

Study of *Crocus sativus* as Complexion Promoter in Skin Care

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ABSTRACT

The combined complexion effect of dry extract from the stigmata of *Crocus sativus* was inoculated in various cosmetic products. Extraction of dried pulverized stemens of the flowers was carried out by maceration method using ethyl acetate: isopropyl alcohol: Water (65:25:10) as solvent system. The dry extract was inoculated in o/w cream, lotion and face powder formulation. The complexion properties were studied by patch test on various subjects in age group of 18 to 28 years. Results of complexion property clearly observed the shine and lightening of skin due to crocin and crocetin present in saffron.

Keywords: Saffron, complexion effect, *Crocus sativus*.

INTRODUCTION

The basic instinct of man is to look beautiful and attractive. And therefore for many centuries he has been using artificial colors, bleaches and some or the other way to alter the normal appearance of the skin. These practices have been interwoven with his belief, philosophy, religion and his insatiable vanity.^[1]

The Ayurvedic herbs such as saffron are used to give a shine and lighten the skin, to increase complexion. In Ayurveda products containing these herbs are called Ayurvedic Rasayan or Ayurvedic Cosmetics.^[2] Since that time the concept of fairness came into existence, thus giving rise to the creation of skin lightening cosmetics. These cosmetics are mainly intended for reducing the hyper pigmentation or pigmentation of the skin.^[3]

MATERIALS AND METHODS

Ethyl acetate, cetyl alcohol, white petroleum jelly, mineral oil, propyl paraben, butylated hydroxyl toluene, glycerine, methyl paraben, Tween 80, sodium metasilphite, sodium EDTA, zinc oxide, zinc stearate, rice starch, emulsifying wax, propylene glycol, triethanolamine etc. were procured from S. D. fine chemicals, Mumbai. Saffron extract received as a gift sample from Dabur India Ltd. Jammu.

Extraction

500 mg of saffron were crushed and soak with 50ml solvent system (ethyl Acetate: isopropyl alcohol: water) for 24 hrs. After 24 hrs, saffron washed with solvent fraction.

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The colour of saffron appears white and the supernatant liquid was collected and evaporated.^[4]

Formulation of various cosmetics

Cream

The ingredients of oil and aqueous phase were heated separately in beaker to 75-80°C. As soon as temperature was reached the oil phase was added to the aqueous phase and mixed well with stirrer. The perfume was added when product was cooled to 40°C. The selected formula for cream loaded with saffron is given in Table 1.

Lotion

The lotion was prepared by the conventional method. The oil and aqueous phase were heated separately in beakers to 75-80°C. As soon as temperature was reached the oil phase was added to the aqueous phase & mixed well with stirrer. The perfume was added when product was cooled to 40°C. The dry extract of saffron was incorporated in all above products in the concentration of 0.1 %, 0.2 % and 0.3 %. The selected formula for lotion loaded with saffron is given in Table 2.

Face powder

Face powder was prepared by geometrical mixing method of various ingredients used in formulation having particle size range 2.9-3.9 micrometer. The mixing all the ingredients were carried out by geometrical mixing method and passes through # 20, 40, 60, 80, and 120 separately. The selected formula for face powder loaded with saffron is given in Table 3.

Evaluation of cream and lotion

Cream and lotion was evaluated by using different methods such as accelerated stability studies, determination of pH, total fatty substances content and determination of water content.^[5]

Evaluation of face powder

Face powder was evaluated by determination of fineness, moisture, volatile matter, particle size and pH. [6]

