

Status of thorny oyster in Rakhine coastal region: diversity profile

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Naung Naung Oo

 Lecturer, Department of Marine Science, Patheingyi University,
 10014, Patheingyi, Ayeyarwady Region, Myanmar

Correspondence: Naung Naung Oo, Lecturer, Department of
 Marine Science, Patheingyi University, 10014, Patheingyi, Ayeyarwady
 Region, Myanmar

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Opinion

Spondylus, commonly known as thorny oysters, is a genus of unusual, ornate bivalves found in a variety of marine environments.

The key aspects of their typical habitat

- Widely distributed in tropical to temperate oceans, with notable diversity in the Indo-Pacific region and along parts of the Atlantic.
- Generally, inhabit shallow to moderately deep waters, from the intertidal zone down to about 100 meters, though some species can be found deeper.
- Prefer soft substrates such as sandy or silty bottoms where they can bury partially with their anterior hinge exposed. They also occur on rocky bottoms and coral reefs, often attaching to solid substrates.
- Many *Spondylus* species are sessile as adults, attaching themselves to surfaces using byssal threads or expanding byssus and living in anchored locations on reefs, rubble, or other hard substrates.
- As filter feeders, they rely on plankton and suspended organic particles in the water column, aided by their gaping siphons.
- They often occur in sheltered coastal environments, such as lagoons or coral reefs, where currents bring a steady supply of particulates.
- Some species are found in deeper offshore habitats or along continental shelves, reflecting ecological diversity within the genus.
- Habitat destruction from fishing practices: Bottom trawling, dredging, and destructive fishing gear can physically damage reefs and rocky habitats where *Spondylus* reside.
- Pollution and water quality decline: Sedimentation, nutrient runoff, oil spills, and chemical pollutants degrade habitat quality and can be toxic to juveniles and adults.
- Climate change and warming seas: Rising ocean temperatures can shift suitable habitats, disrupt reproductive timing, and increase disease susceptibility. Ocean acidification can affect shell formation and integrity.
- Coral reef decline and ecosystem changes: Many *Spondylus* species rely on healthy reef systems. Loss of coral structure reduces shelter and feeding opportunities, making populations vulnerable.

Natural and ecological threats

- Predation and competition: Predators, such as crabs, sea stars, and humans, can reduce both juvenile and adult populations. Competition for space and resources with other benthic organisms can also limit growth.
- Habitat degradation: *Spondylus* often inhabits coral reefs, rocky shores, and shallow subtidal zones. Damage to these habitats from storms, sedimentation, or destructive bottom fishing can reduce suitable living space.
- Reproductive challenges: As broadcast spawners in many species, they depend on favorable conditions for larval survival. Disruptions in water quality, temperature, or currents can lower larval recruitment.

Anthropogenic threats

- Overharvesting and collection pressure: *Spondylus* species are valued for their shells and meat. Intensive harvesting, especially in regions with lucrative shell trades, can deplete local populations.

Conservation and management considerations

- Sustainable harvesting practices: Implementing quotas, size limits, and seasonal closures can help maintain populations.
- Habitat protection: Establishing marine protected areas (MPAs) and enforcing protections against destructive fishing can preserve critical habitats.
- Monitoring and research: Population surveys, life-history studies, and larval dispersal research help inform management decisions.
- Pollution control: Reducing coastal runoff and improving water quality benefits *Spondylus* habitats.
- Climate adaptation strategies: Protecting and restoring resilient reef habitats can help populations cope with changing conditions.

The thorny oyster (*Spondylus* spp.) in the Rakhine Coastal Region (Figure 1) exhibits a diverse profile, characterized by various species (Figure 2, Table 1) and ecological interactions.

Table 1 Identification of the thorny oyster in the Rakhine Coastal Region

Phylum: Mollusca Cuvier, 1795			
Class: Pelecypoda (= Bivalvia) Linnaeus, 1758			
Order: Pectinida Gray, 1854			
Family: Spondylidae Gray, 1826 (Thorny oyster)			
Genus: <i>Spondylus</i> Linnaeus, 1758			
Sr. No.	Species	Common name	Length (mm)
1	<i>S. anacanthus</i> Mawe, 1823	Nude thorny oyster	31
2	<i>S. butleri</i> Reeve, 1856	Butler's thorny oyster	58.8
3	<i>S. candidus</i> Lamarck, 1819	Bright thorny oyster	63.1
4	<i>S. echinatus</i> Schreibers, 1793	Prickly thorny oyster	82.7
5	<i>S. imperialis</i> (Chenu, 1843)	Imperial thorny oyster	115.3
6	<i>S. nicobaricus</i> Schreibers, 1793	Nicobar thorny oyster	36.1
7	<i>S. sinensis</i> Schreibers, 1793	Chinese thorny oyster	55.5
8	<i>S. squamosus</i> Schreibers, 1793	Scaly or ducal thorny oyster	79.9
9	<i>S. tenellus</i> Reeve, 1856	Scarlet thorny oyster	68.7
10	<i>S. varius</i> G. B. Sowerby I, 1827	Variable thorny oyster	87.2
11	<i>S. versicolor</i> Schreibers, 1793	Golden thorny oyster	72
12	<i>S. zonalis</i> Lamarck, 1819	Ocellate thorny oyster	74.6

