

Culture of microalgae using interstitial water extracted from shrimp pond bottom sediments

ABSTRACT

Interstitial water, extracted from the bottom sediment of a shrimp culture pond, was rich in nutrients containing total phosphorus with concentration of 25.98 mg/l and total nitrogen of 65.45 mg/l. A diatom, *Chaetoceros calcitrans*, a green alga, *Nannochloropsis oculata*, and a cyanobacterium, *Oscillatoria* sp., were cultured in pure interstitial water (PIW), diluted interstitial water (DIW) and in Conway medium (CM). *C. calcitrans* showed a significantly higher ($P < 0.05$) growth rate in DIW compared to CM and PIW. Alternatively, *Oscillatoria* sp. had a significantly lower ($P < 0.05$) growth rate when grown in DIW compared to CM. Similar to the other algae, *Oscillatoria* sp. showed the lowest growth rate in PIW. *C. calcitrans* and *Oscillatoria* sp. were also grown in DIW with the addition of nitrogen, phosphorus, silica and the combination of the three nutrients. The addition of nitrogen and silica to the diluted interstitial water significantly improved ($P < 0.05$) the growth rate of *C. calcitrans*, but the addition of phosphorus significantly decreased ($P < 0.05$) its growth. On the other hand, the growth rate of *Oscillatoria* sp. significantly decreased ($P < 0.05$) with the addition of nitrogen, but increased ($P < 0.05$) with the addition of phosphorus. There was no significant difference ($P > 0.05$) in the growth rate of *Oscillatoria* sp. cultured in interstitial water and that with added silica or a combination of nitrogen, phosphorus and silica. This study indicates that interstitial water extracted from aquaculture ponds, in sterilized diluted form, has the potential to be used as an effective medium for the culture of microalgae. © 2001 Elsevier Science B.V. All rights reserved.

Keyword: Interstitial water; Microalgae; Sediment