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Mayonnaise with table olive flours: development and characterization of an innovative product

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The olive sector has been investing in innovation, exploring new products and presentations to respond to the market, not only to satisfy consumer tastes and needs but also to reduce losses in the food industry within a circular economy perspective. Our research group has recently characterized "table olive flours", a new product gaining increasing expression, prepared from fruits at different maturation stages - green, turning colour, and black olives, with interesting results[1], aiming to increase the value of table olives not prone for commercialization. Following these studies, this work intended to explore a new valorisation approach for those "flours", by incorporating them into mayonnaises.

Four mayonnaises produced without (control) and with three different "table olive flours" from cv. Cobrançosa were studied, with the support from rheology (texture and viscosity), lipid fraction characterization (fatty acids and tocopherols), antioxidant activity (Total Reducing Capacity, and Free Radical Blocking Effect of DPPH) and phenolic profile by High-Performance Liquid Chromatography - Diode-Array Detection (HPLC-DAD), together with quality parameters for lipid oxidation (peroxide indices and specific extinctions at 232 nm and 268 nm). The mayonnaises with "table olive flours" had different colours (**Figure 1**) and textures than the control mayonnaise, with few exceptions. The mayonnaise with the "green olive flour" stood out in terms of firmness (maximum positive force) compared to the control, being firmer than all the others approaches. When evaluating the viscosity of the mayonnaises, hysteresis was observed, presenting a behaviour closer to a thixotropic fluid.

Figure 1: Mayonnaises with "olive flours": control (without "olive flour"), with "table olive flours" from fruits at different maturation stages - green, turning colour, and black olives (from left to the right).

The main fatty acid found in mayonnaise was linoleic acid (C18:2c), with percentages between 53.6% (corresponding to mayonnaise with the addition of "black table olives flour") and 56.0% (value corresponding to the control). The mayonnaises with "olive flours" presented higher percentages of saturated (SFA) and monounsaturated fatty acids (MUFA) and lower percentages of polyunsaturated fatty acids (PUFA) than the control mayonnaise, influenced by the olive flour addition. Among the tocopherols, α-tocopherol was the major, with the control mayonnaise having the highest value. However, in this sample (control), β- and γ-tocopherols were not detected, suggesting that these compounds are only present in mayonnaise if "table olive flour" is added. Furthermore, it was found that the control had the highest total reducing capacity (2.60±0.42 mg equivalents of gallic acid/g mayonnaise). On the contrary, the inhibition percentages of the DPPH free radical varied between 16.0 and 18.4%, with no significant differences between the four analysed mayonnaises. Thus, adding "table olive flour" did not affect this parameter. Regarding the phenolic compounds, hydroxytyrosol, tyrosol and luteolin were detected. The mayonnaise with "green olive flour" had the highest levels of these compounds. The mayonnaise with "turning colour table olives flour" was the one that showed the lowest peroxide values. Still, all the mayonnaises showed similar levels of lipid oxidation, evaluated by

the specific extinctions at 232 nm and 268 nm in iso-octane. Therefore, mayonnaises with the incorporation of “table olive flours from cv. Cobrançosa” can be an innovative product, reaching new clients.

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