**Figure 1** Collection sites of the thorny oyster in the Rakhine Coastal Region.

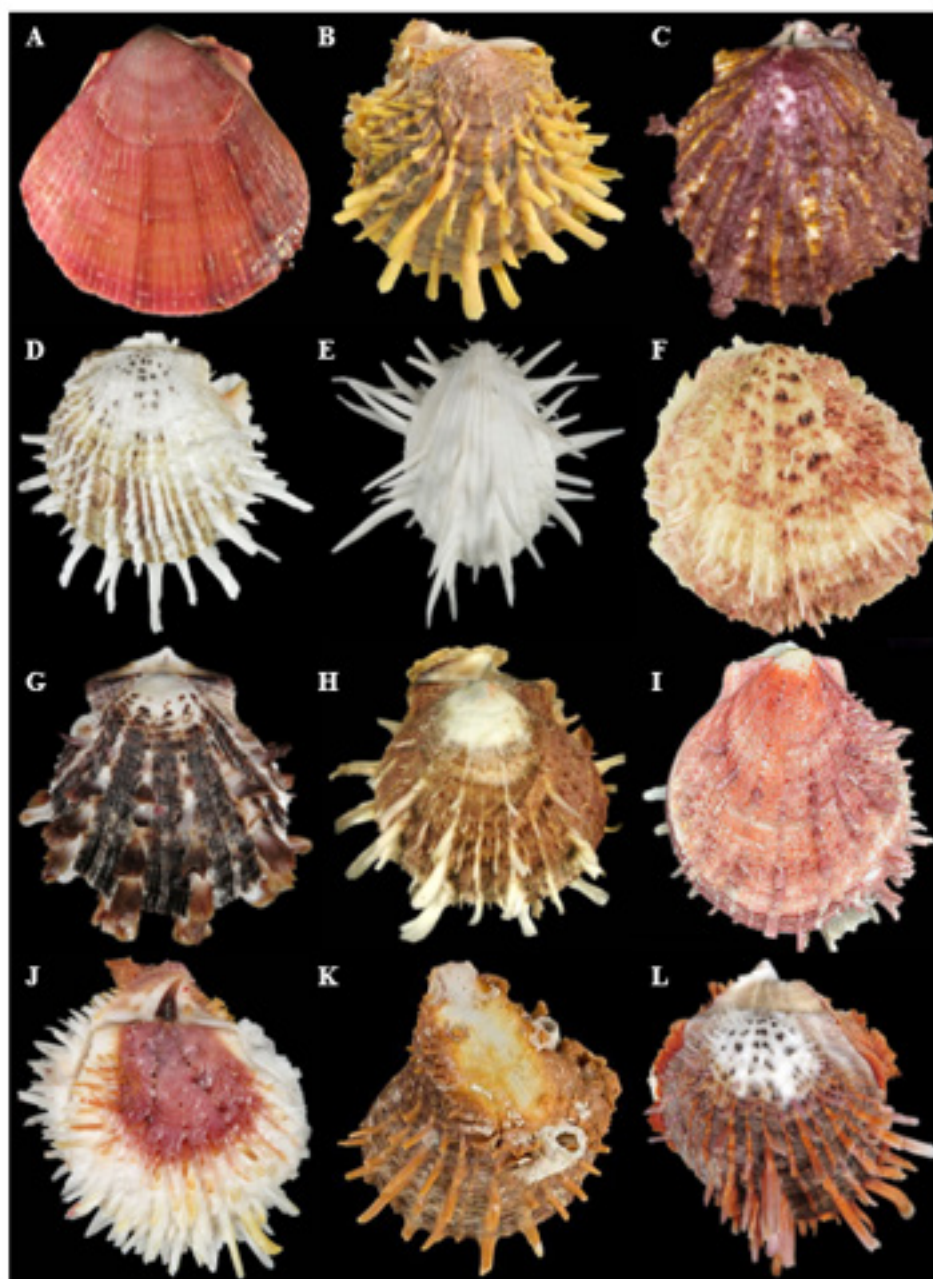


Figure 2 Thorny oyster of Rakhine Coastal Region (A-L): A) *Spondylus anacanthus* Mawe, 1823, B) *S. butleri* Reeve, 1856, C) *S. candidus* Lamarck, 1819, D) *S. echinatus* Schreibers, 1793, E) *S. imperialis* (Chenu, 1843), F) *S. nicobaricus* Schreibers, 1793, G) *S. sinensis* Schreibers, 1793, H) *S. squamosus* Schreibers, 1793, I) *S. tenellus* Reeve, 1856, J) *S. varius* G. B. Sowerby I, 1827, K) *S. versicolor* Schreibers, 1793, L) *S. zonalis* Lamarck, 1819.

Species diversity

- a. The region hosts multiple species of thorny oysters, contributing to its biodiversity.
- b. Common species include *Spondylus varius* and *S. nicobaricus*.

Habitat and distribution

- a. Thorny Oysters thrive in rocky substrates and coral reefs along the Rakhine coast.

- b. They are often found in shallow waters, where they attach to hard surfaces.

Ecological role

- a. These oysters play a significant role in the marine ecosystem by providing habitat for other marine organisms.
- b. They contribute to the overall health of coral reef systems.

Conservation status

- a. The conservation status of thorny oysters in this region is not well-documented, but habitat degradation poses potential threats.
- b. Overfishing and environmental changes may impact their populations.

Research and monitoring

- a. Ongoing studies aim to assess the population dynamics and health of thorny oysters in Rakhine.
- b. Collaborative efforts between local communities and researchers are essential for effective conservation strategies.

Current information may vary, and further research is needed to fully understand the diversity and status of thorny oysters in the Rakhine Coastal Region.

Acknowledgments

None.

Conflicts of interest

We declare that there is no conflict of interest of any kind.