Table 1: Formulation of O/ W Cream and Optimization

S. No.	Ingredients	CLS1	CLS2	CLS3
1	Stearic Acid	8.00	8.00	8.00
2	Cetyl Alcohol	3.00	3.00	3.00
3	White Petroleum Jelly	3.00	3.00	3.00
4	Mineral Oil	6.00 ml	6.00 ml	6.00 ml
5	Propyl Parabean	0.1 g	0.1 g	0.1 g
6	B.H.T.	0.01 g	0.01 g	0.01 g
7	Glycerine	7.0 ml	7.0 ml	7.0 ml
8	Methyl Parabean	0.2 g	0.2 g	0.2 g
9	Tween 80	1 ml	1 ml	1 ml
10	Water	70.0 ml	70.0 ml	70.0 ml
11	Sod.Metabisulphite	0.01 g	0.01 g	0.01 g
12	Disod.EDTA	0.01 g	0.01 g	0.01 g
13	Saffron (Conc. Saffron dry extract)	0.1%	0.2%	0.3%
	Optimization	Saffron Showed no change in the test patch	Saffron Showed slight change in the test patch	Saffron Showed maximum effect in the test patch

Table 2: Formulations of Lotion and Optimization

S. No.	Ingredients	LLS1	LLS2
1	Emulsifying wax	7.0 g	7.0 g
2	Propylene Glycol	5.0 g	5.0 g
3	Triethanolamine	1.0 g	1.0 g
4	Glycerine	8.0 gl	8.0 gl
5	Water	79 ml	79 ml
6	Saffron (Conc. Saffron dry extract)	0.1%	0.3%
	Optimization	Saffron Showed no change in the test patch	Saffron Showed maximum effect in the test patch

Table 3: Formulation of face powder and Optimization

S. No.	Ingredients	Formulation No. 1	Formulation No. 2	Formulation No. 3
1	Talc	77.0 g	37.0 g	80.0 g
2	Mica	10.0 g	-	-
3	Kaolin	5.0 g	16.0 g	-
4	Red iron oxide	0.36 g	-	-
5	Zinc stearate	5.0 g	5.0 g	5.0 g
6	Yellow iron oxide	0.36 g	-	-
7	Black iron oxide	0.03 g	-	-
8	Zinc oxide	-	16.0 g	5.0 g
9	Precipitated chalk	-	18.0 g	-
10	Rice starch	-	8.0 g	10.0 g
11	Perfume	0.25	q.s.	q.s.
	Optimization	Particle size 17.39	Slight rough, Particle size 15.93	Imparting of smooth finish to the skin, Easy to spread, Particle size 10.26, so this batch was selected.

RESULTS AND DISCUSSION

Three different cosmetic products of different characteristics were chosen as a base or carrier for these antioxidising agents. They include cream, lotion and face powder which is the bases for preparation of various saffron inoculated

products and all variable parameters in the formulation procedure were optimized in each care. Therefore they were elevated as per respected ISO accelerated stability studies. These carriers are having more advantages when studied various parameters.

Accelerated Stability Studies

pH

The pH of all samples was slightly increased from the initial value and then become constant but was within the range of 6.7-6.95 which has no toxic effect or irritation on the skin.

Table 4: Effect of pH on cream at room temperature

Days	At room temperature		
	0.1% S	0.2% S	0.3% S
0	6.85	6.78	6.78
3	6.80	6.79	6.79
6	6.86	6.77	6.81
9	6.80	6.83	6.85
12	6.85	6.86	6.89
15	6.82	6.85	6.90
18	6.87	6.88	6.90
21	6.88	6.83	6.90
24	6.90	6.84	6.88
27	6.83	6.82	6.88
30	6.85	6.82	6.88

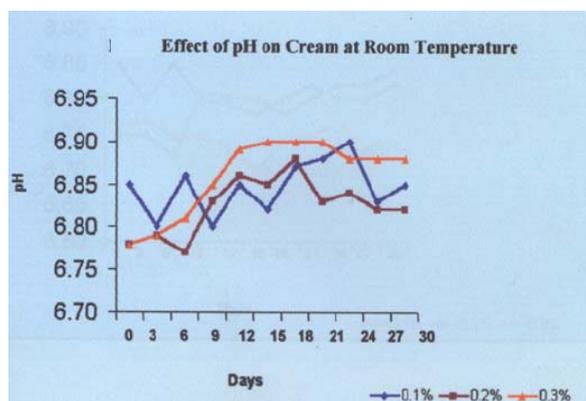


Table 5: Particle size of oil globule at room temperature

Days	At room temperature		
	0.1% S	0.2% S	0.3% S
0	1.41	1.47	1.35
3	1.23	1.60	0.92
6	1.05	1.33	1.60
9	1.32	1.32	1.29
12	1.08	1.40	0.74
15	1.20	0.86	1.51
18	1.08	1.51	0.77
21	1.25	1.27	1.33
24	0.98	1.35	0.71
27	1.24	0.92	1.57
30	1.60	1.26	0.95

