PREFACE

Several species of bivalve shell fishes abundantly found in Indian waters can sustain regular and very productive fisheries in India. In Maharashtra State several species of commercially important and edible bivalves like clams, oysters, mussels, scallops, abalones are found along the coastal area, whereas, other bivalve shell fishes like mussels and clams are found in both lotic and lentic freshwater bodies.

Both marine and freshwater bivalve shell fishes play an important role as a bio-indicators or bio-detectors to detect various environment fluctuations and aquatic characteristic changes due to natural and man made calamities. These bivalve shell fishes are filter feeders or collector filters capable or collecting and filtering huge volume or the water and they are able to detoxifying hazardous substances in aquatic systems. By removing organic materials bivalve can significantly reduces turbidity level and the total B.O.D. (Biological Oxygen Demand).

Bivalves particulate suspended matter in the water and change it into dense particles that fall to the bottom. They are potentially major consumers of phytoplankton and bacteria. Generally they remain totally buried under the mud or sand and some have sedentary habitat. A few freshwater and marine species are exploited for pearl culture and flesh of the species is considered as a main food due to their edibility value and cheap resource.
The living freshwater bivalve molluscan fauna is represented (according to classification of Vokes, 1980), primarily by three super families, the Unionaceae, Corbiculaceae, and Dreissenaceae. The Unionaceae (in which freshwater mussels belong) is dominated by the families Margaritiferidae and Unionidae. The family Unionidae includes a large number of genera and species of bivalve shell fished. Among these freshwater bivalves (The unionids genera) occurs. In Maharashtra state the species of bivalve found to be Lamellidens, Parreysia, corbicula and Indonaia. In the genera Lamellidens, Lamellidens marginalis is a common species, abundantly found in Marathwada Region. Lamellidens marginalis was firstly reported by Lamark and Parreysia corugata by Muller’s.

The freshwater bivalves are suspension feeders on the primary stage of food chains hence they notably influences the organization and functioning of the ecosystems. Also, they perform efficient role in transformation of energy in food chains coupled with their sessile mode of life. The significance of the shell fishes, in future will be greater as a potential source of food for human beings. Many of the bivalve molluscs have not yet attended their place on the governments table that they could. The oysters and mussels particularly along the coastal regions are much relished. The provision of nutritious food is a long standing problem and only means to tackle it should be tried and if successful, popularized. In several
parts of the world, including our India, the shell fishes are exploited for various purposes, apart from food.

The freshwater mussels are feed on fine particulate suspended organic matter in to the water columns. Assimilated nutrients are used by bivalves for growth, reproduction, respiration and for metabolism they are excreted in dissolved inorganic forms. The significant role of freshwater mussels in stream system is release of nutrients via excretion, settled on suitable substratum. Being a component of ecological food chain, these animals are not able to migrate form one place to another, and hence they remain under severe environmental stress.

Many scientists have been shown much interested to study the ecological and physiological aspects of bivalve molluscs, since past few decades. Though the research work on the biology and fisheries of commercially important shell fishes contributing to the substantial catches was started comparatively recently in India. There have been considerable preliminary and some detailed investigation on various species of local importance and the result obtained from it helpful to make effective attempt in advancing the modern trends in research on various aspects of physiology and ecophysiology. Some notable contributions on clams, mussels, and oysters are from Mumbai, Sindhudurg and Ratnagiri coasts in Maharashtra while freshwater mussels are form only Thane, Kolhapur, Ahmednagar, Nanded and Aurangabad districts.
Historically, physiological ecology of freshwater bivalves is based on taxonomy with notes on habitat, community composition, abundance and distribution on the basis of life cycles, growth, reproduction, population dynamics and energetic (Burky, 1983), modern physiological ecology of freshwater bivalves has more recently involved both field and laboratory studies.

The physiological-ecology and energy metabolism, during the reproduction in bivalve molluscs have been studied and reviewed by many investigators, because the physiological ecology of bivalves can give an insight on adaptation of animal to function in its particular environment oxygen consumption can be chemical and affected by biological factors in the environment as well as the physiological events in the animals. To get additional information on some physiological aspects, the experiments were conducted to study the habitat or site specific changes in ammonia excretion and changes in oxygen: nitrogen (O/N).

The present species was undertakes to study the aspects like, reproductive cycle of the field population and changes in the digestive tubules.

These aspects have been studied on the samples collected from a fixed location along the bank of Peerkalyan dam at Peerkalyan dist. Jalna on every season full moon and new moon days. Over a period of two years to understand and interactions of several physical, chemical and biological factors in the
environment on the physiological events in the animals. To get additional information on the some physiological aspects, the experiments were conducted to study the size specific changes in oxygen consumption, ammonia excretion and oxygen: Nitrogen ratio.

While reproduction of marine and fresh water shell fishes has been studied for a long a time, more data and desirable on the their annual reproductive cycles with environmental stress in aquatic system to determine their effects on gonads and the accompanying change in the animal body at this time, showing in release of gametes and energy storage. A number of studies on the gonad development of marine and fresh water bivalve molluscs have been carried out, the workers like Virabhadrarao; Algara Swami; Bal and Purves; Nagabhusanam and Mane have contributed in this field.

The toxic effects of polluting substances on reproduction also occur in the different ways. Teratological development of embryos may results in deformed or malfunctioning of larvae which do not survive and they not show hatching. Reproduction may be influenced by behavior, the production of eggs and sperms, the secretion of egg membranes, the production of nutrients may be considerably affected in presence of environmental stress like salinity changes, insecticides oil and detergent and inorganic pollutant considerably affect the animals in aquatic
system. Many workers have used histological and physiological aspects of a tool in determining the stress effects on animal body.

The entire data collected are formed under five sections.

1) Changes in oxygen consumption
2) Changes in ammonia excretion
3) O:N ratio
4) Histology of the gonad (Reproduction)
5) Histology of digestive gland (hepatopancreas)

Introduction and materials and methods are given in the beginning of the results as sectioned above whereas discussion and bibliography are given at the end of the results. Finally general Summary and conclusions have been given.