

Integrated Aquaculture: an eco-innovative solution to foster sustainability in the Atlantic Area

Anna Soler-Vila¹, Jessica J. Ratcliff², Maria Galindo-Ponce², Maeve D. Edwards¹

¹Irish Seaweed Consultancy Ltd, NUI Galway, Ireland

²Irish Seaweed Research Group, Ryan Institute, NUI Galway

contact@irishseaweed.com / www.integrate-imta.eu



SUMMARY

Despite being a key driver of the maritime economy in the European Atlantic Area, aquaculture faces significant challenges: environmental management at farming sites, the European north-south divide, regulatory hurdles, long licensing processes, low levels of consumer knowledge and acceptance, competition for space with other maritime activities, etc.

INTEGRATE contributes to overcoming these challenges by facilitating the transition towards commercial Atlantic Integrated Multi-Trophic Aquaculture (IMTA).

IMTA systems are a circular economy paradigm. They contribute to making Atlantic aquaculture more sustainable and competitive, thus unlocking green growth within the European aquaculture sector.

However, despite IMTA being encouraged by European Union (EU) policies such as the Blue Growth Strategy, the Atlantic Action Plan and Smart Specialisation Strategies (RIS3), there still are socio-economic, administrative and legal bottlenecks hampering its development to its full potential. To overcome these, INTEGRATE supports meaningful cooperation between academia, the corporate sector and relevant authorities



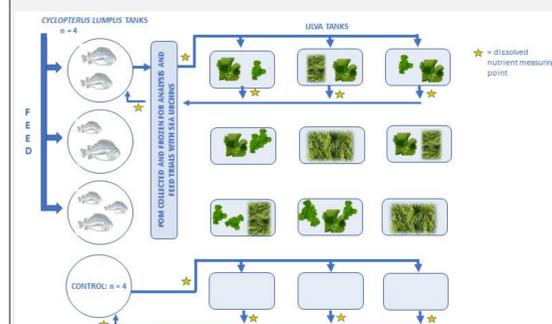
OBJECTIVES:

- To strengthen collaborative networking around eco-efficient aquaculture techniques
- To communicate the principles and benefits of IMTA (eco-innovation and eco-efficiency) and raise awareness of IMTA's holistic approach
- To achieve market consolidation of EU sustainable seafood
- To fulfill Atlantic Area & EU regional goals as the industry transitions to resource-efficient technologies: promotion of green and blue growth in aquaculture



PROJECT WP4/Activity 1:

NUIG: Bioremediation of lump sucker effluent using different morphotypes of *Ulva* spp.



Aims: Creation of a biofilter using different morphologies of *Ulva* spp. And quantify the effect of integration with lump suckers on growth, yield and quality. Achieving an efficient recirculating IMTA system, thereby optimising space and improving accessibility for small businesses. Increasing the value of the *ulva* for human and/or animal consumption by increasing protein content.

Trial 1: Bioremediation efficiency and productivity of laminar and tubular morphotypes of *ulva* grown together and separately.

Trial 2: Effect of *ulva* stocking density on nutrient uptake rate and productivity.

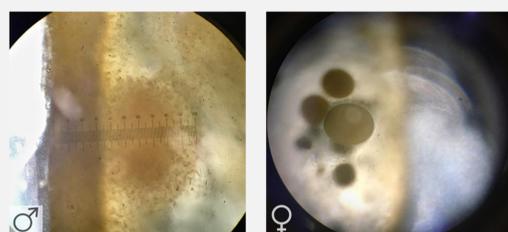
Trial 3: Effect of effluent flow rate (residence time in the *ulva* tanks) on nutrient uptake rate and productivity.

Analysis: Proximate composition of *Ulva*; CHN; metals; water nutrient analysis (NH_4^+ , NO_3^- , PO_4^{3-})

