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Research Article

**FORMULATION AND EVALUATION OF ANTI ACNE
TONER CONTAINING LIQUORICE EXTRACT**Pallavi S. Gore¹, Nandkishor B Deshmukh², Dr. Swati P Deshmukh³¹ Student, Shraddha Institute Of Pharmacy, Washim.² Associate Professor, Department of Pharmaceutics, Shraddha Institute of Pharmacy,
Washim.³ Principal, Department Of Pharmacology, Shraddha Institute Of Pharmacy, Washim.**Abstract:**

Acne vulgaris is a chronic inflammatory skin disorder affecting a larger populations especially adolescence. The use of herbal formulations has gained significant attention due to their safety effectiveness and minimal side effects. This study focuses on the formulation and evaluation of anti-acne containing liquorice (Glycyrrhiza galbra) extract. Liquorice possesses anti-inflammatory antimicrobial and skin brightening properties that are beneficial in acne management. The toner was formulated using suitable excipient such as humectants preservatives and solvents. Evaluation parameters including pH stability viscosity antimicrobial activity and skin irritation test were performed. The results indicated that the formulated toner exhibited good stability acceptable pH for skin compatibility and significant antimicrobial activity against acne causing bacteria. Hence the developed herbal toner can be considered an effective and safe alternative for active treatment

Keywords: Anti-acne toner, Liquorice extract, Glycyrrhiza galbra, Herbal formulation, Acne vulgaris, Antimicrobial activity, Cosmetic formulation, Glycyrrhin

Corresponding author:**Pallavi Shantaram Gore,**

Shraddha Institute of Pharmacy, Kondala Zambre, Washim – 444505

Email: pallavigore682@gmail.com

QR CODE



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INTRODUCTION:

A skin toner is a liquid cosmetic preparation applied to the face to cleanse the skin and minimize the appearance of pores. In addition to its cleansing action, a toner helps protect, hydrate, and Revitalise the skin. Facial toners are commonly used as an integral part of daily skincare Routines, particularly in the management of oily and acne-prone skin..

Acne is a common skin condition in which hair follicles become clogged with excess sebum and dead skin cells, resulting in the formation of blackheads, whiteheads, pimples, or deeper cystic lesions. These lesions most commonly appear on areas rich in sebaceous glands, such as the face, chest, and back.

The major causes of acne include:

- Excess sebum production
- Follicular hyperkeratinization
- Bacterial growth (*Cutibacterium acnes*)
- Inflammation

Herbal cosmetics are increasingly preferred due to fewer side effects compared to synthetic products. Liquorice (*Glycyrrhiza glabra*) is widely used in dermatology due to its anti-inflammatory and antimicrobial properties. *Glycyrrhiza glabra* (Liquorice) as an Anti-Acne agent has been extensively explored worldwide for its ethnic haematological and therapeutic properties. Liquorice contains bioactive compounds known for their anti-inflammatory, antimicrobial, and soothing effects, which are particularly beneficial in the treatment of acne and allergic dermatitis. The herbal potential of liquorice provides promising opportunities for the development of safe and clinically effective cosmetic and cosmeceutical preparations. Incorporation of liquorice extract in an anti-acne toner formulation may enhance therapeutic efficacy while minimizing adverse effects, thereby improving patient compliance and skin tolerance.

Studies show that herbal extracts, including liquorice, exhibit antibacterial activity against acne-causing microorganisms such as *Staphylococcus aureus* and *Cutibacterium acnes*.

OBJECTIVES

- To formulate an anti-acne toner using liquorice extract
- To evaluate physicochemical properties of the toner
- To assess antimicrobial activity against acne-causing bacteria

- To ensure stability and skin compatibility

Drug Profile:**1.Liquorice:**

Common names: Licorice, Mulethi, Yashtimadhu
Biological Source: Liquorice consists of subterranean peeled and unpeeled stolons, roots and subterranean stems of

Glycyrrhiza glabra Linn, belonging to family *Leguminosae*.

Chemical constituents:

Fig No:1 Liquorice

Saponins: Glycyrrhizin, glycyrrhetic acid (major bioactives).

Flavonoids: Liquiritin, liquiritigenin, glabridin, isoliquiritigenin, and formononetin.

Uses:

1. *Glycyrrhiza* is widely used as a sweetening agent and in bronchial problems such as catarrh, bronchitis, cold, flu and coughs.
2. It reduces irritation of the throat and yet has an expectorant action.
3. It produces its demulcent and expectorant effects.
4. It is used in relieving stress

**2.Aloe vera**

Botanical name: *Aloe barbadensis* miller
belongs to the Family *Asphodelaceae*

Chemical constituents:

It is rich in vitamin A, E, C, B12, Folic acid, minerals.

Uses -

Fig No:2 Aloe vera

- 1 Its anti-inflammatory properties can reduce pain, Swelling.
2. It increases the production and release of collagen.
3. It reduces wound healing time and limits scarring.
4. It has antioxidant properties used to treat sun damage.



3. Turmeric:

Botanical name: Turmeric, Haldi.

Biological Source:

Turmeric is the dried rhizome of *Curcuma longa* Linn).