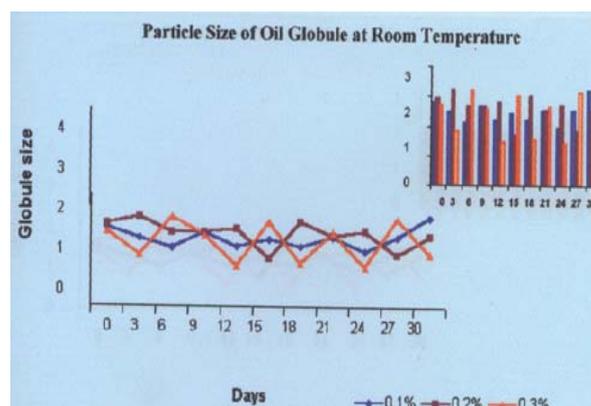


Table 6: Effect of pH on lotion at room temperature

Days	At room temperature	
	0.1% S	0.3% S
0	6.8	6.79
3	6.85	6.81
6	6.82	6.85
9	6.87	6.89
12	6.9	6.86
15	6.87	6.91
18	6.88	6.91
21	6.85	6.88
24	6.83	6.85
27	6.8	6.83
30	6.82	6.84

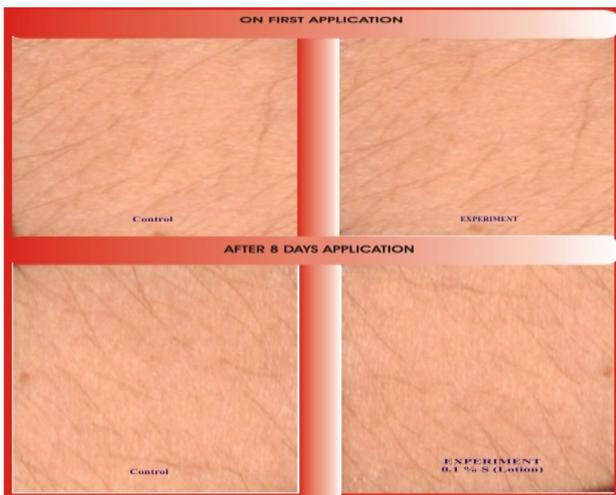
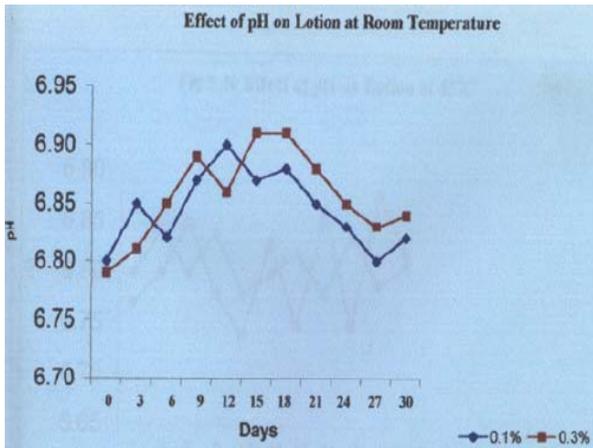


Fig. 1: In-vivo case study (Lotion loaded with Saffron)

