

DEVELOPMENT OF SKIN CREAM FROM SUNFLOWER (*HELIANTHUS ANNUUS* L.) SEED OIL FOR ENTREPRENEURIAL VALUE- CREATION

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Abstract

Most personal, skin and hair care may be described as 'cosmetic products. His research aimed to conduct out physicochemical analysis and formulate skin cream from sunflower seeds oil and assessed its suitability for topical application. The oil was soxhlet extracted using n-hexane. Its physical and chemical characteristics were evaluated. The seed yield 45.50 ± 0.01 (%) of light brown oil with the following parameters saponification value 184.50 ± 0.02 (mgKOH/g), Iodine value, 124.30 ± 0.03 (g I₂/100g), acid value 12.60 ± 0.02 (mgKOH/g) and Free fatty acid 1.58 ± 0.04 (%), iodine value of seed oil showed that it is semi drying and could be used in the production of skin cream. The thermal stability showed positive results. The results of and pH of cream pH 7.4 indicate it is suitable for topical application.

Keywords: Sunflower oil, skin cream, value addition, entrepreneurial, sustainability

Introduction

Sunflower (*Helianthus annuus*L.) is one of the most important oil crops in the world due to its excellent oil quality (Baydar and Erbas, 2005). There are literature reports on *Helianthus annuus* (sunflower) for numerous personal care applications. The stability and in vivo efficiency of natural cosmetic emulsion systems with sunflower oil were reported (Pavlačková et al., 2018). *Aloe vera* has enjoyed a great popularity in household remedies and cosmetics. (Cseke, et al, 2006). *Aloe vera* gel is an alternative source of natural antimicrobial substances to prevent infections (Udgire and Pathade, 2014).

Materials and Methods

Sample preparation

The sunflower seeds procured from local sunflower traders at Zaria market, Kaduna State. The seeds were air-dried, for one week, and was then pulverized using pestle and mortar. The powdered seeds were used for oil extraction.

Oil Extraction

Oil extraction from the seeds was carried out in a Soxhlet apparatus using analytical grade hexane (n-hexane) for 5 hours. After solvent recovery, the residual solvent was removed by evaporation at 50°C. The flask containing the oil was cooled and weight. The oil yield was calculated using the equation below.

as extracting solvent for the work. At the completion of the extraction process the oil was recovered from the mixture by evaporating the residual extracting solvent in an oven set at 50°C and stored in the bottle. This process was repeated until a substantial quantity of oil was achieved. Each batch of extraction lasted for about 5 hours on the average (Okolie et al., 2012)..

Then percentage yield was calculated as

W.

$$\text{Oil content}(\%) = \frac{\text{Weight of the oil}}{\text{Weight of sample}} \times 100$$

The extracted oil was stored in sample bottles until needed for the analysis (Okolie et al., 2012).

Determination of Colour

The colour of the oil samples was determined by observation using several independent competent individuals. Oil colour was correlated using colour charts (Okolie et al., 2012).

Determination of Saponification Value, Acid Value, Iodine Value and Free Fatty Acid

These were performed according to standard methods of analysis (Official Methods of Analysis of the Association of Official Analytical Chemists, AOAC 1998);

Formulation of Skin Cream

Sunflower seed oil (4.75 g) was mixed with 2.0 g emulsifying wax, 1 g stearic acid and 0.5 g cetyl alcohol. The mixture was melted at 70°C and a mixture of 15 ml water, 1.7 g glycerine and 5 g sodium stearate was added with continuous stirring. Sodium benzoate (0.5 g), 0.2 g methyl paraben and 0.5 ml propylene glycol were added to the mixture with addition of 1.5 g Aloe vera gel and constant stirring (Gavarkar et al., 2016). (Table 2).

Physical Evaluation of Skin Cream

The results of Physical Properties are summarized in table 3. The results of Thermal Stability and pH of cream are summarized in table 4.

Table 3. Physical properties of the cream

Test	Observation
Colour	White
Odour	Characteristic
Appearance	Semi solid

Table 4. Thermal stability and pH of the cream

Test	Observation
Thermal stability	Stable and no oil separation
pH	7.4
Appearance	Semi solid

Results and Discussion

The seed oil had a light brown colour and a characteristic sweet odour. The oil was also stable at room temperature. The physicochemical parameters of the seed oil are summarized in Table 1. The results clearly showed that the iodine and saponification values are incredibly high. The oil physicochemical parameters indicated its suitability for

cosmetic preparations. The high iodine values placed them as semi-drying oils and could be used for preparation of skin cream. The white semi-solid cream produced from the sunflower oil had a sweet odour with a pH value of 7.4 which is suitable for topical application because of the skin-friendly pH. Table 1. Physicochemical characteristics of sunflower seed oil.

Parameters	Values
Oilyield(%)	45.50±0.01
Colour	Light brown
Physical state at room temperature	Liquid
Saponification value(mgKOH/g)	184.50 ±0.02
Iodine value(gI ₂ /100g)	124.30 ±0.03
Acid value(mgKOH/g)	12.60 ±0.02
Free fatty acid(% w/w)	1.58 ±0.04

Note: values are expressed as mean ± standard deviation of triplicate determinations.

Table 2. Physical properties of the cream produced using Sunflower seed Oil

Test	Observation
Colour	White
Odour	Sweet
Appearance	Semi solid
Thermal stability	Stable and no oil separation
pH	7.4

Job creation potential

Developing herbal skin care products from indigenous plant resources will pave the way for research and development capable of commercialization by local industries and unemployed youth for national entrepreneurial development.

Social sustainability

The project if well structured to ensure a socially sustainable business enterprise aims to provide divergent quality of life for all gender through team work initiatives beneficial enough for future generations.

Approach to social problem identification and solution development

Due to the humectant and emollient properties of developed product it is applicable to the skin for moisturization.

Conclusion

From the study, it was concluded that seed oil was found to contain properties of significant application to the skin. Thus, there is immense potential in establishing the use of sunflower seed oil for further development of commercial products.

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