

# The Biochemical Variations and Isozyme Characterization in Species of Two Genera (*Clibanarius*, *Diogenes*) of Hermit Crabs Found Along the Coast of Pakistan

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## INTRODUCTION

The omnivore creatures and the resident of gastropod shells belong to Subphylum Crustacea (Class: Decapoda: Infraclass: Anomura) commonly known as “Hermit crab”. They play a vital role in the food chain of the ecosystem. A large number of extant species have adapted themselves to live inside the Gastropod shells. These crabs are more diverse and found in various parts of oceanic waters such as muddy, sandy and rocky bottoms and algae beds (Yoshikawa *et al.*, 2018). They can be found near coastal shallow as well as deep waters. The body is mainly divided in two parts: Cephalothorax, and abdomen. Three families (Paguridae, Diogenidae, and Coenobitidae) belong to 7 genera (*Pagurus*, *Paguristes*, *Calcinus*, *Diogenes*, *Dardanus*, *Clibanarius*, *Coenobita*) have been reported from Pakistan (Tirmizi and Siddiqui, 1981).

## OBJECTIVES

This study aimed to investigate the Protein distinction in species of two genera which may help to understand the extent of differentiation species of the same genus on the level of biochemical characterization.

## MATERIALS AND METHODS

The hermit crabs were collected from different sites (Sonmiani bay, Sea view, Sonari beach, Korangi, and Russian beach) along the coast of Pakistan. Initially, the crabs were identified by available taxonomic keys: Tirmizi and Siddiqui, (1981); Reay and Haig, (1990); Siddiqui and Kazmi, (2003). The crab samples were analyzed through PAGE Electrophoresis and the tissues were extracted from the chela muscles then homogenized and centrifuged at 14000 pm. Total three enzymes; Amylase (*AMY\**), Carbonate dehydratase (*CD\**), and Catalase (*CAT\**) were selected for characterization and species discrimination. The staining procedure and banding pattern analyses were followed by Murphy *et al.*; (1996).

## RESULTS

The individual belong to seven species varied according to size and the larger one individual (size: TL: 164 mm, SL: 14 mm, Chela: 73 cm) belongs to genus *Diogenes* and the smallest one (size: TL: 9 mm, SL: 1 mm, Chela: 6 mm), was from genus *Clibanarius*. Investigation of this study revealed that the Protein distinction occur in the species of two genera. Total three enzymes; Amylase (*AMY\**), Carbonate Dehydratase (*CD\**), and Catalase (*CAT\**) were selected to study the species discrimination. Total nine loci revealed from three enzyme system, the polymorphic loci (PL) and the Nei’s expected heterozygosity ( $H_e$ ) was (PL=7, 4, 5 and 9;  $H_e$ = 0.0384±0.218, 0.205±0.255, 0.482±0.035 and 0.269±0.256) observed among the species of genus *Clibanarius* (*C. signatus*, *C. virescens*, *C. padavensis* and *C. infraspinatus*) respectively. However, for the *Diogenes* Genera; twenty-three (23) loci were resolved in the samples whereas the polymorphic percentage of observed species (*Diogenes avarus*: 43.48%, *Diogenes alias*: 47.83%, *Diogenes planimanus*: 56.52%).

## CONCLUSION

The banding pattern showed a monomorphic and polymorphic pattern in the experimented species and revealed the inter and intraspecific variabilities among the species of two (*Clibanarius* and *Diogenes*) genera.

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## KEYWORDS

Hermit crab, Protein Discrimination, banding pattern, *Clibanarius*, *Diogenes*.

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