Color Polymorphism of Sand Crabs, Lepidopa Benedicti (Decapoda: Anomura: Albuneidae)

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Color variation in sand crabs
Unnam Nasir, Zen Faulkes
The University of Texas-Pan American

Introduction
Why do sand crabs on South Padre Island, Texas, vary from gray to white? Species in this genus have previously been reported as chalky white (Efford 1971), and color variation is not mentioned in recent descriptions of this species (Boyko 2002).

Is color related to the sex of individuals?

Is color normally distributed, or does it fall into categories (i.e., polymorphism)?

Is one color more beneficial to crabs than the other?

Methods
Sand crabs (*Lepidopa benedicti*) were collected from South Padre Island, Texas, and brought to the main campus of The University of Texas-Pan American. Animals were photographed with a digital camera, and were filmed swimming in a small tank. The sex of each individual was determined by examining the swimmerets; females have long swimmerets, males have extremely short swimmerets.

Results
Gray crabs are more common and larger than white crabs; males and females can be either color

![Carapace length distribution](image)

<table>
<thead>
<tr>
<th>Carapace length (mm)</th>
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<tr>
<td></td>
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<tr>
<td>Male</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>2</td>
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</tbody>
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Dot = mean; horizontal line = median; box = 50% of data; whiskers = 95% of data; asterisk = minimum and maximum.

Carapace color has a bimodal distribution

![Color intensity distribution](image)

Left column: Color intensity of three points on crabs' carapace (anterior medial, lateral, posterior medial). Right column: Color intensity of standard reference (table), showing that bimodal distribution is not due to auto adjustment features of cameras.

Conclusions
The greater abundance and size of gray sand crabs suggests that there may be an advantage being gray, though it is not clear what this might be. One way of testing further ideas about the origin and function of color differences in this species may be to examine other populations across the species’ range. *Lepidopa benedicti* are distributed around the Gulf of Mexico and the Atlantic coast of southern Florida.

Crabs do not use countershading

Countershading is a situation where animals are dark on top and light on the bottom. This coloration compensates for light coming from above, making animals harder to see. If gray crabs benefitted from countershading, they should swim dorsal side up, but they typically swim upside down.

Acknowledgements
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References