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FORMULATION AND EVALUATION OF NATURAL HERBAL FACE PACK

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ABSTRACT

The objective of this work is to formulate and evaluate a herbal face pack for cosmetics purpose from herbal ingredients. The natural powders were procured from the local market and were dried, powdered, then passed through, mixed gemotrically and evaluated for its organoleptic and physcio- chemical, general powder, microscopial characters and chemical evaluation. The dried powder of combined form had passable flow property which is suitable for face pack. Particle size of the powder was found to be 20-25µm. The microscopial characters of dried powder of combined form were noted Herbal face packs or masks are used to stimulate blood circulation, rejuvenates the muscles and help to maintain the elasticity of the skin and remove dirt from skin pores. The advantages of herbal cosmetics is their non toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in the present work, we found good properties for the face packs and further optimization studies are required on this study to find the useful benefits of face packs on human use as cosmetic product.

KEY WORDS: Face Pack, Natural, Standardization, Cosmetics.

INTRODUCTION

Cosmetics are products created for skin & hair care for the purpose of cleansing, beautifying and enhancing the attractive features. Skin care is not a modern trend. In fact, people in every civilization used cosmetics to protect and embellish their skin – which naturally leads us to conclude that this is a primordial need. Although cosmetic products have undergone many changes in modern times, the basic concept of using cosmetics to enhance the features of good health has not changed.[1] Present research article deals with the formulation and

characterization of cosmetic natural herbal facepack and preparation Normal skin is neither too dry nor too oily so it looks vibrant and moist. Skin care can be cleansing, toning and moisturizing. However, herbs selected in this preparation rejuvenates the skin protect it from tanning and allergies. The present work was carried to formulate herbal face pack containing powders of Fullers earth, aloe Vera, green tea, rose petal, cucumber, turmeric, almond, orange peel, tulsi as the base along with other required ingredients which will fulfill as complete face pack .The prepared face pack was evaluated for physical, chemical and biological evaluation.[2]

MATERIALS AND METHODS

Materials: Fullers earth, Aloe Vera powder Green tea powder Rose powder Cucumber powder Turmeric powder Almond powder Orange peel powder. All the extracts are commercial and purchased from the market.

Methods

Formulation of herbal face pack[3]: The herbal face pack was formulated using simple mixing process. Herbal face pack was formulated by adding the required amounts of herbal ingredients as given in formulation table1.

Table 1 Formulation of herbal face pack

Ingredients	F1	F2	F3	F4	F5	F6
Fullers earth powder	5gm	5gm	5gm	5gm	5gm	5gm
Green tea powder	5gm	5gm	5gm	5gm	5gm	5gm
Aloe Vera powder	10gm	10gm	10gm	10gm	10gm	10gm
Rose powder	30gm	10gm	10gm	10gm	10gm	10gm
Cucumber powder	10gm	30gm	10gm	10gm	10gm	10gm
Turmeric powder	10gm	10gm	30gm	10gm	10gm	10gm
Almond powder	10gm	10gm	10gm	30gm	10gm	10gm
Orange peel powder	10gm	10gm	10gm	10gm	30gm	10gm
Tulsi powder	10gm	10gm	10gm	10gm	10gm	30gm
*Rose water	q.s	q.s	q.s	q.s	q.s	q.s

[Adjusted not more than 5 ml].

Evaluation of herbal face pack[4]

Physical Appearance /Visual Inspection[5]: The formulations prepared were evaluated in terms of their clarity, smoothening texture and coloring.

Bulk density (B.D)[6]: Is the ratio of total mass of powder to the bulk volume of powder .It was measured by the pouring the weighed powder (passed through standard sieve#20) in to a measuring cylinder and the initial volume called the bulk volume .from this, the bulk density is calculated according to the formula mentioned below .It is expressed in g/cc and is given by.

B.D $=m/v_0$

Where,

M=mass of the powder

V_0= bulk volume of the powder

Tapped density (TD): It is the ratio of total mass of powder to the tapped volume of powder. The volume was measured by tapping the powder for 100 times .Then the tapping was done for 50 times and the tapped volume was noted (the difference between these two volumes should be less than 2 %).If it is more than 2% tapping is continued for 1250 times and the tapped volume was noted .It is expressed in g/cc and is given by.

