AQUACOMBINE

In The LOOP: Aquaculture trials

Examine the combination of aquaculture and Salicornia farming - promising results on health effects for shrimp and sea bass.

RIASEARCH | Rui J. M. Rocha | ruirocha@riasearch.pt

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 86283

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Salicornia ramosissima production: green house + RAS effluents

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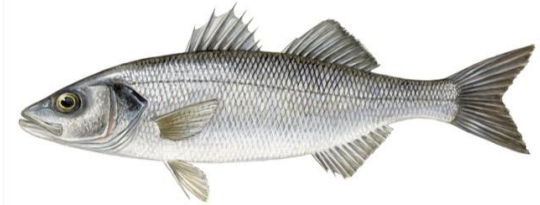

Dicentrarchus labrax

Penaeus vannamei

- growth performance feed utilisation digestibility of nutrients
- immune status and inflammatory response
- anti-genotoxic properties DNA-damage repair system antioxidant responses
- phytochemical profiles in fish and shrimp tissues

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CTRL

Commercial like diet

ST2.5

2.5% inclusion of Salicornia

WHOLE PLANT

ST5

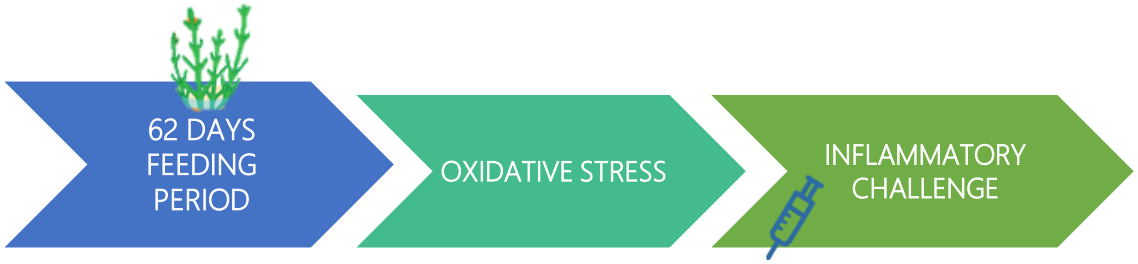
5% inclusion of Salicornia

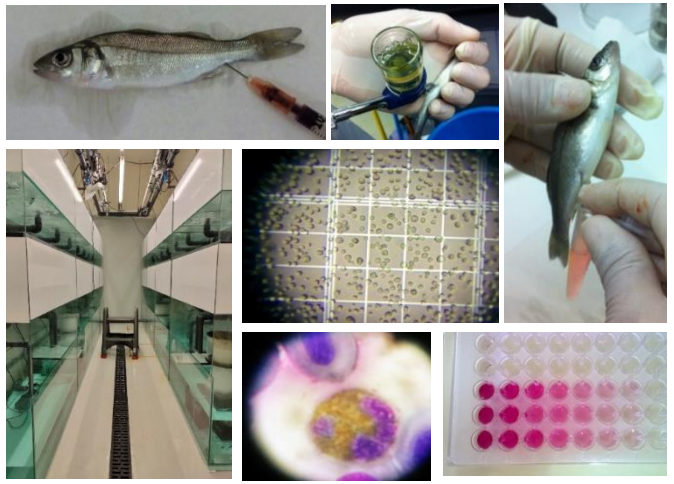
WHOLE PLANT

ST10

10% inclusion of Salicornia

WHOLE PLANT





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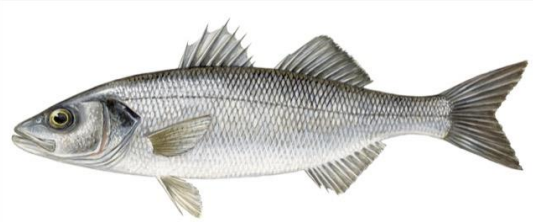

Dicentrarchus labrax

- **No significant differences** between treatments were observed in **final body weight, RGR, FCR, Feed intake and survival values**.

