

# Exploring *Helix pomatia*: Transforming Hepatopancreas to High-Value Fish Feed

Muntean George<sup>1</sup>, Paul Alexandru Uiuu<sup>1</sup>, Arsène Houssou<sup>2</sup>, Daniel Cocan<sup>1</sup>, Dorina Simedru<sup>3</sup>, Anca Becze<sup>3</sup>

<sup>1</sup>INCDO-INOE2000, Research Institute for Analytical Instrumentation, ICIA Cluj-Napoca Subsidiary, 400293 Cluj-Napoca, Romania,

<sup>2</sup>Research Unit in Aquaculture and Fisheries Management, School of Aquaculture, National University of Agriculture, Porto-Novo BP 50, Benin

<sup>3</sup>INCDO-INOE2000, Research Institute for Analytical Instrumentation, ICIA Cluj-Napoca Subsidiary, 400293 Cluj-Napoca, Romania,

## INTRODUCTION

*Helix pomatia*, commonly known as the Roman snail or Burgundy snail, is a terrestrial gastropod mollusk that has been a culinary delicacy for centuries. Beyond its gastronomic appeal, the hepatopancreas of this snail, a primary digestive organ, holds untapped potential in the realm of aquaculture. With the global demand for sustainable and high-quality fish feed on the rise, there is an imperative need to explore alternative protein sources that are both efficient and environmentally friendly.

The consumption of *Helix pomatia* dates back to prehistoric times. Archaeological evidence suggests that snails have been consumed by humans for thousands of years. Originally native to Central and Southeastern Europe, *Helix pomatia* has been introduced to other parts of the world, including North America. However, its culinary consumption is most prominent in European countries, especially France.

*Helix pomatia* is often considered a delicacy. In French cuisine, it's commonly prepared with garlic and parsley butter, then returned to its shell and baked in an oven. (fig. 1)

Snails, in general, are a good source of protein, low in fat, and contain essential fatty acids. They are also a good source of minerals like iron, magnesium, and zinc, as well as vitamins like vitamin E and B12. Due to the high demand, especially in countries like France, there are snail farms (heliculture) dedicated to raising *Helix pomatia* and other edible snail species. Farming ensures a steady supply and also helps in conserving wild populations. In some areas, the wild population of *Helix pomatia* has been declining due to over-collection and habitat destruction. As a result, there are regulations in place in certain regions to protect the species. For instance, in some countries, there are restrictions on the collection of wild snails during certain periods to ensure population sustainability. The snail industry, including the farming, processing, and sale of snails like *Helix pomatia*, contributes significantly to the economy, especially in regions where snail consumption is a cultural tradition. The global interest in diverse and sustainable protein sources has led to a renewed interest in snails as a food source. This trend is not only seen in traditional markets like France but also in other parts of the world.

