

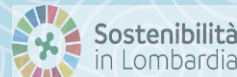


Materiali da Proteine

Bioeconomy Dialogues 2025

2nd Edition

Milan 28 October 2025



From Blue Crab to Biopolymers:
Valorization Opportunities of Protein-Rich
Side Streams in the Chitin/Chitosan Value
Chain



INTRODUCTION

BIOCHICA s.r.l. is an innovative start-up company, born in July 2020 and inspired by the Enabling Project experience (H2020).



BIOCHICA is successfully incubated within B4Ds at MIND-Milan since 2023



Introduction



BIOCHICA has its headquarters in Italy and it works both in the local and in the international context.

Thanks to the "Coaching&Brokerage" and the "Dissemination" activities of Enabling Project, Biochica has focused the attention on **Chitosan-based chain** by exploitation of local biomass residues.



TEAM



MATTEO FABBRI

CEO & Co-founder

Agronomist specialized in molecular genetics with a Master's degree in Finance.

He has over **20 years of experience in the agri-food industrial sector.**

He has worked on **agro-industrial supply chains** and international commodity markets (sugar, tobacco), contributing to research projects in plant science and sustainability.

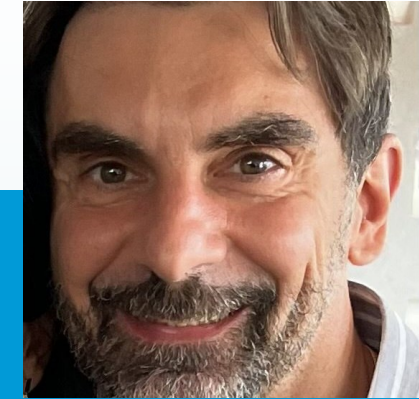


CARLA DE CAROLIS

Co-founder & Biomass Expert

Researcher Ph.D at UNIVPM and Specialist in Biomass, Biofuels, and BBPs with extensive experience in **International Cooperation: UN/UNIDO, UNDP, EU, and EIB.**

She has coordinated more than **15 projects on biomass** and sustainable value chains across Europe, North Africa, and the Balkans, with a strong focus on industrial research for biomass valorization.



LEONARDO POSTACCHINI

Co-founder & Engineer

Engineer and Researcher with **PhD in Sustainable Energy**, he teaches **LCA and LCC** at **UNIVPM - Polytechnic University of Marche.**

He has experience in **renewable energy plants, wastewater treatment, and circular bioeconomy**, with a focus on **supply chain and environmental sustainability.**

