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# Utilisation of Rice Bran Fatty Gel in various Cosmetics

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**Abstract :** The Rice bran fatty acid a natural remedies are more acceptable in the belief that they are safer with fewer side effect .Cosmetic are considered as essential components in life exponential increased in demand for crucial needs everyday item high quality value added product like cream cosmetic product natural formulation having growing demand in world market .The present work deals with the development and formulation we propose to make shampoo, cold cream by using rice bran fatty acid gel it is a natural vegetable wax by product of rice bran oil (RBO) , the gel have seen is light , non sticky , smooth , and suitable for normal and oil skin . the studies carried out in preparation of cosmetic. There physio -chemical properties were tested tested and observed it can widely used in industrial application because of its good consistency emollience , and gelling property also good moisturising agent its keep skin soft and moisturised.

**Key words**: Cosmetic products, Emulsion , Natural raw material , Rice bran fatty acid, rice bran oil, Consistency , Eco – friendly , Natural Content ,Rice bran fatty acid Gel , Natural cosmetics ,Organic products , Essential fatty acid , Eco – product.

## Introduction

Rice bran fatty acid wax is said to be most abundantly available by-product, which is derived from crude rice bran oil. It is obtained from outer brown layer of rice extracted from husk usually balance fatty acid. There are large amount of fatty acid and wax are present in mixture. The oil is remove to obtained fatty acid and wax which can be used in cosmetic. It has emollience property& it works as gelling agent. Rice is the world largest crop a large part of world human population rice bran wax has been historically used in wide variety of cosmetic. It is superior quality rice bran is considered an excellent source of rice oil . fatty acid may be divided essential and non essential types .Cosmetics are substance used to enhance alter the appearance of face and texture of body .they are generally mixture of chemical compound, some being derive from natural source cosmetic industries mainly used rice bran oil (RBO). It has been chosen for its emollients moisturising and smoothing properties on skin it is avegetable origin.

Recently both cosmetic market and research moving towards natural cosmetics and organic products in order to obtain more effective and safe products according to the demand .The tendency of consumer prefer natural product has oriented the scientific research in cosmetic sector towards study of organic or natural



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cosmetics .it is considered natural only when it is made from natural raw materialmean those natural substances extracted from plant origin . Rice bran oil is the oil extracted from the husk it is popular in several Asian countries, including Japan, India, China. The Indian cosmetic industry is growing in term of product, development the preferences of Indian consumer is changing from merely functional product to more advanced and specialised cosmetic item. New scientific development, technique product has contributed in greater choice, growth in retail segment and widely availability. Utilisation of wax for production of natural cosmetic product had becomes trend now technologist are again trying to swipe toward natural raw material utilisation of rice bran fatty acid gel basic raw material , natural content for used in cosmetic preparation . It can be used to make lip balm, moisturiser, skin conditioning agent. It also gives good Spreadability and softness when applied on skin. It particularly rich in essential fatty acid and vitamin .In addition to that, it is found to be safe ingredient& can be used in cosmetic product to improve skin texture, maintain pH when applied. It considered as natural substance. Rice bran oil fatty acid has smoothing properties huge application in cosmetic and chemicalindustry .

**Table 1: World Rice Bran Oil and Potential**

| | |
|---|---|
| **World Production of Rice** | **486** |
| **Rice Bran Potential (8% of Rice productivity )** | **38.88** |
| **Rice Bran Oil Potential ( 17. 5 % Recovery )** | **6.80** |
| **Current Production of Rice Bran Oil** | **1.70** |
| **World untapped Potential** | **5.1** |
| **Percentage of Untapped Potential** | **75 %** |

**Table 2: Rice producing states**

| **Sr No** | **State/Ut** | **Rice (Th.Tonnes)** | **Area** | **Average Yield** |
|---|---|---|---|---|
| 1 | West Bengal | 14711 | 5386 | 2731.38 |
| 2 | Uttar Pradesh | 12221 | 3809 | 2082.36 |
| 3 | Andrapradesh+Telangana | 11565 | 2894 | 3036.35 |
| 4 | punjab | 11107 | 4166.28 | 3837.94 |
| 5 | 0rissa | 8286 | 3268 | 1988.84 |
| 6 | Bihar | 6377 | 3808.5 | 1951.40 |
| 7 | Chattisgarh | 6021 | 1829.98 | 1581.00 |
| 8 | Tamilnadu | 5839 | 2278 | 3190.75 |
| 9 | Assam | 4863 | 1278 | 2134.77 |
| 10 | Haryana | 4006 | 1387 | 3112.67 |

**Table 3 :Chemical composition Rice bran oil**

| **Composition** | **Percentage%** |
|---|---|
| Triacylglycerol | 80.5 |
| Free Fatty Acid | 6.8 |
| Diacyglycerol | 4.8 |
| Monoacylglycerol | 1.7 |
| Oryzanol | 2.0 |
| Phosphatides | 1.3 |
| Wax | 2.9 |

