WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 16, 1364-1371. Research Article ISSN 2277– 7105

USE OF GHEE RESIDUE IN COSMETICS

Dr. Sampada Pandhare*

LAD & SRP College for Women, Nagpur.

Article Received on
28 September 2022,
Revised on 19 Oct. 2022,
Accepted on 08 Nov. 2022
DOI: 10.20959/wjpr202216-26204

***Corresponding Author**
Dr. Sampada Pandhare
LAD & SRP College for Women, Nagpur.

ABSTRACT

Today a cosmetic formulation is expected to serve two fold purposes. Firstly it should beautify the part of the body where it is applied and secondly it should safeguard the health of the body part where it is applied. The constituents of cosmetic formulations need to be chosen with caution because none should interfere with either of these functions. In many cases the different ingredients are chosen on the basis of their abilities to serve these two purposes. The by-product Ghee Residue (Beri) thrown as a waste matter is nutritionally a rich source of fat, proteins and minerals. As Ghee Residue is rich in milk proteins and nitrogenous compounds, the product has been assessed for its use as cosmetic active.

KEYWORDS: Ghee residue, Antioxidant, Creams, Powders, Cosmetic formulations, *Lagenaria siceraria (L. siceraria)*

INTRODUCTION

Ancient Ayurvedic literature describes many materials used for cosmetic purposes. The remedies for beautification included preparations used for various skin conditions including pimples, glowing complexion, healthy and wrinkle free skin, fairness, bright shining eyes and also for removing body odor. Six different compositions of face packs have been recommended for six different ‘rutu’ (seasons). It is claimed that regular and proper use of these face packs improve complexion, make skin supple and glowing with improvement of vision and prevent wrinkles and black spots on face and also the graying of hair.[1] Formulations to remove scars and spots on skin[2] and face packs for increasing the glow of the skin, for removing black spots and pimples have been recommended.[3] Methods and preparations for maintaining clean teeth and oral hygiene are reported at several places.[4] Several formulations are recommended for thick, black and shining hair, for Ghee Residue. In

around 1951, it was seen that the Ghee (butter fat) which was not filtered off its non-fatty residue remained free from rancidity for a longer period than that which was filtered. It was postulated that the non-fatty portion of Ghee contained something which prevented oxidative rancidity of fat. Later this aspect was studied in detail.[5] It was reported that the Ghee Residue extracted with acetone gave a maximum antioxidant property. It was further observed that phospholipids in Ghee Residue exhibited greater antioxidant activity than tocopherol and vitamin A. Amongst non-lipid constituents the amino acids proline, lysine, cystine and tryptophan showed significant antioxidant activities.[6] The work was reviewed extensively concerning antioxidant activities of Ghee Residue.[7] It was revealed that besides having excellent antioxidant properties it also has an excellent nutritive value. Further studies emphasized the possibility of Ghee Residue being an excellent source of antioxidant substances.[8]

Ghee Residue (Beri)

Ghee Residue is the by-product of the Ghee manufacturing industry. During the manufacture of Ghee, the non-fatty solids present in cream or butter appear in the form of small particles known as Ghee Residue. It is obtained as a moist, brownish sediment after molten Ghee has been strained out. This is a source of good quality protein and minerals.

It is worthwhile to note that 27.5% of total milk produced in India is diverted for the production of Ghee[9] and roughly 90,600 tons of Ghee Residue is annually produced in this country as a by-product.[10] Ghee Residue obtained at household level of Ghee production is generally consumed after mixing with cooked rice or by spreading over chapattis. However in large Ghee manufacturing and refining plants, it is thrown away as a waste product, losing a huge quantity of nutrients in terms of fat, proteins and minerals. Ghee Residue thus by virtue of its chemical composition, physical characteristics and long shelf-life permitting its collection and centralized handling has a great potential and is more amenable for its worthy utilization.[11]

