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PRODUCTION OF VALUE-ADDED COSMETIC PRODUCTS FROM COLD-PRESSED *Helianthus annuus L.* OIL AND PULP

Musa Karadag[*], Ayşe Baran[2], Zübeyir Güneş[3]

[1]Vocational School of Technical Sciences, Iğdır University, Iğdır, Türkiye
[2]Department of Biology, Graduate Education Institute, Mardin Artuklu University, Mardin, Türkiye
[3]Department of Crops and Animal Production, Mardin Artuklu University, Mardin, Türkiye

Abstract. Recycling, in its literal sense, is the recycling of obsolete recyclable waste materials into manufacturing processes as raw materials through various recycling methods. We can say that a lot of waste is generated in environmental and industrial terms. Sunflower (*Helianthus annus* L.) is one of the major oil crops grown in the world for the production of edible and biodiesel oil. A large number of plant and raw material wastes, especially those used in food products, are recycled into cleaning, health, cosmetic and industrial products. In this study, the cold-pressed oil and pulp obtained from the seeds of the sunflower plant were evaluated and transformed into an added-value cosmetic product. Especially the fact that it contains other valuable compounds such as phenolic compounds, fatty acids, fibers, vitamins, minerals and polyphenols increases the popularity of the value-added product. Within the scope of our work, we produced two value-added products. These products are creams containing sunflower oil, which has nourishing, moisturizing and protective properties and the other product is a skin mask containing sunflower pulp. As our university specializes in added-value agricultural products, our product production is increasing day by day.

Keywords: *Value added product, skin cream, skin mask, Helianthus Annuus L.*

[*]***Corresponding Author:*** *Musa Karadag, Vocational School of Technical Sciences, Iğdır University, 76000, Iğdır, Türkiye, e-mail:dengemusa@hotmail.com.*

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1. Introduction

The need for raw resources is somewhat reduced by recycling materials and consumed goods back into the recycling ring. This keeps rising consumption from outpacing population density and upsetting the natural equilibrium, therefore protecting the environment. Saving a significant amount of energy is also made possible by recycling recyclable resources as raw materials (Khalilov & Nasibova, 2010; Dizaj *et al.*, 2021).

All around the world, natural plant oils are used as topical therapies. These are often readily available and reasonably priced skin care products. For xerotic and inflammatory dermatoses linked to disruption of the skin barrier, many natural oils include unique chemicals with antibacterial, antioxidant, anti-inflammatory and

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antipruritic effects. These features make natural oils an appealing alternative and complementary treatment option. When deciding which oils to use for topical skin care, it's vital to take into account their distinct qualities (Aliyeva *et al*., 2023; Khalilov & Nasibova, 2022).

The advantages of natural oils for barrier restoration are mostly determined by the various ratios of essential fatty acids. While oils with higher concentrations of irritating oleic acid may be harmful to skin barrier function, oils with a higher linoleic acid/oleic acid ratio have better potential for barrier restoration. There are several ways to extract oils: you can use heat and chemical distillation to create essential oils, cold pressed to create unrefined oils and add different compounds to create scented oils. When choosing an oil for skin care, the technique of processing and purification is crucial. Cold pressing is the recommended method of oil extraction since it avoids heat and chemicals and protects valuable lipids while limiting irritating byproducts. Natural oil-based skin barrier restoration.

Moisture evaporation, irritants, allergies and microbial invasion are all prevented by a good skin barrier. The stratum corneum (SC), a crucial component of the skin barrier, is made up of intracellular lipids, natural moisturizing agents, epidermal tight junctions and organized corneocytes. These components work together to preserve moisture and the ideal SC. Apart from their particular composition, purity, oxidative stability and shelf life, cold-pressed sunflower oils also offer convenience of use in the production process. Consequently, these oils play a significant role in the manufacture of edible (unrefined) oils through the use of green technologies; in other words, they are more prevalent in the manufacturing of functional foods. Crude oil is mostly produced from sunflower seeds, which are further refined by physical or chemical methods. It is possible to enhance and even prevent certain diseases in humans by consuming goods that promote health, such as cold-pressed oils. It was decided to combine sunflower oil with cold-pressed oils. According to (Ramadan *et al*., 2013; Nasibova *et al*., 2021; Mammadova *et al*., 2022), lipid oxidation is a significant issue in the food and cosmetic industries. Antioxidant phenolic compounds and other phytochemicals that promote health can be found in abundance in cold-pressed oils. This study assessed cold-pressed oil and pulp and converted them into a value-added cosmetic product as part of ongoing attempts to create healthy oils rich in components that are good for health.

2. Composition of cold pressed *Helianthus annuus L.* oil and pulp

Because pulp is a great source of protein and increases biomass, it is typically utilized as feed in animal diets. Cysteine, methionine, leucine, valine, isoleucine, tryptophan, alanine and phenylalanine are essential amino acids that can be found in s *Helianthus annuus L*. press oils and pulp. The most common minerals and vitamins are riboflavin, phosphorus, thiamine, pantothenic and nicotinic acids (Petraru *et al.*, 2021; Oliveira Filho *et al.*, 2021). *Helianthus annuus L*. pulp has high biological value protein along with other beneficial elements like fiber, vitamins, minerals and polyphenols like chlorogenic acid. Sunflower oil and pulp include high levels of palmitic and stearic acid, but low levels of myristic, linolenic, eicosenoic, trisanoic and linolelaidic fatty acids. Still, it is accessible.

3. Conclusion

As a result of the sample analyses we made on the GC-MS device within the scope of the study, Myristic acid, Palmitic acid, Stearic acid, (n-9)–Oleic acid ω9, (n-6)–Linoleic acid ω6, C18:3 (n-6)–g -Fatty acids such as linolenic acid ω6 have been found. Added value in oils and pulps containing very beneficial fatty acids has been included in the production of cosmetic products.

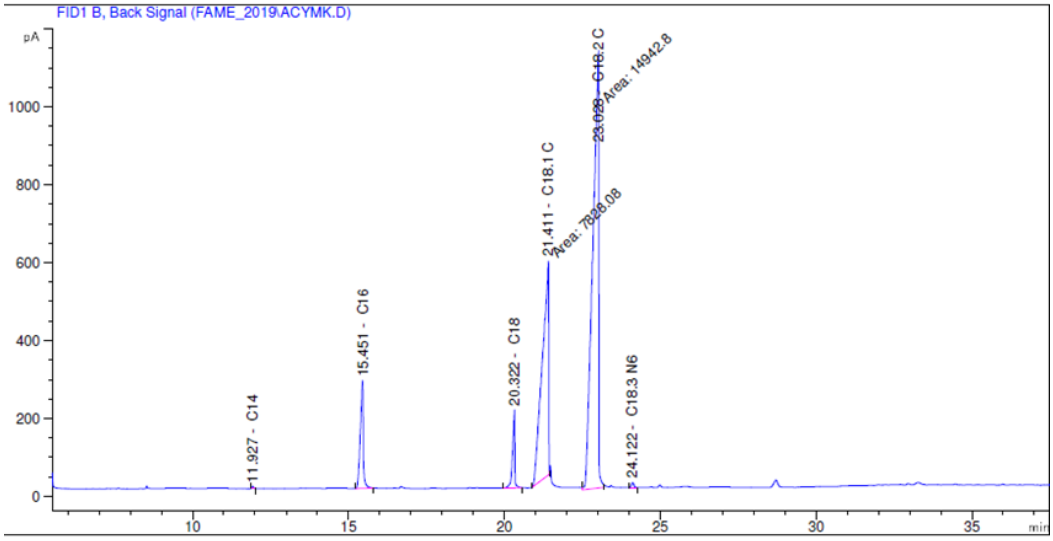

Figure 1. Composition of *Helianthus annuus L.* acids

Table 1. *Helianthus annuus L.* oil acids

Sequence No.	Fatty Acids Found	Fatty Acid Groups	% Amount
1	**C14:0**–Myristic acid	SFA	0,08
2	**C16:0**–Palmitic acid	SFA	7,13
3	**C18:0**–Stearic acid	SFA	3,83
4	**C18:1** (n-9)–Oleic acid ω9	MUFA/ ω9FA	30,48
5	**C18:2** (n-6)–Linoleic acid ω6	PUFA	58,19
6	**C18:3** (n-6)–g-Linolenic acid ω6	PUFA/ ω6FA	0,27

Helianthus annuus L. oil and pulp also represent a successful alternative for future food packaging, as they are renewable and low-cost resources. Moreover, it allows the development of completely edible and biodegradable materials.