MISSION, VISION, APPROACH

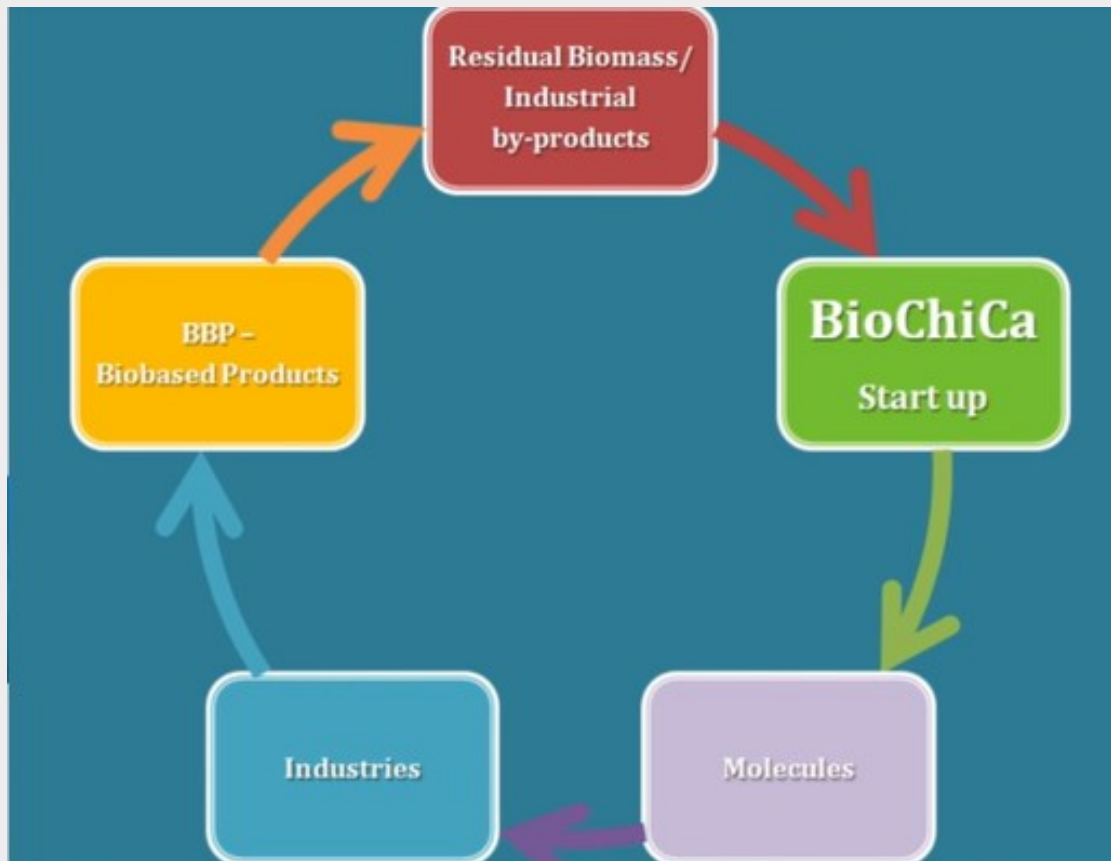
VISION

Biochica identifies/valorizes chitin-based biomass side streams, giving new life to underused biopolymers through innovative applications. Biochica aims to build a sustainable supply chain, develop a zero-waste extraction protocol, and fully reuse process by-products to create high-value BBPs.

MISSION

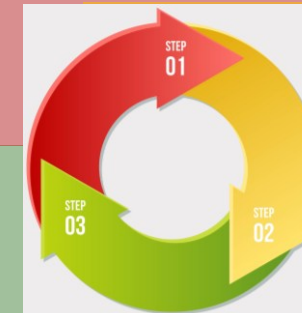
From waste to worth:
transforming agro-industrial and marine by-products into next-generation green polymers

APPROACH



Valorization of by-products

We use raw materials from marine and agro-industrial side streams, reducing waste and avoiding the use of new resources



Market Growth

An expanding market driven by the need for sustainable, scalable solutions across strategic sectors.

Sustainable Alternative

Chitin and chitosan provide a truly sustainable alternative to synthetic polymers, low-impact, versatile, and naturally smart.

MISSION, VISION, APPROACH



Chitin/Chitosan
Chain
by local fishing
residues
“**Blue Crab**”
for novel
applications

Supply biomass residues



Fisheries residues



Fishing industry

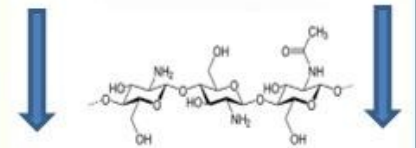
Lab Scale --> Scale Up



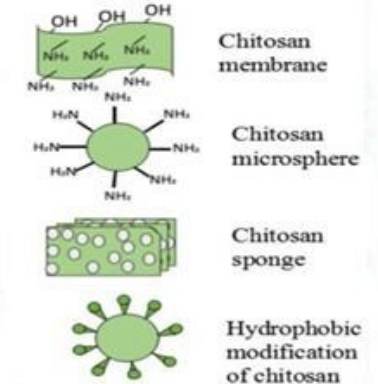
Application Fields

- Food/Feed
- Agro-Industrial
- BBPs – Biomaterials
- Cosmetic
- Biomedical
- Nutraceutical
- Environmental

