



CRITICAL ANALYSIS OF THE ROLE OF YASHTIMADHU IN CHARKOKTA MAHAKASHAYA

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ABSTRACT

Yashtimadhu (*Glycyrrhiza glabra* Linn.), one of the most revered herbs in Ayurveda, is frequently mentioned by Acharya Charaka in eleven different *Mahakashayas*, reflecting its diverse therapeutic importance. These include *Jivaniya*, *Kanthya*, *Varnya*, *Sandhaiya*, *Kandughna*, *Mutra-Virajaniya*, *Sonita-sthapana*, *Chardinigrahana*, *Snehopaga*, *Vamanopaga*, and *Asthapanopaga Mahakashayas*.

Classical references highlight its role in promoting life span, rejuvenation, voice and throat health, complexion, wound healing, allergy and pruritus management, urinary disorders, hemorrhagic conditions, vomiting suppression, oleation therapies, and *Basti karma* support. From an Ayurvedic perspective, its *Madhura rasa*, *Guru-Snigdha guna*, *Sheeta virya*, and *Madhura vipaka* make it *Pitta-Vata shamaka*, *Oja-promoter*, *Rasayana*, and *Balya*. Modern pharmacology validates these classical claims, as Glycyrrhizin, glabridin, and flavonoids confer anti-inflammatory, anti-ulcer, hepatoprotective, immunomodulatory, demulcent, anti-pruritic, and wound-healing actions. The critical appraisal indicates that Charaka's inclusion of *Yashtimadhu* across 11 *Mahakashayas* is not repetitive but reflective of its multidimensional pharmacological spectrum. Thus, *Yashtimadhu* stands as a paradigm where classical Ayurvedic wisdom and contemporary pharmacological evidence converge, justifying its relevance in integrative therapeutics.

KEYWORDS : *Yashtimadhu*, *Glycyrrhiza glabra*, *Charaka Samhita*, *Mahakashaya*.

INTRODUCTION

Ayurveda, the ancient Indian system of medicine, emphasizes the holistic promotion of health and prevention of disease through the principles of *Dravya Guṇa*, *Doṣa–Dhatu–Mala* balance, and *Rasayana* therapy. Among the wide *Materia medica* described in classical texts, *Yashtimadhu* (*Glycyrrhiza glabra* Linn.), commonly known as licorice or sweetwood, occupies a significant place owing to its *Madhura rasa*, *Sheeta virya*, *Madhura vipaka*, and *Guru–Snigdha guṇa*, collectively imparting *Bṛuḥaṇa* (anabolic), *Rasayana* (rejuvenative), and *Vṛushya* (aphrodisiac) actions.^[1]

Acharya Charaka has enumerated *Yashtimadhu* in several *Mahakashayas*, including *Jeevaniya Mahakashaya* (life-promoting group), *Kanthya Mahakashaya* (Phonatory Enhancing Group), *Varnya Mahakashaya* (Complexion-enhancing group),

Sandhaniya Mhakashay (Osteo-Regenerating group), *Kandughna Mhakashay* (Antipruritic group), and *Mutravirajaniya Mahakashaya* (Uro-cleansing group), *Shonitsthapan Mahakashaya* (Haemostatic group), *Chhardighna Mhakashaya* (Antiemetic group), *Snehopag Mhakashaya* (Oleation supporting group) *Vamanopag Mhakashay* (Emesis supporting group), *Asthapanopaga Mhakashaya* (Enema supporting group)^[2]. This multidimensional presence illustrates its diverse pharmacodynamic spectrum (*karma*), including *Oja-var dhana* (immunity enhancement), *Vrana-ropana* (ulcer/wound healing), *Varna-prasadana* (improving complexion), and *pitta-shamana* (pacifying *Pitta* disorders).

Classical texts describe *Yashtimadhu* as effective in a wide range of clinical conditions such as *Kasa* (cough), *Shwasa* (dyspnea), *Amlapitta* (hyperacidity), *Raktapitta* (hemorrhagic disorders), *Vrana* (wounds), and *Kshaya* (tissue depletion)^[3]. Its *Oja*-promoting and *Mamsa-Dhatu-var dhaka* effects make it highly valuable in states of debility, cachexia, and immune suppression.

