

A New Species of *Murex* (Gastropoda: Muricidae) from the Andaman Sea, Thailand

Chorchat Gra-tes

83 Ramintra 5 Yak18, Ramintra Road, Taraeng,
Bangkhen, Bangkok, 10220 Thailand

chorchatshells@yahoo.com

ABSTRACT A new species of the genus *Murex* (Family Muricidae) is described from an island in the Andaman Islands chain off Pang-nga Province, southwest Thailand in the Andamanian Subprovince. This geographical subprovince is located in the eastern Andaman Sea, East Indian Ocean. *Murex suttipraneae* sp. nov. is conchologically differentiated from a closely related species; *Murex pecten* Lightfoot, 1786 and its complex from other geographical provinces around the western Pacific rim.

KEY WORDS Gastropoda, Muricidae, *Murex suttipraneae*, Andamanian Subprovince, Andaman Sea, Thailand

INTRODUCTION

The species of the Genus *Murex* Linnaeus, 1758 are very attractive having an amazing and fascinating club shape with long shoulder spines and cords, and spines on the siphonal canal formed like a comb. Species in this Genus are distributed from the tropical western Pacific to the Central Indian Ocean. This new species was found only in an area around Ba-ngu Island off Phang-nga Province, on the southwest coast of Thailand, which lies in the Andaman Islands chain in the Andamanian Subprovince; “a semi enclosed basin that is centered on the Andaman Sea and enclosed by the west coasts of Myanmar and Thailand and the Mergui Archipelago in the east, to the northern Malacca Strait in the south, and to the Andaman and Nicobar Islands in the west” (Dekkers *et al.* 2022). The southeast Asian peninsula (*i.e.*, Thailand and Malaysia) separates the sea into two oceans (*i.e.*, the Indian Ocean on the west; and the Pacific Ocean on the east). This separation, that occurred millions of years ago, created subprovinces with their own distinct

environmental conditions (*i.e.*, unique water temperatures and salinity, current flows and ocean floor contours). Over time, the species in these provinces adapted to their specific environmental conditions (Petuch & Berschauer 2020) and established different physiological characteristics that are used here to distinguish *M. suttipraneae* n. sp. from *M. pecten* Lightfoot, 1786.

Abbreviations:

CGSC = Chorchat Gra-tes Private Shell Collection

CUMZ = Chulalongkorn University, Museum of Zoology, Bangkok, Thailand.

L = Shell Length (Protoconch to Siphonal canal tip)

S = Spine Number

SC = Shoulder Spine

W = Shell Width

WRTN = Woman in the Royal Thai Navy

MATERIAL AND METHODS

The specimens of *M. suttipraneae* sp. nov. were collected from Ba-ngu Island, Phang-nga Province in the Andaman Sea, southwest of Thailand. The description of shell characters and morphological analyses were obtained from dry empty shells. Other material examined consisted of specimens of *M. pecten* Lightfoot, 1786 and other *Murex* sp. from the CGSC. Photographs of *M. pecten* in the references were also used for comparison.

SYSTEMATICS

Phylum: Mollusca Linnaeus, 1758

Class: Gastropoda Cuvier, 1795

Subclass: Caenogastropoda Cox, 1960

Order: Neogastropoda Wenz, 1938

Family: Muricidae Rafinesque, 1815

Subfamily: Muricinae Rafinesque, 1815

Genus: *Murex* Linnaeus, 1758

Murex suttipraneae Gra-tes, new species
(Plate 1)

Description. *Murex suttipraneae* is dextral, club shaped, fusiform and large for the Genus. It has both short and long spines with cords that are prominent and a moderately tall to tall spire. The siphonal canal is long bearing spines that are moderate to long in length and comb-like. There is a prominent labial tooth. The protoconch is small pointed and creamy yellow, slightly translucent with less pronounced axial ribs (ridges) (Figure 1). The body whorl is moderately large and elongate. The aperture is ovate to lenticular. The siphonal canal is long straight with a narrow opening. The shoulder spine (or primary cord) is medium to long in length and pointed upward. The primary spines are shorter in length with a small deviation angle from axis (Figure 2) and shorter major cords in the siphonal canal, the body with 16-17 major cords (spines) on the siphonal canal

(Figure 3). The tips of the spines along the siphonal canal form an ovate shape (not circular, Figure 7). The deviation angle between the shoulder spine and the axis is narrow (Figure 2). The color of the shell's body and the base of the spines is tan to dark tan with lavender or deep, mauve-colored spines. The spiral rib is weakly nodulose and the color is creamy-tan, lighter than the base color of the shell. The aperture is light brown and white at the margin. The operculum is ovate to elongate with pointed tips oriented toward the anterior and the posterior ends. The color of the operculum is dark tan to brown. On the outer surface are a number of concentric lamella radiating outward from the nucleus (Figure 5). The largest specimen collected of *M. suttipraneae* is 178 mm and is in the author's collection.

