India, with a coastline of over 8000 km and an exclusive economic zone of 2.02 million km$^2$ has large potential for capture fishery. The fishery exhibits marked fluctuations from season to season and from year to year. Fisheries production is influenced mainly by biological factors, especially phytoplankton and zooplankton abundance which are inturn controlled by physico-chemical factors. Environmental parameters are an aquatic system modulates the primary, secondary and tertiary production. A set back in any of these aspects alters the other in the cycle and the entire ecosystem gets jeopardized.

The word plankton (Greek - drifting) introduced by Victor Henson in 1887, distinguishes all organisms passively floating in water. The study of plankton has progressed very much as a result of sustained investigations in Marine Biology and Oceanographic Challenger Expedition (1872 - 1876), Michael sars (1910), the Great Barrier Reef expedition (1828 - 1829), and International Indian Ocean Expedition (1963) in the Bay of Bengal and Arabian Sea, Royal Indian Navy's marine survey ship, the “investigator” and “Mahabus” better known as “John Murray Expedition” (1933 - 1934) have done extensive studies on plankton.

The plankters are two categories, the phytoplankton which includes all the minute photosynthetic floating organisms and the zooplankton by animal groups. Zooplankton forms a major link in the energy transfer in the aquatic biosphere and their ecology is of considerable interest in assessing the production potential of the sea. Copepods are the most numerous metazoans on earth and can represent up to 80% of the zooplankton in the ocean, the study of copepod ecology is an important aspect of biological oceanography because of their significant role in the food web/chain of the aquatic environment. They occupy an intermediate level between the primary and tertiary producers, ie. phytoplankton and nekton.
Copepods usually dominate the mesozooplankton in respect to numbers and biomass in all marine waters (Miller, 2004). Huys and Boxshall (1991) have reviewed copepod anatomy, anatomical variations and phylogeny. Copepods are becoming the natural food sources for many fish larvae and adapted to fluctuating environment and found in all natural water bodies. The name ‘copepod’ originates from the Greek words, ‘Kope’ - ‘an oar’ and ‘podos’ - ‘a foot’, which refers to the peculiar flat, laminar swimming legs of the animals. The order copepoda consists of 10 sub-orders, viz., Calanoida, Harpacticoida, Cyclopoida, Poecilostomatoidea, Siphonostomatoidea, Monstrilloida, Misophrioida, Mormonilloida, Platycopioida and Gelyelloida (Bowman and Abele, 1982 and Ho, 1990). Copepod distributions and life cycle have been shaped by the physical and chemical parameters from where they evolved. Due to their sheer abundance and diversity, copepods are also popularly known as “Insects of the sea”.

Lalli and Parsons (1997) have, segmented crustacea are represented in the sea by several different groups, but copepods are the predominant forms. Some of the most abundant and best known marine zooplankton belongs to the order Calanoida which comprises about 1850 species. These free-living calanoid copepods are present in all marine regions and usually make up 70% or more of all net-collected plankton. Humes (1994) reported that, there are around 11,500 species, classified into 200 families and 1650 genera. About one-third of marine copepod species are parasites, which are associated with invertebrate hosts. They mainly belong to the orders, Monstrilloida, Poecilostomatoidea and Siphonostomatoidea and may have a partial planktonic life. While he attempting to estimate the actual numbers of species on earth suggested that as of now, only 15% of the existing species have been known. Among the planktonic organisms, the copepods are the most abundant animals and probably the most significant first prey in the trophic structure. Copepods constitute on an average 80% of the total zooplankton and at times their numbers are so abundant as to impart a pinkish colour to the water they present.

Aspects of copepod ecology form varies habitats such as mangroves, estuaries, coastal waters, corals lagoons and open oceans are worth considering, as they serve the dynamic nature of marine environment. In an area where several water bodies mix the
planktonic animal alone can give the clue as to the waters origin unless the salinity differences are marked (Russell, 1935).