$T.D=m/V_i$

Where,

M =mass of the powder.

V_i= tapped volume of the powder.

Angle of Repose[7]: This is the maximum angle possible between the surface of a pile of powder or granule and their horizontal plane.

The angle of repose of powder was determined by funnel method .The funnel was fixed at a particular height (2.5cm)on a burette stand. The powder sample was passed through the funnel until it forms a heap. Further adding of granules was stopped as the heap touches the tip of the funnel. A circle was drawn across it without disturbing the pile. The radius and height of the heap was noted down .The same procedure was repeated for three times and the average value was taken. The angle of repose was calculated by using equation.

$$\tan\theta = h/r$$

$\theta = \tan^{-1}(h/r)$

Where, θ = angle of repose

h=Height of the heap

r=Radius of the heap

Sr. No	Angle of repose	Type of flow
1	<25	Excellent
2	25-30	Good
3	30-40	Passable
4	>40	Type of flow

Measurement of P^{H}[8]

The Ph of 10% of herbal face pack solution in rose water was determined at room temperature 25°C.

Measurement of Viscosity[9]

The viscosity profile of the herbal face pack formulations was measured using Brookfield viscometer DV-E model at 25°C. (Brookfield engineering labs, USA).

Skin irritation Test[10]

The albino rabbits were divided in to 8 groups (n=3).On the previous day of the experiment, the hairs on the back side area of albino rabbits were removed. The animals of group I was served as normal, without any treatment. Animal group II+, III,IV,V,VI, VII and VIII. were applied with face pack formulations F1, F2,F3,F4,F5 and F6respectively. Face packs were applied as astandard irritant on animal Group VIII. The animals were applied with formalin solution up to 8 hours and finally the application sites were graded according to a visual scoring scale, always by the same investigator. The erythema scale was as follows:0,none;2;, well defined;2, moderate;2scare formation(severe).

Eye Irritation Test[11]

Animals (albino rabbits) were collected from animal house. About 1% face pack solutions was dripped in to the eyes of six albino rabbits with their eyes held up on with clips at the lid. The progressive damage to the rabbit's eyes was recorded at specific intervals over and average period and of 4 seconds. Reactions to the irritant can include swelling of the eye lid, inflammation of the iris, ulceration, hemorrhaging (bleeding) and blindness.

***Ex Vivo* Studies**

The Ex Vivo Studies were conducted by selecting the 3 human volunteers (usually female) as a group and the formulations were applied for observation of change in the appearance, glow and smoothness of the face. The test was done with all the precautions and necessary observations.

Stability studies[12]

Stability studies were carried out by placing the formulations on petri dishes in humidity cabinet at 45O C and 75% relative humidity. Their appearance, Physical Stability were inspected for a period of 1 month in the order of 1 day, 7th day, 14th day and 28th day.

RESULTS AND DISCUSSION

Physical appearance/ visual inspection

The results of visual inspection of series of formulations are listed in Table 2. As can be seen, all formulation had good characteristic taste and slight recognizable odor with respect to Fine and smoothening texture and colorful appearance.

Table 2: Evaluation of formulations for Physical Appearance.

S. No	Formulation	Physical Appearance	Odor	Taste	Texture
1	F1	Brownish	Slight	Characteristic	Fine
2	F2	Slight Yellowish	Slight	Characteristic	Fine
3	F3	Yellowish	Slight	Characteristic	Fine
4	F4	Cream	Slight	Characteristic	Fine
5	F5	Slight Yellowish	Slight	Characteristic	Fine
6	F6	Brownish green	Slight	Characteristic	Fine

Fig. 12. Prepared herbal Face pack Powder

General Powder Evaluation

Bulk Density

All the formulations were subjected for powder properties evaluation. The bulk density was determined using the Bulk Density Apparatus and the results were tabulated in the table.3 All the values for the formulations were consistent and the ranged between 0.2854 to 0.3156.

