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I International Conference on Research for Sustainable Development in Mountain Regions

Book of Abstracts

INSTITUTO POLITÉCNICO DE BRAGANÇA

Centro de Investigação de Montanha

Embrapa

United Nations Educational, Scientific and Cultural Organization

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Table of Contents

Pag.
Organization 6
Major supporters 6
Other supporters and sponsors 6
Committees 7
Keynote speakers 8
Abstracts 12
Keynote addresses 13
Oral sessions 18
Poster sessions 147
List of authors 212

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Sy08O04

Development of a natural colouring agent based on betacyanins from plant origin

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A current worldwide trend of research is the search for alternative natural sources of colorants to avoid the unsafe effects caused by the synthetic counterparts. Betacyanins, which are betalain pigments displaying a red-violet colour, have been reported to be three fold stronger than the yellow-orange dye produced by anthocyanins. Although being less commonly used than anthocyanins and carotenoids, betacyanin applications cover a wide range of matrices, where they are mainly used as additives or supplements in the food, cosmetics, pharmaceuticals and livestock feed industries. Betacyanins are obtained mainly from the red beet, Beta vulgaris L. (between 10 to 20 mg per 100 g of fresh pulp), but alternative primary sources are needed. The floral parts of Gomphrena globosa L. represent a potential source of betacyanins. In this context, the present study aims to evaluate: 1) a process for the selection and separation of pigmented floral bracts and bracteoles (~4 % of the dried plant material); 2) the identification of the major betacyanin compounds (gomphrenin II and III, and isogomphrenin II and III); 3) the most appropriate extraction procedures (from maceration, microwave and ultrasound assisted techniques) together with the optimal conditions that maximize betacyanin extraction (time, temperature, solid-liquid ratio and ethanol-water ratio); and 4) shelf life and colour stability of the obtained natural agent. The responses were assessed by the quantification of betacyanins by high-performance liquid chromatography coupled with a photodiode array detector and mass spectrometry with electron spray ionization. In addition, results clarified some contradictory trends described in the literature concerning the time and temperature variables, finding a considerable improvement on the betacyanins yield (higher than that typically found for Beta vulgaris), without displaying any type of degradation patterns.

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