

Marine Organisms Associated with Echinoderms and Their Relationship along Mu Ko Surin National Park to Promote Marine Ecological Awareness of Thailand

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Abstract

Many marine organisms require microhabitat as temporary or permanent hosts. Echinoderms are popular because of their complex body structures, which are ideal for hiding and surviving. Furthermore, they are widely distributed on the coral reefs in Thailand, but unfortunately that are still poorly studied.

This study aimed to investigate species diversity of marine organisms associated with echinoderm hosts by collecting samples from the coral reefs of Mu Ko Surin National Park in the daytime and nighttime by SCUBA diving from March 5-9, 2025. Twenty-nine marine organisms from 18 families, related to 19 species and 9 families of echinoderms, were found. The results also showed that marine organisms inhabiting the area select specific echinoderm hosts with two types of ecological relationships: commensalism (+/0) and parasitic (+/-) relationships.

The data presented in the present paper is the first dataset of a project: *Species Diversity, Role, and Environmental Impact of Marine Organisms associated with Echinoderms to Promote Awareness of Marine Ecology and the Environment in Thailand*, with an action plan for 2025-2027. We also expect that our findings will raise awareness about marine ecosystem to local people and public for the sustainability of marine resources in the future

Keywords

Species Diversity, Echinoderms, Surin National Park, Ecological Relationships, Marine Ecological Awareness.

Introduction

The phylum Echinodermata includes animals commonly known as feather stars (Crinoidea); sea stars (Asteroidea); brittle stars (Ophiuroidea); sea urchins (Echinoidea); and sea cucumbers (Holothuroidea). They are common intertidally and abundant at great depths. There are at least 375 species in Thai waters. Echinoderms are marine animals of great importance in marine ecology. Many marine animals use the echinoderm’s spiny skin as a shelter and to hide from enemies. It can also harbor parasites. Unique relationships can be developed between the host and the residents. If echinoderms decline or disappear, it will inevitably have an impact on related marine ecology.

Objectives

- 1. To know the diversity of marine organisms associated with echinoderms and host echinoderms along Mu Ko Surin National Park, Pang Nga, Thailand.
- 2. To know the patterns of relationships between echinoderms and other marine organisms.

Materials and Methods

Study Areas and Collecting Method

Mu Ko Surin National Park is in the Andaman Sea on the west coast of Thailand, consist of 2 main islands and several smaller islands surrounding them. The echinoderm specimens and marine organisms associated with echinoderms were collected by hand-collection on the coral reefs by SCUBA diving from March 5 to 9, 2025, covering 11 sites, as shown in Figures 1.

