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"FORMULATION & EVALUATION OF POLY-HERBAL ANTI-ACNE FACE WASH GEL"

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ABSTRACT

Natural remedies are more acceptable in the faith that they are safer with less side effects than the synthetic ones. Herbal formulations have rising demand in the world market. The present work deals with the development & evaluation of the herbal anti-acne face wash containing extract of Manjishtha (Rubia cordifolia), Sariva (Hemidermusindicus), Vacha (Acoruscalamus), Lodhara (Symplocasrecemesa), and Raktachandan (Pterocarpusantalinus). Although various topical herbal formulations for acne are available in the market, we propose to make poly herbal formulation using different herbal & synthetic ingredient. The plants have been reported in literature having good anti-microbial, anti-oxidant & anti-inflammatory activity. Various formulation batches i.e., F1 to F6 were prepared using polymers in varied concentrations. Prepared formulations (F1 to F6) were evaluated for various parameters like colour, appearance, consistency, washability, pH & spreadability. Amongst all the formulation studies batch F5 was found optimum for all the parameter. It was very good attempt to establish the herbal anti-acne face wash containing extract of Manjishtha, Sariva, Vacha, Lodhara, Raktachandan.

KEYWORDS: Manjistha, polymers, herbal ingredients, anti-acne face wash.

INTRODUCTION

Acne vulgarise is an extremely common disorder of skin (pilocebaceous unit) that affects virtually all individuals at least once during life. The incidence of acne peaks at teenage, but substantial numbers of men & women between 20-30 years of age are also affected by the disorder. [1]

Acne may be classified as comedonal, popular, pustular, cystic & nodular. Comedonal acne is non-inflammatory & divided into two types: whiteheads & blackheads. White heads (closed comedo) present as fresh or white coloured, raised bumps whereas blackhead (open comedo) present as open pores containing dark coloured skin roughage consisting of melanin, sebum & follicular cells. Papules appear as red, solid, elevated lesions often less than 5mm in diameter. Puastules are circumscribed skin elevations containing purulent material. Cysts & nodules are solid, elevated lesions involving deeper dermal & subcutaneous tissue. Cysts are less than 5 mm in diameter whereas nodules exceed 5mm.

The pathogenesis of acne involves multiple physiological factors. These include follicular hyper-proliferation, increased sebum production due to higher androgen levels & colonization of organism, Propionibacterium acnes & staphylococcus epidermidis.[4] Novel concept have emerged to help better understand its pathogenesis, these includes variation in target cell sensitivity, biological markers, neuro-endocrine, genetic,& environmental factors. Plenty of herbal as well as synthetic ingredients are reported to have remarkable beneficial effect on acne vulgaris.[3,5] They may have different mechanism like,

a) Control sebum secretion.
b) Antibiotics which inhibits Propionoibacterium acne & Staphylococcus epidermidis, the main causative organism of acne.
c) Keratolytic which removes the keratin layer & prevents the trapping of sebum under the skin.
d) Anti-inflammatory which prevents the worsening of condition due to inflammation or redness etc.

Numbers of formulations are available in the market with variety of active pharmaceutical ingredients for the treatment of acne. Topical formulations, available in the market are as follows: Gel, Cream, Lotion, Face wash or cleanser, Face pack or mask. Manjishtha (Rubia cordifolia), Ananta/sariva (Hemidesmusindicus), Vacha (Acoruscalamus), Lodhara (Symplocas recemosa), Raktchandan (Pterocarpussantalinus) are reported to have very

beneficial effect on acne due to anti-microbial, anti-inflammatory & anti-oxidant activities of different chemical constituents.[1]

MATERIALS

The different parts of the plants were selected for the study having antimicrobial and antiacne activity which has been already proved. Following herbs were used for the preparation of herbal anti acne gel. Carbopol was used as gelling agent. Triethanolamine was used as pH modifier.

Table: 1 List of ingredients

Sr.No.	Herb Name	Scientific name	Part Used	Use
1	Manjishtha	Rubia cordifolia	Root	Anti-acne
2	Ananta/sariva	Hemidesmusindis	Root	Antibacterial
3	Vacha	Acoruscalamus	Bark	Anti-acne
4	Lodhara	Symplocas recemosa	Bark	Anti-acne
5	Raktchandan	Pterocarpussantalinus	Fruit	Anti inflammatory

METHODS

Preparation of herbal extracts

1) Extraction of Manjishtha

10 g powdered material of roots was subjected to successive extraction by maceration with 150 ml methanol. The extraction was continued until the solvent became colourless. The extracts were collected and air dried.[6]

2) Extraction of Ananta

The roots were dried under shade, powdered and passed through 40 mesh sieve. The powdered material; 10g was extracted with ethanol by maceration method.

The extract obtained was dried in rotary vacuum evaporator at 40ºC, yielding a reddish brown coloured viscous mass, which was then dried in the desiccators and used.

3) Extraction of Raktchandan

10 gm of the powdered material macerated with 100 ml of methanol, shaken frequently and allowed to stand for 24 hr. Thereafter, filtered, evaporated the filtrate to dryness and weight was taken.

4) Extraction of vacha

25gm powdered material macerated with 150 ml of ethanol and shake frequently and allowed to stand for 24 hr. Then filtered through what man filter paper and evaporated to dryness.

5) Extraction of lodhara

25gm powdered material macerated with 150 ml of ethanol and shake frequently and allowed to stand for 24 hr. Then filtered through what man filter paper and evaporated to dryness.

