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Organic acids, tocopherols and antioxidant activity of white and black garlic samples

Joana Botas, Ângela Fernandes, Lillian Barros, Ana Maria Carvalho, Isabel C.F.R. Ferreira

^a*Centro de Investigação de Montanha (CIMO), ESA, Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal*
iferreira@ipb.pt

Garlic (*Allium sativum* L.) has been used worldwide not only for its dietary interest, but also for medicinal purposes, in prophylaxis and treatment of diverse pathologies. Garlic presents an interesting nutritional profile as well as bioactive compounds, responsible for its biological properties, namely, antioxidant, antimicrobial, immunostimulatory, hypoglycemic, among others [1].

The present work aimed to study bulbils (cloves) of white garlic (WG) and black garlic (BG). Both white and black garlic samples were supplied by local producers from Trás-os-Montes region. Black garlic samples were obtained by applying a dehydration procedure to *A. sativum* bulbs with controlled humidity and temperature. All samples were studied regarding their chemical composition in organic acids, analysed by High Performance Liquid Chromatography (HPLC) coupled to a Diode Array Detector, and tocopherols determined by HPLC-fluorescence. Furthermore, their antioxidant activity was evaluated through DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity, reducing power, β -carotene bleaching inhibition and TBARS (tiobarbituric acid reactive substances) formation inhibition assays.

α -Tocopherol was the only vitamer identified in the studied samples, being quantified in BG samples at the highest concentration. These samples presented oxalic, malic and pyruvic acids, while WG samples showed also citric and fumaric acids, besides the ones previously mentioned. Malic and pyruvic acids were the main compounds present in BG and WG, respectively. BG samples presented higher antioxidant activity than WG samples, in all the assayed methodologies.

The knowledge on the chemical and bioactive composition of natural matrices is of great importance in the formulation of novel products. Therefore, the present study highlights that the processed garlic (BG), an innovative product, presented higher antioxidant properties than WG, and could be explored for bioactive purposes.

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