Mediterranean agricultural by-products as insect diet ingredients: The ADVAGROMED perspective

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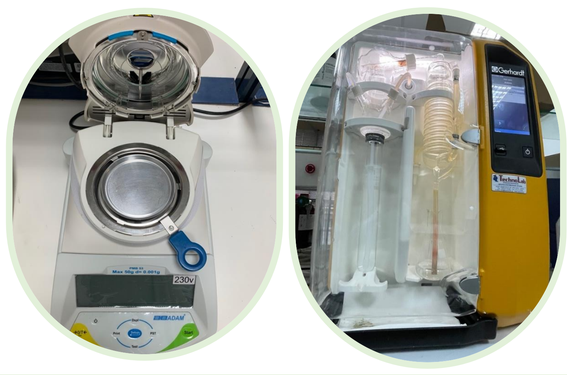
Introduction

- ✓ The high production cost is one of the main barriers for the further development of the insect sector. Among the other costs (labour, infrastructure etc.), the **feed cost** contributes substantially to the insect production cost. The exploitation of organic side-streams and wastes of low or zero economic value has been proposed as a feasible means to mitigate the insect feed cost.
- ✓ The **upcycling** of agricultural **by-products and side-streams** through insect bioconversion can help the **Mediterranean countries** valorize these locally available resources for the production of animal feeds and subsequently decrease their dependency on imported resources and increase the resilience of Mediterranean farming systems.
- ✓ Within the **ADVAGROMED** project, a broad spectrum of agricultural by-products were identified, collected and chemically characterized, as a first step towards their **valorization as diet ingredients** for the two most commonly reared edible insect species, i.e., ***Hermetia illucens*** (Diptera: Stratiomyidae) and ***Tenebrio molitor*** (Coleoptera: Tenebrionidae).

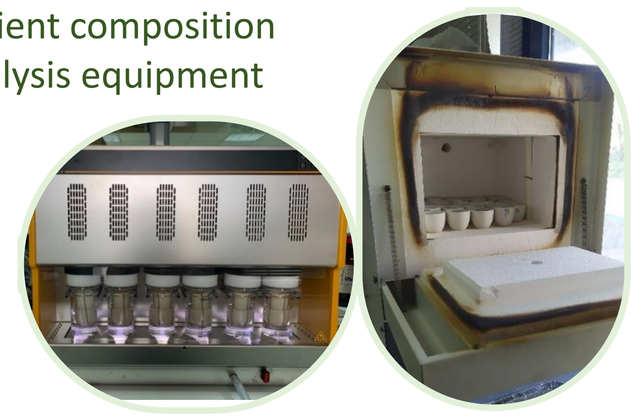
Materials & Methods

- ✓ Local agricultural by-products were identified from **five (5) Mediterranean countries**.

- ✓ **83 by-products** were collected [by-products of the seed cleaning process of cereals and legumes, by-products of the cotton, rice, grape, olive and hemp production, food waste (e.g., cookies, crackers, wafer, bread), vegetable and fruit by-products, as well as algae].
- ✓ **Nutrient composition** analysis was conducted for all by-products (i.e., dry matter, nitrogen, ether extract, ash and crude fiber content).



Nutrient composition analysis equipment



Results

- ✓ **High variability** was observed **in the nutritional composition** of the selected by-products [charts below].

Future research tasks

- ✓ Based on the nutrient composition of the by-products and the nutrient requirements of the insects, **compound insect diets** will be designed, formulated and evaluated for the rearing of *H. illucens* and *T. molitor* larvae.
- ✓ **Live insect larvae** fed on by-products-based diets will be evaluated for the **partial replacement of conventional poultry feeds** for local poultry breeds.
- ✓ The **environmental and economic impacts** and the **consumer acceptance** of the novel farming system will be assessed.

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