Electrochemical Detection of Methyl Parathion in *Fritillaria thunbergii* Based on Acetylcholinesterase Immobilized Gold Nanosphere

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Large use of pesticide is an important issue in modern agriculture. Development of a reliable analytical method for pesticide detection is essential for many fields. In this work, we proposed an electrochemical based detection method for methyl parathion, an organophosphate pesticide, residue in the *Fritillaria thunbergii*, a medicinal plant has been cultivated for several thousand years, based on the acetylcholinesterase immobilized gold nanosphere (Au NS) modified electrode. The combination of acetylcholinesterase and Au NS displayed a strong synergetic effect on enhancing the detection properties of methyl parathion. Au NS could catalyze the oxidation process of the enzymatically produced thiocholine and result a high sensitivity. After optimization, the proposed biosensor was used for analyzing the methyl parathion residue in freshly harvested *Fritillaria thunbergii*.

Keywords: Pesticide; Methyl parathion; *Fritillaria thunbergii*; Gold nanosphere; Acetylcholinesterase

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