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Nutritional characteristics of the potential aquaculture feed species *Boekelovia hooglandii*

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Abstract

There are a variety of factors to be considered when choosing a particular species of microalgae for aquaculture feed, including growth rate, cell size, nutritional composition, digestibility and pigmentation. A good example of a microalga that fits these criteria is the chrysophyte *Boekelovia hooglandii*. This study investigates the growth rate and nutritional profile [protein, lipid (34 fatty acids), carbohydrate, and pigment (7 pigments)] of *B. hooglandii* to assess suitability as a feed. This study also identifies the peak concentrations and correlations among nutritional constituents. Under the tested conditions *B. hooglandii* exhibited a relatively high biomass productivity of 0.52 g L^{-1} day^{-1} dry weight (dw), in comparison with reported growth rates for three commonly used aquaculture feed algae, *Isochrysis galbana* (0.16 g L^{-1} day^{-1} dw), *Tetraselmis suecica* (0.27 g L^{-1} day^{-1} dw), and *Pavlova* sp. (0.28 g L^{-1} day^{-1} dw). In addition, the proportion of lipid, protein, and carbohydrate in the algal biomass on days 35 and 63 is suitable for bivalve larvae and juvenile oysters, respectively. A notable correlation identified in this study was between percent protein and growth rate ($r=0.934$, $p=0.020$), which highlights the nutritional changes occurring during culturing. As a consequence of the relatively high biomass and nutritional profile, *B. hooglandii* appears to be a suitable candidate as aquaculture feed for bivalve larvae and juvenile oysters.

Keywords

Microalgae, *Boekelovia hooglandii*, lipid, protein, pigments, aquaculture

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