

THE POTENTIAL OF BALTIC SEA ALGAE AS AN AGRICULTURAL RESOURCE FOR THE SUSTAINABLE DEVELOPMENT OF THE FOOD CHAIN

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INTRODUCTION & AIM



The Baltic Sea, rich in marine biodiversity, represents a promising opportunity for sustainable resource utilisation. This study explores the potential of Baltic Sea algae, specifically *Furcellaria lumbricalis*, as a renewable agricultural resource to improve the sustainability of the food value chain in Latvia. Algae are known for their rapid growth and high nutrient content, making them an attractive alternative to traditional agricultural inputs. Latvia's Smart Specialisation Strategy (RIS3) emphasises the reconciliation of economic development with environmental sustainability. This research is in line with RIS3 by investigating innovative uses of natural resources to promote sustainable agricultural practices. By utilising the abundant marine resources of the Baltic Sea, this study aims to contribute to a more sustainable and climate-resilient food system in Latvia.

The aim of this research is to assess the feasibility of using *Furcellaria lumbricalis* as a sustainable agricultural resource, focusing on its potential to improve seed germination and plant growth. Through this investigation, the study aims to provide insights into how Baltic Sea algae can be integrated into Latvian agricultural practices to improve the sustainability of the food value chain.

RESULTS & DISCUSSION



The results of this study provide important insights into integrating Baltic Sea algae into the **agri-food value chain** and highlight their potential to contribute to sustainability.



The results showed an **optimal acidity of 6-7 pH**, which is suitable for Latvian soils. These characteristics make it a promising candidate for improving soil fertility and plant growth, thereby supporting a more sustainable agricultural process.

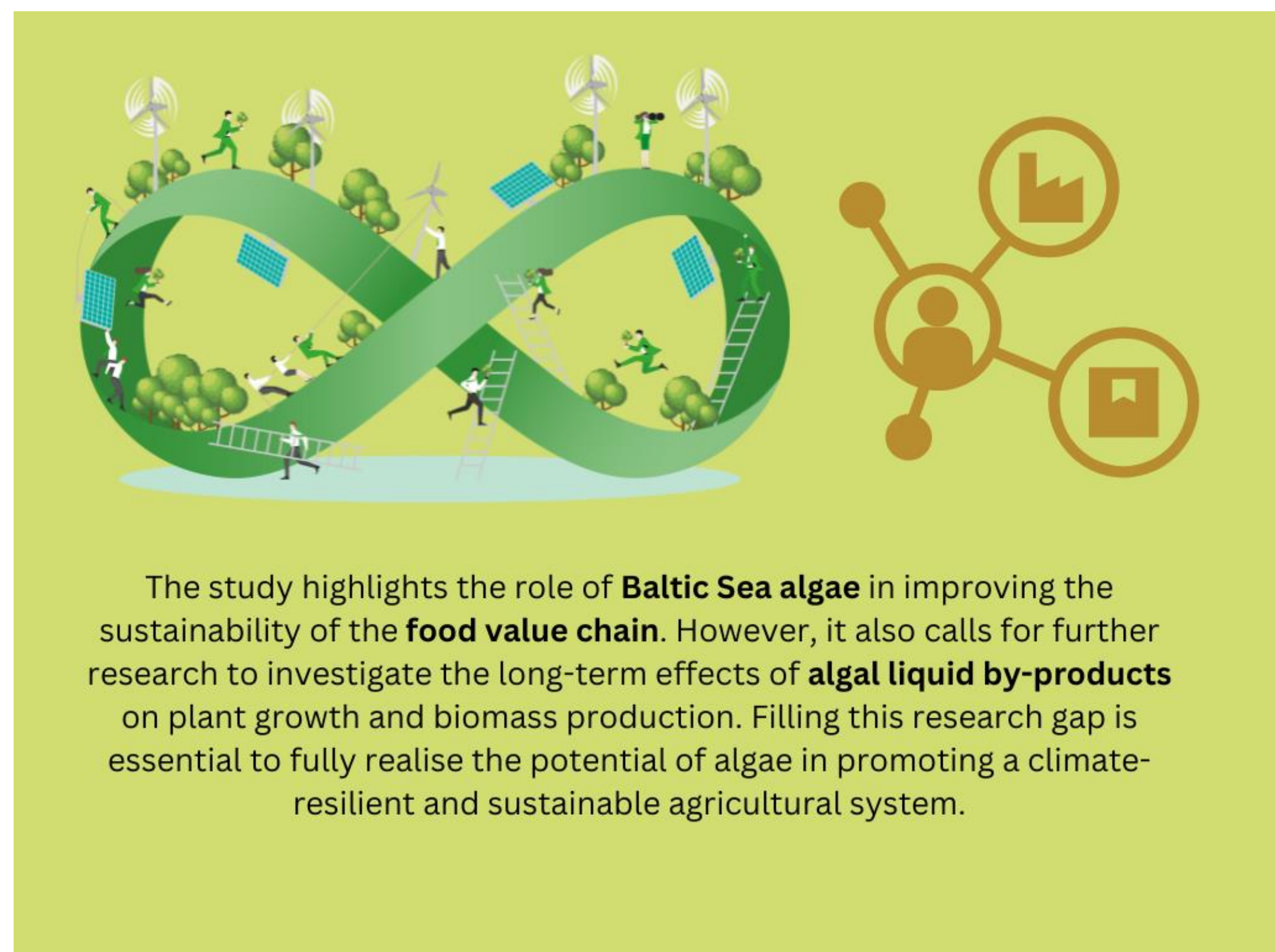


The **highest germination rates** achieved with the **12% concentration** highlight the potential of *Furcellaria lumbricalis* as an effective growth promoter.

METHODS

The study employed a comprehensive methodological framework to evaluate the potential of *Furcellaria lumbricalis* as a sustainable input in the agricultural sector, thereby enhancing the food value chain in Latvia.

- Macroalgal **samples** were systematically collected from various coastal regions of Latvia during low tide, utilizing manual collection techniques to ensure the acquisition of fresh and representative specimens.
- The algae samples collected were subjected to **anaerobic digestion** to assess their biomass potential and nutrient composition. This process provided important insights into the viability of algae as a nutrient source within the agricultural supply chain.
- Controlled experiments evaluated the impact of **liquid digestate** from anaerobically fermented *Furcellaria lumbricalis* on seed germination. By testing concentrations of 3%, 6%, and 12%, the study assessed its effectiveness as a growth enhancer to improve agricultural productivity.



The study highlights the role of **Baltic Sea algae** in improving the sustainability of the **food value chain**. However, it also calls for further research to investigate the long-term effects of **algal liquid by-products** on plant growth and biomass production. Filling this research gap is essential to fully realise the potential of algae in promoting a climate-resilient and sustainable agricultural system.

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CONCLUSION

Baltic Sea algae, in particular *Furcellaria lumbricalis*, can be effectively integrated into the agri-food value chain to improve sustainability, with promising results in improving soil fertility and plant growth.

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