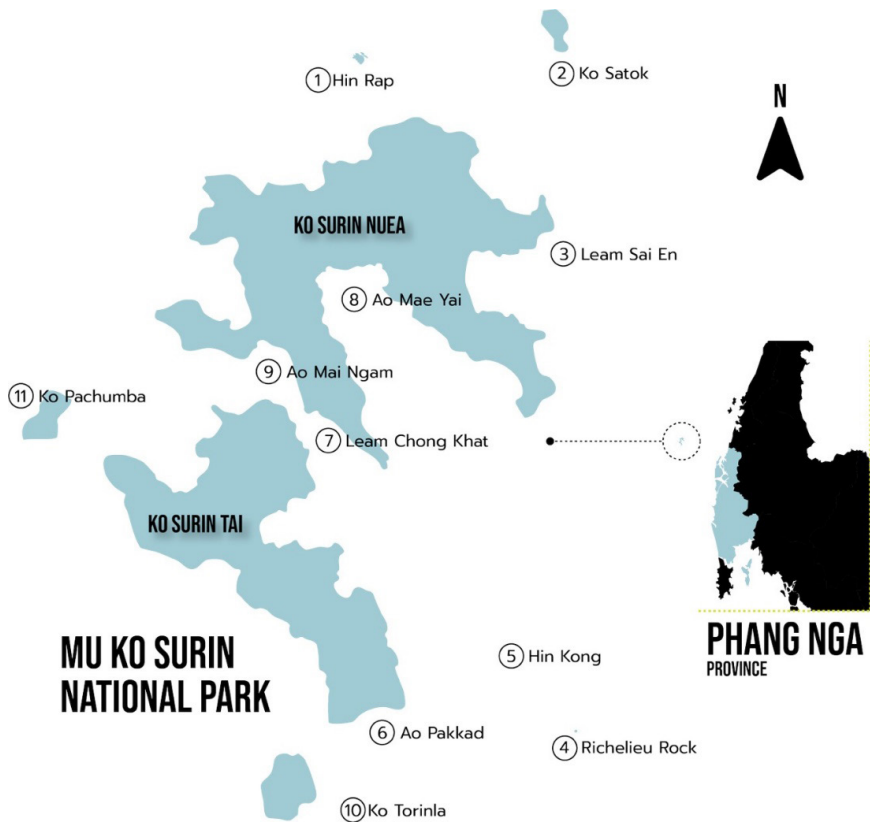


Figure 1. Specimen collecting sites along Mu Ko Surin National Park, Pang Nga, Thailand

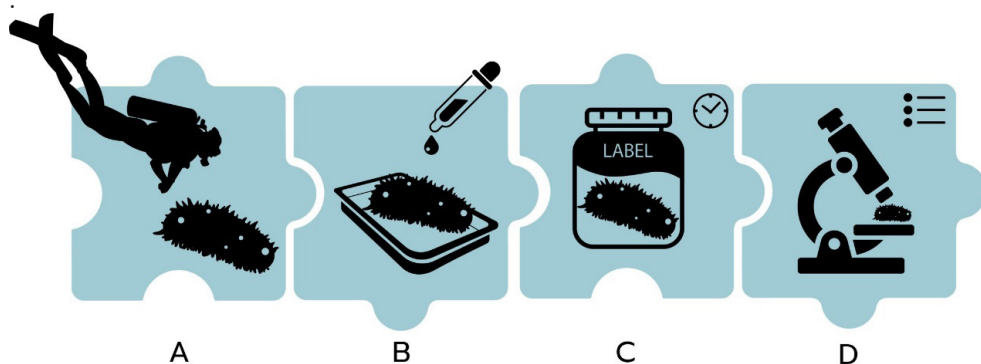


Figure 2. Methodology: A) Specimen collecting *in situ*; B) Fixing; C) Preserving; D) Identifying.

Laboratory Work and Species Identification

The specimens were fixed, preserved and examined under the microscope as shown in Figure 2. The echinoderm taxonomic scheme used in this work follows that of Clark and Rowe (1971), while the other marine taxonomic organisms follow many sources, such as Grube (1878); Okutani (2000); Helmut (2001); Gary (2004); Gerald, Roger, Paul and Ned. (2005); and O'Hara and Byrne (2017).

Results and Discussion

In total, a survey found 29 species of associated marine organisms including one platyhelminths; four annelids; 13 crustaceans; four mollusks; three echinoderms and four chordates. There are six specimens for which we are unable to identify in species namely *Apidioplana* sp.; *Hemicyclops* sp.; *Echineulima* sp.; *Echineulima* sp.; *Pyramidella* sp.; *Ophiothrix* sp., and two other species whose identification is still uncertain namely *Hypomyzostoma* cf. *jonathon*; *Asterophilia* cf. *carlae* are shown in Figure 3 and Table 1.

In addition, we found 19 species of host Echinoderms including four crinoids; three asteroids; four echinoids and eight holothuroids, while the most common relationship type between marine organisms associated with echinoderms was commensalism (+, 0) and a minority of species were parasitic (+, -) are shown in Figures 3 and Table 1.

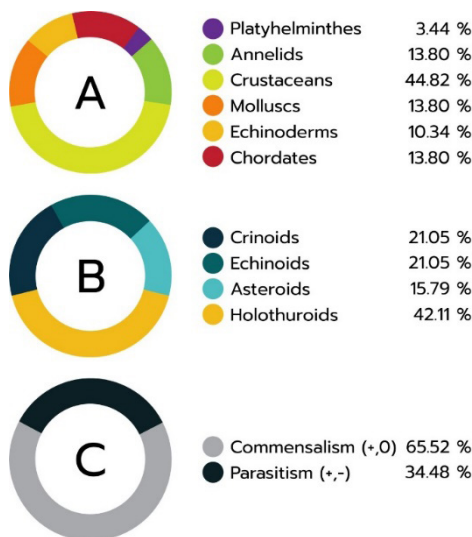


Figure 3. Result: A) Marine organisms associated with echinoderms; B) Echinoderm hosts; C) The relationship type between marine organisms associated with echinoderms.

