

# CLASSIFICATION AND CHEMISTRY OF INSECTICIDES

## I. CLASSIFICATION

The insecticides are classified in three different ways taking into consideration three different criteria viz. mode of entry, mode of action and their chemical nature.

### 1. Classification based on mode of entry:

- Stomach  
- Contact  
- Fumigant

i. Stomach poisons: Those insecticides which enter the body of the target insect through its food are termed as stomach poisons. Such insecticides are sprayed or dusted on the plants and when the insects ingest the parts of these plants such as leaves, tender shoots, fruits etc., they reach the stomach and kill them. Stomach insecticides are very effective against insect pests having biting and chewing type of mouth parts.

ii. Contact poisons: Contact insecticides are those insecticides which enter the body of the insects by penetrating through their cuticle or through spiracles. The pest may absorb the poison while walking on the treated surface, while flying through a mist or fine droplets or when they are hit directly during spraying or dusting of the insecticides.

iii. Fumigants: Fumigants are those insecticides which enter in gaseous state into the body of the insect through the spiracles and tracheae. They are most effective in closed spaces and as such are widely used for controlling the stored grain pests.

The above classification is not very clear as there are certain insecticides which can be classified into more than one group mentioned above. For example, lindane is a contact insecticide but also shows fumigating action. Similarly all the systemic insecticides are both contact and stomach poisons.

### 2. Classification based on mode of action:

- Physical  
- Neurotoxic  
- Respiratory  
- Metabolic

i. Physical poisons: Poisons which kill the insect by exerting a physical effect are known as physical poisons. Heavy oils and tar oils

kill the insects through asphyxiation *i.e.* exclusion of air. Inert dusts cause abrasion of cuticle or absorb moisture from the body of insect. In both cases insect dies due to loss of body moisture.

ii. Protoplasmic poisons: The toxicants which kill the insect by destruction of cellular protoplasm of the mid-gut epithelium are called protoplasmic poisons. Mercury, copper and arsenic compounds are the examples of this group.

iii. Respiratory poisons: Poisons which block the cellular respiration and render the respiratory enzymes inactive are termed as respiratory poisons e.g. HCN, CO etc. *Rotenone, Amytol*

iv. Nerve poisons: Poisons which affect the nervous system and render the insect to behave abnormally leading to death are called nerve poisons. The toxicant gets dissolved in tissue lipoids and inhibits the production of acetylcholinesterase enzyme in insects and mammals. Examples are organophosphate and carbamate insecticides.