

Research Article

Formulation and evaluation of herbal anti-acne gel prepared from *Alternanthera sessilis*, *Catharanthus roseus* and *Lycopersicon esculentum*

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ABSTRACT

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Uses of herbal formulation have increased nowadays with most therapeutic effect without any adverse drug reactions. Acne is the skin condition which arises due to excess production of oil in sebaceous glands. Acne is most common in teenagers and young adults. It is considered as skin disease but also ignore by many peoples. A non-oily gel formulation for topical application suitable in the treatment of acne condition has been prepared by using Carbopol 940. The prepared gel was evaluated for various physical parameters like pH, Color, Odor, Grittiness, Viscosity, Spreadability, Skin irritancy, etc. The herbal plants selected for preparing these gels were *Alternanthera sessilis*, *Catheranthus roseus* and *Lycopersicon esculentum*. The results were showing that the herbal gel formulation giving best results for acne treatment.

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INTRODUCTION

The word acne is derived from Greek word *acme* means point or spot. Acne medically known as the *Acne vulgaris*, it is as kind is ease that involves the excess production of oil in sebaceous glands at the base of hair follicles. It commonly occurs during puberty when these sebaceous glands stimulated by hormones produced by adrenal gland of both male and female (Jain K.L., et al., 2017)

Acne is one of the skin diseases which every one experiences in their life. It is a very common disease but not ignorable and can leave scar on the skin. Human skin has pores which connect to oil glands located under the skin. The glands are connected to the pores via follicles or small canals. These glands produce sebum, an oily liquid which carries dead skin cells through the follicles to the surface of the skin. Pimples occur when

these follicles get blocked, resulting in an accumulation of oil under the skin. Bacterial attack on sebum causes pus formation and whiteheads which leaves scars (Sawarkar HA. et al., 2010)

As acne forms, rubor (redness), tumor (swelling), calor (increased heat), dolor (pain), functio-laesa (loss of function) appears as sign of inflammation. In humans, Pimple appears mostly on the face, back, chest, shoulder and neck region. The defense mechanism of body acts to kill the bacteria, moulding in formation of whiteheads, blackheads, and pustules in these areas. Earlier, due attention was not paid to mild acne but now people are more conscious about their looks. So these days mode of treatment has shifted from allopathic medicines to herbal/ arbopol medicines because of observed side effects on long run (Data AA, Naik B, 2006)

Alternanthera sessilis is one of the crude drug which posses so many different properties such as cooling, constipating, digestive, depurative, cholagogue, galactogogue and febrifuge. It is useful in fever, splenomegaly, dyspepsia, carbopol, piles, burning sensation and skin diseases. Leaves are used as vegetables and have galactogogue and cholagogue properties. Leaf with steam extract is used in leucorrhoea, it is useful in biliousness, dyspepsia and sluggish liver. It is used in hepatitis, bronchitis, asthma and lung problems. The leaves are boiled and ingested to treat hypertension. The shoots of weed are very useful to improve male sexual potency. The most important use of these plants leaves posses anti acne property (Wali A and Bachulkar M, 2016)

The *Catharantus roseus* in traditional medicine, the periwinkle has been used for relieving muscle pain, depression of the central nervous system, also used for applying to wasp stings and to heal wounds. Its application ranges widely from the prevention of diabetes to treatment of stomach ache. Mostly use in the cancer treatment and also treat the acne

Lycopersicon esculentum medicinally use as Pulped fruit – skin-wash for an oily skin. Sliced fruits – first-aid treatment for burns/ scalds /sunburn. Skin of tomato fruit is a good source of lycopine – protect people from heart attacks/ treat an enlarged prostate and the difficulties in urination that accompanies it. To obtain lycopine, it seems to be more effective when cooked. Tomatoes are also a good source for removing acne. The vitamin A, C, K and acidic properties of tomatoes help in reducing and clearing up of acne off your face.