**Table 4 : Physical properties of crude &refined Rice bran oil**

| Character | Crude Rice Bran Oil | Refined oil |
|---|---|---|
| Moisture | 0.5-1.0% | 0.1-0.15% |
| Density(15-15c) | 0.913-0.920 | 0.913-0.920 |
| Refractive Index | 1.4672 | 95-104 |
| Iodine Value | 85-100 | 95-104 |
| Saponification Value | 187 | 187 |
| Unsaponification Value | 4.5-5.5 | 1.8-2.5 |
| Free Fatty Acid | 5-15% | 0.15-0.2% |
| Oryzanol | 2.0 | 1.5-1.8 |
| Tocopherol | 0.15 | 0.05 |
| Colour(Tintometer) | 20Y+2.8R | 10Y+1.0R |

The refined oils produced from high free fatty acid crude oil had high amounts of unsaponifiable matter, oryzanol, tocopherol and tocotrienols and refined rice bran oil obtained from fresh rice bran contain about 90% triacylglycerol

**Table 5 : Crude Rice Bran Oil**

| Parameter | Value |
|---|---|
| Grade | Crude Rice Bran Oil |
| Colour | 30 unit measured in a1/4 cell |
| Flash Point | 100ºC |
| Free Fatty Acid% | 4%-20% |
| Moisture and Insoluble | 0.50% |
| Refractive Index at 40ºC | 1.46-1.47 |
| Specific Gravity at 30ºC | 0.91-0.92 |
| Iodine Value | 85-105 |
| Acid Value | 50 max |
| Unsaponification Matter % by mass | 4.0% max |
| Type | Crude |

The crude rice bran oil mainly composed of glycerides than other oils gives better flavour . The gamma oryzanols in crude rice bran oil shall be in the range of 1.3 to 2.0 .the crude rice bran oil is extracted from raw rice bran outer layer of rice kernel .it is rich in natural antioxidants it has advantage in term of nutritional value .

## Experimental Procedure

The procedure of utilization of Rice Bran fatty Acid Gel formation.

**Reaction**

Rice Bran Fatty Acid + saturated KOH + Emulsifier + Water

( constant temperature and continuous stirring )

**Gel Formation**

**Objectives :**

The objective of this research work will helpful in understanding consumer attitude to natural cosmetic product , attitude towards the different factor , studying the effect of cosmetic purchase on the society specially among the segment under consideration .The research was to formulate the cream , shampoo which does not cause any side effect o adverse reaction .The cream also act as expert in day to day life removing aging sign on face .It also posses nutritional value which provide required nutrient to skin .

**Formation of Gel**

Take 35 gm of Rice bran fatty acid. Heat it at 55 – 65 º C temperature up to fats completely splits and from oil. Then add 20 ml of saturated potassium hydroxide . heat it and stirred it add T20 emulsifier 2ml add 75 ml water .The totally process heating plate and continues stirring .and put it whole night .and analysis in next day.

**Table 6 :Rice Bran Fatty Acid**

| **Chemicals** | **Composition** |
|---|---|
| Rice Bran Fatty Acid | 15 gm |
| Saturated KOH | 3.5 ml |
| Water | 30 ml |
| Emulsifier | 2.5 ml |
| Temperature | 122 ºC |
| Time | 45 min |

Using these Rice bran fatty acid gel for making cosmetic product we prepared three product Shampoo , Cold cream , Cream moisture

**Shampoo :**

Taking an separate glass beaker oil phase prepared by measuring accurate amount of olive oil ,coconut oil , castor oil , jojoba oil , almond oil , rice bran fatty acid gel , bees wax , soft jelly , and melt them together to form a homogeneous phase . After that in another beaker Distilled water was heated at about 75 º C and specified amount of Borax , potassium hydroxide , glycerine ,citric acid , Disodium EDTA , Sodium trideoethlaurate 25 % were added to it then add slowly into oil phase with continuous mixing and heating .The product cooled 50 º C and the other additives and preservative 0.16% and perfume 0.5% added to the final product yield shampoo .

