Preface

Feeding 7 billion people on earth through agriculture in an environmentally sustainable manner has posed a major problem. Hence scientists all over the world are looking upon water as a major source of food production. Interestingly, Asia has been the centre of fishing and aquaculture activities. Among the Asian countries, India ranks second in culture and third in capture fisheries. More than 6 million fishermen and fish-farmers of India rely on fisheries for their livelihood. Area available for fish production in India is vast; for instance, the marine jurisdictional area alone spans to 2.02 m km^2, which is 38% of the total (5.3 m km^2) marine, freshwater and land area of the country; potential area available for aquaculture stretches to 1.4 m ha. From these vast areas, 5 mt fishes and edible invertebrates are now captured and cultured. Our annual fisheries export is 0.4 mt worth 47,000 million rupees. Thus fisheries constitute a highly productive sector, a source of valuable food and employment, and a net contributor to the balance of our payment. The major objective of this special section is to create an awareness among scientists, officials and policy-makers on the significant role played by the fisheries and aquaculture to our food production and export earnings.

Though many more contributions could have been included, the presentation in this special section is limited to nine contributions. The first one shows that the status of marine fisheries is now in a critical phase, after having reached the peak production of 2.7 mt in 1997. M. Devaraj and E. Vivekanandan (**page 314**) describe scientific, technical and socio-economic challenges encountered by the fisheries and identify opportunities to sustain marine capture fisheries. Aquaculture provides one such opportunity; though India's performance in shrimp culture is impressive, it has failed to diversify aquaculture. From FAO reports, M. N. Kutty (**page 333**) points out that there is no substantial evidence to show that aquaculture is a pollution-causing agricultural system.

Hatchery production of quality seed is the first important step for successful aquaculture. Therefore an understanding of the physiological basis of endocrine control of reproduction becomes a necessity. The perfectly coordinated hormonal cascade of events are described by S. Bhattacharya (**page 342**) and T. Subramoniam and R. Arun (**page 361**) in the fish and shelfish, respectively. The shrimps are the money spinner in our aquaculture farms; a shrimp crop is harvested once every 4–6 months. Therefore, there is a need for year-round availability of culturable stages of shrimp larvae. Hence, the development of a stable storage system is a promising option for ameliorating the scarcity of seeds both during the prime and off-seasons. T. Subramoniam (**page 350**) enumerates a series of attempts made by him to cryopreserve shrimp larvae by chilling, freezing and victification.

As a unique group, fishes are amenable to hormonal and ploidy induction; these techniques have established broodstocks to sire monosex progeny. Interestingly, a suitable technique combining cryopreservation of sperm and androgenesis may restore the genotype. T. J. Pandian *et al.* (**page 369**) foresee that cryopreserved fish sperm may become the 'gene banks' for the wild strains and species that are to be conserved for future use. Equally interesting is the description of unconventional pathways through which gametes are generated by fertile triploids. Transgenesis is an emerging area of science. Growth hormone cDNAs of a couple of indigenous fish species have been cloned; heterologous and homologous gene constructs have been electroporetically transferred into the chosen Indian fish species. Mosaicism appears to pose a major challenge for the ultimate realization of a fast growing transgenic fish.

Due to auto-pollution, there has been epidemics of viral infection, which have caused the almost total collapse of our shrimp farms in the coastal areas. The need for early diagnosis, treatment and prevention of microbial diseases has been succinctly enumerated by I. Karunasagar and I. Karunasagar (**page 387**). However, research in this area is in its infancy in India.

India is a major sea-food exporting country in the world; therefore, it must have a simple, rapid and easily practicable method of assessing fish quality. Describing nucleotide degradation, P. T. Lakshmanan and K. Gopakumar (**page 400**) consider the use of *K*-value for evaluation of freshness of selected Indian fish and prawns.

From his personal experience and entrepreneurship, M. Sakthivel (**page 405**) delineates a series of strategies to increase Indian fisheries export, processed at a cheaper cost, in a value-added form, for a higher unit price. He identifies a large number of Indian culturable species and areas, where they can be profitably cultured/sea-ranched. He points out the urgent need for minimum infrastructure and hygenic facility at the landing, pre-processing and processing centres of fish and prawns, which are highly persistable. To him fisheries is a multi-billion dollar spinning industry but receiving woefully minimum care and investment by the Government. The industry brings annually 3.5% of our foreign exchange. But the investment for its development by the government is just 0.3% of its total budget outlay. Our investment on fisheries research must also be doubled, as the targeted fish production is to be doubled in less than 10 years. It is suggested that an independent ministry of Fisheries be formed immediately by the Central Government and a master plan for fisheries research and development be implemented within a time frame.

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