Type Material. The Holotype is deposited in the Chulalongkorn University, Museum of Zoology, Bangkok, Thailand. Holotype: CUMZ 7456, 128 mm. (ex. CGSC 6297-4018). Paratype: 21 specimens CGSC 6297-4019 to CGSC 6297-4039 are in the author's collection (8 Paratype specimens are shown here, Plate 1).

Type Locality. Ba-ngu Island, Phang-nga, Thailand, in the Andaman Sea. Specimens were caught in crab nets by local fishermen at a depth of about 60-70 meters on muddy substrate.

Distribution. This new species was found around Ba-ngu Islands (a small island in a group of islands on the Andaman Islands chain) off Phang-nga Province, southwest of Thailand.

Comparison. The spire is taller compared to other species in the Genus, (*i.e.*, *M. altispira* Ponder & Vokes, 1988 (Figure 9) and *M. djarianensis poppei* Houart, 1979 that have shorter spires). However, *M. suttipraneae* (Plate 1) is closest in form to *M. pecten* (Plate 2). Both *M. pecten* and *M. suttipraneae* are club

shaped, dextral, and large for the Genus. The coloration of *M. pecten* is creamy white to light tan while *M. suttipraneae* is light tan to tan. The average number of spines for *M. pecten* is about 10-12 (Figure 4) while *M. suttipraneae* has about 15-17 but typically have 16 (Figure 3). The shape of the spine set on the siphonal canal of *M. pecten* is round while *M. suttipraneae* is ovate (Table 1, Figures 3 and 4). Length of the siphonal canal and shoulder spines of *M. pecten* are longer and more concave than *M. suttipraneae*. The average deviation of shoulder spine to axis of *M. pecten* is greater than *M. suttipraneae* (Figure 2).

Ponder and Vokes (1988) emphasized the importance of the operculum for identification: "The position of nucleus and the type of sculpture on the outer surface of the operculum are the main character used. This structure is valuable in separating some species of *Murex*." So, by comparison, the tips of the operculum are more pointed toward the anterior and posterior ends in *M. suttipraneae* and there are more concentric lamellas radiating out from the nucleus than in *M. pecten*. The color of the operculum is dark brown to tan in *M. suttipraneae* and tan to dark tan in *M. pecten* (Figure 6). The average ratio between the width and length (W/L) of the 9 specimens of *M. pecten* in Plate 2 is 0.515 while this ratio is 0.432 in *M. suttipraneae* (Table 1), making *M. pecten* broader on average than *M. suttipraneae* (Figure 9).

Murexes that look similar but different are *M. djarianensis poppei* and *M. altispira*. However, the spire of *M. suttipraneae* is taller (Figures 10 and 11). *M. djarianensis poppei* only lives along the western coast of Southeast Asian Peninsula, in the east Andaman Sea. While *M. altispira* only lives along the eastern coast of Southeast Asian Peninsula or west of the Gulf of Thailand. Both come from areas that have

different oceanographic characteristics that contribute to their form variations. The same applies to *M. suttipraneae* from the south Andaman Sea, Indian Ocean and *M. pecten* from the Philippines (Western Pacific rim). Both have evolved differently under the environmental conditions in their respective subprovinces and do not typically cross over into other regions, provinces or subprovinces.

Etymology. This species is named in honor of my mother, Captain Suttipraneae Gra-tes WRTN.

Specimen Number <i>Murex pecten</i> Lightfoot, 1786	L (mm)	W (mm)	W/L
1	170	82	0.482
2	170	83	0.488
3	142	72	0.507
4	135	74	0.548
5	132	70	0.530
6	126	59	0.468
7	120	67	0.558
8	102	55	0.539
9	98	51	0.520
Average W/L			0.515
Paratype Number <i>Murex suttipraneae</i> sp. nov.			
Holotype	119	50	0.420
1	173	78	0.450
2	161	69	0.428
3	154	71	0.461
4	148	60	0.405
5	140	58	0.414
6	122	55	0.450
7	154	66	0.428
8	163	71	0.435
Average W/L			0.432

Table 1. Average W/L of *M. pecten* Lightfoot, 1786 and *M. suttipraneae* sp. nov. A W/L greater than 0.5 means the shell is broader. A W/L less than 0.5 means the shell is slender.

