

**D-06: Some biological problems associated with water purification at the Tissawewa tank in Anuradhapura**

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Purification of the Tissawewa tank water is based upon aeration, slow sand filtration and chlorination.

Two major problems - frequent blocking of the sand filters and bad odour of the filtered water, encountered during this process were investigated.

Microscopic examination of representative water samples removed from the Tissawewa tank revealed the predominant planktonic alga to be a pennate diatom, *Synedra* sp., associated with small numbers of cyanobacteria and certain green algae. The zooplankton was represented by *Daphnia*, *Diaptomis* and *Cyclops*.

The raw water pumped from the tank had little odour, but the filtered water had a very strong earthy smell. Therefore the changes of algae and other organisms during filtration were examined.

Examination of water samples from different depth of the filtration tank clearly showed *Synedra* to be the alga responsible for the blocking of the filters by formation of a virtually impervious algal mat of silicified frustules. The other algae and the zooplankton get trapped and die within this diatom film. Microscopic examination of filtered water samples collected from the outlet at the bottom of the filtration tank showed a large growth of actinobacteria. Water sampled before, during and after filtration, showed an increase in ammonia and sulphide content in filtered water.

Organic substrates from the dead plankton biomass retained on the surface of the filters, flows down with the water and provide an excellent medium for the actinobacteria which are growing heterotrophically in the interspaces within the pebble and gravel layers of the filters. While diatoms like *Synedra* have been reported to produce odour in water, actinobacteria are reputed for odour production, particularly earthy smell.

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