Selection of herbal active concentration

The concentration of herbal extracts, 1% w/v was selected on the basis of reformulation studies.

Preparation of trial batches

Step 1: Preparation of gel base

Aloe-Vera powder weighed (0.25gm) and dissolved in water (25ml) with continuous stirring using mechanical stirrer at 1000rpm (Remi motor RQT-127 HP1/8) at the temperature between 60-80^{0}C for 1hr in the reactor vessel. The pH of the solution was adjusted to 6.0-6.4 by addition of triethanolamine, was used as preservative. All the gel bases were permitted to equilibrate for 12 hours at room temperature.

Step2: Preparation of formulation

The herbal extracts (1% w/v) of Manjishtha, Ananta, Vacha, Lodhara, Raktchandan, were added with continuous stirring using mechanical stirrer at 1000rpm (Remi motor RQT-127 HP1/8) to different gel bases till the uniform dispersion of the ingredients was achieved. All these batches were allowed to equilibrate for 24 hours at room temperature. The prepared gel was filled and stored in a wide mouth polypropylene container. The pharmaceutical studies were performed.

Table 2: Composition of developed formulation

SR.NO	Ingredients (gm.)	Formulation codes					
		F1	F2	F3	F4	F5	F6
Step 1: Gel base.							
1.	Dried Aloe-Vera gel powder.	0.25	0.25	0.25	0.25	0.25	0.25
2.	Carbopol 940	0.5	0.10	0.15	0.20	0.25	0.30
3.	Triethanolamine	0.025	0.025	0.025	0.025	0.025	0.025
4.	Euxyl P.E. 9010	0.15	0.15	0.15	0.15	0.15	0.15
5.	Distilled water	25	25	25	25	25	25
Step 2: Formulation of Herbal gel							
1	Manjishtha extract	0.25	0.25	0.25	0.25	0.25	0.25
2	Ananta extract	0.25	0.25	0.25	0.25	0.25	0.25
3	Lodhara extract	0.25	0.25	0.25	0.25	0.25	0.25

4	Vacha extract	0.25	0.25	0.25	0.25	0.25	0.25
5	Raktachandan extract.	0.25	0.25	0.25	0.25	0.25	0.25
6	Gel base	25	25	25	25	25	25

EVALUATION OF FORMULATION

Physical evaluation

Physical parameters such as colour, appearance & consistency were checked visually.

1. Washability

Formulations were applied on the skin & then ease & extent of washing with water were checked manually.

2. pH

pH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant temperature.[5]

3. Spreadability

Spreadability denotes the extent of area to which the gel readily spread on application to skin or the affected part. The bioavailability efficiency of a gel formulation also depends on its spreading value.[2] The spreadability is expressed in terms of time in seconds taken by two slides to slip off from the gel, placed in between the slides, under certain load. Lesser the time taken for separation of two slides, better the spreadability. Two sets of glass slides of standard dimensions were taken. The herbal gel formulation was placed over one of the slides. The other slide was placed on the top of the gel, such that the gel was sandwich between the two slides in an area occupied by a distance of 6 cm along the slide. 100gm weight was placed upon the upper slide so that the gel between the two slides was pressed uniformly to from a thin layer. The weight was removed & the excess of the gel adhering to the slides was scrapped off. The two slides in position were fixed to stand without slightest disturbance & in such a way that only the upper slide to slip off freely by the force of weight tied to it. A 20gm weight was tied to the upper slide carefully. The time taken for the upper slide to travel the distance of 6 cm & separated away from the lower slide under the influence of the weight was noted. The experiment was repeated three times both formulated gels & marketed gel & the mean time taken for calculation.[1,2]

Spreadability was calculated by using the following formula,

$$S=M\times{}^{L}/T$$

Were, S- Spreadability

M- Weight tied to the upper slide (20gm).

L- Length of the glasss (6.5cm).

T- Time in sec.

RESULT AND DISCUSSION

Formulation was reddish brown in colour. Formulation F1, F2, F3, F4, F5 & F6 was found to have semisolid consistency. All the formulations were homogenous, easily washable. All the formulations had optimal pH which is well-suited with normal skin physiology.

Table 3: Evaluation of formulations

Formulation	Colour	Consistency	Wash ability	pH	Spread ability (gm-cm/sec)
F1	Reddish brown	Semi-solid	Good	6.9	5.909
F2	Reddish brown	Semi-solid	Good	7.5	4.193
F3	Reddish brown	Semi-solid	Good	6.8	5.416
F4	Reddish brown	Semi-solid	Good	7.0	2.6
F5	Reddish brown	Semi-solid	Good	7.0	2.826
F6	Reddish brown	Semi-solid	Good	7.2	4.642

Amongst all the formulation batches F1, F2, and F5 had very optimum spreadability. F5 formulation batch showed comparatively more spreadability than F1, F3, F4 and F5 formulation batches. And the parameters of F5 batch were found to have similar results near to result for the parameters of marketed formulation and hence F5 batch was finalized.

CONCLUSION

Natural remedies are more suitable in the assurance that they are safer with less side effects than the synthetic ones. Herbal formulations have increasing demand in the world market. It is a very good attempt to establish the herbal face wash containing extracts of manjistha, ananta, lodhara, vacha, raktachandan. This study publicized that the developed herbal formulation of batch F5 was comparatively better than other formulations.

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