

SCIENTIFIC NOTES

THE REGULAR SEA URCHINS OF TAIWAN¹

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Chang-Po Chen and Kun-Hsiung Chang (1980) The regular sea urchins of Taiwan. *Bull. Inst. Zool., Academia Sinica*, 20(2): 79-86. There were 21 species of regular sea urchins, including 8 new record ones in Taiwan up to present.

In 1948, Hayasaka recorded 13 species of regular sea urchins from Taiwan, namely *Prionocidaris baculosa* (Lamarck), *Diadema setosum* Gray, *Temnopleurus reynauldi* A. Agassiz, *Microcyphus maculatus* A. Agassiz, *Heterocentrotus mamillatus* (Klein), *Heterocentrotus trigonarius* (Lamarck), *Colobocentrotus mertensii* Brandt, *Echinometra methaei* (de Blainville), *Stomopneustes variolaris* (Lamarck), *Strongylocentrotus tuberculatus* Lamarck, *Strongylocentrotus franciscanus* A. Agassiz, *Tripneustes gratilla* (Linnaeus), and *Hippopoe variegata* Leske.

Among them, *M. maculatus* was noted by Mortensen⁽⁶⁾ that it is known with certainty only from Mauritius, other records being based on mistakes in identity or locality. Moreover, the specimen which Hayasaka identified as *M. maculatus* is 'strong worn away', from which the species can not be identified. *M. maculatus* has been deleted from the Taiwan record. *T. reynauldi* and *H. variegata* were junior synonyms of *T. reveesi* and *T. gratilla*, respectively⁽⁶⁾. Both *S. tuberculatus* and *S. franciscanus* were misidentification of *Anthocidaris crassispina* (A. Agassiz)⁽⁶⁾.

Although *H. mamillatus* and *H. trigonarius* were both listed by Hayasaka from Taiwan⁽¹⁾, however, the latter species is considered as the misidentification of *H. mamillatus* due to the

same number of porepairs (10-12) (Rowe, 1980, pers. comm.). The Hayasaka's list in 1948 has remained 9 valid species.

In 1971, Peng and Tiao listed 6 species, namely *Tripneustes gratilla* (Linnaeus), *Echinostrephus aciculatus* (A. Agassiz), *Anthocidaris crassispina* (A. Agassiz), *Pseudoboletia maculata* (Troschel), *Toxopneustes chloracanthus* (Clark) and *Echinometra mathaei* (Blainville)⁽⁹⁾. Among them, *E. aciculatus* is considered as the misidentification of *Stomopneustes variolaris* (Lamarck) and *T. chloracanthus* is a junior synonym of *T. pileolus* (Lamarck)⁽⁶⁾. Recently Utinomi recorded *Temnotrema sculptum* A. Agassiz from the Taiwan Strait⁽¹⁰⁾. This report added nine more species of regular sea urchins and made up a total of 21 species (Table 1). Among them, only *P. baculosa* has not been collected. The following accounts are the brief description of nine newly recorded regular sea urchins collected during this study period.

1. *Eucidaris metularia* (Lamarck) Plate I, 1.

Eucidaris metularia; Mortensen, 1928: 386; Oshima, 1957: 595; Utinomi, 1978: 113; Liao, 1978: 109.

Materials: One from Yie-Liu, Taipei county, 4 meters in depth on August 21, 1980.

Diagnosis: Primary spines cylindrical; apical system almost naked; interporiferous

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TABLE 1.
A list of regular sea urchins of Taiwan.