,belonging to family Zingiberaceae.

Chemical

Constituents:

Fig No: 3 Turmeric

Turmeric contains yellow colouring matter called as curcuminoids (5%) and essential oil (6%). The chief constituent of the colouring matter is curcumin I (60%) in addition with small quantities of curcumin III, curcumin II and dihydrocurcumin.

USES FOR SKIN -

1. Acne Treatment
2. Brightening and Dark Spots
3. Anti-Aging



4.Green Tea Extract:

- **Biological Name:** Camellia sinensis
- **Family:** Theaceae Genus: Camellia
- **Biological Source:** Originates From the Leaves and Buds of the evergreen shrub or small tree Camellia sinensis
- Green tea contains powerful compounds (especially EGCG) that act in several useful ways:
- Reduces oil (sebum) production : less clogged pores Fig No 4: Green Tea Extract
- Anti-inflammatory : calms redness and swelling

- **Antibacterial :** helps fight acne-causing bacteria
- **Antioxidant :** protects skin from damage



5.Orange Peel Extract:

- **Biological Name:** Citrus sinensis
- **Common Name :** Sweet orange
- **Family:** Rutaceae
- **Genus:** Citrus
- **Biological Source:** Orange peel is consisting of fresh and dried outer part of pericarp of Citrus Aurantium Linn
- **Major Chemical Constituent:** Vitamin C, Citral, Hesperidin, Limanene, Pectin, Aurantimaricin and Aurantimaric acid Fig No5: Orange Peel Extract
- **Colour:** Dark orange reddish
- **Odour:** Aromatic
- **Taste:** Aromatic and bitter
- **Size:** There is Variation in the size and shape of the ribbons or strip. They are between 3 and 4 mm thick



Formulation Table:

Sr.no	Ingredients	Quantity	Function
1.	Liquorice Extract	5ml	Anti-Inflamatory
2.	Orange peel Extract	5ml	Antioxidant
3.	Turmeric Extract	2ml	Enhance Skin tone
4.	Green tea Extract	5ml	Anti-aging
5.	Aloe Vera	5ml	Smoothing
6.	Rose Water	10 ml	Fragrance
7.	Glycerine	3ml	Moisturiser
8.	Sodium Benzoate	0.5 ml	Preservatives
9.	Distilled Water	Q.S	Vehicle

METHOD OF PREPARATION:

- Prepare the extract from crude drugs used like, Liquorice , Orange peel, Turmeric.
- In clean beaker add prepared active extract and mix well.
- Then add Aloe vera gel into the mixture of extract and continuously stirred.
- Add Rose water which helps the balance skin pH and provide fragrance.
- Add glycerine this will help attract moisture to the skin. Keeping it hydrated and soft.
- Finally add Sodium Benzoate as preservative for preserving formulation.
- Then final mixing and ensure all the ingredients are well blended and evenly distributed
- Using a funnel transfer the toner into clean spray bottle or container.

EVALUATION PARAMETERS**Physical Appearance**

- Color, Odor, Clarity

pH Determination

- Measured using digital pH meter (ideal: 5.5–6.5)

Viscosity

- Measured using viscometer

Stability Study

- Stored at different temperatures (room, 40°C)
- Observed for 30 days

Antimicrobial Activity

- Test organisms:
- Staphylococcus aureus
- Cutibacterium acnes

Skin Irritation Test

- Applied on human volunteers
- Observed for redness or irritation

**RESULTS AND DISCUSSION:**

- The toner appeared clear and pleasant in odor
- pH was found to be within acceptable range (5.8–6.2)
- No phase separation observed during stability studies
- Antimicrobial activity showed moderate inhibition zones
- No irritation observed on skin
- Liquorice extract contributes anti-inflammatory and antibacterial effects, making it suitable for acne treatment.

ADVANTAGES OF FORMULATION

- Natural and safe
- Cost-effective
- Minimal side effects
- Suitable for sensitive skin
- Provides hydration and acne control

Disadvantages:

- Requires preservatives for shelf life

- Mild action compared to synthetic drugs
- Stability depends on storage conditions

FUTURE SCOPE

- Clinical trials on larger population
- Incorporation of other herbal extracts
- Commercial scale production
- Advanced stability studies

CONCLUSION

The formulated anti-acne toner containing liquorice extract demonstrated satisfactory physicochemical properties, stability, and antimicrobial activity. The spray toner mixture yielded outstanding outcomes. The products were all affordable and useful, and they were all bought fresh from the neighbourhood market. It was decided that the cooling and toning impact the toner was supposed to have on the skin was sufficient. To make it easier to travel and apply the mixture whenever and wherever needed, it was also made in toner form. It was discovered that the developed formulation possessed the characteristics of a traditional skincare formulation from a cosmeceutical and was physicochemical stable. Since the spray formulation was able to better penetrate the skin's tiny pores by spraying tiny particles into the skin with a specific level of force, it was more effective than any other form, including gel or lotion. The formulation is safe for topical application and effective in reducing acne symptoms. Herbal toners like this can be used as an alternative to synthetic anti-acne products.

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