Now the traditional medicine giving best therapeutic effect. The formulation of non-oily gel for topical application is best instead of taking medicine by orally .It is directly applied to affected site. The chosen plants *Alternanthera sessilis*, *Catharantus roseus* and

Lycopersicon esculentum three different gels were prepared from those three different plants that synergistically play a significant role in treating acne infection. (Jain K.L., et al., 2017)

MATERIALS AND METHOD

Porcelain dish, spatula, stirrer, heating ventle, muslin cloth, cotton wool, measuring cylinder, water bath, filtration assembly, soxhlet apparatus, weighing pan, blender, water bath, beaker, bled, *Alternanthera sessilis*, *Catharantus roseus*, *Lycopersicon esculentum*, Aloe Vera, Carbopol 940, Methyl Paraben, Karaya gum. (Weller P J, et al., 2003)

Preparation of Aloe Vera gel

Take 3 – 4 leaves of Aloe Vera. Collect Aloe Vera bulb by avoiding green part of it. Blend into Aloe juice, filter through muslin cloth. Heat into heating ventle, remove foam and cool. Add 0.01 gm methyl Carbopol in 50 ml of water mix it and heat into water bath. Measure 35 ml of Aloe Vera juice, add methyl Carbopol solution and add Carbopol 940 with simultaneously stirring. After few minutes your gel is prepared for using as a base of following gels.

Preparation of *Alternanthera sessilis* gel

Preparation of plant extract

Alternanthera sessilis dried at room temperature, crushed and the active substance was extracted with hydroalcohol (water-Menthol as 50-50) extraction is get in liquid state.

Preparation of gel

Gels were prepared using proportion of drugs, Aloe Vera gel used as a base, Carbopol 940, Karaya gum as gelling agent. Preservative as the Methyl Paraben. Volume was made up to 20gm. Triethanolamine was added as to enhancing the property of gelling agents.

Table1: Gel of *Alternanthera sessilis*

Components	Gel of <i>Alternanthera sessilis</i>
Alovera gel (base)	15 gm
Carbopol 940	1 gm
Methyl paraben	0.01 gm
Triethanolamine	0.5 ml
Extraction of <i>alternanthera sessilis</i>	3.5 ml
Colour (Light green 5F)	q.s.

Physical Evaluation of Anti acne gel of *Alternanthera sessilis*-

Measurement of pH- pH was measured using a digital pH meter within 24 hrs of preparation. pH was 6.2.

Color- The color of the formulations was checked against white background. Green colour was observed.

Odor- The odor of the gels was checked by mixing the gel in water and smelling it and was found Odorless gel.

Consistency- The consistency was checked by applying

on the skin. Best consistency was found.

Greasiness- The greasiness was assessed by application on to the skin. The non-oily gel was found.

Homogeneity- Homogeneity was tested by visual inspection after allowing them to set in a container. Homogeneous nature of gel was found.

Skin irritancy test- This test was performed by applying gels on skin. Non-irritant gel. (Misal G, et al., 2012)

Anti-acne activity of the formulations-

The anti-acne activity study results of the formulated herbal gel showed anti-acne activity these drug reduce excess production of oil in sebaceous gland. (Agnihotri S, et al., 2021)

Preparation of *Catharanthus roseus* gel-

Blend some flowers of *Catharanthus roseus*. After

blending filter this juice of flowers by cotton wool and boil it for few minutes. Gel was prepared using proportion of drugs, aloe vera gel used as a base. Carbopol 940 as gelling agent. (Latha Samala M, et al., 2016.) /Preservative as methyl paraben. Volume was made up to 20 gm.

Table 2: Gel of *Catharanthus roseus*

Components	Gel of <i>Catharanthus roseus</i>
Alovera gel (base)	15 gm
Karaya gum	1 gm
Methyl paraben	0.01 gm
Triethanolamine	0.5 ml
Juice of <i>Catharanthus roseus</i>	3.5 ml
Colour (Wool Violet 5BN)	q.s.

