Comparative Enzymatic Assay of Laccase Enzymes from *Trametes versicolor* and *Rhus vernicifera*

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The textile industry is responsible for creating some of the most polluting waste water of all industries. The dyes left over in the waste effluent can be toxic or highly mutagenic compounds that are not completely removed by traditional treatment methods. If these compounds get into the environment they will persist there and can decrease light penetration, photosynthetic activity and cause oxygen deficiency in natural waterways. Laccases are multi-copper oxidase enzymes that oxidize compounds in a reaction that reduces oxygen to water. They have become prominent in the textile industry for treatment of waste water effluents as they can remove these toxic and mutagenic compounds or react in a way that these compounds can be removed by precipitating them out. The harsh optimal conditions of the more widely used fungal derived laccases (pH 3, and 50°C) hinder their use in more traditional methods of dyeing, such as hand dyeing. Plant derived laccases may provide a milder alternative as they work at optimal conditions of pH 7, and 25°C. This study explores the potential degradative capacities of the plant laccase derived from *Rhus vernicifera*. ABTS, a common biotechnological redox mediator used to increase decolouration, will be used as the substrate to characterize the enzymatic activity of the plant laccases. The rate of reaction will be measured as a change in absorbance using a spectrophotometer. Plant laccase activity will be compared to the activity of the well-researched *Trametes versicolor* fungal laccase using T-test statistical analysis. The plant laccase is hypothesized to be a comparable alternative. If this hypothesis holds, this will contribute to development of an environmentally friendly effluent treatment that can be used at all levels in the textile industry.