Scallops are the marine bivalves found distributed all over the world oceans. They are unattached epibenthic bivalves living on the soft ocean bottoms. They have beautiful shells which are sculptured with radiating striations. Unlike other bivalves, they are active and mobile with well-developed sensory organs and musculature. The foot is reduced and the mantle margins are provided with light sensitive eyes. They have one adductor muscle and the siphons may be reduced or absent. They swim by ejecting jets of water by rapid closing of the valves.

The scallops are commercially important since they are considered as a delicacy in most parts of the world. Scallop culture is carried out worldwide using several methods and equipments. *Patinopecten yessoensis, Placopecten magellanicus, Pecten maximus,* *P. jacobus, P. novaezelandiae, Argopecten gibbus, A. irradians, A. purpuratus, A. circularis, Chlamys islandica, C. opercularis* and *Patinopecten caurinus* are the commercially important scallops.

Gulf of Mannar, located in Southeast coast of India along Tamil Nadu State, is considered the world’s richest region from marine biodiversity perspective. *Minnivola pyxidata, Mimachlamys sanguinea,*
Volachlamys tranquebaria and Bractechlamys noduliferus are the scallop species found distributed in Gulf of Mannar. Few of these pectinids are being commercially exploited on large scale from the Tuticorin and they include Volachlamys tranquebaria and Spondylus imperialis.

Phylum Mollusca is the second largest group in the animal kingdom and the Class Bivalvia is the second largest, comprising of some forty-one super families, one hundred families and approximately 8000 species. Scallops belong to the subclass Pteriomorphia and order Ostreoida. Twelve species of Pectinidae (Azumapecten squamatus, Decatopecten amiculum, D. plica, Bractechlamys noduliferus, Excellichlamys spectabilis, Felxopecten pesanatis, Gloripallium pallium, Mimachlamys sanguinea, M. splendidula, Minnivola pyxidata, Scaechlamys irregularis and Volachlamys tranquebaria) have been reported in Gulf of Mannar which includes the Sri Lankan side. But, the field survey in 2002 indicated the presence of only six species. They are Bractechlamys noduliferus, Excellichlamys spectabilis, Mimachlamys sanguinea, M. splendidula, Minnivola pyxidata and Volachlamys tranquebaria. Among these six species, Mimachlamys sanguinea, Minnivola pyxidata and Volachlamys tranquebaria are the common forms and have been selected for the detailed study. Bractechlamys noduliferus and Excellichlamys spectabilis were not found in live
condition during the present study. The taxonomical position of the *Mimachlamys sanguinea*, *Minnivola pyxidata* and *Volachlamys tranquabarica* are given with the compilation of synonyms in the taxonomy chapter. Probably, this study is the first taxonomical compilation for the three scallop species in India.

The anatomy of the scallops distributed in Gulf of Mannar, *Minnivola pyxidata*, *Mimachlamys sanguinea* and *Volachlamys tranquabarica* were studied. The valves of the scallop *Minnivola pyxidata* shell though appear to be similar, are not actually identical and is inequivalve. The shells are equivalent in *Volachlamys tranquabarica* and *Mimachlamys sanguinea*. *V. tranquabarica* and *M. sanguinea* were found to develop byssus when they were held in tanks in the lab. But, the observation of the animals in the nature didn’t show any byssus development.

The mantle in all the three scallops is a thin layer of body wall comprising of three folds. The white centrally located posterior adductor muscle observed in the three scallops is a typical characteristic feature of all scallops. The single musculature is divided into two regions namely a ‘quick’ muscle formed of the striated fibres and a ‘slow’ or ‘catch muscle’ formed of smooth fibres. The ctenidia in *M. pyxidata*, *M. sanguinea* and *V. tranquabarica* are large, crescent shaped, found
curved around the posterior adductor muscle, from the anterior region of
the mantle. Each ctenidium is formed of an inner and outer
demibranchs.

At the anterior end of the visceral mass, there lies a white, long
thin foot with a swollen tip. It is reduced and elongated extending from
the visceral mass anterior to the adductor muscle. In *M. pyxidata*, *M.
sanguinea* and *V. tranquebaria*, there are two metanephridia or kidneys.
Between the foot and hinge is the leaf like structures called labial palps
which surrounds the mouth. A short oesophagus extends from the
mouth to the stomach which is surrounded by dark brown or greenish
brown digestive gland or diverticula. The nervous system in the three
scallops consists of three pairs of ganglia with connectives namely
cerebral, pedal and visceral ganglia. The circulatory system of these
scallops is quite simple and similar. The heart is placed in a transparent
triangular sac, the pericardium, located posterior to the digestive gland
and dorsal to the adductor muscle. It consists of two irregularly shaped
auricles and a ventricle. *M. pyxidata*, *M. sanguinea* and *V. tranquebaria*
are dioecious i.e. sexes are separate. The gonads are located in the
visceral mass anterior to the adductor muscle.

The length-weight relationship of these three species are
explained by fitting a regression line through the plots of log length
against log soft body weight in the form of scatter diagram which showed a linear relationship between the two variables viz., length and soft meat weight. There is a close relationship between length and weight. The exponential values for the above species are nearer to ‘3’ indicating that the weight increased correspondingly to the increase in length. The age and growth study could not be taken up due to the irregular availability of scallop specimens. The collection of species for the study is based on the by-catch in boats.

