conferenceseries.com

J Biosens Bioelectron 2018, Volume 9
DOI: 10.4172/2155-6210-C1-037

Development of surface activated disposable screen printed electrochemical sensor utilizing functionalized carbon nanotube for the detection of secondary metabolite in Ganoderma boninense infected oil palm (*Elaeis guineensis*) root

Nor Azah Yusof[1], Sulayman Akanbi Fowotade[1, 2], Jaafar Abdullah[1] and Yusran Sulaiman[1]
[1]Universiti Putra Malaysia, Malaysia
[2]Hussaini Adamu Federal Polytechnic, Nigeria

A highly sensitive and selective Linear Sweep Voltammetric (LSV) method based on the oxidation of Secondary Metabolites (SMs) in modified screen printed carbon electrode for indirect early detection of Ganoderma boninense in oil palms. Under optimized conditions (180 seconds deposition time, -0.52 V deposition potential and 0.06 V/s scan rate). The electrochemical behaviors of root extracts SMs were investigated by cyclic voltammetry. The results demonstrated that the redox peak currents of SMs obtained at BL4/SPCE were higher than those at the ChTSNPs-aMWCNTs/SPCE, AuNPs-aMWCNTs/SPCE and bare/SPCE which can be attributed to the combination of the excellent electrocatalytic properties of AuNPs and aMWCNTs and large surface area of aMWCNTs and biocompatibility of ChTSNPs, the oxidation peak current (Ipa) of all root extracts SMs is linear to root extract concentration in the range from 0.1-0.5 ppm with a correlation coefficient (R^2) in the range 0.9676-0.9994. The Limit of Detection (LOD) is in the range 7.41-16.8 ppb and the Limit of Quantification (LOQ) is between 26.0 ppb and 56.0 ppb. The reproducibility and repeatability of LSV method were acceptable (Relative Standard Deviation, RSD <25% and 1% respectively). The absence of the matrix effect on the detection of SMs by LSV method was validated by F-test and t-test (α=0.05, significance level).

azahy@.upm.edu.my

Notes: