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Rice Bran Fatty Acid Gel, it's Behaviour in Various Cosmetics

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Abstract : The Rice bran fatty acid is a by product originate during refining of rice bran oil (RBO) is natural derivative vegetable oil which bring an effective action in a variety of various external utilization in skin care product cream, lotion, lipstics.it is well known for contents of antioxidant rich components such as gamma oryzanol and phytic acid the demand for these has been increasing for processing in cosmetic industries .The research work make the way for development of cosmetic product in wide range by using rice bran fatty acid gel its had an emollients effect, keeps skin soft when applied .some experimental work carried out and physio-chemical properties were analysed product prepared can be utilized in field of cosmetic.

Key words : Emulsion, Rice bran fatty acid, rice bran oil, consistency, Natural Cosmetics, eco friendly , natural components , natural content gel.

Introduction:

The world production of vegetables waxes is evaluated at about 19,000 tons per year, about half of this quality is cannuaba wax. The production of other plants waxes is relatively smaller. The most essential consumer, The U.S.A imports relatively high quality of plant wax. The price vary from U\$\$ 1, 2000 to U\$\$ 1,600 for each metric ton of wax. Prospectively the marketing at 4,000-5,000 tonne rice wax seem to be possible. The use of rice bran oil and its fatty acid has higher percentage of free fatty acid which accounts for its use in various industries .The rice bran fatty acid can be used with some modification in various system. The current global interest is being desired toward the use of renewable resources as alternative to petroleum product as raw material. The rice bran fatty acid can also used in cosmetic. Wax is the most important by product separated from oil. World production in term of milled rice 571.83 millions ton Rice is the seed of the grass Spices *Oryza sativa* as a grain it is the most widely consumed staple food for a large part of the human population, especially in Asia .The world top three production countries are China, India and Indonesia.

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Table 1: Chemical composition Rice bran oil

Composition	Percentage%
Triacylglycerol	80.5
Free Fatty Acid	6.8
Diacylglycerol	4.8
Monoacylglycerol	1.7
Oryzanol	2.0
Phosphatides	1.3
Wax	2.9

Table: 2 Crude Rice bran oil

Parameter	Value
Grade	Crude Rice Bran Oil
Colour	30 unit measured in a1/4 cell
Flash Point	100°C
Free Fatty Acid%	4%-20%
Moisture and Insoluble	0.50%
Refractive Index at 40°C	1.46-1.47
Specific Gravity at 30°C	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 .

Table: 3 Physical properties of crude and 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.

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



Figure 1: Rice bran fatty acid gel

Formation of Gel

Take 30gm of rice bran fatty acid. Heat it at 55-65 c temp up to fats completely splits and from oil. Then add 35ml of saturated potassium hydroxide .heat it and stirred it add T20 emulsifier 2.5ml add 75 ml water .the totally process heating plate and continues stirring .and put it whole night .and analysis in next day.

Table 4:Rice Bran Fatty Acid

Chemicals	Composition
Rice Bran Fatty Acid	14gm
Saturated KOH	3.8ml
Water	27ml
Emulsifier	2.5ml
Temperature	125°C
Time	45min

Using these rice bran fatty acid gel for making cosmetics product we prepare three product Lipsticks, hand lotion, cream.

Lipsticks –

In this formulation First measured all the ingredients Rice bran fatty acid gel, white beeswax ,paraffin wax ,mineral oil ,coconut oil,olive oil, castor oil , Petrolactum, distilled water, glycol, isopropyl maleate , soft jelly ,were mixed together and heated at 40 min till all the ingredients melts completely .then essential oils rose oil, lavender oil, cinnamon oil, propyl paraben were added to it stirring is done .little amount of flavouring agent spearmint oil, anti-oxidant tocopherol ,and for colouring pigmented stain add after complete addition the final product yield lipstick.

