

## Study of pesticides: Classification and Effects

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### Abstract

Pesticides are a material capable of selectively killing a pest in a Biological Community. Mostly used groups of pesticides are insecticides, Herbicides, fungicides, rodenticides, Molluscicides. The main purposed of this paper is to critically look out major impact of pesticides towards the health and environment. The different literature of relevant topics is collected and reviewed on their adverse effect to environment and health. Those effects are very harmful to health as well as for the environment therefore control of their used in a proper way is necessary. By properly trained the farmers and other people regarding their effect and process of screening may lessen this pesticide problem.

**Keywords:** pesticides, mitigate, environmental impact, harmful pest, fumigant, rodenticides

### Introduction:

The term pesticide covers a wide range of compounds including insecticides, fungicides, herbicides, rodenticides, molluscicides, nematocides, plant growth regulators and others. (Aktar *et al.*, 2009) Pesticides are toxic chemical substance or mixture of substance or biological agent that are deliberately released into the environment in order to kill, prevent, deter, control, destroy, repel or mitigate population of insect, weeds, rodents, fungi, or other harmful pest in agricultural, domestic and industrial setting. Pesticide serves as regulator or modifiers that work by destroying the pest. In agricultural field the insecticide is used to increase the production of quality through controlling pest and pest related disease. The main groups of commonly used pesticides are insecticide, fungicides, fumigants, and rodenticides. Insect are the major fountain of crop vandalism. The use of pesticide has become a common practice and it increased many folds over the past few decades. It estimated that about 5.2 billion pounds of pesticide are used worldwide annually (Alavanja, n.d.). Pesticides are toxic chemical substance or mixture of substance or biological agent that are deliberately released into the environment in order to kill, prevent, deter, control, destroy, repel or mitigate

population of insect, weeds, rodents, fungi, or other harmful pest in agricultural, domestic and industrial setting. Pesticide serves as regulator or modifiers that work by destroying the pest. In agricultural field the insecticide is used to increase the production of quality through controlling pest and pest related disease. The main groups of commonly used pesticides are insecticide, fungicides, fumigants, and rodenticides. As pesticides are responsible for several adverse effects on human health other than acute intoxications. Many studies have reported associations between exposure to agricultural chemicals and various health outcomes, including different kinds of cancer (Daniels *et al.*, 1997, Khuder and Mutgi, 1997; Zahm and Ward, 1998) and degenerative diseases (Engel *et al.*, 2001; Jenner, 2001). Effects in immune, hematological, nervous, endocrine and reproductive systems have been reported (Ojajarvi *et al.*, 2000; Ritz and Yu, 2000; Figa-Talamanca and Petrelli, 2001; Mourad, 2005) and these compounds have been also associated with DNA damage in human populations (Gomez-Arroyo *et al.*, 2000; Undeger and Basaran, 2002; Costa *et al.*, 2007; Ergene *et al.*, 2007; Muniz *et al.*, 2008). Exposure to low-level of pesticides is known to produce a variety of biochemical changes, some of which may be responsible for the adverse biological effects reported in human and experimental studies (Gupta *et al.*, 1998; Banerjee *et al.*, 1999; Panemangalore *et al.*, 1999). Conversely, some biochemical alterations may not necessarily lead to clinically recognizable symptoms, although all the biochemical responses can be used as markers of exposure or effect (Panemangalore *et al.*, 1999).

### 1. Aim And Objectives:

The main aim of present study is to look out the effects of pesticides on health and environment. The second objective is to systematic study of the work done by other author.

### 2. Material And Method:

Though there was no specific method for reviewing articles. So, different literature of relevant topics was collected and studied thoroughly. Books and journals were collected and studied the article and papers about pesticides and toxicology. Besides library work different websites on internet was searched for necessary data.

