

琉球大学学術リポジトリ

The effects of landscape characteristics on the nitrogen dynamics within the coral reef ecosystem: Bise, Okinawa, Japan

メタデータ	言語: 出版者: 琉球大学21世紀COEプログラム 公開日: 2009-04-16 キーワード (Ja): キーワード (En): 作成者: Takagi, Kimberly K., Higuchi, Tomihiko, Matoba, Kana, Koren, Shachar, Cohen, Itay, Kobayashi, Shusei, Tsurumi, Ryota, Nakano, Yoshikatsu, Mimura, Izumi, Myint, Ohnmar, Ulomi, Shadrack, Sekadende, Baraka, Arakaki, Seiji, Tsuchiya, Makoto, Oomori, Tamotsu メールアドレス: 所属:
URL	http://hdl.handle.net/20.500.12000/9868

PE-10 The effects of landscape characteristics on the nitrogen dynamics within the coral reef ecosystem: Bise, Okinawa, Japan

Kimberly K. Takagi¹, Tomihiko Higuchi¹, Kana Matoba¹, Shachar Koren³, Itay Cohen³, Shusei Kobayashi², Ryota Tsurumi², Hiroyuki Fujimura², Yoshikatsu Nakano², Izumi Mimura¹, Ohnmar Myint¹, Shadrack Ulomi⁴, Baraka Sekadende⁵, Seiji Arakaki², Makoto Tsuchiya², Tamotsu Oomori²

¹*University of the Ryukyus, Graduate School of Engineering and Science, Nishihara, Okinawa, Japan*

²*University of the Ryukyus, Faculty of Science, Nishihara, Okinawa, Japan*

³*Bar Ilan University, Faculty of Life Sciences, Ramat-Gan, 52900, Israel*

⁴*Southern University of Denmark, Denmark, Tanzania*

⁵*Tanzania Fisheries Research Institute, Tanzania*

Coral reef ecosystems often act as “filtration” systems for the open ocean via processes which occur within and the interactions between the coral, seagrass, and beach landscapes. While many studies have separately assessed the biogeochemical dynamics in each landscape community, few have yet to elucidate the interactions within co-existing/ mixed ones (i.e. coral+seagrass). This study assessed the seawater nutrient dynamics in various communities within the coral reef ecosystem of Bise, Okinawa, Japan using a closed-chamber system. The uptake/release of nitrate, nitrite, and ammonium into the water column was measured in coral (CR), seagrass (SG), coral+seagrass (CR+SG), sand (SD), and sand+acorn worm (AC) environments over 11, 2-hour incubation periods conducted over 4-days. Preliminary assessment of the results show that the highest fluctuations nitrate and nitrite concentrations (<1-33 $\mu\text{mol/l}$) were found in the AC environment closest to the coast. Although uptake rates were often the highest in this area, (max. $\sim 1000\mu\text{mol/ m}^2/\text{hr}$), this was not necessarily an indicator of efficiency. Significant differences in the uptake/ release of total nitrates between chamber environments confirm that landscape characteristics influence the nutrient dynamics within the coral reef ecosystem. The uptake rate similarities and differences found between the CR+SG chamber (depending on the tide, tidal level and time of day) and the CR and SG chambers respectively, indicate a need for further assessment to clarify the biogeochemical relationships within the landscapes co-inhabited by seagrass and coral.