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Serpa PDO cheese: towards identification of chemical markers involved in organoleptic attributes

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Serpa is a PDO Portuguese cheese manufactured in a demarcated area in the South Alentejo region, using raw ovine milk and extracts of *Cynara cardunculus* L. as rennet, without addition of starter cultures and followed by a minimum (but safe) ripening period. Both the processing technology and ingredients used result in a high microbial biodiversity that allows the development of a characteristic strong and exquisite flavor coupled with a semi-soft and creamy texture [1]. Variations in the manufacturing process and the distinct milk composition among producers result in a cheese that is considerably heterogeneous and unique in terms of sensorial characteristics [2]. Accordingly, the screening of flavor and texture related compounds over time are crucial for the identification of key compounds involved in these properties. In this study, the volatile and some groups of non-volatile compounds present in Serpa cheese with at least thirty days of ripening were investigated, analyzing cheeses from four distinct PDO certified producers and including two consecutive months of production. The results suggested a high diversity and some heterogeneity in chemical composition according to the producer. The free amino acids profile obtained by high-performance liquid chromatography (HPLC) suggested the presence of almost all amino acids in cheeses analyzed, being glutamic acid, alanine, leucine, valine and phenylalanine the most prevalent ones (10.2-96.7 mg 100g⁻¹). Regarding the organic acid profile, lactic, acetic and propionic acids were the dominant groups (7-2037 mg 100g⁻¹), separated and quantified by HPLC. The volatile analysis using headspace solid-phase microextraction (HS-SPME) coupled to gas chromatography–mass spectrometry (GC–MS) suggested a high diversity and variability of volatile composition between cheeses including several chemical groups, namely, ethyl esters, aldehydes, alcohols and ketones. The identification of chemical markers involved in sensorial attributes will guide the selection and development of an autochthonous starter culture that will allow to maintain the authenticity as well as contribute to the improvement of Serpa's quality and safety.

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