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**Enlightenment of *Pycnoporus* species: isolation, characterization, and biotechnological applications of a new tyrosinase from *Pycnoporus sanguineus*.**

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Tyrosinase (monophenol, o-diphenol:oxygen oxidoreductase, EC 1.14.18.1) is a copper-containing enzyme that catalyses two different reactions: the ortho-hydroxylation of monophenols (monophenolase activity) and the oxidation of o-diphenols to o-quinones (diphenolase activity), both using molecular oxygen. Tyrosinase can have numerous biotechnological applications including waste water treatment with phenol removal<sup>1</sup>, synthesis of high-value o-diphenolic drugs<sup>2</sup>, healthy antioxidant molecules<sup>3</sup>, and formation of biopolymers by cross-linking of polysaccharide-protein<sup>4</sup> or protein-protein<sup>5</sup>. The practical application of tyrosinase in biotechnology requires large quantities of enzyme. Therefore, we screened various *Pycnoporus* strains (known for their ability to produce high amount of laccase<sup>6, 7</sup>), deposited in international collections or isolated from Chinese tropical regions, as potential overproducers of tyrosinase. The strain *P. sanguineus* BRFM 49 showed the highest productivity (45.4 and 163.6 U g proteins<sup>-1</sup> day<sup>-1</sup> for monophenolase and diphenolase, respectively) and was subsequently chosen for tyrosinase purification. This tyrosinase was monomeric with a molecular mass of 45 kDa. It was shown to be almost fully active in a pH range of 6-7, in a large temperature range (30-70°C), and was stable below 60°C; it showed an acidic pI (4.5-5) with four isoforms or isoenzymes.  $K_m$  and  $V_m$  values were 1 mM and 37.8 U mg proteins<sup>-1</sup> for monophenolase activity, and 0.9 mM and 78.7 U mg proteins<sup>-1</sup> for diphenolase activity. No N-glycosylation could be detected. The N-terminal amino acid sequence was determined as IVTGPVGGQTEGAPAXNR. This tyrosinase was shown to be effective for the bioconversion of p-tyrosol and p-coumaric acid into the antioxidants p-hydroxytyrosol and caffeic acid, respectively.