

Poster Presentation

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Crystallographic characterization of eggshells as scaffolds for bone regeneration

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The aim of this work was to characterize six different eggshell types as future osseous regeneration scaffolds. The study design was cross-sectional observational. The study was conducted in the Laboratory of Materials and the chemical analysis in the Faculty of Chemistry, UNAM, Mexico. Fifty samples of fresh eggs were obtained, 10 from each species (hen, turkey, duck, dove and quail). Square-shaped pieces of about 2 x 2 cm were obtained from the eggshells by means of a high-speed handpiece with a # 701 carbide bur. From the total of eggshell pieces, the ones coming from fresh eggs were included, and the ones showing signs of fracture or spots were excluded. Their morphology was analyzed with a low vacuum scanning electron microscope (JEOL 5200), with an accelerating voltage of 20 kV. The chemical elemental analysis was performed with an EDAX energy dispersive spectrometer (EDS) and the chemical composition was determined by means of a Siemens diffractometer. All of the eggshells were constituted by calcium carbonates, and their outer structure was less porous than the inner one, sometimes with granules and cuticles firmly attached to the inner surface of the eggshell. The eggshell major chemical components were mainly: oxygen, calcium, phosphorous, magnesium, sulfur and carbon. There are no significant quantities of sulfur (S) in the turkey and quail eggshells. These kinds of eggshells have not been tested yet as a scaffold, but it is expected that they may be used soon in bone regeneration once the organic part is removed. Eggshells are largely waste material. The authors acknowledge the technical support to Chem. Rafael Ivan Puente Lee

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