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FABRICATION AND EVALUATION OF POLYHERBAL HANDWASH GEL

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ABSTRACT
In the recent times the large numbers of herbal formulations are overtaking the market. The trend of utilization of herbal formulations in the current has increased especially after the covid scenario. The covid has forced to use the herbal products in the absence of allopathic products which were available in scarcity at that time. Still after the covid the market of herbal formulation keep up the pace and many commercial products were introduced. In this paper, one among the most used herbal product i.e. hand wash gel is being formulated and evaluated using the numerous herbs. The main aim behind the formulation is to establish the synergistic effect of polyherbs.

KEYWORDS: Herbs, Polyherbal, Hand wash, Gel, Synergistic.

INTRODUCTION
Hands are considered to be one of the main factors for the transfer of pathogens.[1] If the hands are not been washed properly; than the chances of infection can increases manifold. In the present conditions after covid a lot of stress has been given to the proper hand washing.[2-3] The other ailments such as diahorrea, stomach upset, nausea and vomiting etc can also arises from the infection transmitted through bare hands.[4-5] Hand hygiene is thus the most vital measure to evade the transmission of harmful germs and avoid the infections. Before the introduction of commercial formulations the herbs are considered to be one of the most promising methods to generate anti-microbial actions. With the advancement of the technology numerous formulations for the washing of hands are being introduced commercially including hand gel, soaps, medicated soaps etc. All these formulations basically contain the synthetic ingredients as the major ingredient which causes the dryness with continuous use. Moreover, the gel based formulations have shown better patients compliance and are accepted by the majority of population.[6] In addition to this if the formulation is plant based then the chances of side effects can also be minimized. The lot of research and review work is being carried out by the researchers in the past to develop such formulations which are herbal based.[7-15] The current research work tries to focus on the fabrication and evaluation of polyherbal hand gel with good synergistic effect.

MATERIAL AND METHODS
The material used for the formulation of the herbal hand wash gel was being purchased from the local market. All the ingredients used in the formulation of the polyherbal gel were of analytical grades. The herbs used for the formulation of hand wash were obtained from the local area with best possible quality to get the optimum results. The Aloe vera used in the formulation provides antibacterial, soothing and moisturizing effect. The Turmeric provides the antiseptic, antioxidant, anti-inflammatory and good tone to the skin. The Ajwain enhances the antibacterial effect along with the minor antifungal property. All these herbs used were nearby having good synergistic effect as an antibacterial.

Figure 1: Aloe vera, Turmeric, Ajwain.

The formulation of the polyherbal hand wash gel is being carried out using gelling method.[16] Polyherbal Hand wash Gel was prepared using Carbopol 940 as gelling agent which is socked in 15ml distilled water overnight. Turmeric powder, ajwain powder and aloe vera gel were measured accurately and dissolved by gentle heating.

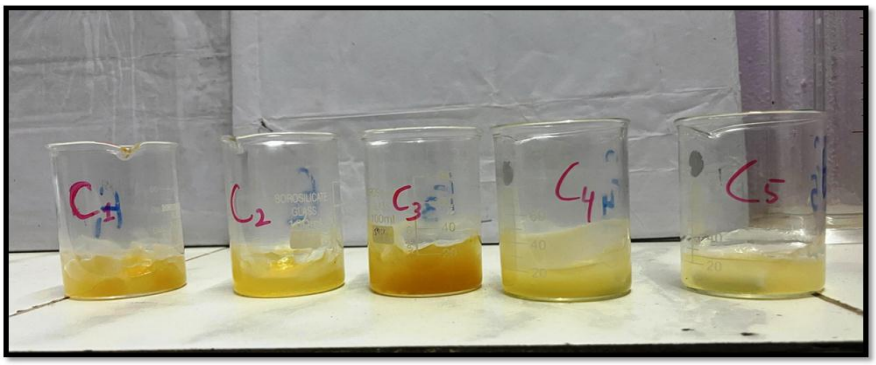

Figure 2: Formulated polyherbal hand wash gel.

Table 1: Formulation of the polyherbal hand wash gel.