Cidaridae 頭帕科	冠棘真頭帕海膽
*1. <i>Eucidaris metularia</i> (Lamarck)	環鋸棘頭帕海膽
2. <i>Prionocidaris baculosa</i> (Lamarck)	
Arbaciidae 阿伯科 (暫譯)	三菱刺海膽
*3. <i>Coelopleurus maculatus</i> A. Agassiz & H. L. Clark	
Diadematidae 冠海膽科	粒狀毛冠海膽
*4. <i>Chaetodiadema granulatum</i> Mortensen	刺冠海膽
5. <i>Diadema setosum</i> (Leske)	藍環冠海膽
*6. <i>Diadema savignyi</i> Michelin	環刺棘海膽
7. <i>Echinothrix calamaris</i> (Pallas)	冠刺棘海膽
*8. <i>Echinothrix diadema</i> (Linnaeus)	
Stomopneustidae 口鰓海膽科	口鰓海膽
9. <i>Stomopneustes variolaris</i> (Lamarck)	
Temnopleuridae 刻肋海膽科	角孔海膽
*10. <i>Salmacis bicolor</i> L. Agassiz	芮氏刻肋海膽
11. <i>Temnopleurus reveesi</i> (Gray)	刻孔海膽
12. <i>Temnotrema sculptum</i> A. Agassiz	
Toxopneustidae 毒棘海膽科	斑點毒棘海膽
13. <i>Pseudoboletia maculata</i> Troschel	喇叭毒棘海膽
14. <i>Toxopneustes pileolus</i> (Lamarck)	白棘三列海膽
15. <i>Tripneustes gratilla</i> (Linnaeus)	
Echinometridae 長毒膽科	紫海膽
16. <i>Anthocidaris crassispina</i> (A. Agassiz)	球海膽
17. <i>Colobocentrotus mertensi</i> Brandt	梅氏長海膽
18. <i>Echinometra mathaei</i> (de Blainville)	白尖紫叢海膽
*19. <i>Echinostrephus aciculatus</i> A. Agassiz	紫叢海膽
*20. <i>Echinostrephus molaris</i> (de Blainville)	鉛筆海膽
21. <i>Heterocentrotus mammillatus</i> (Linnaeus)	

*: new record in Taiwan.

zone of ambulacra almost naked; small form.

Locality: Yie-liu (野柳) and Kuei-hou (龜吼), Taipei county; Gi-chi (磯崎), Hua-lien county; Long-mon (龍門), Penghu county.

2. *Coelopleurus maculatus* A. Agassiz & H. L. Clark Plate I, 2, 3, 4

Coelopleurus maculatus; Mortensen, 1935: 631.

Materials: One specimen and several spines collected by Ms. H. L. Hsieh from fish market of An-pin (安平), Tainan on April 7, 1980.

Diagnosis: Primary spines banded with red bands.

3. *Chaetodiadema granulatum* Mortensen Plate II, 1, 2; Figs. 1, 2, 3

Chaetodiadema granulatum; Mortensen, 1940: 218.

Materials: Three specimens from Tung-Kang (東港) fish market by Dr. S. K. Wu on June 6, 1965.

Diagnosis: Blue spots in the naked inter-ambulacral area are isolated, not fromed to blue lines.

4. *Diadema savignyi* Michelin Plate I, 5

Diadema savignyi; Mortensen, 1940: 265; Nishimura and Suzuki, 1971: 158; Utinomi, 1978: 113; Liao, 1978: 111.

Materials: One specimen from Nan-wan at the depth of 2 meters on October 27, 1979.

Diagnosis: No red ring around the anal opening; white spots absent; blue ring on apical

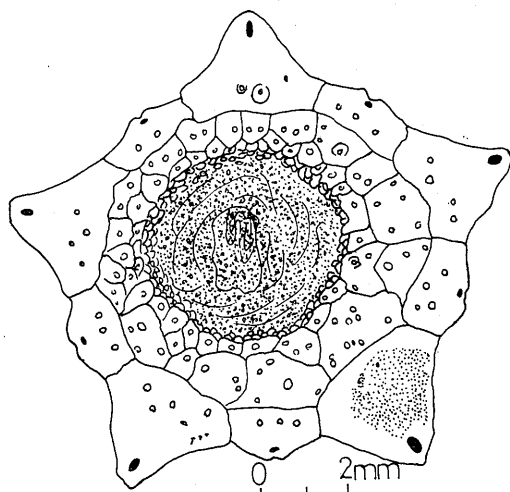


Fig. 1. Apical system of *Chaetodiadema gradulatum*.

system; blue lines on aboral interambulacra.

