

Environmental Toxicology

Edited by :

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CHAPTER - 9

Toxicology

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Toxicology is the science of poisons (also called toxins). It deals with the chemical nature of toxic substances and how they make adverse effects on life. A poison is usually defined as any chemical instrument that has the ability to produce abnormal, unwanted, or harmful changes to an organism showing to it. In humans, adverse effects of poisons can array from minor symptoms like headache and nausea to cruel ones like convulsions and unconsciousness. The critical adverse effect is death.

Toxicology is the qualitative and quantitative study of the undesirable or toxic effect of chemicals and other anthropogenic resources or xenobiotics on organisms. It also deals with foodstuff and cosmetics for public utilization both in living or dead victims. Broader definition of toxicology, such as "the study of the detection, occurrence, properties, effects, and guideline of toxic substances". The study of toxicology serves society in many ways, not only to care for humans and the environment from the harmful effects of toxicants but also to make easy the development of more selective toxicants like anticancer and other clinical drugs and pesticides.

Toxicology is a multifaceted, interdisciplinary subject, straddling the fields of chemistry, biology, pharmacology, drugs, inheritance, economics, and law. Contemporary toxicology is generally divided into three main branches:

- Clinical toxicology, which deals with study of effects of toxins (typically in the form of drugs) on human patients.
- Forensic toxicology, which is concerned with detecting the illegal (criminal) use of toxic agents.
- Environmental toxicology, which includes the effects of industrial and agricultural toxins on human being health and the environment.

Regulatory toxicology, with its highlighting on public policy/risk evaluation, and occupational toxicology, which concerns toxic exposure in the workplace, are also sometimes considered in other branches of toxicology.

The definition of a poison, or toxicant, also includes a qualitative biological aspect as a compound, toxic to one species or genetic strain, may be quite harmless to another. Compounds may be toxic in some circumstances but not others or, possibly, toxic in combination with another compound but nontoxic alone. The measurement of toxicity is also difficult. Toxicity may be acute or chronic, and may vary from one organ to another as well as with age, genetics, sex, diet, physiological condition, or the health status of the living being. The toxicity of a particular compound may vary with the gateway of entry into the body, whether through the alimentary canal, the lungs, or the skin. Experimental methods of administration such as vaccination may also give highly variable results; thus the toxicity from intravenous (IV), intraperitoneal (IP), intramuscular (IM), or subcutaneous (SC) injection of a given compound may be quite different.