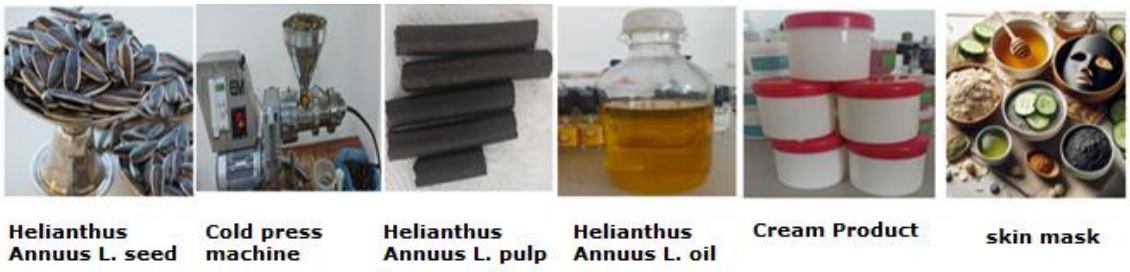

Figure 2. Cold-pressed oil production process

Production of skin creams and masks with added value

The applicability of oils for particular industrial sectors is greatly influenced by their chemical makeup. The vegetable oils that are highest in phytosterols, squalene and polyunsaturated fatty acids are highly valued by the pharmaceutical and cosmetic industries (Górnaś *et al*., 2016, Nasibova, 2020). *Helianthus annuus L.* seed pulp needs to be well ground, especially after it has dried, as lumps shouldn't form when the mask is formed.

Table 2. List of ingredients in *Helianthus annuus L.* pulp mask production

S/N	Raw materials used	Mount (gr)
1	*Helianthus Annuus L*. Seed Pulp (Grounded as Flour)	20.00
2	Polyvinyl Alcohol (PVA)	2.50
3	Kaolin	15.00
4	Deionized Water	40.00
5	Glycerine	7.50
6	*Helianthus Annuus L*. Oil	10.00
7	*Olea Europaea L*. Oil	5.00

Dried and ground into powder *Helianthus annuus L.* Pulp is placed in a glass beaker, kaolin clay is added and mixed. Then water is added and mixed to create a homogeneous solution. After dissolution is achieved, other raw materials are added respectively.

Table 3. Production process of nourishing and moisturizing cream from *Helianthus annuus L.* oil

Phase	Raw materials used	Mount (gr)
A	Cetearath 20	6.00
A	Stearik Acid	3.00
A	Cetyl Alcohol	5.00
A	Water	69.00
B	Paraffin	2.00
B	Glycerine	3.00
B	Dimethicone	1.00
B	*Helianthus Annuus L.* Oil	10.00
B	Phenoxyethanol	1.00

1. PHASE A

In the first stage, an evaporation container was placed on the Magnetic Stirrer Heater, deionized water was added and a 200 mL Beaker was placed into the evaporation container. Deionized water, Ceteareth 20, Stearic Acid and Cetyl Alcohol were added to the beaker and the temperature was heated to 75 and 80 C. It was mixed with a Mechanical Mixer until a homogeneous mixture was obtained. It was then cooled to 40 C for the addition of the second phase.

2. PHASE B

Glycerin, Paraffin, Dimethicone, cold-pressed *Helianthus annuus L*. oil and Phenoxyethanol were added to the product cooled to 40 C and mixing was continued

with the Mechanical Mixer until a single phase was formed. After resting at room temperature, the resulting product was placed in containers and made ready for use.

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