

## Formulation Development and Evaluation of Herbal Face Wash

<sup>1</sup>B. Jahnavi Reddy, <sup>2</sup>P. Shriya, <sup>3</sup>Dr. N. Srilakshmi

<sup>1</sup>Student, <sup>2</sup>Student, <sup>3</sup>Associate Professor

Affiliated to Osmania University

Sri Venkateshwara College of Pharmacy, Hyderabad, Telangana

Submitted: 25-03-2024

Accepted: 05-04-2024

### ABSTRACT:

Face wash is a cleansing product specifically formulated for the face, designed to remove dirt, oil, makeup, and other impurities. The essential task of keeping skin clean, germ free, smooth, and fresh is accomplished by a face wash, which also moisturizes the horny layer without irritating the skin. The prepared herbal face wash was a cosmetic preparation, prepared by using herbal ingredients like Carrot, Orange peel extract, Flax seed oil, Vitamin E oil, Honey, Rose water, and Konjac gum is used as a gelling agent. They have good anti-bacterial, anti-oxidant and anti-inflammatory properties. Honey acts as a humectant which allows it to retain moisture. Flax seed oil is often considered as one of the best emollients due to its high content of omega-3 fatty acids, which helps to moisturize and nourish the skin effectively. Sodium lauryl sulphate is used as a foaming agent. Methyl paraben is used as a preservative. Herbal face wash was prepared by homogenous mixing of all the herbals extracts. The herbal face wash was evaluated by various parameters such as organoleptic evaluation, pH test, irritancy test, washability, spreadability, Homogeneity and phase separation were observed.

### KEY WORDS:

Herbal face wash, Konjac gum, Orange peel extract, Emollient, Humectant, Anti-oxidant, Anti-inflammatory properties.

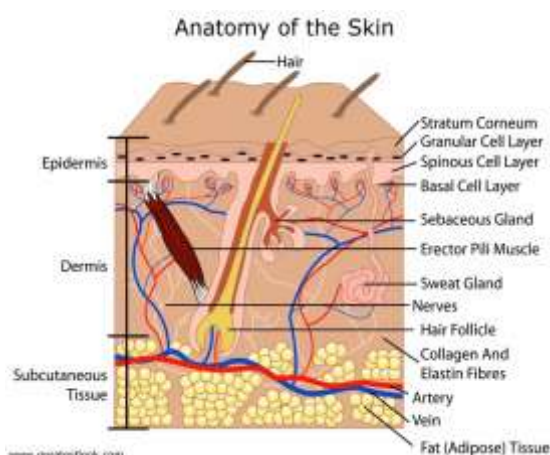
### I. INTRODUCTION:

One of the world's oldest medical care systems is the industry for herbal drugs in India. It is found in ancient India, where the use of herbs as medicines was documented in the Vedas, a prehistoric religious book. Two traditional medical systems, Ayurveda and Unani, used herbs and natural products to treat a wide range of ailments. Plant extracts are used extensively in many prescribed drugs today, even though Western doctors view them as a passing fad. The increasing recognition of the benefits of this traditional medical practice by the global population has led to

a notable growth in the demand for Indian herbal remedies<sup>[1]</sup>. This industry has grown at a pace of around thirty percent each year because of the increase in demand for cosmetics, skincare products, and herbal remedies. There has been a noticeable increase in the demand for natural products in recent years.<sup>[2]</sup> Herbal medicines are more often accepted than modern chemical substances due to the belief that they are safe, offer a variety of therapeutic benefits, and have minimal to no side effects. The skin is the largest and most susceptible region of our body to diseases. Consequently, to protect against and prevent skin diseases, formulations with anti-bacterial, anti-oxidant, anti-inflammatory, and other properties must be used.<sup>[3]</sup>

#### 1.1. Skin:

15% of an adult's weight is made up of their main organ, the skin. Its surface size is 1.5 to 2 meters square in adults, and it is made up of glands, hair, and nails. The skin serves as a barrier against pathogens, controls body temperature, and enhances our sense of touch and feeling.<sup>[4]</sup> The skin is an extensive and essential organ of the body that defines a person's personality, particularly the sensitive skin on the face, which is frequently seen as a typical parameter. The skin and the tissues that support it make up the integumentary system, which provides overall protection for the body. In addition, it has many sympathetic and autonomic nerve fibers, which help it communicate with the brain. The three primary layers of skin are the dermis, hypodermis and epidermis.<sup>[5]</sup>



**Figure 1: Anatomy of skin**

### 1.1.1. The Epidermis <sup>[1,6]</sup>

The skin's outer layer, or epidermis, acts as the body's primary defense against germs, viruses, and even the external environment. To cover all its duties, the epidermis is composed of four thinner layers. The top layer, known as the stratum corneum, varies in thickness depending on where it is located on the body. For example, the skin on your heel is significantly thicker than the skin on your eyelid. The next layer is called the stratum granulosum. This region's cells produce a waxy material that keeps your skin feeling dry. The next layer is called the stratum spinosum, and it is composed of cells that bind other cells together by acting as skin-like glue. Stratum Basale is the lowest layer of the epidermis.

### 1.2.1. The Dermis

At least with skin, a large portion of the magic occurs in the dermis. Collagen, elastin, and fibroblasts—the cells that produce collagen and elastic tissue—make up a large portion of the dermis. This layer serves a few purposes. The dermis layer contains blood and lymph vessels, which oversee supplying your skin with nutrition and eliminating waste and pollutants. The dermis contains the sweat glands.<sup>[7]</sup> Through your pores, they cause sweat, which purges pollutants from the body and cools it down. Additionally present in the skin are the hair follicles, which attach to your hair, and the oil glands, which occasionally produce too much oil, irritating skin and causing breakouts and greasiness.

### 1.3.1. The Subcutaneous Layer <sup>[1,6]</sup>

This layer of fat, which binds your muscles to your bones, is the deepest layer of skin. It's so deep that active components in skin care

products will never get there. The following duties fall under the purview of this layer: The way the subcutaneous layer works is like a thermostat. In an emergency, it can serve as a source of energy while simultaneously protecting the body. Additionally, fat serves as cushioning, preventing damage to your bones, muscles, and organs <sup>[6]</sup>. Lastly, more blood vessels, nerve endings, hair follicle roots, and the deepest sebaceous glands that secrete oil are found in the subcutaneous layer.

### 1.2. Cosmetic

The word "cosmetic" comes from the Greek word "adorn," which describes the addition of anything ornamental to a person or something. Greek word "Kosmetikos," which meaning cosmetics or cosmetics, is the source of the English word "cosmetic" <sup>[8]</sup>. A vast array of goods intended to improve or modify the appearance of the face, body, or hair are included in the category of cosmetics. These goods are used for makeup, scent, skincare, and grooming, among other things. An increasing trend in recent years has been the acceptance of natural chemicals in skincare and cosmetic products, among other areas of daily life. Plant- and herb-based herbal cosmetics have become increasingly popular because of their purported safety, effectiveness, and environmental friendliness.

The increased desire from consumers for natural, ecological, and eco-friendly beauty products is propelling the herbal cosmetics market's rapid growth. To address certain skin conditions, beauty businesses are spending money in R&D to create novel herbal formulas. Additionally, there is a shift towards eco-friendly packaging options to lessen their environmental impact. All things considered, herbal cosmetics provide a comprehensive approach to beauty by harnessing the power of nature to promote skin health and vitality <sup>[9]</sup>.

### 1.3. Face wash <sup>[10]</sup>

A face wash is a type of cleaning solution that is especially made for the face and is intended to get rid of debris, oil, makeup, and other contaminants. A face wash has the vital job of keeping skin clear, germ-free, smooth, and fresh; it also hydrates the horny layer of the skin without irritating it. The skin feels clean and renewed after using it to help unclog pores and avoid skin disorders like acne.

### 1.3.1. Advantages of Face wash <sup>[3,12]</sup>

There are several benefits of using a face wash as part of your skincare routine, including

- **Removal of dead skin cells:** Regular use of a face wash helps to remove dead skin cells from the surface of the skin, which allows new skin cells to replace them. This promotes healthy skin cell turnover and helps to keep the skin looking radiant.
- **Fresh and healthy skin:** A face wash helps to remove dirt, oil, and other impurities from the skin, which can leave it looking dull and tired. Regular use of a face wash can help to keep the skin looking fresh and healthy.
- **Prevention of acne:** Excess oil and dirt can clog pores and lead to acne breakouts. Using a face wash can help to unclog pores and prevent the formation of acne whiteheads, blackheads, and other skin problems.
- **Slower development of wrinkles:** By removing dead skin cells and promoting healthy skin cell turnover, a face wash can help to slow down the development of wrinkles.

