MOISTURIZING AND GLOWING EFFECT OF ROSE WATER

Safia Abidi[*], Sara Naqvi[**], Hania Kauser[***], Uzma Asad[****], Tayyaba Mumtaz[*****], Areesha Anwar[******]

[*]Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences, University of Karachi, Karachi, Pakistan.

**Department of Pharmacognosy, Iqra University, Karachi, Pakistan.
***Faculty of Health sciences, Iqra University, Karachi, Pakistan.
****Department of Research, Faculty of Pharmacy and Pharmaceutical Sciences, University of Karachi, Karachi, Pakistan.
*****Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences, Sohail University, Karachi, Pakistan.
******Department of Physiotherapy, Dow Institute Of Physical Medicine and Rehabilitation, Dow University Of Health Sciences, OJHA Campus, Karachi. Pakistan

Author's Contribution:

S.A. and S.N. designed the model and the computational framework and analysed the data. S.A. and H.K. carried out the implementation. U.A. performed the calculations. S.A. and T.M. wrote the manuscript with input from all authors. S.A. and A.A. conceived the study and were in charge of overall direction and planning

Corresponding Author:
Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences, University of Karachi, Karachi, Pakistan.

ABSTRACT

Background:

Rosa Damascena Mill (Rosacea) are very popular for their ornamental point of view and also utilized in medicine for treatment of various ailments since ancient times.The aim of this study is to evaluate the moisturizing effect of rose water on stratum corium by observing the hydration glow and oil measurement of the skin.

Material and Methods:

In this study were used total 12 samples in which 11 samples were marketed and 1 sample was hydro-distiilled by using *Rosa Damascena Mill* petals . The clinical study was carried out on 20 healthy individuals per sample (aged 20–25 years) the sample was applies twice a day over a period of 3 weeks on the forearms of individuals. The skin of all individuals were observed for hydration oil content and glow by using V-care analyzer and Lux meter

Result:

All twelve samples, sample #09 showed a great increase in hydration that is 27.33±6.78 for control and 32.03±6.21 for test. The oil measurement was as follow 18.61±3.99 for control and 20.40±3.73 for the test. While sample # 06 showed the lowest increase in hydration that was 24.91±8.63 for control and test 25.39±9.19 and the oil measurement was as follow 19.23±4.01 for control 22.40±4.10 for the test.while glow measurment Sample#09 showed the highest glow control reading was 14.73±7.42 and test reading was 20.83±7.54. The lowest glow was showed by the sample#06 with 24.10±13.09 for control and 24.50±13.62 for the test group.

Conclusion:

The results indicate that all 12 samples of rose water show the moisturizing and glowing effect in time dependent manner but sample 09 shows the highest effect

Keywords:

Stratum conium, hydration, moisture contant, lux meter, rose water

INTRODUCTION

Damask rose botanically known as *Rosa Damascena Mill*., belong to the family *Rosacea*, an extraordinarily popular family containing numerous decorative plants. Rose has more than 200 species and cultivar are also above 18000 [1].

Rose is a valuable and imperative chief material for aroma and beautifying principle. From the rose, rose water, rose oil, concrete and absolute are also extracted [2]. A variety of naturally occurring materials are an outstanding source of antioxidant and used for beautifying purpose for their good moisturizing and skin glow activities. The biggest organ of the body is skin which is approximately 20 square feet and of diverse types normal, oily, dry and [3]. Skin act as an obstacle between the peripheral environment and body. The lipid matrix act as a defensive sheet to prevent excess loss of water and electrolyte and penetration of foreign antigen [3-6]. Stratum corneum the uppermost layer of the epidermis contains 30% of water content, it protects the skin from peeling and infections [7]. Stratum corneum also contain the skin moisturizing factors (SMF) which is accountable for the absorption and preservation of water [8].

The hydration of the stratum corneum and lipids of the skin surface participate significant role on the specific appearance and function of the skin [9]. There are many factors which produce effects on the skin (external and endogenous factors) [2, 10, 11]. The topical use of soap, detergent, and irritants (alcohol and hot water) injured the skin [12]. Due to the upshot of all of these materials the skin act unusually and dissimilar types of tribulations arise in which the most common one is the dehydration of the skin, which lead to the dryness of the skin such as cracking, scaling, itching and redness, roughness and tightening of the skin [13, 14].