Table 3: Results of formulations for Bulk Density

S. No	Formulation	Bulk Density
1	F1	0.2854 ± 0.01 g/ml
2	F2	0.3156 ±0.03 g/ml
3	F3	0.3002± 0.02 g/ml
4	F4	0.3098 ± 0.03 g/ml
5	F5	0.2908 ± 0.01 g/ml
6	F6	0.2946± 0.02 g/ml

Tapped Density

All the formulations were determined for tapped densities and the results showed that the powders mixture was plugged in the gaps and reduced their volume which resulted in increase in density values. The values are ranged between 0.4077 to 0.4246 tabulated in the table 4.

Table 4: Results of formulations for Tapped Density

S. No	Formulation	Tapped Density
1	F1	0.4077±0.02 g/ml
2	F2	0.4246±0.03 g/ml
3	F3	0.4056±0.02 g/ml
4	F4	0.4186±0.01 g/ml
5	F5	0.4154±0.04 g/ml
6	F6	0.4208±0.03 g/ml

Angle of Repose: The flow properties of powders was satisfactory which is evident from the results obtained. All the formulations containing powder mixture showed good angle of repose values which were tabulated in the table 5.

Table 5: Results of formulations for Angle of Repose

S. No	Formulation	Angle of Repose	Type of Flow
1	F1	26±0.28	Good
2	F2	25±0.32	Good
3	F3	26±0.52	Good
4	F4	27±0.22	Good
5	F5	25±0.59	Good
6	F6	26±0.36	Good

Particle size: The subjected evaluation for particle size determined through sieve analysis made evident from the table 6 that all the size of the particles in all the formulation mixture are in between lowest size of 20 and highest of 45. As the spread ability, grittiness depends on particle size, the results obtained are satisfactory showing good for spread ability and fineness.

Table 6: Results of formulations for Angle of Repose

S. No	Formulation	Particle Size (µm)
1	F1	25-30
2	F2	24-38
3	F3	20-45
4	F4	20-30
5	F5	25-35
6	F6	20-40

Physicochemical evaluation

Measurement of p^H

The pH for prepared formulations was measured using Digital pH meter showed that all the formulations are slightly acidic in nature and provides good compliance towards the normal skin of all types with usual pH of 5.5. All the values are tabulated in the table 7.

Table 7: Results of formulations for p^H

S. No	Formulation	P^H
1	F1	5.21± 0.02
2	F2	5.39±0.03
3	F3	5.49±0.01
4	F4	5.51±0.07
5	F5	5.72±0.02
6	F6	5.83±0.04

Moisture content, Total Ash Value and Acid Insoluble Ash Value

From the values obtained and tabulated in the table 8 revealed that all the formulations are little hygroscopic in nature, the ash values evaluated showed that the inorganic matter present in the formulations is within the acceptable limits indicating he purity of the formulations containing mixture of powder extracts.

Table 8 Results of Formulations for Moisture content, Total Ash Value and Acid Insoluble Ash Value

S. No	Formulation	Moisture content (%)	Total Ash Value (gms)	Acid Insoluble Ash Value (gms)
1	F1	4.5	4.4	2.9
2	F2	5.2	4.2	3.1
3	F3	4.8	4.3	2.8
4	F4	5.5	4.4	3.2
5	F5	5.3	4.1	3.3
6	F6	4.9	4.3	2.8

Measurement of Viscosity

The results of rheological evaluation showed that the viscosity of the samples are in the range which usually suitable to apply to skin easily and affirms good durable property for all the formulations.

Table 9: Evaluation of formulation for Viscosity

Formulation	RPM	Viscosity
F1	30	73793.63 cp
F2	30	76854.56 cp
F3	30	69896.15 cp
F4	30	65894.85 cp
F5	30	61356.33 cp
F6	30	60576.63 cp

Skin Irritation Test

The results evident that all the formulations are perfectly suitable for face pack preparation, none of the formulation causing no irritation on skin tested on healthy rabbits. As the formulations are natural extracts though they contains the minute and traces of other organic and inorganic matter dose not cause irritation to the skin.

Table 10: Results of formulation for Skin irritation Test

Formulation	Skin Irritation
F1	NO Irritation
F2	NO Irritation
F3	NO Irritation
F4	NO Irritation
F5	NO Irritation
F6	NO Irritation

Eye Irritation Test

From the test results obtained and tabulated in the table 9 made evident that the formulations F1, F3, F5 and F6 showed eye irritation resulting redness of eye. The dryness and scaling was also observed in the four formulations. The adverse reactions may occur due to one of the primary constituents of the cosmetic formulation or contamination of procedural misconduct. Preservatives are the second most common cause of eye irritations besides other materials in formulations. Here the reactions were clearly observed in four formulations and the other two made to select best for further studies that is F2 and F4.

