

The expansion of the promising value of *Flammulina velutipes* and the prospect of its sustainable development

Jiaxin FAN¹, Ahmed ASHOUR¹, Ahmed HASSAN¹, Yhiya AMEN¹, Maki NAGATA¹, Masako MATSUMOTO¹, Shuhei KANEKO¹, Dongmei WANG¹, Satoshi ISHIKAWA², Shinichi MUTA², Kuniyoshi SHIMIZU¹

¹ Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Japan

² Hakutakekan Agricultural Corporation, Japan

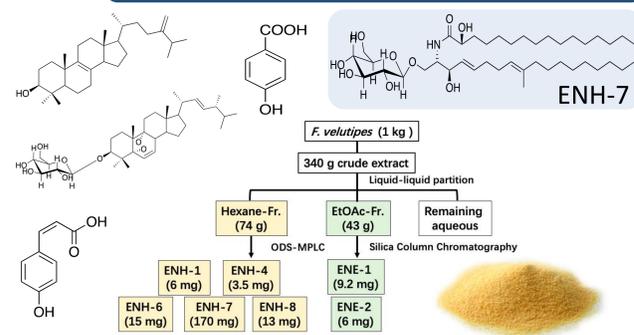
Background

- *Flammulina velutipes*, the Enoki mushroom, a nutritional and low-calorie food, and an excellent source of amino acids and vitamins.
- Global Enoki mushroom market is projected to reach USD 1517.4 million by 2026.
- Asia, one of the largest consumer markets. In Japan alone, the annual output of Enoki mushroom is over 140,000 tons.

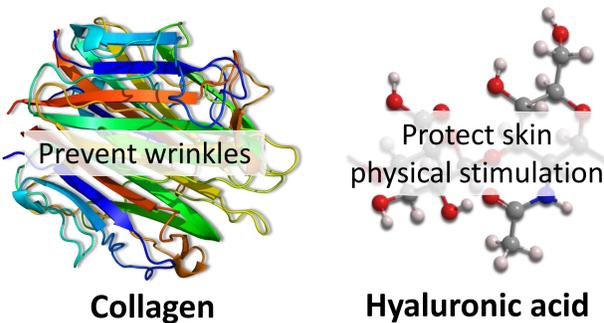
Purpose

- Further expand the unrevealed value in *Flammulina velutipes*.
- Increase the added value in *Flammulina velutipes*.
- Explore the lipid component and its essential role in the development of *Flammulina velutipes*.
- Provide the new ideas of edible fungi related agro-product research and its sustainable development.

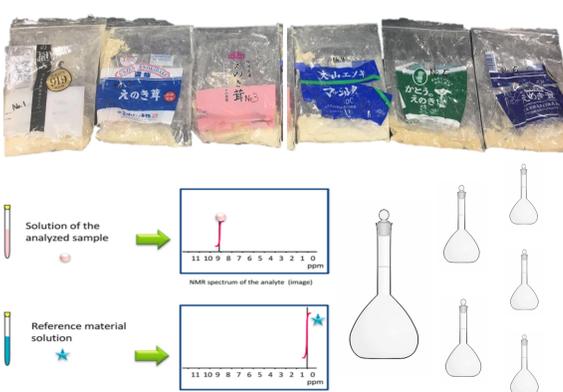
Isolation and identification



Bioassay evaluation



Quantification analysis

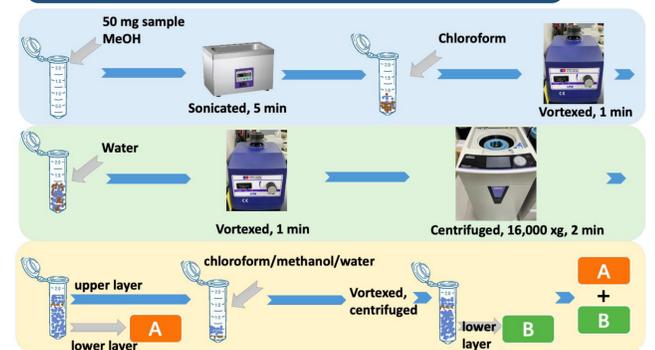


Flammulina velutipes (Enokitake)

