Abstract

Victoria is a Oligomictic reserevoir constructed by damming of river Mahaweli, the longest river in Sri Lanka.

Some of the important morphometric parameters of the reservoir are 23.7 km surface area, 722 mcm volume, 98 m maximum depth, 165 km shore line, 6.8 km maximum length & 2.41 km maximum width.

Climate of the catchment area are characterized by south west monsoons, north east monsoons and two inter monsoon seasons.

Physical chemical and biological parameters of the reservoir were studied under the present investigation by sampling at 13 sampling locations. Locations were selected in order to obtain the samples horizontally and vertically. Verticall samples were obtained at three major locations by sampling surface to the bottom. Sampling was done once a fortnight. Some laboratory experiments were also conducted in order to obtain information about growth development & reproduction of calanoids.

Water levels of the Victoria reservoir fluctuated very much within the investigation period ranging from about 20 m to full supply level which influenced the physical, chemical & biological properties of the reservoir.

According to percentage frequency distribution values, the Euphotic limit of the reservoir was around 6 m.

There is clear thermal stratification in the Victoria reservoir even with the mixing up of the water mass due to usage of water from the bottom for hydro electric power generation. This stratification is reflected in the other properties as well.

According to the values obtained for dissolve Oxygen concentrations, the upper epilimnetic waters contained the highest Oxygen concentrations. The bottom region still contained 1 mg/l - 2 mg/l dissolved Oxygen levels. Reservoir contained clinograd type of Oxygen curves but still there was no deoxygenated layer at the bottom.

The mean conductivity values of the reservoir ranged from 38.19 s/cm to 145.83 s/cm within the three year investigation period.

pH values varied upto 20 m depth which coincide with the thermocline & then the variation was very slight up

to the bottom.

According to pH & pHs values, Victoria reservoir has shown scale forming properties during most parts of the investigation.

The Nitrogen compounds such as Nitrate Nitrite & Amonia were present in considerable amounts at the bottom of the reservoir.

Nitrate concentration ranged from 5.0 ppm to 110 ppm, & Amonia ranged from 0.05 - 0.4 ppm. Ammonia was found only in the bottom region of the reservoir.

Hydrogen Sulphid concentration at the bottom of the reservoir ranged from 0.001 ppm to 0.15 ppm from March 1987 to July 1987.

Water hardness of the reservoir ranged from 0.21 - 1.04 m.mol/l. Higher values were observed during drought seasons & lower levels were found during rainy seasons.

Orthophosphate concentrations were well bellow .25 mg/l in the reservoir.

Sulphate concentration increased with increasing depth.

There were fifteen species of rotifera, nine species of cladocera, 2 species of calanoids & two species of cyclopids & some unidentified species (in low densities) in the reservoir.

When the zooplankton densities are concerned, mostly the zooplankton were concentrated in the upper epilimnetic water from about surface to 20 m depth. There was a seasonal maxima & minima in their populations.

Highest primary productivity values were observed from 0.45 mgC/m/h & 0.5 mgC/m/h in August 1987 & in December 1987.

According to the physical chemical & biological properties of the Victoria reservoir it has not yet underground eutrophication, even though there is an increase in productivity values by the end of the investigation period. To protect the Victoria reservoir from eutrophication problem, it is advisible to limit usage of fertilizers in the catchment area & limit the human settlement closer to the reservoir.

To reduce the release of nutrients through sedimentation it is advisible to grow trees like bamboo in the shore line area of the reservoir.