**Table 7 : Composition of Shampoo**

| **Chemicals** | **Composition (g)** |
|---|---|
| Rice bran fatty acid gel | 4.5 |
| Soft jelly | 2% |
| Citric acid | 2.5 |
| Coconut oil | 2 ml |
| Vitamin E oil | 3.5 ml |
| Olive oil | 2.7 |
| Glycerine | 3.2 |
| Distilled water | 27 ml |
| Methyl paraben | 0.16 % |
| Perfume | 0.20 |
| Potassium hydroxide | 2 |
| Disodium EDTA | 2.5 |
| Jojoba oil | 1.5 |
| Ethyl alcohol | 2.1 |
| Soft jelly | 2 % |

**Cream Moisture :**

For preparation of cream moisturemeasured all the ingredients separately oil phase was prepared in a glass beaker by taking an appropriate amount of rice bran fatty acid gel , Beeswax , Lanoline , Stearic acid , Cetyl alcohol , Triethanolamine , almond oil , mineral oil vitamin E oil , paraffin wax , coconut oil were melted together in a beaker put priscribe amount of Distilled water and methyl paraben , glycerol paraben , added to this is an aqueous phase . oil phase and aqueous phase heated at 26 – 33 min at 74 º C . after heating process aqueous phase slowly added to the oil containing ingredients and at the same time continuous stirring is done while pour until uniform mixture emulsion is formed and allow mixture to cool down at 63º C after complete addition other additives perfume and preservatives like methyl paraben 0.21 % added to yield final product cream moisture .

**Table 8 : Composition Cream Moisture**

| **Chemicals** | **Composition (g)** |
|---|---|
| Rice bran fatty acid gel | 3.5 |
| Soft jelly | 2% |
| Cetylalchol | 2.5 |
| jojoba oil | 2 ml |
| Vitamin E oil | 3.5 ml |
| Glycerol | 2.7 |
| Glycerine | 3.2 |
| Distilled water | 29 ml |
| Methyl paraben | 0.16 % |
| Perfume | 0.20 |
| Glycerol monostearate | 4 |
| Tri ethanol amine | 2.5 |
| Lanoline | 1.5 |
| Isopropanol | 1 |
| Tween 20 | 2 |

**Cold Cream :**

Intially , the specific amount of white bees wax , rice bran gel , liquid paraffin , stearic acid , Terpineol , mineral oil , lanoline , propylene glycol , borax , weigh properly heat it till its melts together in a beaker . this mixture was at neutralised using TEA . weigh accurate amount of soft jelly and melt and mix to the oil phase and heated all ingredients at 73ºC maintain heat. Further , in another vessel dissolve borax , methyl paraben perfumes and preservatives in water and heat to at 73ºC which is aqueous phase , then slowly add this to oil phase mineral oil , beeswax heated ( oil phase ) stirring continuous to form a homogenous mixture . the final product we get cold cream 0.2 % perfume added to cream .

**Table 9 : Cold Cream**

| **Chemicals** | **Composition (g)** |
|---|---|
| Rice bran fatty acid gel | 43.5 |
| White Bees wax | 2.5 ml |
| Tri ethanol amine | 4 |
| Terpineol | 1.5 |
| Mineral oil | 2.5 ml |
| Coconut oil | 2 ml |
| Borax | 3 |
| Liquid paraffin | 2.5 |
| EDTA | 2 |
| Distilled water | 35 ml |

| | |
|---|---|
| Sorbitol | 2 |
| Lanoline | 1.2 |
| Methyl paraben | 1.5 |
| Propylene glycol | 1 |
| Perfume | 0.12% |

**Evaluation Parameters :**

1. **pH -** The pH of person skin is about 5 – 6 gather necessity near this to go immediate acceptance of the truth the importance of quality by the skin .
2. **Foam height –** The height of the column that occur after spraying it in a foam cylinder and shaking it upside and down for 45 min .
3. **Appearance –** The appearance of this cream was found by observing its colour , opacity etc.
4. **Irritancy Test-** The cream was applied on left hand side surface of 1 sq. cm and observed in equal interval upto 24 hrs for irritancy , redness and Edema
5. **Accelerated stability studies –** Accelerated stability studies were performed on all the formulation by maintaining at room temperature for 20 days with constant time interval .during the stability studies the parameters like homogeneity , viscosity , physical stability were studied .

## Results and Discussion

**Table 9 : Result of Gel**

| **Test** | **Sample** | **Standard Reference** |
|---|---|---|
| Appearance of gel | Off white | Pale yellow |
| Colour | 9 max | 8 max |
| Iodine value | 102 | 108 |
| Sap value | 195 | 205 |
| Acid value | 175 | 200 |
| Consistency | Well | Excellent |

**Table 10 :Specification Of Rice Bran fatty Acid Gel**

| **Parameter** | **DHRBFA** |
|---|---|
| Acid value | 198 min |
| Sap value | 199 min |
| Iodine value | 60 max |
| Titre(c) | 42-45 |
| Lovibond Units(1*cell[Y+5R] | White semisolid |
| Colour in lovibond 2*cell(max) -initial | 10 (max) |
| At 200$^{o}$c for 2 hour | - |
| DHRBFA: Distilled Hydrogenated Rice Bran Fatty Acid | |