### 1.3.2. Disadvantages of face wash <sup>[12]</sup>

- Use face wash only twice a day. Using it more than twice may cause dry skin.
- Removes dead skin cells, which means your skin wrinkles more slowly.
- The biggest drawback is its limited use.

### 1.3.3. Types of face washes

In general, face washes are suitable for all skin types; however, there are currently products in the market that are designed to cater to certain skin types. For instance, an oily skin face wash is designed for individuals with oily skin conditions; it doesn't contain oils and instead leaves a thin, greasy film on the skin. Among the many varieties of face washes in the market there are,

- Oily skin face wash.
- Dry skin face wash.
- Normal skin face wash.

### 1.3.4. Forms of face washes

- Cream based face wash.
- Gel based face wash.
- Liquid based face wash.

Face based face wash

### 1.3.5. Benefits of face wash <sup>[13]</sup>

- It aids in the removal of dead skin cells, which aids in the healing process.
- Old skin cells are replaced by new ones.

- It keeps the skin looking young and healthy.
- It gives the skin a healthy glow.
- Dead skin cells and excess oil block pores, resulting in acne, white heads, blackheads, and an overall tired appearance.
- Regularly exfoliating the pores.

### 1.3.6. Properties of face wash <sup>[14]</sup>

- It should be stable and should have a good appearance.
- It should spread easily without dragging.
- During application it should not have an oily or greasy feel.
- A thin emollient film should remain on the skin after its use.
- It should soften on application to the skin.
- After evaporation of water the cream residue should not become viscous.
- Its physical action should be to flush the skin and open the pores rather than to absorb.
- There must be no greasy feeling during application.

### 1.3.7. Uses of face wash [15]

- Face wash helps remove dirt and impurities from the skin.
- Using facewash regularly can prevent acne breakouts.
- Washing your face with a gentle facewash can help maintain a healthy complexion.
- Regular use of facewash can control excess oil production on the skin.
- Facewash with hydrating ingredients can keep the skin moisturized and soft.
- Facewash is a quick and easy way to maintain good skincare hygiene.

## II. MATERIALS

### 2.1. Orange peel extract



Figure 2: Orange peel extract

**Biological source:** Orange peel is fresh or dried outer part of pericarp of *Citrus aurantium* Linn.

**Family:** Rutaceca.

**Active constituents:** Flavonoids (hesperidin), vitamins (vitamin C), and essential oils (limonene).

**Uses:** It acts as hydrating and moisturizing agent.

Contains antioxidant and anti-inflammatory properties.

Reduce wrinkles and fine lines.

Reduce acne.

Exfoliating agent.

## 2.2. Carrot



Figure 3: Carrot

**Biological source:** *Daucus carota* is a root vegetable, known for its edible taproot.

**Family:** Apiaceae.

**Active constituents:** Carotenoids like beta-carotene, lutein, vitamins (A, C, K, B6), minerals (potassium, magnesium) and dietary fibers.

**Uses:** It acts as hydrating agent.

Protects against UV damage.

It helps to balance oily skin.

## 2.3. Flax seed oil



Figure 4: Flax seed oil

**Biological source:** Flax consists of the strands of pericyclic fibres of the stem *Linum usitatissimum* Linn.

**Family:** Linaceae.

**Active constituents:** Alpha-linolenic acid which is an omega-3 fatty acid, lignans which have antioxidant properties and vitamin-E.

**Uses:** It has anti-aging property.

Lightens scars and pigmentation.

It has anti-inflammatory and antioxidant properties.

## 2.4. Vitamin-E oil



Figure 5: Vitamin E oil

**Biological source:** Vit-E is found in vegetable oils (wheat, sunflower, corn) and in nuts.

**Family:** Fat-soluble vitamins

**Active constituents:** Tocopherols and tocotrienols, beta, gamma, and delta tocopherols and the most biologically active form of vitamin E is alpha tocopherol.

**Uses:** Moisturizes and nourishes the skin.

Helps in scar reduction.

It has antioxidant properties.

## 2.5. Honey



Figure 6: Honey

**Biological source:** honey is a sugar secretion deposited honeycomb by the bees *Apis mellifera*, *Apis dorsata*.

**Family:** Apidae.

**Active constituents:** Honey is primarily composed of sugars (glucose and fructose), enzymes (invertase, glucose oxidase), organic acids (gluconic acid) and polyphenols (flavonoids).

