

CSIR-CENTRAL GLASS & CERAMIC RESEARCH DIVISION

BUSINESS DEVELOPMENT & PUBLICATION DIVISION

i. **Name of Technology:** Converting Sea Fish Waste (bone and scale) into Calcium Phosphate Based Value Added Ceramics

ii. **Details of technology**

Abstract: We have successfully transformed solid waste generated from marine fish processing industries—specifically a mixture of fish bones and scales—into value-added bioceramics, namely Hydroxyapatite (HAp) and Biphasic Calcium Phosphate (BCP). BCP is composed of an intimate mixture of Hydroxyapatite [$\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$] and β -tricalcium phosphate (β -TCP), combining the advantageous properties of both phases.

HAp and BCP are widely recognized as biocompatible, osteoconductive, and bioresorbable ceramics, and are often used for bone reconstruction, dental and orthopaedic applications. These materials function as scaffolds that support new bone formation; the stable HAp phase provides long-term structural integrity, while the more soluble β -TCP phase facilitates controlled resorption and enhances biological remodeling.

Biogenic resource-derived HAp and BCP thus represent sustainable, high-value biomaterials with significant potential for applications in veterinary bone regeneration, cosmetic formulations, and carrier for drug in tablet, etc.

Deliverables: Biphasic calcium phosphate (BCP) (Hydroxyapatite and Beta-tricalcium phosphate (β -TCP)) or single phase hydroxyapatite (HAp)

iii. **Year of Development:** 2025

iv. **TRL:** TRL 4 (1 kg batch) [Lab Testing/Validation of Alpha Prototype Component/ Process]

v. **Patenting Status:** Process Know-how available