The present work is focused on the application of a hydrogen peroxide (H2O2 ) biosensor for the detection of heavy metals ions. The biosensor was constructed by physical adsorption of horseradish peroxidase (HRP) onto a maize tassel (MT)-multiwalled carbon nanotube (MWCNT) composite and was characterized using spectroscopic and voltammetric methods, UV-Vis results inferred that HRP was not denatured during its immobilization on MT-MWCn t composite. The biosensing principle was based on the determination of the cathodic responses of the immobilized HRP to H2O2 . before and after incubation in trace metal standard solutions. Using Cd2* as a model metal ion, the inhibition rate of the trace metal was proportional to concentration in the range of 2 -3 0 p.gL_1 with a limit of detection of 0.51 p,gL_ l. Representative Dixon and Cornish-Bowden plots showed that the reaction was non-competitive. The developed biosensor exhibited good stability, repeatability and reproducibility, thus providing a new promising tool for analysis of enzyme inhibitors.