

## Characterization of Patchouli and Vanillin Industrial Wastes as a Strategy for their Valorization

Lígia L. Pimentel<sup>α</sup>, Susana S. M. P. Vidigal<sup>α</sup>, Francisca S. Teixeira, Paula T. Costa, Manuela E. Pintado, and Luís M. Rodríguez-Alcalá\*

Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Diogo Botelho 1327, 4169-005 Porto, Portugal

<sup>α</sup> both authors contributed equally/\*contacting author: [lalcala@ucp.pt](mailto:lalcala@ucp.pt)

Patchouli is a cyclic terpene alcohol used as a fragrance ingredient (i.e. powerful sweet, herbaceous and spicy) [1] that has been demonstrated to exert low acute dermal toxicity [2-3]. The aromatic aldehyde Vanillin is a widely used flavoring agent and relevant antifoaming ingredient [4]. Fragrances/flavoring production from plants is accomplished by steam distillation, supercritical CO<sub>2</sub> or microwave assisted extraction. Hence, recent investigation suggests using of genetically modified microorganism to ensure reliable and sustainable supply [5]. Thus, Vanillin can be isolated from *Vanilla planifolia*, from chemical synthesis or by fermentation procedures [6].

In the framework of a valorization strategy, this research work aims to characterized fermentation by-products of the production of Patchouli and Vanillin through liquid (HPLC-ELSD) and gas chromatography (GC-QqQ). The assayed materials derived from the production of Patchouli and Vanillin contained high-value molecules such as Patchouli alcohol,  $\alpha$ -Guaiene,  $\alpha$ -Bulnesene and Vanillin and Vanillic Acid, as well as vanillin glucosides. Future assessment of its bioactivity will provide better information on the application of these compounds to turn waste into resource.

### REFERENCES

- [1] Bhatia SP. et al. Food Chem. Toxicol., **2008**, 46, S255-S256. doi: 10.1016/j.fct.2008.06.069.
- [2] Belsito D. et al. Food Chem. Toxicol., **2008**, 46, S1-S71. doi: 10.1016/j.fct.2008.06.085.
- [3] Soon Hong Soh et al. J. Clean Prod., **2021**. doi:10.1016/j.jclepro.2021.126661.
- [4] Banerjee G, Chattopadhyay P. J. Sci. Food Agric., **2019**, 99(2), 499-506. doi: 10.1002/jsfa.9303.
- [5] Francisco Aguilar et al. ACS Omega, **2020**, 50, 32436-32446. doi: 10.1021/acsomega.0c04590
- [6] Kaur B, Chakraborty D. Appl. Biochem. Biotechnol. , **2013**, 169,1353-72. doi: 10.1007/s12010-012-0066-1.