Locality: Yeh-Liu, Kuei-hou, Gi-chi, Lan-Yu (蘭嶼), Lu Island (綠島), Nan-wan (南灣), Shiao-Liu-Chiu (小琉球), Penghu.

5. *Echinothrix calamaris* (Pallas) Plate II, 5

Echinothrix calamaris; Mortensen, 1940: 285; Oshima, 1957: 589; Utinomi, 1978: 114; Liao, 1978: 111.

Materials: One specimen from Yie-liu, Taipei county on 4 meters in depth on February 23, 1981.

Diagnosis: Aboral ambulacra usually conspicuously raised and with a naked sunken median area; anal tube large, swollen with numerous small, round, thick, white plates; ambulacral tubercles not enlarge at the ambitus.

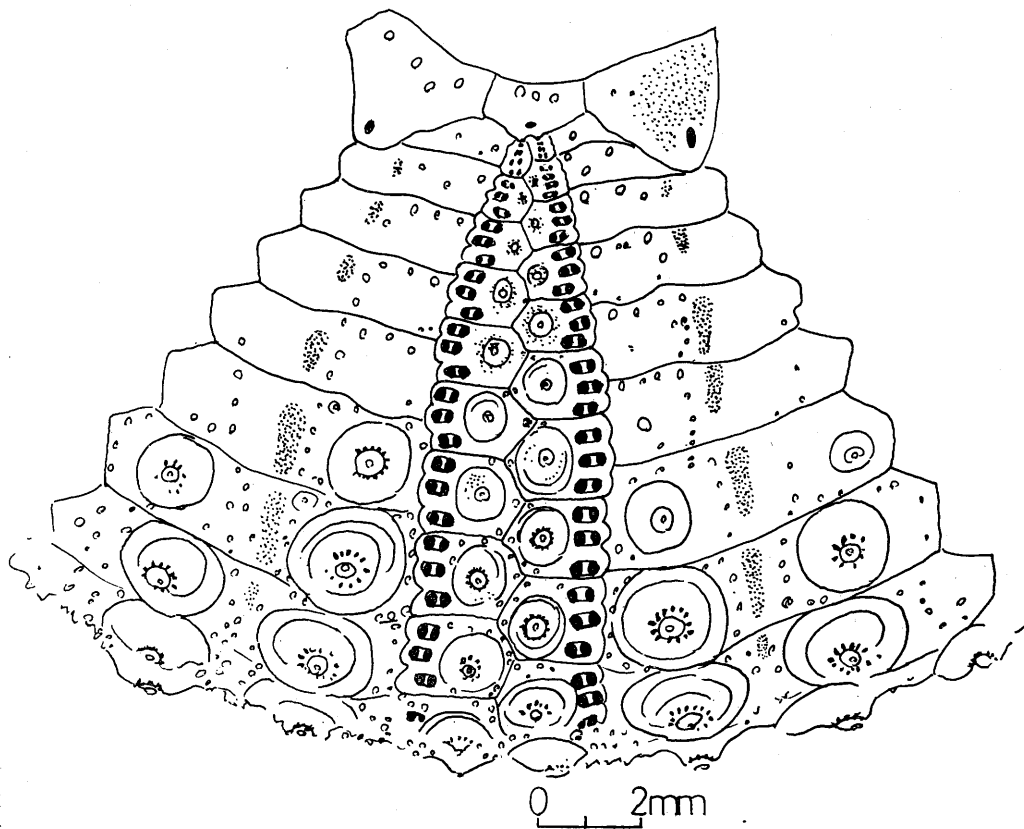


Fig. 2. Aboral test of *Chaetodiadema gradulatum*.

