Aroma profile of submerged cultivated *Laetiporus montanus*

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Introduction

Basidiomycota offer a great biotechnological potential for the production of natural flavorings. *Laetiporus montanus* (LMO) is an edible fungus whose flavor profile has not yet been investigated. LMO shows a high macroscopic similarity to its well-studied close relative *Laetiporus sulphureus* (LSU), hence their distinction is based on ITS sequencing [1]. The LMO strain used was collected from spruce deadwood in the Black Forest National Park (Fig. 1) and is the first reported finding of LMO in the state of Baden-Württemberg. Submerged cultures of LMO were characterized by an intense spicy and “Maggi”-like aroma.

Fig. 1: Fruiting bodies of *Laetiporus montanus* on spruce deadwood in the Black Forest National Park (Photo by Flavius Popa)

Methods and results

After liquid-liquid extraction (LLE) followed by automated solvent-assisted flavor evaporation (aSAFE) of the submerged LMO cultures, the obtained SAFE extract was diluted stepwise 1:2 (flavor dilution (FD) factor = 2^n, with n = dilution level), and an aroma extract dilution analysis (AEDA) was performed by means of gas chromatography-olfactometry (Fig. 2).

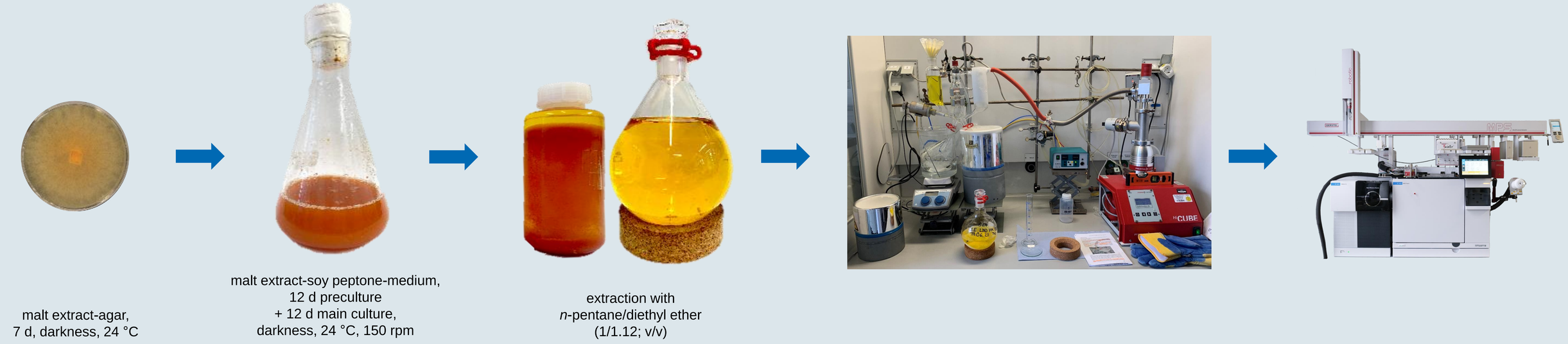

Fig. 2: Approach of aroma extract dilution analysis (AEDA)

