



DEVELOPMENT AND CHARACTERIZATION OF POLY-HERBAL FACE PACK FOR THE TREATMENT OF ACNE VULGARIS

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Abstract: -

Acne which is an inflammatory disorder of pilosebaceous unit. It is the formation of comedones, papules, nodules or cysts as a result of obstruction and inflammation of pilosebaceous units which consist of hair follicle and their accompanying sebaceous gland causing increased sebum production. In the 21st century, the demand for herbal formulation has been increased day to day. The face pack was made with the intention of enhancing the skin's look and aesthetic feel while also promoting nutrition. Powders from several natural plants and herbs were combined to produce it. Although they tend to be beneficial, natural ingredients in formulations do not directly change the basic physiological features of skin. In contrast to synthetic face packs that include chemical agents that may be toxic when applied, these agents also often have little adverse effects. To get rid of dead and fleecy skin, the prepared face pack can also be used as a face scrub. The created face pack based on home remedies is safe to use on skin, according to the observation of all assessment parameters.

Keywords: - Acne, Face pack, Herbal cosmetics

1. INTRODUCTION: -

Acne which is an inflammatory disorder of pilosebaceous unit that occurs during adolescence which causes characteristic lesions with open (black) and closed (white) comedones, which may progress into inflammatory lesions (papules, pustules, nodules and cyst. Acne in general is a form of eruption on the skin mainly in the facial area which tends to affect the appearance of an individual (1). Acne is common among both males and female genders and mostly affects people in their adolescence. Acne has both physiological as well as psychological effects on the person. While the physiological effects are mainly soreness accompanied with pain, the psychological effects are anxiety, depression and low self-esteem (2). In one of the studies, it was also reported that 8.8 % of women dealing with acne reported suffering from depression which was twice the number of men. With proper care, development of acne can be prevented with the help of conventional therapies as well as alternative therapies containing new agents under development for the treatments that are available for curing acne once the skin condition arise (3).

These skin condition that is formed when a hair follicle becomes plugged with oil, dirt, and dead skin cells. This accumulation causes the formation of whiteheads, blackheads, pimples or cysts. Acne has been found to be more common in teenagers but it may affect people of all ages. Based on age, acne can be neonatal, infantile, mid-

childhood and preadolescent. This classification is based on a panel convened by the American Acne and Rosacea Society (4).

Mid-childhood acne affects children from ages 1-6 years and is rather rare, hyper-androgenism, and therefore a visit to an endocrinologist must be made. Preadolescent acne expresses itself in the first signs of puberty, between ages 7 to 12 years or up to menarche in females and is the most common age group that is affected by this skin condition, usually affecting the T-zone of the face (5).

1.1 FORMATION OF ACNE VULGARIS:

Acne vulgaris is the formation of comedones, papules, nodules or cysts as a result of obstruction and inflammation of pilosebaceous units which consist of hair follicle and their accompanying sebaceous gland causing increased sebum production (6). These obstructions are also contributed to by keratin retention and growth of bacteria which results in inflammation. One of the major pathogenic factors involved in acne vulgaris is hyper-keratinization (7). The sebaceous follicles get obstructed and result in abnormal keratinization of infundibular epithelium. The increase in sebaceous gland secretion due to androgens and microbial colonization of pilosebaceous units (8).

In general *Propionibacterium acnes* (*P. acnes*), an anaerobic bacterium is believed to play a vital role in the formation of acne vulgaris on the skin. The accumulated sebum gets oxidized in a process called sebum peroxidation. The oxidative damage thus caused by the free radicals lowers the oxygen supply to the area and *P. acnes* being anaerobic, thrives in this environment (9).

1.2 MECHANISM OF ACTION

The mechanism of acne formation involves pathogenic factors like seborrhea, sebum retention and inflammation in the respective sequence. The sebum retention is caused by hyper-keratinization of the infra infundibulum of the sebaceous duct. This is due to the stimulation of sebaceous gland by androgens which may be due to the excessive sensitivity of sebaceous end-organs to androgens (10). The corresponding inflammation is related to the inflammatory role of various enzymes of *P. acnes* and to the chemotaxis of neutrophils.