**Uses:** Acts as hydrating agent.  
 Exfoliates skin.  
 Thickening agent.

### 2.6. Rose water



**Figure 7: Rose water**

**Biological source:** Rose water is obtained from the petals of *Rosa damascena*.  
**Active constituents:** Essential oils (geraniol, citronellol), phenolic compounds (flavonoids), Vitamin C, anthocyanins.  
**Uses:** Maintains skins pH balance.  
 Acts as cleansing agent.  
 It has anti-bacterial and anti-septic properties.

### 2.7. Konjac gum



**Figure 8: Konjac gum**

**Biological source:** Konjac gum is obtained by drying the tuber of *Amorphophallus konjac* plant.  
**Family:** Araceae.  
**Active constituents:** glucomannan, a water-soluble dietary fiber.  
**Uses:** Acts as gelling agent.  
 Stabilizer.  
 Nourishes the skin.

### Formulation table

S.NO	INGREDIENTS	F1	F2	F3	F4	F5
1.	Orange peel extract (ml)	—	4	2	2	2
2.	Carrot (ml)	4	—	2	2	2
3.	Flax seed oil (ml)	1.5	1.5	1.5	—	3
4.	Vitamin E oil (ml)	1.5	1.5	1.5	3	—
5.	Honey (ml)	1.5	1.5	1.5	1.5	1.5
6.	Rose water (ml)	q.s	q.s	q.s	q.s	q.s
7.	Konjac gum (g)	0.1	0.1	0.1	0.1	0.1
8.	Sodium lauryl sulphate (g)	0.2	0.2	0.2	0.2	0.2
9.	Methyl paraben (g)	0.01	0.01	0.01	0.01	0.01

### III. METHODOLOGY

Ingredients were weighed according to the formulation table for 10g of herbal face wash. To the konjac gum carrot extract and orange peel extract was added. Oily phase was prepared by mixing flax seed oil and vitamin E oil. Now both oily phase and active ingredients were mixed with a continuous stirring. Honey was added to it and stirred continuously until the desired semisolid consistency was achieved. Rosewater was added to it to make up the volume. Sodium lauryl sulphate was added to produce the desired foam. Methyl

paraben was added as a preservative. Herbal face wash was formulated.



Figure 9: Prepared formulations

#### IV. EVALUATION TESTS

##### 4.1. Organoleptic evaluation<sup>[16]</sup>

The prepared face wash gel was evaluated for various parameters.

**4.1.1. Color:** The color of the face wash formulation was visually analyzed.

**4.1.2. Odour:** The odour of the formulation was assessed by sniffing it.

**4.1.3. Consistency:** It was determined manually

**4.1.4. Greasiness:** It was determined by feeling it.

##### 4.2. Physicochemical assessment<sup>[17]</sup>

**4.2.1. pH:** At constant temperature, the pH of a 1 percent aqueous solution of the formulation was determined using a calibrated digital pH meter.



Figure 10: Digital pH meter

##### 4.3. Evaluation of performance<sup>[18]</sup>

**4.3.1. Washability:** After applying the formulation to the skin, the ease and extent of washing with water were personally assessed.

**4.3.2. Foamability:** only a small amount of formulation was used.

**4.3.3. Grittiness:** The formulation was checked for the presence of any gritty particles by applying it on the skin.

**4.3.4. Spreadability<sup>[19]</sup>:** A glass slide with conventional dimensions was taken in two sets. The polyherbal formulation was sandwiched between the two slides for a total length of 60mm. Removed the extra formulation that had attached to the glass slides surface and secured them to a stand without causing any disruption. A 20g weight was linked to the top slide, and the time it took for the upper slide to move to 60mm under the influence of the weight was recorded.

Spreadability was calculated by using following formula:

$$S = M * L / T$$

Where,

S = Spreadability

M = Weight tied to upper slide

L = Length of the glass slide

T = Time

**4.3.5. Homogeneity:** allowed the formulations to be set on a container and homogeneity was tested by visual inspection. They are hence evaluated for their appearance and presence of aggregates.

##### 4.4. Irritancy test on skin<sup>[18]</sup>

For 10 minutes, a small amount of the produced formulation was applied to the dorsal side of the left hand. After 10 minutes, irritability and any allergic reactions were assessed.

##### 4.5. Phase separation<sup>[20]</sup>

The prepared facewash was maintained at a temperature of 25-100°C, away from light in a sealed container. Then over the next 30 days, phase separation was monitored every 24 hours. The phase separation was examined and confirmed for any changes.