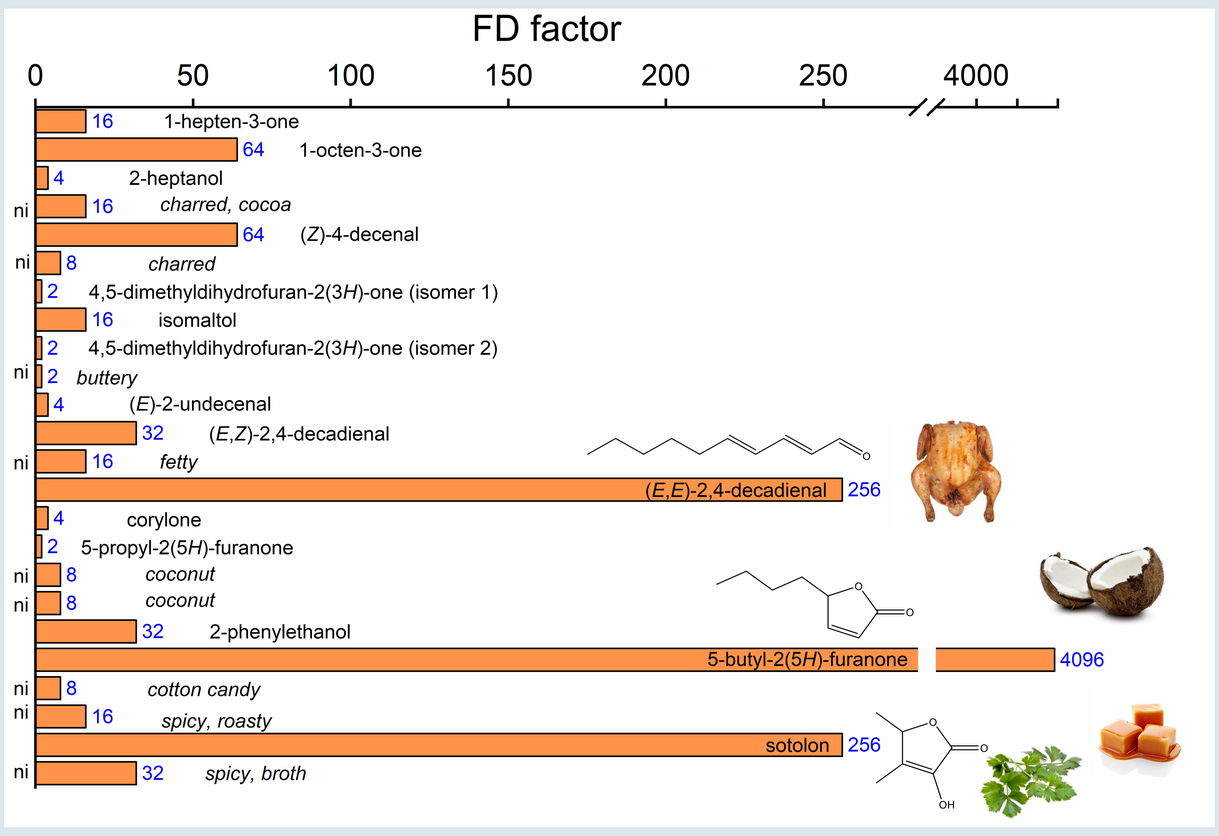

Fig. 3: AEDA results for LMO submerged cultures (12 d) in malt extract-soy peptone-medium (ni = not identified)

Conclusions

5-Butyl-2(5*H*)-furanone (FD 4096), (*E*,*E*)-2,4-decadienal (FD 256), and sotolon (FD 256) were determined as the compounds with the highest FD-factors (Fig. 3). In particular, (*E*,*E*)-2,4-decadienal (fatty, chicken-like) and sotolon (spicy, caramel), together with other caramel notes, contributed to the spicy, "Maggi"-like aroma of LMO submerged cultures grown in malt extract-soy peptone-medium. 5-Butyl-2(5*H*)-furanone, on the other hand, was characterized as imparting a coconut-like aroma. Sotolon has also been detected in submerged cultures of LSU [2], whereas the occurrence of (*E*,*E*)-2,4-decadienal and 5-butyl-2(5*H*)-furanone has not been yet described for LSU. The results presented show the potential of LMO for flavoring vegan and vegetarian foods.

[1] Tomšovský M.; Jankovský L. (**2008**) Validation and typification of *Laetiporus montanus*. *Mycotaxon* ***106*****(5), 289–295**.
[2] Krings, U.; Grimrath, A.; Linke, D.; Schindler, S.; Berger, R. G. **(2011)** Volatiles responsible for the seasoning-like flavour of cell cultures of *Laetiporus sulphureus*. *Flavour Fragr. J.* ***26*****, 174–179**.