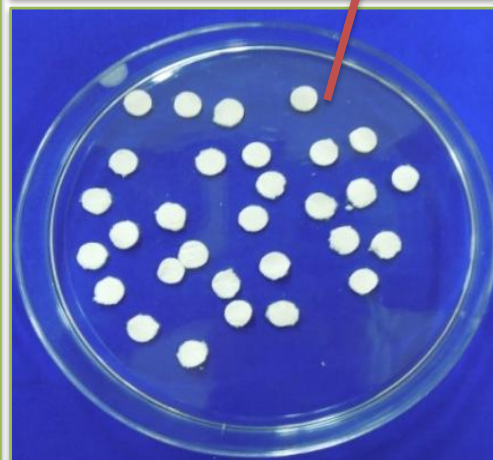
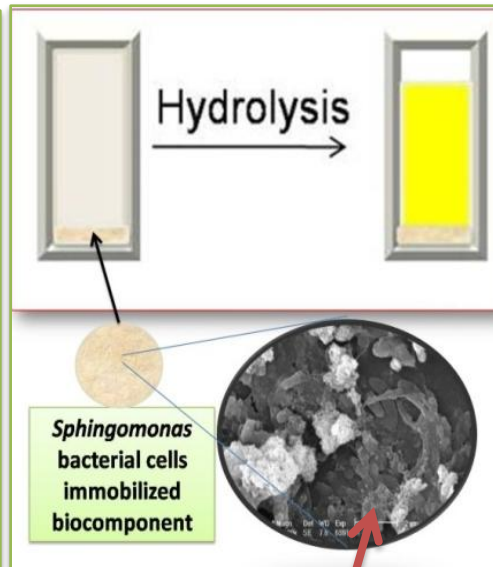


Tech. Code AB28NABTD

Handheld Biosensor for detection of Methyl parathion Pesticide



➤ Methyl parathion is an organophosphate pesticide used to control insect pest in agriculture

➤ Highly toxic in nature and harmful for human being

➤ Detection Range: **1 – 10 ppm Methyl parathion pesticide**

➤ Response time: **5min**

➤ **Battery operated and can be taken to field for analysis**

➤ Technology transferred to one licensee, **Deepak Instrument, Bhandup**

➤ Cost of the Instrument: **Rs.50,000/+ GST**

➤ Cost of biocomponent for analysis: **Rs. 10/each**

Handheld Biosensor for detection of Methyl parathion Pesticide

Methyl parathion is an organophosphate (OP) pesticide, which is being used as insecticide in agriculture to protect the crops from insects. As per statistical reports by Directorate of PPQS, India, consumption of methyl parathion in India was 8408 MT during 2005 - 2010 and 5645 MT during 2010 - 2017.

Methyl parathion causes inhibition of acetylcholinesterase and that lead to excess accumulation of acetylcholine and causes overstimulation of muscle and nerve fibers, uncontrollable twitching, convulsions, difficulty in breathing or death. Thus, it has been classified by the WHO under 'Category Ia' (extremely toxic) and by the US EPA under 'Toxicity Category I' (most toxic) insecticide.

Methyl parathion was banned by Govt. of India in 2018 but still presence of this pesticide is reported in some news reports. Thus there is an urgent need to develop a method that is rapid, selective, reliable and economically feasible for onsite monitoring of samples.

NABTD has designed and developed a prototype of handheld colorimetric biosensor, which can detect methyl parathion pesticide in the range of 1 - 10ppm.

This biosensor consists of two components; first is the biocomponent disc (5mm diameter) (Figure 1A) and second is handheld colorimetric device (1B). Biocomponent disc consist of immobilized microbial cells that convert specifically methyl parathion pesticide (transparent) into detectable yellowish colour product (Figure 2) in 5 min which is detected by handheld colorimeter and determine the concentration of methyl parathion if it is in the range of 1 – 10ppm. The concentration is being displayed in LCD panel of handheld device. Total response time of biosensor is 10 - 20 min.