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COMMENTS ON *ISCHNOCHITON HARTMEYERI*
THIELE 1910
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Pages 34-37

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INTRODUCTION

The Dry Tortugas, located in the extreme southeastern Gulf of Mexico, contain seven small islands (total area 46 hectares) surrounded by nearly 23,000 hectares of shallow (<10 m) carbonate sands, seagrass

beds, and coral reefs. Ft. Jefferson National Monument was established in 1935 to protect the historic and natural resources of Dry Tortugas; the monument is administered by the National Park Service (NPS). Physiography and major faunal components of the area are described by Davis (in press).

In 1978, I visited Dry Tortugas to assist NPS biologists studying feeding habits of the spiny lobster, *Paralurus argus*. Examination of lobster stomach contents during the subsequent year revealed a high incidence of polyplacophoran ("chiton") remains, principally radulae but also including valves of several species. I returned to Dry Tortugas in

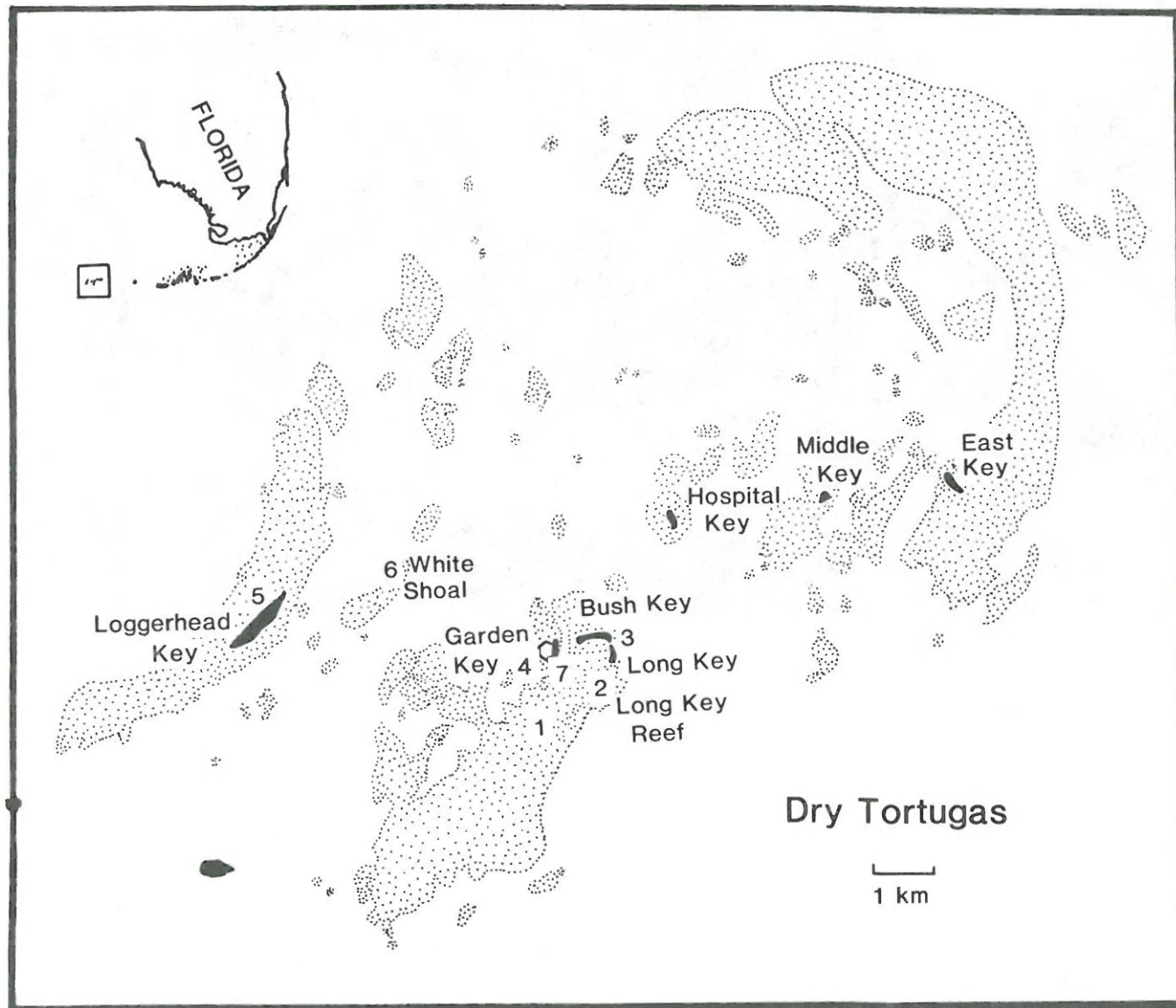


Figure 1. Station locations, Dry Tortugas polyplacophoran study.