Shell characteristics	<i>Murex pecten</i> Lightfoot, 1786	<i>Murex</i> <i>suttipraneae</i> sp. nov.
Color (Figure 7)	Creamy white to light tan	Light tan to tan
Number of cords (spines) on the siphonal canal (Figures 3 & 4)	10-12	15-17
Shape of the arrangement of spines on the siphonal canal (Figure 7)	round	ovate
Length of spines	longer	shorter
Apex (Figure 1)	small pointed and creamy yellow, slightly translucent with less pronounced axial ribs (ridges)	blunt and creamy white with pronounced axial ribs (ridges)
Average deviation of shoulder spine to Axis (Figure 2)	greater	smaller
Shoulder spines (Figures 3 & 4)	longer, more concave up	shorter, less concave up
Operculum (Figure 6)	The tips of operculum toward the anterior and posterior are more rounded, and there are less concentric lamella radiating out from the nucleus on the outer surface. The color is tan to dark tan.	The tips of operculum toward the anterior and posterior are more pointed, and there are a greater number of concentric lamella radiating out from the nucleus on the outer surface. The color is dark tan to brown.
Aperture (Figure 6)	Edge of aperture white, light to dark brown within.	Edge of aperture light brown and white at the margin.

Table 2. Comparing characters of *M. pecten* Lightfoot, 1786 and *M. suttipraneae* sp. nov.

DISCUSSION

At present, this new species is endemic to Ba-ngu Island off Phang-nga Province southwest coast of Thailand that lies in the Andaman Islands chain on the Andamanian Subprovince. However, range extension beyond Ba-ngu Island requires further research.

The Indian Ocean and the Pacific Ocean have been separated by the Southeast Asian Peninsula for millions of years. This separation obstructed current flows and affected atmospheric weather conditions that shaped the characteristics of the oceans including water salinity and temperature in these subprovinces. The salinity of sea water at the surface in the Indian Ocean ranges from 32 to 37 parts per 1000. The highest is 37 in Arabian Sea and the lowest is in Bay of Bengal.¹ While the Pacific waters that approach 60° F have salinities of less than 34 parts per 1000, the lowest salinities of less than 32 parts per 1000 occur in the extreme northern region of the Pacific. The heavy rainfall in the western Pacific, associated with the monsoons of the region, gives rise to relatively low salinities.² These differences of salinity and ocean temperature created an environment that existed for millions of years allowing marine creatures (*e.g.*, Mollusca) to evolve and adapt to these conditions establishing new species and variations of existing species that we see today.

Some examples of very close and related species and subspecies but from different ecological environmental conditions include *Lambis scorpius* Linnaeus, 1758 from the Philippines vs. *Lambis indomaris* Abbott, 1961 from the Indian Ocean (Figure 10), *Cymatium lotorium* Linnaeus, 1758 from the Philippines vs. *Cymatium perryi* Emerson & Old, 1963 from the Indian Ocean (Figure 11), *Cypraea* (*Perisserosa*) *guttata* Gmelin, 1791 from the

Philippines vs. *Cypraea (Perisserosa) surinensis* (Raybaudi, 1978) from the Indian Ocean (Figure 12) etc. These species look similar, but their shell characteristics have evolved differently when adapting to their specific environmental conditions.

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End Notes.

- <https://www.quora.com/What-is-the-average-salinity-level-in-the-Indian-Ocean>
- <https://www.britannica.com/place/Pacific-Ocean/Temperature-and-salinity>

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Figure 1. Protoconch Comparison. A= The protoconch of *M. suttipraneae* sp. nov. is small pointed and creamy yellow, slightly translucent with less pronounced axial ribs (ridges), B= the protoconch of *M. pecten* Lightfoot, 1786 is blunt and creamy white with pronounced axial ribs (ridges). Specimens are from the CGSC.

