

DETERMINING SOME CHARACTERISTICS OF MEZRA EGGPLANT

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Abstract

Eggplant is a highly nutritious vegetable, widely consumed in almost every dish in Turkey, and is considered very beneficial to human health. In this study, the protein, mineral content, moisture, ash, and total phenolic compound values of Mezra Eggplant (*Solanum melongena*), cultivated in Mezra village of Birecik district, Şanlı Urfa province, were investigated. The results showed that the moisture content was 93.19 ± 0.114 g and the ash content was 0.564 ± 0.029 g. Protein analysis was performed using the Kjeldahl method, yielding a protein content of 0.85 ± 0.25 g and a nitrogen content of 0.135 ± 0.04 g. Total phenolic compounds were determined by the Folin Ciocalteu method and measured at 405.815 mg/kg. Mineral analysis was carried out using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES), and the eggplant samples were found to contain phosphorus (23.28 mg/100 g), magnesium (22.67 mg/100 g), potassium (230.30 mg/100 g), iron (0.25 mg/100 g), zinc (0.19 mg/100 g), calcium (8.92 mg/100 g), copper (0.12 mg/100 g), and sodium (7.70mg/100g).

Keywords: Eggplant, Mezra, Local Food.

Introduction

Eggplant (*Solanum melongena L.*), a member of the Solanaceae family, is widely cultivated and consumed across diverse agro-ecological regions, and has been recognized as a vegetable of considerable nutritional and pharmacological importance. Its composition includes dietary fiber, proteins, minerals, and phenolic compounds [1].

Recent comparative analyses of indigenous and exotic cultivars have demonstrated significant variation in bioactive compound content, with eggplant consistently exhibiting high levels of phenolics and flavonoids, thereby positioning it as a promising candidate for functional food development [2]. Furthermore, mineral profiling has revealed substantial concentrations of potassium, magnesium, calcium, and phosphorus, which contribute to its role in maintaining electrolyte balance and supporting metabolic functions [3]. In addition to its nutritional attributes, eggplant has been investigated for its potential in nutraceutical applications, given its capacity to modulate oxidative stress and reduce risk factors associated with chronic diseases. Collectively, these findings underscore the dual significance of eggplant as both a staple in traditional diets and a scientifically validated source of health-promoting compounds, warranting further interdisciplinary research into its sustainable utilization and valorization [1, 4].

Eggplant holds a special place in Turkish cuisine, with many eggplant-based dishes being internationally recognized by their original Turkish names. Culinary preparations such as musakka, imambayıldı, karnıyarık, dolma, alinazik, and eggplant kebab are referred to in the same form in foreign-language cookbooks and online platforms. Indeed, eggplant is used in a wide variety of dishes in Turkish gastronomy, and beyond its role in hot meals, it is also processed into canned

products, pickles, and even jams, reflecting its versatility and cultural significance [5, 6]. Several eggplant (*Solanum melongena L.*) cultivars are cultivated in Turkey, including Aydın Siyahı, Trabzon Kadife, Kadife Kemer, Topan (Gümüşay), Süper Pala, and Pala 49 [6].

In addition, Kemer and Halkapınar varieties are among the most widely grown, while the round and fleshy *Bostan* eggplant is also frequently preferred. The Mezra eggplant, cultivated in Şanlıurfa's Birecik district, is characterized by its smooth skin with a moderately purple color, whitish flesh, very low seed content, and soft texture. Due to these properties, it is particularly favored in eggplant kebab and other traditional dishes. The fruit is generally cylindrical in shape, with a length ranging between 25–30 cm, a diameter of 5–6 cm, and either no curvature or only a slight bend [7].

The aim of this study was to determine the protein, total phenolic compounds, and mineral content of Mezra eggplant.