Scallops are opportunistic filter feeders that take advantage of both pelagic and benthic microorganisms as food sources. The gut content of the scallops Minnivola pyxidata, Mimachlamys sanguinea and Volachlamys tranquebaria were mainly composed of phytoplankton. The phytoplankton Coscinodiscus sp. was found to be dominant in the guts of all the three scallop species throughout the study period. The other plankton were Pleurosigma sp., Nitzschia sp. and Navicula sp. which were also abundant throughout the study period. A total of 15 species of phytoplankton, two species of micro-zooplankton and one foraminifer were recorded from the gut contents of the three scallops.

The sexes are separate in Minnivola pyxidata, Mimachlamys sanguinea and Volachlamys tranquebaria. In the developing stages, the colour of the gonad was orange in female and cream colour in male.
The sex ratio fluctuated in all the three scallops during the study period. Interestingly, the number of females was on the higher side than that of the males in all the three species. The mean male: female sex ratio in all the three scallops was ranging from 1: 1.2 to 1: 1.4. The fecundity was 30,000-45,000 eggs per female in *Minnivola pyxidata*, 40,000-50,000 eggs per female in *Mimachlamys sanguinea* and 50,000-55,000 eggs per female in *V. tranquebaria*.

The Gonad Index showed that these scallops spawn throughout the year but the maximum gonad index was noted in March 2002 for *Minnivola pyxidata* and in October 2001 for *Mimachlamys sanguinea* and *Volachlamys tranquebaria*. The sex ratio study indicated an interesting female only status in *Minnivola pyxidata* during November’01 and December’01 and during November’01 in *Volachlamys tranquebaria*. 1:1 sex ratio was observed only in February’02 in *Minnivola pyxidata* and in January’02 in *Mimachalamys sanguinea*. In all other months, the females were found to be dominant. Five maturation stages, immature stage, maturing stages I and II, matured stage, spawning and spent were observed in all the three scallops.

Various parts of the scallops like the adductor muscle, foot, ctenidia, kidney, mantle, intestine and digestive gland were sectioned and the tissue organization in each part was studied. The scallops are
fouled by a large number of organisms causing damage to the host. Barnacles, polychaetes, bryozoans, sponges, tunicates and algae were found associated with scallops. Among the associated fauna, the cirriped Balanus amphitrite was most numerous and found throughout the study period. The other associated fauna were the tubiculous polychaetes, sponges and spats of Crassostrea sp., Spondylus sp. and Pinctada sp. Next to barnacles, the tubiculous polychaetes were the major boring organisms.

The Gulf of Mannar Marine Biosphere Reserve, covering an area of 40,000 sq. Km from Mandapam to Tuticorin, possess unique and diversified habitats, supporting complex biological communities. Tuticorin coast, located at 78° 46'E and 8° 45'N in the southern part of Gulf of Mannar, is rich in molluscan fauna. Gastropods are mainly exploited for operculum and shell. Gastropod and bivalve meat are consumed in select pockets along Tuticorin coast. Otherwise, the bivalves are exploited for ornamental purpose and for use in lime industry. Among the bivalves, eight species of Pectinids belonging to two subfamilies are reported from Tuticorin coast. The subfamily Pectininae is represented by Bractechlamys noduliferus, Mimachlamys sanguinea, Minnivola pyxidata and Volachlamys tranquebaria and the subfamily Spondylinae by Spondylus regius, S. layardi, S. imperialis and Spondylus sp. The survey indicated that Volachlamys tranquebaria
and *Spondylus* are exploited mainly for ornamental purposes. These shells are collected and sent to major shell trading centres like Keelakarai, Rameswaram and Kanniyakumari. The exploitation is seasonal and depends on the market demand. Awareness could be created among the coastal community on the food value of scallop meat. The culture of these commercially important scallops could be initiated to augment the natural resource and to meet out the demand for the nutritive food.

The biomedical potential of the one of the scallop species, *Minnivola pyxidata* was explored through antibacterial assay and pharmacological studies. The acetone extract showed inhibitory against 11 pathogens except *Klebsiella pneumoniae*. The methanol extract exhibited activity against *Salmonella paratyphi*, *Shigella dysenteriae* and *Proteus mirabilis*, *Streptococcus pneumoniae*, *Staphylococcus epidermidis*, *S. aureus*, *Pseudomonas* sp. and *Salmonella typhi*. The water extract exhibited trace activity against *Salmonella paratyphi*, *Pseudomonas* sp. and *Salmonella typhi*.

The *Minnivola* extracts were not able to induce deep sleep in the rats, but they were found to be drowsy after 40 to 50 minutes of the administration of the extracts. The observed drowsiness indicated the presence of CNS depressant activity. The methanol and acetone
extracts of *Minnivola pyxidata* exhibited analgesic activity by inducing the rats to tolerate heat up to 8 to 8.5 seconds. The activities of methanol and acetone extracts were comparable to the positive control Pentazocin. The acetone and water extracts of *Minnivola pyxidata* exhibited anti-inflammatory activity by inhibiting the inflammation induced by carrageenan. The extracts of the scallop *M. pyxidata* exhibited an effect on the locomotor activity of the rats. The water extract showed more activity than the other two extracts. Anti-histamine activity was exhibited by the three extracts of *Minnivola pyxidata* by inhibiting the inflammation, bronchoconstriction, vasodilation and allergic caused by histamine even after 15 minutes and 32 seconds as observed in the control. The study indicated that the *Minnivola pyxidata* do possess some pharmacological properties. So, further studies would reveal the potentiality of the compound responsible for the activity.