

## The Effect of Pesticides Pollution on Our Life and Environment

Ghorab MA<sup>1,3\*</sup> and Khalil MS<sup>2</sup>

<sup>1</sup>National Institute of Oceanography and Fisheries (NIOF), Environmental Toxicology Laboratory, Central Laboratories Unit (CLU), Alexandria, Egypt

<sup>2</sup>Agricultural Research Center (ARC), Central Agricultural Pesticides Laboratory (CAPL), El-Sabaheya, Alexandria, Egypt

<sup>3</sup>Department of Animal Science, Wildlife Toxicology Laboratory, Michigan State University, East Lansing, MI, USA

In recent years, Pesticides are widely used in agriculture to control a variety of pernicious organisms that spoil the crops. More than 600 kinds of agrochemicals are used around the world. They provide unquestionable benefit for agricultural production, even though, as a consequence, low amounts of some residues may persist in the food supply, air, water and soil and could constitute a significant exposure pathway for humans. For example, dicofol (DCF) is used worldwide as a pre-harvest miticide on cotton, citrus, vegetable, nuts, date palm and other crops [1].

The agricultural industry has been using chemical pesticides since the early 1900's. German chemists developed a new class of pesticides, OP compounds, during the Second World War, some of which also proved to be chemical warfare agents. OP pesticides are a group of highly toxic agricultural chemicals extensively used in plant protection. OP pesticides such as parathion, and methamidophos, are widely used around the world despite their high toxicity. OP pesticides are of particular interest since they represent the major proportion of agricultural pesticides utilized today [2].

Moreover, pesticide compounds are being increasing used in management of pests of man, animals and plants. Pesticides are important in agriculture to reduce the losses in food production caused by Weeds, insects, microbial diseases and other agricultural pests. Pests in the world today are destroying about 35% of all potential food crops before harvest. These losses are primarily due to insects, plant pathogens and weeds [3,4].

In last few years various investigators proved that compounds which belong to Ops groups are dangerous on human life, owing to their toxic effects such as, mutagenic, teratogenic and carcinogenic effects. Drastically, it was found that Leukemia, Lymphoma and Parkinson's diseases are linked with OPs exposure [5].

Also, organophosphorous have harmful effects on the nervous system of the affected organisms where they inhibit acetyl cholinesterase. Organophosphorous pesticides (OPs) are popular candidates to replace the more persistent organochlorine compounds which are suspected to be bio-accumulated up the food chain. OPs represent up to one third of world pesticideconsumption. Their insecticide and nematicide activities are attributed to the inhibition of the enzyme acetyl cholinesterase, which disrupts the nervous system of simpler organisms [5,6].

Recently, the world realized that OPs compounds or their metabolites reduce the fertility of human being, which often related to decrease in the level of testosterone. Moreover, some reports showed that organophosphates pesticides responsible for some behavioral problems especially with children. Organophosphates are involved in some immune problems of human and animals which reflect on diseases infection resistance [7].

There are some available options to farmers could be used as alternative tools to pesticides and these tools including Integrated pest management, integrated crop management and sustainable agriculture [6]. These tools represent the only solution to human to decrease the usage of pesticides to the minimum limits, which may guarantee a clean environment.

The environmental pollution with pesticides is one of the most serious problems that facing the world due to their potential toxicity, high persistence and slow degradation. Currently, biotechnology is so concerned to achieve control on pesticide pollution. Soils with Organophosphates pesticide residues not only affect the non-target organisms but also lead to disequilibrium in the ecology of pesticide-degrading microorganisms.

Biodegradation of Organophosphates by microorganisms in soil has been widely documented. Some bacteria that capable of breakdown the Profenofos in soil have been isolated and identified [8].

On the other hand, water is the main source for life on the earth. But as result to human activities, water was contaminated with many pollutants as pesticides and industrial pollutants. Therefore, water treatment is very important process to eliminate pollutants and disease-causing agents to diminished the hazard on human health and the surrounding environment [9].

One of new trends that deal with contaminated water is using microbial biofilms. Biofilms are highly dynamic systems. These biofilms are mediated many biotechnological processes applied to materials recovery and handling such as pollution control and effluent treatment. Through the metabolic activities of the biofilm, degradable organic matter present in the surrounding water is gradually broken down and transformed into inorganic compounds. Furthermore, Biofilms contribute largely to removal of organic and inorganic contaminants from water and wastewater.

### References

1. Osman KA, Ibrahim GH, Askar AI, Rahman A, Alkhalil A (2008) Biodegradation kinetics of dicofol by selected microorganisms. *Pesticide Biochemistry and Physiology* 91: 180-185.
2. Casas AZD (2004) Bioremediation of the organophosphate methyl parathion using genetically engineered and native organisms. M.Sc. Thesis, Texas A&M University 135.
3. Ghorab MA, Khalil MS (2015) Toxicological Effects of Organophosphates Pesticides. *International Journal of Environmental Monitoring and Analysis* 3: 218-220.
4. Gupta RC (2006) *Toxicology of Organophosphate & Carbamate Compounds*. Chapter 26, Elsevier Academic Press, Amsterdam 371-380.
5. Alavanja MC (2009) Introduction: pesticides use and exposure extensive worldwide. *Rev Environ Health* 24: 303-309.

\*Corresponding author: Ghorab MA, National Institute of Oceanography and Fisheries (NIOF), Environmental Toxicology Laboratory, Central Laboratories Unit (CLU), Alexandria, Egypt, Tel: +00201200878899; E-mail: [mghorabniof@gmail.com](mailto:mghorabniof@gmail.com)

Received February 19, 2016; Accepted March 09, 2016; Published March 14, 2016

Citation: Ghorab MA, Khalil MS (2016) The Effect of Pesticides Pollution on Our Life and Environment. *J Pollut Eff Cont* 4: 159. doi:10.4172/2375-4397.1000159

Copyright: © 2016 Ghorab MA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

6. Khalil MS, Kenawy A, Ghorab MS, Mohammed EE (2012) Impact of microbial agents on *Meloidogyne incognita* management and morphogenesis of tomato. J Biopest 5: 28-35.
7. WHO (1986) Environmental Health Criteria 63. Organophosphorous Insecticides: a general introduction. World Health Organization, Geneva.
8. Garbi C, Casasús L, Martínez-Álvarez R, Robla JI, Martín M (2006) Biodegradation of oxadiazon by a soil isolated *Pseudomonas fluorescens* strain CG5: Implementation in an herbicide removal reactor and modeling. Water Research 40: 1217-1223.
9. Routt RJ, Roberts JR (1999) Recognition and management of pesticide poisonings. EPA, Washington DC. 223.