Physical Evaluation of Anti acne gel *Catharanthus roseus*

Measurement of pH- pH was measured using a digital pH meter within 24 hrs of preparation. pH was 6.4.

Color- The color of the formulations was checked against white background. Purple colour was observed.

Odor- The odor of the gels was checked by mixing the gel in water and smelling it was found Odorless gel.

Consistency- The consistency was checked by applying on the skin. Best consistency was found.

Greasiness- The greasiness was assessed by application on to the skin. The non- oily gel was found.

Homogeneity- Homogeneity was tested by visual inspection after allowing them to set in a container. Homogeneous nature of gel was found.

Skin irritancy test- This test was performed by

applying gels on skin. Non-irritant gel (prabhu SL, et al., 2017).

Anti-acne activity of the formulations

The anti-acne activity study results of the formulated herbal gel showed anti-acne activity these drug reduce excess production of oil in sebaceous gland. (Panigrahi L, et al., 1997.)

Preparation of *Lycopersicon esculentum* gel

Blend some flowers, after blending *Lycopersicon esculentum* filter this juice of flowers by cotton wool. And boil it for few minutes. Gel was prepared using proportion of drugs, aloe-vera gel as a base, Carbopol 940 as gelling agent. Preservative as methyl paraben. Volume was made upto 20 gm. (Das K, et al., 2009)

Table 3: Gel of *Lycopersicon esculentum*

Components	Gel of <i>Lycopersicon esculentum</i>
Alovera gel (base)	15 gm
Carbopol 940	1 gm
Methyl paraben	0.01 gm
Triethanolamine	0.5 ml
Juice of <i>lycopersicon esculentum</i>	3.5 ml
Colour (Lake red D)	q.s.

Physical Evaluation of Anti acne gel *Lycopersicon esculentum*-

Measurement of pH- pH was measured using a digital pH meter within 24 hrs of preparation. pH was 6.8.

Color- The color of the formulations was checked against white background. Red colour was observed.

Odor- The odor of the gels was checked by mixing the gel in water and smelling it. Odorless gel was found.

Consistency- The consistency was checked by applying on the skin. Best consistency of gel was found.

Greasiness- The greasiness was assessed by application on to the skin. Non-oily gel was found (ICH Guidelines,

1993).

Homogeneity- Homogeneity was tested by visual inspection after allowing them to set in a container. Homogeneous nature of gel was found.

Skin irritancy test- This test was performed by applying gels on skin. Non- irritant gel was found. (Bhing S.D. et al., 2019.)

Anti-acne activity of the formulations-

The anti-acne activity study results of the formulated herbal gel showed anti-acne activity these drugs reduce excess production of oil in sebaceous gland. (Sinha P, et al., 2014.)



Fig.1- Prepared gel of *Alternanthera sessilis*



Fig.2 - Prepared gel of *Catharanthus roseus*



Fig.3 - Prepared gel of *Lycopersicon esculentum*

RESULT AND DISCUSSION

The prepared herbal gels were subjected to physical evaluation parameters. Gels were green, purple, red in color with transparent appearance. pH of all gel was in the range of 6–7. The gel was found non-oily, non-irritant when applied to the skin. Physical evaluation results which show that formulations of those gel possess anti-acne property.

CONCLUSION

Uses of herbal formulation have increased nowadays with most therapeutic effect without any adverse drug reactions. Those formulated gels possess the anti-acne property with best therapeutic effect.

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CONFLICT OF INTEREST

The authors declare no conflict of interest

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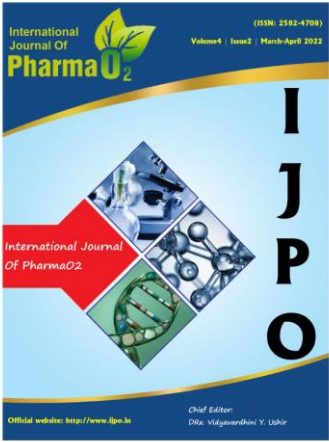
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