Summary

- 20 freshwater bodies including man-made reservoir, tanks, ponds and temporary pools were studied at the Northwest regions of Andhra Pradesh.
- 350 plankton samples were collected qualitatively. Among these 114 species of zooplankton were recorded, of which 80 species (70.1%) of rotifers, 29 species (25.4%) of cladocerans and 05 species (4.4%) of copepods were found.
- 20 species of rotifers and 13 species of cladocerans were new records to Andhra Pradesh.
- Genus *Lecane* and *Brachionus* have more number of species in rotifera, which broadly represent the tropical climatic nature of this region.
- Morphological variations of *Brachionus calyciflorus*, *B. falcatus*, *B. diversicornis*, *B. quadridentatus* and *B. caudatus* were observed within the same species and it may be due to abiotic and biotic changes in the habitats.
- *Brachionus angularis*, *B. calyciflorus*, *B. quadridentatus*, *B. caudatus*, *Diaphanosoma sarsi*, *Ceriodaphnia cornuta* and *Moina micrura* were most common species that occur in this region. *Indianola ganapati* which was endemic to central India had been recorded during the study. In copepoda *Mesocyclops leuckarti* occurred most commonly.
- Cyclomorphic changes were observed in rotifers including seasonal changes during the period of study.

**Osmansagar reservoir**

- The Osmansagar reservoir had 74 species of zooplankton, of which 56 species of rotifer, 15 species of cladocera and 03 species of copepoda.
Density of zooplankton varied between 83-1080 No/L over the two years study period. The reason for high density was due to high rotifer and copepoda population.

High density of zooplankton was noted when nutrients like phosphate, nitrate and nitrite were high.

The diversity of the zooplankton varied between H=0.679-2.63, with a high diversity during late winter and in summer due to more rotifer population.

The evenness of the overall zooplankton community varies between 0.257-0.904.

Dominance of the zooplankton community was high in the month of November, 2011 (87%).

The species richness was between 8-24 numbers. The abundance of zooplankton community was reciprocal to the dominance.

SHE information analysis showed that increase of diversity was due to the evenness of the individuals than the species richness.

Physicochemical parameters were more or less similar during both years of study periods except minor fluctuations. It implied acceptable water quality and healthy aquatic ecosystem.

Unusual climatic changes, overexploitation of water for drinking also might be the reason for the community changes and decline of the zooplankton population and diversity.

There was no seasonal periodicity of any zooplankton community over two year study period in Osmansagar.

**Ameenpur tank**

61 species of zooplankton were recorded, of which 43 species of rotifers, 17 species of cladocerans and 03 species of copepods.

The overall zooplankton density was 195-5500 No/L throughout the study. High density was due to high population of rotifers during the entire study period.
Diversity of zooplankton varied between $H= 0.6-2.45$, evenness ($J$) between 0.212-0.80, Species richness between 5-27 numbers, abundance 3.34-49.7% and Dominance was 18.4-88.7%.

SHE information analysis of zooplankton community showed that as the species richness increased, the diversity also increased. Further, it decreased due to the decrease of evenness.

The population density of zooplankton of this tank showed wide fluctuation and high population during winter and summer seasons of 2011-12.

Unusual bloom of Keratella tropica in winter and Brachionus angularis, B. calyciflorus, B. caudatus and B. rubens in summer were recorded.

Numerical abundant populations of B. angularis, B. calyciflorus, B. rubens and B. caudatus in rotifers, Moina micrura in cladocera were observed and its abundance was considered as a biological indicator for eutrophication.

Genus Brachionus particularly B. calyciflorus was considered to be a good indicator of eutrophication.

Physicochemical profile of the tank showed a tropical climatic, hard water nature and high chloride attributed to the influx of sewage waters and pollutants. Phosphate content was high due to high nutrient content which was also evidenced with high concentration of nitrate, nitrite and ammonia.

**Bandam Kommu cheruvu**

It is a shallow weedy pond which had 84 species of zooplankton, of which 63 species of rotifers, 19 species of cladocerans and 02 species of copepods.

Zooplankton density was 119-26463No/L and high density was due to the rotifer population.
Diversity of zooplankton was $H = 0.893-2.683$, evenness was $J = 0.47-0.961$, species richness was between 5-21, dominance varied between 18.6-74.1% and the dominance values were reciprocal to the abundance.

SHE information analysis showed that the diversity ($H$) depends upon the evenness of the individuals rather than species richness of this pond.

High density of rotifer was due to *Brachionus angularis*, *B. calyciflorus*, *B. caudatus*, *B. plicatilis*, *B. quadridentatus*, *B. rubens*, *Keratella tropica*, *Filinia terminalis* and *Epiphanies mucronata*.

Numerical abundance of the *Rotatoria rotatoria*, *R. neptunia*, *Keratella tropica*, *Brachionus calyciflorus* and *B. plicatilis* in rotifer, *Ceriodaphnia cornuta* and *Diaphanosoma sarsi* in cladocera were observed.

Few dominant species with high density was common characteristic of the eutrophic ecosystem.

Physicochemical feature of this pond expressed tropical nature. Total hardness, alkalinity was high due to variation in the ionic content and changes in the climatic condition.

High content of chloride was due to the anthropogenic pressure, agricultural runoffs. The nutrient enrichment was due to the high content of the phosphate and nitrates.

**Trophic assessment of the three freshwater habitats**

Zooplankton population density in the three habitats such as Osmansagar reservoir, Ameenpur tank, and Bandam Kommu cheruvu pond were 207.5No/L, 1046No/L and 2351No/L respectively.

The pond had high density of zooplankton, even though the area is small compared to the reservoir and tank.
Zooplankton diversity was high in Osmansagar (H=1.917±0.47), evenness was high in Bandam kommu cheruvu (J=0.77±0.14). Species richness and dominance of zooplankton was more in Ameenpur tank and Bandam kommu cheruvu.

Numerical dominance of the *Brachionus calyciflorus*, *B. diversicornis*, *B. forficula*, *Keratella tropica*, *Mesocyclops leuckarti* was observed in Osmansagar reservoir.

Analysis of physicochemical factors along with zooplankton diversity indicates that the reservoir is mesotrophic (H’=1.9). Further SQB/T ratio of the reservoir also points out the mesotrophic nature.

Diversity and SQB/T ratio were represents that the eutrophic nature of Ameenpur tank and pollution threat of Bandam Kommu cheruvu.

Dominant species like *Brachionus angularis*, *B. calyciflorus*, and *Moina micrura* (Ameenpur tank) *B. calyciflorus* and *B. plicatilis*, *Keratella tropica*, *Rotatoria rotatoria*, *R. neptunia*, *Simocephalus exspinosus* and *Karualona karua* (Bandam Kommu cheruvu) were recorded, which is indicative of eutrophication.

Further, the present study recommends that the change in community structure, diversity, dynamics and composition of zooplankton, especially rotifers, the indicator species, in freshwater lakes may be helpful for further biomonitoring, better management and conservation of freshwater faunal diversity and the water quality.