BOOK OF ABSTRACTS

Pineapple by-products integrated valorisation towards functional foods

Débora A. Campos*[1], Ricardo Gómez-García[1], José A. Teixeira[2], Lorenzo Pastrana-Castro[3], Maria Manuela Pintado[1]

[1]Universidade Católica Portuguesa, CBQF – Centro de Biotecnologia e Química Fina – Laboratório associado, Escola Superior de Biotecnologia, Rua Diogo Botelho 1327, 4169-005 Porto, Portugal
[2]Centro de Engenharia Biológica, Universidade do Minho, Campus Gualtar, 4710-057, Braga, Portugal
[3]INL – International Iberian Nanotechnology Laboratory, 4710-330, Braga, Portugal
* *deborancampos@gmail.com*

A high amount of industrial by-products are produced every day through processing of tons of fresh fruits. The processing generates a positive impact in the economy, but a negative impact on the environment, through the production of wastes that implies a loss of nutrients. During processing ca. 60% (w/w) of the pineapple fruit is lost, since usually only pineapple pulp is used for the production of products, so the main by-products generated are crowns (leaves), stems (core) and peels (Figure 1). Through green chemistry approach was possible to develop a fractionation of pineapple stems and peels, leading to the development of six pineapple new products (ingredients), two enzymatic high purity grade extracts, two pineapple liquid fractions with high antioxidant capacity and two pineapple flours with high content of soluble and insoluble dietary fiber. The enzyme fraction represented around 0.26% (w/w) of total fresh pineapple fresh weight for both by-products. Pineapple liquid fractions for stem by-product represented 68.5% (w/w) [4.8% (w/w) in dry basis] and for peel represented 57.7% (w/w) [17.3% (w/w) in dry basis]; pineapple solid fractions for stem represented 31.2% [3.1% (w/w) in dry basis] and for peel represented 42.2% [11.4% (w/w) in dry basis] of the total fresh pineapple weight. The total content of phenolic compounds has shown differences, the peels fractions showed lower content than the stems fractions, and the same tendency was found for the antioxidant capacities assays, as well as, the content total of vitamin C. Through HPLC analysis was possible to identify eight main phenolic compounds (for stem liquid fraction, while for peel liquid fraction seven were identified, and for both fractions was possible to quantify three compounds (chlorogenic, caffeic and ferulic acids). This data was corroborated by LC-ESI-UHR-QqTOF-MS where besides the 8 most representative where also identified new 11 compounds in small amounts. The fractionation by a green chemistry approach allowed the characterization and the study of different fractions of two pineapple by-products, leading to clear innovation by the development of six new ingredients. Therefore, this work has opened the opportunity to the market of new green products, as a result of by-products valorisation, not only for food industry, but also for nutraceutical and cosmetic industries.

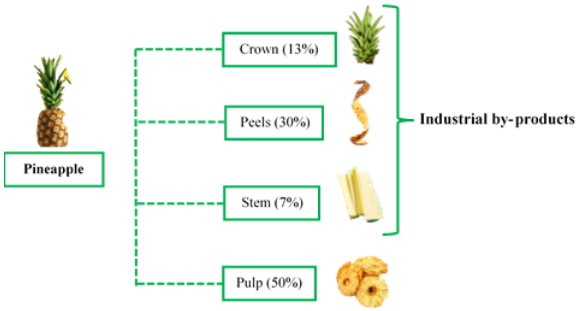

Fig.1. Flow chart of pineapple by-products identification in fruit processing industries.

Acknowledgments: This work was financially supported by CBQF under the FCT – Fundação para a Ciência e a Tecnologia through project Multibiorefinery – Multi-purpose strategies for the valorisation of a wide range of agroforestry by-products and fisheries: A step forward in the creation of an integrated biorefinery, (POCI-01-0145-FEDER-0066) and the project UID/Multi/50016/2019 and by PhD grant SFRH/BD/104074/2014 to Débora Campos.

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