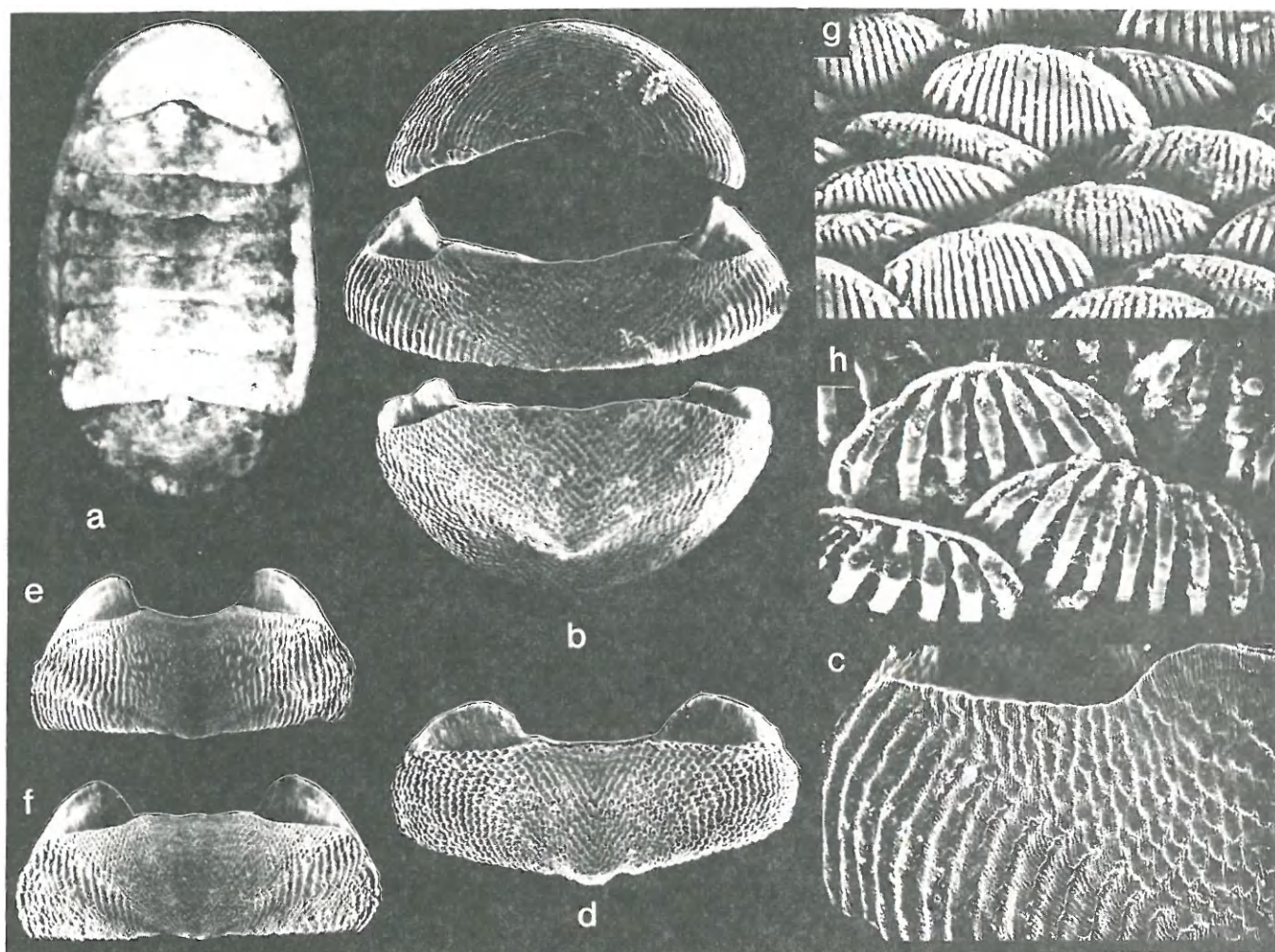


Figure 2a, *Ischnochiton hartmeyeri*, entire specimen, length 6.1 mm (x12); 2b, same, specimen length 6.0 mm, valves I (top), IV and VIII (x22); 2c, same specimen, valve IV, left lateral margin (x75); 2d, *Ischnochiton papillosus*, specimen length 5.8 mm, valve IV (x22); 2e, *Ischnochiton erythronotus*, specimen length 11.9 mm,

valve IV (x11); 2f, *Ischnochiton striolatus*, specimen length 11.8 mm, valve IV (x11); 2g, *I. hartmeyeri*, same specimen as b, girdle scales (x750); 2h, *I. papillosus*, same specimen as d, girdle scales (x750). All specimens from Dry Tortugas.

May 1979 to collect potential lobster prey. A diverse chiton assemblage was revealed, but little time was available to canvas the fauna. I returned again in October 1979 and devoted three full days and parts of two others sampling chitons.

METHODS AND MATERIALS

Seven stations were sampled (Figure 1; Table 1), some during both visits. Most stations were located near Garden Key (Ft. Jefferson) because of accessibility via small boat, but use of the NPS vessel *Activa* allowed visits to the submerged bank at White Shoal and to the only massive beach rock at Dry Tortugas, located on the west side of Loggerhead Key.

Chitons were collected from the intertidal zone to depths of approximately 4 m, but most were from depths of 2 m or less. Specimens usually occurred on undersides of coral rubble or dead gastropod shells (principally *Strombus gigas*); loose bricks near the moat wall at Ft. Jefferson also yielded many specimens.

Living specimens were relaxed and extended on glass slides in

