

Pesticides (Part-2)



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Pesticides



Insecticides:

Organophosphate :

Organophosphates are used as-

- Garden and household pesticides,
- In agriculture.
- Formulations include liquids, sprays, and powders.
- In veterinary medicine they are found in pediculicide lotions:.

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Organophosphate (contd...)

- Shampoos, aqueous and alcoholic lotions are also used as human pediculicides and scabicides
- Organophosphate nerve agents may be used as chemical warfare agents
- An example was sarin used in the Tokyo subway attacks of 1995.
- Parathion is an organophosphate insecticide that is widely used in agriculture

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Organophosphate Toxicity

- Organophosphate bind ChE(cholinesterase) and inhibit its function .
- Organophosphate cross the blood-brain barrier, they may cause seizures, respiratory depression, and CNS depression
- OP bind to RBC cholinesterase & plasma cholinesterase (pseudo cholinesterase) in the serum. •

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Organophosphate Toxicity (contd...)

- Thus organophosphates (OP) interferes with an important nervous system enzyme, cholinesterase , causing twitching, convulsions, seizures and death
- Large exposures can cause acute poisoning.
- Small exposures over time “add up” in the body leading to poisoning.

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Carbamates

- They are used for the control of ectoparasite in both large and small animals.
- It also interferes with cholinesterase

Symptoms of OP and Carbamate poisoning:

- Mild - headache, fatigue, dizziness
- Moderate - muscle twitching, unable to walk, pinpoint pupils •
- Severe - unconscious, seizures, death

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Herbicide

Paraquat

- Water soluble herbicide (weed killer)
- It is used since 1962.
- It is available as an aqueous concentrate and in granular formulations • there are 2 compounds: – Gramaxone (yellowish liquid) – Weedol (granulation form)

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Paraquat toxicity:

- Paraquat is very toxic when ingested.
- The exact mechanisms of toxicity is not fully understood.
- The lethal dose is 1-4 grams.
- Lungs are the main target of paraquat due to active, energy-dependent uptake by alveolar type I and II cells.
- Skin absorption is poor.
- Inhalation is a possible route of toxicity

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Rodenticides:

- Rodenticides are used to kill rodents

Warfarin :

- Chemically it is 3-acetyl benzyl 4-hydroxy coumarine
- Very important anticoagulant drug used in mammalian
- Death occurs due to hemorrhage
- Toxicity appears with dose of 1 mg/kg, used for 4-5 days
- Also used to prevent cereals from rats

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Scilliroside-

- stomach poison•
- Obtained from Red squill (Liliaceae)•
- Also present in white squill•
- Part used is fleshy scale of bulb•
- Contains cardio-active glycoside-Scilliroside
- It is irritant to hands, so should be used with gloves•
- It does not produce toxic effects on other animals e.g cats•
- Death in rodents occur due to haemorrhage, convulsions and respiratory failure

Thank You

