

Supatar Seeploy 2010: Remediation of Polycyclic Aromatic Hydrocarbons Contaminated Soil using Spent Mushroom Compost. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Associate Professor Patana Anurakpongsatorn, D.Tech.Sc. 101 pages.

Spent mushroom compost (SMC) is a waste from mushroom growing farm. Mushroom is white rot fungi. Most of white rot fungi group produces ligninolytic enzyme. This enzyme has been used to degrade organic compound for fungi subsistence. More recently, ligninolytic enzyme can break down aromatic ring of polycyclic aromatic hydrocarbons (PAHs). This research studied using 6 types SMC of *Pleurotus ostreatus*, *Ganoderma lucidum*, *Pleurotus cystidiosus*, *Pleurotus sajor-caju*, *Lentinus edodes*, *Auricularia spp.* to remediate PAHs contaminated soil. SMC was mixed to contaminated soil and moisture content of mixed compost was kept for 40-60% through out 28 days. The *P. ostreatus* SMC showed a highest removal of all PAHs ($p < 0.05$). The percentage removal of pyrene, benzo[a]pyrene, anthracene and naphthalene from a treatment of *P. ostreatus* SMC were 74.2, 79.49, 79.36 and 80.33%, respectively. Furthermore, the total laccase enzyme activity from a treatment of *P. ostreatus* SMC was the highest laccase enzyme activity at 114.8 U/kg ($p < 0.05$) after compared with other SMC. MnP enzyme was very low in all treatments. That was not significant different in each fungi ($p > 0.05$). Laccase is an important enzyme for PAHs removed than MnP enzyme. The research studied on efficiency of PAHs removal using *P. ostreatus* SMC mixed with contaminated soil by adjustment ratio of contaminated soil with *P. ostreatus* SMC and moisture content of mixed compost was kept for 40-60% through out 28 days. The 1:3 ratio of soil contaminated with *P. ostreatus* SMC showed the highest percentage removal of PAHs $74.9 \pm 0.48\%$ follow 2:3 ($67.8 \pm 0.73\%$), 1:2 ($53.0 \pm 0.68\%$) and 1:1 ($46.7 \pm 0.86\%$), respectively. The temperature of compost increased when the compost systems was added more of *P. ostreatus* SMC. Within laboratory scale, the SMC had a potential to remediate the soil contaminated with PAHs.

Student's signature

Thesis Advisor's signature