### 3. results:

Misuse of pesticide induced tremendous effect on health and environment. The various effects of pesticides on health and environment are as follows -

**Effect of pesticide on environment:**

Mostly farmers and field workers are illiterate or they less educated and they hence applied pesticides without screening and proper specific information, due to which various hazardous effect posed on environment. Myriad use of pesticide without screening on daily basis also affects the non-target organism. Due to irregular screening sometimes, they used pesticide abundantly after damaging the crop. Ultimately those are persisting for long time in the environment and causes environmental pollution specially soil pollution. The innumerable use of pesticides also kills the helpful microorganism as a result of which the self-fertility property of soil is reduced.

Regarding pesticides it is important to have practical understanding of their physical and chemical properties, since their solubility determine the transportation of surface runoff and absorbing capacity of soil. In environment the pesticides are tempo rated long distance and their deposition to water causes water pollution. In several cases pest are resistances to a particular pesticide as effect of natural selection, which cause hazards to non-target organism and cause sudden death of that organism. On the contrary, the pesticides which are demoted through photodecomposition, microorganisms, or through physical or chemical reaction. But the undemoted pesticides are remaining on environment over long time which greatly causes environmental damage. The long-time persisting pesticide causes hazards to biodiversity of aquatic or terrestrial organism. Pesticides are entered to aquatic ecosystem that act as toxic agent and causes hazard to aquatic plant and animal.

**Effect of pesticide on health:**

Human beings are highly vulnerable to deleterious effect of pesticide due to nonspecific nature, haphazard application or misuse of pesticide. The pesticide enters human body through ingestion, inhalation, penetration (skin) but majority of people get affected via intake by pesticide contaminated food. Pesticide shows acute as well as chronic effects which are-

**A. Acute effects of pesticides:**

Acute effects of pesticide include headache, skin irritation, itching, rash and blisters, diarrhea, abdominal pain, nausea, vomiting, blindness etc.

**B. Chronic effect of pesticide:**

Long term effect of pesticide damage body organ and diseases as follows-

1. **Neurological-** pesticide cause neurological health effects include memory or learning disability, vision, impairment, signaling disability etc.
2. **Immune-** immune effects include hypersensitivity, asthma, and allergic reaction.
3. **Carcinogenic-** pesticide associated with brain cancer, prostate cancer, ovarian cancer etc. It is estimated that worldwide chemical exposure is responsible for 4% of all death from cancer (Abdelbagi *et.al* 2005).
4. **Endocrine disruptors-** pesticide act as endocrine disruptors as it is interfered with endocrine system by blocking/mimicking, displaying, and the hormone in living organism. Mainly they confirmed estrogenic action as affect the reproductive system such as still birth, miscarriages, and abortion infertility etc. endocrine receptor also mimic insulin thereby block the insulin receptor site and cause diabetes mellitus.
5. **Other-** long term exposure of pesticide also damage liver, lung, kidney etc.

**Table no 1- Different classes of pesticide and its health effect**

	Organophosphorus Pesticides	Carbamates Pesticides	Organochlorine Pesticides	Pyrethrin and pyrethroids Pesticides	Triazine Pesticides	Phenoxy Derivative Pesticides	Dipyridyl Derivatives Pesticides
EXPOSITION	Skin, conjunctiva, gastrointestinal tract, and lungs	Lungs, gastrointestinal tract, and skin	Lungs, gastrointestinal tract, and skin	Lungs, gastrointestinal tract, and skin	Skin, eye, nose, and gastrointestinal tract	Lungs, gastrointestinal tract	Skin, eye, nose, and gastrointestinal tract
SIGN AND SYMPTOM	Muscarinic syndrome and nicotine	Miosis, salivation, sweating, tearing, behavioral	Dizziness, headache, nausea, vomiting, diarrhea, muscle	In coordination prostration, drooling irregular movement of			

	syndrome, resulting of excess acetylcholine in the synaptic cleft	change	weakness, mental confusion, anxiety	limbs and hypersensitivity to stimuli			
TREATMENT	Maintenance of vital function and cholinesterase levels. Avoid the use of parasympathomimetic agents.	Maintenance of vital function and cholinesterase levels. Avoid the use of parasympathomimetic agents.	Maintenance of vital function and administer diazepam and Phenobarbital to control seizures.	Decontamination of the skin and eyes, besides basic maintenance of vital functions.			

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