



Determination of Some Elements Contents of *Melon genal* peel in White Nile and Gezira states, Sudan, and some of Its health benefits

Yousif M Alnour AbdelHakam¹

¹Sudan University of Science and Technology, Faculty of Education, Department of chemistry, Khartoum, Sudan.

Received: 21/06/2025

Published: 30/06/2025

Abstract

In this study twenty four samples of Melon genal peel were collected from two locations, White Nile and ELgezera states. Their elements contents were determined using atomic absorption spectroscopy. Study results showed that average values of cationic composition of Melon genal peel mg/kg collected from White Nile and ELgezera states; in mg/ Kg for; sodium (1079 - 1831), potassium (145.5 - 175.9), calcium (1594 - 1816), magnesium (4.228 - 6.391) and iron (1325 - 1979) respectively. Average values were determined using Infra-red spectrophotometer in mg/Kg for; ash (0.043 - 0.063), protein (0.45, 0.78), carbohydrate (1.9 - 2.8) and fats (0.04 - 0.07). These results clearly showed samples collected from ELgezera state are significantly higher in contents and better than those collected from White Nile state, due to soil and climate difference between the two states.

Keywords: Melon genal peel, bleeding, anti-cancer substances, anti-oxidant compounds.

Introduction

Literary references referring to *Melon genal* (eggplant) are found in Sanskrit literature since early third century AD. It appeared for the first time in British history A textbook on botany (Jaganathan and Dugar, 1997). In the sixteenth century. *Melon genal* or Eggplant was described in a historical Chinese document between the seventh and ninth centuries AD as different sizes, shapes, colors *Melon genal*. It has been suggested in an animal study (Muhaisen, 2019) that nasunin and the anthocyanins found in the *Melon genal* peel, they may contribute to protect brain cell membranes harmful free radicals, and also people who transfer nutrients into and out of cells. Waste from within, while anthocyanins participate nerve cells inflammation. It works to facilitate blood flow to the brain, which may prevent memory loss and other defects associated with age and mental decline. The discovery that nasunin may reduce the breakdown of fats of brain reported that (AOAC, 2000). Eggplant Family name *Solanum* Arabic name Eggplant, a word of Indian origin, and in Sudan it is called a word. With what Black is a metaphor, but it has been proven that there are many different color varieties in that white color. Eggplant is one of the vegetable crops known to the Arabs since the middle of the current century. It did not spread as a food crop in Europe until the fifteenth century AD. America began cultivating it in the nineteenth century from plants of tropical regions and it is believed that its origin may be India or the Burma region (FAO, 2013). Perennial herbaceous plant that grows in clusters around of upright, many branching, root system strong. The stem is grassy and becomes woody with age. The leaves are simple, large and thick. It is somewhat absorbent, with dense bristles. The flowers are large, up to 5 cm in diameter, hermaphroditic, self-pollinating. The fruit is smooth, shiny, and fleshy (Miles, C.etal, 2017). It is believed that *Melon genal* originated in the hot regions of India. Its Arabic name was derived from its Indian name, and Ibn Sina mentioned 595 AD and date. In Sudan is not known, but it



is likely that it came from Egypt. It is purple in color and large sized, but there are different types, sizes, shapes and colors of eggplant, as it is available small, long, and in various colors such as purple, white, and green. Where a recent study (Montavon, et al. 2003) revealed that the *melongenal peel* contains anti-oxidants, that protects brain cells from damage and bacterial infections. These substances are: Fiber, as the study confirmed that eggplant peel is an important source of fiber .This helps prevent constipation, colitis and hemorrhoids. *Melon genal* peel contains phenolic compounds, which are antioxidant compounds, the most important of which is acid “Horogenic”, which is one of the most powerful plant antioxidants, and prevents imbalances DNA structure that prevents the formation of cancer cells as well as its role in reducing bad cholesterol. In addition, *Melon genal* peel is rich in vitamin B and some important minerals such as potassium, copper, Magnesium, Manganese, phosphorus and folic acid, which reduce the risk of coronary heart disease, and helps relieve swelling, bleeding and dysentery, as well Potassium in *Melon genal* peel helps to control the level of salts in the blood, in addition to moisturizing the body(Miles, C.etal, 2017). It is used to treat atherosclerosis, as medical research has confirmed that eggplant is good for health Especially in the treatment and prevention of hardening of the arteries, and it can be eaten cooked with food or in the form of pickles or appetizers and reduces the percentage of fat. Eggplant contains high percentage of anti-cancer substances, “the same chemicals, which make apples good,” and dark pigments prevent oxidation. It prevents the occurrence of heart disease, as nutrition experts confirm that eggplant helps prevent heart disease, and maintains the urinary tract, and works to strengthen memory (FAO,2013). It prevents some types of cancer. Given that these nutrients are mainly located in its shell, this is why it is recommended eat eggplant peel without peeling it. One of the most important benefits of *Melon genal* peel is a diuretic sudanese, so it is advised for those suffering from urine tract stones and it is considered useful for those who suffer from diarrhea, as the dietary fiber that contained in eggplant stimulates bowel movement, and helps to regulate the emptying of waste from it is a powerful remedy for diarrhea, which is why people with diarrhea should eat raw eggplant peel which works to stop diarrhea, as the *Melon genal* peel performs the process of purifying the intestines, and contributes to killing germs and expelling them from the body. It is advised not to peel the *Melon genal* peel because most of the nutrients are in the skin pulp (Montavon et al., 2003). It is beneficial for *Melon genal* peel for hair health.

Material and Methods

100 grams of ground *Melon genal* peel sample were weighed and placed in an oven 500C for 4 hours. Cooled and one gram dissolved in 5 ml of dilute hydrochloric acid (20%), the solution was transferred into a 50 mL volumetric and completed to volume with distilled water. The Cationic Composition was determined using atomic absorption Spectroscopy. Ash and Protein, Carbohydrate, Fats content find were determined using Infra-red spectrophotometer (IR) the FDA requires that food manufacturers calculate the total carbohydrate content of a food using the following mathematical formula: Total Carbs = Total Serving Weight - (Net Protein Weight + Total Fat Weight + Moisture Weight + Powder Weight) average values were using.

Results and Discussion

Table. 1 Cationic composition of *Melon genal* peel from White Nile state

Sample No.	Fe mg/kg	Na mg/kg	K mg/kg	Ca mg/kg	Mg mg/kg
A1	1121	147.4	1697	4.448	1365
A2	1035	142.8	1503	4.126	1332
A3	1041	149.4	1511	4.478	1317
A4	1105	151.1	1671	4.210	1299
A5	1120	141.9	1599	4.111	1301
A6	1052	140.6	1583	4.000	1333
Mean	1.079	145.5	1594	4.228	1325

Table. 2 Cationic composition of *Melon genal* peel from ELgezera state

Sample No.	Fe mg/kg	Na mg/kg	K mg/kg	Ca mg/kg	Mg mg/kg
B1	1732	152.1	1861	6.362	2112
B2	1835	161.2	1750	6.239	1932
B3	2041	198.0	1722	7.367	1899
B4	1908	171.6	1879	5.219	2196
B5	1628	191.9	1798	6.123	1801
B6	1842	180.8	1885	7.034	1938
Mean	1831	175.9	1816	6.391	1979

Table. 3 Ash, Protein, Carbohydrate and Fats (mg/kg) of *Melon genal* peel from White Nile state

Sample No.	Ash mg/kg	Protein mg/kg	Carbohydrate mg/kg	Fats mg/kg
A1	.02	.5 0	2.1	.02
A2	.06	0.5	1.3	.03
A3	.06	60.	1.8	.05
A4	.04	0.4	2.3	.04
A5	.05	0.3	1.9	.05
A6	.03	0.4	2.0	.02
Mean	.043	0.45	1.9	.04

Table. 4 Ash, Protein, Carbohydrate and Fats (mg/kg) of *Melon genal* peel from ELgezera state

Sample No.	Ash mg/kg	Protein mg/kg	Carbohydrate mg/kg	Fats mg/kg
B1	.09	.90	1.9	.08
B2	.07	0.7	2.8	.06
B3	0.1	1.0	3.0	.09
B4	.08	0.8	3.3	.06
B5	.07	0.6	2.8	.07
B6	.06	0.7	3.1	.05
Mean	.063	0.78	2.8	.07

Tables 1 and 2 showed the some cationic composition of *Melon genal* peel from White Nile state and ELgezera state. Dome elements were determind using atomic absorption. Study results showed that average values of some cationic composition of *Melon genal* peel collected from White Nile and ELgezera states were significantly higher in Elgezera than White Nile state. Cationic compounds in mg/Kg included: sodium (1079-1831), Potassium (145.5-175.9), Calcium (1594-1816), Magnesium (4.228-6.391) and Iron (1325-1979) respectively. Tables 3 and 4 showed in mg/Kg; Ash (0.043-0.063), Protein (0.45, 0.78), Carbohydrate (1.9-2.8) and Fats (0.04 - 0.07). Study results are similar to those reported by Montavon, P et al, (2003). Cationic, ash, protein, carbohydrate and fat contents are



significantly higher in ELgezera state than White Nile state due to differences in soil and climate, between these two states.

Conclusions

Elements content concentrations of the two states are significantly different. Elements content concentrations of ELgezera state is higher than White Nile state. The Ash, Protein, Carbohydrate and Fats composition of ELgezera state is almost higher than White Nile state.

Acknowledgements

The Author would like express thanks for "Environment and Natural Resources Research Institute" (ENRRI), "National Center for Resource" (NCR) and the "Central Laboratory of the Republic of the Sudan" (CLRS) for helpful technical support.

References

- AOAC, (2000). Official methods of analysis, 17th ed. Association of Official Agricultural Chemists, Washington, D.C.61-66.
- Analytical Methods for Atomic Absorption Spectroscopy (AAS).(1994)40-45.
- FAO (2013) ,Good Agricultural practices for greenhouse vegetable crops. Principles for Mediterranean climate areas. Tuzel, Y. Cultural practices. FAO Plant Production and Protection Paper 217, Rome.
- Jaganathan J. and Dugar S.M. (1997). Atomic absorption spectrometric determination of copper in malt beverages *Atomic Spectr.*, 18: 156-159.
- Muhaisen, H.M., (2019). " *Melon genal* And Their Biological Activities On Human Health". Arab journal of sciences and research publishing (journal of medicinal and pharmaceutical sciences); Vol. (3):1-22.
- Miles, C. and Crow, D. (2017) Grafting manual. How to produce grafted vegetable plants, Eds. Kubota. C., Miles. C. and Zhao, X, Washington State University. www. Vegetablegrafting. org.
- Montavon, P., Mauron, A., & Duruz, E. (2003). Changes in protein *Melon genal* profiles during roasting. *J Agric Food Chem.*, (51),35–213.
- Production of important vegetable crops in Sudan 1989, 112-121.
- Fundamentals of Chemistry Dr. Abdul Hakim Qandil First Edition 200 AD Committed Printing and Publishing Dar Fundamentals of Physical Chemistry Prof. Dr. Eid Al-Alim Abu Al-Magd 95-99.