Composition of Ghee Residue: There is considerable variation in the chemical composition of Ghee Residue depending upon method of preparation of Ghee. The approximate composition varies as fat (32 to 70%), protein (12 to 39%), moisture (8 to 30%), lactose (2 to 14%) and ash (1 to 8%).[5]

Antioxidant Properties of Ghee Residue

Ghee Residue possesses antioxidant properties and both lipid and non-lipid fractions of Ghee Residue are responsible for these.[5] The overall antioxidant properties depend on the phospholipids amino acid profile and other non-lipid constituents present in the Ghee Residue.[6] Utilization of Ghee Residue: Ghee Residue was used as a source of natural antioxidant to improve the shelf life of flavored butter oil.[12] It was found that incorporation of Ghee Residue at the rate of 15-20% followed by heating to 120 0 C for 3 minutes gave oxidative stability to the product parallel to that imparted by BHA and BHT. Thus, Ghee Residue can be used as a source of natural antioxidants for improving the shelf life of food products including dairy products where the use of synthetic antioxidants is generally not preferred because of their toxic effects.

Cosmetic Formulations Used For Skin Care

Amongst various cosmetic formulations, the following formulations can be included in the category of formulations used for skin care.

a) Skin Creams
b) Astringents and Skin Toners
c) Protective lotions and cleansers
d) Antiperspirant and Deodorants
e) Sunscreen, Suntan and Anti-sunburn Preparation
f) Skin Lighteners or Bleaches
g) Face Packs and Masks
h) Powders and Make-up

Aging symptoms are being faced as the greatest challenge even today. Oxidation is the root because antioxidants are a solution. Many proven antioxidants are being employed in many formulations. The claim about these products are basically because of such actives but they are of theoretical utility. Practicability and suitability are never taken into account. It would be that natural antioxidants might be more effective as cosmetic agents achieving a greater degree of desired effects but they also give rise to other associated challenges.

In view of these serious issues emphasis is being focused on natural agents in the present studies with a hope that it would achieve some tangible results and if not, at least achieve a change in attitude and approach so that many other natural products are pressed in service of which at least one would establish its supremacy over many others.

MATERIALS AND METHODS

Development of products with natural actives to suit Indian climatic conditions, their effectiveness, stability, suitability and an attempt to change attitude of consumers being the foundation of present studies, cosmetic worthiness of Ghee Residue and Ghee Residue in combination with other natural actives and also along with a few of established actives is the principal issue involved in these studies. Resultantly an attempt to find an answer as to whether Ghee Residue, reported to be having antioxidant activity, can be an active in cosmetic formulations and whether it could be a worthy active as an antioxidant agent in cosmetic formulations is the basic object of present studies.

Various studies on Ghee Residue have reported its antioxidant activity.[5,6,7,8]

However, the antioxidant activity of Ghee Residue in cosmetic formulations has remained unexplored. This prompted to undertake studies on Ghee Residue to evaluate its applicability in cosmetic formulations.

Analysis of Ghee Residue

A. The Ghee Residue was examined for the following parameters.
B. Colour –Brown.
C. Odour – Characteristic.
D. Taste –Sweet.
E. Solubility in water, alcohol, chloroform, ether, benzene and carbon disulphide.
F. Fineness 139 – 10.0g Ghee Residue was weighed accurately and placed on 75 micron & 150 micron IS sieve and washed by means of slow stream of running tap water and finally with fine stream from wash bottle until much material passed through the sieve. Water was drained out and sieve containing the residue was dried on steam bath. The residue was transferred on tarred watch glass and dried in oven to constant mass at 105± 2C. Abrasiveness 139 - Ghee Residue was spread to about 15 to 20 cm length on a butter paper and tested by pressing it along its entire length by a finger for presence of hard and sharp edged particles.

