# Physical Properties of the Queen Conch *Strombus gigas* (Mollusca Gastropoda) and its Consequences on the Shell Growth Development

A.HERNÁNDEZ-AYALA, M. ZAMBRANO-ARJONA, J. P. VALCÁRCEL, D. AGUILAR, P. QUINTANA, D. ALDANA-ARANDA, y J.J. ALVARADO-GIL
*Laboratorio de Biología Marina*
*CINVESTAV IPN, Unidad Mérida*
*Km. 6 Carr. Ant. a Progreso C.P. 97310*
*Mérida, Yucatán, México*

ABSTRACT

The thermal, thermoelastic, mechanical and structural properties of the shell of the Queen conch (*Strombus gigas* ) is presented. The evolution of these properties as a function of the shell growth in mollusks. Thermal properties show a typical high conductivity behavior of the aragonite materials, thermoelastic properties show the interaction of the organic with the inorganic matrix, mechanical properties show the high toughness of the aragonite biogenic material and X-ray diffraction study is used to monitor the texturization.

The consequences of our results on the development and susceptibility to thermal and mechanical stress is discussed and proposed an adequate rapport: Shell size *versus* different properties of the conch shells (thermal properties, thermoelastic properties, mechanical properties and texturization) in order to propose an adequate size for the rehabilitation programs

KEY WORDS: Queen conch, *Strombus gigas*, shell growth

# Características Físicas del Caracol Rosado *Strombus gigas* (moluscos Gastropoda) y su Cosequencias en el Desarrollo y en el Crecimiento de la Concha

Las características termales, thermoelastic, mecánicas y estructurales de la cáscara del conch de la reina (gigas de Strombus) se presentan. La evolución de estas características en función del crecimiento de la cáscara en moluscos. Las características termales demuestran un alto comportamiento típico de los materiales del aragonite, demostración thermoelastic de la conductividad de las características la interacción del orgánico con la matriz inorgánica, demostración mecánica de las características la alta dureza del material biogénico del aragonite y el estudio de la difracción de la radiografía se utiliza para supervisar la textura. Las consecuencias de nuestros resultados en el desarrollo y la susceptibilidad a la tensión termal y mecánica se discuten y propusieron una simpatía adecuada: Descasque el tamaño

contra diversas características de las cáscaras del conch (características termales, características thermoelastic, características mecánicas y textura) para proponer un tamaño adecuado para las programas de la rehabilitación.

PALABRAS CLAVES: Caracol rosado *Strombus gigas,* desarrollo y crecimiento de la concha

## Queen Conch (*Strombus gigas*), Genetics Analysis: Preliminary Results

FELIX MORALES[1] and JOSE LOPEZ[2]
[1] *Florida Institute of Technology*
*150 West University Blvd.*
*Melbourne, Florida 32907 USA*
[2]*Division of Biomedical Marine Research*
*Harbor Branch Oceanographic Institution*
*5600 US 1 North*
*Ft. Pierce, Florida 34946 USA*

ABSTRACT

The queen conch (*Strombus gigas*) is a western Atlantic Gastropod and one of the Caribbean species in the family Strombidae. It is the most important.mollusk in the area. Due to the artisanal fisheries that the conch has .supported for centuries in the Caribbean Sea increased fishing pressures led .to the decline of the stock. Since the 1970s several private and public efforts are being made to recover the species from commercial exploitation, .but to date queen conch are still considered a "commercially threatened .species". My hypothesis is that queen conch populations throughout the Caribbean are interconnected due to larval transport resulting gene flow.among populations in different locations effectively creating a metapopulation .of queen conch in the Intra-Americas Sea. . If this is the case, international.efforts would need to be coordinated to ensure recovery of the species throughout the Intra-Americas Sea. In a preliminary analysis queen conch samples were collected, preserved, followed by DNA extraction and amplification with PCR methods, and surveyed for amplified fragment length polymorphisms (AFLP), a multi-locus DNA fingerprint technique. Results suggest a relatively genetic uniform species-specific fingerprint pattern in Strombus gigas from Andros Island, Bahamas and the possibility of
working with conch genomic DNA, which are important steps in future genetic studies of queen conch.

KEY WORDS: Queen conch, *Strombus gigas*, genetic analysis