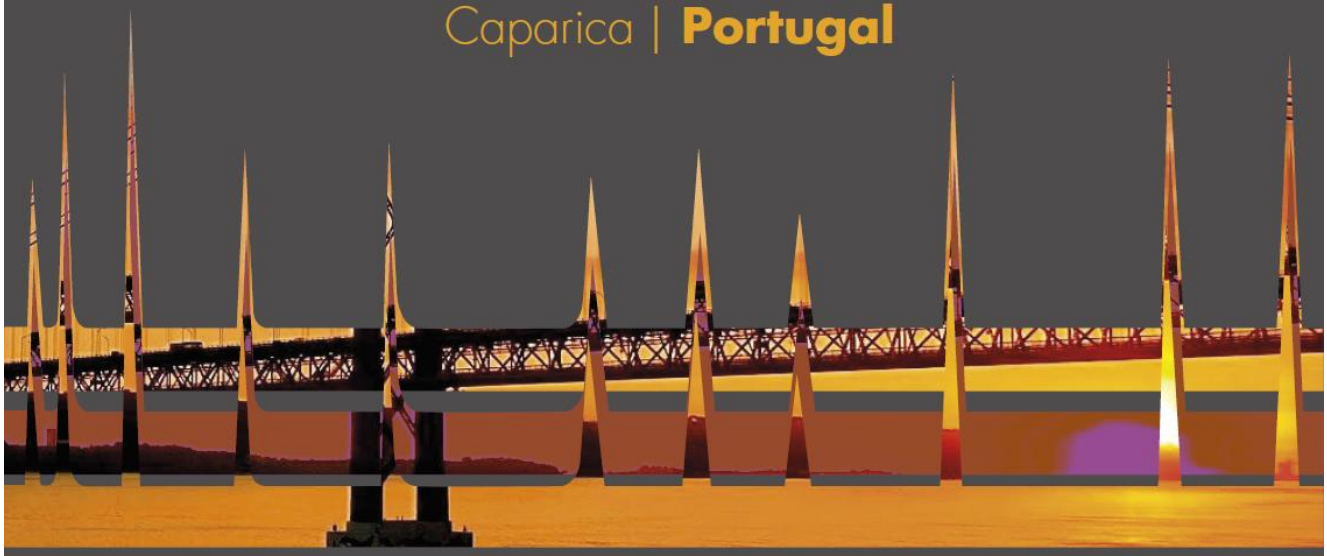
11º CONGRESSO NACIONAL DE **CROMATOGRAFIA**

20 anos CROMATOGRAFIA

11th NATIONAL MEETING ON CHROMATOGRAPHY

9|11 Dezembro 2019

Caparica | **Portugal**



Faculdade de Ciências e Tecnologia,
Universidade NOVA de Lisboa

Sociedade Portuguesa de Química

FCT Faculdade de Ciências e Tecnologia Universidade Nova de Lisboa

Universidade de Évora

Ciências ULisboa

Title
11th National Chromatography Meeting

Título
11º Encontro Nacional de Cromatografia

Authors
Eduardo Mateus (Universidade Nova de Lisboa)
José Manuel F. Nogueira (Universidade de Lisboa)
Marco Gomes da Silva (Universidade Nova de Lisboa)
Maria João Cabrita (Universidade de Évora)

Edition
Faculdade de Ciências e Tecnologia
Universidade Nova de Lisboa
Campus de Caparica, Portugal
https://www.fct.unl.pt/

Imaging services
Camy (FCT, Universidade Nova de Lisboa)

URL
http://11enc.eventos.chemistry.pt/
e-mail: 11enc@chemistry.pt

ISBN: 978-989-8124-29-6

O34 Use of GC×GC-ToFMS to evaluate the impact of plant-based coatings in the preservation of 'Rocha' pears during long-term storage

Alexandre M. A. Fonseca[1], Cindy Dias[2], Ana L. Amaro[2], Nélson Isidoro[3], Manuela Pintado[2], Armando J. D. Silvestre[1], Sílvia M. Rocha[4]

