SUMMARY

The thesis is a compendium of the work pertaining to ecological studies on fish communities of Anchuthengu backwater, a small ecosystem on the South-west coast of India. The physico-chemical factors, qualitative and quantitative aspects of phyto and zooplankters of the backwater are also investigated. The study is based on samples of fish collected from three different areas of the backwater, over a period of one year.

A brief account is presented on the importance of the present investigation. A detailed description is given of the area of investigation. Brief notes are furnished of the three stations from where the samples were collected for the study.

Results are presented of the physico-chemical factors and their seasonal variations. Rainfall showed clear seasonal variations reflecting the influence of the monsoons. The range of variation of the air temperature was found to be moderate. The water temperature fluctuated closely with atmospheric temperature, with maximum values during premonsoon and minimum during the monsoon season. The light penetration was high during the pre and postmonsoon
periods. The hydrogen-ion concentration of the backwater continued to be around neutral; the range of variation was from 6.06 to 8.08 at the surface and from 5.97 to 7.97 at the bottom. The maximum variation was noticed at station 3. The dissolved oxygen values of the surface and bottom water of the whole ecosystem fell within a range of 3.92 ml/l to 7.14 ml/l. The surface and bottom water showed almost the same trend of variation in salinity, indicating that the entire system is uniformly mixed in the vertical direction. The phosphate content always remained well below the critical level. The nitrite–nitrogen concentration was very low throughout the backwater. The nitrate–nitrogen at all stations registered a high value during the premonsoon season.

Detailed accounts are furnished on the temporal variations of the quantitative abundance of plankton at the three stations. In general, the phytoplankton consisted of 17 genera of Bacillariophyceae, 12 of Dianophyceae, 8 of Cyanophyceae and 14 of Chlorophyceae. Out of the 4 major groups of phytoplankton, the Bacillariophyceae dominated at stations 1 and 3 and its dominance was due to _Nitzschia sp._ The Chlorophyceae occupied the prime position at station 2. The Shannon diversity index values (H) of phytoplankton ranged from 0.54 to 2.50 decits in the water body.
The zooplankton population composed mainly of rotifers and crustaceans and showed its primary peak in May at station 1 & 2 and in March at station 3. Rotifers were predominantly present in the backwater almost throughout the year with peaks during premonsoon at station 2 and 3 while it was during postmonsoon at station 1. The copepods were the main crustacean present in the backwater. Greater abundance of copepods was observed when more or less stable conditions prevailed in the ecosystem. Of other zooplankters, occurrence of insects was quite erratic. Molluscan larvae were noted sparingly at all stations and bulk abundance of fish fry was noticed at station 1. The physico-chemical factors responsible for relative abundance and distribution of the plankton in the backwater also discussed.

Thirty eight species of fishes belonging to 26 families have been recorded from this backwater during the present study. Most of the families are represented by one or two species. Percids are represented by a total 21 species under 15 genera. *Ambassis commersonii* was the most numerically abundant species, followed by *Chanda nama*. The rest of the six most numerically dominant species are *Mugil cephalus*, *Carnax ignobilis*, *Arius artus*, *Therapon jarbua*, *Liza parsia* and *Megalops cyprinoides*. Seventeen species with >1% occurrence made
up to 95.7% of the total catch. Other species were very rare and uncommon. About 73.3% of the total fish caught were coming under the Order Perciformes, of which ambassids followed by carangids were the dominant groups in the assemblage. Spatial variation in fish abundance and in distribution of various species was noticed in the backwater. Maximum number of fish was caught from station 1 and minimum from station 3. *A. commersonii* formed the dominant species at station 1 & 3 and *C. nama* at station 2. All the 38 species of fish identified could be collected from station 1. A clear spatial difference in distribution of common species was noticed in the backwater. Variations in abundance and composition of each species of fish during each month and also during different seasons were also observed in the study. Diversity indices calculated showed that species diversity and species richness were high at station 1. In general, diversity was high at all stations during the monsoon season. The correlations between various physico-chemical parameters and fish abundance, plankton density and fish abundance were also worked out in the study.

Food and feeding spectrum of 15 most abundant species have been attempted. Detailed data are furnished in frequency of occurrence and percentage composition of various food items consumed by fishes of the backwater. The seasonal feeding habit of fishes are also
provided. High degree of overlap in resource use between closely related species is seen in the backwater.

All the species of fish examined in the study exhibited feeding periodicity. Diel variation in diet composition was also found out. Certain fishes exhibited a crepuscular feeding pattern; others showed intense feeding at 1800 h.

In a study of length-weight relationship of fish assemblage it was observed fishes exhibiting allometric pattern of growth. Interfamilial plasticity in mean length-weight parameters revealed isometric and allometric relationships in 4 and 6 families respectively.

The results obtained during the present study have been discussed in relation to the findings of similar studies elsewhere.