**A Novel Hydrogel-Potato Powder Modified Carbon Paste Electrode as a Biosensor for Determination of Paracetamol**

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An electrochemical biosensor based on paraffin/graphite modified with potato powder as a source of polyphenol oxidase and hydrogel as a matrix for immobilization of enzyme was developed and it was used for determination of paracetamol. This enzyme, catalyses the oxidation of paracetamol to n-acetyl-p-benzoquinoneimine. The electrochemical behavior of paracetamol was studied by hydrogel-potato powder carbon paste electrode using cyclic voltammetry (CV). For construction of the electrode, the tissue of potato was fragmented, exposed to air, washed with distilled water to remove the oxidation products from the tissue, and then it was vacuum dried and pulverized to a fine powder. The acrylic based hydrogel was synthesized; afterwards, a novel, simple modified carbon paste electrode with hydrogel was prepared. The chemical and electrical parameters affecting the voltammetric response of the biosensor like potato and hydrogel composition, pH, scan rate, temperature, were optimized. The results obtained by cyclic voltammetry revealed that the hydrogel-potato powder carbon paste electrode shows a higher current response about 4 folds compared to a potato powder carbon paste electrode and about 20 folds compared to a bare carbon paste electrode. The linear calibration range of the biosensor was 25µM to 1.25 mM (R2= 0.995) with a detection limit of 4.0 µM paracetamol. The proposed electrode exhibits a long life time (2 months) and was successfully applied to paracetamol determination in urine samples.

**Keywords:** Tissue biosensor, Carbon paste, Polyphenol oxidase, Hydrogel