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First Report of a Population of the Freshwater Caridean Shrimp *Macrobrachium carcinus* from an Anchialine Cave on Grand Cayman

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Abstract.—*Macrobrachium carcinus* is reported for the first time from the Cayman Islands. Specimens were collected on multiple occasions from an unusual habitat for this species – an anchialine cave. It is likely the cave was colonized by *M. carcinus* larvae via movement through subterranean karst tunnels from the sea inland to the cave entrance. Because only juveniles were collected, it is uncertain whether reproduction is occurring in this cave. However, it is possible *M. carcinus* may continue to colonize this and other similar caves, and sustained populations may eventually become established on Grand Cayman.

Keywords.— Palaemonidae, *Macrobrachium*, Cayman Islands

A population of the freshwater caridean shrimp, *Macrobrachium carcinus*, was discovered at the entrance of a small anchialine cave, locally known as Beach Bay Cave, on Grand Cayman. This cave is located on private property formerly named the Mahogany Estate, approximately 1 km southwest of Bodden Town and 0.5 km from the south shoreline of the island (19^0 16' 8" N, 81^0 16' 22" W). The cave is surrounded by a dry evergreen woodland growing from the jagged, weathered dolostone substrate, and the presence of a karst system below (Brunt 1994, Jones 1994). The opening of the cave exists at the bottom of a narrow crack in the substrate, measuring approximately 8 m long, 1 m wide, and 7 m deep.

The first specimen of *M. carcinus* from Grand Cayman, a juvenile female, was collected on 10 March 2016. Four additional juvenile females (TL 37.3 - 70.6 mm, CL 10.1 - 22.1 mm) were collected on 26 May 2016 with three more juveniles reported to have been captured the following evening. Two individuals in the May 26 collection were deposited in the Texas A&M University Biodiversity, Teaching and Research Collection (TCWC 2-4794) while the other two were placed in the University of Central Oklahoma Natural History Museum Invertebrate Collection (UCONHM 9737, UCONHM 9738). Specimens were collected using a dip net during the daylight and leaving baited minnow traps near the cave entrance during the overnight period. During the May collections, water temperature was measured to be 28^0C and salinity was determined to be $1^0/_{00}$.

Besides being the first documentation of *M. carcinus* in the Cayman Islands, this population is noteworthy because an anchialine cave is an unexpected habitat for this species. Most reports of *M. carcinus* describe its habitat as streams and ponds, where they often occur from sea level to several hundred meters above sea level (Chace & Hobbs 1969, Bass 2003, Valencia & Campos 2007, Perez-Reyes et al. 2013). However, Hobbs (1994, 2001) notes *M. carcinus* has been collected from similar anchialine cave environments in Costa Rica and Jamaica. We suspect this Grand Cayman population became established by larvae, which tolerate brackish conditions, moving inland from the sea through the subterranean connections of the karst environment to the opening of Beach Bay Cave where these specimens were collected. This appears to be the case for a few other species of *Macrobrachium* reported from cave environments (Fujita et al. 2015). There is no evidence these shrimps are reproducing in Beach Bay Cave, due to the lack of adults documented in these collections. However, because juveniles are present, it is possible *M. carcinus* may colonize this and other similar caves, and reproductive populations may eventually become established on Grand Cayman.

Interest in the biodiversity of anchialine

caves has increased in recent years as more sites are explored and new species are discovered (Iliffe 2000). The fauna appears to be dominated by crustaceans and many anchialine species show high levels of endemism (Iliffe 1992). Although no other crustacean species have been collected in Beach Bay Cave, it is possible they exist. *Anopsilana crenata* (Isopoda), *Bahadzia caymanensis* (Amphipoda), and *Stygiomysis* (Mysida) have been reported from nearby anchialine caves on Grand Cayman (Bass, 2012). Due to the porosity of the island's karst system, it is likely numerous connections occur between these caves.

Bass (2012) reported that a single carcass of another caridean, *M. heterochirus,* was collected from a seasonal wetland pond near Red Bay in 2007, approximately 7 km west of Beach Bay Cave. However, whether a population of *M. heterochirus* ever existed on the Grand Cayman remains questionable.

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