-0-methyl glabridin, 3′- methoxyglabridin, glycyrrhetinic acid; methyl olean-11,13 (18)- diene-3, 24-diol-30-oate, glabranine, formononetin, glabrene, saponaretin (isovitexin), 24-hydroxy-11-deoxyglycyrrhetic acid, methyl olean 11, 13 (18) diene-3, glycerrhetol, 21α-hydroxy isoglabrolide, licoflavonol, glyzarin, glyzaglabrin, licoisoflavones A, B and licoisoflavon, glycyrin, sugars and aspargin (root and other plant parts).

Several bioactive compounds have been isolated from *Glycyrrhiza glabra*, including a water- soluble complex that constitutes approximately 40–50% of the plant's total dry weight. This complex is made up of triterpene saponins, flavonoids, polysaccharides, pectins, simple sugars, amino acids, mineral salts, and various other constituents**[11]** One of the primary components, glycyrrhizin—a triterpenoid compound—is responsible for the characteristic sweetness of licorice root. It exists as a mixture of potassium, calcium, and magnesium salts of glycyrrhizic acid, with concentrations typically ranging from 2% to 25%. Glycyrrhizic acid, one of the natural saponins, is a compound composed of a hydrophilic portion (two glucuronic acid molecules) and a hydrophobic segment (glycyrrhetic acid).**[12]** The yellow coloration of licorice is attributed to its flavonoid content, particularly compounds like liquiritin, isoliquiritin (a chalcone), and others. Notably, isoflavones such as glabridin and hispaglabridins A and B exhibit strong antioxidant properties,**[13]** while glabridin and glabrene also demonstrate estrogen-like activity.**[14]**

These phytochemicals collectively contribute to the wide-ranging therapeutic properties of *Yashtimadhu*, reinforcing its importance in both traditional and modern medicinal systems.

Toxicology

A well-documented side effect of *Glycyrrhiza glabra* consumption is an increase in blood pressure, primarily attributed to its influence on the renin-angiotensin-aldosterone system. Licorice saponins are believed to enhance the action of aldosterone by binding to mineralocorticoid receptors in the kidneys, leading to a condition termed pseudoaldosteronism. This can result in symptoms such as hypertension, hypokalemia (loss of potassium), and sodium retention, often leading to edema. These effects are generally reversible and tend to resolve once licorice intake is discontinued. **[15]** Although many studies have reported no adverse effects during licorice therapy,**[16,17]** the likelihood and severity of side effects typically depend on the dose, duration of use, and individual sensitivity. Individuals with delayed gastrointestinal transit may be more prone to such reactions due to enterohepatic recirculation and reabsorption of licorice metabolites. The amount of licorice associated with mineralocorticoid-related side effects varies widely, with reported daily intake ranging from 1.5 grams to 250 grams.**[18]**

Dosage

Due to the wide variability in individual responses to different licorice preparations, determining a universally appropriate dosage is challenging. However, a daily oral intake of 1–10 mg of glycyrrhizin - equivalent to approximately 1–5 grams of licorice (assuming a glycyrrhizin content of 2%) - is generally considered safe for most healthy adults.**[19]**

Substitutes and adulterants

Manchurian licorice, derived from *Glycyrrhiza uralensis*, is commonly used as a substitute for *Glycyrrhiza glabra*. Although it contains glycyrrhizin, the key active component, it has significantly lower levels of free sugars. A frequent adulterant is wild licorice, also known as Indian licorice, which is obtained from the roots of *Abrus precatorius* (family Leguminosae).**[20]**

Pharmacokinetics of *Glycyrrhiza glabra*

After oral administration of licorice in humans, its primary active component, glycyrrhizic acid, is converted into glycyrrhetic acid by intestinal bacteria that produce a specific β-glucuronidase enzyme.**[21,22]**

Studies have shown that glycyrrhetic acid is 200 to 1,000 times more potent than glycyrrhizic acid in inhibiting 11-β-hydroxysteroid dehydrogenase, an enzyme involved in corticosteroid metabolism. Therefore, the pharmacokinetics of glycyrrhetic acid are of greater clinical relevance following oral intake. Once absorbed, glycyrrhetic acid is rapidly transported to the liver by carrier proteins, where it undergoes metabolism into glucuronide and sulfate conjugates. These conjugates are then hydrolyzed back into glycyrrhetic acid, which is reabsorbed into circulation, leading to delayed plasma clearance. **[23]** In studies where healthy volunteers were given 100 mg of glycyrrhizin orally, glycyrrhetic acid was detected in plasma at levels below 200 ng/mL, while glycyrrhizin itself was not present. However, glycyrrhizin was detected in the urine within 24 hours, indicating that a portion of it may be absorbed intact.**[24]**