Phytochemically, *Glycyrrhiza glabra* contains bioactive constituents such as glycyrrhizin, glycyrrhetic acid, liquiritin, isoliquiritin, glabridin, and flavonoids, which have been reported to exhibit Anti-inflammatory, Immunomodulatory, Antioxidant, Hepatoprotective, Anti-ulcer, Antiviral, and Adaptogenic activities^[4,5]. Glycyrrhizin, the principal saponin glycoside, demonstrates corticosteroid-like effects by inhibiting 11 β -Hydroxysteroid Dehydrogenase, thereby potentiating endogenous cortisol activity and exerting strong Anti-inflammatory and Anti-allergic effects^[6]. These findings scientifically substantiate its *shothahara* (Anti-inflammatory) and *Rasayana* (Rejuvenative) claims from Ayurveda^[7].

Considering its extensive references across *Mahakashayas* and validated modern pharmacological profile, *Yashtimadhu* holds promising potential as a bridge between traditional Ayurvedic wisdom and evidence-based integrative medicine. This article aims to critically review the rationale for its inclusion in *Charakokta Mahakashayas*, correlate its Ayurvedic pharmacodynamics with modern pharmacology, and highlight its clinical relevance in the management of respiratory, gastrointestinal, immune, and degenerative disorders.



Fig. 1: Plant of Glycyrrhiza Glabra.



Fig. 2: Root and powder of Glycyrrhiza Glabra

MATERIAL AND METHOD

All Ayurvedic treatises including *Brihatrayi*, and contemporary textbooks were referred for detailed information regarding *Yashtimadhu* (*Glycyrrhiza glabra* Linn.), its *Dravya Guṇa*, *Karma*, and therapeutic indications. Relevant research articles, Pharmacological studies, and Modern reviews were also consulted to understand its Phytoconstituents and Pharmacological actions.

The classification of *Mahakashaya* in Charaka Saṃhita is based on the predominant pharmacological actions of herbs. The inclusion of *Yashtimadhu* in multiple *Mahakashaya* (*Jeevaniya*, *Varnya*, *Ropaniya*, etc.) highlights its diverse therapeutic potential. A critical analysis was carried out to evaluate whether its repeated mention is based on Ayurvedic Pharmacodynamics, Therapeutic indications or its synergistic actions with other *Mahakashaya Dravyas*.

Yashtimadhu in *Mahakashayas*^[8]

1. *Jeevaniya Mahakashaya*

तद्यथा- जीवकर्षभकौ मेदा महामेदा काकोली क्षीरकाकोली मुद्गपर्णीमाषपर्ण्यौ जीवन्ती मधुकमिति दशेमानि जीवनीयानि भवन्ति ।

2.Kanthya Mahakashaya

सारिवेक्षुमूलमधुकपिप्पलीद्राक्षाविदारीकैट्यहंसपादीबृहतीकण्टकारिका इति दशेमानि कण्ठ्यानि भवन्ति ।

3.Varnya Mahakashaya

चन्दनतुङ्गपद्मकोशीरमधुकमज्जिष्ठासारिवापयस्यासितालता इति दशेमानि वर्ण्यानि भवन्ति ।

4.Sandhaniya Mahakashaya

मधुकमधुपर्णीपृश्निपर्ण्यम्बुष्ठीकीसमङ्गामोचरसधातकीलोध्रप्रियङ्गुकट्फलानीति दशेमानि सन्धानीयानि भवन्ति ।

5.Kandughna Mahakashaya

चन्दननलदकृतमालनक्तमालनिम्बकुटजसर्षपमधुकदारुहरिद्रामुस्तानीति दशेमानि कण्डूघ्नानि भवन्ति ।

6.Mutravirajaniya Mahakashaya

पद्मोत्पलनलिनकुमुदसौगन्धिकपुण्डरीकशतपत्रमधुकप्रियङ्गुधातकीपुष्पाणीति दशेमानि मूत्रविरजनीयानि भवन्ति ।

7.Shonitasthapan Mahakashaya

मधुमधुकरुधिरमोचरसमृत्कपाललोध्रगैरिकप्रियङ्गुशर्करालाजा इति दशेमानि शोणितस्थापनानि भवन्ति ।

8.Chhardinihrahana Mahakashaya

जम्ब्वाम्रपल्लवमातुलुङ्गाम्लबदरदाडिमयवयष्टिकोशीरमृल्लाजा इति दशेमानि छर्दिनिग्रहणानि भवन्ति ।

