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メタデータ	言語: 出版者: 琉球大学21世紀プログラム 公開日: 2007-06-26 キーワード (Ja): キーワード (En): 作成者: Yuen, Yeong Shyan, Yamasaki, Hideo メールアドレス: 所属:
URL	http://hdl.handle.net/20.500.12000/674

PE-10 Nitrogen uptake by endolithic microorganisms residing in crustose coralline algae-covered substrate

Yeong Shyan Yuen and Hideo Yamasaki

Faculty of Science, University of the Ryukyus, 903-0213 Okinawa, Japan

Crustose coralline algae (CCA) are one of the most important biological and geological components in the coral reef ecosystems. They reside on and subsequently cover carbonate substrate, particularly coral skeleton. CCA-covered substrates provide an ideal habitat for the growth of various endolithic microbes. This calcareous algae substrate commonly known as “live rock” has long been used in reef aquariums in maintaining the water quality. Communities of endolithic microorganisms resembling those in coral skeleton has been reported in CCA crusts. In order to study the role of endolithic microorganisms in nutrient uptake, CCA covered substrate was treated with antibiotic-antimycotic mixed solution. Antibiotic treated samples exhibited lower ammonium uptake activity in comparison to untreated ones. On the contrary, a difference in nitrate uptake was not observed between treated and untreated samples. However, when both ammonium and nitrate were supplemented together, ammonium uptake showed no difference between the treated and untreated samples, whereas significantly lower nitrate uptake was observed in treated samples. These results suggest the presence of a microbial consortium that plays an important role in the nitrogen cycle in CCA covered substrate. This is further supported by the observation of high ammonium uptake activity by recently bleached CCA. The current finding sheds new light on the nutrient dynamics in the coral reef ecosystem.