Table 5:Composition of Lipsticks

Chemicals	Composition (g)
Rice bran fatty acid gel	4.5
White bees wax	2.5
Mineral oil	2 ml
Coconut oil	1.5 ml
Castor oil	2 ml
Paraffin wax	2.4
Soft jelly	2 %
Glycol	4
Petrolactum	1%
Pigmented stain	2
Tocopherol	2.6
Spearmint oil	3 ml
Vitamin E oil	1.4 ml
Propyl paraben	2

Hand Lotion-

For preparation of hand lotion measured all the ingredients separately oil phase was prepared in a glass beaker by taking an appropriate amount of rice bran fatty acid gel, beeswax stearic acid, Cetyl alcohol, glycerol monostearate, coconut oil, jojoba oil, almond oil, vitamin E oil, soft jelly were melted together in a beaker till all the ingredient comes to oil. Now for further process take another beaker put Prescribe amount of distilled water and Carbopol, Tri-ethanol amine methyl paraben, glycerol propyl, paraben added to it this process called aqueous phase. Oil phase and aqueous phase heated at 25-30 min at 73 C. After heating aqueous phase added slowly to the oil containing ingredients and continuous stirring is done while pour until uniform mixture emulsion is formed and allow mixture to cool down at 65 C after complete addition other additives perfumes and preservatives like methyl paraben 0.20% added to yield final product hand lotion.

Table 6: Composition of Hand lotion

Chemicals	Composition (g)
Rice bran fatty acid gel	3.5
Soft jelly	2%
Stearic acid	2.5
Coconut oil	2 ml
Vitamin E oil	3.5 ml
Glycerol	2.7
Glycerine	3.2
Distilled water	27 ml
Methylparaben	0.16 %
Perfume	0.20
Glycerol monostearate	4
Tri ethanol amine	2.5

Cream –

The oil in water Emulsion based cream take all oil soluble components rice bran fatty acid gel, almond oil, coconut oil, paraffin wax, castor oil, stearic acid, cetyl alcohol, mineral oil triethanol amine, EDTA were dissolved in oil phase (part A) and other water components methyl paraben, propylene glycol, glycerine distilled water 30 ml, sorbitol were dissolve in aqueous phase (Part B) heated at 75 C till it melt after heating part (B) was added in portion to oil phase (part A) with stirring continuously until cooling of emulsifier took place. Other additives perfume 0.20 % and preservatives added to the final product cream.

Table 7: Composition of Cream

Chemicals	Composition (g)
Rice bran fatty acid gel	4
Almond oil	3 ml
Castor oil	3.5 ml
Triethanol amine	4
Mineral oil	2.5 ml
Coconut oil	2 ml
Stearic acid	3
Bees wax	2.5
EDTA	2
Distilled water	35 ml
Sorbitol	2
Glycerine	1.2
Methyl paraben	1.5
Propyl paraben	1
Cetyl alcohol	1.2
Perfume	0.33%

Results and Discussion

Table 8 : 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 9: 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°c for 2 hour	-
DHRBFA: Distilled Hydrogenated Rice Bran Fatty Acid	

Table 10: Result of lipstick

Test	Results	Std Reference
pH	7	7
Consistency	Well	Excellent
Spreadability	8.5	8.9
Residue	6.56	7.89
Glossy	Feel comfortable	Feel comfortable
Gritty	4	5
Break strength	0.45	0.56
Dropping point (c)	70	72
Layer thickness	6 micron	10 micron
Stability	Stable at room temperature	No deformation occur at room temperature

Table 11: Results of Hand lotion

Test	Results	Std Reference
Total residue	10.32	11.71
Surface tension	13.23	14.03
Viscosity	3256.63 cps	2458.61 cps
Water content	4.34	4.422
pH	5.80	5.46
Gritty matter	3	4
Stability	3.6	4
Total fatty acid	7.83	7.65

Table 12 : Results of cream

Test	Results	Std Reference
Spreadability	11.23	12.34
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	7	7
Dilution test	Oil in water type emulsion	Oil in water type emulsion

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 .

Active component eco-friendly good formulating properties associated with rice bran fatty acid gel from above discussion it is concluded that its has good spreadability, no evidence of phase separation good consistency, non toxic, safe natural cosmetics ,natural content do not have any side effect on human body, instead it is enrich the body with nutrient and other useful minerals advance chemical technology which has wide range of people acceptability .The formulation were made successfully with improved properties creamy

and having off white colour .we prepared three product at lab scale and compared with standard product .The prepared can also be used in cosmetic industry .

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