Entomology, Ornithology & Herpetology: Current Research
ISSN: 2161-0983
Sudha and Baskar, Entomol Ornithol Herpetol 2017, 6:2
DOI: 10.4172/2161-0983.1000e126
Editorial Open Access

Importance of Aquatic Toxicology

Venkatesan Sudha[1] and Kathirvelu Baskar[2]*
[1]*Department of Ecotoxicology, International Institute of Biotechnology and Toxicology (IIBAT), Tamil Nadu, India*
[2]*Optimurz Bio and IT Solutions, Chennai, Tamil Nadu, India*

The aquatic ecosystem is a combination of interrelated species and they are responding to each other habits and habitats. The application of many different types of synthetic fertilizers and pesticides into the agriculture fields for the production and protection; it causes several adverse effects to the aquatic environment. In this connection, alterations into the water quality, it affects the biodiversity of aquatic ecosystem. The impacts of chemicals on the water temperature, pH, dissolved oxygen, conductivity, hardness, etc., are directly influences the population density of aquatic ecosystem. If any changes in the water parameters occur due to the contamination of some chemicals, may affect the species diversity in the particular ecosystem. For example, a chemical contamination in a pond or lake affects algal population which is a primary producer will directly affects the consumers, as the food web is disturbed which leads to the depletion of aquatic biota. Hence the release of chemicals or effluent from the industries into the environment has to be restricted upto certain limit. Therefore the regulatory agencies compile techniques and testing methods to conduct toxicity tests for a particular manufactured chemical before they are released to the environment.

The toxicity tests are conducted over many decades to reveal the undesirable effects of chemicals on the biota. The acute and chronic toxicity testing is performed with the aquatic bioindicator organisms such as unicellular algae and cyanobacteria, aquatic macrophyte (*Lemna*), aquatic invertebrate (*Daphnia*) and aquatic vertebrate (Fish) respectively to evaluate the limit of toxic effect. Algae are the most important primary producer in an aquatic ecosystem. It associates in maintaining the dissolved oxygen in the aquatic ecosystem through photosynthesis and also maintains the atmospheric oxygen. *Daphnia* are the small zooplanktons, comes under cladoceran which feeds on the phytoplankton like algae. Fish are one of the important consumers in the aquatic ecosystem which consumes zooplanktons and phytoplankton's. In this food cycle, if any one of the species diversity is disturbed by a chemical contamination will adversely affects the total aquatic ecosystem. In this connection the chemical contamination will also reaches the birds and human when the contaminated fishes are consumed. Hence the toxic effects are studied either as growth inhibition, sublethal effect and/or lethal effect. In aquatic toxicity testing, the acute toxicity test requires less time period and less quantity of sample to conduct the study, usually 72 h for alga growth inhibition test, and 48 h for *Daphnia* immobilization test, 96 h for Fish toxicity test and 7 days for *Lemna* growth inhibition test (OECD guideline). The chronic tests are long term studies which requires time period of months to years. In long term studies, reproduction toxicity and bioaccumulation tests are performed to know the long term effect of the compound. The toxicity testing methods and aquatic toxicology resources are standardized by various organization and regulatory agencies such as US EPA, OECD, SETAC, APHA, ASTM, WPCF, etc.

The potential of a compound must be assessed before it is applied to the environment. It is compulsory to assess the limit of toxicity by using the standardized protocols to protect the environment from the harmful effect of the hazardous chemicals. The environmental safety studies under laboratory condition helps in protecting the aquatic biodiversity from the effects of manufactured chemicals and helps in maintaining the aquatic ecological niche and succession.

***Corresponding author:** Kathirvelu Baskar, Optimurz Bio and IT Solutions, Shenoy Nagar, Chennai–600030, Tamil Nadu, India, Tel: +91-8110009641; E-mail: eribaskar@gmail.com

Received April 17, 2017; **Accepted** April 24, 2017; **Published** April 27, 2017

Citation: Sudha V, Baskar K (2017) Importance of Aquatic Toxicology. Entomol Ornithol Herpetol 6: e126. doi: 10.4172/2161-0983.1000e126