



A RESEARCH ON FORMULATION AND EVALUATION OF POLYHERBAL ANTI- ACNE FACEWASH

JINCY.V.VARGHESE¹, ATHIRA P², SANDRA T.S³, SRUTHI K.B⁴, STELLA JOSE⁵

¹Assistant professor Department of Pharmaceutics, ^{2,3,4,5}B pharm students, Nehru of pharmacy, Pampady, Thrissur

ABSTRACT

In today's world market natural remedies are more acceptable because they are safer with minimal side effects than the synthetic ones. Acne is a chronic inflammatory disorder of pilosebaceous unit, which involves increased sebum production by sebaceous glands and abnormal desquamation of hair follicle occur in response to increasing androgen level with the onset of puberty. Acne is found as a most common skin problem. Various researches have been proved utility of herbal based formulations for cleaning purpose which also removes excess oil; considering this fact the present work was intended to prepare anti-acne face wash gel using camellia sinensis with anti-oxidant and anti-inflammatory property.

The aim of this study was to formulate and evaluate the anti-acne poly herbal face wash containing Camellia sinensis (Green tea), Citrus sinensis (Orange peel), Psidium guajava (Guavaleaf), Ocimum tenuiflorum (Tulsi), Citrus limon (Lemon). The plants have been reported in the literature having good anti-oxidant, anti-microbial and anti-inflammatory activity. Prepared formulation was evaluated for various parameters like physical parameters, consistency, homogeneity, greasiness PH, viscosity, spreadability, washability, skin irritability, stability studies etc.

INTRODUCTION

COSMETICS

According to Drug and Cosmetics Act, 1940 Cosmetic is defined as, any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any for, beautifying, cleansing, promoting attractiveness, or alter the appearance and includes any article intended for use as a component of cosmetic.[1] Cosmetics are constituted of mixtures of chemical compounds obtained from either natural sources or synthetically created ones.[2]

HERBAL COSMETICS

The cosmetics which are prepared using plant products have cosmetic actions. Recently the increased use of botanicals in cosmetics is mainly due to their mild action and non-toxic nature. In cosmetics, both Phyto-ingredients and natural supplements are used. Natural products Include oils, extracts, secretions, etc. phyto-ingredients include pure constituents obtained by various process.[3]

ADVANTAGES

1. They do not produce allergic reactions and do not have any side effects.
2. They can easily be used for skin and hair.
3. These relatively show maximum activity with a lesser dose and fewer side effects.
4. They have more stability, purity, and efficacy, with their herbal constituents.
5. Easy to manufacture.[4]

ANTI-ACNE FACE WASH

Acne vulgaris is a common disorder of skin (pilocebaseous unit) that affects all individuals at least once during life. The incidence of acne peaks in teenage, but substantial numbers of men & women between 20-30 years of age are also affected by the disorder. Acne infections of the skin are mainly caused by changes in the sebaceous glands.

Acne may be classified as comedonal, popular, pustular, cystic & nodular. Comedonal acne is non-inflammatory & divided into two types: whiteheads & blackheads.

The word acne is derived from the Greek word acme which means prime of life. Generally, acne is considered to be a benign, self-limiting condition, that causes severe psychological problems or disfiguring scars that can prolong over a lifetime. It is a polymorphic disorder and can manifest at any

time during life but it most commonly presents between the ages of 12-24, which an estimated 85% of the population affected.[5]

ACNE-VARIOUS TYPES

ACNE ROSACEA

It is a skin disease of adults commonly affected by women in which blood vessels of the face enlarge indicating a flushed appearance. Rosacea is a chronic, incurable, adult acne-like skin condition that is easily controllable and curable medically. The symptoms may come and go and the skin may be clear for weeks, months, or years and then may emerge time and again. Symptoms and signs of rosacea are Redness of the face, tiny red pimples, and fine red lines on the facial skin. An enlarged, bulbous red nose, Eye problems, like swollen, red eyelids and conjunctivitis

ACNE VULGARIS

It is the most common form of acne; usually affects people from puberty to young adulthood. Acne vulgaris is a general skin condition that is characterized by the development of seborrhea, comedones, nodules, papules, pustules, and cysts. It occurs in the areas of the skin with plentiful hair growth such as in the upper chest, back, legs and face. Sebaceous glands get infected and clogged

ACNE-SYMPTOMS

Commonly it develops on the face, neck, back, chest, and shoulders. If you have acne, you will typically notice pimples that are white or black in appearance. Blackheads are usually seen on the surface of the skin giving them a black appearance whereas whiteheads are seen just under the surface of the skin, giving them a white appearance. Whiteheads and blackheads are the most prominent types of acne, other lesions can occur.