If the percentage of water content becomes low up to 10%, skin becomes dehydrated. For the revitalization of the skin hydration, special types of moisturizers are accessible which retain the health of the skin [13, 14]. Currently different preparations of moisturizers are available in the marketplace containing a variety of artificial ingredients which have toxic effects on the skin. To conquer the toxic effect of such synthetic components, replaced with the natural ingredients [15, 16]. Plant-based natural beautifying preparations are available and having lesser side effects for the rehydration of different skin.

MATERIALS AND METHODS

Collection of sample

Total twelve samples of rose water were used in present study, four samples were provided by Mohammad Hashim Tajir Surma laboratories, seven samples were collected from local market and one sample was prepared in the lab using hydrodistillation method as reported by Verma et al., 2011. Samples was filtered through Whatman filter paper and stored at 6 ºC in a refrigerator for further analysis. The sample and the voucher specimen number of *Rosa Damascena Mill* (RD-01-12) is available in Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences, University of Karachi herbarium.

Equipment

Glow measurement, Lux meter (LU-1010B, Matrix Electronics, MEXTECH, China) was applied Readings of lux meter was taken in lux which indicate a measure that how much photon is reflected back by the marked area of the skin. For skin hydration and oil contents V-care Skin Analyzer MODE:SK-8 was utilized.

CLINICAL STUDIES

In clinical studies, twelve samples of rose water were evaluated for their aptitude to progress the skin glow, hydration and oil percent. The experimental protocol was permitted by Instituional Bio Ethical Committee No.IBCPH22, University of Karachi- Pakistan.

PROTOCOL FOR GLOW MEASUREMENTS

Twenty healthy females subjects 20-25 years old, having normal skin type participated in the study. All subjects pre- checked for any skin problem like dermatitis and skin allergy or having any history of previous skin treatment with any cosmetic. Forearm skin area (6× 3) centimeter was selected for the study, right hand of the subject serves as control and left hand as a test. During the study period, the subjects was washed their hand normally without applying any soap or cleansing agents on the area marked on the forearm skin. The total duration of the study was three weeks during that period subjects were not allowed to expose the marked area directly to the sunlight.

Samples applied in the form of a spray. All subjects applied two puffs of sample twice a day, one puff in the morning and second puff application in the evening. Reading was taken using Lux meter on a regular basis till the three weeks application period was completed. All subjects were pre-informed about the nature of the test written consent was signed by the subjects before the start of the study. The readings were obtained by keeping the probe of lux meter at constant distance away and in the same intensity environment range from 5 to 7 luxes [3].

SKIN HYDRATION AND OIL CONTENT MEASUREMENTS

Exclusion criteria

Participants involved in the study had no previous history of hypersensitivity and pre-examen for skin problems like cut, wounds, dermatitis on the forearm area. Systemic and topical application of any cosmetics formulation such as moisturizer, sunscreens, etc were not allowed two weeks before and during the study.

Inclusion criteria

Twelve female participants (aged 20-25 years) was selected for each sample with normal skin type. The Duration of study was 03 weeks .During the study phase, the participants was not allowed to use any skin formulation on the marked forarm area. All the procedures performed according to the guideline, written consent signed by each participant.

The skin hydration and oil content was analyzed by using V-care Skin Analyzer MODE:SK-8. Two puffs of rose water samples were applied on the marked forearm area of participant's twice daily one puff in the morning and other puff in the evening. The readings in percent were taken daily for three weeks [3].

RESULTS

Glow Measurement

Sample # 09 showed the highest glow control reading was 14.73±7.42 and test reading was 20.83±7.54. The lowest glow was showed by the sample # 06 with 24.10±13.09 for control and 24.50±13.62 for the test group. The results expressed in mean ± S.D summarized in table-1.The intensity of glow of all samples in comparision with control was presented in Fig-1. The comparison of different samples are shown in Fig-2.

