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SYNTHESIS ON RICE BRAN FATTY ACID GEL, IT'S BEHAVIOUR IN VARIOUS COSMETIC: A CASE STUDY

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Abstract - *The Rice Bran Fatty Acid wax is natural derivative obtained during extraction of rice bran oil. It is widely used in industrial application i.e. in preparation of cosmetics industry. The aim of study was to investigate process of synthesis and utilisation of Rice Bran Fatty acid because of its good consistency emollience and gelling property, as formulation in lipsticks lip care etc .it is a good moisturising agent also. Rice Bran Fatty Acid wax is good in keeping skin soft and moisturised .some experimental was carried out to make different cosmetic products to observe their Physico chemicals properties. Mostly it is in the field of cosmetics preparation such as face cream, skin cream*

Key Words: **Cosmetic Products, Rice Bran Fatty Acid Rice Bran Oil, Consistency**

1. INTRODUCTION

Rice Bran Fatty Acid Wax is said to be most abundantly available-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 is large amount fatty acid and wax present in mixture. The oil is removed to obtained fatty acid and wax. This can be used in cosmetic. It has emollience property and gelling agent .it can be used to make lip care, skin cream, and face cream, conditioning agent. It's also gives good spread ability and softness to skin when applied on skin .it particularly rich in essential fatty acid and vitamins. In addition to that, it is found to be safe ingredients and can be used in cosmetics product to improve skin texture, maintain Ph when applied considered as natural substances. Rice bran fatty acid has smoothing properties huge application in cosmetics and chemical industry. The world production of vegetables wax is evaluated 16,000 tons per year, about half of this quality is carnuba wax. The production of other plants waxes is relatively smaller.

Table 1: 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	Andra pradesh+Telangana	11565	2894	3036.35
4	punjab	11107	4166.28	3837.94
5	Orissa	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 2: Chemicals Composition of 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 3: 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

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

2. Experimental Procedure:

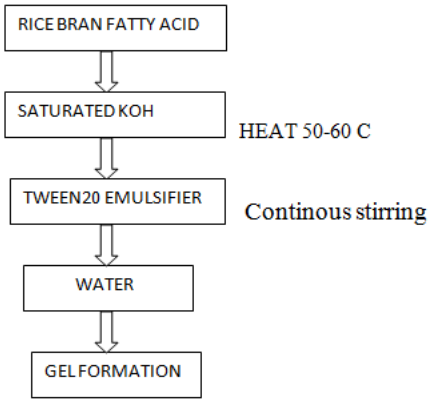

Figure 1: Process for Rice bran fatty Acid gel

Figure 2: **GEL**

FORMATION OF GEL

Take 25gm of rice bran fatty acid. Heat it at 50-60 c temp up to fats completely splits and from oil. Then add 25 ml of saturated potassium hydroxide .heat it and stirred it add T20 emulsifier 2ml add 70 ml water .the totally process heating plate and continues stirring .and put it whole night .and analysis in next day.

Table 5: Rice Bran Fatty Acid

Chemicals	Composition
Rice Bran Fatty Acid	12gm
Saturated KOH	3.4ml
Water	25ml
Emulsifier	2.3ml
Temperature	120ºC
Time	40min

The Face cream, skin cream lip care can be prepared by using gel which is formed from rice bran fatty acid.

2.1 Face Cream – first measured all ingredients separately in a top loading balance in glass beaker combine all oil phase ingredients castor oil, Stearic acid, cetyl alcohol, rice bran gel methyl paraben. Further in another beaker put prescribe amount of distilled water, glycerine glycerol, this is(aqueous

phase)heat both phase about 10-15 min at 72 C until all the ingredients have been melted. Once done add all the oil phase ingredients to the heated aqueous phase stirring continuous till the mixture formed . All mixture to cool down at 62 C in homogenizer 15-20 min .until smooth texture is attained .After complete addition resultant yield face cream.