Acknowledgement

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References

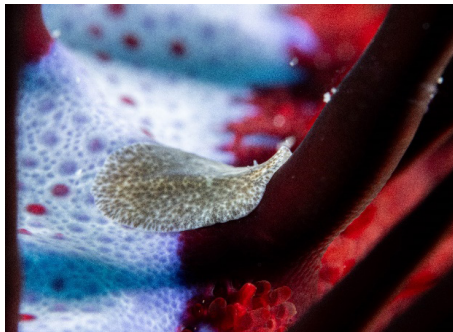
- Clark, A.M and F.W.E. Rowe. 1971. **Monograph of Shallow-water Indo-West Pacific Echinoderms.** Trustees of the British Museum (Natural History), London. 238 pp.
- Gary, C.B.P. 2004. **Marine Decapod Crustacea of Southern Australia: A Guide to Identification.** BPA Print Group, Australia. 574 pp.
- Gerald, R.A., S. Roger, H. Paul and D. Ned. 2005. **Reef Fish Identification Tropical Pacific.** D2Print Pte Ltd., Singapore. Second Printing. 457 pp.
- Grube, Ed. 1878. **Annelidenfauna der Philippinen Nach den von herrn prof. Semper Mitgebrachten sammlungen.** Mémoires de L'académie Impériale des Science de St.-Petersbourg, VII Série, Tome XXV, N° 8. 354 pp.
- Helmut, D. 2001. **Crustacea Guide of the World.** IKAN-Unterwasserarchiv D-65933, Frankfurt. 321 pp.
- O'Hara, T. and M. Byrne. 2017. Ecology and Behavior, p. 37-73. In: O'Hara T. and Byrne M., (eds) **Australian Echinoderms: Biology, Ecology and Evolution.** CSIOR Publishing, Clayton, Australia.
- Okutani, J. 2000. **Marine Mollusks in Japan.** Tokai University, Japan. 1,232 pp.

Table 1. Result: Species Diversity of Marine Associated Organisms and their relationship with Echinoderms at Mu Ko Surin National Park, Pang-Nga, Thailand

Associated Organism (AO) with Echinoderm		Echinoderm (EC)		Interspecific
Sc. Name	Thai Name	Sc. Name	Thai Name	Interactions
1. <i>Apidioplana</i> sp.	หนอนตัวแบน ลายจุด	5. <i>Acanthaster planci</i>	ดาวมงกุฎหนาม	Parasitism (+,-)
2. <i>Hypomyzostoma</i> cf. <i>jonathoni</i>	หนอนข้อดาว ขนนก	1. <i>Capillaster macrobrachius</i>	ดาวขนนก	Parasitism (+,-)
3. <i>Unknown</i> (Polychaetes)	โพลีคีต	17. <i>Stichopus</i> sp.	ปลิงหิน	Parasitism (+,-)
4. <i>Gastrolepidia clavigera</i>	หนอนเกล็ดแผ่น ปรสิตปลิงทะเล	12. <i>Pearsonothuria graeffei</i>	ปลิงการ์ฟิลด์	Parasitism (+,-)
		13. <i>Bohadschia vitiensis</i>	ปลิงฟักทอง	Parasitism (+,-)
		14. <i>Holothuria leucospilota</i>	ปลิงดำตัวนึ่ง	Parasitism (+,-)
		15. <i>Holothria atra</i>	ปลิงดำตัวแข็ง	Parasitism (+,-)
		16. <i>Holothuria edulis</i>	ปลิงชมพูตัวแข็ง	Parasitism (+,-)
		18. <i>Stichopus hermanni</i>	ปลิงหิน ปลิงกาหมาด	Parasitism (+,-)
5. <i>Asterophilia</i> cf. <i>carlae</i>	หนอนเกล็ดตุ้ม ปรสิตปลิงทะเล	15. <i>Holothria atra</i>	ปลิงดำตัวแข็ง	Parasitism (+,-)
6. <i>Synalpheus stimpsonii</i>	กุ้งติตชันดาว ขนนก	1. <i>Capillaster macrobrachius</i>	ดาวขนนก	Commensalism (+,0)
		3. <i>Comaster multifidus</i>	ดาวขนนก	Commensalism (+,0)
7. <i>Synalpheus carinatus</i>	กุ้งติตชันใสดาว ขนนก	3. <i>Comaster multifidus</i>	ดาวขนนก	Commensalism (+,0)
8. <i>Laomenes cornutus</i>	กุ้งดาวตายาว ขนนก	2. <i>Capillaster sentosus</i>	ดาวขนนก	Commensalism (+,0)

