

Cellulase enzyme production from filamentous fungi *Trichoderma reesei* and *Aspergillus awamori* in submerged fermentation with rice straw

ABSTRACT

Fungi are a diverse group of microorganisms that play many roles in human livelihoods. However, the isolation of potential fungal species is the key factor to their utilization in different sectors, including the enzyme industry. Hence, in this study, we used two different fungal repositories—soil and weed leaves—to isolate filamentous fungi and evaluate their potential to produce the cellulase enzyme. The fungal strains were isolated using dichloran rose bengal agar (DRBA) and potato dextrose agar (PDA). For cellulase enzyme production, a rice straw submerged fermentation process was used. The enzyme production was carried out at the different incubation times of 3, 5, and 7 days of culture in submerged conditions with rice straw. Fungal identification studies by morphological and molecular methods showed that the soil colonies matched with *Trichoderma reesei*, and the weed leaf colonies matched with *Aspergillus awamori*. These species were coded as *T. reesei* UMK04 and *A. awamori* UMK02, respectively. This is the first report of *A. awamori* UMK02 isolation in Malaysian agriculture. The results of cellulase production using the two fungi incorporated with rice straw submerged fermentation showed that *T. reesei* produced a higher amount of cellulase at Day 5 (27.04 U/mg of dry weight) as compared with *A. awamori* (15.19 U/mg of dry weight), and the concentration was significantly different ($p < 0.05$). Our results imply that *T. reesei* can be utilized for cellulase production using rice straw.