Table 1: Measurment of Glow

Samples	Mean values ± S.D		Significance
	Control	Test	
01	16.40±8.44	19 .17±9.66	**p<0.05**
02	14.93± 8.45	20.37±13.17	
03	22.03±12.43	22.47±12.59	
04	26.03±15.65	28.93±16.87	
05	23.73±13.66	26.20±14.25	
06	24.10±13.09	24.50±13.62	
07	21.33±4.91	24.70±4.61	
08	18.33±8.81	21.23±9.14	
09	14.73±7.42	20.83±7.54	
10	19.47±4.97	23.17±3.78	
11	24.40±14.72	25.63±14.62	
12	23.43±13.76	26.03±15.06	

- The source and manufacturer's names are available upon request.
- Values are recorded as MEAN ± S.D
- Mean difference is significant at the 0.05 level as analyzed by independence t-test followed by one-way analysis of variance (ANOVA)

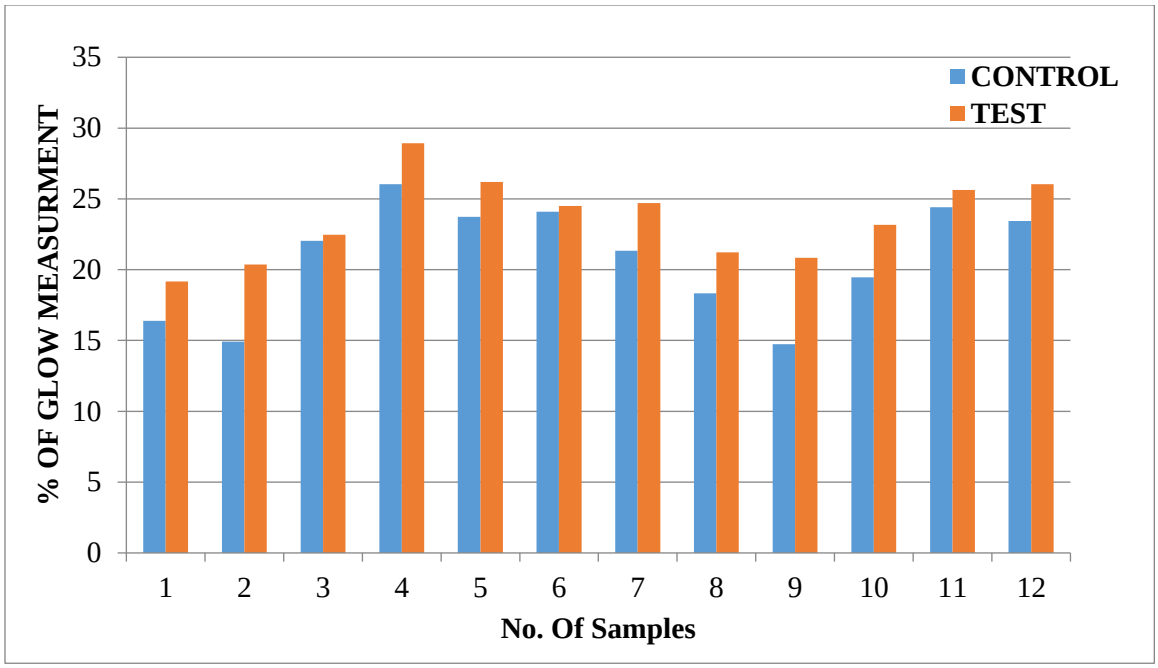

Fig 1. Percentage of Change in Skin Glow after Application of Rose Water Samples

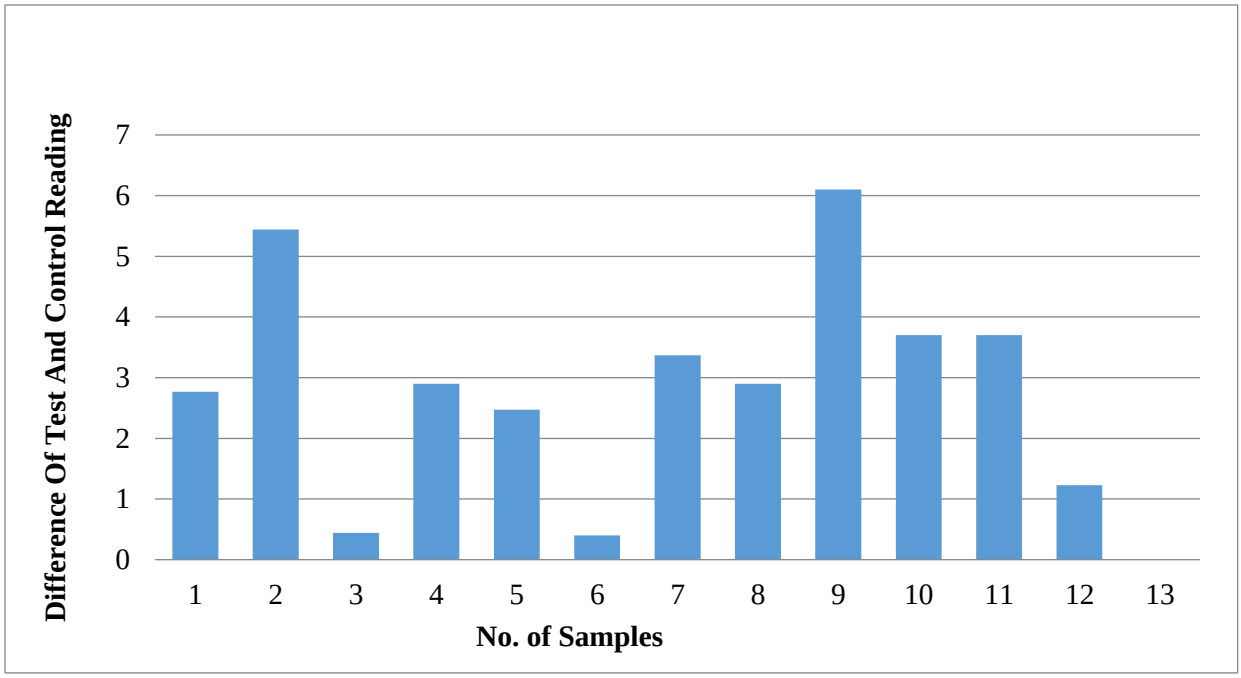

Fig 2. Comparison of Different Samples of Rose Water Enhancing Glow Effect

Hydration and Oil Measurement

The results shown in the tables 2-3 indicated that during 03 weeks of study, sample #09 showed a great increase in hydration that is 27.33±6.78 for control and 32.03±6.21 