

POTATO PEEL EXTRACT: NATURAL COSMETIC INGREDIENT

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Abstract: Generally lot of food waste is thrown daily in garbage. The largest in India is food waste. In India the daily consumption of vegetables is maximum. Out of all the vegetables the per capita consumption of potato (*Solanum Tuberosum*) is maximum. The potatoes are mostly boiled or roasted. The skin of potato is generally removed after boiling and thrown out as it is considered as waste material. Waste can be recycled to turn best. This skin was collected and subjected to extraction process. Potato peels is rich in antioxidant, antibacterial property. It contains fiber, minerals (iron, zinc, potassium, and calcium). It even contains vitamin (B & C), starch, phenol, etc. Potato peel extract can be incorporate in various cosmetic products to enhance activity of product.

Index Terms- Solanum Tuberosum, starch, phenol, antibacterial, antioxidant, cosmetic ingredient.

I. Introduction

Food waste is considered a non-valued material and the volume is increasing with population and these wastes can be used as raw materials to produce useful cosmetics.¹

Potato peel is not only a household waste but also from small scale industries and fast food companies are dealing with an ever increasing number of potato peel waste. Sanitation and disposal of waste can be recycled in variety of application.^{2,3} Recycling of potato peels which can be useful for the society for their health benefits.



Potato peels⁴



Wastage⁵



Environmental pollution⁶

Img 1:- Potato peels waste.

Potato

Botanists and historians have extensively researched the origin and history of the potato and even today there is still widespread disagreement regarding the precise details. The genus *Solanum* comprises about 1,500-2,000 species. There are more than 4,000 varieties of native potatoes, mostly found in the Andes. They come in many sizes, shapes, skin colours and flesh colours. The potato is fundamentally important as a staple food of humanity. As a food crop, the potato is the third most important in the world after rice and wheat in terms of human consumption.⁷

Botanical name: - *Solanum tuberosum* L.

Family: - *Solanaceae*^{8,9}

Order: Solanales¹⁰

Genus: *Solanum*¹⁰

Species: *Solanum tuberosum*¹⁰

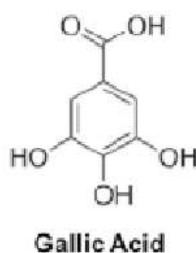
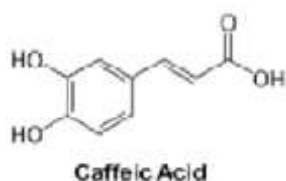


Active constituent

Table 1 Active constituents present in potato peel.

Constituent	Percentage	Cosmetic property	Reference
Phenolic acids			
Chlorogenic acid (CGA)	753.0–821.3 mg/100 g	Antioxidant and antibacterial activities	11
Gallic acid (GAC)	58.6–63.0 mg/100 g		
Caffeic acid (CFA)	278.0–296.0 mg/100 g		
Protocatechuic acid (PCA)	216.0–256.0 mg/100 g		
Starch	52.14%	Skin lightener	12
Nonstarch polysaccharide	30%	-	
Protein	18%	Conditioning, moisturizing	
Lipids	1%	Emollient, soothing	
Moisture	80.06	-	
Total carbohydrate	68.70	Moisturizer	
Total soluble sugar	1.00	Humectant	
Reducing sugar	0.61	-	
Nitrogen	1.30	-	
Fat	2.60	Emollient	

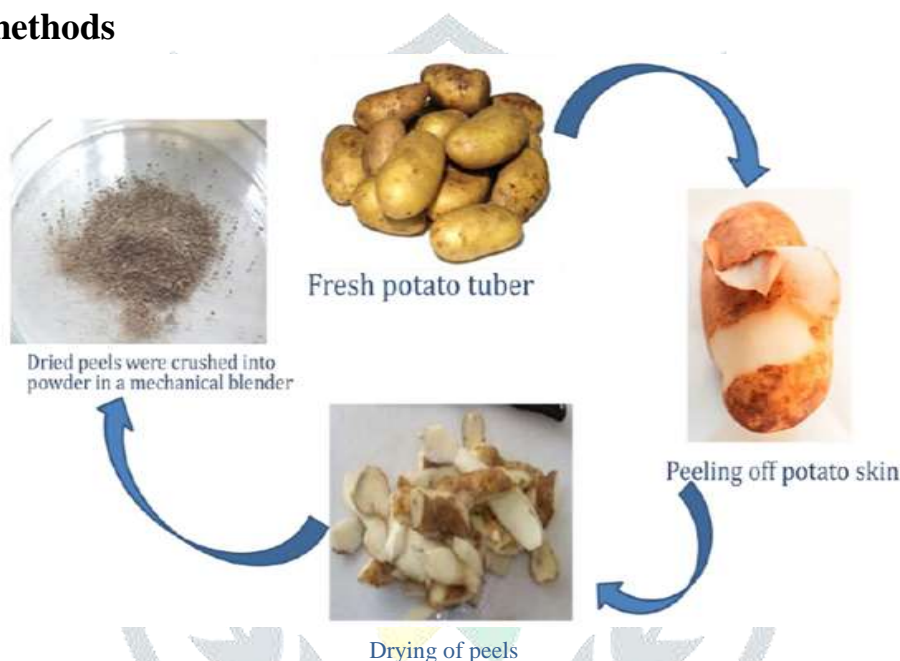
Potato peels also contains polyphenols, fatty acids¹², minerals (iron, zinc, potassium), vitamin B and vitamin C, alkaloids, tannins and flavonoids¹³.





Img 2:- Structures of some Phenolic acids and Flavonoid

Materials and methods



Img 3:- Method of preparation of potato peels powder¹⁴

- Peels of potato are air dried as per Img 3.
- Powder about 50g used for extraction using hydro alcohol (30:70) as solvent.
- Alcohol was evaporated, and residue was further tested.

Phytochemical analysis

- **Test for phenol:** - small quantity of alcoholic and aqueous extracts was treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicates the presence of phenols.¹⁵
- **Test for tannins:** - small quantity of alcoholic and aqueous extracts was treated with 3-4 drops of ferric chloride solution, 10% sodium chloride, 10% lead acetate. Formation of brownish colour indicates the presence of tannins¹⁵.
- **Test for saponin:** - about 1ml of alcoholic and aqueous extracts is diluted separately with distilled water to 20ml and shaken in a graduated cylinder for 15 minutes. One cm layer of foam indicated presence of saponins¹⁵.
- **Test for flavonoids:** - **Alkaline Reagent Test:** Extracts were treated with few drops of sodium hydroxide solution. Formation of intense yellow colour, which becomes colourless on addition of dilute hydrochloric acid, indicates the presence of flavonoids¹⁵.

- **Test for alkaloids: - 10% Tannic acid solution:** - small quantity of alcoholic and aqueous extracts was treated with tannic acid 10% solution (water). It gives a buff coloured precipitate with alkaloids¹⁶

Result

Table 2 Phytochemical testing of hydro alcoholic extract of potato peels, (+) present, (-) absent.

Phytochemical tests	Observations
Phenol	+
Alkaloids	+
Tannins	+
Saponin	-
Flavonoids	+

Conclusion

Some vegetable materials which are considered as waste are generally profitable, for example, potato peels. By recycling the potato peels it can prevent environmental pollution and it can be turned best out of waste. Potato peels are dried and its extract can be incorporated in various cosmetic products. Potato peels contain phenol, alkaloids, tannins, flavonoids, starch, etc. which can be used in cosmetic industries for its different properties like, antibacterial, antioxidant properties. From all literature study and result it can be concluded as potato peel extract can be utilized in cosmetic manufacturing.

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