**Table 11: Result of Shampoo Evaluation of Formulation for solids , viscosity , pH**

| Formulation code | pH | Solid (%) | Surface Tension (dy. / cm ) | Viscosity (poise) |
|---|---|---|---|---|
| F 1 Clear | 6.3±0.01 | 23.43± 0.02 | 38.34±0.23 | 6.6±2 |
| F 2 Clear | 5.23±0.03 | 22.09± 0.01 | 37.12±0.15 | 6.1±3 |
| F 3 Clear | 5.13±0.04 | 25.86±0.02 | 33.45±0.17 | 5.8±2 |
| F 4 Clear | 5.01±0.02 | 24.92±0.03 | 39.32±0.12 | 5.3±4 |

**Table 12 : Result of Shampoo**

| Test | Results | Std Reference |
|---|---|---|
| Moisture | 3.13 | 3.67 |
| Surface tension | 37.35 | 38.45 |
| Viscosity | 5.2 | 5.8 |
| Water content | 4.34 | 4.422 |
| pH | 6 | 6.22 |
| Percent solid | 26.73 | 25.41 |
| Visual Stability | Good | Excellent |
| Absorption Rate | 33 | 20 |
| Skin irritation Test | No irritation | No irritation |
| Foam Quality | 900 ml | 800 ml |
| Spreadbility | 1 | 2 |
| Physical Appearance | No characteristic smell | No smell |

**Table 13 : Result of Cream Moisture**

| Test | Results | Std reference |
|---|---|---|
| Spreadability | Easy separable | Easy separable |
| Acid value | 5.7 | 5.9 |
| Sap value | 22.3 | 21.7 |
| Appearance | Off white | Pale yellow |
| Thermal stability | 3 | 4 |
| Total fatty substance | 7.18 | 7.89 |
| pH | 5.45 | 5.79 |
| Gritty Matter (%) | 60.52 | 74.02 |
| MIV (%) | 32.83 | 34.83 |
| Consistency | Good | Excellent |
| wetness | Good | Good |
| Visual | Homogenous | Homogenous |
| Touch | Smooth | Smooth |
| Stability | Stable | Stable |
| Emolliency | No residue left | No residue left |

**Table 14: Result of Cold cream**

| Test | Results | Std reference |
|---|---|---|
| Spreadability | 10.12 | 12.34 |
| Consistency | well | Excellent |
| Texture | smooth | smooth |
| Appearance | Off white | Pinkish white |
| Thermal stability | 3 | 4 |
| Total fatty substance | 7.18 | 7.89 |
| pH | 5 | 4.6 |
| Dilution test | Oil in water type emulsion | Oil in water type emulsion |
| Viscosity | 9500 | 9600cp |
| Wash Ability | Good with water | Good with Detergent |
| Feel | Sticky | Sticky |
| Irritability Test | Non irritant | Non irritant |
| Ease of Application | Easy | Easy |
| Homogeneity | Homogeneous by Visual | Homogenous by Visual |

The intent of these come across together with a innumerable report on the Rice bran fatty acid gel is a active components the sample of shampoo pH of shampoo has been shown important improving and enhancing the qualities of hair ,the current trend to promote shampoo of lower pH is one of the way to minimize damage to the hair .Mild acidity prevents swelling ang promotes tightening of the scales, they includes shining to hairs the foam quality is observed is goodeasy to apply and easy to spread on hair. The cream moisture we prepare has an emollient effect without much oiliness it is very light and smooth pH was successfully improved the product

was easily spreadable on skin .the formulation of cold cream is an emulsion of water with certain fats .it is proven moisturization and steady.

## Conclusion

The study reveals to the matter of cosmetics of rice bran fatty acid has a slight ability to brighten the look of skin helping to smooth skin tone provide active component that maintain youthful glow containing all natural anti- aging secret vitamin E maintaining hydration skin wondering deep moisturising capability due to its excellent combination of vitamin E and fatty acid its also contains natural emollients protect our skin huge important in terms of cosmetics rice bran fatty acid contain high percentage of fatty acid which is a perfect skin moisturizer ,antioxidant.

The Rice bran fatty acid is must abundantly available natural content ,eco-friendlywith naturally occurring raw material .The gel was prepared and studied thoroughly all the parameter like viscosity , pH . around three cosmetic product synthesised in lab scale and tested their physiochemical property .It was observed that it posses nutritional value which provide required nutrient to skin also it is non irritant to normal as well to oily skin .the cream has antibacterial activity due to its retards aging sign and pimple formation on face .studies done on these formulation .The gel fortify the great influential movement to maintain good healthy skin it is safe more effective components is at good quality with greatest stability which has important cosmological activities non toxic ,safe and improve patient compliance by utilisation of Rice bran fatty acid gel in cosmetic industry and these Cosmetic product has now created strong impact in the our life and has been attracting item .

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