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Effect of Bioactive Compounds from Pumpkin Powder on the Quality and Textural Properties of Shortbread Cookies

Aliona Ghendov-Mosanu ¹, Natalia Netreba ^{1,*}, Greta Balan ², Daniela Cojocari ², Olga Boestean ¹, Viorica Bulgaru ¹, Angela Gurev ¹, Liliana Popescu ¹, Olga Deseatnicova ¹, Vladislav Resitca ¹, Carmen Socaciu ³, Adela Pinteau ³, Tamar Sanikidze ⁴ and Rodica Sturza ¹

- ¹ Faculty of Food Technology, Technical University of Moldova, 9/9 Studentilor St., MD-2045 Chisinau, Moldova; aliona.mosanu@tpa.utm.md (A.G.-M.); olga.boestean@tpa.utm.md (O.B.); viorica.bulgaru@tpa.utm.md (V.B.); angela.gurev@chim.utm.md (A.G.); liliana.popescu@tpa.utm.md (L.P.); olga.deseatnicova@toap.utm.md (O.D.); vladislav.resitca@adm.utm.md (V.R.); rodica.sturza@chim.utm.md (R.S.)
- ² Department of Preventive Medicine, "Nicolae Testemitanu" State University of Medicine and Pharmacy, 165 Stefan cel Mare Blvd., MD-2004 Chisinau, Moldova; greta.balan@usmf.md (G.B.); daniela.cojocari@usmf.md (D.C.)
- ³ Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, 3–5 Calea Manasturs St., 4003724 Cluj-Napoca, Romania; csocaciudac@gmail.com (C.S.); apinteau@usamvcluj.ro (A.P.)
- ⁴ Faculty of Exact and Natural Sciences, Javakhishvili Tbilisi State University, 1 Ilia Chavchavadze Ave., Tbilisi 00186, Georgia; tsanikidze@tsmu.edu
- * Correspondence: natalia.netreba@tpa.utm.md

Abstract: The problem of food with functional ingredients, characterized by low energy intake and a variety of phytonutrients with biological activity, is one of the concerns of the population. The objectives of this study were to investigate the effect of pumpkin powder and its bioactive components on the quality, color and textural properties of shortbread cookies. In the drying process of pumpkin powder (*Cucurbita moschata*) at 60 ± 2 °C, the physicochemical parameters did not change significantly in relation to fresh pulp. The chromatic parameters L*, a* and b* showed that the pumpkin powder was brighter than the pulp, with a greater presence of yellow pigments. Pumpkin powder presented a rich source of bioactive compounds (polyphenols flavonoids, carotenoids) with an antioxidant potential of 161.52 mmol TE/100 g DW and 558.71 mg GAE/100 g DW. Antimicrobial activity against Gram-positive (*Staphylococcus aureus*, *Bacillus cereus*), Gram-negative (*Escherichia coli*, *Salmonella Abony* and *Pseudomonas aeruginosa*) bacteria and high antifungal activity against *Candida albicans* were attested. The sensory, physicochemical, texture parameters and color indicators of shortbread cookies with yellow pumpkin powder (YPP) added in a proportion of 5–20% were analyzed. The optimal score was given to the sample of 15% YPP. The use of 15–20% YPP contributed to improved consistency due to the formation of complexes between starch and protein.

Keywords: *Cucurbita moschata*; shortbread cookies; biologically active compounds; antioxidant activity; antimicrobial activity; texture; sensory quality; physicochemical quality



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1. Introduction

Pumpkin (*Cucurbita moschata*), widely cultivated in different climatic zones, famous for its nutritional value and health-promoting effects, is consumed in abundance as a functional food and as a medicine for the treatment of various health conditions [1–3]. Pumpkin seeds, peel, pulp, flowers and leaves contain compounds characterized by high bioactivity, such as polysaccharides, proteins, polyphenols, carotenoids, phytosterols, vitamins and minerals, which positively affect human health [4–6].

The qualitative and quantitative profile of biologically active compounds in pumpkin seeds, peels and cores depends on several factors: genotype [7], cultivation method,

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