[1]*CICECO, Departamento de Química, Universidade de Aveiro, 3810-193 Aveiro*
[2]*Universidade Católica Portuguesa, Centro de Biotecnologia e Química Fina – Lab. Associado, Escola Superior de Biotecnologia, 4169-005 Porto*
[3]*Cooperativa Agrícola dos Fruticultores do Cadaval, CRL (COOPVAL), Estrada Nacional 115, Km 26 2550-108 Cadaval*
[4]*QOPNA/LAQV-REQUIMTE, Departamento de Química, Universidade de Aveiro, 3810-193 Aveiro*
Email: alexandrefonseca@ua.pt

'Rocha' pear (*Pyrus communis* L. cv. Rocha), is a Denomination of Protected Origin cultivar from west region of Portugal. It is a fruit highly appreciated by the consumers, in both internal and external markets due to its unique sensorial properties, namely its distinctive aroma. With an average annual production of 173 000 tons, 'Rocha' pear represents the main pear cultivar in Portugal and occupies the fourth position in Europe[1]. Currently, pears from this cultivar are harvested in August and may be stored up to 9 months under controlled atmosphere (CA) conditions (at 0 to 1°C and 0.3% O_2). During this long-term cold storage period, pears are susceptible to physiological disorders that are highly dependent on pre- and postharvest factors. One of such disorders, the so-called "superficial scald", is characterized by the appearance of brown or black patches on the fruit's surface that greatly depreciates its appearance, taste, texture and flavour, and inevitably their economic value. The superficial scald has been associated with α-farnesene oxidation into conjugated trienes (CTs)[2], although a full understanding of its mechanism remains unclear. CTs disrupt cell membranes, leading to polyphenoloxidase-mediated browning of the fruit peel and subsequent necrosis of the hypodermal cell layers[3]. Some strategies to prevent or minimize superficial scald have been developed, however they still show limited success, which open opportunities for the development of sustainable and more efficient methodologies to prevent superficial scald and preserve the peculiar characteristics of 'Rocha' pears. Thus, the objective of this study is to evaluate the impact of plant-based coatings in the preservation of 'Rocha' pears during long-term storage. To fulfil these objectives, a pilot scale assay was performed across a 4-month storage period in both modified (2°C; 0.3% O_2) and normal atmospheric conditions (2°C). For each storage condition, 3 coatings were tested: pectin, and pectin combined with two different plant extracts. The volatile compounds released from uncoated pears, used as control, and coated pears were followed by headspace solid-phase microextraction (HS-SPME) combined with comprehensive two-dimensional gas chromatography coupled with time-of-flight mass spectrometry (GC×GC-ToFMS). This methodology allowed the detection of hundreds of instrumental features, among which a set of 64 compounds potentially related with oxidative processes and peculiar aroma of 'Rocha' pears[4] were selected[3,4]. Brix° and CTs were also quantified along the time of storage[5]. Hierarchical clustering analysis and heatmaps were performed combining all the domains of information (volatile components, Brix° and CTs) for the conditions under study (uncoated pears and three types of coated pears, storage under two conditions) across a 4-month storage period. Coating with pectin and plant extracts seems to delay ripening and oxidation processes, contributing to the preservation of pears longer compared to control conditions. These effects are more evident if combined with storage under modified conditions (2°C; 0.3% O_2).

Funding: *Thanks are due to FCT/MEC for the financial support to the QOPNA research Unit (FCT UID/QUI/00062/2013) and CICECO (FCT UID/CTM/50011/2013), through national funds and where applicable co-financed by the FEDER. Also thanks to the financial support of the project ReStoragePear – Desenvolvimento de estratégias na prevenção do escaldão superficial e acastanhamento interno na pera rocha e garantia da qualidade no armazenamento de longo prazo", with the reference POCI-01-0247-FEDER-017777, supported by COMPETE 2020.*

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