Aquaculture is the most significant growth component of the Indian fisheries industry interest in marine fish culture has dramatically increased with the recent failures in the commercial fishery. The main bottleneck for fry production in the marine fish is associated with larval feeding. Many commercial marine finfish species that are raised through their entire life cycle are unable to grow if fed exclusively on formulated diets during their first developmental stages. Development of fish meals suitable for all stages would definitely assist the growth of the aquaculture industry. However, the knowledge about first feeding on formulated diets is still limiting. Larval first feeding occurs when the endogenous energy reserves in the larva's yolk sac are exhausted and the larva must begin to feed exogenously. Larval mortalities are generally greatest at this stage. The high mortality is in part, due to the lack of nutritionally adequate live food organisms. Fish larva's are required live food organisms which have relatively high concentrations of the long-chain, n-3 highly unsaturated (HUFA) or essential fatty acids (EFA) such as 20:5n-3 (EPA; eicosapentaenoic acid) and 22:6n-3 (DHA; docosahexaenoic acid). These are essential because the larvae do not have the necessary n-6, n9 and putative 6-4 desaturases to synthesize these fatty acids (FA) from shorter chain n-3 fatty acids. Alitrical larvae need to feed on small prey due to the small size of their mouth. Also, because the gut of the altricial larvae is not fully developed at the time of first feeding, it is an advantage to get live prey which brings some exo-enzymes to the fish, helping the digestion of the prey. Another reason for using live prey for first feeding is that moving prey are more attractive to fish than inert particles.

Most of the hatcheries have been using the brine shrimp (Artemia sp.) and rotifers as live food for crustacean and fish larval culture because of their ease to use, but many industries suffer from high mortality during the first developmental stages of their fish larvae despite the use of these live foods. Because Artemia and rotifers show low long-chain EFA levels enrichment is necessary before use in first feeding (Stottrup et al. 1986 and Sargent et al. 1997). Furthermore, the size of Artemia is too large for
the first days of feeding for many fish larvae with small mouths, however in such cases smaller live prey such as rotifers may be substituted.

Though rotifers have long been considered as pests in the aquaculture industry, their use as live prey has increased in common hatchery facilities. The two main species used are *Brachionus plicatilis* and *Brachionus rodundiformis*. Rotifers are parthenogenetic, reproduce at high rates and their densities achieved in culture are extremely high. However, as for *Artemia*, the biochemical composition of rotifers is poor and the need for enrichment is required.

There are more potential live preys that could be developed for the aquaculture and aquarium industries, however none of the alternative prey has been intensively used by the industries due to the difficulty to grow, store, or transport them. Among these potential alternatives, copepods are the best prospective candidate and the development of many studies is increasing their potential as live prey.

It is well accepted that, many copepods are a valuable source of food for fish larval rearing although they are not often used in aquaculture industry. Many results considering biochemical composition and the size of the copepods suggest that, the use of copepods will be established in the near future. Støttrup (2000) and Payne and Rippingale (2000b) have been strongly suggest that the inclusion of copepods in the aquaculture industry will increase the number of successfully reared fish species. Raised copepods as well as harvested zooplankton contain a biochemical characteristic which makes them a good alternative or supplemental live prey for larval rearing (Naess and Lie, 1998; Stottrup and Norsker, 1997; McEvoy et al. 1998; Payne and Rippingale, 2000a; Evjemo et al. 2003; Santhanam, 2002; Rajkumar and Vasagam, 2006; Gopakumar and Santhoshi, 2009 and Jeyaraj and Santhanam, 2011). Also, copepods have a slower passage through the gut of fish larvae than *Artemia* spp., which leads to a more complete digestion and more efficient nutrient uptake (Pedersen, 1984). This may be due to the fact that, copepods have higher digestive enzyme contents than *Artemia* which can be used by the fish larvae as exo-enzymes (Munilla-Moran et al., 1990).
However, the copepod industry is still not fully developed primarily due to the lack of knowledge about large scale cultivation. Hence, the present study has been aimed to study the seasonal distribution and diversity of marine copepod in Muthupet waters followed by biology, culture and evaluation of cultured copepod *P.parvus* for their suitability as live feed for larval production of finfish *L.calcarifer* and shrimp *P. monodon*. 