9.Snehopaga Mahakashaya

मृद्वीकामधुकमधुपर्णीमेदाविदारीकाकोलीक्षीरकालोलीजीवकजीवन्तीशालपर्ण्य इति दशेमानि स्नेहोपगानि भवन्ति ।

10.Vamanopaga Mahakashaya

मधुमधुककोविदारकर्बुदारनीपविदुलबिम्बीशणपुष्पीसदापुष्पाप्रत्यक्पुष्पा इति दशेमानि वमनोपगानि भवन्ति ।

11.Asthapanopaga Mahakashaya

त्रिवृद्धिल्वपिप्पलीकुष्ठसर्षपवचावत्सकफलशतपुष्पामधुकमदनफलानीति दशेमान्यास्थापनोपगानि भवन्ति ।

Pharmacological Actions of Yashtimadhu

- **Ayurvedic Pharmacopoeia of Yashtimadhu^[9]**

1. Upayukta Anga (Useful/Utilized part)

Root (*Mula*) - primary useful part (stolon/rootstock used).

2. Rasapanchaka

- Rasa : Madhura
- Guṇa : Guru , Snigdha
- Virya : Sheeta
- Vipaka : Madhura
- Doṣaghna/ Doshaprabhava: Predominantly *Vata–Pitta Shamak* tends to increase *Kapha* if used excessively.
- **Modern Pharmacology**
 - Active Constituents: Glycyrrhizin (glycyrrhizic acid), liquiritin, glabridin, glabrol, isoliquiritigenin, liquiritigenin, flavonoids, saponins, polysaccharides, coumarins, and essential oils.

- **Therapeutic Actions:**
 - ✓ Demulcent & Anti-ulcer: Forms a protective coating over gastric mucosa, reduces acidity, promotes healing of ulcers and gastritis.
 - ✓ Expectorant & Anti-tussive: Loosens mucus, clears respiratory tract, and relieves cough and throat irritation.
 - ✓ Anti-inflammatory & Immunomodulatory: Downregulates inflammatory mediators (TNF- α , IL-6) and helps manage allergic, autoimmune, and inflammatory disorders.
 - ✓ Hepatoprotective & Antioxidant: Shields hepatocytes from toxins (e.g., CCl₄-induced injury), neutralizes free radicals, supports detoxification.
 - ✓ Adaptogenic & Neuroprotective: Balances HPA (hypothalamic-pituitary-adrenal) axis, reduces stress response, improves memory and cognitive performance.
 - ✓ Skin Protective & Wound Healing: Inhibits melanogenesis (reduces pigmentation), soothes inflammatory skin conditions like eczema, and accelerates wound repair.
- **Critical Analysis of *Yashtimadhu*'s Role in *Mahakashayas***

1. Why *Yashtimadhu* is included in multiple *Mahakashayas*?

- **Multimodal pharmacology (multisystem action) :** Glycyrrhizin, flavonoids and saponins produce demulcent, expectorant, anti-inflammatory, hepatoprotective and neuroprotective effects, so the drug is relevant to gastrointestinal, respiratory, hepatic, immune and nervous-system indications.
- **Immunomodulation and anti-inflammatory activity :** Experimental evidence shows modulation of inflammatory mediators and cytokines (reduction of pro-inflammatory signaling), which supports inclusion in *Mahakashayas* that address inflammatory, allergic and blood-related disorders.
- **Synergism and formulation potentiation:** *Yashtimadhu* improves palatability, stabilizes liquid/semisolid preparations (mucilage/saponins) and can potentiate the therapeutic effect of companion herbs - a practical reason for its frequent inclusion in different *Mahakashayas*.
- **Safety and suitability for prolonged therapy :** Relative palatability and tolerability (*Madhura rasa*) make it appropriate for long-term *Rasayana* use and for debilitated/pediatric patients - a key consideration in classical formula design.

