# Biosorventum: A Novel Approach for Textile Effluent Treatment

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The Brazilian textile industry has been a highlight of the global economy. However, this industry generates great quantities of effluents that present high concentrations of dyes and chemical substances. To resolve this problem it could be used the adsorption technique with alternative materials instead of activated carbon. So, the aim of this project was to evaluate the use of agricultural byproducts from North Coast of Rio Grande do Sul in the adsorption of blue cationic dye (BCD). I produced three different biosorbents: rice husk (RH), passion fruit peel (PFP) and passion fruit seed (PFS). I characterized the biosorbents properties. Experiments were performed in triplicate using a $2^2$ factorial design with response surface methodology in order to evaluate the influence of pH and initial concentration of BCD in the dye adsorption. Analysis of Variance was used to analyze the significance of the proposed model at 95% of reliability. Then, with my best results from $2^2$ factorial design: pH 8.0 and 5mg/L of BCD, I performed a $2^3$ factorial design to optimize the quantities of RH, PFP and PFS. I observed that all biosorbents were statistically significant with an adsorption up to 99.8%. So, I collected an industrial effluent from my region to test my developed materials. In the effluent tests, I observed that the biosorbents adsorbed 82.3%. The sale price was 38.7% cheaper than the commercial activated carbon. This project presents environmental, financial, scientific and social relevance, since the studied adsorbents are innovative and a sustainable solution to textile effluent treatment.

**Awards Won:**

University of Arizona: Tuition Scholarship Award