Table 6: Composition of Face cream

Chemicals	Composition(g)
Castor oil	2
Stearic Acid	20.9
Cetyl Alcohol	0.50
Rice Bran Gel	2
Triethanolamine	4
Distilled Water	32
Glycerine	7.0
Methyl Paraben	0.15%
Perfume	0.20%

2.2Skin cream-The Oil soluble phase was prepared in a glass beaker by taking an appropriate amount of cetyl alcohol, Almond oil, Coconut oil, Rice bran gel, Stearic acid, propylene glycerol melted. In a separate beaker (aqueous phase) add Distilled water, triethanolamine, methyl paraben were added to it. Oil phase and aqueous phase about 15-20 min heated at 72 C. After heating aqueous phase was added in portion to oil phase stirring continuous until uniform mixture is formed. Allow mixture to cool down at 62 c. After completion perfume 0.15% added to yield the final product Skin cream.

Table 7: Composition of Skin cream

Chemicals	Composition (g)
Cetyl alcohol	2
Stearic Acid	4
Almond oil	2 ml
Coconut oil	2 ml
Rice Bran Gel	3
Propylene glycol	4
Triethanolamine	3
Methyl paraben	0.1
Distilled water	28
Perfume	0.15%

2.3Lip Care-In this formulation, Rice Bran fatty acid, Beeswax and coconut oil were mixed and then heated for 30 min, till it melt completely. Then vitamin E oil, soft jelly and essential oil were stir together. Little amount of natural colour was mixed for pink colour. Other additives Perfume 0.10% and preservatives were added.

Table 8: Composition of Lip Care

Chemical	Composition (g)
Rice Bran Fatty Acid Gel	4.5
Beeswax	2.5
Coconut oil	1.5
Kusum oil	2 ml
Essential oil	8 ml
Soft jelly	2%
Vitamin oil	1.6 ml

3.Results & Discussions:

3.1 Results of Rice Bran Gel

Test	Prepared Sample	Std. References
Acid value	185	205
Sap value	200	210
Iodine value	101	108
Colour	8 max	7 max
Appearance	Off white	Pale yellow

3.2 Specification of Rice Bran Gel

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

3.4 Results of Face cream

Test	Result	Std. References
pH	6.7	6.8
Cream viscosity	23681.61 cps	24681.61 cps
Dilution Test	Oil in water type emulsion	Oil in water type emulsion
Spread ability	12.45	13.46
Appearance	Yellow semi-solid cream	White
Emollience	No-residue left	No residue left
Gritty Matter	4	3

3.5 Results of Skin Cream

Test	Results	STD. References
Water content	4.14	4.24
Viscocity	2608 cps	28001
pH	5.5	6.8
Thermal stability	3	4
Gritty matter	3.48	3.61
Total residue	6.45	6.73
Total fatty substance	7.18	7.86
Acid value	4.9	5.7
SAP Value	21.2	22.3
Surface Tension (dyne/cm)	12.30	14.13

3.6 Results of Lip Care

Test	Result	Std. Reference
pH	7	7
Spread ability	8.9	9.0
Glossy	Feels comfortable	Feel comfortable
Break strength	0.40	0.46
Residue	7.34	7.89
Dropping point (c)	72	74
Glittery	5	6
Layer thickness	10 micron	15 micron
Consistency	well	Excellent

4.Conclusion: Rice bran fatty acid is readily available and also it can be utilize for gel formation which is helpful in cosmetic industry .Around four cosmetics product synthesized in lab scale and tested for its physiochemical property. It is observed that, when it is applied on dry lip, it will heal faster to similar other lip care cosmetic product.

The formulation were made successfully with improved properties and having nutritional value. It is prepared by simple regular method and with less equipment. Sample is creamy and having consistency along with homogeneous off white colour .the cream prepared also has antioxidant and antibacterial activity .The Gel prepared can also be used in cosmetic industry.

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