Chitin-Chitosan based
Product

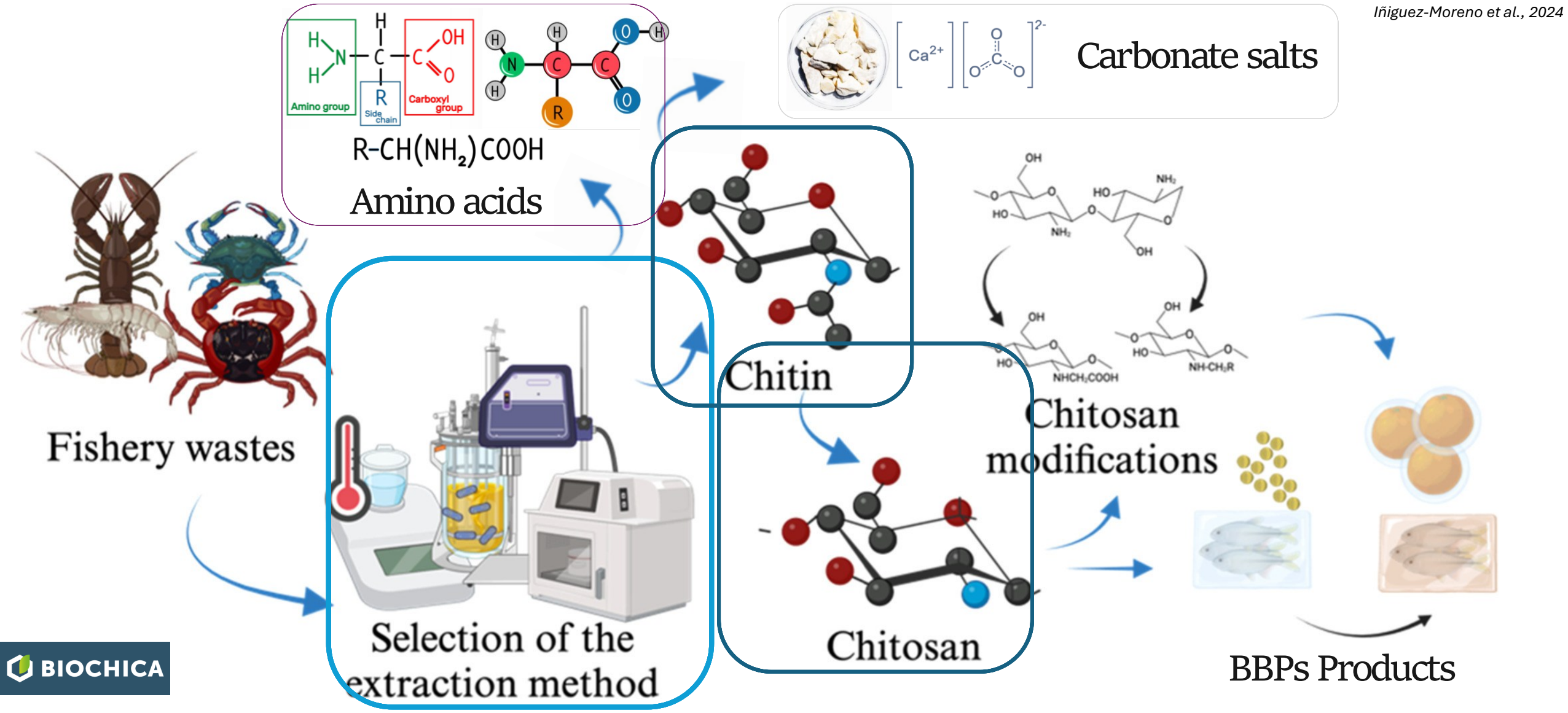


Chitosan Based Carrier

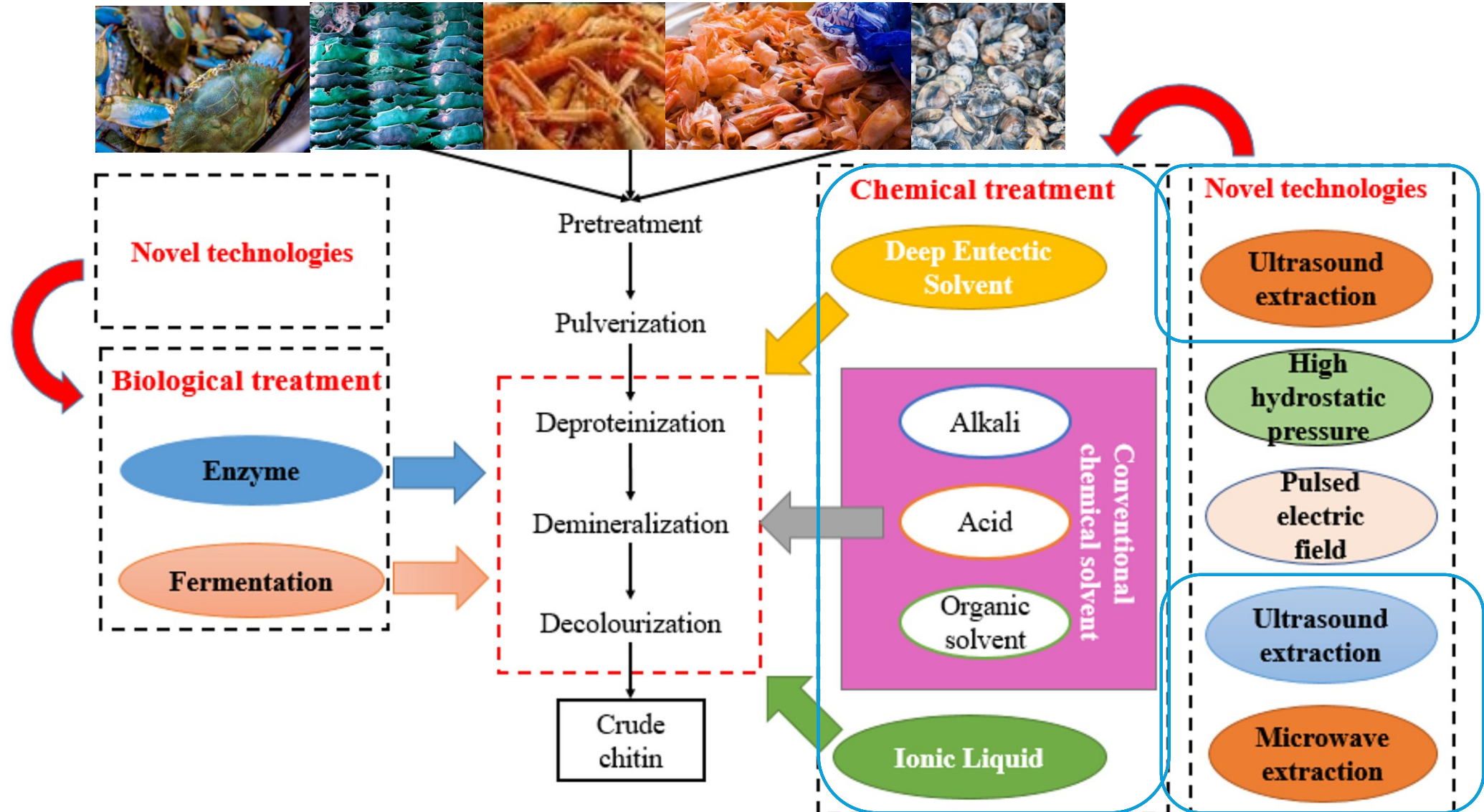


Valorization of fishery industry residues: CBBs – Chemical Building Blocks

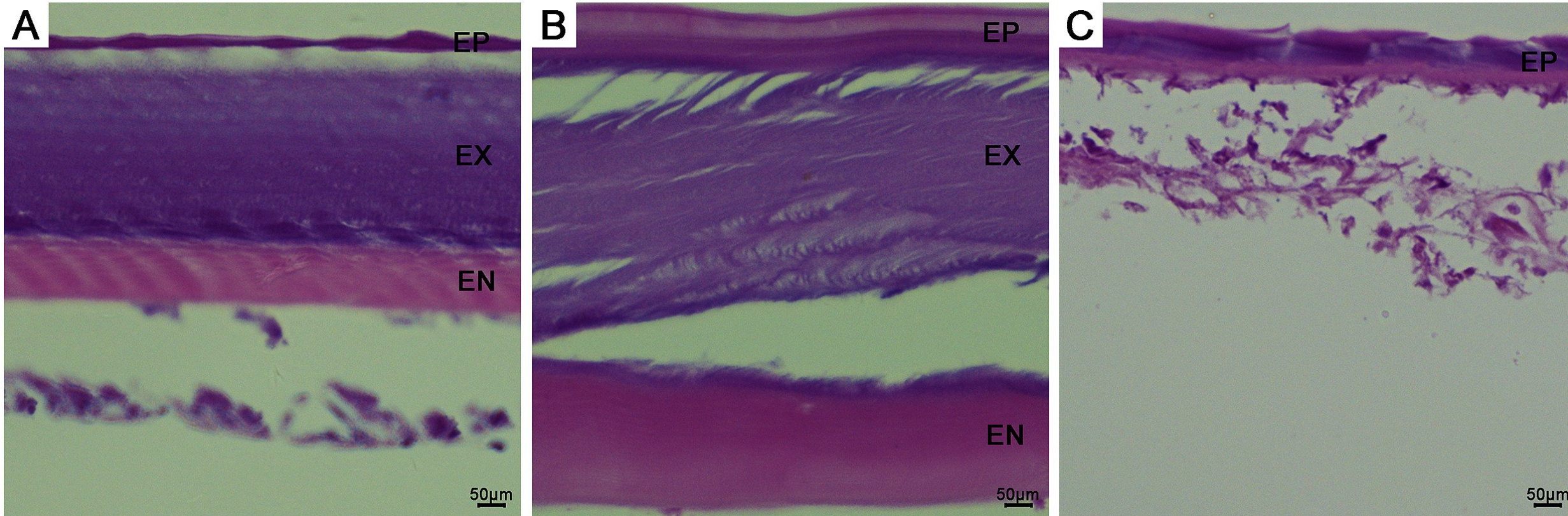
Iñiguez-Moreno et al., 2024



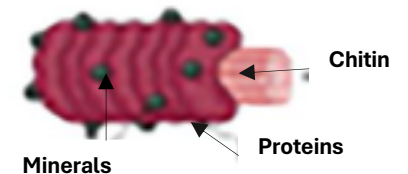
Valorization of fishery industry residues: Green extraction through novel technologies



Green Extraction to improve recovery of protein, chitin, carbonate salts, lipids, astaxanthin.



Light micrograph of shrimp shell sections: EN, endocuticle; EP, epidermis; EX, exocuticle.
(A, B) Shrimp shell treated with heat-denatured enzymes (control; A) and proteases A and B (B).
(C) Deproteinized shell treated with chitinase.