for test the oil measurement was as follow 18.61±3.99 for control and 20.40±3.73 for the test. While sample # 06 showed the lowest increase in hydration that was 24.91±8.63 for control and test 25.39±9.19 and the oil measurement was as follow 19.23±4.01 for control 22.40±4.10 for the test. The increase in hydration and oil content in comparison with control was shown in Fig-3-5. While the comparison study of samples are mentioned in Fig-4-6.

Table 2. Measurement of Hydration

Samples	Mean values ± S.D		Significance
	Control	Test	
01	25.230±5.69	27.42±5.89	**p<0.05**
02	30.74±10.17	31.48±8.88	
03	23.82±9.01	27.09±9.77	
04	28.62±7.37	31.38±6.67	
05	25.84±10.82	27.84±10.62	
06	24.91±8.63	25.39±9.19	
07	32.77±12.39	37.47±11.91	
08	36.55±11.36	40.32±8.81	
09	27.33±6.78	32.03±6.21	
10	36.42±6.92	38.34±7.45	
11	27.22±6.86	29.68±6.22	
12	30.55±8.50	35.10±9.76	

- Source & manufacturer's name are available upon request
- Values are recorded as Mean ± S.D
- Mean difference is significant at the 0.05 level as analyzed by independence t-test followed by one-way analysis of varience(ANOVA)