seawater, bound to the slides, and then fixed in a solution of equal parts ethyl alcohol, glycerine and water.

RESULTS

A total of 450 specimens comprising 14 species were collected (Table 2). Coral rubble at the patch reef (Station 1) yielded 24 specimens of 9 species. Only *Acanthochitona* sp. and *Stenoplax purpurascens* were relatively common.

Thirteen species totaling 174 specimens were found at Long Key Reef (Station 2), where the extensive rubble zone provided excellent collecting opportunities. Few chitons occurred above the low tide line, nearly all being found under rocks or shells in depths ranging from several cm to 1 m where temperatures were markedly cooler. Principal species at Long Key Reef were *Ischnochiton erythronotus*, *Calloplax janeirensis*, *I. striolatus*, *Stenoplax floridanus* and *S. purpurascens*.

Station 3, located in an area of heavy wave surge, contained massive submerged rocks and coral heads but few rocks small enough to overturn. Even considering scarcity of rocks suitable for sampling, the

TABLE 1. STATION DATA, DRY TORTUGAS POLYPLACOPHORAN COLLECTING SITES

Station	Location	Depth (m)	Date
1	Patch reef near former site of Bird Key	2.0	5/11, 12/79
2	Long Key Reef	0-1.0	5/11, 12/79 10/3, 6/79
3	Southeast end Bush Key	1.0-3.0	5/13/79
4	Moat near wall, west side Garden Key	1-2.0	5/13, 14/79 10/3/79
5	West side Loggerhead Key	0-1.0	10/2/79
6	White Shoal	3.0-4.0	10/3/79
7	Southwest corner Garden Key	1.5-2.0	10/6/79

fauna appeared reduced as compared to the diverse assemblage at nearby Long Key Reef. *Ischnochiton erythronotus*, the most common species at Long Key Reef and Garden Key, was absent at Station 3.

