

Protein (Isoenzyme) Approach Towards an Identification Tool: The Unfolding of Genetic Variability; Detected by Page Electrophoresis in Hermit Crabs Found Along the Coast of Pakistan

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ABSTRACT

Infra order Anomura; Superfamily Paguroidea generally known as Hermit crabs. Diverse numbers of species of these crabs found along the coast of Sindh and Baluchistan. They are ubiquitously distributed in shallow waters of the tropics and subtropics and their occurrence on almost each coast of Pakistan indicate the role and importance in ecological significance.

Keywords: Hermit crabs, Isozyme variations, Loci, PAGE Electrophoresis.

INTRODUCTION

The Householding crabs belong to Decapoda: Crustaceans and fall in the category of infraorder-Anomura, known as “Hermit crab”. These dwindling crabs can be seen on the ocean floors in search of food and shell utilization to cover up their vital posterior organs from desiccation and predators. Isoenzymes are veiled by homologous genes that have veered off over time. Although, firmly speaking, allozymes characterize the enzymes of the same gene with different alleles and perform the similar function or catalyze the same reaction as like particular enzyme. PAGE Electrophoresis is the nascent technique used to evaluate the 3–Dimensional through the characterization of these molecular markers by separation and also can be indicator to determine the physicochemical properties of specific enzyme (Mateus et al., 2009). These molecules act as a marker and are helpful to estimate genetic variability and become an important tool for systematic studies.

OBJECTIVES

The present study aimed to examine the Protein variation through Isozyme characterization in order to reveal the genetic structure in between two Species that are closely native to each other and hard to distinguish on the morphological appearance.

MATERIALS AND METHODS

The hermit crabs were collected from various (Sonmiani bay, Sea view, Sonari beach, Korangi, and Russian beach) sites along the Pakistan coast. Initially, the collected crabs were identified with the help of available taxonomic (Tirmizi and Siddiqui, 1981; Siddiqui and Kazmi, 2003) keys. The muscle tissue was extracted from the crab chela and homogenized with Tris-Citrate buffer following (Saher et al.2017, Naz et al. 2019) and the centrifuged at 14000 rpm. The isozymes; Carbonate dehydratase (*CD**) EC 4.2.1.1 and Amylase (*AMY**) EC 3.2.1.1, were selected for the isozyme variation study.

Vertical native polyacrylamide gels (Native-PAGE) electrophoresis was performed as described by Laemmli (1970) in discontinuous buffer arrangement under reducing conditions at room temperature. Nei's Unbiased Measures of Genetic Identity was used to calculate genetic distance and measurement (Nei 1978).

RESULTS

The two species share a close inhabitant where they overlap the resources of each other resources and always remain in the competition. In the study, both species revealed the Banding variability with each other and shows the dynamically different on the biochemical basis i.e., Isoenzyme; Amylase (AMY*), and Carbonate Dehydratase (CD*) for species discrimination. A total of polymorphic loci (PL) eleven loci were revealed from *Clibanarius padavensis* with the percentage (%) of polymorphic loci (47.83%) and *Clibanarius infraspinus* polymorphic loci (PL) were eight loci with the percentage (%) of polymorphic loci (34.78%), While the Obs-Hom (Observed Homozygosity); 0.73 ± 0.41 , Obs-Het (Observed Heterozygosity): 0.26 ± 0.41 and Nei's Expected Heterozygosity: 0.15 ± 0.21 . as estimated through the relative mobility data. The study also provides information about the specific bands' profiles that can be used as markers for the identification and differentiation between the cryptic or sibling species.

Table 1. Genetic variation Parameters in the two species of family Diogenidae collected from coastal waters of Pakistan

	<i>Clibanarius infraspinus</i>	<i>Clibanarius padavensis</i>
Polymorphic loci	8	11
% of polymorphic loci	34.78%	47.83%
Mean No. of locus	1.34	1.47
Average Heterozygosity	0.26	0.75

CONCLUSION

The banding pattern and distribution of loci showed only a polymorphic pattern in the studied species and revealed the intra and interspecific variabilities in between two (*Clibanarius padavensis* and *Clibanarius infraspinus*) species of Hermit crabs.

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