

# PHYTocosMETIC PRODUCT (SKIN CREAM) DEVELOPMENT FROM *TERMINALIA CATAPPA* L. SEED OIL: VALUE ADDITION FOR ENTREPRENEURIAL SUSTAINABILITY

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## Abstract

*Seed oils have an important role in providing greener cosmetics that are skin and eco-friendly. Designed and developed strategy to explore and utilize full benefits of these cosmetic products from plant oils needs to be exploited. This research was aimed to carry out physicochemical analysis and formulate skin cream using seed oil extracted from Terminalia catappa L. Seed Oil. Extraction of oil was done by soxhlet using n-hexane. The physical and chemical characteristics revealed the following: Color of the oil was light yellow, liquid at room temperature, Oil yield was 40.70 (%), saponification value 284.50 (mgKOH/g), Iodine value , 102.30 (g I<sub>2</sub>/100g), acid value 3.60 (mgKOH/g) and Free fatty acid 1.48 (% w/w).. The physiochemical analysis result of the iodine value of seed oil showed that it is semi drying and could be used in production of skin cream.*

## Introduction

Terminalia catapa contain healthy fats, fibres, phytochemicals, vitamins and minerals whose potential application includes food production and some other useful products, the oil from Indian almond seed has potential in the cosmetic industry (Ogbeide et al.,2021).Report showed a good yield of Terminalia catappa L. kernel oils from purple (CR) and yellow (CA) varieties above 54% . This was achieved by solvent extraction (Santos et al, 2022). A preliminary preclinical study of Terminalia catappa as potential herb to promote hair growth was reported (Harsha and Jaikumar, 2019). Literature reviewed the ability of this plant for traditional medicine that can treat dermatitis among other ailments. Young Terminalia catapa leaf juice is used in an ointment form as a skin medicine to relieve scabies and leprosy (Prayitno et al., 2022). This research is aimed at development of skin cream from Terminalia catappa L. seed oil expressing its

valueaddition for entrepreneurial sustainability.

## Materials and Methods

### Sample preparation

The Terminalia catappa seeds which was obtained at City King Hotel, Gusau, Zamfara State, were air-dried in the laboratory at room temperature, for a period of one week, and was then ground, using manual pestle and mortar. The dry powdered sample was then kept at room temperature in the laboratory for extraction.

### Oil Extraction

The extraction of oil from the seeds was carried out in a soxhlet apparatus using analytical grade hexane (n- hexane) 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).

#### 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 Percentage Yield

The hexane extract of the shea nut fat was transferred into a measuring cylinder which was placed over water bath for 30 min at 70°C so as to ensure complete evaporation of solvent.

Then percentage yield was calculated as

Oil content (%) =

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

w/w.

$$\frac{\text{Weight of the oil}}{\text{Weight of sample}} \times 100$$

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

Terminalia catappa L 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. 0.5 g Sodium benzoate, 0.2 g methyl paraben and 0.5 ml Propylene glycol were added to the mixture with stirring as reported in literature with modifications (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 1. Some physical and chemical characteristics of Terminalia catappa L seed oil

Parameters	Values
Color of the oil	Light brown
Physical state at room temperature	Liquid
Oil yield (%)	40.70
Saponification value (mgKOH/g)	284.50
Iodine value (g I <sub>2</sub> /100g)	102.30
Acid value (mgKOH/g)	3.90
Free fatty acid (% w/w)	1.46

Note: values are expressed as triplicate determinations.

Table 2. Formulation of Terminalia catappa L seed oil Herbal skin cream

Ingredients	Quantity
Terminalia catappa L seed oil	4.75 g
Aloe vera gel	1.5 g
Emulsifying wax	2.0g
Stearic acid	1.0 g
Cetyl alcohol	0.5 g
Glycerin	1.5 g
Sodium Stearate	5.0 g
Sodium benzoate	0.5 g
Methyl Paraben	0.2 g

Table 3. Physical properties of the cream

Test	Obsevation
Colour	White
Odour	Characteristic
Appearance	Semi solid

Table 4. Themal stability and pH of the cream

Test	Obsevation
Themal stability	Stable and no oil separation
pH	7.4
Appearance	Semi solid

### Results and Discussions

The seed oil had a light yellow colour and a characteristic sweet odour. The oil was also stable at the room temperature. The physical and chemical characteristic of the seed oil are summarized in Table 1. clearly showed that the iodine and saponification values are especially high. The physical characteristic results from the oil indicated that the properties of the seed oil 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 results of Physical Properties are summarized in table 3. The results of Thermal Stability and pH of cream are summarized in table 4. The pH of the prepared cream with the extract was found to be 7.8 which is suitable for topical application because of the skin friendly Ph.

Value Addition for Entrepreneurial Sustainability Development of herbal

skin care products from our indigenous plant resources will pave value additiony local industries for national entrepreneurial development. The project if well-structured will ensure a sustainable business enterprise aims to provide divergent quality of life beneficial enough for future generations.,

### Conclusion

From the study, it was concluded that seed oil was found to contain skin friendly 'properties potential enough 'in establishing the use of the seed oil for further development of commercial cosmetic products.

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