



Impact of organophosphates and its potential risk of causing diabetes and its detection

Elakiya S

Department of Biotechnology, India

Abstract:

Diabetes is a non-communicable metabolic disease that affected about 415 million people in the age group between 20-79 worldwide in 2015. By the year 2040 the count will rise up to 642 million. Genetic and Environmental factors contribute to this world pandemic disease. Because of the occurrence of Plant-Disturbing Organisms Farmers produced low number of crops than expected. As a consequence of this farmers received low income which gave rise to the use of pesticides. Nowadays, the demand for pesticides have increased among the farmers as it is efficient in controlling the Plants-Disturbing Organisms. Today farmers depend on the pesticides to safeguard their crops as it is efficient, simple and fast. Statistical data reveals that longtime exposure to Pesticides results in the global pandemic Diabetes. Pesticides like Organophosphates, Organochlorides, herbicides are the compounds increases the risk of diabetes. Glucose homeostasis can be disrupted by Organophosphate poisoning which causes the aggregation of acetylcholine due to the inhibition of acetylcholinesterases. Organophosphates increases the risk of type 2 diabetes mellitus with “incretin effect”. In conclusion, the consumers of agricultural products and producers are at risk of acquiring Diabetes mellitus. This can be reduced by testing the fruits and vegetables for Organophosphates contamination at risk causing level using Biosensors. Organophosphates in food can be detected by a novel approach through a sensitive amperometric acetylcholinesterase (AChE) biosensor. Products can be washed well before it is used for consumption. Since Farmers are more susceptible, they can prevent the exposure to some extent by wearing masks and use of Biopesticides and Organic farming will have a greater effect on this global pandemic.

Biography:

Elakiya S, born in Salem District, Tamil Nadu, India. She is presently a Student, pursuing II MSc., Biotechnology at Kongunadu Arts and Science College, Coimbatore, India. She has obtained her Bachelor Degree in Biotechnology from Bharathiar University, Coimbatore, India. She attended conferences including Indian Science Congress Association held in the year 2020, Bangalore, India. She is very much interested in Plant



Tissue Culture and underwent hands-on-training as a part of her Internship. She has a keen interest in product development like Bio composting, and Biofertilizer. She has completed the project as a part of CSIR- Summer Research Training Program, under the study “Insight into IDS gene using insilico tools for enhancing the early diagnosis of Hunter Syndrome” which is under publication process.

Publication of speakers:

1. Elakiya S, (2018). Association between diabetes and pesticides: a case control study among Thai farmers Chudchawal Juntarawijit, Yuwayong Juntarawijit Environ Health Prev Med. 2018; 23: 3. Published online 2018 Jan 27. doi: 10.1186/s12199-018-0692-5
2. Elakiya S, (2017). Overview on Biosensors for Detection of Organophosphate Pesticides. Current Trends in Biomedical Engineering and Biosciences. 5. 1-11. Melo, Js. (2017).
3. Elakiya S, (2019). A sensitive amperometric AChE-biosensor for organophosphate pesticides detection based on conjugated polymer and Ag-rGO-NH₂ nanocomposite. Bioelectrochemistry.
4. Elakiya S, (2016). From organophosphate poisoning to diabetes mellitus: The incretin effect. Med Hypotheses. 2016 Jun;91:53-55. doi: 10.1016/j.mehy.2016.04.002. Epub 2016 Apr 7. PMID: 27142144.
5. Elakiya S, (2014). Pesticide use and incident diabetes among wives of farmers in the Agricultural Health Study. Occupational and Environmental Medicine, 71(9), 629–635.

[Webinar on Food safety | November 16, 2020 | Dubai, UAE](#)

Citation: Elakiya S; Impact of organophosphates and its potential risk of causing diabetes and its detection.; Food Safety 2020; November 16, 2020; Dubai, UAE