



## EVALUATION OF ANTIOXIDANT ACTIVITY IN AQUEOUS EXTRACT OF AJWAIN AND FORMULATION OF HERBAL LOTION AND PEEL-OFF FACE MASK

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**ABSTRACT** Herbal medicines have been used since the dawn of civilization to maintain health and to treat diseases. This review deals with the evidence-based information regarding the Pharmacognostical examinations like morphological and histological characteristics of fruits of *T. ammi* besides physicochemical and phytochemical analysis; hence it is encouraging to find its new therapeutic uses. Ajwain seeds revealed to possess antiseptic, carminative, diuretic, antioxidant, antimicrobial, antiviral, antiulcer, antiplatelet and hepatoprotective as well as antihyperlipidemic effects, many of those were remarked by early Persian physicians. With reference to these pharmacological activities, Ajwain seeds can be a good candidate for to be applied in clinical practice. Data evolved in this exploration could be used in laying down pharmacopoeial principles for the drug studied, as standardization of herbal medicines is completely essential. The purpose of this study is to formulate and evaluate herbal lotion and peel-off face masks with aqueous extract of *Trachyspermum ammi*.

**KEYWORDS :** Ajwain, Extraction, Antioxidant activity, Herbal Formulation, Lotion, Peel-off mask.

### INTRODUCTION:

*Trachyspermum ammi* Linn. Sprague, fruits, family- Apiaceae commonly known as ajwain in Indian language and Bishop's weed (English name) is an annual herbaceous plant having grayish brown fruits or seeds. The plant is native to Egypt and is cultivated in India, Iran, Afghanistan and Iraq. In India it is cultivated in Uttar Pradesh, Gujarat, Rajasthan, Maharashtra, Bihar and West Bengal. (Rajeshwari et al., 2011) Excessive production of free radicals and the unbalanced mechanisms of antioxidant protection lead to oxidative stress. (Sharma et al., 2012) Epidemiological and in vitro studies on medicinal plants and vegetables have strongly supported the phenolic compounds, which are widely distributed in many fruits, vegetables and tea is believed to account mainly for the antioxidant capacity in them. One such plant is ajwain. (Chatterjee et al., 2013) Seeds of Ajwain are known to possess antioxidant, and antimicrobial activity. (Bairwa et al., 2012) Herbal extracts are primarily added to cosmetic preparations due to several associated properties such as antioxidant, antibacterial and anti-inflammatory properties. The lotion as topical suspensions or emulsions usually serves as emollients, or as protective. (Silwal et al., 2016) Peel-off facial masks are known for their unique characteristics inherent to the use of film-forming polymers that, after complete drying, create a very cohesive plastic layer allowing for the manual removal of the product without leaving any residue. In addition, the firming action of these formulations leads to a sensation of clean skin. Moreover, it also provides slight moisturizing action and enhances the effect of the active compounds on the epithelium. (Beringsh et al., 2013) This study explores phytoconstituent and antioxidant potential of aqueous extract of ajwain obtained by soxhlet extraction. The extract is then used as an active constituent in formulation of lotion and peel-off masks along with their physicochemical evaluation.

### MATERIALS AND METHODS

#### Chemicals:

All chemicals and materials for present study were collected in optimal form from the SRL chemicals and Astron chemicals. All chemicals used for the experiment were of analytical grade.

#### Collection And Extraction:

Plant material was collected from local shops in Rasayani, Maharashtra. Morphological characteristics such as shape, size, colour and odour of seeds were studied. The seeds were powdered in mortar and pestle and then successive extraction was carried out, for 6 hours, using soxhlet apparatus and water as solvent. The solvent containing the extract was evaporated and dried extract was weighed to calculate the final yield.

#### Antioxidant Activity By Frap:

##### Ferric Reducing Antioxidant Power assay:

**Reagents:** 1% Potassium ferrocyanide (1gm in 100ml), 10% Trichloroacetic acid (10gm in 100ml), 0.1%  $FeCl_3$  (0.1 in 100), Phosphate buffer (mono/ dibasic sodium phosphate) pH-6.6 buffer, concentration 0.2 molar.

#### Procedure:

Prepare plant extracts of different concentrations. To it add 2.5 ml phosphate buffer, mix thoroughly, add 2.5 ml ferrocyanide. Cover with aluminum foil and incubate at 50°C for 20 min in a water bath (once

temp. reaches 50°C start the timer). After 20 min shake and add 2.5 ml of 10% TAA. Centrifuge at 3000 rpm for 6 min, take the supernatant i.e. the upper layer (2.5ml) in another test tube then add 2.5 ml water and 0.5ml of  $FeCl_3$ , mix well. A blue colored solution is obtained. The reduction of  $FeCl_3$  was checked by measuring the change in absorbance at 700 nm.

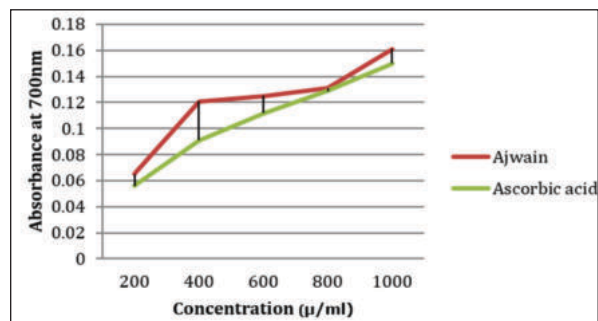


Figure 1: Ferric reducing antioxidant power assay of aqueous extract of ajwain.

#### Formulations:

##### Herbal Lotion:

The lotion was prepared with the composition as in table.2.1. Weigh and melt the oil phase together in a water bath. Heat the water phase as well. Now add the melted oil phase to the water phase while it is still warm. Aqueous extract of ajwain was dissolved in glycerin and mixed with lotion base. Once the temperature reaches 40°C add in the preservatives and fragrance. (Namita & Srivastava, 2013)

Table No. 1.1: Formulation of herbal lotion

INGREDIENTS	QUANTITY
Glycerine	6.5 g
Distilled water	82.20 g
Olive oil	16g
Cocoa butter	11.20 g
Cetyl alcohol	3.8g
Emulsifying wax	3.8g
Methylparaben	0.5 g
Propylparaben	0.5 g
Fragrance	0.5g

#### Evaluation Parameter

- 1. Organoleptic Characteristics:** Organoleptic characteristics were assessed from color and scent. (Saptarini & Hadisoebroto, 2020)
- 2. Homogeneity:** Homogeneity was analyzed by visual inspection for the appearance and existence of any clog. (Saptarini & Hadisoebroto, 2020)
- 3. pH Evaluation:** The pH of 1% solution of lotion was measured using a digital pH meter. (Saptarini & Hadisoebroto, 2020)

- 4. Viscosity:** Viscosity was determined by Brookfield Viscometer II + model using spindle no S – 64 at 20 rpm at a temperature of 25 °C. (Saptarini & Hadisoebroto, 2020)
- 5. Smoothness:** The smoothness of the lotion formulation was tested by rubbing between the fingers. (Saptarini & Hadisoebroto, 2020)
- 6. Absorbency:** Evaluated by noting changes in skin surface. (Saptarini & Hadisoebroto, 2020)
- 7. Irritancy Test:** The cream was applied on the left hand dorsal side surface of 1sq.cm and observed in equal intervals up to 24hrs for irritancy, redness and edema. (Saptarini & Hadisoebroto, 2020)
- 8. Spreadability:** The therapeutic efficacy of a formulation also depends upon its spreading value. It is calculated by using the given formula:

$S = M - L / T$  where, M = weight tied to upper slide,

L = length of glass slides,

T = time taken to separate the slides. (Saptarini & Hadisoebroto, 2020)