Associated Organism (AO) with Echinoderm		Echinoderm (EC)		Interspecific
Sc. Name	Thai Name	Sc. Name	Thai Name	Interactions
9. <i>Cristimenes commensalis</i>	กุ้งดาวขนนก กลายเลอะเขียว	3. <i>Comaster multifidus</i>	ดาวขนนก	Commensalism (+,0)
10. <i>Cristimenes commensalis</i>	กุ้งดาวขนนก กลายเลอะ	3. <i>Comaster multifidus</i>	ดาวขนนก	Commensalism (+,0)
11. <i>Zenopontonia soror</i>	กุ้งจักรพรรดิจิว ดาวทะเล	6. <i>Culcita novaeguineae</i>	ดาวหมอนปักเข็ม	Commensalism (+,0)
12. <i>Zenopontonia rex</i>	กุ้งจักรพรรดิ ปลิงทะเล	13. <i>Bohadschia vitiensis</i>	ปลิงฟักทอง	Commensalism (+,0)
		18. <i>Stichopus hermanni</i>	ปลิงหิน ปลิงกาหมาด	Commensalism (+,0)
13. <i>Allogalathea elegans</i>	ปูมังกรดาว ขนนก	4. <i>Colobometra perspinosa</i>	ดาวขนนก	Commensalism (+,0)
14. <i>Permanotus purpureus</i>	ปูดาวขนนกขอบ กระดองเรียบ	2. <i>Capillaster sentosus</i>	ดาวขนนก	Commensalism (+,0)
15. <i>Harrovia longipes</i>	ปูดาวขนนกขอบ กระดองหนาม	2. <i>Capillaster sentosus</i>	ดาวขนนก	Commensalism (+,0)
16. <i>Echinoecus pentagonus</i>	ปูกันเม่นทะเล	8. <i>Echinothrix calamaris</i>	เม่นหนามใหญ่ ขาว	Parasitism (+,-)
		9. <i>Echinothrix diadema</i>	เม่นหนามใหญ่ดำ	Parasitism (+,-)
17. <i>Lissocarcinus orbicularis</i>	ปูม้าปลิงทะเล	13. <i>Bohadschia vitiensis</i>	ปลิงฟักทอง	Commensalism (+,0)
		14. <i>Holothuria leucospilota</i>	ปลิงดำตัวน้ม	Commensalism (+,0)
18. <i>Hemicyclops</i> sp.	โคพีพอดหู กระต่าย	15. <i>Holothria atra</i>	ปลิงดำตัวแข็ง	Commensalism (+,0)
19. <i>Thyca crystallina</i>	หอยคริสตัลดาว ทะเล	7. <i>Linckia laevigata</i>	ดาวแขนยาว	Parasitism (+,-)
20. <i>Echineulima</i> sp.	หอยเจดีย์ปรสิติ ดาวทะเล	7. <i>Linckia laevigata</i>	ดาวแขนยาว	Parasitism (+,-)