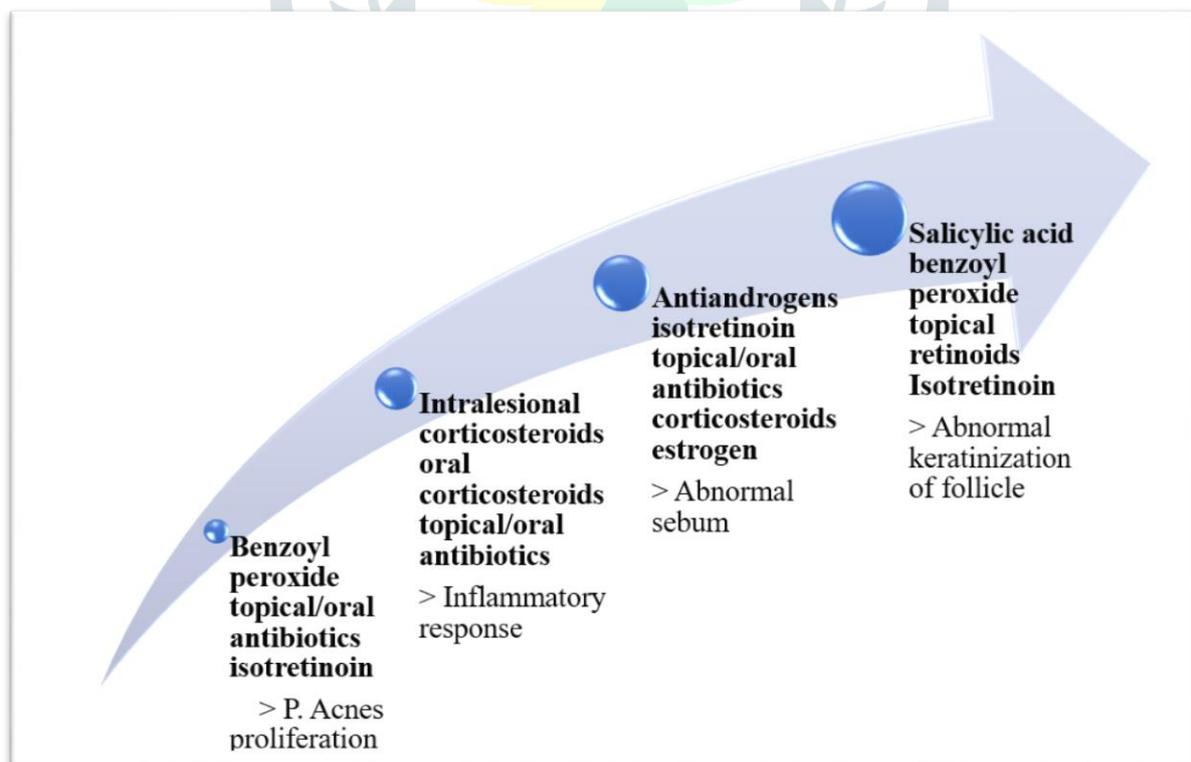


Figure no.1: - Mechanism of action Acne Vulgaris

1.3 CONDITION FAVOURABLE FOR ACNE FORMATION:

Typical areas for appearance of acne are forehead, face, chest, shoulders and upper back as they contain relatively more pilosebaceous units. This means that acne prone skin is typically oily in nature. There are certain triggers for the formation of acne on skin or those that may worsen it. Factors such as hormonal changes, diet, stress and certain medications may in fact worsen the acne condition. Acne vulgaris can also be hereditary in some cases (11).

Acne vulgaris not only affects the skin but also may take a toll on the emotional health of an individual. This is due to the fact that acne may result in discolored skin and permanent scarring on the areas that it affects. It may also leave open pores on the skin. Studies have shown that people suffering from acne vulgaris can develop signs of depression, anxiety, low self-esteem, poor selfimage and an overall low quality of life (12).