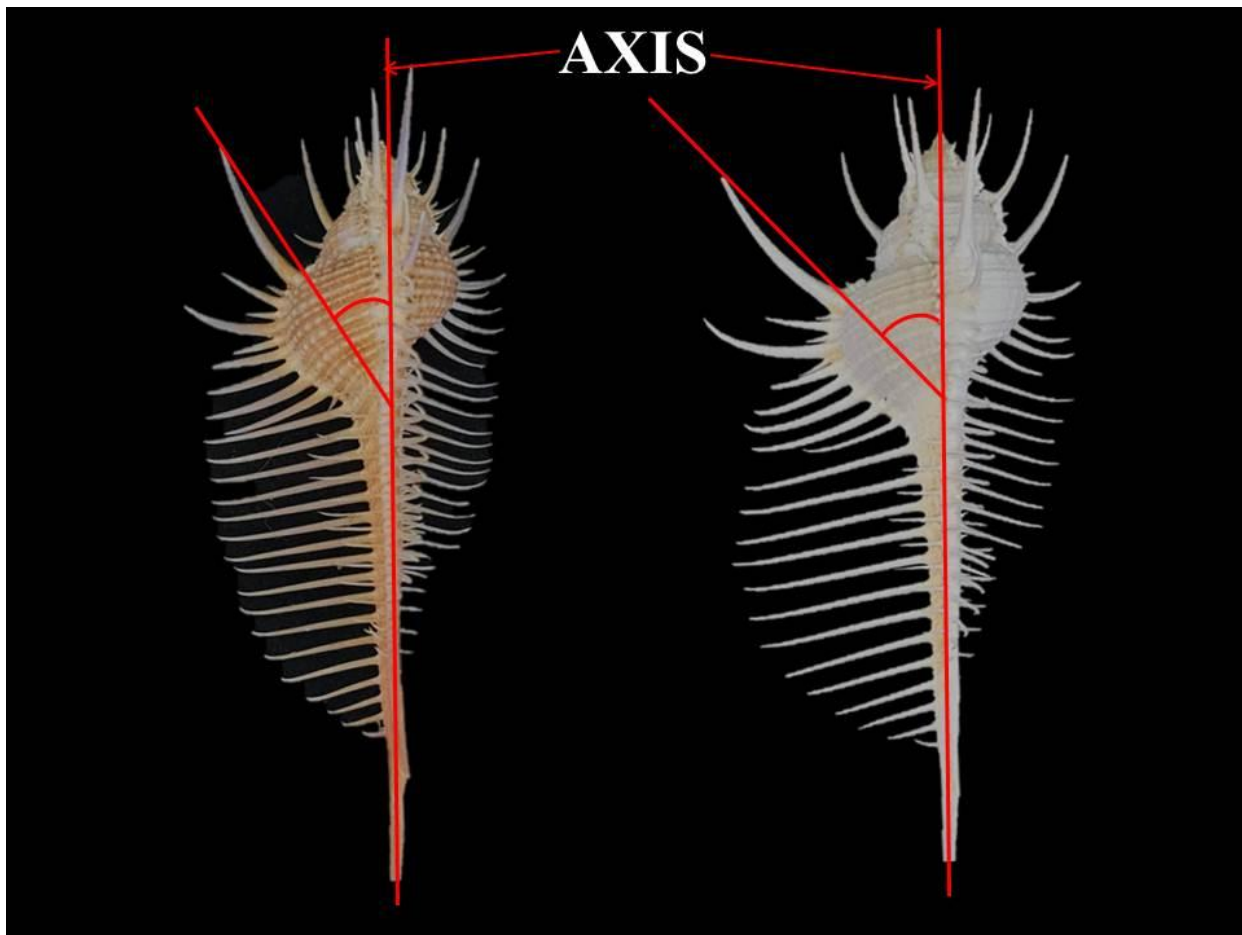


Figure 2. Deviation angle between shoulder spines and axis of *M. suttipraneae* sp. nov. (left) is less than *M. pecten* Lightfoot, 1786 (right). Shoulder spines of *M. suttipraneae* sp. nov. are shorter and less concave than *M. pecten* Lightfoot, 1786. Specimens are from CGSC.

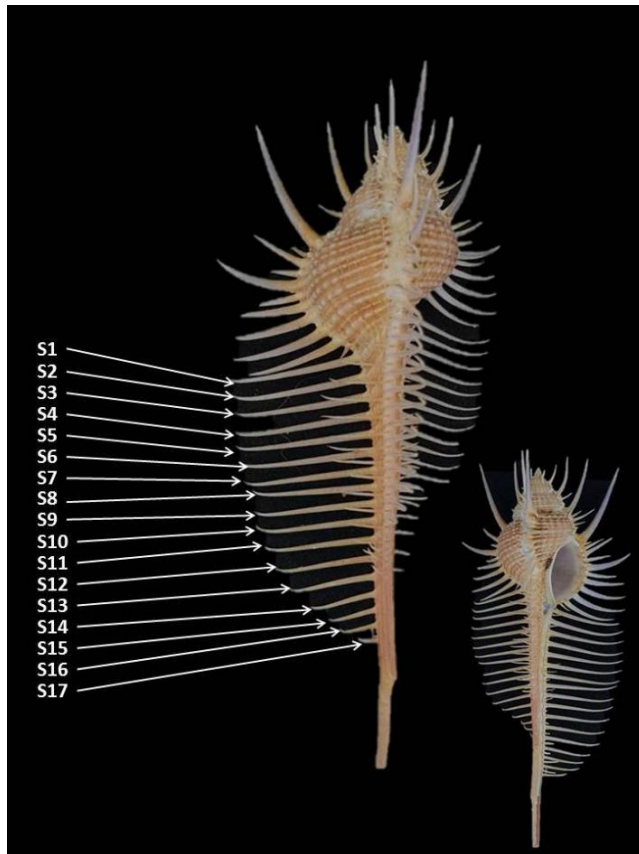


Figure 3. *Murex suttipraneae* sp. nov. has 16 spines with average W/L at 0.425 slender than *M. pecten* Lightfoot, 1786. The set of spines (left) form an ovate shape. Specimen is from the CGSC.