Research studies on *Glycyrrhiza glabra*

Prevention of *in-vitro* glucose-induced cataract by *Vasanjana* prepared by *Yashtimadhu Kalka* (paste of *Glycyrrhiza glabra* Linn)[25]

A study was conducted to evaluate the anti-cataract activity of *Vasanjana*, a formulation prepared using *Yashtimadhu Kalka* in the fat of domestic fowl, on glucose-induced cataract in sheep lenses. Cataract was induced by incubating sheep eye lenses in artificial aqueous humor containing 55 mM glucose.

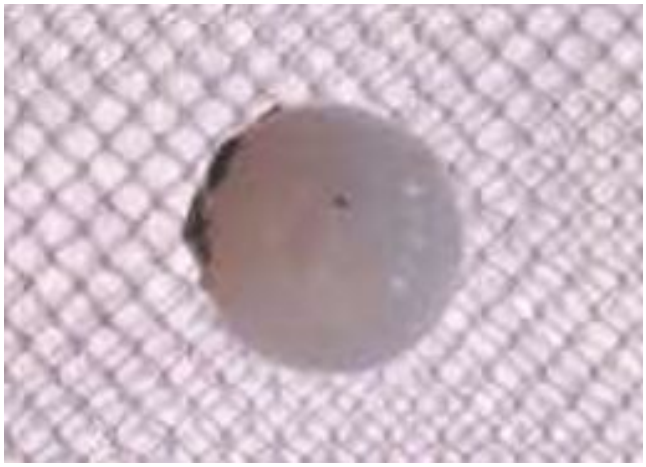
Treatments included *cow ghee* (CG), plain fat, *Vasanjana*, and Vitamin E, all administered in the same medium. The lenses were incubated at room temperature for 72 hours.

Biochemical parameters analyzed included total protein content, malondialdehyde (MDA) levels, Na^+/K^+ ATPase activity, and electrolyte levels (Na^+ and K^+). Photographic documentation was also performed. Complete lens opacification was observed within 72 hours in the glucose-treated group.

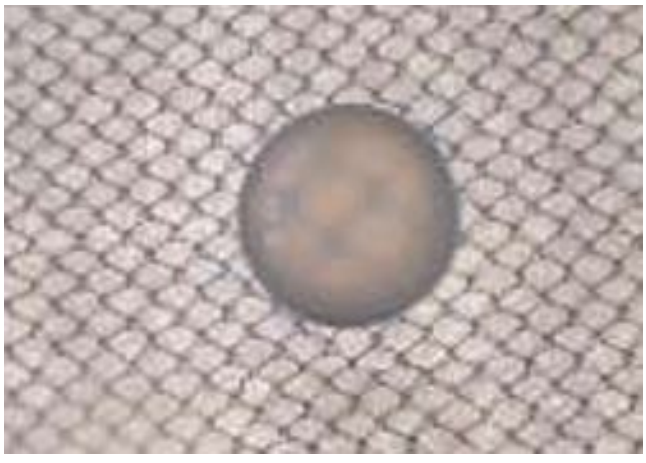
These cataractous lenses exhibited a significant increase in Na^+ and MDA levels, along with a significant reduction in total protein content and Na^+/K^+ ATPase activity. Lenses treated with *Vasanjana* showed a non-significant increase in total protein content, a decrease in MDA levels, and prevention of cataract formation and progression, as confirmed through photographic evidence.

Notably, *Cow ghee* and Vitamin E treatments significantly reversed glucose-induced biochemical alterations. The anti-cataract effects of *Vasanjana* and *Cow ghee* are likely attributed to their antioxidant and free radical scavenging properties.

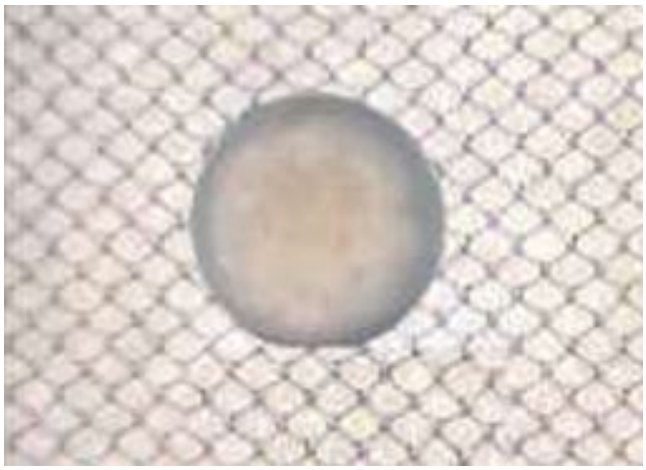
From Glucose control group – lens treated with high concentrated glucose



