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ACCEPTED MANUSCRIPT

The diploid genome of the only sclerotia-forming wild-type species in the genus *Pleurotus* - *Pleurotus tuber-regium* - provides insights into the mechanism of its biomass conversion from lignocellulose substrates

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Abstract
Pleurotus tuber-regium (Fr.) Singer, being a white-rot fungus, is widely used for food and medicine in the Asia-Pacific region. In this study, we sequenced and annotated the genome of a dikaryon *P. tuber-regium* wild strain to provide a better understanding of the carbohydrate-active enzymes (CAZymes) involved in the bio-conversion of lignocellulose to beta-glucan reserves in this sclerotia-forming *Pleurotus* mushroom with reference to enzyme participated in cellulosic compound breakdown and glucan reserve biosynthesis. The present genomic data provides new insights for lignocellulose bioconversion of white-rot fungus for the genus *Pleurotus*.

Keywords:
BUSCO (Benchmarking Universal Single-Copy Orthologs)
Carbohydrate-active enzymes (CAZymes)
Diploid genome
Illumina sequencing
Pleurotus tuber-regium
Sclerotia-forming
White-rot fungi

Lignocellulose, including cellulose, hemicelluloses and lignins, is the world most abundant organic compound (Sánchez, 2009). Bioconversion of lignocellulosic biomass by white-rot fungi/mushroom of the genus *Pleurotus* plays an important role in producing biofuels and value-added products (Martínez et al., 1994). *Pleurotus tuber-regium*, being the only sclerotia-forming species in *Pleurotus* mushroom is also known as the King Tuber Mushroom (Nwachukwu & Adedokun, 2014). It has been widely exploited for converting lignocellulosic by-products into sclerotia and fruiting bodies with very high nutritional and medicinal values (Oranusi et al., 2014). It has been demonstrated that *P. tuber-regium* can grow on a wide range of lignocellulosic substrates such as sawdust, grass, agricultural waste from sugarcane and corn-cobs (**Figure 1**).

As a white-rot fungus, *P. tuber-regium* produces various secretory enzymes, including cellulases, hemicellulases, pectinases, ligninases, proteases and peptidases, for transforming the substrate biomass, including cellulose, hemicellulose and lignin into its own carbohydrate reserves which are mainly glucans. However, the detailed composition of the carbohydrate-active enzymes CAZymes) specifically acting on the lignocellulosic substrates at the genome-scale in this fungus remains to be revealed.

Dikaryon wild strain *P. tuber-regium* was obtained from Fungi Perfecti, Ltd. Co. (Olympia, WA, USA). The strain was maintained on complete Potato Dextrose Agar (cPDA) medium (the

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