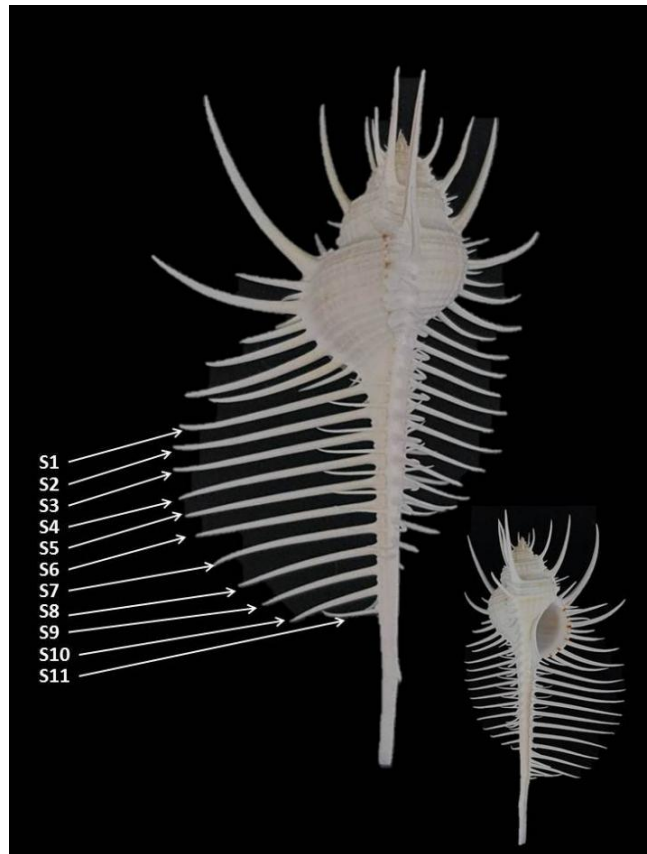


Figure 4. *Murex pecten* Lightfoot, 1786 has 11 spines with average W/L at 0.515 broader than *Murex suttipraneae* sp. nov. The set of spines (left) form a round shape. Specimen is from the CGSC.

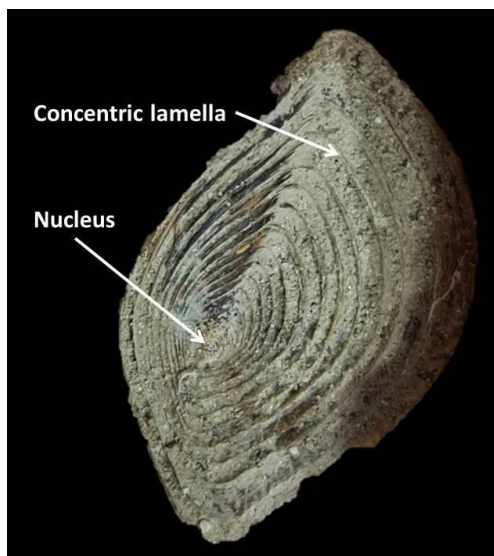


Figure 5. Nucleus and concentric lamella of *M. suttipraneae* sp. nov.

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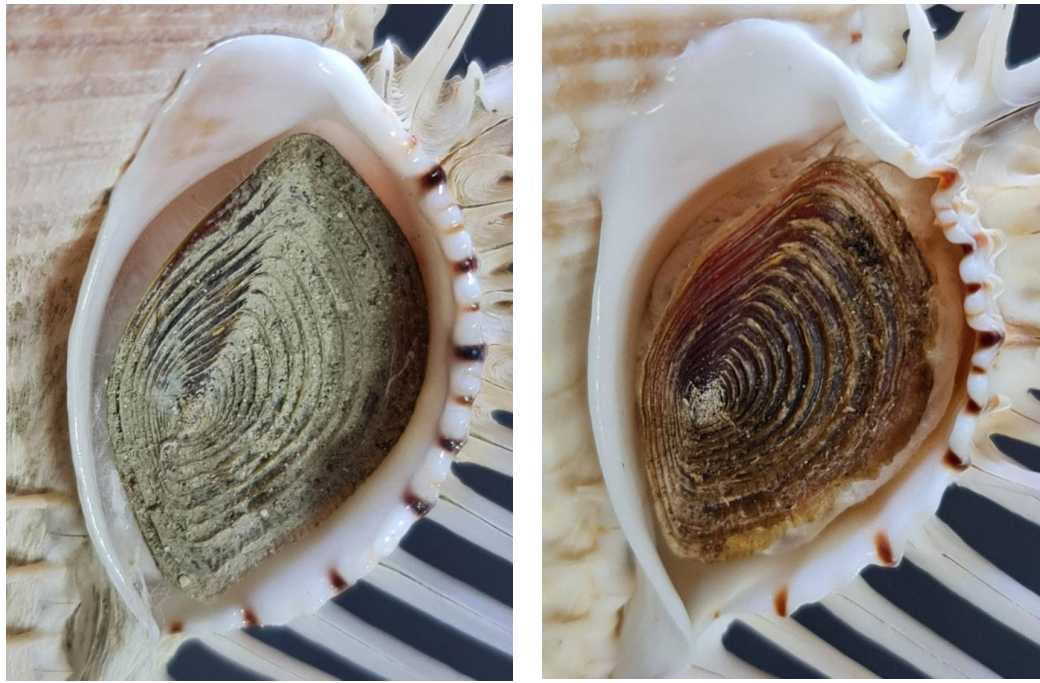