From Normal control group - normal lens, with no treatment



From *Cow ghee* group - lens treated with high concentrated glucose and cow ghee



From *Vasaanjana* group (Vk) - lens treated with high concentrated glucose and *Vasaanjana* prepared by *Yashtimadhu Kalka*

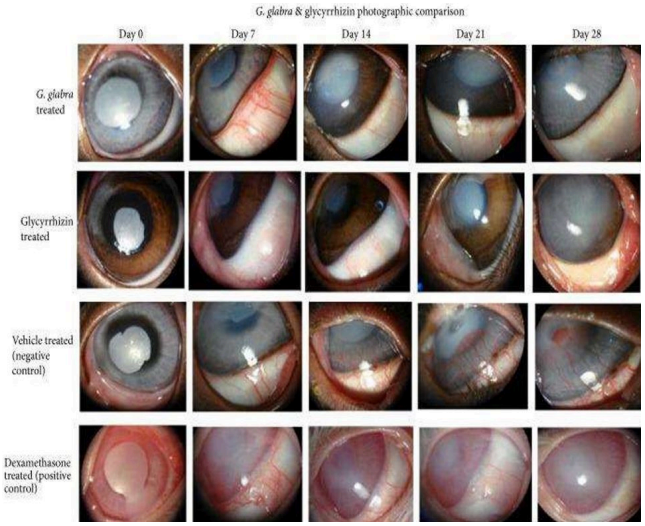
Inhibitory Effects of *Glycyrrhiza glabra* and Its Major Constituent Glycyrrhizin on Inflammation - Associated Corneal Neovascularization[26]

Glycyrrhizin, a key bioactive compound of *Glycyrrhiza glabra*, is known for its anti-inflammatory properties. This study aimed to evaluate the efficacy of *Glycyrrhiza glabra* methanolic extract and glycyrrhizin in the treatment of corneal neovascularization (CNV). The extract was prepared using 70% aqueous methanol and analyzed for its phytochemical composition through standard phytochemical tests, thin-layer chromatography (TLC), and high-performance liquid chromatography (HPLC).

Topical formulations were prepared using *Glycyrrhiza glabra* methanol extract (2% w/v) and glycyrrhizin (1% w/v) in normal saline. CNV was induced in experimental animals through corneal alkali burns using 1 N NaOH. After allowing one week for neovascularization to develop, treatments commenced on day 7 and continued for 21 consecutive days. Each group received three drops of the respective topical solution three times daily. Phytochemical screening of the methanolic extract revealed the presence of saponins, phenols, carbohydrates, flavonoids, and proteins, while TLC and HPLC confirmed the presence of glycyrrhizin. Digital photographic analysis demonstrated a significant reduction in CNV in the extract- and glycyrrhizin-treated groups.

Histological examination revealed the absence of blood vessels and the presence of well-organized collagen fibers in treated corneas.

The results suggest that both *Glycyrrhiza glabra* extract and glycyrrhizin are effective in managing CNV. Further bioassay-guided isolation may support the development of ophthalmic formulations for therapeutic use in CNV treatment.



Histological evaluation was conducted to assess the presence of inflammation, corneal fiber restoration, and neovascularization (NV) in different treatment groups. Hematoxylin and eosin (H&E) stained microphotographs were used for this analysis. The left eye of each animal, which did not undergo alkali burn and was maintained under normal conditions, served as a reference. In these reference corneas, no epithelial overgrowth, neovascularization, or morphological abnormalities were observed.

In contrast, the vehicle control group exhibited extensive neovascularization and disrupted collagen structure, indicating clear development of CNV. Corneas treated with *Glycyrrhiza glabra* extract showed significant recovery, with minimal blood vessel presence and collagen fibers restored to their normal arrangement, suggesting near- complete healing. The glycyrrhizin-treated group also demonstrated substantial recovery, though not as complete as the *Glycyrrhiza glabra* extract group. While most of the corneal architecture appeared normalized, some signs of damage persisted, including epithelial hypertrophy and a small number of residual blood vessels. In comparison, dexamethasone-treated corneas (positive control) showed reduced epithelial proliferation and limited neovascularization.

