

WATER QUALITY IN AQUACULTURE

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PHOSPHORUS COMPOUNDS

- Phosphorus is an essential nutrient for living organisms and exists in water bodies as both dissolved and particulate species.
- It is generally the limiting nutrient for algal growth and, therefore, controls the primary productivity of a water body.

PHOSPHORUS COMPOUNDS

- Artificial increases in concentrations due to human activities are the principal cause of eutrophication

PHOSPHORUS COMPOUNDS

In natural waters and in wastewaters, phosphorus occurs mostly as dissolved orthophosphates and polyphosphates, and organically bound phosphates.

Changes between these forms occur continuously due to decomposition and synthesis of organically bound forms and oxidised inorganic forms.

PHOSPHORUS COMPOUNDS

Natural sources of phosphorus are mainly the weathering of phosphorus-bearing rocks and the decomposition of organic matter.

Domestic waste-waters, industrial effluents and fertiliser run-off contribute to elevated levels in surface waters.

Phosphorus associated with organic and mineral constituents of sediments in water bodies can also be mobilised by bacteria and released to the water column.

PHOSPHORUS COMPOUNDS

Phosphorus is rarely found in high concentrations in freshwaters as it is actively taken up by plants.

As a result there can be considerable seasonal fluctuations in concentrations in surface waters.

In most natural surface waters, phosphorus ranges from 0.005 to 0.020 mg l⁻¹ PO₄-P.

Concentrations as low as 0.001 mg l⁻¹ PO₄-P may be found in some pristine waters and as high as 200 mg l⁻¹ PO₄-P in some enclosed saline waters.

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As phosphorus is an essential component of the biological cycle in water bodies, it is often included in basic water quality surveys or background monitoring programmes.

High concentrations of phosphates can indicate the presence of pollution and are largely responsible for eutrophic conditions. The management of a lake or reservoir, particularly for drinking water supply, requires a knowledge of the levels of phosphate in order to help interpret the rates of algal growth.

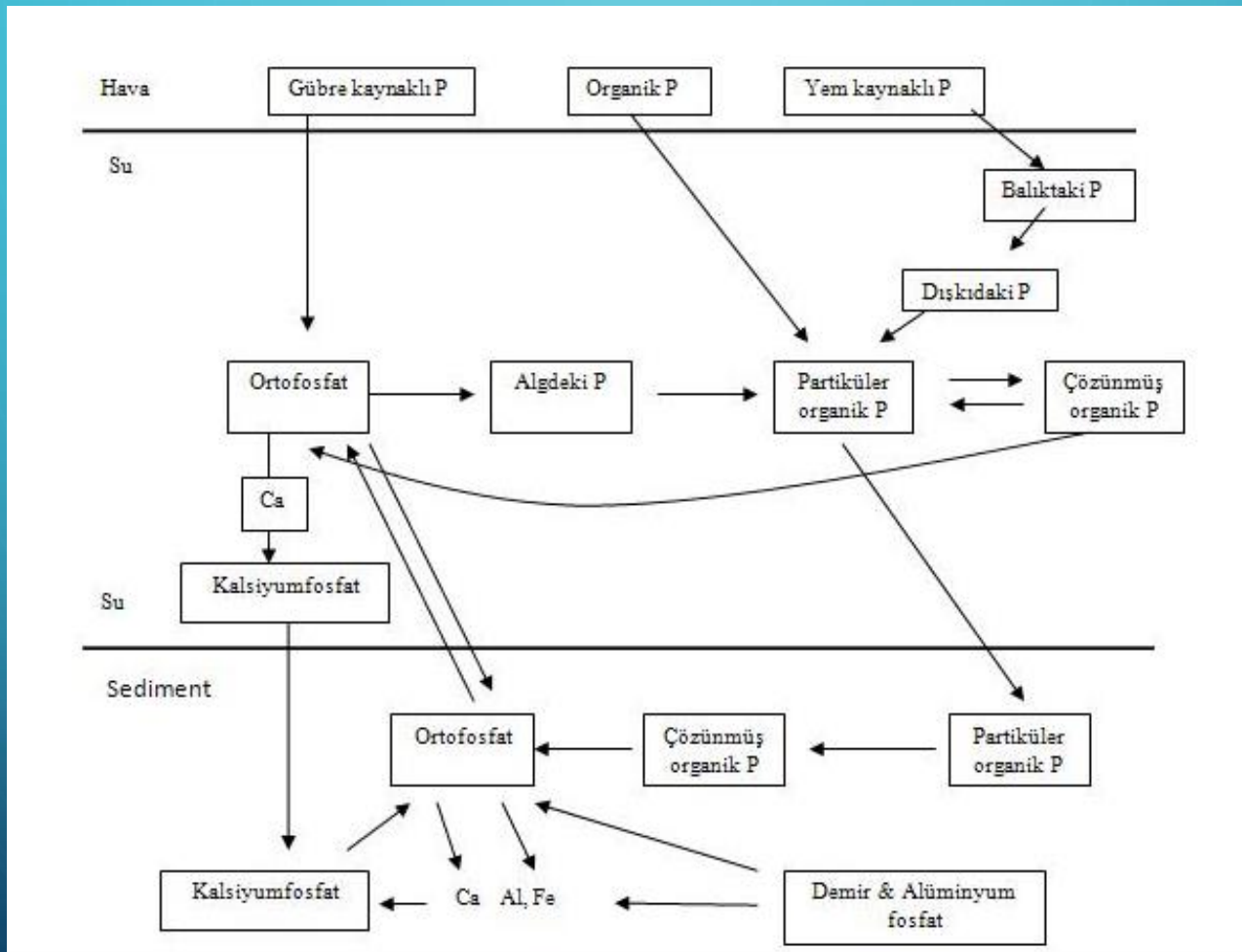


Figure. Phosphorus cycle in fish pond.