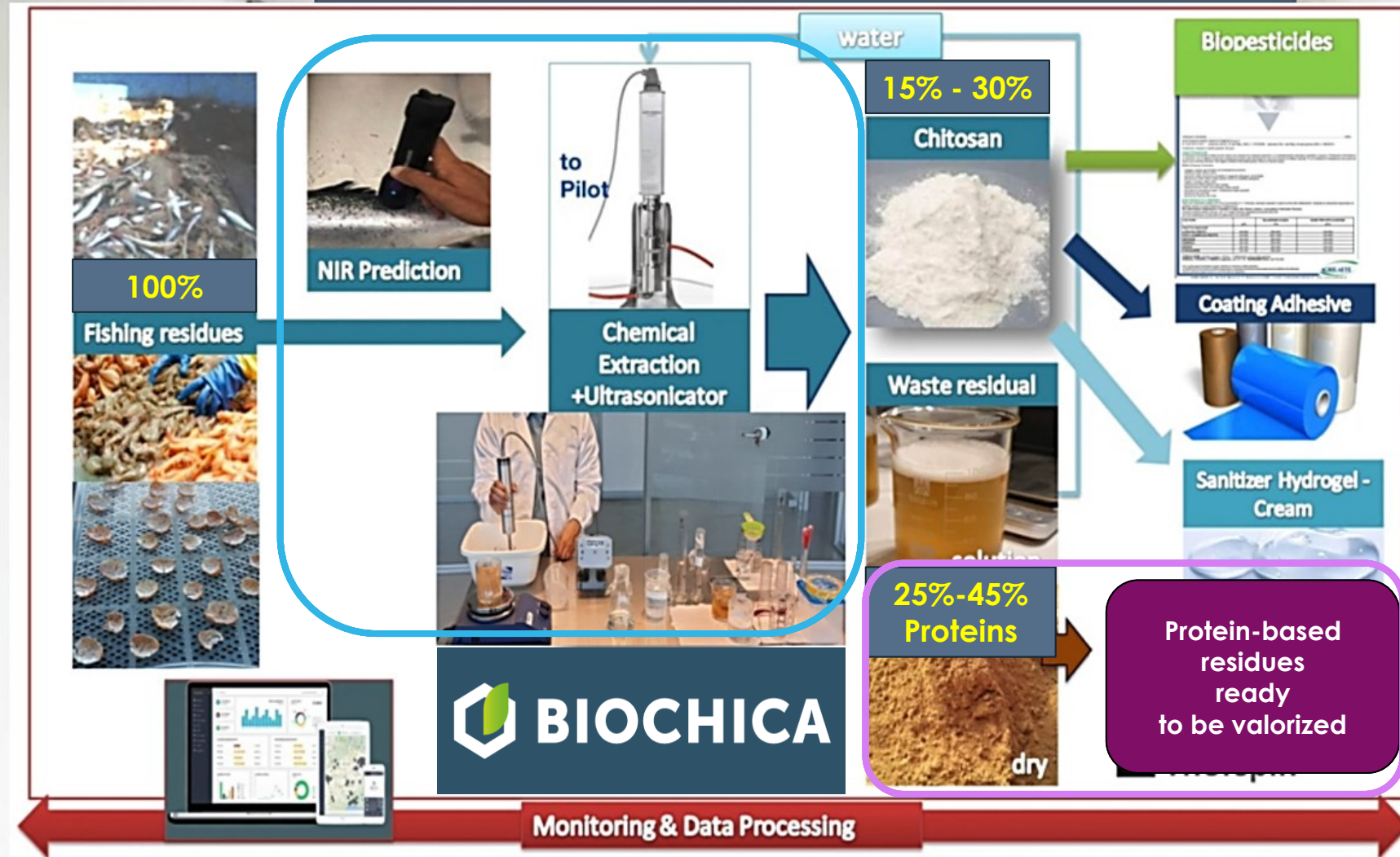


Jun-Jin Deng et al., 2020.

Biochica aims at valorizing the biomass residues by extracting useful chemical building blocks to be incorporated into innovative Chitosan-Based Products (CBP), such as:

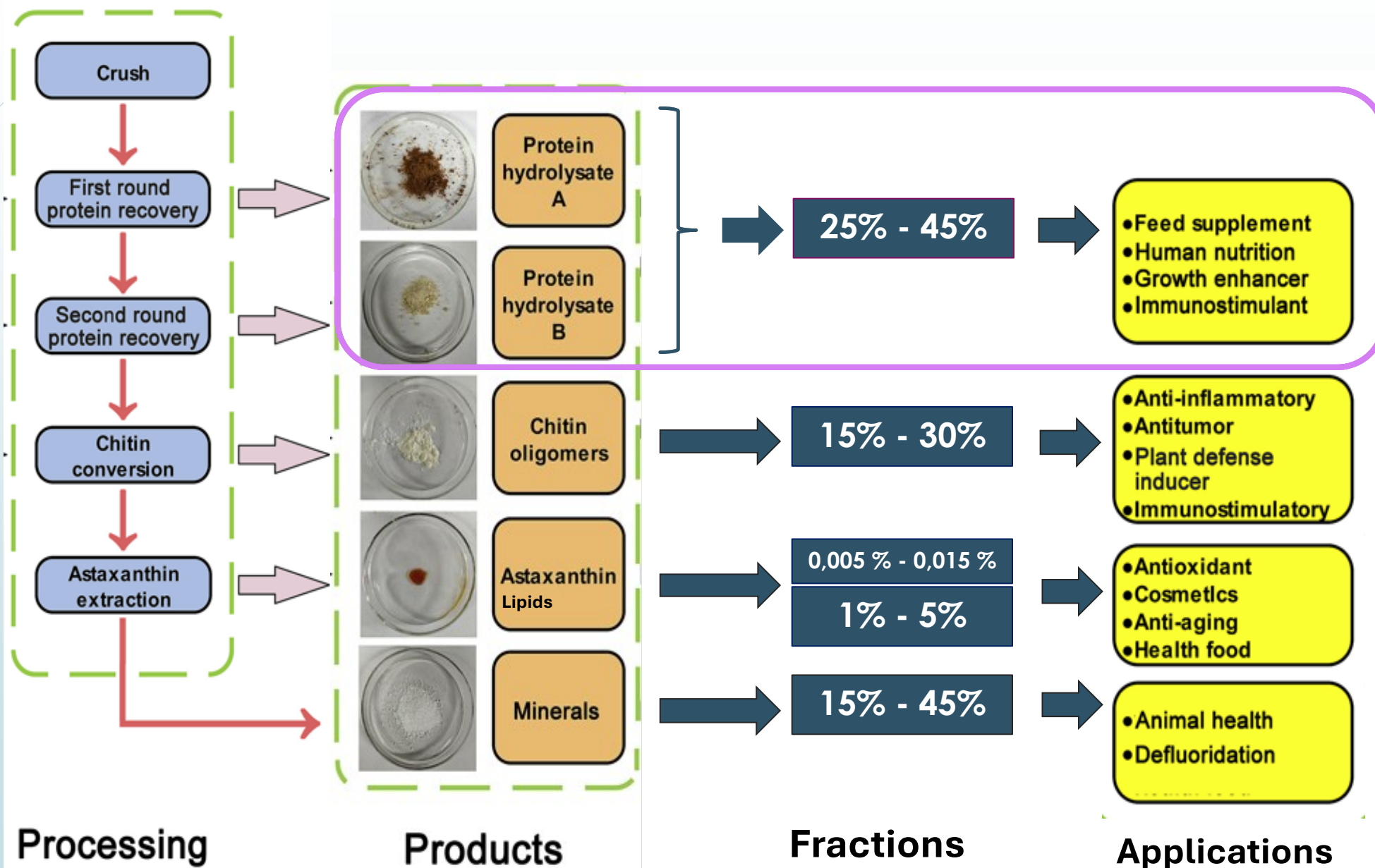
- Biopesticides
- Food-packaging
- Drugs carrier-molecules, Pharma Sector
- Textile sector
- Cosmetic applications

Chitosan-Based Process



Green Extraction to improve recovery of protein, chitin, carbonate salts, lipids, astaxanthin.

BIOCHICA



Valorization of fishery industry residues

Scenario <i>(total crustacean biomass captured, t/year)</i>	Chitin (t/yr)	Proteins (t/yr)	CaCO ₃ (t/yr)	Lipids (t/yr)	Astaxanthin (kg/yr)
Alto Adriatic: Blue crab (2024) = 1,900 t	380 – 475 (20–25%)	475 – 665 (25–35%)	665 – 855 (35–45%)	38 – 76 (2–4%)	95 – 285 kg (0.05–0.15 kg/t)
2025 plan / pulse (Veneto+ER) = 2,600 t	520 – 650	650 – 910	910 – 1,170	52 – 104	130 – 390 kg
Mediterranean crustacean production (FAO GFCM baseline 2021) = 3,600 t	540 – 1,080 (15–30%)	900 – 1,620 (25–45%)	1,080 – 1,800 (30–50%)	36 – 180 (1–5%)	180 – 540 kg

NEXT STEPS: ROADMAP

PHASE 1



PRELIMINAR TEST → R&D + VALIDATION

- **TEST** of EXTRACTION
- **TEST** OF APPLICATIONS
- **PROTOTYPES** (PROTEINS EXPLOITED)

PHASE 2



AGREEMENT & NDA

- **EU/National Projects**
- **Specific Agreements** on marine biomass exploitation for novel chain development from lab to pilot scale.

PHASE 3



REPLICABILITY BUSINESS MODEL & PILOT SCALE

- **Development of relationships** with key clients and investors
- Definition a 5-year growth chain **roadmap**



CONTATTI

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