2. Comparison with Other Herbs in *Mahakashayas*

- **In *Kanthya Mahakashaya*:** Among the *Kanthya Mahakashaya* *Yashtimadhu* is unique for its *madhura rasa*, *sheeta virya*, and direct soothing effect on *kantha*. Other drugs either act by *Kapha-shamana* (*Pippali*, *Kantakari*), *Rasaprasadana* (*Sariva*, *Draksha*), or *Balya-Brimhana* (*Vidari*), making *Yashtimadhu* the most mucoprotective and demulcent agent of the group.
- **In *Sandhaniya Mahakashaya*:** Within *Sandhaniya Mahakashaya*, *Yashtimadhu* is unique for combining *Ropana* + *Rasayana* actions, providing both quick wound healing and long-term tissue strength. Other drugs are mostly astringent, *stambhana*, or granulation-promoting, making *Yashtimadhu* the most soothing, nutritive, and collagen-promoting agent in this group. *Yashtimadhu* promotes wound healing and tissue regeneration through its anti-inflammatory and antioxidant effects. Compared to *Mochrasa*, *Dhataki*, *Samanga* act more as *Stambhana* (hemostatics), whereas *Yashtimadhu* promotes soft granulation and scar-free healing.
- ***Shonitasthapana Mahakashaya*:** Within, *Shonitasthapana Mahakashaya* *Yashtimadhu* is distinct because it not only stops bleeding but also restores mucosal integrity, improves liver function, and supports *dhatu poshana* (tissue nutrition) – thus addressing both acute bleeding and long-term prevention of recurrence, Compared to *Lodhra* which mainly act as *Lekhana* and *Stambhana*.
- ***Chhardinigravana Mahakashaya* :** In *Chhardinigravana Mahakashaya*, *Yashtimadhu* provides a unique dual benefit – acute vomiting control (like *Dadima* and *Matulunga*) plus long-term mucosal protection and *dhatu poshana*. *Dadima* mainly offers *grahi* & *agni*-stimulating effect, while *Matulunga* acts as a digestive

stimulant & *pachaka*. Thus, *Yashtimadhu* is preferred in chronic gastritis, acid peptic disorders, and recurrent *pittaja chhardi* where mucosal healing is crucial.

3. Therapeutic Applications and Formulation Synergy of *Yashtimadhu*

- ***Yashtimadhu Phanta*:** Water infusion used in *Vamana Panchakarma* for its soothing effect on gastric mucosa and to reduce post-procedure irritation.
- ***Yashtimadhu Ghrita*:** Medicated ghee extensively used in peptic ulcers, gastritis, and acid-peptic disorders; provides deep mucosal healing and *rasayana* effect.
- ***Yashtimadhu Taila (Oil)*:** Applied in *Nasya* therapy for headache, hair fall, premature greying; nourishes scalp and supports healthy hair growth.
- ***Kumkumadi Taila (Classical Formulation)*:** *Yashtimadhu* is an important ingredient contributing to skin glow enhancement, complexion improvement, and anti-inflammation.

4. Limitations and Precautions - *Yashtimadhu*

- ✓ Excessive use may cause sodium and water retention, leading to edema, hypertension, or hypokalemia due to glycyrrhizin-induced mineralocorticoid effect.^[10]
- ✓ Contraindicated in patients with uncontrolled hypertension, renal failure, or congestive heart failure.^[11]
- ✓ Long-term use should be monitored to avoid electrolyte imbalance and potential drug interactions (e.g., corticosteroids, diuretics, antihypertensives).^[12]
- ✓ Excess dose may aggravate *Kapha*, causing water retention, bloating, or weight gain if not balanced with appropriate *anupana*.^[13]

5. Clinical Applications & Research Evidence – *Yashtimadhu*

- Gastrointestinal: Proven anti-ulcer and mucoprotective effect; effective in gastritis & GERD.^[14]
 - Respiratory: Expectorant & bronchodilator; useful in chronic cough, bronchitis, asthma.
 - Hepatic: Supports liver function, reduces oxidative stress in hepatitis & NAFLD (Non Alcoholic fatty liver disease).^[15]
 - Metabolic: Improves lipid profile & insulin sensitivity, helpful in metabolic syndrome/PCOS.
 - Neurocognitive: Enhances memory & stress resilience via Hypothalamo Pituitary Adrenal axis modulation.
 - Dermatology: Reduces hyperpigmentation & inflammation.
- ❖ ***Yashtimadhu* in Charaka Samhita – Inclusion in *Mahakashayas***