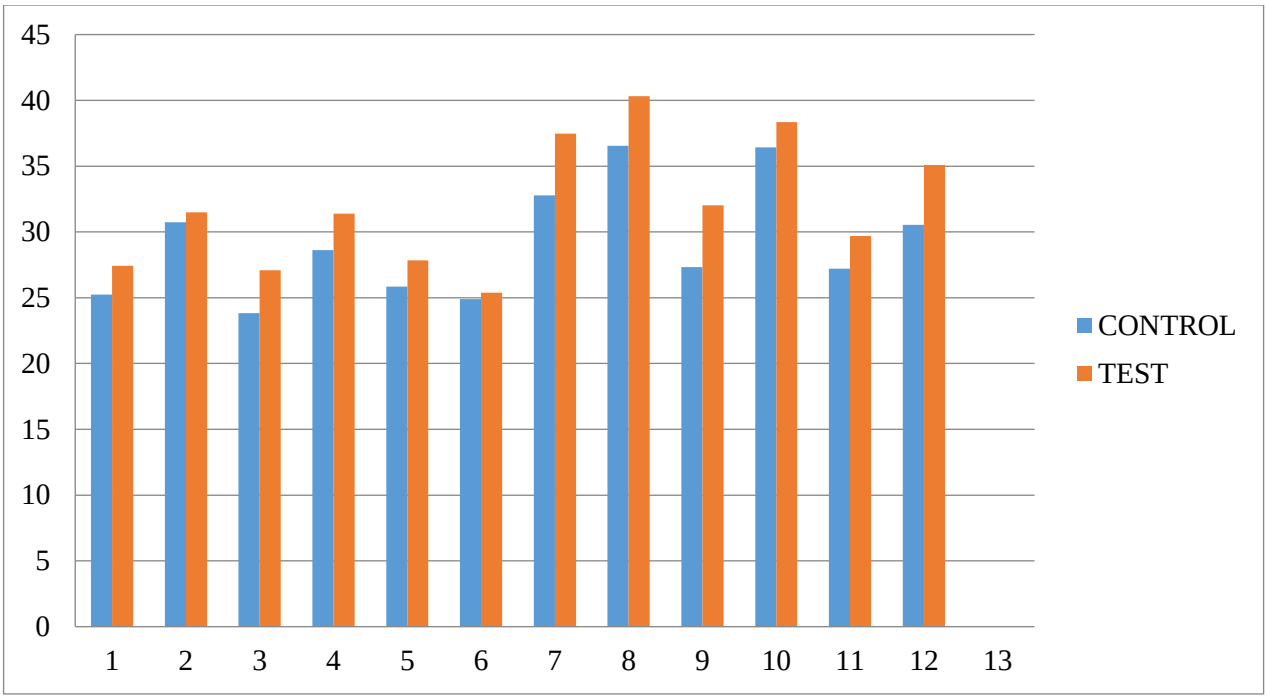

Fig 3. Percentage of Change in Skin Hydration after Application of Rose Water Samples