In the area near the moat wall at Ft. Jefferson (Station 4) 213 specimens of 10 species were found. The same species common at Long Key Reef were common here, but *Acanthochitona hemphilli* and *Ischnochiton papillosus* were also common. Most of the chitons were found on loose bricks. However, situation of bricks in the environment determined the species associated with them. Virtually all *Ischnochiton* and *Stenoplax* species occurred on undersides of bricks slightly buried in surrounding sediments, whereas species of *Lepidochitona*, *Acanthochitona*, *Cryptoconchus* and *Calloplax* occurred among encrusting sponges, bryozoans and algae within piles of bricks. *Acanthochitona hemphilli* was notably common in the latter habitat; more specimens were observed than were collected. No polyplacophorans were found on vertical moat walls.

One hour sampling of the rock beach at Loggerhead Key (Station 5), produced no chitons but four species totaling nine specimens were collected in the nearby rubble zone; all species also occurred at other stations.

Substrate at White Shoal (Station 6) consisted of rubble, principally remnants of staghorn coral (*Acropora cervicornis*). Only one specimen was found during 1 hr of sampling.

Station 7, characterized by scattered bricks and rocks on sand, was surveyed for approximately 45 minutes; it supported an assemblage of four *Ischnochiton* and two *Stenoplax* species, including relatively common *I. hartmeyeri*, a species rare or absent elsewhere.

DISCUSSION

The Dry Tortugas have yielded several important polyplacophoran collections (Kaas, 1972), but the list of species known to occur there has increased slowly. Dall (1889a) mentioned *Ischnochiton* (*Stenoplax*) *limaciformis* Sowerby [probably = *Stenoplax purpurascens* (Kaas (1972))] and *Notoplax* [= *Cryptoconchus floridanus*]. In his catalogue of mollusks from the southeastern United States, Dall (1889b) listed *Acanthochiton astriger* Reeve [= *Acanthochitona spiculosa*] from Dry Tortugas. Pilsbry (1893) reiterated two of Dall's records (as *Acanthochites astriger* and *Acanthochites* (*Cryptoconchus*) *floridanus*) but added no new species to the list. Thiele (1910) reported *Cryptoconchus floridanus*, *Calloplax janeirensis*, *Ischnochiton* [= *Stenoplax*] *floridanus* and *I. erythronotus*, and described *Ischnochiton hartmeyeri* from a single specimen collected at Tortugas. Kaas (1972) listed nine species from Dry Tortugas, including the seven previous plus *Acanthochitona hemphilli* and *A. pygmaea*. Kaas only examined Tortugas specimens of *Acanthochitona hemphilli*, *Calloplax janeirensis* and *Ischnochiton erythronotus*, repeating previous records for the other six species; he credited to Thiele the record for *A. pygmaea*, but I failed to find that record in Thiele (1910).

Table 2. NUMBERS OF POLYPLACOPHORANS COLLECTED AT DRY TORTUGAS STATIONS.¹

Species	1	2	3	4	5	6	7	Total
<i>Lepidochitonidae</i>								
<i>Lepidochitona lineolata</i> (Dall and Simpson, 1901)	1	0/2		0/2				5
<i>Cryptoplacidae</i>								
<i>Acanthochitona hemphilli</i> (Pilsbry, 1893)	1	3/2		8/6				20
<i>Acanthochitona pygmaea</i> (Pilsbry, 1893)			0/4		0/1			5
<i>Acanthochitona sp.</i> (<i>Cryptoconchus floridanus</i>) (Dall, 1889)	6	1/0						7
	2	3/1		4/1				11
<i>Ischnochitonidae</i>								
<i>Ischnochiton papillosus</i> (Pilsbry, 1893)			0/2		1			3
<i>Ischnochiton erythronotus</i> (Gray, 1828)	1	5/13		5/9	1			30
<i>Ischnochiton hartmeyeri</i> (C.B. Adams, 1845)	1	4/99		0/103	1		10	218
<i>Ischnochiton rugulatus</i> (Thiele, 1910)		0/1	1				7	9
<i>Ischnochiton papillosus</i> (C.B. Adams, 1845)				1/11			1	15
<i>Ischnochiton rugulatus</i> (Sowerby, 1832)			1/0					1
<i>Ischnochiton striolatus</i> (Gray, 1828)	2	0/12	1	1/72		1	3	42
<i>Stenoplax floridanus</i> (Pilsbry, 1892)	2	2/10		0/6			1	21
<i>Stenoplax purpurascens</i> (C.B. Adams, 1845)	8	0/9	2	7/16	6		1	59
Total	24	19/155	4	26/187	9	1	25	450

¹ 0/0 = May/October numbers at stations sampled during both months.

