

Morphological Study of Genus *Astropecten* with One New Report in Coastal Water of Pakistan

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ABSTRACT

Its flattened and solid shape is attributed to the pentaradial body structure of the starfish that typically comprises of five or more short and wide arms. The colors may differ much but generally it is between yellow and orange with the arms. portraying darker patterns. This is a species that is characterized by the modest size of the madreporite and asymmetrical position on the central disc. The research paper presents a report about the discovery of a new species in the coast of Pakistan, alongside the already reported species *A. polycanthus* and *Astropecten indicus*.

Keywords: Taxonomy, Genera, Ossicles, *Astropecten*.

INTRODUCTION

Jean-Baptiste Lamarck, a famous French naturalist, described the popular genus of starfish, *Astropecten*, in his book in 1816. This genus has more than a hundred species, as written in 1840 by Gray (Mah & Hansson, 2008). Reasons why they have so many descriptions are the huge literature surrounding these species is laden with synonyms and revisions (Hussain *et al.*, 2020). Despite the fact that *Astropecten* can be found at a broad range of depths, Pawson *et al.* (2009) have found nine known species, which inhabit the East Florida Shelf and the Gulf of Mexico. The study of echinoderm ossicles has revealed the significance of the same to the movement, feeding patterns and the interaction of the organism with its environment. The article by Guillaume *et al.* (2025) devoted to structure and functioning of ossicles of sea stars studies the biochemical processes related to the formation of ossicles and mechanical characteristics of these structures. There have been earlier reports of the species *A. polycanthus* and *Astropecten indicus* in Pakistan showing that they are typically found in muddy or sandy or shallow seabed habitats often near coral reefs or sea grass beds.

OBJECTIVES

The primary aims of research into its various genera are to know the taxonomy, morphology, ecological functions, and identification of the characteristic of distinguishing between species at the genus *Astropecten*, a family of sea stars or starfish.

MATERIALS AND METHODS

The intertidal zone was sampled in the Pakistani coastal waters of Manora, Sea View, and Clifton in the period between 2023 and 2024 with the aim of collecting *astropecten* in the low-tide. The specific sampling locations will be taken into account to collect the samples of Asteroidea. The samples will be collected and then forwarded to a laboratory to undergo further analysis and stored in an ice box. After the visual classification of the recognized taxonomic keys, the specimens were compared by analyzing their ossicles (Tahera, 1996; Gondim *et al.*, 2013).

RESULTS

There were significant differences in the colors of fresh specimens, the arrangement of the spines on the margin and the structure of the madreporite and the morphology of the three species. (*Astropecten* sp., *Astropecten*

polycanthus and *Astropecten indicus*). The structure of the terminal and marginal ossicles, also that of the mouth, was different in these three species.

CONCLUSION

This research presents a new species of *Astropecten* discovered within the waters of Pakistan. Not only will it add diversity to echinoderms within the area, but it would also provide vital information on biological connections among surrounding aquatic ecosystems. It would appear that it is no coincidence that a new species with remarkable morphology, specifically within its arm shape as well as colourings, has been discovered.

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