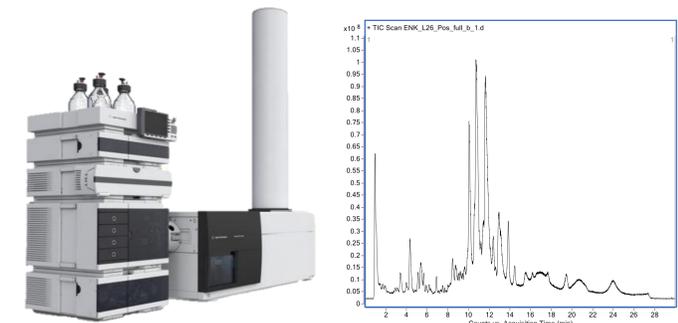
Prospect



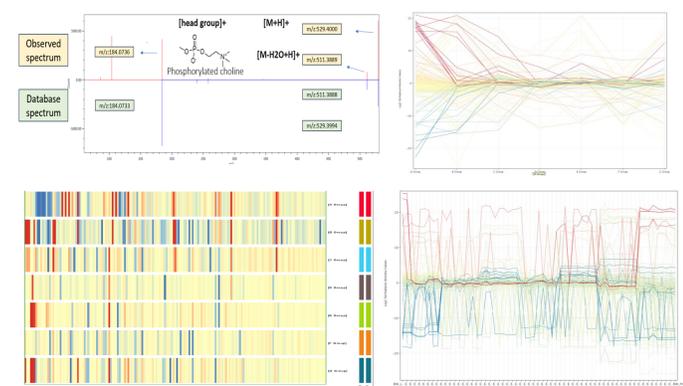
Sample pretreatment



UPLC-QTOF/MS analysis



Statistical Data Processing

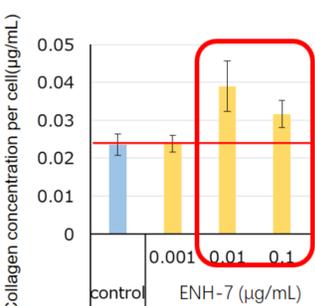


Result

- To our knowledge, the glucosylceramide ENH-7 is reported from *F. velutipes* for the first time.
- Figure 1 suggested that ENH-7 has an action of enhancing the expression of ceramide synthases genes. Additionally, ENH-7 can be expected to promote the production ability of collagen and hyaluronic acid.
- All tested brands showed the presence of ENH-7. ENH-7 could be potential marker of quality control. (Table 1)
- The content of lipid components other than glucosylceramide in different growth stages of *F. velutipes* has significant changes.

Discussion

With glucosylceramide as a starting point, this study explored the composition and potential biological activity of lipid components in *F. velutipes* that few people have paid attention to. Provides the possible prospects of lipid components in the research of in *F. velutipes* and in functional development, mass production, and biomass utilization.



Enoki Brand	mean ± SD (mg/kg, n=4, (Dry weight))
A	907 ± 20
B	803 ± 10
C	830 ± 12
D	861 ± 20
E	775 ± 14
F	734 ± 9

Table 1. Quantification result of ENH-7 in Enoki from 6 brands

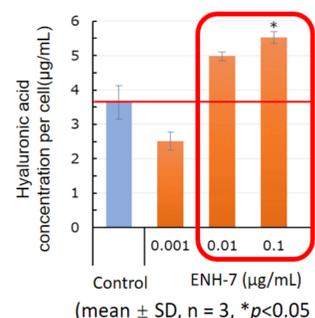


Figure 1 Bioassay evaluation

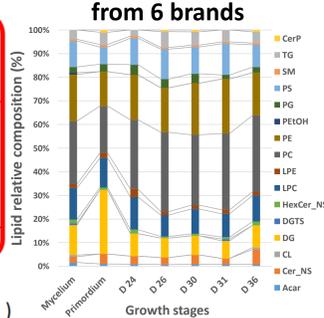


Figure 2 Lipid relative composition during growth stages



Jiaxin FAN, 2nd year PhD student
3be20107w@s.kyushu-u.ac.jp