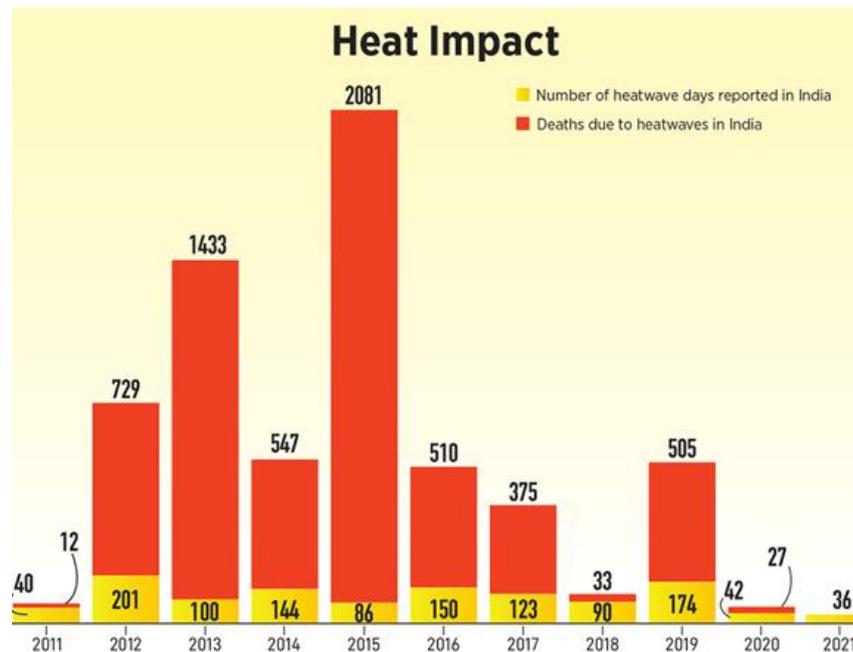


Figure 2: - Heat Impact in India

This condition is characterized by an intense urge to pick and scratch at the lesions even if they are small whiteheads or blackheads (13).

Acne vulgaris is known to grow in the following four grades:

Grade I – Simple non inflammatory acne consisting of comedones and a few papules.

Grade II – Here comedones, papules as well as a few pustules are observed.

Grade III – Larger inflammatory papules, pustules and a few cysts are observed.

Grade IV – Here, cysts are seen to become confluent (14).

1.4 ACNE VULGARIS TREATMENT-

There is various method of treatment but we will be focusing on the topical application in the form of face pack. It included Resorcinol which acts as the active ingredient and various herbal drugs which helps to treat acne vulgaris.

i. Topical treatment for acne vulgaris:

People suffering from mild or moderate cases acne vulgaris sometimes prefer to self-medicate, turning to over-the-counter drugs and products. Noticing this behavior of consumers, many cosmetic, personal wellness and skin care brands have designated the term “Anti Acne Products” to a particular group of products (15).

These products are developed and marketed as such and are formulated with ingredients that are effective against acne vulgaris such as Salicylic acid, Benzoyl peroxide, Niacinamide, Glycolic acid. An array of products has been developed under Anti acne products such as creams, lotions, serums, face-washes, scrubs, face packs, gels, foams, sheets, exfoliators and soaps. Some brands also offer an entire regimen or routine specifically for acne

prone skin (16).

ii. Natural, herbal and home remedies for acne vulgaris:

Indians have always had a knack for home remedies for various skin and health conditions. Acne vulgaris is no exception to this. Many people who suffer from acne vulgaris have been known to opt for such remedies rather than medications or cosmetics as a first line approach. Natural, herbal and fruit extracts and oils such as Neem leaf oils, Tea tree oil, Aloe vera gel and extracts, Pear extracts etc. have been included in many anti acne formulations. These have greatly helped overcome the resistance from prolonged use of antibiotics (17).

1.7 FACE PACK

Acne, black heads, pimples, and dark circles are now very frequent among young people and those who have the condition. According to Ayurveda, blood impurities are typically the cause of skin issues. Skin-related disorders are brought on by toxins that have accumulated in the blood due to inappropriate diet and lifestyle. Ayurveda describes a number of herbs and medicines for purifying the blood (18). Blood purifiers include beneficial herbs like aloe vera, neem, orange peel, etc. In ayurveda, the herbal paste used to cure acne, pimples, scars, markings, and pigmentation is known as “mukha lepa.” The application of this herbal mixture to the face is known as “mukha lepana.” As a facial, this beauty therapy is well-liked. The silky powder that is applied to the skin pack. A good herbal face pack must give the skin the nutrition it needs. In order to give the necessary nutrients, it must penetrate the subcutaneous tissues. Different herbal face packs are needed for different skin types (19).