Material and Methods

In this study, Mezra Eggplant (*Solanum melongena*), cultivated in Mezra village of Birecik district, Şanlıurfa province, was used. The samples (n:15) were taken from fresh eggplants, and the moisture (%) [8], ash (%) [8], protein [8], and total phenolic compound levels [9] were determined. Mineral content analysis was performed using Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES). In the eggplant samples, the amounts of phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), copper (Cu), zinc (Zn), and sodium (Na) were determined, and the results were expressed as mg/100 g [10].

Results and Discussion

The proximate composition of Mezra Eggplant (*Solanum melongena*) is presented in Table 1. The results indicate that the eggplant has a very high moisture content

($93.19 \pm 0.110\%$), which is typical for fresh eggplant fruits. The ash content was found to be $0.564 \pm 0.029\%$, representing the mineral residue. Protein content, determined by the Kjeldahl method, was $0.85 \pm 0.25\%$, while nitrogen content was $0.135 \pm 0.04\%$. These findings confirm that Mezra Eggplant is characterized by high water content and moderate mineral composition, although relatively low in protein.

The mineral composition analysis of Mezra eggplant revealed that most values were within the standard ranges reported in the National Food Composition Database, with the exception of sodium, which was found to be above the standard limits. This result is consistent with the variability observed in previous studies on different eggplant cultivars. For instance, [6] reported protein contents of 0.98 ± 0.02 g/100 g in the Kadife Kemer variety, 1.00 ± 0.05 g/100 g in the Trabzon Kadife variety, and 1.21 ± 0.05 g/100 g in the Aydın Siyahi variety, highlighting the nutritional diversity among traditional cultivars.

In comparison, the elevated sodium levels in Mezra eggplant are presumed to be influenced by environmental factors such as soil composition, irrigation water, and regional climatic conditions. These findings emphasize the importance of local agro-ecological characteristics in shaping the nutritional profile of indigenous varieties and suggest that Mezra eggplant may possess distinctive compositional traits that differentiate it from other regional cultivars. In conclusion, the proximate and mineral composition analyses of Mezra eggplant demonstrate that this local cultivar possesses a nutritional profile largely consistent with national standards, while exhibiting distinctive traits such as elevated sodium levels and a relatively high phenolic content (405.8 mg GAE/kg). These findings highlight the influence of local agro-ecological conditions—including soil composition, irrigation practices, and climatic factors—on the nutritional characteristics of traditional varieties. The

unique compositional attributes of Mezra eggplant not only contribute to its dietary value but also underscore its potential role in functional food development and sustainable food systems.

Furthermore, the documentation of such indigenous cultivars enriches national food composition databases and supports the preservation of regional biodiversity, offering both scientific and cultural significance. Future research on Mezra eggplant should focus on expanding its characterization beyond proximate and mineral composition to include detailed phytochemical profiling, bioavailability studies, and potential health-promoting properties. Given its distinctive sodium and phenolic content, this cultivar may serve as a valuable candidate for functional food development and nutraceutical applications.

Moreover, integrating Mezra eggplant into sustainable agricultural practices could enhance regional biodiversity and contribute to climate-resilient food systems. Collaborative studies involving international food composition databases would further strengthen the recognition of Mezra eggplant as a unique genetic resource, supporting both scientific advancement and cultural heritage preservation. Ultimately, the valorization of such indigenous cultivars can promote dietary diversity, foster local economic development, and provide new opportunities for innovation in food technology.

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Table 1. Proximate composition of Mezra Eggplant (*Solanum melongena*)

Analyze	result
Moisture (%)	93.19± 0.110
Total Ash (%)	0.564± 0.029
Protein (%)	0.85± 0.25
Total phenolic compound (GA mg/kg)	405.815 ± 0.75
Phosphorus (P) mg/100g	23.28± 0.23
Magnesium (Mg) mg/100g	22.67± 0.19
Potassium (P)mg/100g	230.30± 0.110
Iron (Fe) mg/100g	0.25± 0.02
Zinc (Zn) mg/100g	0.19± 0.01
Calcium (Ca) mg/100g	8.92± 0.09
Copper (Cu) mg/100g	0.12± 0.001
Sodium (Na) mg/100g	7.70± 0.09