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PE-9 Acorn worm (*Hemichordata: Enteropnuesta*) habitat variation and subsequent impact on biogeochemical cycles within the coral reef ecosystem

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To maintain energetic balance in coral reef ecosystems, efficient biogeochemical nutrient cycles are important. Benthic organisms such as the hemichordate: enteropnuesta, *Ptychodera flava* (common name: acorn worm) aid in maintaining these cycles via burrowing and fecal cast production –a process called, "bioturbation". In Bise, Okinawa, Japan, *Ptychodera flava* are found at densities up to 24 individuals m^{-2}. In addition, it inhabits beach, seagrass and coral/ seagrass environments. While few studies have been conducted on the ecological role of *Ptychodera*, understanding its influence on a micro and macro-organismal scale may add to our understanding of coral reef ecosystem function. In this study, we assess the relationship between *Ptychodera* and its habitats. By comparing environments inhabited and not inhabited by *Ptychodera*, we address the following assertions: Acorn worm behavior encourages micro-organismal diversity by increasing the anoxic-oxic interface. In addition, injestion and subsequent egestion of seagrass detritus will enhance microbial decomposition, aiding in nitrogen mineralization. Surrounding seagrass should benefit through increased nutrient availability, enhanced leaf production and growth. As sandy beaches act as biological purification systems, here, *Ptychodera* should aid in biopurification by assimilating excess nutrients. Results show a decrease of total nitrates in the water column and sediments in beach and seagrass environments, confirming nitrogen mineralization due to *Ptychodera* presence. C:N ratios increase in beach and seagrass habitats and decrease in coral/ seagrass habitats indicating nutrient assimilation in the former and production in the latter. Thus, the role of *Ptychodera* in the coral reef environment may change with respect to its habitat.