ACNE-CAUSES

- Due to hormonal changes caused by puberty or pregnancy.
- Certain medications such as birth control pills or corticosteroids.
- A diet containing huge refined sugars or carbohydrates like bread and chips.
- Change in hormone levels of women at the time of menstruation.
- In certain cases, acne may occur from heredity or can aggravate them.[6]

PLANT PROFILE

Camellia sinensis (Green tea)

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Theales
Family	Theaceae
Genus	Camellia L.
Species	Camellia Sinensis

Citrus Sinensis (Orange peel)

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Sapindales
Family	Rutaceae
Genus	Citrus
Species	Citrus sinensis

Ocimum tenuiflorum (Tulsi)

Kingdom	Plantae
Division	Tracheophyta
Class	Magnoliopsida
Order	Lamiales
Family	Lamiaceae
Genus	Ocimum L.
Species	Ocimum tenuiflorum L.

Psidium guajava (Guava leaf)

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Myrtales
Family	Myrtaceae
Genus	Psidium L.
Species	Psidium guajava L.

METHODOLOGY

COLLECTION

Green tea, orange peel, guava leaf, tulsi are collected from the local area. Aloe Vera, honey, rose water, carbapol, lavender oil, sodium lauryl sulphate, triethanolamine, methyl paraben, glycerin are purchased from the local market.

PREPARATION OF HERBAL EXTRACT

Herbal extracts can be prepared by the maceration method by using rose water used as a solvent. Green tea, guava leaf, orange peel, and tulsi were kept in a hot air oven for drying purposes at 45 0C and ground into small pieces by using a grinder. Desired quantities of the herbal drug were weighed and each herb was macerated with rose water in a conical flask. Dried herbs were allowed to mix with rose water by moderate shaking of the conical flask for 3days separately. After 3days, contents were filtered out by using a simple filtration method, and filtrates were collected in vessels separately.

FILTRATION

Extracts were filtered using simple filter paper and funnel for two times.

DEVELOPMENT OF FORMULATION

Various batches of formulations were prepared according to the table. The desired quantity of gelling agent i.e., carbopol was weighed accurately and dispersed in hot rose water (not more than 60 degree:50% weight of the batch size) with moderate stirring in order to avoid air entrapment and allowed to soak overnight. Desired quantity of lemon juice and honey mixture by gentle stirring together with the desired quantity of concentrated herbal extracts were added to the above-prepared carbopol mixed with sodium lauryl sulphate. To this add a few ml of triethanolamine in order to obtain accurate consistency. To this add a sufficient quantity of glycerine and lavender oil. Then the Prepared formulations were filled in a suitable container and labeled accordingly.

LIST OF INGREDIENTS USED IN THE FORMULATION

INGREDIENTS	F1	F2	F3	F4
Green tea extract	2ml	3ml	4ml	5ml
Orange peel extract	2ml	3ml	4ml	5ml
Guava leaf extract	2ml	3ml	4ml	5ml
Tulsi extract	2ml	3ml	4ml	5ml
Aloe Vera extract	2ml	3ml	4ml	5ml
Lemon juice	1ml	1ml	1ml	1ml
Honey	1ml	1ml	1ml	1ml
Carbopol 940	20ml	20ml	20ml	20ml
Sodium lauryl sulphate	0.3g	0.3g	0.3g	0.3g
Triethanolamine	0.5ml	0.5ml	0.5ml	0.5ml
Methyl paraben	0.05g	0.05g	0.05g	0.05g
Glycerine	2ml	2ml	2ml	2ml
Lavender oil	1ml	1ml	1ml	1ml
Rose water	q.s	q.s	q.s	q.s

EVALUATION TESTS

The prepared formulations evaluated for following tests and compared with marketed Himalaya neem face wash.

PHYSICAL APPEARANCE

Visually checked the physical appearance of the formulation.

Colour: The colour of the formulations was checked out against a white background.

Odour: The odour of the face washes was checked manually.

CONSISTENCY

The consistency was evaluated by applying on the skin.

GREASINESS

The greasiness was assessed by directly applying onto the skin.

PH

An amount of 20 ml of the formulation was taken in a beaker and was subjected to the PH measurement using a digital PH meter within 24 hours of manufacture

WASHABILITY

The prepared formulations were applied to the skin and then ease and extent of washing with water were checked manually.

HOMOGENEITY

Here allow the formulation to set on a container and homogeneity was tested by visual inspection. They are hence evaluated for their appearance and presence of aggregates.

VISCOSITY

Viscosities of formulations were determined using Brookfield viscometer spindle # 64 at 100 rpm and 25 degrees Celsius. The corresponding viscometer reading was noted accordingly.

SPREADABILITY

METHOD: 1

Spreadability denotes the extent of the area to which the formulation readily spreads on the application to the skin. The bioavailability efficiency of the formulation also depends on the spreadability value. Spreadability is defined in terms of time in seconds required taken by the upper slide to slip off the product placed between the two slides under a certain load. The lesser time is taken for the separation of two slides, the better the spreadability. A few ml of the formulation was sandwiched between the two slides. A weight of 100g was placed upon the upper slide so that the formulation between the two slides gets pressured uniformly to form a thin layer. Then the weight was removed, and the excess of the formulation adhering to the slides was scrapped.

