

## 【論文】

アルコール耐性アミラーゼを生産するきのこ類の検索および当該菌を用いた味醂の製造

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Screening of mushroom strains producing alcohol-tolerant amylase and mirin production using these strains

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### [Abstract]

We produced mirin (Japanese fermented alcoholic seasoning) using mushrooms instead of *Aspergillus oryzae*. Thirteen strains were screened from 91 strains of edible mushrooms as high amylase-producing strains, and alcohol tolerance of amylase produced by these strains was investigated. Amylase of *Ganoderma lucidum* NBRC31863 showed the highest tolerance in the presence of 20% ethanol (the activity was 89.5% of that in the absence of ethanol). The amylase activity of commercial rice koji (*Aspergillus oryzae*) under the same conditions was 72.3%. We selected *Ganoderma lucidum* NBRC31863 and three other mushrooms strains, and produced mirin using these strains. Mirin produced by *Mucidula mucida* var. *asiatica* SKB021, and *G. lucidum* NBRC31863, showed high total sugar content in the mushroom mirin produced (180 g/L, and 177 g/L, respectively), although it was lower than that of commercial mirin (425.6 g/L). The organic acid content and amino acid content of mushroom mirin were both higher than commercial mirin. Furthermore, mushroom mirin showed high antioxidative activity, and the DPPH radical scavenging activity of mirin produced by *M. mucida* var. *asiatica* SKB021 was 33.3 nmol-Trolox/mL, which is one of the advantages of using mushrooms for mirin production. The taste and aroma of mirin produced by *G. lucidum* NBRC31863 was good, and no significant difference was observed compared to commercial mirin in sensory evaluations.

**Key words:** Alcohol-tolerant amylase, Basidiomycetes, *Ganoderma lucidum*, Mirin, *Mucidula mucida* var. *asiatica*

### [摘要]

きのこ類を用いて味醂を製造するため、食用・薬用きのこ類 91 株を対象としてアミラーゼ生産性の高い 13 株を選抜し、アミラーゼのアルコール耐性を調べた。その結果、エタノール 20%存在下でのマンネンタケ NBRC31863 株の相対活性は 89.5%で市販米麴の 72.3%よりも高い値であった。そこで 4 株のきのこ類を用いて味醂の試醸を行ったところ、全糖量は高い値を示したヌメリツバタケ SKB021 麴味醂、マンネン

タケ NBRC31863 麴味醂でそれぞれ 180 g/L, 177 g/L と, 市販本味醂 (426 g/L) よりも低かったが, 有機酸・アミノ酸含有量は市販本味醂よりも高かった. またきのこ味醂は高い抗酸化活性を有しており, このことはきのこ類を用いる利点になると思われた. 呈味性についても良好であり, 官能検査においてマンネンタケ NBRC31863 麴味醂は味, 香りについて市販本みりんとの間には有意な違いは示されなかった.