Production of fungal biomass protein (FBP) using *T. reesei* and green macroalgae

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The bioconversion of macroalgae, such as *Ulva rigida*, by microbial fermentation allows the production of microbial biomass protein and it protein can be exploited for production of feeds. This research aimed to study the saccharification and fermentation of *Ulva rigida* by a cellulolytic fungus to provide a product with a nutritional added-value. For this purpose, *Ulva rigida* was directly saccharified and fermented in batch using the filamentous fungus *Trichoderma reesei Rut-C3*0. The fermentation product obtained from the growth of *T. reesei Rut-C30* on *Ulva rigida* as the sole carbon source in 72 h was called fungal biomass protein (FBP), which contained all essential amino acids and compared favorably with the FAO guideline profiles. Furthermore, the content of limiting amino acid methionine of FBP from Ulva rigida increased 4-folds compared to the raw macroalga and it was similar to the methionine levels of ovalbumin protein. Additionally, the in vitro digestibility of FBP increased from 71% to 94% compared to the raw alga and was higher than that of leguminous seeds and similar to that of soybean meal. The results of our work demonstrate that Ulva rigida can be saccharified and fermented in a single step by a terrestrial fungus in 72 h under submerged fermentation to provide high-quality proteins suitable to produce feeds.

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