#### Herbal Face Mask:

Herbal face packs or masks are used to stimulate blood circulation, rejuvenate and help to maintain the elasticity of the skin and remove dirt from skin pores. The advantage of herbal cosmetics is their non-toxic nature, that reduces the allergic reactions and time tested usefulness of many ingredients. (Somwanshi et al., 2017)

#### Formula:

**Table No. 1.2: Formulation of herbal peel-off mask.**

INGREDIENTS	QUANTITY
Polyvinyl alcohol	6g
Gum acacia	1g
Cetyl alcohol	3g
Methylparaben	0.25g
Propylparaben	0.25g
Charcoal	2g
Water	50g-q.s.

#### Evaluation Of Herbal Peel-off Mask:

- 1. Organoleptic properties:** The peel-off mask was examined physically for its colour and odour. (Somwanshi et al., 2017)
- 2. Consistency:** The consistency was checked by spreading a small amount of pack on skin. (Somwanshi et al., 2017)
- 3. Moisture Content:** The moisture content of the films was determined using Sartorius moisture analyzer. (Somwanshi et al., 2017)
- 4. Folding Endurance:** The folding endurance was measured manually for the prepared films. Peel off mask was applied on the surface of the skin. After its drying a strip of film (3x3 cm) was cut evenly and repeatedly folded at the same place till it broke. (Somwanshi et al., 2017)
- 5. pH:** The pH value of topical peel off mask was determined by using a digital pH meter. (Somwanshi et al., 2017)
- 6. Spreadability:** Spreadability of the peel-off mask was calculated. (Somwanshi et al., 2017)
- 7. Irritancy:** The peel-off mask was applied on the dorsal side of the left hand and was kept for 24 hours to check the irritancy or redness. (Somwanshi et al., 2017)

#### RESULT

The yield of extract was 12.59% of dark brown colour with a characteristic scent of ajwain. Phytochemical screening was performed and results showed that aqueous extract of ajwain contained saponin, flavonoids, steroids, glycoside and alkaloid. The reducing power of tested component was concentration dependent. The antioxidant activity of aqueous extract of ajwain showed higher FRAP value with increasing concentration, which higher than that of ascorbic acid (Figure 1).

and was stable during the 6 weeks of observation and had a light vanilla scent due to fragrance added in it. There was no clog in the lotion, it showed that the bases of lotion were homogenous. The pH was found to be ranging from 5.5 to 6.5, viscosity was found to be around 147.5 to 190 cps, spreadability was ranging from 7.05 to 7.89 g.cm/s. The absorbency rate was moderate. The lotion was safe and did not develop any skin irritations, redness or edema, it showed that all the ingredients were well tolerated and safe.

The herbal peel-off face mask formulated in table no. 2.2 showed that the colour of face mask was black and was odourless. The number of times the film could be folded at the same place without breaking gave the folding endurance which was found to be 200 times. Moisture content of formulated peel is 14.42% (Weight taken = 0.721gm, Dry weight = 0.617gm ; Moisture =  $W-D/W * 100$ ). The pH was found to be 5.15. Spreadability of the peel-off mask was found to be 1.9±0.5 cm. It did not produce any irritation or redness on skin.

#### DISCUSSION:

In the present study the preliminary phytochemical screening and FRAP assay were performed. The studies were able to show the presence of various constituents such as saponins, alkaloids, flavonoids, glycosides and steroids. Flavonoid has the capability of acting as an antioxidant. The formulations showed good physical stability.

#### CONCLUSION:

The proposed outcome of the study is selection and formulation of optimum dose and to develop poly-herbal drugs for therapeutic purposes. The results from analyses by the FRAP assay revealed that the tested component showed significant antioxidant activity. Both the formulations showed good physico-chemical parameters.

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The lotion, formulated in table no. 2.1, showed brownish-white colour