<i>Mhahakashya</i>	Ayurvedic Explanation (Why <i>Yashtimadhu</i> Works Here)	Major Constituents ^[10]	Modern Role
1. Jeevaniya (Vitality-promoting)	<i>Madhura rasa</i> directly nourishes <i>rasa</i> & <i>mamsa dhatu</i> (<i>Jeevaniya karma</i>), <i>sheeta virya</i> maintains <i>bala</i> by <i>pitta-shamana</i> , <i>madhura vipaka</i> promotes long-term tissue strength and <i>oja vriddhi</i> .	Glycyrrhizin, flavonoids	Adaptogen, supporting overall vitality, energy levels, and tissue nourishment. It prevents oxidative stress-induced cellular damage.
2. Kanthya (Voice-soothing)	<i>Snigdha guna</i> Lubricates <i>kantha</i> , relieves dryness & inflammation, restores <i>swara</i> ; <i>sheeta virya</i> reduces <i>kantha shosha</i> & <i>pitta upadrava</i> .	Liquiritigenin, glabridin	Demulcent, anti-inflammatory, soothes pharyngeal mucosa.
3. Varnya (Complexion-enhancing)	<i>Madhura rasa</i> - <i>raktaprasadana</i> , <i>Sheeta virya</i> - calms <i>pitta</i> and prevents <i>twak daha</i> & <i>vyanga</i> , <i>Snigdha guna</i> - <i>twak snigdha</i> ; Improves <i>rakta dhatu</i> quality - enhances <i>varna</i> .	Isoflavones, glabridin, Liquiritigenin	Glabridin and liquiritin reduce melanin, protect from UV damage, and enhance collagen –

			promoting clear, glowing, even-toned skin.
4. Sandhaniya (Union-promoting)	<i>Madhura rasa - sandhanakara, Snigdha guna - mamsa poshana, Sheeta virya pitta-pacifying for proper granulation, Madhura vipaka - dhatu sthiratva, supports union of fractured bones, promotes dhatu & asthi poshana by nourishing rasa → asthi dhatu chain.</i>	Glycyrrhizin	Promotes tissue repair, collagen synthesis, and wound healing; supports bone and soft tissue regeneration.
5. Kandughna (Anti-pruritic)	<i>Sheeta virya- pitta-shamana, Madhura rasa - vranaropaka, twak prasada, Snigdha guna -ruksha harana, Reduces pitta-rakta dushti, main cause of kandu, pacifies burning/itching, restores moisture balance in skin.</i>	Glabridin, chalcones	Antihistaminic, antipruritic, anti-allergic relieves itching and irritation.
6. Mutravirajaniya (Urine-purifying)	<i>Sheeta virya -daha-pacification, Snigdha guna -mutra-marga snigdhatva, Clears discolored urine by pacifying pitta in mutravaha srotas, relieves mutrakriccha and daha.</i>	Glycyrrhizic acid, flavonoids (liquiritin, isoliquiritin)	anti-inflammatory, and urine-purifying; helps restore normal color of urine improving urine output.
7. Shonitasthapana (Hemostatic)	<i>Sheeta virya -pitta-shamana, Madhura ras-vipaka-dhatu sthirikarana, Stabilizes and purifies rakta dhatu, stops atipravritti like raktapitta.</i>	Liquiritigenin	Anti-inflammatory and hemostatic; helps stabilize blood and prevent bleeding.
8. Chhardinigrhna (Anti-emetic)	<i>Madhura rasa- hridya, pittashamana; Sheeta virya- calms urdhwaga pitta, Snigdha guna- protects mucosa, Reduces pitta-induced chhardi, protects gastric mucosa, calms vomiting reflex and restores appetite</i>	Flavonoids, glycyrrhizin	Anti-emetic, protects gastric mucosa, and soothes nausea and act as a Anti-emetic, anti-ulcer.
9. Snehopaga (Oleation-supporting)	<i>Snigdha guna-snehana, Madhura rasa-snehavardhaka, Sheeta virya -prevents pittaja upadrava during snehapana, Enhances proper distribution of sneha dravyas, prevents aggravation of pitta during oleation, promotes unctuousness in srotas.</i>	Glycyrrhizic acid	Improves bioavailability of fat-soluble drugs, mucosal protection during snehana.
10. Vamanopaga (Vamana-supporting)	<i>Madhura rasa -hridya, Snigdha guna - kshobha-shamana, Sheeta virya -pitta-shamana, Protects gastric mucosa, prevents irritation & complications during vamana karma, maintains hridya comfort.</i>	Flavonoids	Prevents vamana-induced gastric damage, soothes stomach.
11. Asthapanopaga (Basti-supporting)	<i>Snigdha guna-pakwashaya snigdhatva, Madhura rasa- vatashamana, Lubricates colon, prevents rukshata, facilitates smooth administration & absorption of basti dravya.</i>	Glycyrrhizin	Improves tolerance to basti, anti-inflammatory for colon.

