

# **WATER POLLUTION and CONTROL**

## Pesticides Toxins

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Pesticides are a cause of water pollution.

The most hazardous pesticides are the organochloride compounds, because of their stability and persistence in the environment.

Persistent organochlorides can accumulate in the food chains.

## Acid and Alkali Toxins

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Acids and alkalis may be regarded as hazardous because they lower or raise the pH value of water from its neutral value of pH 7.

Most aquatic animals and plants will not survive in water with a pH value of below 5, or above pH value of 9.

Changes in pH can also affect the actions of other toxins, which are more toxic in acid conditions than they are in neutral or alkaline conditions.

## Other Organic Compound Toxins

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Polychlorinated biphenyls, or PCBS, are by-products of the plastic, lubricant, rubber and paper producing industries.

PCBS have appeared in tissues of fish, predatory birds, pelagic feeding marine birds and shore mussels.

PCBS are lethal to these animals even in very small quantities.

## **CHEMICAL NUTRIENT EFFECTS**

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Chemical nutrients are substances that are required by plants and animals for maintaining their growth and metabolism.

In water pollution, the two most important nutrients are nitrogen and phosphorus, usually present in nitrates and phosphates.

The rise in nutrients is called natural ageing or eutrophication.

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- Unicellular green and blue algae and floating filamentous algae in entrophic conditions.
  - The effect is to cause adverse conditions for river and canal craft navigation, and for swimming, bathing and fishing.
  - The dense algae growth eventually dies, and the subsequent biodegradation produces an oxygen deficit which can result to anaerobic conditions.
  - In relation to humans, there is concern about excessive nitrate concentration in drinking water abstracted from rivers, aquifers.

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- Some bacteria in the intestines can reduce nitrates to nitrites, and when this enters the blood, the nitrite attaches to the hemoglobin to form a complex called **methahaemoglobin**.
  - This causes a reduction in the oxygen carrying capacity of the blood, and a condition called anoxia, or methahaemoglobin anaemia, or blue baby disease. This is particularly severe in young babies and may be fatal.

## **MICRO-ORGANISM EFFECTS**

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- Wastes that are discharged into water contain pathogenic organisms that are capable of causing human diseases...
- Some bacteria cause; cholera, typhoid fever, bacillary dysentery and gastroenteritis.
- Viruses are also found in water, including strains which cause poliomyelitis, infectious hepatitis ...



## **RADIONUCLIDE EFFECTS**

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Development of nuclear energy is producing more radioactive waste to be disposed off into the environment, and it contains various radionuclides with long half-lives.

These radionuclides can end up in the food chain, and so enter the bodies of humans and animals.

## References

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- <http://phpt.uonbi.ac.ke/sites/default/files/cavs/vetmed/phpt/BSc%20Fisheries%20Notes.pdf>