EVALUATION OF SOME NUTRITIONAL PARAMETERS OF WILD ROSE HIP POWDER

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Abstract

Rosehip (*Rosa canina*) fruits are a valuable source of nutrients, widely appreciated for their nutritional value as well as their functional properties. This study aimed to evaluate the nutritional composition of powder obtained from rosehip fruits collected from wild flora. Standardized analytical methods were applied to determine several nutritional parameters, including moisture, mineral content (ash), protein, fat, crude fiber, and carbohydrates.

The results indicated that rosehip fruit powder contains considerable amounts of nutrients, with values varying depending on the origin of the fruits and the analyzed parameter: 10.45 –11.06% moisture, 3.72 – 4.21% minerals, 4.78 – 5.56% protein, 2.11 – 2.66% fat, 8.54–9.11% crude fiber, and 68. 31 – 70.05% carbohydrates.

These values demonstrate that the rosehip fruit powder obtained and analyzed in this experiment is a product rich in carbohydrates and fibers, with a moderate intake of proteins and minerals, low fat content and a low humidity level, which gives it stability and the possibility of long-term storage.

Taken together, these characteristics emphasize the nutritional potential of rosehip fruit powder and support its use as an ingredient in the development of functional foods with added nutritional value.

Keywords: Rosehip (*Rosa canina*), rosehip powder, nutritional composition, functional foods

Introduction

Wild rose hips, the fruits of *Rosa canina L.*, are characterized by a balanced nutritional composition, being rich in carbohydrates (particularly dietary fiber) and minerals, and containing moderate amounts of proteins and lipids [1]. Proximate composition analyses highlight insoluble fibers, natural sugars, unsaturated fatty acids, and essential minerals such as calcium, magnesium, potassium, and iron [2]. In addition, rose hips are notable for their high levels of bioactive compounds—including polyphenols, flavonoids, carotenoids, and tannins—which contribute to strong antioxidant potential, as well as for their exceptional vitamin C content, a key determinant of their functional value [3,4].

Most previous research has focused on the bioactive profile of rose hips, with fewer studies addressing their nutritional composition. Nevertheless, available data show that, besides their bioactive richness, rose hips also provide significant amounts of essential nutrients [5–11], supporting their potential as a valuable source of functional ingredients in food formulations. According to the Frida fooddata.dk database, dried rosehip (*Rosa rugosa*) powder contains

94.2% dry matter, 5.8% water, 5.5% protein, 1.3% fat, 3.3% ash, 43.0% dietary fiber, 83.0% carbohydrates (by difference), and 40.0% available carbohydrates [5].
Comparative studies further illustrate variability in nutritional parameters depending on species, cultivar, and growing conditions. For instance, Shomirov et al. (2023) reported that dried wild rosehips contained 3.18% lipids, 5.89% protein, 4.1% ash, and 67.98% carbohydrates, with a high proportion of soluble fiber and simple sugars. Ivanova et al. (2023) found differences between wild and cultivated rosehips in Bulgaria, with wild fruits richer in protein and dietary fiber. Other studies confirmed that rosehip powders generally contain moderate protein (3–6%), low fat (<3%), appreciable fiber (8–39%), and a predominance of carbohydrates (38–70%) [7–11]. By-products of rosehip processing also retain nutritional value; for example, rosehip paste residues were reported to contain almost 7% protein, 3% fat, and over 37% crude fiber [12].
Overall, the nutritional composition of rosehip fruits and derived powders varies according to cultivar, climate, soil, ripening stage, and processing method [11]. Taken together, existing evidence highlights rosehip powder as a nutritionally valuable and functionally promising ingredient for the development of value-added foods [8–13].

Experimental

Fruit material

Fruits of rosehip (*Rosa canina L.*) were harvested in early October 2024, at full maturity (bright red color), from non-polluted areas suitable for culinary use. Approximately 1 kg of fruits was collected from three different locations, from which three composite samples were prepared. After removing damaged fruits and plant residues, the samples were washed and pre-dried for about 2–3 hours on filter paper. Subsequently, the fruits were dried in an oven at 55–60 °C for 8 hours. The dried fruits were ground using a household grinder, and the resulting powders were stored in polyethylene bags under refrigeration until analysis.
The rosehip fruit powders thus obtained were used as analytical material for determining moisture content, ash (minerals), protein, fat, crude fiber, and carbohydrates.