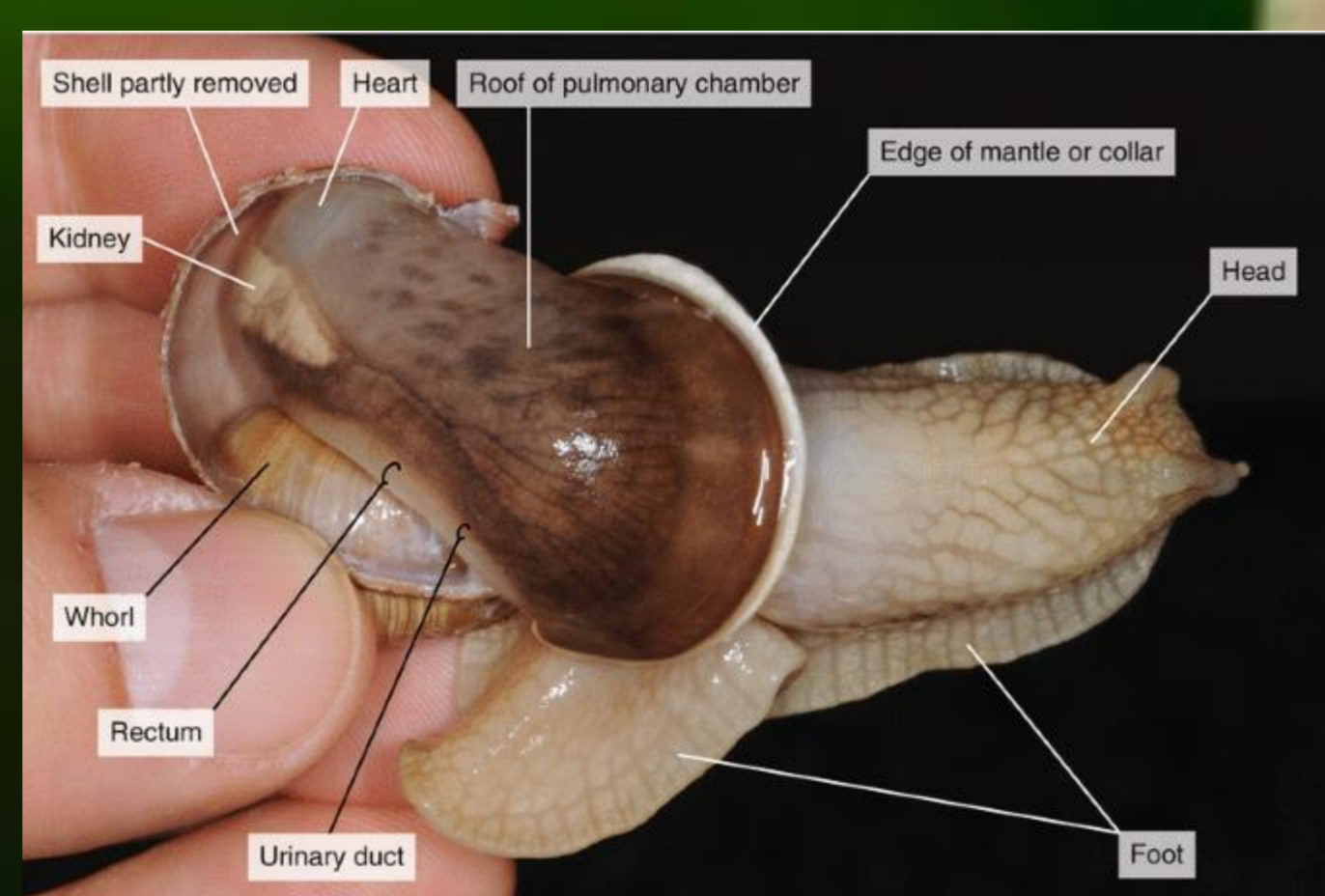


Fig. 1 *Helix pomatia*

In the era of the circular economy, where resource optimization and waste minimization are paramount, there's a growing emphasis on repurposing by-products and overlooked resources. With the global demand for sustainable and high-quality fish feed on the rise, there is an imperative need to explore alternative protein sources that align with these circular principles.

This study delves into the hepatopancreas of *Helix pomatia*, aiming to quantify its protein content and assess its viability as a high-value ingredient for fish feed. By harnessing the potential of this overlooked organ, we hope to pave the way for innovative solutions in sustainable aquaculture practices.

## SAMPLE PREPARATION

- Hepatopancreas from *Helix pomatia* was obtained through processing of live snails at a snail meat production unit.
- The hepatopancreas is obtained by following these steps:
  - Live snails are put in a heat resistant plastic container and covered with boiling water.
  - The snails are left for 3-4 minutes in hot water, until the meat at the entrance of the shell turns to a yellowish color.
  - Afterwards, the water is drained, and the snail is extracted from the shell using a small metallic fork with two prongs.
  - Using sharp scissors, the hepatopancreas is cut from the snail meat.
  - Snail hepatopancreas was stored in the refrigerator at 4°C for up to 24 hours, or in the freezer for longer periods, depending on when further processing of the hepatopancreas to hepatopancreas meal took place.
- The hepatopancreas was then dried at 105°C and grinded. (fig. 2)



Fig. 2 Grinded hepatopancreas

## ANALYSIS METHOD

Using the Tango spectrometer from Bruker (Ettlingen, Germany), samples were measured directly without any extraction.

## RESULTS

| Crt. No | Determination | Values |
|---------|---------------|--------|
| 1.      | Moisture      | 1.2 %  |
| 2.      | Fats          | 8.5 %  |
| 3.      | Protein       | 21 %   |
| 4.      | Ash           | 2.3 %  |

## CONCLUSIONS

- ❖ The hepatopancreas of *Helix pomatia* exhibits a significant protein content of 21%. This underscores its potential as a protein-rich ingredient, making it a promising candidate for fish feed formulations.
- ❖ Given the nutritional profile of the hepatopancreas of *Helix pomatia*, there's a clear opportunity to incorporate it into fish feed, potentially reducing the reliance on traditional, less sustainable protein sources. This aligns with the global push towards more sustainable aquaculture practices.

## FUNDING

This work was carried out through the Core Program within the National Research Development and Innovation Plan 2022-2027, carried out with the support of MCID, project no. PN 23 05.