Ingredients	Units	Formulated Quantity				
		C1	C2	C3	C4	C5
Turmeric	grams	0.3	0.4	0.5	0.6	0.7
Ajwain	grams	0.3	0.4	0.5	0.6	0.7
Aloe vera	grams	0.5	0.5	0.5	0.5	0.5
SLS	grams	0.5	0.5	0.5	0.5	0.5
Glycerine	ml	5	5	5	5	5
Methyl paraben	--	q.s	q.s	q.s	q.s	q.s
Lavender oil	gm/ml	0.15	0.15	0.15	0.15	0.15
Distilled water	ml	100	100	100	100	100

After heating, the solution was kept aside for sometimes. The required quantity of Sodium lauryl Sulphate dissolved in 10ml distilled water along with Glycerin were mixed in above aqueous phase with continuous stirring. Methyl paraben was dissolved in remaining quantity of purified water and dispersed into the extract. The swelled Carbopol 940 was stirred using a mechanical stirrer to ensure the uniform dispersion of polymer and finally added into the above mixture to form a homogenous gel and then the required quantity of lavender oil was added for fragrance.

Evaluation of the formulated polyherbal hand wash gel[17-20]

The formulated polyherbal hand wash gel was being evaluated using the various specified tests. The evaluation was carried out to optimize the samples.

Grittiness test

1ml of gel was taken on finger tips and rubbed between two fingertips, and then the formulation was evaluated for grittiness.

Skin irritation test

Skin Irritation Test was evaluated by applying Polyherbal Hand wash Gel on skin and left for half hour, after 30 minutes it was washed and observed for any sign of itching, rashes or redness on skin by sensory and visual inspection.

pH

1gm of sample of Polyherbal Hand wash gel was taken and dissolved it into 100ml distilled water. The pH solution was measured by standardized digital pH meter.

Spreadability

0.5gm of sample of Polyherbal Hand wash gel was pressed between two slides and left for about 5 minutes where no more spreading was expected. Diameter of spreaded circle was measured in cm and was taken as comparative values for spread ability.

Foam height

1 gram of sample of Polyherbal Hand wash gel was taken and dispersed in 50ml distilled water. Dispersion was transferred into measuring cylinder. Volume was made up to 100ml with water. 10ml of the sample was drawn from the stock solution into the test tube. Then the test tubes were shaken for 15 seconds. Then the test tube is allowed to stand for 5 minutes and the height of foam was measured.

Foam retention

25ml of Polyherbal Hand wash gel was taken into 100ml measuring cylinder and shaken 10 times. Then the time of the foam retention was monitored. Foam retention should remain stable for at least 5 minutes.

RESULTS AND DISCUSSION

The results of the evaluation parameters were quite effective and were nearly upto the standards with little variations. The results clearly indicate that the formulated formulation with different concentration of active ingredients shows response in accordance with the standards.

Table 2: Results of the evaluation of polyherbal hand wash gel.

S. No.	Evaluation Parameters	C1	C2	C3	C4	C5	Marketed standard
1	Grittiness Test	No Grittiness	No Grittiness	No Grittiness	No Grittiness	No Grittiness	No Grittiness
2	Skin Irritation Test	- ve	- ve	- ve	- ve	- ve	- ve
3	pH	5.0	5.1	5.1	5.3	5.2	5.5
4	Spreadability (cm)	0.001	0.001	0.001	0.002	0.002	0.002
5	Foam Height (cm)	1.7	1.6	1.7	1.8	1.8	2.0
6	Foam Retention (ml)	32	33	34	35	34	36

CONCLUSION

In the present scenario large numbers of the products are commercially and economically available in the market with herbal base. The herbal products being less toxic and with least side effects are being preferred. The present poly-herbal hand wash gel containing turmeric, ajwain and Aloe vera resulted in the optimum formulation with good antibacterial activity. The five formulations C1, C2, C3, C4 and C5 have shown good results but the C4 formulation was the best among them. The present optimized formulation C4 were also evaluated against the market formulation and have shown results very close to the marketed formulation. Further, there is a lot of scope in the current formulation that can be utilized for alterations in formulation to increase synergistic effect and enhance other evaluation parameters. The formulation is also economically good hence can be consumed for the larger grade of population.

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