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NUTRACEUTICAL FORMULATIONS: ADDITION OF NATURAL INGREDIENTS AS PRESERVATIVES

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The growing concern about the amount of chemicals added to food products has driven consumer preference towards products with less food additives, and, when possible, only with natural ones. Thus, the main objective of this work was the study of natural ingredients of recognized bioactivity (quercetin, citric acid, dry chestnut flower, and chestnut flower extract) as preservatives for a commercial nutraceutical formulation based on *Aloe arborescens* Mill. in substitution of the used artificial preservative (sodium benzoate). These formulations were characterized in terms of their centesimal composition, individual profile in free sugars (HPLC-RI), organic acids (UFLC-PDA), fatty acids (GC-FID) and phenolic compounds (HPLC-DAD-ESI/MS); and also in terms of their antioxidant activity (TBARS and OxHLIA). The different formulations were contaminated to understand their influence on microbial growth, having been contaminated with different microorganisms (*Escherichia coli*, *Bacillus cereus*, *Aspergillus parasiticus* and *Zygosaccharomyces rouxii*) and subsequently analyzed for the microbial loads over 45 days. All results were compared to formulations with sodium benzoate and a to negative control without any preservative. The most abundant nutrients were carbohydrates, with values between 98 and 99 g/100 g of fresh weight, followed by proteins. All nutraceutical preparations showed moisture ranging from 66 to 71 %, the fat content was 0.04 to 0.06 g/100 g, averaging an energy value of 397 kcal/100 g. Different minerals were found, with calcium being the most abundant with an average value of 105 mg/100 g fw. Three soluble sugars and two organic acids were identified, with fructose and malic acid standing out. Seventeen fatty acids were quantified with the higher abundance of palmitic (C16:0) and stearic (C18:0) acids. Regarding the phenolic compounds, the presence of 10 phenolic compounds was evident, especially alioenin (flavonoid) as the major compound. Regarding the antioxidant activity, higher activity was found in formulations containing quercetin, showing EC₅₀ values of 0.04 µg/mL (TBARS) and IC₅₀ of 139 µg/mL (OxHLIA - Δt = 60 min). As for the microbial stability of the formulations over the 45 days, they proved to be effective in inhibiting the growth of microorganisms, with a higher reduction in colonies when compared to the formulations with sodium benzoate, being the best of them the ones preserved with citric acid and chestnut flower. These results showed that the studied natural preservatives have little to no influence on the nutritional and chemical composition of the nutraceutical formulations, but have proved to be good alternatives to sodium benzoate in terms of their preservation.

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