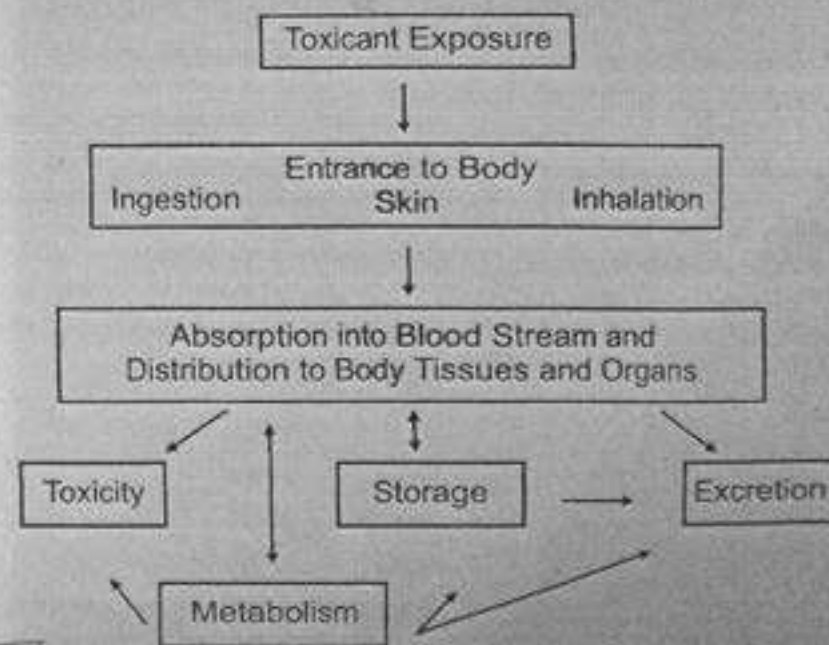
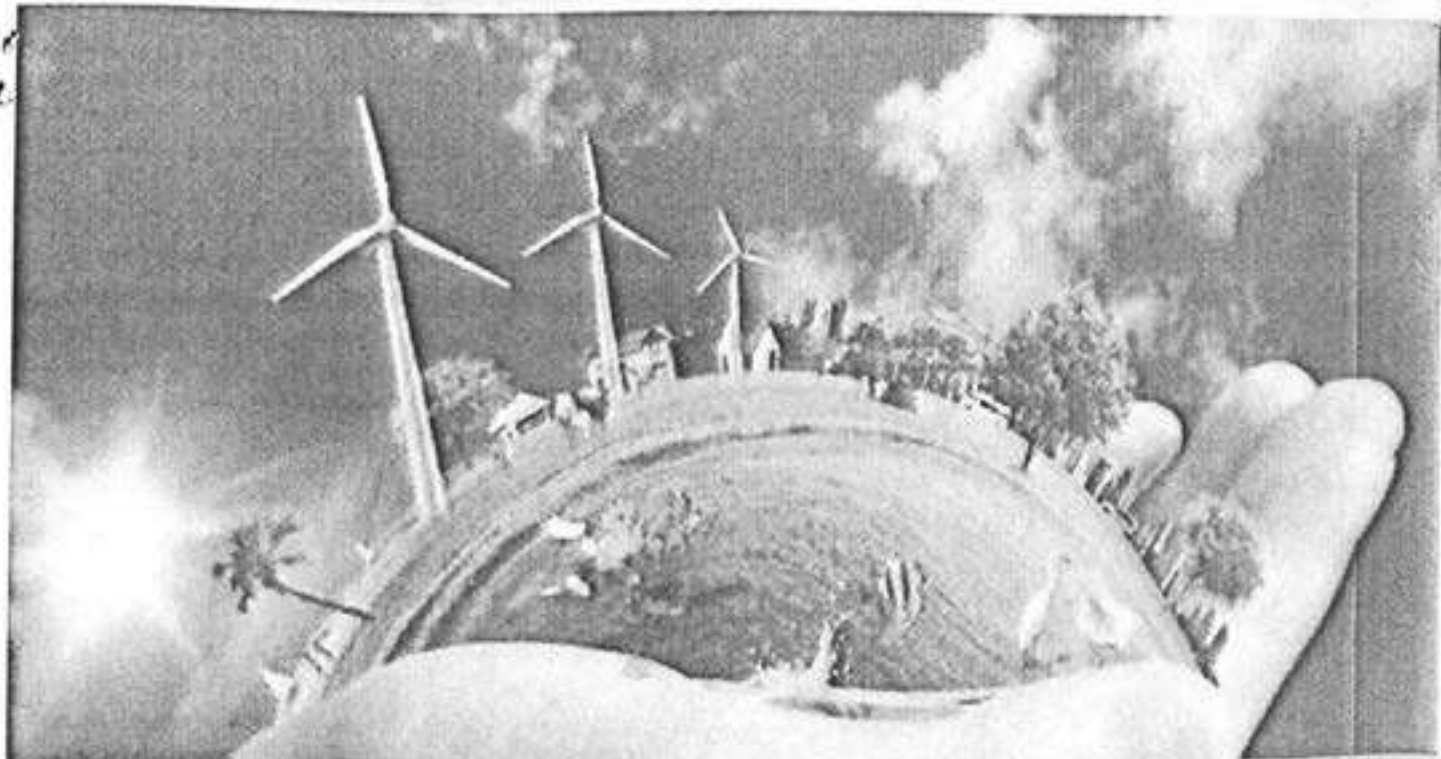


Figure 1.1 Fate and effect of toxicants in the body.



Environmental Toxicology

"What can be measured can be managed"
Peter Drucker

**Toxicology is a Burning Issue....needs
Realization, Education, Measurement, Control and
Contribution by Society at Large.**



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