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Nationality: Iranian
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Education:

- PhD student in Animal and Food Science (2025-)
- Master student in Marin Biology (2021-2024)
- Master student in Natural Resources Engineering - Trend of Aquatic Reproduction and Breeding (2013-2016)
- Bachelor student in Natural Resources Engineering - Trend of fishery (2003-2008)

Research areas:

- Aquaculture
- Aquaponic
- Food sustainability

Brief description of Ph.D project:

The proposed PhD project aims to design and optimize multitrophic aquaponic systems operating with brackish water, integrating fish, invertebrates, and halophytic plants within a circular and resource-efficient framework. The research will focus on

commercially valuable aquatic species, such as European seabass (*Dicentrarchus labrax*), gilthead seabream (*Sparus aurata*), and shrimp species, together with bivalves, polychaetes, and halophytes, to establish productive and ecologically balanced recirculating aquaculture systems

The project's innovative approach lies in its multitrophic and saline dimension: it will explore how combinations of trophic levels can be harmonized to enhance nutrient recycling, minimize waste, and improve both environmental performance and product quality. By coupling finfish culture with filter-feeding and deposit-feeding invertebrates and salt-tolerant plants, the research aims to achieve maximal resource efficiency and ecological integration.

Experimental activities will be conducted to:

1. Identify the optimal trophic configuration by defining the best mix of fish, bivalves, polychaetes, and halophytes to ensure balanced nutrient flows and stable system performance;
2. Assess the influence of salinity on growth, physiology, and product quality of both aquatic and plant species, supporting the development of resilient brackish aquaponic models;
3. Evaluate innovative feeding strategies, including the use of live or processed insects and polychaetes as natural enrichment sources for fish and shrimp, improving animal welfare, feed conversion, and final nutritional value.

Overall, the project will contribute to the development of next-generation multitrophic aquaponic systems under controlled, low-impact conditions. The outcomes will offer new insights into circular bioeconomy approaches and provide scalable solutions for sustainable food production in coastal and saline environments.

Supervisor:

Professor, Marco Birolo

