ABSTRACT
The post-ecdysial mineralization in crustaceans involves deposition of carbonate salts, such as calcium carbonate, to the organic matrix in the new exoskeleton. Cadmium is a toxic, non-essential metal frequently found in tissues of aquatic crustaceans. In spite of the similarity between cadmium and calcium ions, no study has previously been carried out to investigate whether the exoskeleton is a repository for cadmium. The purpose of this project was to determine whether cadmium is incorporated into the new shell during the post-ecdysial mineralization using the blue crab, Callinectes sapidus as the model crustacean. It was hypothesized that the injected cadmium would be deposited into the shell by calcium transporters in the epidermis during the mineralization process because of the resemblance between cadmium and calcium ions. To test this, soft shell blue crabs were injected with cadmium chloride, and cadmium content in the exoskeleton was quantified using ICP-OES. Cadmium content in the hepatopancreas, blood, gills and muscles will also be analyzed. As carbonic anhydrase is an important enzyme in the mineralization process, its activity levels were also analyzed for both groups. The initial findings of this study have suggested that during the mineralization process, blue crabs can incorporate cadmium into their shells as they would calcium. The presence of cadmium in control crabs and the amplification of cadmium content in treated crabs suggests that crab shells can be used as biomarkers for cadmium pollution.

RESULTS AND DISCUSSION
- The results of the carbonic anhydrase assay have suggested that cadmium treatment does not affect the enzyme’s level of activity.
- There was not a significant difference in calcium content in the shell between the two groups. However, the cadmium treated crabs contained significantly more cadmium in the shell.
- This is the first direct evidence that Cd is incorporated into the exoskeleton during post-ecdysial mineralization phase.
- The presence of cadmium in control crabs and the increase of cadmium content in treated crabs suggests that crab shells can be used as biomarkers for cadmium pollution.
- Follow-up studies can be carried out to establish which epidermal calcium transporters are responsible for the delivery of cadmium to the exoskeleton.

REFERENCES
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