SUMMARY AND CONCLUSION
7.0. SUMMARY AND CONCLUSION

The present study has mooted out for isolation of sponge associated cyanobacterial symbionts along South East coast of India and to find out their potential to use in the field of agriculture, aquaculture and pharmaceutics. The salient features of the present study are highlighted, as are follows:

- Three cyanobacterial species *viz.* *Phormidium angustissimum* (MSUSRC1), *Chroococcus minor* (MSUSRC2) and *Oscillatoria amphibia* (MSUSRC3) associated with three sponge species *viz.* *Sigmadocia carnosa* (MSUSR3), *Callyspongia fibrosa* (MSUSR2) and *Colloclathria sp.* (MSUSR1) were reported from both the collection sites, along South East coast of India.

- The frequency of occurrence of the reported cyanobacteria was varied with the month of collection. However, the percentage occurrences of sponge associated cyanobacteria were found higher during monsoon season than in non-monsoon season in both the collection sites. The associations of cyanobacterial symbionts are found to be specific with host organisms. For instance, *Ph. angustissimum* (MSUSRC1) is specifically associated with *S. carnosa* (MSUSR3), *C. minor* (MSUSRC2) found particularly associated with *C. fibrosa* (MSUSR2) and *O. amphibia* (MSUSRC3) has specific growth on *Colloclathria sp.* (MSUSR1), irrespective of the study sites.
• The effect of different sponge extract (E₁, E₂, E₃) on the growth, pigments and the biochemical constituents in identified species of sponge associated cyanobacteria reveals that, the homogenate (E₂) from *Colloclathria* sp. (MSUSR1), *Callyspongia fibrosa* (MSUSR2) and *Sigmadocia carnosa* (MSUSR3) showed maximum response over control than the other two extracts.

• The biofertiliser effect of sponge on rice seedlings showed that, the 50% concentration of tissue homogenate extract (E₂) of *C. fibrosa* (MSUSR2) enhanced the maximum growth parameters than the other two sponge species.

• The effect of sponge associated cyanobacterial species supplemented with chemical fertilizer in rice seedlings revealed that, the supplementation of *Ph. angustissimum* (MSUSRC1) along with urea enhanced the maximum growth parameters than the other treatments.

• The antibacterial sensitivity of sponge associated cyanobacterial symbionts against 4 fish pathogens reveals that, symbionts showed sensitivity against all the tested fish pathogens. The antibacterial sensitivity of sponge associated cyanobacterial symbionts against 10 common human bacterial pathogens and ophthalmic pathogens were also carried out. It showed that, all the cyanobacterial species showed sensitivity against bacterial pathogens except *B. subtilis, P. aeruginosa, S. enteritdis, Salmonella sp.*, *S. pneumoniae, E. coli, Pseudomonas sp.* and *Acinetobacter sp.*
• It is concluded from the present study that, the diversity of sponge associated cyanobacterial symbionts varied with the seasons, months and collection sites along the south east coast of India. Moreover, the sponge homogenate could be used as a biofertiliser for the growth of rice seedlings and also for the mass scale production of associated cyanobacterial symbionts. The bioactive compounds from sponge associated cyanobacteria, mass cultivated in sponge homogenate could be used for the treatment of variety of bacterial borne infectious disease in human and fish.