Associated Organism (AO) with Echinoderm		Echinoderm (EC)		Interspecific
Sc. Name	Thai Name	Sc. Name	Thai Name	Interactions
21. <i>Echineulima asthenosomae</i>	หอยเจดีย์ปรสิต เม่นทะเล	8. <i>Echinothrix calamaris</i>	เม่นหนามใหญ่ ขาว	Parasitism (+,-)
22. <i>Pyramidella</i> sp.	หอยเจดีย์แก้ว ปรสิตปลิงทะเล	15. <i>Holothria atra</i>	ปลิงดำตัวแข็ง	Parasitism (+,-)
		16. <i>Holothuria edulis</i>	ปลิงชมพูตัวแข็ง	Parasitism (+,-)
		17. <i>Stichopus</i> sp.	ปลิงหิน	Parasitism (+,-)
		18. <i>Stichopus hermanni</i>	ปลิงหิน ปลิงกาหมาด	Parasitism (+,-)
23. <i>Gymnolophus obscura</i>	ดาวเปราะดำ ดาวขนนก	4. <i>Colobometra perspinosa</i>	ดาวขนนก	Commensalism (+,0)
24. <i>Ophiothrix</i> sp.	ดาวเปราะหนาม	19. <i>Thelenota ananas</i>	ปลิงหินหนามแดง	Commensalism (+,0)
25. <i>Ophiosphaera insignis</i>	ดาวเปราะสอง เพศ	11. <i>Tripneustes gratilla</i>	เม่นม่วงหัวยุ่ง	Commensalism (+,0)
26. <i>Rhinolepadichthys lineatus</i>	ปลากอดูดสอง แถบ	1. <i>Capillaster macrobrachius</i>	ดาวขนนก	Commensalism (+,0)
27. <i>Sueviota lachneri</i>	ปลาบู่น้แกระ	13. <i>Bohadschia vitiensis</i>	ปลิงฟักทอง	Commensalism (+,0)
28. <i>Dascyllus trimaculatus</i>	ปลาสลิดหินสาม จุด	1. <i>Capillaster macrobrachius</i>	ดาวขนนก	Commensalism (+,0)
29. <i>Siphamia tubifer</i>	ปลาอมไข่ คาร์ดินา	5. <i>Acanthaster planci</i>	ดาวมงกุฎหนาม	Commensalism (+,0)
		10. <i>Diadema setosum</i>	เม่นดำหนามยาว	Commensalism (+,0)



AO: 1. *Apidioplana* sp.
EC: 5. *Acanthaster planci*



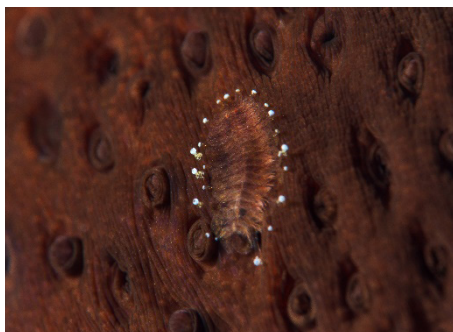
AO: 2. *Hypomyzostoma* cf. *jonathoni*
EC: 1. *Capillaster macrobrachius*



AO: 3. *Unknown* (Polychaetes)
EC: 17. *Stichopus* sp.



AO: 4. *Gastrolepidia clavigera*
EC: 14. *Holothuria leucospilota*



AO: 5. *Asterophilia* cf. *carlae*
EC: 15. *Holothuria atra*



AO: 6. *Synalpheus stimpsonii*
EC: 1. *Capillaster macrobrachius*

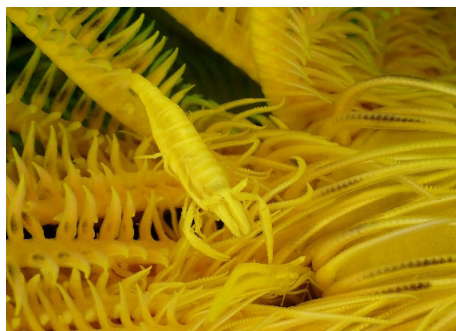
Figure 3. Result: Species Diversity of Marine Associated Organisms and their Echinoderms Host at Mu Ko Surin National Park, Pang-Nga, Thailand (AO: Associated Organism; EC: Echinoderm)



AO: 7. *Synalpheus carinatus*
EC: 3. *Comaster multifidus*



AO: 8. *Laomenes cornutus*
EC: 2. *Capillaster sentosus*



AO: 9. *Laomenes amboinensis*
EC: 3. *Comaster multifidus*.



