

2024 年 11 月 6 日

YYYY/MM/DD

独立行政法人日本学術振興会理事長 殿  
To: President, Japan Society for the Promotion of Science

## 研究活動報告書 Research Report

### 1. 受入研究者/ Host researcher

受入研究機関・部局・職  
Name of Host Institution, Department and Title 琉球大学・熱帯生物圏研究センター・教授

受入研究者氏名  
Host Researcher's Name 波利井 佐紀

### 2. 外国人招へい研究者/ Fellow

所属研究機関・部局・職  
Name of Institution, Department and Title オールドドミニオン大学・生物科学研究科・准教授

外国人招へい研究者氏名  
Fellow's Name BARSHIS Daniel James

### 3. 採用期間/ Fellowship Period

2024 年 5 月 7 日 ～ 2024 年 8 月 6 日

### 4. 研究課題/ Research Theme

沖縄の深場サンゴの熱限界を診断する / Diagnosing thermal limits of mesophotic corals in Okinawa

### 5. 研究活動報告/ Research Report

#### (1) 研究活動の概要・成果/ Summary of Research Results

A total of 22 individual thermal tolerance experiments were run encompassing 7 species from the upper mesophotic zone and 10 species from shallow reef areas. Each experiment consisted of testing the upper thermal tolerance limits of corals in response to a standardized heat stress. Shallow species included: *Acropora hyacinthus*, *Goniastrea retiformis*, *Acropora tenuis*, *Pachyseris speciosa*, *Acropora digitifera*, *Turbinaria mesenterina*, *Porites cylindrica*, *Pocillopora verrucosa*, *Porites sp.*, and *Galaxea fascicularis*. Upper mesophotic species included: *Seriotopora hystrix*, *Acropora tenella*, *Acropora sp.*, *Anacropora matthaii*, *Alveopora spongiosa*, *Pachyseris speciosa*, and *Porites sp.*

Overall, thermal tolerance limits of mesophotic species were equal to or higher than most shallow species, demonstrating high resilience potential in upper mesophotic populations. Chosen species represented a range of sensitive to resilient coral types. In comparison to thermal thresholds of other reef areas, Okinawan corals were equivalent or slightly lower than similar species in American Samoa. Examination of the algal symbiont identities of these samples is underway, as is some preliminary genome sequencing to determine whether the species tested in Okinawa are the same species or a different species from those tested previously.

Additionally, we collected and re-deployed temperature loggers at Minne Sone at depths down to 80m and conducted benthic photoquadrat surveys of the reef habitat at 80-70-60-50-40-30 and 20m at Minne Sone.

(2) 主な研究発表 (雑誌論文、学会、集会、知的財産権等) / Main Research Publications  
Writing of the manuscript for publication is underway.

(3) その他/ Remarks  
This research exchange was a very valuable opportunity to collaborate on investigation of the thermal tolerance of reef building corals in Okinawa at shallow and mesophotic depths. Host researchers Dr. Harii and Dr. Sinniger-Harii were great collaborators and extremely supportive in enabling this research.