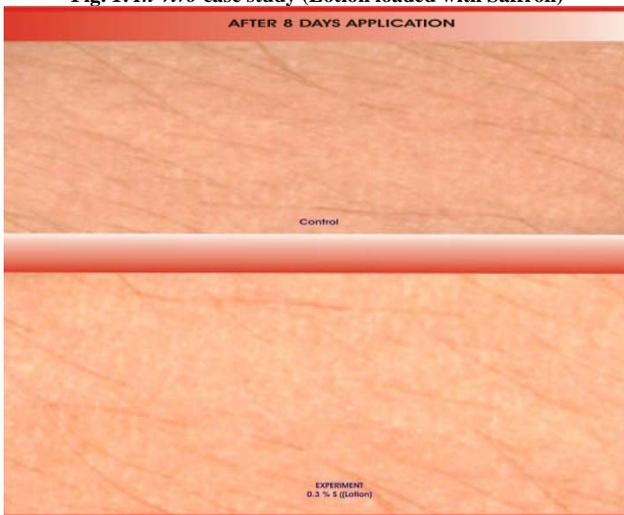


Fig. 2: In-vivo case study (Lotion loaded with Saffron)

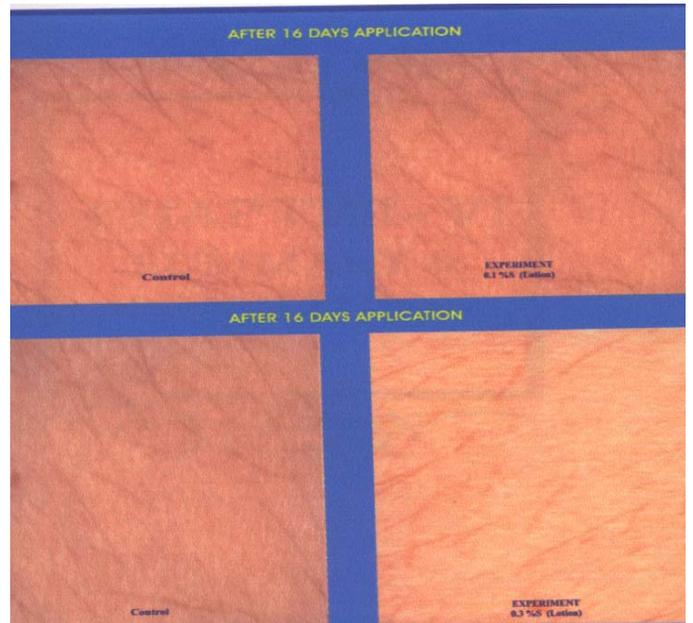


Fig. 3: In-vivo case study (Lotion loaded with Saffron)

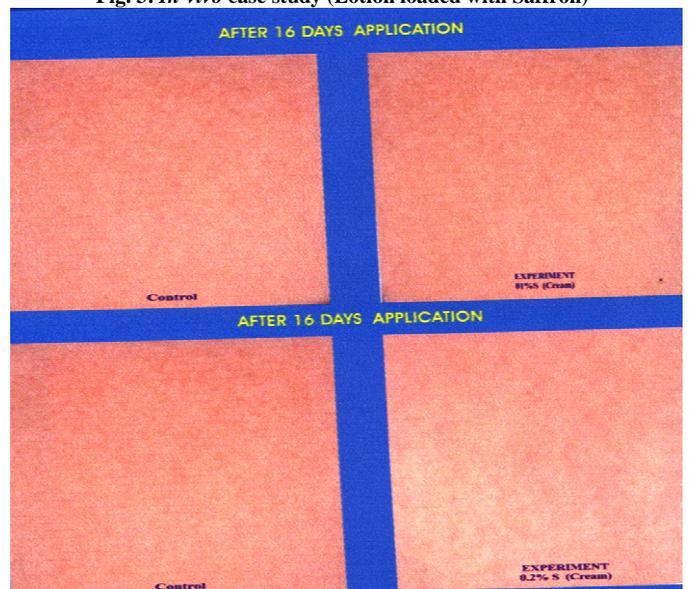


Fig. 4: In-vivo case study (Cream loaded with Saffron)