Figure 6. The operculum of *M. suttipraneae* sp. nov. (left) and *M. pecten* Lightfoot, 1786 (right). On the outer surface, the concentric lamella from the nucleus outward of *M. suttipraneae* sp. nov. is frequent and the tips of operculum toward the anterior and posterior is more pointed than *M. pecten* Lightfoot, 1786.

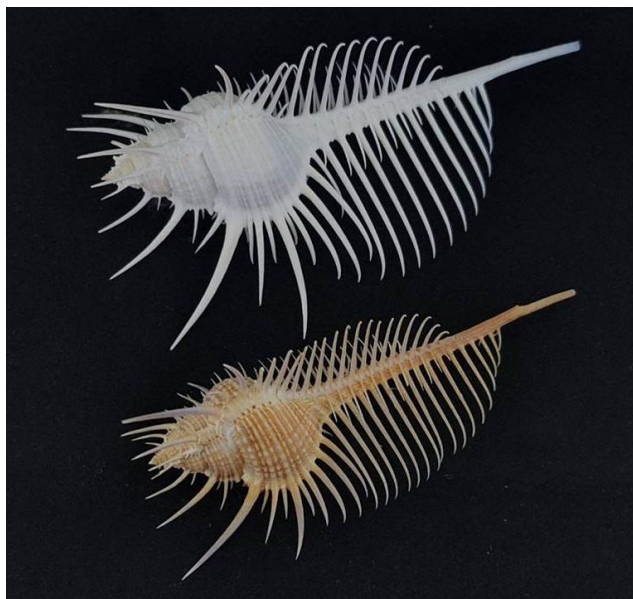


Figure 7. Top is *M. pecten* Lightfoot, 1786, and bottom is *M. suttipraneae* sp. nov. Note the number of spines on the siphonal canal. Specimens are from the CGSC.



Figure 8. Dorsal and ventral view of *M. suttipraneae* sp. nov. Specimen is from the CGSC.