Analysis method

Standardized analytical methods used according to Velciov et al.'s recommendations, (2022) were applied to determine and nutritional parameters, including moisture, mineral content (ash), protein, fat, crude fiber, and carbohydrates [14,15]. For moisture content, dried apple peel powder was dried in an oven at 105^0C to constant mass. The mineral substances (ash) were determined by the calcination method at 550°C. The protein content was determined by the Kjeldahl method, using a conversion factor for nitrogen of 6.25. The crude fat was determined using the Soxhlet method with hexane as solvent. Crude fibers were determined by using the method of acid base digestion. The carbohydrate content was obtained by difference. The crude fat was determined using the Soxhlet method with hexane as solvent. Crude fibers were determined by using the method of acid base digestion. The carbohydrate content was obtained by difference.

Table 1. Nutritional parameter values of rosehip (*Rosa canina*) powder obtained from fruits harvested in wild flora

Specification	**Nutritional parameters, % from dry matter (DM)**					
	Moisture	Ash	Protein	Fat	Brute fibre	Carbohydrates
Limits	10.45 –11.06	3.72 – 4.21	4.78 – 5.36	2.11 - 2.66	8.54 - 9.11	68.31 - 70.05
Mean values	10.55±0.38	4.01± 0.20	4.99±0.26	2.34±0.23	8.91±0.26	69.16±0.71

Results and discussion

The results obtained from the analysis of the nutritional parameters of dried rosehip powder, harvested from plants grown in wild flora, are presented in Table 1.

The nutritional parameters of rosehip powders varied slightly depending on fruit origin, with values ranging between 10.45–11.06% moisture, 3.72–4.21% minerals, 4.78–5.56% protein, 2.11–2.66% fat, 8.54–9.11% crude fiber, and 68.31–70.05% carbohydrates. On average, the powders were characterized by high carbohydrate (69.16%) and dry matter content (89.45%), significant amounts of fiber (8.91%), protein (4.99%) and minerals (4.01%), and low fat levels (2.34%). These values, comparable to those reported by other authors, reflect the influence of cultivar, pedoclimatic conditions, and processing methods. The low moisture content supports microbial stability and longer shelf life, while bioactive compounds such as vitamin C, polyphenols, and carotenoids (not shown in the table) further enhance the functional and antioxidant value of rosehip powder as a potential ingredient for value-added foods.

The ash content of rosehip powders ranged between 3.72–4.21% (average 4.01%), indicating a considerable amount of minerals that can contribute to the intake of essential micro- and macroelements, thereby enhancing the biological value of food products. Protein levels were moderate (4.78–5.36%, average 4.99%), showing that although rosehips are not a primary protein source, they complement the nutritional profile of foods. Fat content was the lowest among the analyzed parameters (2.11–2.66%, average 2.34%), supporting the suitability of rosehip powder for formulations aimed at low-fat diets. Crude fiber was present in significant concentrations (8.54–9.11%), confirming the potential of rosehip powder as a valuable source of functional dietary fiber with beneficial effects on digestion, intestinal transit, and glycemic regulation. Carbohydrates represented the major component (68.31–70.05%, average 69.16%), providing energy while being balanced by the high fiber content. Overall, the nutritional profile supports the use of rosehip powder as a valuable ingredient for the development of foods with both nutritional and therapeutic value.

The analysis of proximate composition of rosehip (*Rosa canina*) powder obtained from fruits harvested in wild flora revealed a valuable profile, comparable to data reported in the scientific literature. Rosehip powder is characterized by a high content of carbohydrates and dry matter, a significant supply of crude fiber and minerals, as well as a moderate protein level. Its low fat content makes it suitable for food formulations with reduced lipid intake. The low moisture level enhances product stability and enables longer storage, while the richness in organic compounds and minerals supports its biological value. Therefore, rosehip powder represents a promising ingredient for the development of value-added foods, with potential applications both as a nutritional additive and as a functional component in various food products with prophylactic and therapeutic roles.

Conclusion

The results of the nutritional profile analysis of rosehip (*Rosa canina*) powders obtained from fruits grown in non-polluted wild flora indicated that they contain significant amounts of nutritional compounds, varying according to fruit origin and the analyzed parameter: 10.45–11.06% moisture, 3.72–4.21% minerals, 4.78–5.56% protein, 2.11–2.66% fat, 8.54–9.11% crude fiber, and 68.31–70.05% carbohydrates.

Rosehip powder is characterized by a high content of carbohydrates and dry matter, making it a nutritionally concentrated product. It is also an important source of crude fiber and minerals, with a moderate protein contribution. Its low-fat content makes rosehip powder suitable for diets with reduced lipid intake. Moreover, the low moisture level ensures storage stability and an extended shelf life. Altogether, these characteristics recommend rosehip powder as a valuable ingredient for the development of value-added foods.

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