AO: 10. *Cristimenes commensalis*
EC: 3. *Comaster multifidus*



AO: 11. *Zenopontonia soror*
EC: 6. *Culcita novaeguineae*



AO: 12. *Zenopontonia rex*
EC: 13. *Bohadschia vitiensis*

Figure 3. Result: Species Diversity of Marine Associated Organisms and their Echinoderms Host at Mu Ko Surin National Park, Pang-Nga, Thailand (AO: Associated Organism; EC: Echinoderm)



AO: 13. *Allogalathea elegans*
EC: 4. *Colobometra perspinosa*



AO: 14. *Permanotus purpureus*
EC: 2. *Capillaster sentosus*



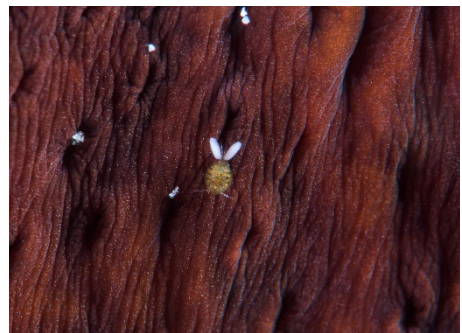
AO: 15. *Harrovia longipes*
EC: 2. *Capillaster sentosus*



AO: 16. *Echinoecus pentagonus*
EC: 8. *Echinothrix calamaris*



AO: 17. *Lissocarcinus orbicularis*
EC: 13. *Bohadschia vitiensis*



AO: 18. *Hemicyclops* sp.
EC: 15. *Holothuria atra*

Figure 3. Result: Species Diversity of Marine Associated Organisms and their Echinoderms Host at Mu Ko Surin National Park, Pang-Nga, Thailand (AO: Associated Organism; EC: Echinoderm)



AO: 19. *Thyca crystallina*
EC: 7. *Linckia laevigata*



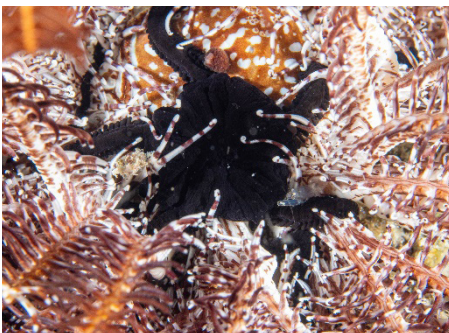
AO: 20. *Echineulima* sp.
EC: 7. *Linckia laevigata*



AO: 21. *Echineulima asthenosomae*
EC: 8. *Echinothrix calamaris*



AO: 22. *Pyramidella* sp.
EC: 15. *Holothuria atra*



AO: 23. *Gymnolophus obscura*
EC: 4. *Colobometra perspinosa*



AO: 24. *Ophiothrix* sp.
EC: 19. *Thelenota ananas*

Figure 3. Result: Species Diversity of Marine Associated Organisms and their Echinoderms Host at Mu Ko Surin National Park, Pang-Nga, Thailand (AO: Associated Organism; EC: Echinoderm)



AO: 25. *Ophiosphaera insignis*
EC: 11. *Tripneustes gratilla*



AO: 26. *Lepadichthys lineatus*
EC: 1. *Capillaster macrobrachius*



AO: 27. *Sueviota lachneri*
EC: 13. *Bohadschia vitiensis*



AO: 28. *Dascyllus trimaculatus*
EC: 1. *Capillaster macrobrachius*



AO: 29. *Siphamia tubifer*
EC: 5. *Acanthaster planci*



AO: 29. *Siphamia tubifer*
EC: 10. *Diadema setosum*

Figure 3. Result: Species Diversity of Marine Associated Organisms and their Echinoderms Host at Mu Ko Surin National Park, Pang-Nga, Thailand (AO: Associated Organism; EC: Echinoderm)