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First report of Noah's clam *Tridacna noae* (Röding, 1798) in the reef of Culion: An addition to the distribution range in Palawan, Philippines

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ABSTRACT

This study provides additional information regarding the distribution range and habitat characteristics of two specimens *Tridacna noae* (Röding, 1798), a previously misidentified giant clam species, encountered in Barangay Malaking Patag, Culion, Palawan, Philippines. The giant clams were identified as *T. noae* due to the presence of ocellate spots or teardrops and sparse hyaline organs on the mantle. The specimens measured 7.8 and 7.9 cm in shell length and were found partially buried in dead coral substrates at a depth of 2 meters. The current findings provide additional information on the distribution range of *T. noae* in the province of Palawan and the Philippines. Identification of the distribution of certain threatened species, such as the giant clams, is crucial step in protecting and conserving their population in the wild.

Keywords: Calamianes Islands, distribution, teardrops giant clams, northern Palawan

Tridacna noae, also known as Noah's clam or Teardrops giant clam, was initially described by C. Röding in 1798. However, Rosewater (1965) considered it a variant of *Tridacna maxima* (Röding, 1798) due to similarities in shell morphology. Only in 2014 was *T. noae* resurrected as a valid and distinct species of giant clam based on morphological characteristics, supported by molecular analysis (Su et al. 2014). Both *T. noae* and *T. maxima* have a similar maximum shell length of 40 cm, although Borsa et al. (2014) reported that *T. noae* can only reach up to 28 cm max shell length and possess almost the same number of radial ribs, making these two species challenging to distinguish on the reef. However, the

two species differ in mantle coloration and pattern. The mantle of *T. noae* can be recognized by the presence of its unique ocellate spots or teardrops with sparse hyaline organs, while *T. maxima* has continuous hyaline organs on the mantle edge (Su et al. 2014). Meanwhile, the distribution of *T. noae* in coral reefs is inferred to be similar to *T. maxima* where they typically occur in shallow reef areas and lagoons with water depths between 1-15 m (Neo 2023). They can be found partially buried either on boulder coral or coral substrate surrounded by various macroalgae (Sue et al. 2014; Neo et al. 2017).

Tridacna noae is geographically distributed in the Indo-West Pacific, extending from the Ryukyu



Archipelago in Japan, Kiribati, Cook Island, Christmas Island, Vietnam, and the Philippines (see Neo et al. 2017). In the Philippines, *T. noae* was first reported by Lizano and Santos (2014) from eastern Negros, followed by Ecube et al. (2019) in Port Barton, San Vicente, Palawan, facing the West Philippine Sea (WPS).

This study provides additional information on the distribution range and habitat characteristics of *T. noae* in Palawan. Two specimens of *T. noae* were accidentally found in Pitchy One (11° 51.945'N; 119° 53.593'E) in 2021, a private beach area in Barangay Malaking Patag, directly facing the WPS in the municipality of Culion, Palawan, while engaging in recreational skin diving (Figure 1).