## V. RESULTS

### 5.1. Organoleptic evaluation

The prepared facewash was evaluated for its color, odour, greasiness and consistency.

Formulation code	Color	Odour	Greasiness	Consistency
F1	Light orange	Pleasant	No greasiness	Semi-solid
F2	Brownish cream	Pleasant	No greasiness	Semi-solid
F3	Pale brownish orange	Pleasant	No greasiness	Semi-solid
F4	Pale brownish orange	Pleasant	No greasiness	Semi-solid
F5	Pale brownish orange	Pleasant	No greasiness	Semi-solid

### 5.2. Physicochemical assessment

The pH of formulation was found to be satisfactory, and in the range 6.3 - 6.9 which is near

to the skin pH, in turn indicates that the prepared formulation can be compatible with skin.

Formulation code	pH
F1	6.9
F2	6.6
F3	6.9
F4	6.3
F5	6.5

### 5.3. Evaluation of performance

#### 5.3.1. Washability

Prepared formulations were easily washed with water.

Formulation code	Washability
F1	Easily washable
F2	Easily washable
F3	Easily washable
F4	Easily washable
F5	Easily washable

### 5.3.2. Foamability

The prepared formulations foamability is found to be good.

Formulation code	Foamability
F1	Good
F2	Good
F3	Good
F4	Good
F5	Good

### 5.3.3. Grittiness

No gritty particles were found in prepared formulations.

Formulation code	Grittiness
F1	No gritty particles
F2	No gritty particles
F3	No gritty particles
F4	No gritty particles
F5	No gritty particles

### 5.3.4. Spreadability

The spreadability studies show that all formulations have better spreadability. But among the prepared formulations F3 was found to have better spreadability.

Formulation code	Spreadability (gm-cm/sec)
F1	2.32
F2	2.49
F3	3.01
F4	2.74
F5	2.36

### 5.3.5. Homogeneity

Under visual inspection of the prepared formulation indicates no lumps or aggregates.

Formulation code	Homogeneity
F1	Homogenous
F2	Homogenous
F3	Homogenous
F4	Homogenous
F5	Homogenous

### 5.3.6. Irritation test on skin

On applying no irritation, Itching, Redness, Pain was found.

Formulation code	Irritancy
F1	No irritation
F2	No irritation
F3	No irritation
F4	No irritation
F5	No irritation



### 5.3.7. Phase separation

There is no phase separation of prepared formulations.

Formulation code	Phase separation
F1	No phase separation
F2	No phase separation
F3	No phase separation
F4	No phase separation
F5	No phase separation

## VI. 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 and for cosmetic purposes including dermal preparations like poly herbal 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 herbal facewash using natural ingredients like carrot, orange peel extract, flax seed oil, vitamin E oil, konjac gum, rosewater and honey and to evaluate the prepared formulations for the desired parameters. Prepared formulations were evaluated for physical parameters like color, odour, greasiness, pH, viscosity, consistency, spreadability, washability, and stability studies. Konjac gum produces desired 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.

## REFERENCES

- [1]. Vishal Prajapati, Shashikant Maury, Dr. Mohd Wasiullah, Piyush Yadav "Formulation and evaluation of herbal facewash". International Journal of Pharmaceutical Research and Application, Vol: 8(3),518-523, 2023.
- [2]. Sowmya K.V, Darsika C, Grace F, Shanmuganathan S "Formulation and evaluation of poly herbal face wash". World Journal of Pharmacy and Pharmaceutical Sciences, Vol: 4(6), 585-588, 2015.
- [3]. Nitin Yadav, Shashikanth Maury, Piyush Yadav, Manish. K Maurya "A review on: Formulation and Evaluation of Herbal Face wash". Journal of Emerging Technologies and Innovative Research, Vol: 8(6), 410-417, 2021.
- [4]. Shital A. Tiwari, Komal Khond Warghane, Priyanka Waghmare, Neha P. Rumale "Review on Herbal Face wash". International Journal of Pharmaceutical Chemistry and Analysis, Vol: 10(4), 220-228, 2023.
- [5]. Banyal M, Joshi S. "Technique for Transdermal Drug Delivery System". International Journal of Pharmacy and Pharmaceutical Research, Vol: 20(3), 109-131, 2021.
- [6]. Pallavi T. Madavi, Yogita S. Patle, Yash G. Baishnab, Payal khandait, Updesh Lade "Preparation and Evaluation of Herbal Face wash". International Journal of Creative Research Thoughts, Vol: 5(6), 2001-2007, 2016.
- [7]. Dhanashri Sanjay Koli, Abhyangshree Nandkumar Mane, Vinayak Balu Kumbhar, Kalyani Sanjay Shaha "Formulation and Evaluation of Herbal Anti-Acne Face wash". World Journal of Pharmacy and Pharmaceutical Sciences, Vol: 5(6), 2001-2007, 2016.
- [8]. Miss. Priti Pawar, Miss. Gauravi Pacharne, Miss. Harshada Tribhuvan, Miss. Jagruti Kumbhar, Prof. Kajal Walunj "Formulation and Evaluation of Ubtane Face wash". International Journal of Advanced International Journal of Advanced Research in Science, Communication and Technology, Vol: 2(5), 347-355, 2022.
- [9]. Krishnamurthy A, Kamalapurkar, Revati D. Mengshetti and Pradnya G. Vhanamane "Formulation and Evaluation of Herbal Anti-Acne Face wash". World Journal of Pharmacy and Pharmaceutical Sciences, Vol: 12(2), 1323-1330, 2023.

