

Comparison of Bioactive Compound Profiles in Freeze-Dried Blackberry, Mulberry, Raspberry, and Blueberry Samples

Muhammed Zahid Kasapoglu*

Ph. D, Department of Nanotechnology, Institute of Nanotechnology and Biotechnology, Istanbul University-Cerrahpaşa, Avcılar, Istanbul 34320, Turkey

Abstract:

This study aimed to investigate and compare the bioactive compound contents of freeze-dried blackberry (*Rubus fruticosus*), mulberry (*Morus nigra*), raspberry (*Rubus idaeus*), and blueberry (*Vaccinium myrtillus*) to determine their potential applications as sources of functional food ingredients. These berries were chosen due to their rich phenolic profiles, known health benefits, and high consumer demand in the functional food and nutraceutical industries. High-performance liquid chromatography (HPLC) analysis revealed that each berry species was distinguished by unique bioactive components. Raspberry stood out with the highest gallic acid content (73.98 µg/mL), along with significant levels of quercetin (4.64 µg/mL) and myricetin (1.36 µg/mL). Mulberry exhibited the highest rutin (55.22 µg/mL) and quercetin (15.26 µg/mL) contents, demonstrating its richness in polyphenols. Blackberry showed a remarkable concentration of hyperoside (43.46 µg/mL) and also contained rutin (8.34 µg/mL) and quercetin (6.44 µg/mL). Blueberry was notable for its hyperoside content (26.80 µg/mL), although its gallic acid (5.04 µg/mL) and rutin (3.66 µg/mL) levels were relatively lower. These findings highlight the diverse phenolic profiles of the berries and emphasize their potential to serve as sources of targeted bioactive compounds in functional food formulations.

Keywords:

Bioactive compounds, Phenolic profiles, Freeze-drying, Polyphenols, HPLC.