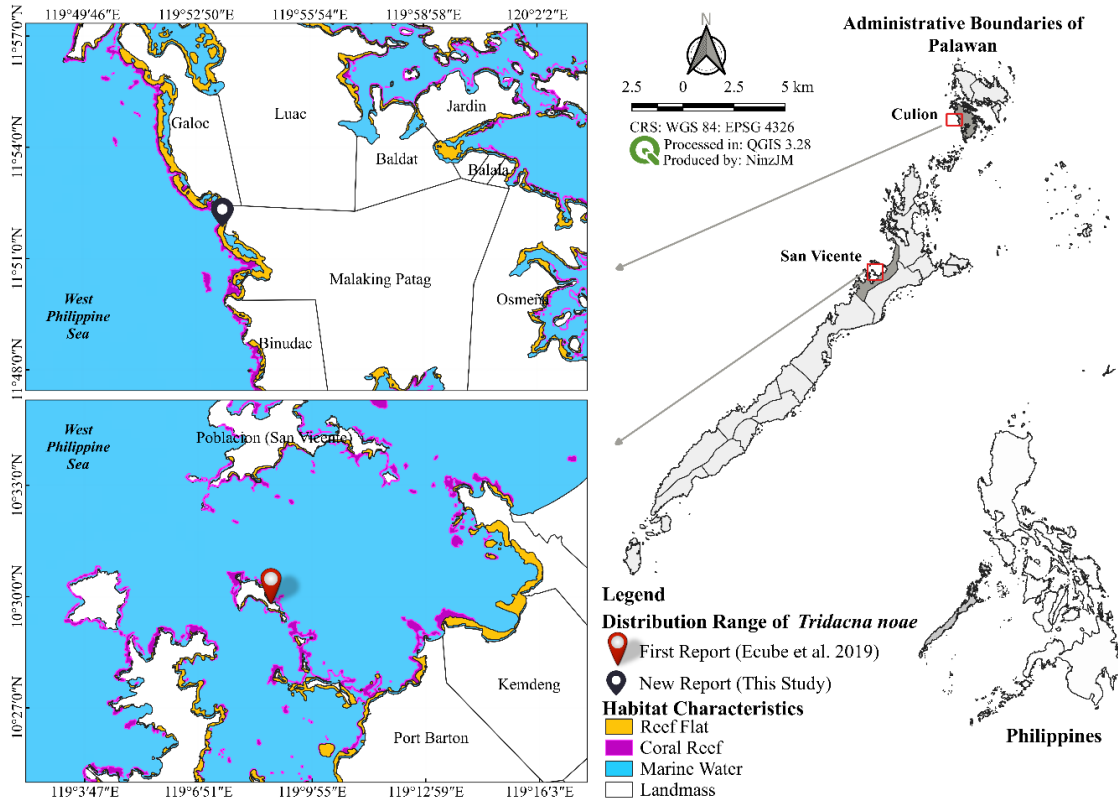


Figure 1. The current known distribution range of *Tridacna noae* in the reefs of Palawan, Philippines.

The two specimens were identified as *T. noae* due to the presence of ocellate spots or teardrops and sparse hyaline organs on their mantle (Figure 2), which are the unique morphological characteristics of the species (Su et al. 2014; Militz et al. 2015; Neo 2023). The specimens measured 7.8 and 7.9 cm in shell length, suggesting that both specimens were juveniles (Braley et al. 2018; Su et al. 2021). These sizes were considerably larger than those reported in Port Barton, San Vicente, Palawan (4.5 cm TL; see Ecube et al. 2019). Additionally, the two specimens were found approximately 110 meters from the highest shoreline at a depth of 2 meters and were partially buried in dead coral substrate surrounded by various macroalgae, such as *Sargassum* spp. and *Halimeda* spp. (Figure 2), similar to the findings of Ecube et al. (2019). These sizes and habitat characteristics of *T.*

noae found in Palawan conform to the observation of Su et al. (2021) in Taiwan and Neo (2023) in Singapore.

Giant clams are keystone species in the coral reef ecosystem, playing important ecological roles as a source of food and shelter for various marine organisms (Cabaitan et al. 2008; Neo et al. 2015). However, coastal inhabitants have traditionally used giant clams as a food source, particularly during adverse weather conditions. According to the caretaker, also a fisherman on the beach, this species is often collected along with other burrowing giant clam species such as *T. maxima* and *Tridacna crocea* (Lamarck, 1819), for food by local inhabitants during low tide. The caretaker's claims about the presence of *T. noae* in the area were based on the image of the species shown on an Android phone and verbal