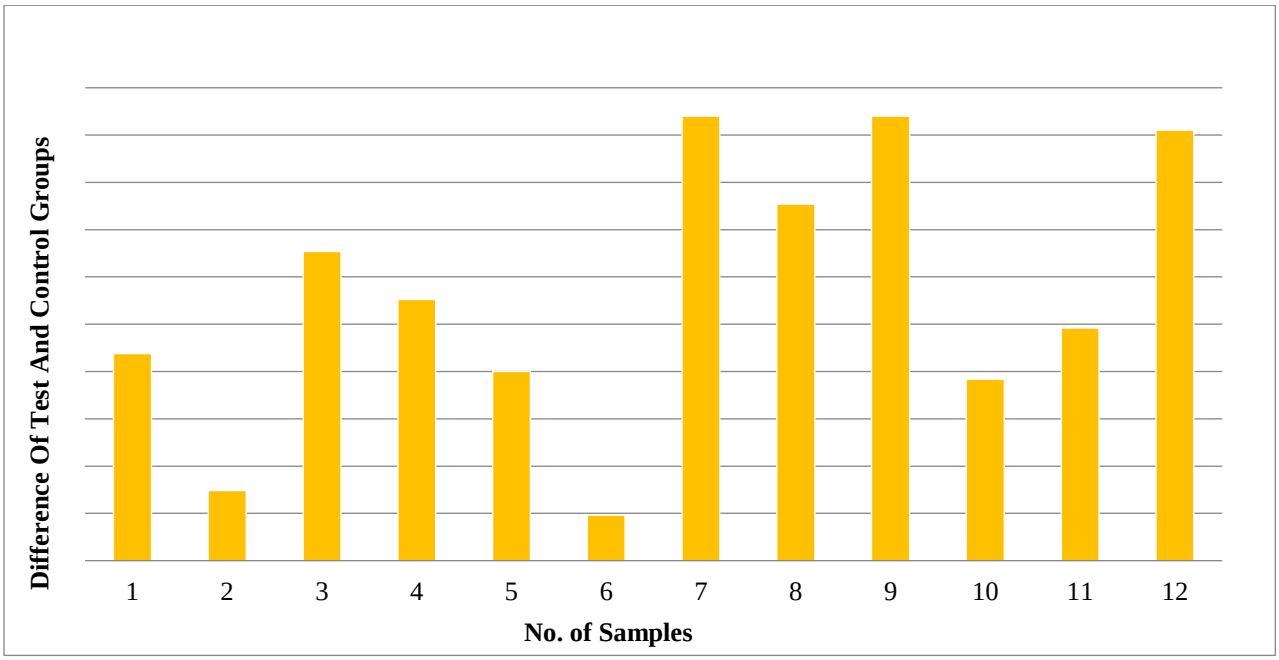

Fig. 4 Comparison of Rose Water Samples Enhancing Hydration Effect

Table 3: Oil Measurement after Application of Rose Water Sample

Samples	Mean values ± S.D		Significance
	Control	Test	
01	19.08±4.53	22.40± 3.98	
02	20.77±4.47	22.86±4.26	
03	19.83±2.92	22.75±2.94	
04	26.20±6.82	27.74±6.20	
05	25.78±12.51	26.66±12.33	
06	19.23±4.01	22.40±4.10	**p<0.05**
07	21.71±7.70	24.08±6.09	
08	21.58±3.82	24.73±3.95	
09	18.61± 3.99	20.40±3.73	
10	19.95± 4.02	22.76± 3.66	
11	26.96±13.79	28.91±12.63	
12	24.80±9.85	27.27±9.71	

- Source & manufacturer's name are available upon request
- Values are recorded as Mean ± S.D
- Mean difference is significant at the 0.05 level as analyzed by independence t-test followed by one-way analysis of variance (ANOVA)

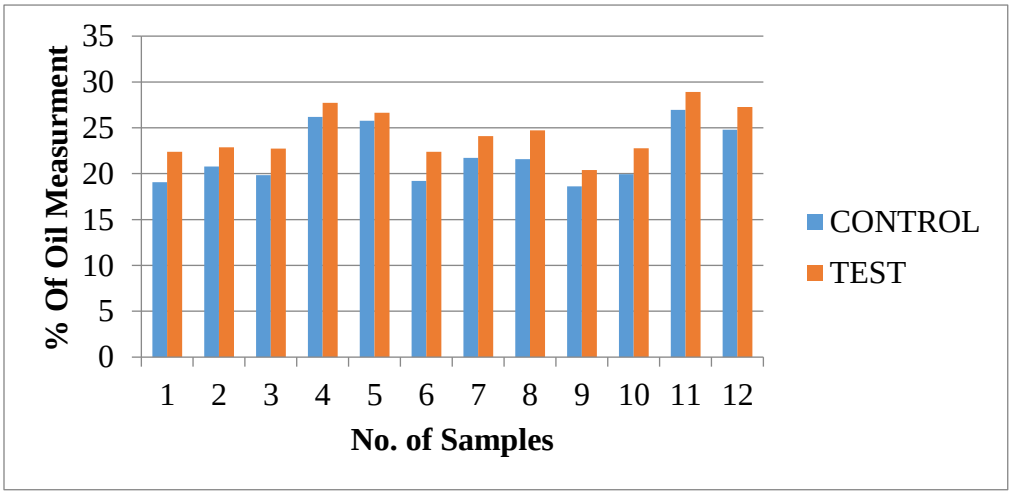

Fig 5. Percentage of Change in Skin Oil Content after Application of Rose Water Sample

