



# Natural products application: Health, Cosmetic and Food

Provided by nature, adapted scientifically for industry



**Book of abstracts**  
**1st International Online Conference**  
**4th - 5th February 2021**

**Title**

1st Natural products application: Health, Cosmetic and Food: book of abstracts

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**Suport**

Eletronic

**Format**

PDF

**Edition**

Instituto Politécnico de Bragança (IPB)

<http://www.ipb.pt>

5300-253 Bragança, Portugal

Tel. (+351) 273 303 382

**ISBN**

978-972-745-286-6

**URL**

<http://hdl.handle.net/10198/22068>



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## PCF-17

## CHEMICAL COMPOSITION AND BIOACTIVE PROPERTIES OF PUMPKIN SEEDS AND SEED CAKES

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Pumpkin, (*Cucurbita pepo* L.) is one of the most important vegetables of the Cucurbitaceae family which is widely used for its edible fleshy fruit, especially fruit pulp. However, other fruit parts such as seeds are a good source of phytochemical and usually consumed in raw or processed form. In the present work, the chemical composition and bioactive properties of pumpkin seeds and seed cakes were evaluated. Plants from local landrace “Nychaki” were cultivated at the experimental farm of the University of Thessaly during the summer-autumn growing period of 2020 and fruit were collected at marketable maturity. Seeds were removed from 15 randomly selected after cutting each fruit at the equatorial axis. Then seeds were air-dried at room temperature and pressed with a cold-press to obtain the seed oils and seed cakes, while whole air-dried seeds were ground to fine powder. The ground seeds were rich in fat and proteins (42.7 g/100 g dw and 37.7 g/100 g dw, respectively) while carbohydrates and ash content were 16.1 g/100 dw and 3.5 g/100 g dw. On the other hand, seed cakes contained a high amount of protein (58.6 g/100 g dw) and carbohydrates (28.4 g/100 g dw). Ground seeds and seed cakes contained all the four vitamin E isoforms ( $\alpha$ -,  $\beta$ -,  $\gamma$ - and  $\delta$ -tocopherols) with  $\gamma$ -tocopherol being the most abundant isomer in both samples (6.59 mg/100 g dw and 1.07 mg/100 g dw, respectively). The main detected free sugar in ground seeds and seed cakes were sucrose, followed by trehalose, fructose and glucose, while seed cakes contained a higher amount of sucrose and total free sugars than ground seeds. Regarding the organic acids content, oxalic acid content was the only detected compound in seed cakes, whereas no organic acids were detected in ground seeds. The main detected fatty acids were linoleic acid (43.9% and 41.5% in ground seeds and seed cakes, respectively) and oleic acid (37.0% and 36.3% in ground seeds and seed cakes, respectively), followed by stearic acid (4.83% and 5.46% in ground seeds and seed cakes, respectively). Polyunsaturated and unsaturated fatty acids were the main fatty acids class and accounted for 81.9% and 79.0% of total fatty acids in ground seeds and seed cakes, respectively. Finally, both materials showed no toxic effects against non-tumor PLP2 cell lines indicating that they are safe for human consumption. In conclusion, the presented results highlighted the nutritional value of the tested materials which could be considered a rich source of protein. Moreover, the high content in polyunsaturated fatty acids and tocopherols could be further valorized for pharmaceutical and nutraceutical purposes and increase the added value of pumpkin crop.

### Acknowledgments

This work was funded by the General Secretariat for Research and Technology of Greece and PRIMA foundation under the project PULPING (Prima2019-08). The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES to CIMO (UIDB/00690/2020); for the financial support through national funding from the FCT, within the scope of the Project PRIMA Section 2 - Multi-topic 2019: Pulping (PRIMA/0007/2019); and L. Barros and Â. Fernandes thank the national funding by FCT, P.I., through the institutional scientific employment program-contract for their contacts.