

【論文】

Production of plant cell wall-degrading enzymes in *Lentinula edodes* and the important role of laccase in early stages of solid-state cultivation

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[Abstract]

We studied the production of plant cell wall-degrading enzymes in *Lentinula edodes* grown on sawdust medium. A mycelial mat was spotted onto the center of a medium plate, which was then incubated at 23°C for 31 days. Laccase (EC 1.10.3.2) activity was detected before that of other enzymes. Laccase activity increased along with mycelial growth until the leading edge of the mycelium reached the edge of the plate, and then decreased. Decrease of laccase activity was followed by increased activity of other enzymes. Sawdust treated with purified laccase (Lcc1) was more sensitive to degradation by crude enzymes from *L. edodes*. These results suggest that laccase plays an important role during early stages of solid-state cultivation of *L. edodes*.

**Key words:** Laccase, *Lentinula edodes*, Lignin-degrading enzymes, Plant cell wall-degrading enzymes, Solid-state cultivation

[摘要]

菌床を模したシャーレ上のコナラの大鋸屑を含む固体培地で生育させたシイタケが生産するリグニン分解酵素活性と植物細胞壁分解酵素活性の変動を測定した。シイタケは、シャーレ上の固体培地で23°C、31日間培養した結果、菌糸の成長点付近において強いラッカーゼ活性が認められ、ラッカーゼ活性は菌糸のシャーレへの蔓延とともに減少した。アミラーゼ、カルボキシメチルセルラーゼ、キシラナーゼはラッカーゼが減少した後に生産された。ラッカーゼにより処理したコナラの大鋸屑では未処理の大鋸屑に比べてセルラーゼを含む粗酵素液に対する感受性が高まったことから、シイタケの固体培養におけるラッカーゼの重要性が示唆された。