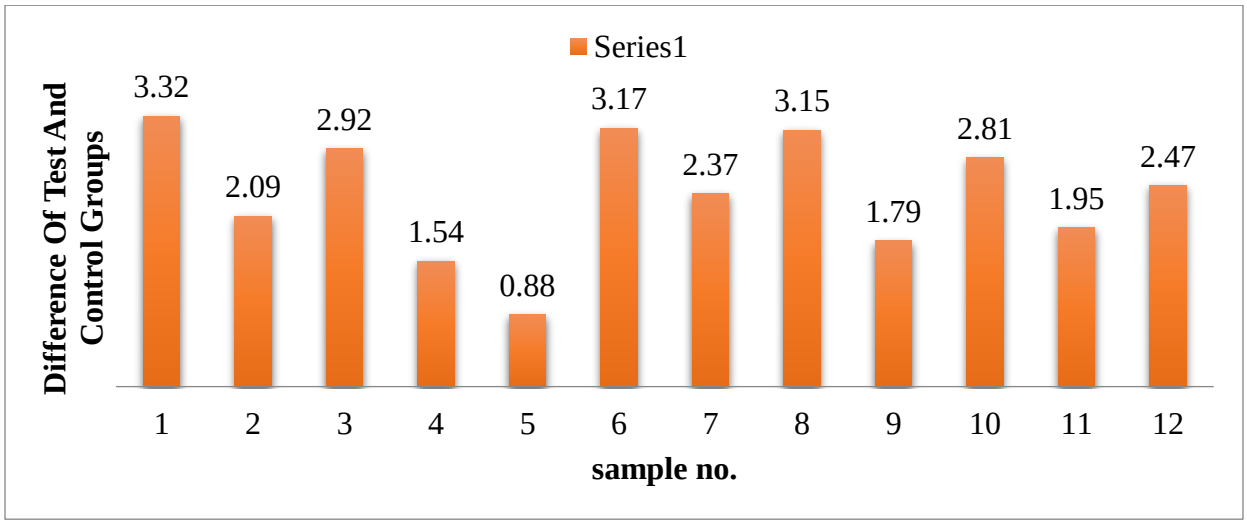

Fig 6. Comparison of Rose Water Samples Enhancing Oil Content Effect

DISCUSSION

In the present study we have taken a different marketed samples of rose water and observed their effects on the skin hydration, oil and glow also one sample was extracted in the lab by adopting simple distillation method. Skin hydration is a vital factor in maintaining a healthy skin and water is considered necessary for the regular function of the skin. For the study of skin hydration a biomechanical and the electrical technique were applied. A small skin hydration meter was used having an LCD screen on which the result showed digitally. The glowing effects on skin were experiential during the study period, i.e. from 1st week till the end of 3rd week between control and test hand. Luxmeter dealings the light strength, which is the quantity of photons. When the light is episode on skin, than skin reflects some fraction of light. The measure of this reflected light is considered here as glow, a good moisturizer beside increasing the hydration also increase the glow of the skin.in the following research work the appreciably improved in skin glowing effect was recorded and this effect may be due to the application of rose water extract which contained polyphenolic compounds.These photochemicals are natural efficient component for skin glowing silken and skin rejuvenating.The natural antioxidants participate a vital position in neutralize the destructive effect of free radicals and adding up a young-looking glow to skin. Flavanoids are definitely valuable for the skin and act as an antioxidant, avoid early aging, nourish the skin, stop

skin darkening, support healthier skin by protecting from the UV penetration, reducing free radical destructionntain the skin hydrated, even, slippery, supple and bestowing a healthy glow [17]. Due to its strong antioxidant effect, Flavonoids may produce multiple actions such as counteracting the effect of aging or regenerating tired stress-ridden skin and pink cheeks and unblemished skin, fewer lines, minimized pores and strengthen the skin [18]. Therefore, it was suggested that the rose water significantly improves the radiance of the skin.