Figure 3: - Face Pack

Herbal face packs are this day being used on a wide range, due to the various well-being of them over chemical-based packs. They are non-toxic, non-allergic and non-habit forming. They are Natural in every aspect, having larger Shelf life. They have no added preservatives. They can be easily formulated and stored over a larger span of time.

iii. Benefits of herbal face pack-

- (i) Herbal face packs give skin nutrition.
- (ii) Depending on their herbal contents, herbal face packs can diminish acne, pimples, scars, and blemishes.
- (iii) Face packs typically exfoliate the skin's dead cells.
- (iv) These face masks provide a calming and unwinding impact on the skin.
- (v) They aid in quickly restoring the skin's lost radiance and glow.
- (vi) They help to prevent premature aging of skin.
- (vii) Natural face packs give the skin a youthful, healthy appearance.
- (viii) It keeps the skin's suppleness.
- (ix) Natural face masks improve the texture and tone of the skin and give it a glow when used frequently.
- (x) The negative impacts of pollution and extreme weather can be successfully combated by using face packs sensibly

- iv. Advantage of herbal face pack -
- Herbal products don't have negative side effects.
 - It aids in eliminating our skin's dead cells.
 - Herbal products are inexpensive.
 - Products made from herbs are widely accessible.
 - It is utilized to make our skin sparkle.
- v. Disadvantage of herbal face pack-
- Sometimes our skin displays signs of irritability and redness.
 - Inflammation has taken place.
 - The effects of the face pack will develop gradually.

2. MATERIAL AND METHEDOLOGY: -

2.1 INGREDIENT TABLE:

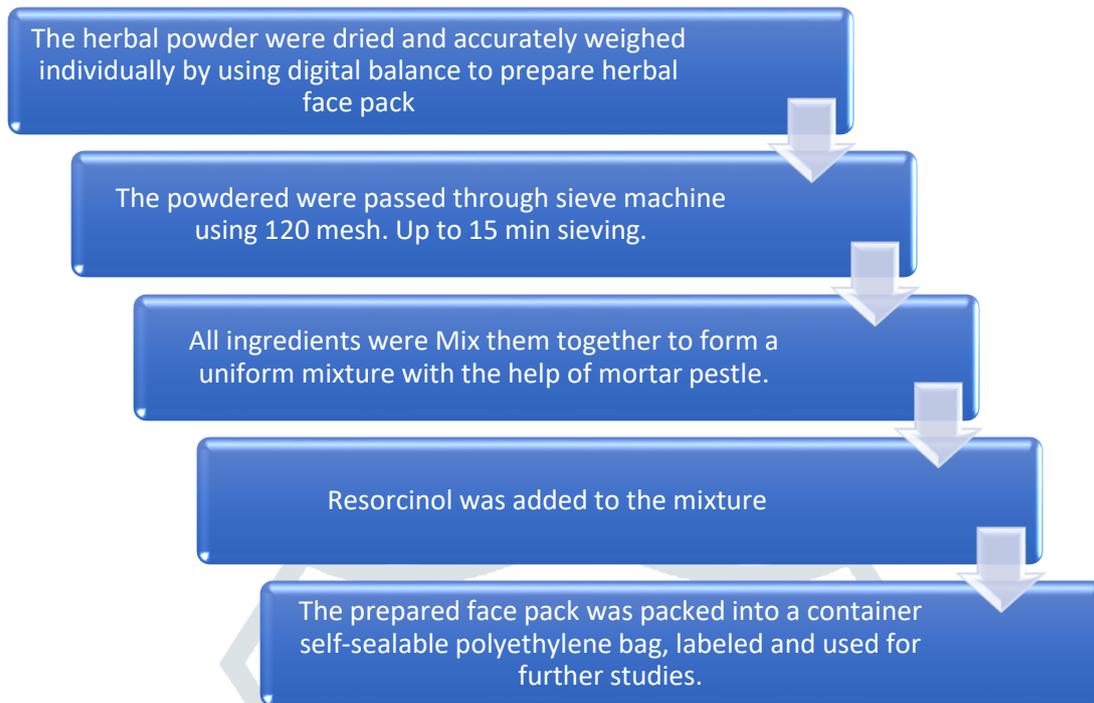
Table No. 2.1 Formulation Table

S.NO.	INGREDIENT	QUANTITY F1	QUANTITY F2	QUANTITY F3	QUANTITY F4
1	Orange Peel powder	8gm	10gm	8gm	5gm
2	Neem Powder	12gm	9gm	10gm	15gm
3	Sandalwood Powder	20gm	18gm	23gm	20gm
4	Turmeric	10gm	7gm	10gm	5gm
5	Fullers Earth	15gm	10gm	20gm	20gm



Figure 4: - Prepared Herbal powder

2.2 FORMULATON OF POLY HERBAL FACEPACK: -



2.3 PROCEDURE OF APPLICATION OF FACE PACK: -

- 1) Take prepared face pack powder in a bowl as per requirement and add rose water/Distilled water to mixture.
- 2) Mix well to form a paste with optimum thickness. It should be applied evenly on the face with the help of brush/hand

Cover the acne and blemishes spots too. Kept as it is for complete drying for 20 to 25 min. then it should be removed with the help of cold water.

