Abstract:

The goal of this thesis was to create different biomaterials for bone grafts obtained from marine organisms, in particular from the shell of *Rapana venosa* and natural polymers with excellent biologic qualities, for use in different medical applications, particularly for surgical procedures in oral cavity.

The original contributions start right from the collecting stage of shell biomass from three representative sites from the Romanian Black Sea coast: Midia Cape, Vadu-Corbu and Limanu, performing a detailed study on the morphology and composition of the *Rapana venosa* shell using statistical methods for processing biometric parameters, analyzing the relationship between shell morphology and its chemical composition and determining *Rapana venosa* phenotypes found on the Romanian Black Sea coast

Traces of Mg, Al, P, Si, S, Cl, K and Sr are present in the shell structure, particularly attached to the outer and inner surfaces of the exoskeleton. Detailed analysis of the microstructure and chemical composition of rapana shells revealed that they are not contaminated with pollutants, and heavy metals, recommending this bio-waste as a useful raw material for biomaterial synthesis.

. The original contributions on biomaterials synthesis began by obtaining hydroxyapatite nano-powders by hydrothermal process using *Rapana venosa* shell as natural bioresource. With regard to the synthesis of composite materials for bone regeneration was prepared by lyophilization from natural compounds represented by rapana shell and collagen type I of bovine origin. SEM micrographs show that obtained biomaterials structure is a porous, sponge-like structure similar to that of the bone. In this way, the sponges obtained confer osteoconductive properties required for the development of bone tissue. Furthermore, the study reports the elaboration of a new method for the obtaining biomaterials based on natural polymer and *Rapana venosa* shells, by in situ conversion of $CaCO_3$ micro-particles into HA in the collagen matrix, thus offering a stable matrix structure.

.