CONCLUSION

The test results indicate that the daily usage of rose water improves the skin hydration and appearance. Significant improvement was seen after the 3rd week in the skin hydration, oil contant and glow. The employed method seems to be easy and efficient. The statistical analysis of the experimental data was carried out by one-way analysis of variance (ANOVA) .It was found that the rose water extracted from rosa damascena petals contain valueable phytoconstituents which are helpful in maintenance of skin.

CONFLICT OF INTEREST

The authors should not had any conflict of interest with the data contained in the manuscript.

ACKNOWLEDGEMENT

The authors Safia Abidi thankful to the Dean,s Research Grant No.Uok/D.F.P/2018.Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences. University of Karachi.

REFERENCES

1. Najem, W., et al., *Essential oil composition of Rosa damascena Mill. from different localities in Lebanon.* Acta botanica gallica, 2011. **158**(3): p. 365-373.
2. Egawa, M., et al., *Effect of exposure of human skin to a dry environment.* Skin Research and Technology, 2002. **8**(4): p. 212-218.
3. Saraf, S., et al., *Comparative measurement of hydration effects of herbal moisturizers.* Pharmacognosy research, 2010. **2**(3): p. 146.
4. Capitanio, B., et al., *Modulation of sebum oxidation and interleukin-1α levels associates with clinical improvement of mild comedonal acne.* Journal of the European Academy of Dermatology and Venereology, 2014. **28**(12): p. 1792-1797.
5. Das, C. and P.D. Olmsted, *The physics of stratum corneum lipid membranes.* Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2016. **374**(2072): p. 20150126.

6. Thiele, J., et al., *The antioxidant network of the stratum corneum.* CURRENT PROBLEMS IN DERMATOLOGY-BASEL-, 2001. **29**: p. 26-42.
7. Holck, D.E. and J.D. Ng, *Facial skin rejuvenation.* Current Opinion in Ophthalmology, 2003. **14**(5): p. 246-252.
8. Fulton, J.E. and S. Porumb, *Chemical peels.* American journal of clinical dermatology, 2004. **5**(3): p. 179-187.
9. Rawlings, A. and C. Harding, *Moisturization and skin barrier function.* Dermatologic therapy, 2004. **17**: p. 43-48.
10. Thorleifsson, A. and H. Wulf, *Emollients and the response of facial skin to a cold environment.* British Journal of Dermatology, 2003. **148**(6): p. 1149-1152.
11. Flynn, T.C., et al., *Dry skin and moisturizers.* Clinics in Dermatology, 2001. **19**(4): p. 387-392.
12. Yosipovitch, G., *Dry skin and impairment of barrier function associated with itch–new insights.* International journal of cosmetic science, 2004. **26**(1): p. 1-7.
13. Loden, M., *The clinical benefit of moisturizers.* Journal of the European Academy of Dermatology and Venereology, 2005. **19**(6): p. 672-688.
14. Lodén, M., *Biophysical methods of providing objective documentation of the effects of moisturizing creams.* Skin Research and Technology, 1995. **1**(3): p. 101-108.
15. Kapoor, S. and S. Saraf, *Regulatory bodies and truth about cosmetic ingredients.* Farmavita. net, 2007. **6**.
16. Kapoor, S. and S. Saraf, *Formulation and evaluation of moisturizer containing herbal extracts for the management of dry skin.* Pharmacognosy Journal, 2010. **2**(11): p. 409-417.
17. Abidi, S., et al., *Photoprotective and antioxidant activities along with phytochemical investigation of rose water.* Int. J. Pharm. Sci. Res, 2018. **9**(12): p. 5320-5326.
18. Imam, S., et al., *Studies on in vitro antioxidant activity and total flavonoid contents of a cream formulation to correlate its anti-aging effect.* World Journal of Pharmaceutical Research, 2015. **4**(1): p. 1646-1655.