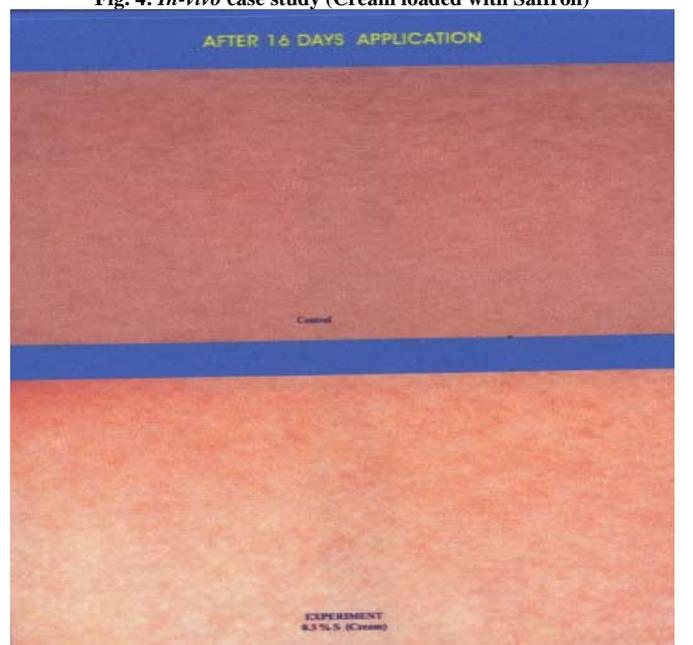


Fig. 5: In-vivo case study (Cream loaded with Saffron)

Colour

At 45°C sample changed its colour from initial yellow colour to yellowish white and finally become almost white.

Odour

At room temperature showed slight decrease in perfume with faint saffron odour towards the end. At 45°C there was a slight decrease in perfume and finally no perfume remained till the end. The odour of all the samples kept at 0°C showed no change throughout the stability testing period.

Formulation optimization and evaluation

Three different batches of cream, lotion and face powder with different ingredients were formulated and formulation 3 as given in Table 4, 5 and 6 respectively was selected on the basis of optimization.^[7-12]

CONCLUSION

In-vivo case study product efficacy was found to be viz. 0.1 % saffron showed no change in test patch, product with 0.2 % saffron showed slight change in test patch whereas 0.3 % saffron showed maximum effect as compared to control. Hence it was concluded that 0.3 % is safe for use and showed maximum desirable results.

REFERENCES

1. M. S. Balsam & Edward, Sagarin: Cosmetic Science & Technology Krieger publisher, vol. I, 2nd edition, 1992, pp. 223.
2. <http://www.webhibits.org/pigment/colour/yellow.htm>.
3. <http://www.informationofsaffron.com>
4. Indian herbal Pharmacopoeia revised new edition 2002, pp. 161-167.
5. Indian Standard: Guideline hygienic manufacture of cosmetics "Specification for Skin Cream" IS No. 6608-1978
6. Indian Standard: Guideline hygienic manufacture of cosmetics "Specification for Face powder" IS No. 3509-196.
7. M. S. Balsam & Edward, Sagarin: Cosmetic Science & Technology Krieger publisher vol.III, 2nd Edition, 1992, pp. 173-228.
8. Maysen P, Argpmbeaux H. A new method for testing complexion effect of cream preparation. J. Cos. Sci. 2003; 54 (3): 263-270.
9. Baskar D: Saffron chemistry, In Saffron *Crocus sativus* L. (Ed. Negbi, M.), Harvard Academic Publishers, 1999, pp. 45-52.
10. Rios JL, Recio MC, Giner RM, Manes S. An update review of saffron & its active constituents. Phytotherapy Research 1996; 10: 189.
11. Ghosal S, Tripathi VK. The active constituents of Saffron part-I the chemistry & effect of Saffron Ind. J Chem. 1996; 35B: 941-948.
12. Hilda Butter, Poucher Perfumes, Cosmetics and Soaps Vol. III. 9th Edition, 1993, pp. 408-409.