

英 文 摘 要

Grifola gargal Singer (Anninko), which is the edible mushroom with the characteristic almond favor, is naturally found only in the limited areas of Chile and Argentine in South America. Thus, very few studies of this wood-rotting fungus not only on the morphological, physiological and biological characteristics, but on the mushroom cultivation have been reported. In this research, aiming the commercial mushroom production, the fruit body formation of *G. gargal* in artificial wood meal media was investigated, and the flavor and nutritional components of *G. gargal* were determined. The investigation of the taxonomic position of *G. gargal* was also included.

The morphological features of some wild strains of *G. gargal* mostly consisted with those of *Grifola* sp. as described with Singer. The sequences for the ITS-rDNA of GG010 strain are 560bp, and showed 99% similarity to *G. sordulenta*, 96% similarity to *G. frondosa*. In the phylogenetic trees using these sequences data indicated that *G. gargal* and *G. sordulenta* formed the independent clade from *G. frondosa*.

The fruit-bodies of *G. gargal* could be formed in Buna (*Fagus crenata*) and mixed

hardwood (*Quercus serrata* et.) media. Sugi (*Crytomeria Japonica*) was also able to use as a component of media (hardwoods : sugi = 4 : 1). Of the 12 strains examined for fruit-body production in mixed hardwood media, the two strains of GG006 and GG010 were found to be suitable strains for the commercial cultivation of the mushroom judging from the yield, the shape and color of mushroom.

The major flavor product from the fruit-bodies and the mycelia of *G. gargal* was identified by gas chromatography-mass spectrometry analysis to be benzaldehyde. The mycelia of *G. gargal* grew favorably in peptone-glucose-yeast extract liquid media adjusted at 20°C. Under this growth condition, the production of benzaldehyde from *G. gargal* significantly accumulated after the linear growth phase, and the amount did not decline during the stable stage of mycelial growth. The production of benzaldehyde was promoted by adding of phenylalanine, asparagine and benzoic acid into the liquid media. Therefore, *G. gargal* could be a potential producer of benzaldehyde, which is a very expensive and a popular natural aroma.

The cultivated mushroom of *G. gargal* contained remarkably high amounts of vitamin D as compared to those of the cultivated mushrooms such as maitake (*G. frondosa*) and shiitake (*Lentinula edodes*). The amount of vitamin D in *G. gargal* significantly increased with the

exposure to light of fluorescent lamps during a period of fruiting body formation. In addition, the vitamin D content of *Ggargal* increased up to 20-fold after irradiating of UV-light in the wavelength 245nm for 2 hours. Therefore, *Ggargal* could be expected to be a healthy food for preventing to rickets in children and osteoporsis in adults as a potential source of vitamin D.

From these results, it would become possible in the near future to commercially supply a new type edible mushroom with almond flavor and rich vitamin D to the Japanese market by the artificial cultivation of *Ggargal* in wood meal media, and to biologically produce benzaldehyde as a natural aroma by mycelial incubation of *Ggargal* in liquid media.