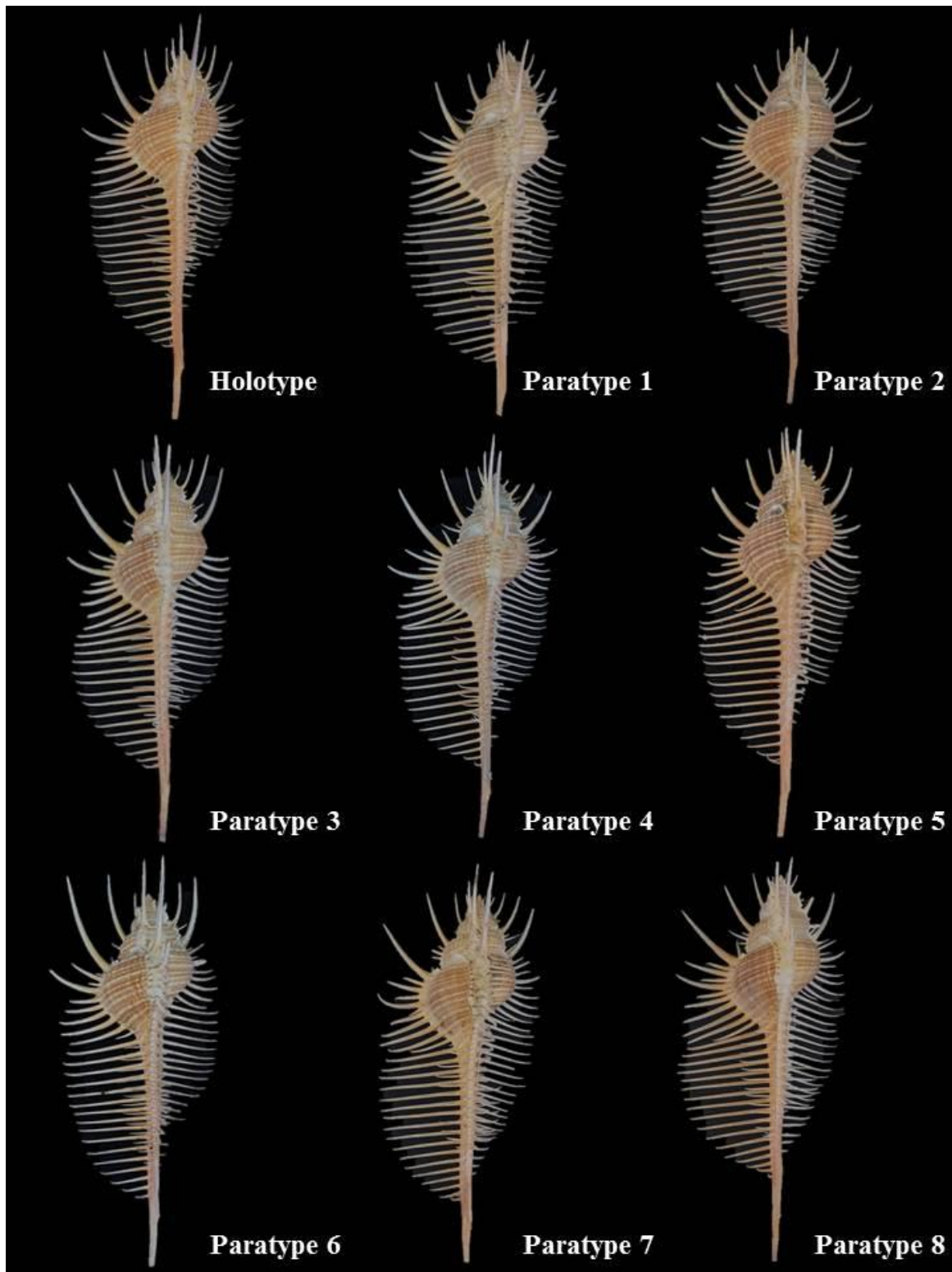


Plate 1. Nine specimens of *M. suttipraneae* sp. nov. Holotype is in the CUMZ, Paratypes 1-8 are in the CGSC. The size of Holotype to Paratype 8 are 119 mm, 173 mm, 161 mm, 154 mm, 148 mm, 140 mm, 122 mm, 154 mm, and 163 mm respectively.