G, Preparations of cosmetics containing Ghee Residue

a. Creams

b. Powders

Preparation of GHEE RESIDUE (BERI):

Preliminary experiments indicated that pure fresh milk should be preferred over packed pasteurized milk available in the market. Accordingly for the preparation of Ghee Residue buffalo milk was obtained by making the milkman milk buffalo in presence of the author. Milk was boiled, cooled and the milk along with cream was seeded with domestic curd. Mixture was allowed to ferment overnight and then churned to separate butter. The butter obtained was heated to evaporate (remove) water and then filtered through muslin cloth. The residue obtained on the cloth was cooled and used in the present experiments as 'Ghee Residue'. Before using Ghee Residue for formulation it was washed with diethyl ether thrice to remove the fat. Cosmetic formulations containing ghee residue: The types of formulations selected for the present study included cream and body powder. These formulations were prepared on the basis of preliminary experiments of trial and error type.

Creams

Creams were formulated using Ghee Residue and/or *L. siceraria* experimental extract and were coded as C1, C2, C3, C4, C5 and C6 as detailed in Table 1.

Table 1: Formulations of Cream.

Ingredients	C1	C2	C3	C4	C5	C6
Ghee Residue	5%	5%	2.5%	–	–	–
L.siceraria extract	–	–	2.5%	5%	5%	5%
Stearic acid	10%	10%	10%	10%	10%	10%
Cetyl alcohol	2%	2%	2%	2%	2%	2%
Glyceryl monostearate	2%	2%	2%	2%	2%	2%
Triethanolamine	0.5%	–	0.5%	0.5%	–	–
Glycerine	10%	10%	10%	10%	10%	10%
Methyl paraben	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Perfume	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Propylparaben	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Lanolin	–	0.5%	–	–	0.5%	0.5%
Vitamin E	–	–	–	–	–	0.5%
Distilled water to make 100 gm.	qs	qs	qs	qs	qs	qs
Observation after 5 months of preparation	Deteriorated	Stable	Stable	Stable	Stable	Stable

Method of preparation for Cream

1. All the ingredients are weighed as per formula. All oil soluble ingredients (except perfume) are added in the beaker named 'A' and water soluble ingredients are added in the beaker named 'B'.

2. Beaker ‘A’ and ‘B’ are heated simultaneously in a water bath
3. At 70-72° C, they are mixed together and perfume is added at 45° C then stirred till the creams are cooled down

Powders

Powders were formulated by using Ghee Residue and /or L. siceraria extract and combination of Ghee Residue and L. siceraria extract and were coded as P1, P2 and P3 as per details stated in Table 2.

Table 2: Formulations of Powder.

Ingredients	P1	P2	P3
Ghee Residue	2%	–	2%
L.siceraria extract	–	2%	2%
Kaolin	2%	2%	2%
Zinc oxide	2%	2%	2%
Calcium carbonate	4%	4%	4%
Methyl paraben	0.25%	0.25%	0.25%
Perfume	0.5%	0.5%	0.5%
Propylparaben	0.25%	0.25%	0.25%
Talc to make 100 gm.	89.00%	89.00%	87.00%
Observation	Stable	Lumps formed	Lumps formed

Method of preparation for Powder:

1. All the ingredients are weighed as per the formulation.
2. They are then triturated and mixed properly.

RESULTS AND DISCUSSION

The studies in the present work were focused on exploring use of Ghee Residue individually or in combination with other natural antioxidants namely *L. siceraria* extract as antioxidants in cosmetic formulations. The Ghee Residue could be obtained in fairly better yield and was found to possess physical and chemical properties which were suitable for being used in cosmetic formulations except the issue of solubility being insoluble in water, alcohol, c Preparation of formulations containing Ghee Residue and *L. siceraria* extract was a challenging job because desired consistency and stability were major factors of concern. Formulations of creams containing Ghee Residue or *L. siceraria* extract did not pose a serious problem and the formulations were acceptable with regard to consistency as well as stability. Amongst six creams, Cream 2 and Cream 6 were found to be more suitable and these formulations were evaluated further in the study. (Cream-1 Contained 5% Ghee

Residue while Cream-6 contained 5% L. siceraria extract). Both the creams were found to possess pH within the range of 7.2.% to 7.6. The creams did satisfy and remained stable during storage.