Present collections add *Lepidochitona lineolata*, *Calloplax shuttlesworthianus*, *Ischnochiton papillosus*, *I. rugulatus* and *I. striolatus*, and confirm the presence of *Acanthochitona pygmaea*. The species designated *Acanthochitona sp.* is underscribed and is not conspecific with Florida specimens presently called *A. spiculosa* but may be the species previously reported from Dry Tortugas under that name. The list of polyplacophorans known from Dry Tortugas is therefore increased to 14, possibly 15, species.

The classification of Florida and Caribbean Polyplacophora is presently unsettled. For convenience, I follow for the most part that of Kaas (1972), recognizing that his arrangement differs considerably from those of Smith (1960), Keen (1971) and Abbott (1974). I am aware of Ferreira's (1978) paper wherein he synonymized several species in *Stenoplax* and *Ischnochiton*; I retain these separately because I believe both problems require further study. Specimens of *S. purpurascens* were the only *Stenoplax* found at Stations 3 and 5 and were usually more common than *S. floridanus* at other stations. However, Ferreira correctly noted that some specimens are difficult to assign to either species, and identities of some present specimens remain estimates. Small juveniles of *Ischnochiton erythronotus* and *I. striolatus* were difficult to distinguish, but larger specimens differed distinctly. *Ischnochiton erythronotus* was far more common than *I. striolatus* at shallow stations, but *I. striolatus* also occurred at deeper stations where *I. erythronotus* was absent. Specimens of *I. papillosus* did not overlap morphologically with *I. erythronotus* nor with *I. striolatus*. *Ischnochiton papillosus* occurred only at Garden Key stations.

Ecological separation is also suggested among the species of *Acanthochitona*; *A. hemphilli* occurred rarely at reef and patch reef stations but was common on encrusted bricks at Garden Key. Nearly all *A. pygmaea* occurred at the reef, and most *Acanthochitona sp.* occurred at the patch reef.

I agree with Keen (1971) that *Ischnochiton rugulatus* (Sowerby, 1832) seems indistinguishable from *I. boogii* Haddon, 1866; the former name has precedence. Only one 5 mm juvenile was collected.

Thiele's description [translated to English by Kaas (1972)] of his single 5.5 mm specimen of *Ischnochiton hartmeyeri* from Bird Key Reef

is reasonably accurate. Present specimens range in length from 4.8 to 6.7 mm. Small brown spots "in the median parts" mentioned in the original description appear as fine brown lines on all specimens I examined (Figure 2a). Fine but distinct concentric furrows crossed by numerous microscopic radial striae on the anterior valve and posterolateral areas of intermediate valves (Figure 2b, c) distinguish the species from *I. papillosus* and small *I. erythronotus* and *I. striolatus* (Figure 2d-f), all of which it resembles superficially until viewed under magnification. Thiele described about 16 narrow riblets on very small scales from the upper part of the girdle; riblet numbers on present material range from 16-18 (Figure 2g). This character also distinguishes *I. hartmeyer* from the previous three species, all of which possess about 7-9 riblets on considerably larger scales (Figure 2h). Sutural laminae of *I. hartmeyer* are short and sharply attenuated anteriorly (Figure 2b), resembling those of juveniles of some other *Ischnochiton* species. However, the 6.0 mm specimen dissected for illustration carried about 50 large eggs indicating maturity.

Comparisons of small (seldom > 4 mm length) chitons from coastal rubble zones near Tampa Bay, Sarasota Bay, Sanibel Island (all Florida Gulf coast) and Hutchinson Island (Florida central east coast) indicate these to be conspecific with *I. hartmeyer*, so known range of the species is extended northward along both Florida coasts. I have also examined a single valve of this species from the Florida Middle Ground. Rios (1975) listed *I. hartmeyer* from off Alagoas, Brazil, in 36 m depth but did not illustrate specimens. Considering the range otherwise known, that record should be verified.

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