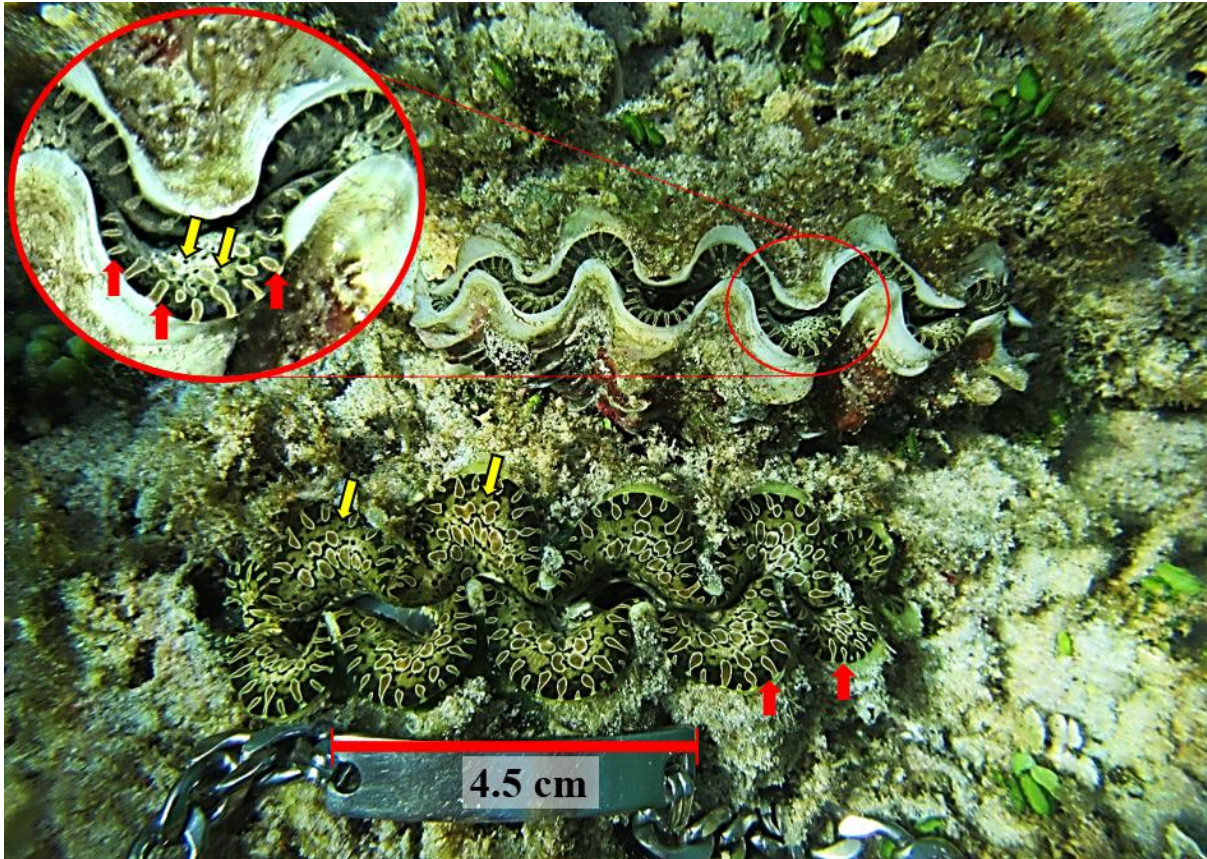


Figure 2. The two specimens of *Tridacna noae* found partly buried in the dead coral substrate at a depth of 2 m in Pitchy One, Malaking Patag, Culion, Palawan. The inset enlarged photo shows the ocellate spots or teardrops (red arrows) and sparse hyaline organs (yellow arrows) on the mantle of the specimens.

descriptions provided during an interview. Therefore, establishing a no-take zone MPA in the area could help protect giant clam species and other ecologically and economically important fauna, allowing local inhabitants to continue benefiting from these resources within the reef area through spill-over effects (Abesamis and Russ 2004; Alcalá and Russ 2006; da Silva et al. 2015; Lenihan et al. 2021). Furthermore, the use of the "bareta de kabra" or crowbar for harvesting buried giant clams also poses a threat, as this can destroy the coral reefs while forcibly extracting the buried giant clams, necessitating immediate action from relevant authorities.

Understanding the distribution range and habitat characteristics of a threatened species is crucial (Militz et al. 2015; Marra-Biggs et al. 2022) and is an essential step in the conservation and protection management of its wild population. Unlike the semi-protected cove area in Port Barton, San Vicente, where *T. noae* was first reported in Palawan (see Ecube et al. 2019), the two specimens in Culion were found on a coastal beach directly facing the WPS (Figure 1), providing additional characteristic information about

its distribution range in the province of Palawan. While there are similarities in the water depth and substrate characteristics where *T. noae* was encountered in Palawan, there is a need to conduct more inventory assessments in the reefs of Palawan to gain a deeper understanding of the distribution range, habitat characteristics, and the status of its population in the wild. In addition, the distribution status and habitat preferences of *T. noae* around the Philippines still warrant further investigation.

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ETHICAL CONSIDERATION

No animal was harmed during the conduct of this study.

DECLARATION OF COMPETING INTEREST

To the best of the author's knowledge, no conflict of interest exists.

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