- The **ST 5%** diet induced a **slight increase in the DNA damage**, which, rather than a negative effect, **may reflect an activation mechanism of the molecular defence system**.

- After **2 months**, all the **supplemented diets** showed to **improve DNA integrity**. The increase of supplementation levels seems to be favourable up to 10%.

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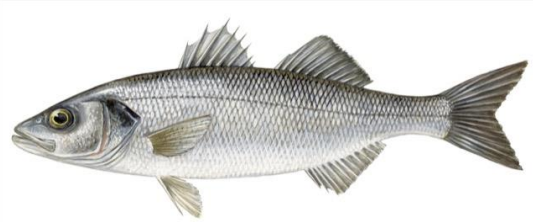

Dicentrarchus labrax

- Inclusion of ***S. ramosissima*** biomasses of up to **10%** can be performed **successfully** in diets for juvenile European sea bass with **no compromises** to **haematological** profile **and** HUMORAL PARAMETERS.

- In fact the **highest inclusion** level showed to **improve leucocyte recruitment** to the **inflammatory focus** (peritoneal cavity) in response to heat-inactivated Phdp, what could be key in response to infection.

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Commercial like diet

Penaeus vannamei

SL5

5% inclusion Salicornia leaves and seeds

SL10

10% inclusion Salicornia leaves and seeds

SS5

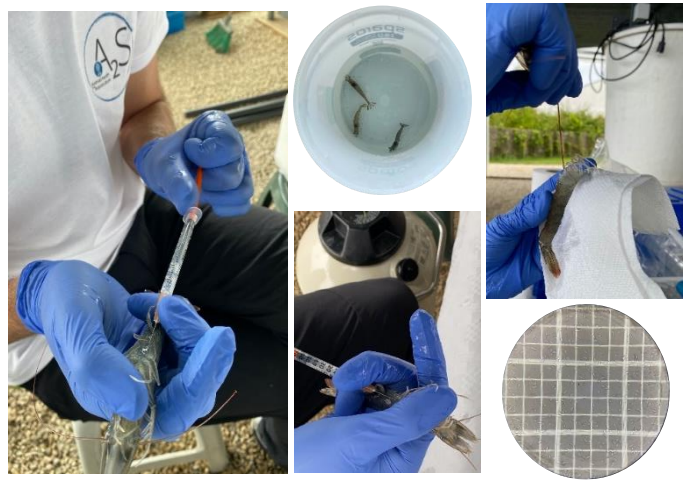
5% inclusion Salicornia stems

SS10

10% inclusion Salicornia stems

Zootechnical performance

Challenge



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Penaeus vannamei

- The inclusion of ***Salicornia ramosissima*** **biomasses** in diets for juvenile *Penaeus vannamei* does not affect the shrimp growth performance and survival.
- After **1 month**, it seems that ***S. ramosissima***, in the form of **stems**, provides an **antioxidant shielding**.
- After 2 months, the protective effect of *S. ramosissima* is no longer evident, on the basis of the assessed parameters.
- The **supplementation with stems** proved to be **more beneficial than with leaves** towards a **healthier antioxidant status**, regardless the dose.

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Penaeus vannamei

- The inclusion of ***S. ramosissima*** biomasses **modulate** some **gene expression** on **hepatopancreas** and **humoral parameters** analysed in plasma.
- When the **immune mechanisms** are **activated by** the presence of a **bacteria** the incorporation of **5%** inclusion of ***S. ramosissima*** **leaves and seeds** (SL5) showed to **modulate the inflammatory response** resulting in a **higher disease resistance** to *Vibrio parahaemolyticus* compared to the commercial-like diet.

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thank you!

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RIASEARCH

universidade de aveiro

ciimar
Centro Interdisciplinar de Investigação Marinha e Ambiental

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