

Morphological and Molecular Variability of the Sea Anemone *Pseudactinia flagellifera* and *Bunodosoma* sp. from the Karachi Coast, Pakistan

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INTRODUCTION

Sea anemones are water-dwelling, predatory and sedentary organisms (Cnidaria: Anthozoa: Actiniaria) they are merely marine, found in intertidal and shallow subtidal zones of coastal areas. These organisms play a substantial role as they provide ecological niche and homes for other organisms, such as small fish and shrimp species that live in the anemone's tentacles to protect themselves from predators (Erralde and Acuna 2020). They often have large polyps that allow for digestion of bigger prey and lacking of a medusa stage. Morphological characters are expedient in the anthozoans taxonomy as they do not have many distinctive characteristics; that is why taxonomic classification become difficult (Bernston *et al.*, 1999). The colour pattern of Sea Anemone's are important for the morphological identification in field, however a highly variable coloration exist in most Actiniaria and having slight diagnostic value. Therefore, due to the lacking about the Actiniaria phylogeny based on morphological characters, it is important to examine through the molecular characterization. The vertical SDS-PAGE electrophoresis of whole cell proteins is a valuable technique for discrimination of species. An electrophoretic method SDS-PAGE (Sodium Dodecyl Sulfate Poly acrylamide Gel Electrophoresis) is described to differentiate between species according to their protein distribution and can be performed without complex or expensive equipment.

OBJECTIVES

The present study intended to determine the morphological and molecular variability of the Sea Anemone *Pseudactinia flagellifera* and *Bunodosoma* sp. from the Karachi coast, Pakistan.

MATERIALS AND METHODS

Collections of two Sea Anemone species were collected manually from the intertidal zone of Manora and Buleji rocky coast of Karachi during 2019. For detailed morphological examination and measurements Specimens were shifted to the laboratory. Morphological identification based on the available identification keys and their coloration patterns. For molecular variations through vertical SDS-PAGE electrophoresis of cell proteins for the specimens with diverse colorations, the noted morphological features were compared and analyzed. The complete process of Polyacrylamide gel electrophoresis for general protein was accomplished by extraction, separation and particular staining as described by Naz *et al.*, (2017), Hebert and Beaton, (1993) and Shaw and Parasad, (1970). The process of SDS-PAGE performed by following Laemmli, (1970) under reducing conditions in the discontinuous buffer system of electrodes. The relative mobility (Rm) of protein bands was estimated.

RESULTS

In the current study, two species of Sea Anemone's *Pseudactinia flagellifera* and *Bunodosoma* sp. were collected from the shallow waters of Manora and Buleji. Taxonomic identification was based on external morphology as well as internal anatomic features include, Siphonoglyph, Actinopharynx and Mesenteries. The biochemical variability between two species of Sea Anemone *Pseudactinia flagellifera* and *Bunodosoma* sp. was also observed through SDS-PAGE (Sodium Dodecyl Sulfate - Poly acrylamide Gel Electrophoresis). The results of electrophoresis resolved the total seven different protein bands for both species and revealed the clear difference in banding patterns and band numbers of General protein (non-specific) between the two species of Sea anemone.

CONCLUSION

The study showed the marked difference in general protein distribution in the two selected species of Sea Anemone with some population variations.

KEYWORDS

Intertidal and shallow subtidal, Karachi coast, Pakistan, SDS-PAGE, Sea anemones.

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