- [10]. Dr. Sanjay Kholiya, Dr. Jyoti Gangwal, Dr. Rajendra Prasad Sharma "Herbal Cosmetics for Skin in Ayurveda". International Journal of Trend in Scientific Research and Development, Vol: 4(1), 1001-1005, 2019.
- [11]. Harsharan Pal Singh, Neeraj Samnhotra, Sumeet Gullaiya, Ishpreet Kaur "Anti acne Herbal Face wash: Formulation, Evaluation and Development Studies". World Journal of Pharmaceutical Research, Vol: 4 (9), 1261-1273, 2015.
- [12]. Khade Swati S, Uchale Tushar P, Gosavi Akshata A, Gunjal Abhishek, Avanti R. Thanage "Formulation and Evaluation for Herbal Face Wash". International Journal of Advanced Research in Science, Communication and Technology, Vol 2(5), 807-813, 2022.
- [13]. Palle. Annie Jerusha, Dr. K.V. Ratnamala "An overview on herbal cosmetics and cosmeticuals". International Journal of Pharmaceutical Sciences Review and Research, Vol: 9(1), 75-82, 2021.
- [14]. Mayur N. Ghotkar, Shubam S. Kharade, Rushikesh S. Chavan, Ranjit S. Jadhav "Formulation and Evaluation of Herbal Face wash". Asain Journal of Pharmaceutical Analysis, Vol 8(4) 183-185, 2018.
- [15]. Dhanashri Sanjay Koli, Abhyangshree Nandkumar Mane, Vinayak Balu Kumbhar, Kalyani Sanjay Shaha "Formulation and Evaluation of Herbal Face wash". World journal of pharmacy and pharmaceutical sciences, Vol 5(26), 2001-2007, 2016.
- [16]. Singh H. P, Samnhotra N, Gullaiya S, Kaur I, "Herbal Face wash, Formulation, Evaluation and stability study". World Journal of Pharmaceutical Research, Vol: 3(37), 155-159, 2015.
- [17]. Ankita Sehgal, Maneesh Banyal, Jyoti Gupta, Swati Joshi "Formulation and Evaluation of Anti-Acne Face wash". International Journal of Advance Research and Innovative Ideas in Education, Vol:9(2), 1652-1662, 2023.
- [18]. Jincy. Varghese, Athira P, Sandra T.S, Sruthi K.B, Stella Jose "Research on Formulation and Evaluation of Polyherbal Face wash". International Journal of Creative Research Thoughts, Vol:10(4), 488-498, 2022.
- [19]. Duhan P, Dahiya G, Payal, Kataria R "Formulation and Evaluation of Herbal Face wash: A Step Towards Nature and a Boon to Skin". International Journal of Newgen Research in Pharmacy & Healthcare, Vol: 1(1), 22-27, 2023.
- [20]. Dnyaneshwar S. Solanki, Prof. Suraj Dattatray Sagrule, Shrikrushna Subhash Unhale, Quazi Bilal Ansar, Prof. M. G. Chitte and Prof. Dr. K. R. Biyani "Formulation Development and evaluation of Instant Whitening Face wash". World Journal of Pharmaceutical Research, Vol: 9(5), 2541-2557, 2020.