The theme of the thesis is to present information on the chemical biology of fish. However, because of the influence of anatomical heterogeneity on quantitative biochemical data, the distribution of some constituents in the somatic tissues of teleostean species was also examined. Concentrations of protein, fat, water, ash and cholesterol in 'red' and 'white' muscles, and liver of two riverine cat-fishes, namely, Wallagonia attu (Schn.) and Rita rita (Ham.) were determined, while RNA and DNA in the skeletal muscle, heart, kidney and liver of Clarias batrachus (Linn.), an air breathing cat-fish, were analysed quantitatively. Heterogeneity in the distribution of these organic and inorganic constituents has been interpreted, especially in the light of anatomical and physiological characteristics of the various tissues.

Sex-linked differences in the concentrations of some biochemical components of muscle and liver of Clarias batrachus were studied in two different stages of maturation of the fish. RNA and DNA in the muscle, and cholesterol and glycogen in the liver, were investigated in the recovering spents, whereas fat was determined in the liver of the individuals in the ripening phase. Biochemical differences in the two sexes have been explained on the basis of the available information on the
biology and physiology of the cat-fish. To substantiate discussion on chemical constituents of liver, the hepatosomatic indices of some teleosts were also determined. Relationships of RNA concentrations in the muscle and liver of *Clarias batrachus* with ponderal index and liver condition of *Clarias batrachus* have been established and elaborated in detail.

Quantitative variations in the nucleic acids in the 'white' muscle of *Wallagonia attu* during doubling of its body length were worked out and efforts have been made to correlate these changes with certain factors in a way as to indicate the 'cause and effect' relations.

Data was also collected on the DNA contents of the ripe, unspawned and unfertilized eggs of *Channa punctatus* Bloch., *Rita rita* and *Mastacembelus armatus* (Lacep.). Using cellular DNA contents attempt was made to establish probable pylogenetic relationships and evolutionary lines of teleost fishes.