

**SAPONINS FROM *MEDICAGO SATIVA*  
AS THE NATURAL INDUCTORS OF LACCASE FROM WHITE ROT FUNGI**

**Jarosz-Wilkolazka A.<sup>1</sup>, Malarczyk E.<sup>1</sup>, Biały Z.<sup>2</sup>, Jurzysta M.<sup>2</sup>**

<sup>1</sup> *Department of Biochemistry, Maria Curie-Skłodowska University,  
Skłodowska Place 3, 20-031 Lublin, Poland*

<sup>2</sup> *Department of Biochemistry, Institute of Soil Science and Plant Cultivation,  
Czartoryskich Street 8, 24-100 Pulawy, Poland*

The influence of aqueous extract of alfalfa (*Medicago sativa*) tops, roots or seeds, and isolated saponins (SAP) from alfalfa roots on the growth and biological activity of *Trametes versicolor* was examined. This white rot fungus produces an extracellular complex of non-specific, delignifying enzymes, which degrade different resistant molecules in the environment. The main ligninolytic enzyme of *Trametes versicolor* is laccase (LAC), a multicopper oxidase, which reduces oxygen to water and simultaneously catalyses one-electron oxidation of many aromatic substrates.

Results of the present study indicate that saponins from roots of a *Medicago sativa* strain are very good inductors of extracellular LAC. This strain was cultivated on liquid, mineral medium for 10 days. A 10-fold increase in the LAC activity was observed after the addition of saponins. Both crude extracts from saponin-rich alfalfa and highly refined saponin fractions were examined. The kinetic data were calculated for crude LAC prepared from the liquid growth medium of *T. versicolor*. These data were obtained with three different substrates: 2,2'-azinobis(3-ethylbenzthiazoline-6-sulfonate (ABTS), 2,6-dimethoxyphenol (DMP) and guaiacol (GWA). With ABTS as substrate, the quantity of a saponin sample did not make any difference for the Lineweaver-Burk plots. These plots were identical also with DMP, for the control, 0.1 and 1 mg of saponin. The lowest results were obtained with GWA as substrate. The LAC activity was measured against 1 mg/mL of root saponins and relations between them were as follows: DMP>ABTS>GWA.

The results of the present study suggest that saponins may be used as natural inductors of fungal LAC; this would obviate the need to use toxic xenobiotics.