However, collagen fibers appeared disorganized and partially degraded. These findings suggest that while both *Glycyrrhiza glabra* extract and glycyrrhizin exhibit anti- CNV effects, the whole extract appears to be more effective in restoring normal corneal structure than glycyrrhizin alone.

Preventive Effect of *Glycyrrhiza* Glabra Extract on Oral Mucositis in Patients Under Head and Neck Radiotherapy: A Randomized Clinical Trial[27]

Approximately two-thirds of cancer patients undergo radiotherapy, with oral mucositis being a common and serious side effect. It significantly contributes to patient morbidity, potential mortality, and a reduced quality of life. This study was conducted to evaluate the preventive effect of *Glycyrrhiza* aqueous extract on oral mucositis in patients receiving head and neck radiotherapy.

In this double-blind clinical trial, 37 patients with head and neck cancer were randomly assigned to two groups: an intervention group (n=19) receiving *Glycyrrhiza* aqueous extract, and a control group (n=18) receiving a placebo. Patients in the intervention group applied the extract topically twice daily, beginning on the first day of radiotherapy and continuing through the end of the second week. Prior to treatment, all participants were examined to rule out any pre-existing oral ulcers; those with existing oral wounds were excluded from the study.

The findings indicated that the use of *Glycyrrhiza* aqueous extract led to a reduction in the severity of oral mucositis, as well as decreased wound size and irritation. These results suggest that *Glycyrrhiza* root extract may be beneficial in preventing or alleviating oral mucositis and its associated complications in cancer patients undergoing radiotherapy.

Hair Growth Promotant Activity of Petroleum Ether Root Extract of *Glycyrrhiza Glabra* L (Fabaceae) in Female Rats[28]

Female Wistar rats were used for the hair growth promotion studies. They were divided into three groups(n = 6) and their dorsal skin was completely denuded to completely remove hair. Paraffin oil (control), 2 % minoxidil solution (reference) or petroleum ether (60–80°C) root extract of *Glycyrrhiza glabra* (2 %), was applied to the denuded skin once daily for 30 days.

During this period, they were observed visually for hair growth and thereafter skin biopsy was taken for evaluation of follicular density and cyclic phases of hair growth. Animals treated with petroleum ether extract of *Glycyrrhiza glabra* roots showed longer hair than those treated with either minoxidil or control. Furthermore, the time (5–13 days) for commencement of hair growth and to reach complete hair growth was least in extract- treated animals, followed by those treated with minoxidil (6 - 19 days). A maximum of 76% of hair follicles were in anagenic stage (active growth phase of hair) in extract- treated animals, compared to 66 and 45 % in minoxidil-treated and control groups, respectively this study indicates that the petroleum ether extract of *Glycyrrhiza glabra* roots has potentials as a hair growth promoting agent for females

Effect of *Glycyrrhiza glabra* on oral health, aphthous ulcer and lichen planus:

In a double-blind, placebo-controlled clinical trial, 24 patients with recurrent aphthous ulcers were randomly assigned to receive either 2 g of glycyrrhizin (as carbenoxolone sodium) dissolved in 30 ml of warm water, three times a day after meals for four weeks, or a placebo. The group using the licorice-based mouthwash showed a significant reduction in the average number of daily ulcers, pain levels, and the formation of new ulcers**[29]** compared to the placebo group. In another study involving 20 patients, a deglycyrrhizinated licorice (DGL) mouthwash was used four times daily. After just one day, 15 patients showed 50–75% clinical improvement, and complete healing of canker sores was reported within three days.**[30]**

Furthermore, an open-label clinical trial was conducted in 17 hepatitis C-positive patients suffering from oral lichen planus - an inflammatory condition characterized by lymphocytic hyperkeratosis of the oral mucosa. Participants were treated with either routine dental care or 40 ml of intravenous glycyrrhizin daily for one month. Among those receiving glycyrrhizin, 66.7% showed overall clinical improvement, including reduced redness, fewer white papules, and less mucosal erosion.**[31]**

These findings support the potential efficacy of glycyrrhizin and its derivatives in treating inflammatory conditions of the oral cavity. *Yastimadhu* (*Glycyrrhiza glabra*) has long been valued in Ayurveda for its role in maintaining oral health and treating dental diseases (*Danta Roga*).

