

***SUMMARY AND
CONCLUSION***

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The present work was carried out for a period of one year from December, 1999 to November, 2000 to study the heavy metal load in the water, sediment and bivalve molluscs from Krishna river. Three stations were selected for the study at the stretch of 12 Km. along the river (Sangli, Haripur and Ankali). Some of the important physico-chemical parameters of water were studied fortnightly. Collection of sediments and bivalve molluscs for metal detection from three stations were made in different seasons, and the data obtained is presented with the help of tables and figures.

The water temperature followed a seasonal trend with maximum (29°C) temperature in summer (May) and a minimum (20°C) during winter season (January, 2000).

The turbidity is important limiting factor in the productivity of aquatic ecosystem. Turbidity may be due to the suspended inorganic substances such as silt, clay and planktonic organisms. In river turbidity is due to disposal of industrial effluent, sewage and agricultural runoff. The maximum turbidity was observed in summer season (23 NTU) and minimum during winter season (5 NTU) turbidity.

Transparency depends upon suspended matter in the water. Light is an essential factor in fresh water body for survival of organisms. Penetration of light directly affects the productivity of

the fresh water bodies. The maximum (62 cm) transparency was recorded in summer season (April) at station 'C', while a minimum (20 cm) transparency was recorded in summer season (May) at station 'A'.

Total solids in river water was found to be high (1240 mg/l) during summer period and it was minimum (100 mg/l) during monsoon period. The total dissolved solids was observed to be high (1000 mg/l) during summer season and low (80 mg/l) during monsoon season. The study on total suspended solids showed maximum values (600 mg/l) in summer season while minimum suspended solids (20 mg/l) were recorded in monsoon season.

The hydrogen ion-concentration of water sample was found to be more towards alkaline conditions. High values (8.5 mg/l) were recorded during early summer months and lower values (7.5 mg/l) were recorded in monsoon season.

In present study, dissolved oxygen was observed to be high (25.4 mg/l) during winter season and low (0.8 mg/l) during monsoon season. Dissolved oxygen is the most important factor in the water bodies for existence of biota. The dissolved oxygen is responsible for the biological and biochemical reactions.

Free carbondioxide in river water was found to be high (39.00 mg/ l) during the winter season and a low (8.8 mg/l) during monsoon season. The availability of free CO₂ in the water bodies depends

upon various sources like, atmosphere, respiration of living organisms, bacterial decomposition etc.

Total hardness (CaCO_3) of water was high during winter season and found to be low during monsoon season. Maximum value (480 mg/l) was recorded in January, while minimum (60 mg/l) value was recorded in September.

Chloride content in natural water appears to be mainly due to sewage discharge and their principle sources are drained rich in animal refuse. The highest (175.6 mg/l) value of chloride was observed during summer season, while lowest (21.3 mg/l) value was observed in monsoon seasons.

Acidity of water sample showed to be high (255 mg/l) during summer season and found low (15 mg/l) during monsoon season. Alkalinity values of river water was maximum (400 mg/l) during winter season, and minimum (80 mg/l) value was recorded in monsoon season. Several investigators were reported that most of the Indian rivers water is alkaline in nature.

The phosphate-phosphorus was higher ($494 \pm 13.63 \mu\text{g/l}$) during monsoon season and it was found low ($11 \pm 17 \mu\text{g/l}$) in summer season. The reason for high phosphate during monsoon might be due to influence of rainwater containing fertilizers from the nearby fields and domestic sewage. Low value of phosphate in summer may be due to less volume of domestic sewage mixing in the water. The nitrate-nitrogen was found maximum (941 ± 42.12

µg/l) during winter season and minimum (66.6 µg/l) values were recorded in monsoon season. Maximum nitrate-nitrogen may be derived from surface runoff, sewage, agricultural runoff. Minimum nitrate-nitrogen might be due to high water level and dilution of sewage and agricultural runoff.

Heavy metals such as Zn, Ni, Pb, Al, Cr, Cu, Cd, Mn, Hg were analysed from water samples from three different stations. In water samples heavy metals are not observed during study period. Metal concentrations in the sediments from the Krishna river was analysed.

The samples of river water, sediments and various tissues of bivalve molluscs (*Lamellidens corrianus*, *L. marginalis* and *Indonaia caeruleus*) were analysed for qualitative and quantitative estimation of different heavy metals like Zn, Ni, Pb, Al, Fe, Cd, Cr, Mn, Hg and Cu during different seasons. The results showed that, heavy metals were absent in water samples throughout year. The sediment contains some metals in the descending order of Zn > Al > Ni > Pb. The bivalve tissues like mantle, gill, foot, siphon, hepatopancreas and gonads of three bivalve species showed typical pattern of accumulation. In general, accumulation of Zn was maximum in gills, while minimum in foot in different seasons. Similarly accumulation of Ni, Pb and Al was maximum in gonads whereas, it was minimum in siphon in different seasons in all the bivalve species studied.

From the above observations and the data obtained, it is concluded that the water quality at station 'A' was very poor, while at station 'B' it was moderate. Due to which the bivalve species are not available at station 'A' and very few individuals were observed at station 'B'. The heavy metal content in the sediments was in the order of station $A > B > C$. Similarly heavy metal concentration was maximum during winter in various bivalve tissues as compared to other seasons.