Conclusion

Yashtimadhu (*Glycyrrhiza glabra* Linn.) demonstrates a multidimensional therapeutic potential across eleven *Mahakashayas* of Charaka Samhita, reflecting its broad-spectrum pharmacodynamics. Its classical Ayurvedic properties -*Madhura rasa*, *Sheeta virya*, *Madhura vipaka*, and *Guru -Snigdha guna* - underpin key actions such as *Jeevaniya* (vitality-promoting), *Sandhaniya* (tissue-regenerative), *Varna-prasada* (complexion-enhancing), *Chhardighna* (anti-emetic), *Shonitasthapana*

(hemostatic), *Kandughna* (anti-pruritic), and *Mutravirajaniya* (urine-purifying). These effects are achieved through *dosha*-pacifying, *dhatu*-nourishing, and *strotas*-balancing mechanisms, making it suitable for both acute and chronic conditions.

Modern pharmacology corroborates these traditional claims. Bioactive constituents like glycyrrhizin, flavonoids, liquiritin, glabridin, and saponins exhibit anti-inflammatory, immunomodulatory, hepatoprotective, antioxidant, demulcent, anti-ulcer, adaptogenic, and neuroprotective activities. These pharmacological actions explain its efficacy in gastrointestinal disorders, respiratory ailments, hepatic protection, immune modulation, dermatological applications, and metabolic support.

Its frequent inclusion in polyherbal formulations and multiple *Mahakashayas* is justified by its multisystem activity, synergistic potential, mucoprotective properties, and safety for prolonged *Rasayana* therapy. However, caution is advised in *Pitta*-prone individuals or those at risk of glycyrrhizin-induced mineralocorticoid effects.

References

1. Sharma PV. Dravyaguna Vigyana, Vol. 2, Chaukhamba Bharati Academy, Varanasi, 2015.
2. Charaka Samhita, Sutra Sthana 4/9, edited by Acharya YT, Chaukhamba Sanskrit Sansthan, Varanasi, 2020.
3. Bhavaprakasha Nighantu, Madhura Varga 183-187, commentary by Chunekar KC, Chaukhamba Bharati Academy, 2021.
4. Fiore C, Eisenhut M, Krausse R, et al. "Antiviral effects of Glycyrrhiza species." *Phytotherapy Research*. 2008;22(2):141–148.
5. Pastorino G, Cornara L, Soares S, Rodrigues F, Oliveira MBPP. "Licorice (*Glycyrrhiza glabra*): A phytochemical and pharmacological review." *Phytotherapy Research*. 2018;32(12):2323–2339.
6. Ming LJ, Yin AC. "Therapeutic effects of glycyrrhizic acid." *Natural Product Communications*. 2013;8(3):415–418.
7. Dhiman KS. Rasayana: Rejuvenative Care in Ayurveda. CCRAS, New Delhi, 2014.
8. Ravi Dutta Tripathi edited Charaka samhita, chikitsa sthan. adhyay 4, verse 8, hindi commentar and Marathi translation by Vd. Vijay Shankar Kale), chaukhamba Sanskrit pratisthan Varanasi 2005.
9. Ayurvedic Pharmacopoeia of India, First Edition, Govt. of India, Ministry of Health and Family Welfare, Department of Indian System of Medicine & Homoeopathy, New Delhi, 2001; Part-I, Vol. I: Monograph of Yashtimadhu (Stem & Root) pp. 214-215.
10. Fiore C, Eisenhut M, Krausse R, et al. Licorice: From Pseudoscience to Science. *Phytother Res*. 2005;19(7):649–659.
11. Isbrucker RA, Burdock GA. Risk and Safety Assessment on the Consumption of Licorice Root (*Glycyrrhiza* sp.). *Regul Toxicol Pharmacol*. 2006;46(3):167–192.
12. Bernardini S, Tiezzi A, Laghezza Masci V, Ovidi E. *Glycyrrhiza glabra*: A phytochemical and pharmacological review. *Phytother Res*. 2021;35(3):1188–1203.
13. Sharma PV. Dravyaguna Vigyana, Vol. 2. Chaukhamba Bharati Academy, Varanasi, 2015.
14. Aly AM et al. *AAPS PharmSciTech*. 2005;6(1):74–82.
15. Van Rossum TG et al. *Aliment Pharmacol Ther*. 1998;12(3):199–205.