Ayurvedic texts recommend chewing *Yastimadhu* sticks - approximately nine inches in length - daily to help prevent dental caries and promote oral hygiene. Modern studies support these traditional practices by identifying several active phytochemicals in *Yastimadhu*, such as glycyrrhizol A, glycyrrhizol B, 5-O- methylglycryol, isoglycyrol, 6,8-diisoprenyl-5,7,4’-trihydroxyisoflavone, and gancaonin G. These compounds have demonstrated antimicrobial activity**[32]** against cariogenic bacteria, including members of the Mutans group of Streptococci, Streptococcus sanguis, Lactobacillus spp., and Actinomyces spp. - all known contributors to dental caries.**[33]**

In an animal study, MAIDS mice (infected with the LP-BM5 murine leukemia virus) were found to be 100 times more susceptible to Candida albicans infection than healthy mice. Treatment with glycyrrhizin significantly improved their resistance to the infection.**[34]** Supporting this, an in vitro study by Motsei et al. revealed that licorice extracts, particularly from freshwater sources, had antifungal effects against C. albicans.**[35]** Further research by Lee et al. identified that liquiritigenin (LG), a flavonoid in licorice, helped protect mice from systemic candidiasis by stimulating the CD4+ Th1 immune response.**[36]**

Additionally, polysaccharides extracted from *Glycyrrhiza glabra* have been shown to possess strong anti-adhesive properties against *Porphyromonas gingivalis*, a major pathogen in periodontal disease.**[37]**

Clinical studies on over-the-counter products like Canker Melts GX patches, which contain licorice extract, have shown that they reduce lesion size, duration, & discomfort in aphthous ulcers, thereby accelerating healing.**[38]** In randomized, double-blind clinical trial involving 23 patients, dissolving oral patch containing licorice extract demonstrated superior results in reducing ulcer size & pain compared to placebo, when used for up to eight days. **[39]** These findings collecti. highlight therapeutic potential of *Yastimadhu* in maintaining oral health & managing various oral infections & conditions.

Discussion

Yashtimadhu (*Glycyrrhiza glabra*) widely recognized in *Ayurveda*, holds great therapeutic potential in the management of diseases above the clavicle,

The pharmacological properties of *Yashtimadhu* such as *Madhura Rasa*, *Sheeta Veerya*, *Snigdha Guna* and *Tridoshaghna Karma* contribute to its efficacy in *Urdhwajatru Rogas*. In *Dantha Rogas*, *Glycyrrhiza glabra* has shown promising results. Chewing its sticks has been traditionally advised for maintaining oral hygiene and preventing dental caries.

Scientific research confirms its antimicrobial activity against cariogenic bacteria such as Streptococcus mutans, Lactobacillus spp, and actinomyces spp which supports its use in preventing plaque formation, gingivitis and dental caries. *Yashtimadhu* based mouthwashes and patches have shown to reduce ulcer size, pain and healing time in recurrent aphthous ulcers and radiation induced mucositis.

Yashtimadhu is also used in *Kantha Rogas* due to its soothing, anti-inflammatory and demulcent properties *Yashtimadhu* possess phytoconstituents like glycyrrhizin, asparagine and triterpenoids which has anti-inflammatory and analgesic properties which are beneficial in conditions like pharyngitis, laryngitis and allergic rhinitis. Phytoconstituent like glabridin substantially reduce retinal damage by protecting the retinal pigment epithelial cells against oxidative stress and apoptosis.

Yashtimadhu also helps in preventing cataract formation due to its antioxidant and free radical scavenging properties. Chemical constituents like glycyrrhizin and liquiritigenin have shown immunomodulatory effect and antifungal activity, particularly against candida albicans which helps in managing oral candidiasis especially in immune compromised patients.

Conclusion

Glycyrrhiza glabra (GG), commonly known as licorice, is medicinal plant with rich ethnobotanical history. Traditionally, its root and rhizome have been widely used in folk medicine across Europe and Eastern countries. Scientific studies have confirmed that extracts of *Glycyrrhiza glabra* exhibit broad range of therapeutic properties, including antitussive, antimicrobial, antioxidant, anti-inflammatory, antiulcer, and anticancer activities. These effects are attributed to its diverse array of bioactive compounds such as triterpenes, saponins, flavonoids, alkaloids, glycyrrhizin, glycyrrhetic acid, glabridin, and liquiritin.

The chemical composition of *Glycyrrhiza glabra* has been extensively explored in recent decades, which aided information of its bioactive constituents.

These compounds hold significant potential for yielding novel molecules with valuable therapeutic applications, making *Glycyrrhiza glabra* a promising source in the ongoing drug discovery and development process both classical *Ayurvedic* use and contemporary scientific studies support its therapeutic efficacy.

With further standardization and clinical validation, *Yashtimadhu* holds significant potential for integrative management of head and neck disorders.

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