3. RESULT AND DISCUSSION: -

3.1 RESULT: -

Following are the results of all evaluation parameters performed to ensure supremacy of prepared face pack: -

A. Organoleptic evaluation:

The herbal face pack prepared in current study was evaluated for various organoleptic parameters and its observations are shown in the Table 3.1.

Table 3.1 Organoleptic evaluation

S.NO	EVALUATION PARAMETERS	F1	F2	F3	F4
1.	Color	Slightly yellow	Yellowish white	Yellowish white	Yellow
2.	Oduor	Pleasant	Pleasant	Pleasant	Pleasant
3.	Texture	Fine	Fine	Fine	Fine
4.	Appearance	Powder	Powder	Powder	Powder
5.	Nature of face after wash	Soft and fresh	Soft and fresh	Soft and fresh	Soft and fresh



Figure 5: Formulated Face pack

B. PHYSIO-CHEMICAL PARAMETER: -

Table 3.2 Parameter

S.NO.	EVALUATION PARAMETER	F1	F2	F3	F4
1	pH	7.8	6.4	7.8	6.3
2	Moisture content	2.4% w/w	1.8% w/w	1.3% w/w	2.75w/w
3	Total Ash	2.5%	2.7%	2.1%	2.4%
4	Acid insoluble ash	0.58	0.60	0.45	0.52
5	Water-soluble ash	1.2	1.3	0.9	1.4
6	Tapped density	0.68gm/ml	0.74gm/ml	0.70gm/ml	0.73gm/ml
7	Bulk density	0.75gm/ml	0.83gm/ml	0.78gm/ml	0.81gm/ml

8	Particle size	28-32 μm	25-30 μm	29-33 μm	30-35 μm
9	Grittiness	Nil	Nil	Nil	Nil



Figure 6: - Evaluation of moisture content

C. Skin Permeability Test: -

The Franz Cell system is designed to imitate the behavior of actives and formulations when applied to skin. Test sample is placed in contact with a membrane and the rate of transfer is determined by collection of the permeate on the other side of the membrane. The use of Franz diffusion cell to assess skin permeability has evolved into a major research methodology, providing key insights into the relationships between skin, drug and formulation.

The drug was easily able to penetrate into the skin.



Figure 7: - Skin Permeability Test



Figure 8: - Goat Skin

3.2 Discussion: -

The results obtained from various evaluations properties indicated that the prepared face pack was smooth and fine in texture with pale yellow color and had pleasant smell. Flow properties indicated good flowability of the powders. Irritancy test did not show any signs of redness, rashes, and swelling. While the pH of the formulation was 6. Which is close to skin pH, indicating that the face pack is suitable for application on skin. Formulation can be easily washed off from skin with no signs of stains on skin.

These indicate that the preparation formulated has good flow properties.

Herbal face packs are used for the purpose like deep cleansing, astringents, stimulating, tanning, hydrating and Nourishing. They are used to stimulate blood circulation and rejuvenate the muscles. They maintain elasticity of skin and remove dirt from it. The major advantages of herbal face pack are, it is derived from natural sources, so any of the chemical ingredients is not involved. This is non-toxic in nature and reduce allergic reaction.

By performing the test like washability, angle of repose, pH it gives idea about formulation. The formulation found homogeneous, easily washable; the pH is slightly alkaline which is more suitable with our skin. The value of angle of repose indicates the powder has good flow properties.

4. Conclusion: -

In the present study, people need cure for various skin problems without side effects. Herbal formulation has growing demand in the world market. The face pack was prepared with the aim to promote nourishment, to enhance the appearance and aesthetic feel of skin. It was prepared by combining powders of various natural plants and herbs. Presence of natural agents in formulation does not directly alter the normal physiological properties of skin and yet tends to be effective. These agents also tend to cause minimal side effects unlike synthetic face pack containing chemical agents which may be harmful upon application. The prepared face pack can also be used as face scrub to remove dead and flaky skin. From the observation of all evaluation parameters, it can be concluded that the prepared face pack based on home remedies is safe to use on skin.