Powders containing Ghee Residue and *L. siceraria* extract were though stable did exhibit drawback of formation of lumps. In view of the fact that only a few of the formulations were found to be stable and apparently acceptable.

Cream – 2 - 5% Ghee Residue

Powder-1 - 2% Ghee Residue

CONCLUSIONS

1. Ghee Residue is a by-product of Ghee prepared from butter obtained from fermentation of curd. This yields about 5 to 6% of Residue, which contains phospholipids and some amino acids and exhibits substantive antioxidant activity.
2. Ghee Residue could be easily incorporated in cream, powder.
3. Cream containing Ghee Residue was seen to be more effective as cold cream in comparison to other cold creams because it retained the moisturizing effect for a longer time.
4. Anti-wrinkle action of cream containing Ghee Residue was only marginal as compared to that of cream containing L. siceraria extract.
5. Ghee Residue can be treated to be a promising ingredient of formulations like cream and powder that showed excellent potential as a cosmetic agent and availability of cosmetic products containing these natural actives would prove beneficial to the consumers, both young and old alike.

ACKNOWLEDGEMENT

Though the contribution of following people is beyond the scope of words and though it is rather difficult to express my gratitude to them in words, it is a humble attempt.

I express my deep sense of indebtedness to my Guide Dr.(Mrs.) Sheela B. Kulkarni, Head, Department of Cosmetic Technology, Lady Amritabai College for Women of Arts, Commerce & amp; Science and Smt. Ratnidevi Purohit College of Home Science & amp; Home Science Technology, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur. for her valuable contribution during the entire course of my research work. Her constant encouragement, excellent cooperation and sincere but essential suggestions was the driving

force for the entire work which as on date is codified in this thesis. My sincere gratitude to the Honorable Principal Dr. Shamla Nair of Lady Amritabai College for Women of Arts, Commerce & Science and Smt. Ratnidevi Purohit College of Home Science & Home Science Technology, Rashtrasant Tukadoji Maharaj Nagpur University, whose valuable cooperation has made it possible for me to complete the work.

I express my gratitude to the members of the teaching staff of the Department of Cosmetic Technology. I owe my gratitude towards my mother-in-law, my parents and above all my husband for their cooperation all throughout the research work. My acknowledgements are also due to my daughters for their sense of tolerance in the course of this work.

REFERENCES

1. G.K. Gorde, Sarth Vagbhat, 6th Edition, Aryabhushan Mudranalaya, Pune, 1970; P.91.
2. G.K. Gorde, "Sarth Vagbhat," 6th Edition, Aryabhushan Mudranalaya, Pune, 1970; P.431.
3. "Sarangdhar Samhita, Subodhini Hindi Commentary," J.H. Gupta Chaukhamba Sanskrit Series, Banaras, 1948; P.546.
4. "Sarangdhar Samhita, Subodhini Hindi Commentary," J.H. Gupta Chaukhamba Sanskrit Series, Banaras, 1948; P.362.
6. Santha I.M. and Narayanan K.M., Journal of Food Science and Technology, 1978; 15: P.24.
7. Santha I.M. and Narayanan K.M., Indian J. Ani. Sci, 1978; 48: P.266.
8. Santha I.M. and Narayanan K.M., Ind. J. Dairy Sci, 1978; 31: P.365.
9. Santha I.M. and Narayanan K.M., Indian J. Ani. Sci, 1979; 49: P.37.
10. Dairy Indian, Dairy Industry Scenario, New Delhi, 1997; P.17.
11. Verma B.B. and De S., Indian J. Dairy Sci, 1978; 31: P.370.
12. Galhotra K.K. and Wadhwa B.K., Indian J. Dairy Sci, 1991; 44: P.565.
13. Wadhwa B.K., Surinder Kaur and Jain M.K., Indian J. Dairy Sci, 1991; 48: P.469.