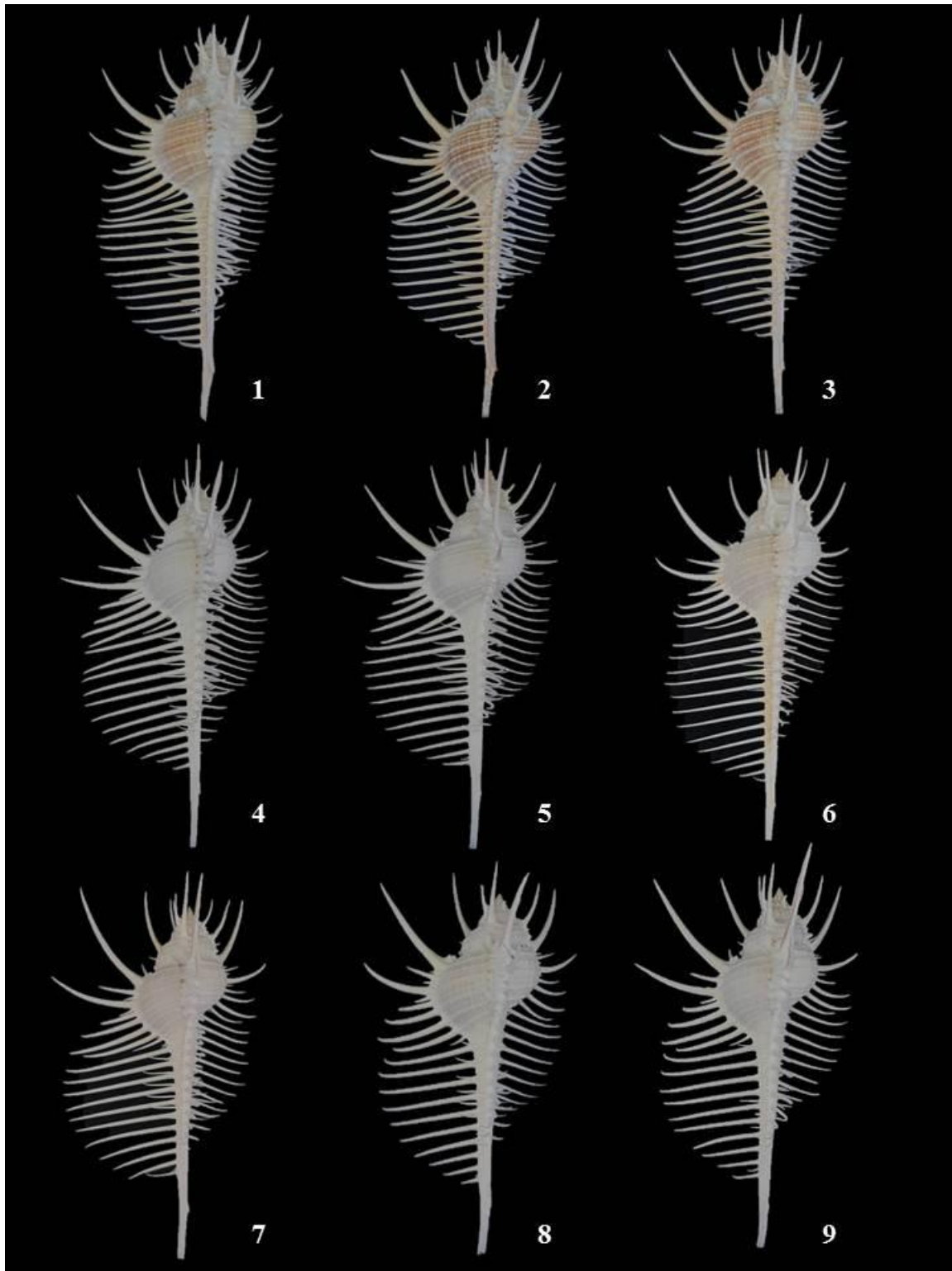


Plate 2. Nine specimens of *M. pecten* Lightfoot, 1786, size from 1 to 9 are 170 mm, 170 mm, 142 mm, 135 mm, 132 mm, 126 mm, 120 mm, 102 mm, and 98 mm respectively. Specimens are from the CGSC.



Figure 9. *Murex altispira* Ponder & Vokes, 1988 (130 mm) from the west Gulf of Thailand (Pacific Ocean Side) (left) vs. *M. djarianensis poppei* Houart, 1979 (125 mm) from the Andaman Sea, south Thailand (Indian Ocean Side) (right). Specimens are from the CGSC.



Figure 10. *Lambis scorpius* Linnaeus, 1758 (150 mm) from the Philippines (left) vs. *L. indomaris* Abbott, 1961 (170 mm) from the Indian Ocean (right) Specimens are from the CGSC.

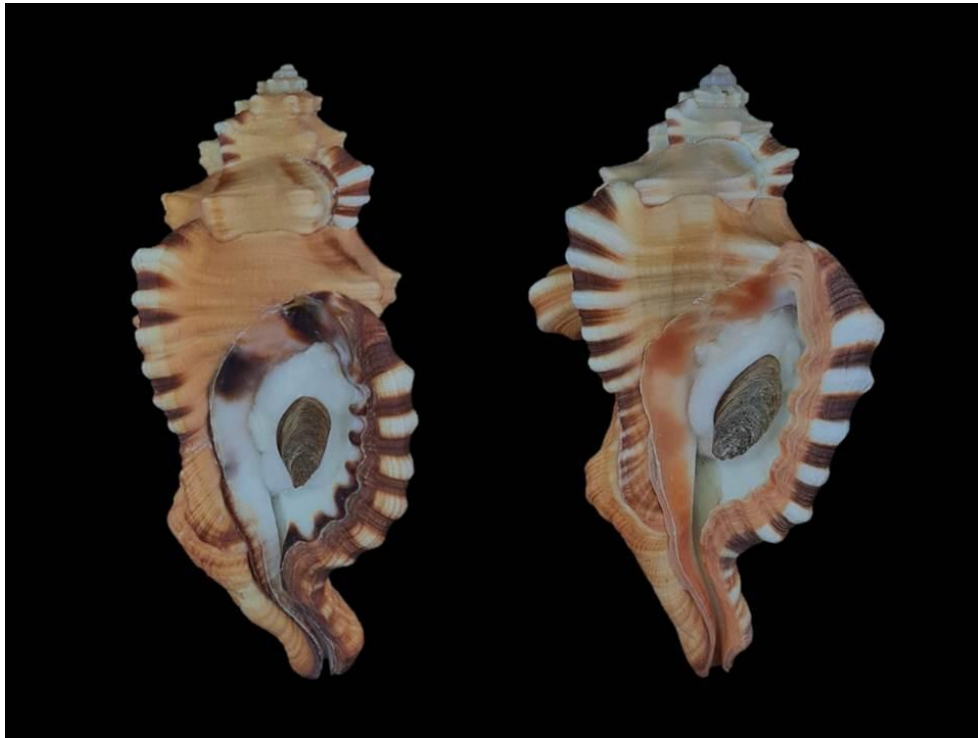


Figure 11. *Cymatium lotorium* Linnaeus, 1758 (136 mm) from the Philippines (left) vs. *Cymatium perryi* Emerson & Old, 1963 (122 mm) from the Indian Ocean (right) Specimens are from the CGSC.



Figure 12. *Cypraea (Perisserosa) guttata* Gmelin, 1791 (58 mm) from the Philippines (left) vs. *Cypraea (Perisserosa) surinensis* (L. Raybaudi, 1978) (50 mm) from the Indian Ocean (right). Specimens are from the CGSC.