Table 11: Results of formulation for Eye irritation Test

Formulation	Eye Irritation Test
F1	Irritation and redness was observed
F2	No Irritation
F3	Irritation and redness was observed
F4	No Irritation
F5	Irritation and redness was observed
F6	Irritation and redness was observed

Ex-Vivo Test: From the above studies and results obtained it is considered that the formulations F2 and F4 were two which dose not have eye irritation causing content. From this view the two formulations were subjected to study further for *Ex-vivo* studies. From the studies it is evident that the application of prepared face packs showed satisfactory positive results. The changes in the face like improve in the appearance, glow of the skin and improved smoothness of the skin made the prepared face packs to reach the objective of the present work.

Just Before Applied Just after Applied After 20 mins

Fig 19. Ex- vivo test for formulation F2 in subject 1.

Just Before Applied Just after Applied After 20 mins

Fig 20. Ex- vivo test for formulation F2 in subject 2.

Just Before Applied Just after Applied After 20 mins

Fig 21. Ex- vivo test for formulation F2 in subject 3.

Just Before Applied Just after Applied After 20 mins

Fig 21. Ex- vivo test for formulation F4 in subject 1.

Just Before Applied Just after Applied After 20 mins

Fig 22. Ex- vivo test for formulation F4 in subject 2.

Just Before Applied Just after Applied After 20 mins

Fig 23. Ex- vivo test for formulation F4 in subject 3.

Stability studies

Stability and acceptability of organoleptic properties (color and odor) and physical properties like pH and Viscosity of two formulations F2 and F4 during the storage period indicated that they are chemically and physically stable. The stability results of herbal formulations is listed in the following table 12.

Table 12 Stability Studies for F2 Formulation.

Parameter	1st Day	7th Day	14th Day	28th Day
Colour	No Change	No Change	No Change	No Change
Odor	No Change	No Change	No Change	No Change
pH	5.39	5.40	5.40	5.40
Viscosity	76854.56	76854.32	76855.21	76855.38

Table 13 Stability Studies for F4 Formulation.

Parameter	1st Day	7th Day	14th Day	28th Day
Colour	No Change	No Change	No Change	No Change
Odor	No Change	No Change	No Change	No Change
pH	5.39	5.40	5.40	5.40
Viscosity	65894.85	65895.10	65895.23	65895.30

SUMMARY AND CONCLUSION

The usage of Herbal Cosmetics has been increased to many folds in personal care system and there is great demand for herbal cosmetics. Personal Care industry is currently more concentrated on those herbal based cosmetics as now – a – days it is a fasting growing with a vast scope of modified expansion in coming years. The use of bioactive ingredients in cosmetic influence biological functions of skin and provide nutrients necessary for the health skin. In general, botanicals provide different vitamins, anti – oxidants, various oils, essential oils, hydro colloids, proteins, terpenoids and other bioactive molecules. There is tremendous scope to launch numerous herbal cosmetics using appropriate bioactive ingredients with suitable fatty oil, essential oils, proteins and additives. It is mandatory that adequate safety testing should be conducted according to existing rules and well documented along with ingredients composition.

The formulations was found homogeneous, easily washable and safe which were compatible with normal skin physiology. The poly herbal face pack containing different ingredients and made into different formulations safed musli is able to reduce the dryness of the skin and increase dirt removal capacity and glow of the skin. The hazy layers and dead cell layers on the facial skin were easily removed which improves the appearance and anti – ageing

property so as to minimize the formation of shady layer on the face, depending upon the results of evaluation.

The poly herbal face pack was formulated using natural ingredients and was evaluated. By combining all the ingredients it can be concluded that this herbal face pack can be used as multipurpose herbal facial product and the ingredients mixed can produce synergistic effect of the other. Furthermore evaluation studies can be carried out on the formulations with change in concentration of individual ingredients and can be carried out on adding mixture of ingredients in different ratios.

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