5. Reference: -

1. Kakara M, Dasari S, Gundupalli MP, Kangsadan T, Katam K. Understanding the Environmental Distribution and Potential Health Risks of Pollutants from Deodorant Products: A Review. InE3S Web of Conferences 2023 (Vol. 428, p. 02015). EDP Sciences.
2. Teerasumran P, Velliou E, Bai S, Cai Q. Deodorants and antiperspirants: New trends in their active agents and testing methods. *International journal of cosmetic science*. 2023 Mar 10.
3. Sidek NA, Berg BV, Husain K, Said MM. Antimicrobial potential of ten medicinal plant extracts against axillary microbiota causing body odor. *Pharmacophore*. 2021 Nov 1;12(6):1-5.
4. Ogbebor IM. EFFECT OF DEODORANT ON MICROFLORA OF THE ARMPIT OF UNIBEN FEMALE STUDENTS. *African Journal of Health, Safety and Environment*. 2021 Oct 18;2(2):100-8.
5. Ranade SS, Thiagarajan P. Lemon grass. *Int. J. Pharm. Sci. Rev. Res*. 2015;35(2):162-7.
6. Sahu P, Nema R K. Covid-19: Pandemic in India; an update. *European Journal of Biomedical and Pharmaceutical sciences*; Vol-8, Iss-6 (June 2021): 312-320
7. Sahu P, Nema R K. Bioenhancer: An Agent for Increasing Bioavailability. *World Journal of Pharmaceutical Research*; Vol-8, Iss-6 (May 2021): 613-634
8. Sahu P, Nema R K. A Peer Review on Herbal Cosmetics and Skin Care. *World Journal of Pharmacy and Pharmaceutical Sciences*; Vol-10, Iss-7 (June 2021): 613-634.
9. Sahu P, Sahu G, Sharma H, Sahu G K. Preparation & Characterization of nutraceutical drink. *International Journal for Multidisciplinary Research*, Vol- 5, Iss 2 (March- April 2023), 2582-2160
10. Sahu P, Chandravanshi A, Bhuneshwar, Singh S, Sharma H, Sahu G K. Development of Analgesic Chewable gummy tablet for palatable drug delivery. *International Journal for Multidisciplinary Research*, Vol- 5, Iss 2 (March- April 2023), 2582-2160
11. Sahu P, Yadav S, Bhimte P, Sarparaj S, Sahu N, Sharma H, Sahu G K. Development & Characterization of Vanishing Cream. *Acta Scientific Pharmaceutical Sciences*, Vol- 7, Iss 4 (May-June 2023), 2581-5423
12. Sahu P, Bhimte P, Singh S, Sarparaj S, Sahu N, Sharma H, Sahu G K. Formulation of polyherbal soap and evaluation of its physico-chemical parameters. *Acta Scientific Pharmaceutical Sciences*, Vol- 7, Iss 4 (April 2023), 2581-5423

13. Tandi DY, Sahu P, Sharma H, Nema RK, Sahu GK. Piperine: Physicochemical Aspects for Lung Cancer. *International Journal of Biology, Pharmacy and Allied Sciences*, January 2023, 12(1): 294-304
14. Sahu P, Sahu G, Sharma H, Sahu GK. Preparation and Characterization of Nutraceutical Drink.
15. Sahu M, Choubey R, Sahu P, Mishra A. A comparative molecular docking study of Syzygium cumini to understand the binding pattern with four different proteins Used for anti-diabetic activity.
16. Sahu P, Nema RK. Bioenhancer: an agent for increasing bioavailability. *World J Pharm Res.* 2021 Apr 1;10(6):613-34.
17. Sahu P, Sahu GK, Sharma H, Kaur CD. Formulation, characterization and ex vivo evaluation of epinephrine transdermal patches. *Research Journal of Pharmacy and Technology.* 2020;13(4):1684-92.
18. Sahu L, Nagwanshi P, Sahu P, Sahu A, Sahu G, Sharma H. Novel Approaches of Treatment of Cancer: Nanoparticle. *Research Journal of Pharmaceutical Dosage Forms and Technology.* 2020;12(2):115-24.
19. Nagwanshi P, Sahu L, Sahu P, Sahu A, Sharma H, Sahu G. Emphasis of Phytoconstituent in the treatment of cancer. *Research Journal of Pharmaceutical Dosage Forms and Technology.* 2020;12(3):169-77.

