

## Introduction



### FURCELLARIA LUMBRICALIS

*Furcellaria lumbricalis*, commonly known as *Furcellaria*, is a species of red algae that holds significant commercial importance, particularly for its use in the production of agar (agar-agar), a polysaccharide widely used in the food and cosmetic industries. *Furcellaria lumbricalis* is harvested for its valuable extract, furcellaran.

*Furcellaria lumbricalis* is indeed a significant species in the Baltic Sea region. It is the only seaweed species in the Baltic Sea that is harvested on a commercial scale, primarily for its use in hydrocolloid production.



### RESEARCH GAP

The existing research that is based on the use of algae biomass is not building a common biomass chain that will provide a higher level of added value overall.

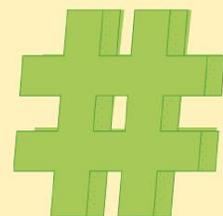


### AIM

The aim of the study is to assess the potential of the algal species *Furcellaria lumbricalis* as a sustainable agricultural resource in the Baltic Sea region.

### OBJECTIVES

- Evaluate the Historical and Current Exploitation of *Furcellaria lumbricalis*.
- Evaluate the use of *Furcellaria lumbricalis* in the biorefining business model
- Investigate the effect of the liquid fraction of *Furcellaria lumbricalis* digestate on the germination of crop seeds.



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## Methodology

### LITERATURE REVIEWS

The study included an academic literature review, which is a comprehensive review of academic sources on a particular topic. It provides an overview of current knowledge and allows the identification of relevant theories, methods and gaps in existing research.

1

### QUANTITATIVE ANALYSIS METHODS

The numerical data from the experiments were analysed using statistical tools to determine the significance of the results and to establish cause-and-effect relationships between the use of algae and agricultural outputs.

2

### LABORATORY ANALYSIS

Algae samples were collected along the Kurzeme coast and the species and volumes of algae washed up were analysed.

3

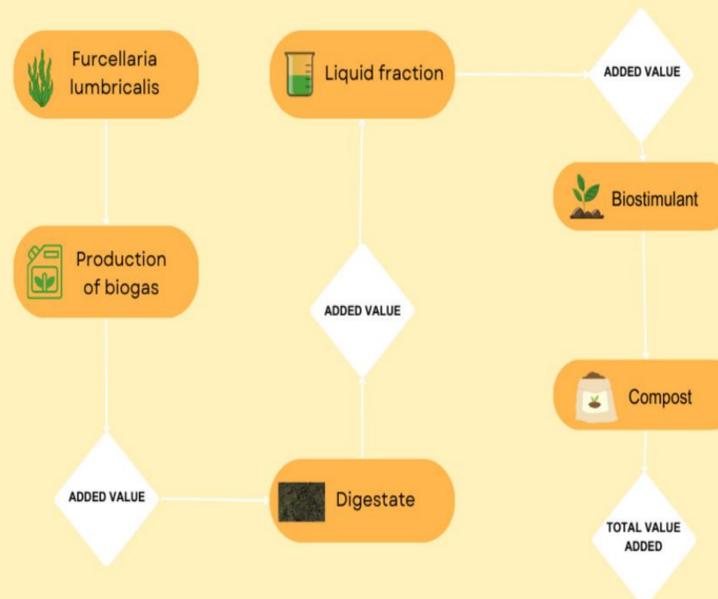
### LABORATORY EXPERIMENTS

Conducting controlled experiments to quantitatively assess the impact of algae on plant seed growth. Data were collected on yield rates.

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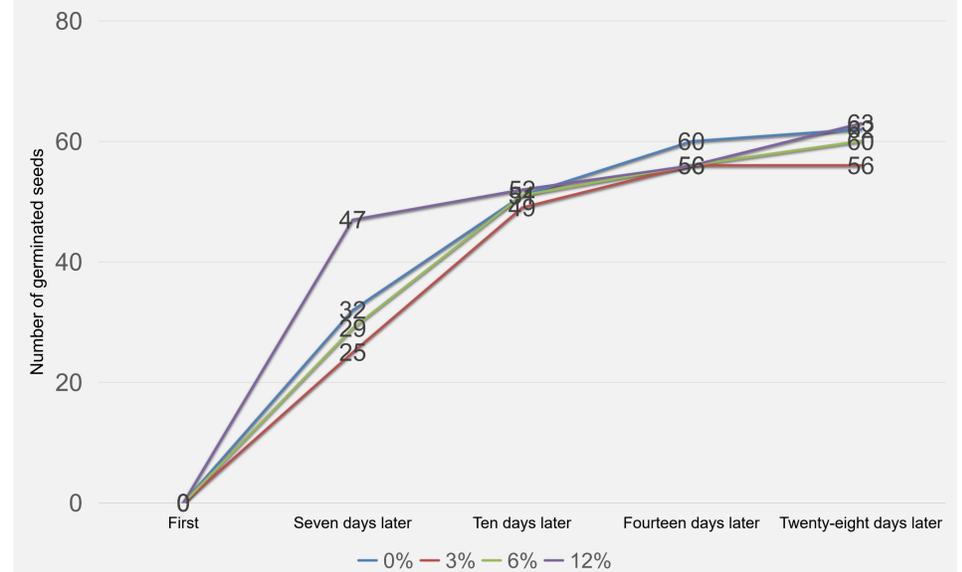
## Results

### AGRICULTURAL PRODUCTS FROM THE ALGAE VALUE CHAIN



## Results

Evaluation of the primary effect of the liquid fraction at a concentration of 3 %, 6 % and 12 % on basil seeds



## Conclusions

1

The author's analysis of the theoretical literature confirms that the main problems in reconciling economic development and environmental sustainability in Latvia are currently caused by the use of non-renewable resources. There is a gap in research on the use of algae based on the biorefinery business model to fully exploit the innovation potential generated.

2

The algal *Furcellaria lumbricalis*, which has the second highest dry matter content at 13.11% DW, carries fewer sand particles on its surface, is not flattened and has a low acid response. These characteristics make it particularly suitable for most soil types in Latvia and increase the likelihood of maintaining an aggregated form when commercialised.

3

The experiments conducted in the study indicate that a 12% concentration of the liquid fraction of the digestate promotes faster germination compared to 3% and 6% concentrations. In addition, visual observations suggest that plants treated with 3%, 6% and 12% liquid digestate fractions are more drought resistant.