METHOD: 2

Take two and place few drops of formulation on the lower slide, whereas tie a weight of 10g on the upper slide. Place the upper slide on the lower slide. Then the time taken by the upper slide to slip off the lower slide was noted.

$$\text{Spreadability} = m \cdot l / t$$

Where, m = weight tied to upper slide

l = length of the glass slide

t = time in seconds

SKIN IRRITABILITY TEST

This test was performed on a few healthy human volunteers of either sex after obtaining consent for the same. About a few drops of the formulation were applied to an area of skin and kept as such for certain minutes and note down any irritancy occurrence.

STABILITY STUDIES

The physical stability of the formulations was studied by placing them in a plastic or a glass container and they were placed in a humidity chamber at 45°C and 75% relative humidity. Their appearance and physical stability were inspected for a period of three months at an interval of 1 month. [6]

RESULTS AND DISCUSSION

PHYSICAL PARAMETERS

The prepared acne face wash was evaluated for its colour, odour, consistency, greasiness.

FORMULATION CODE	ODOUR	COLOR	CONSISTENCY	GREASINESS
Marketed(Himalaya neem facewash)	Pleasant	Light green	Semi solid	No
F1	Pleasant	Yellowish orange	Semi solid	No
F2	Pleasant	Yellowish orange	Semi solid	No
F3	Pleasant	Yellowish brown	Semi solid	No
F4	Pleasant	Yellowish brown	Semi solid	No

PH

The PH of formulation was found to be satisfactory, and in the range of 5.5 to 5.8 which is near to the skin PH, in turn indicates that the prepared formulation can be compactable with skin. Here comparing other formulations F3 formulation found to have better PH.

FORMULATION CODE	PH
Marketed	5.5
F1	5.2
F2	5.3
F3	5.8
F4	6.2

WASHABILITY

Prepared formulations were easily washed with water.

FORMULATION CODE	WASHABILITY
Marketed	Good
F1	Good
F2	Good
F3	Good
F4	Good

HOMOGENEITY

Under visual inspection of the prepared formulation indicates no lumps or aggregate presence. And the formulation is found to have uniform colour dispersion, free from any particles.

FORMULATION CODE	HOMOGENEITY
Marketed	Homogenous
F1	Homogenous
F2	Homogenous
F3	Homogenous
F4	Homogenous

VISCOSITY

Brookfield viscometer was used to measure the viscosity of the face wash. Here the F3 formulation found to have better viscosity compare to others.

FORMULATION CODE	VISCOSITY
Marketed	6.23
F1	4.20
F2	5.10
F3	5.70
F4	4.80

SPREADABILITY

The spreadability studies shown that all formulations have better spreadability when compared to the marketed formulation. But among the prepared formulations F3 found to have better spreadability.

FORMULATION CODE	SPREADABILITY (gm-cm/sec)
Marketed	10.23
F1	9.1
F2	9.09
F3	9.4
F4	8.98

SKIN IRRITABILITY TEST

Small amount of the formulation was applied on the skin and kept for few minutes and found to show no redness, oedema, inflammation and irritation during the studies. This formulation is safe to use for skin.

FORMULATION CODE	IRRITABILITY TEST		
	1hour	3hour	6hour
Marketed	No	No	No
F1	No	No	No
F2	No	No	No
F3	No	No	No
F4	No	No	No

STABILITY STUDIES

During stability studies F3 formulation produces good results during one month duration.

PARAMETER	F3 FORMULATIONS			
	INITIAL	10 days	20 days	30 days
Colour	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
Odour	Pleasant	Pleasant	Pleasant	Pleasant
PH	5.6	5.57	5.53	5.43
Skin irritation test	No	No	No	No

CONCLUSION

Herbal formulations are more acceptable in the belief that they are safer with fewer side effects than synthetic ones. The world market is also moving towards polyherbal medicines for health care, health, and for cosmetic purposes including dermal preparations like poly herbal anti-acne face washes. etc. The consumer use of herbal products has significantly increased over the past years according to a survey of Global skincare market trends. In the present study, an attempt was made to formulate poly herbal anti-acne face wash using natural ingredients like green tea, orange peel, guava leaf, and tulsi and to evaluate the prepared formulations for the desired parameters. Prepared formulation polymers were evaluated for physical parameters like color, odor, greasiness, PH, viscosity, consistency, spreadability, washability, and stability studies. Carbopol produces desired gel strength in formulations. Honey produces humectants activity during stability studies. Thus the preparations will have good spreadability results. It indicates easy application on the skin. This study revealed that the developed herbal formulation of batch F3 was comparatively better than other formulations.

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