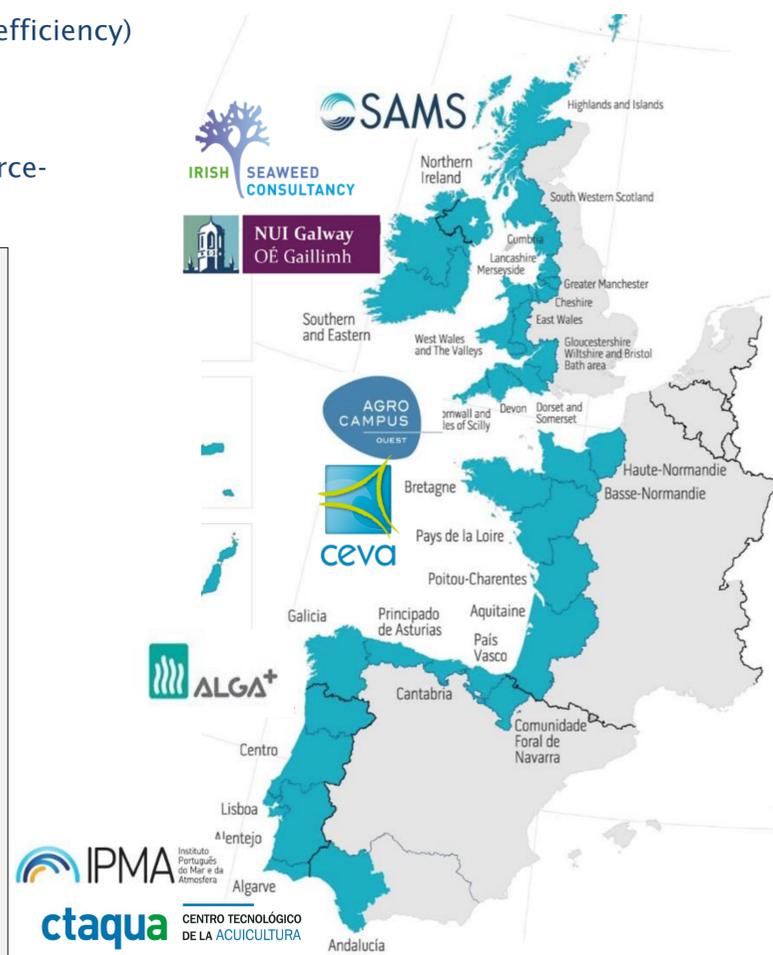
ISC: Cultivation of *Himathalia elongata* (HE), as a new species in an IMTA system.

Aims:

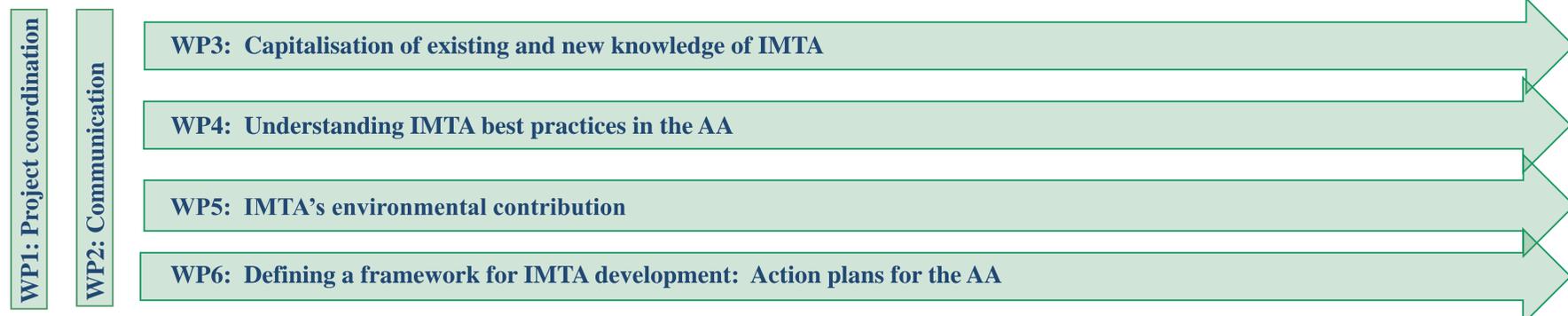
- To follow growth and fertility of HE in the wild, by measuring lengths and conceptacle size.
- To identify males and females and release the eggs and sperm in the laboratory.
- To cultivate HE in control conditions
- To grow new individuals at sea in an IMTA farm



Pictures: Male and female plants under the microscope



WORK PACKAGES: INTEGRATE's work plan is structured in 6 Work packages



PARTNERSHIP:

The INTEGRATE partnership consists of 8 core partners and 11 associated partners from the five Atlantic Area members states, led by the Spanish aquaculture research organisation Fundación Centro Tecnológico Acuicultura de Andalucía - CTAQUA