Locality: Yie-liu, Kuei-hou, Gi-chi, Lan-yu, Nan-wang, shiao-liu-chiu, Penghu.

6. *Echinothrix diadema* (Linnaeus) Fig. 4

Echinothrix diadema; Mortensen, 1940: 290; Utinomi, 1978: 113; Liao, 1978: 112.

Materials: One specimen from Nan-wan at the depth of 2 meters on August 19, 1979.

Diagnosis: No naked median area in the interambulacra; anal tube small and without swollen and small rounded white plates; ambulacral tubercles enlarged.

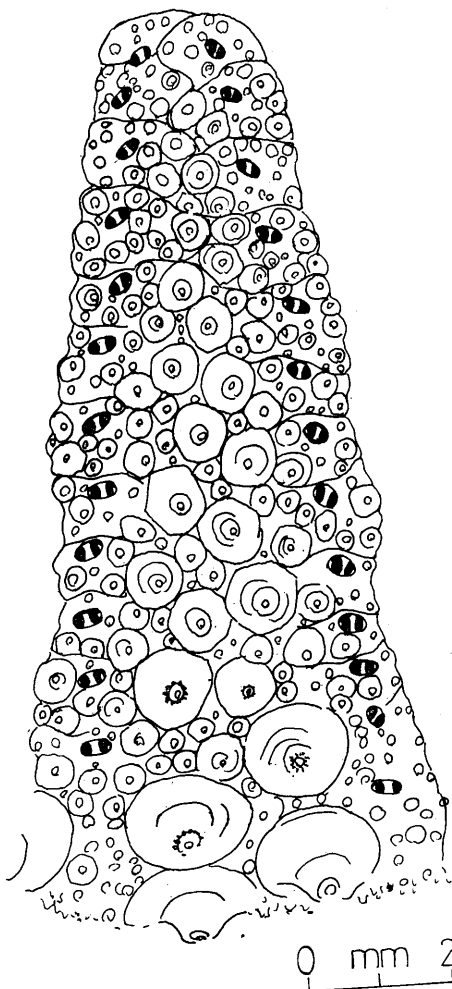


Fig. 3. The oral ambulacrum of *Chaetodiadema granulatum*.

Locality: Yeh-liu, Lu Island, Lan-Yu, Gi-chi, Nan-wang, Shiao-liu-chiu.

7. *Salmacis bicolor* L. Agassiz

Salmacis bicolor; Mortensen, 1943 (III. 2): 112.

Materials: Two specimens from artificial reefs casted at the depth of 20 meters in Penghu, by Mr. C.H. Hwa on December 11, 1978.

Diagnosis: Primary spines banded; base of spines red; two sorts of globiferous pedicellariae; valves of tridentate pedicellaria broad and slightly dentate.

8. *Echinostrephus aciculatus* A. Agassiz

Plate II, 4

Echinostrephus aciculatus; Mortensen, 1943 (III. 3): 306; Nishimura and Suzuki, 1971: 159; Utinomi, 1978: 116.

Non: *Echinostrephus aciculatus*; Peng and Tiao, 1971: 130 (= *Stomopneustes variolaris* (Lamarck)).

Materials: One specimen from San-tiao-giao, Taipei county at the depth of 1 meter on May 31, 1980.

Diagnosis: Ambulacra quadrigeminate except orally; spines white tipped.

Locality: Common in northern Taiwan: San-tiao-giao (三貂角), Yeh-liu and Kuei-hou; one individual observed at Gi-chi.

9. *Echinostrephus molaris* (de Blainville)

Plate I, 6

Echinostrephus molaris; Mortensen, 1943 (III. 3): 306.

Materials: One specimen from Nan-wan at the depth of 2 meters on August 18, 1979.

Diagnosis: Ambulacra entirely trigeminate; spines without white tips; small-sized form.

Locality: Yeh-liu, Kuei-hou, Lu Island Lan Yu, Nan-wan, Shiao-liu-chiu, and Chi-mei (七美) of Penghu.

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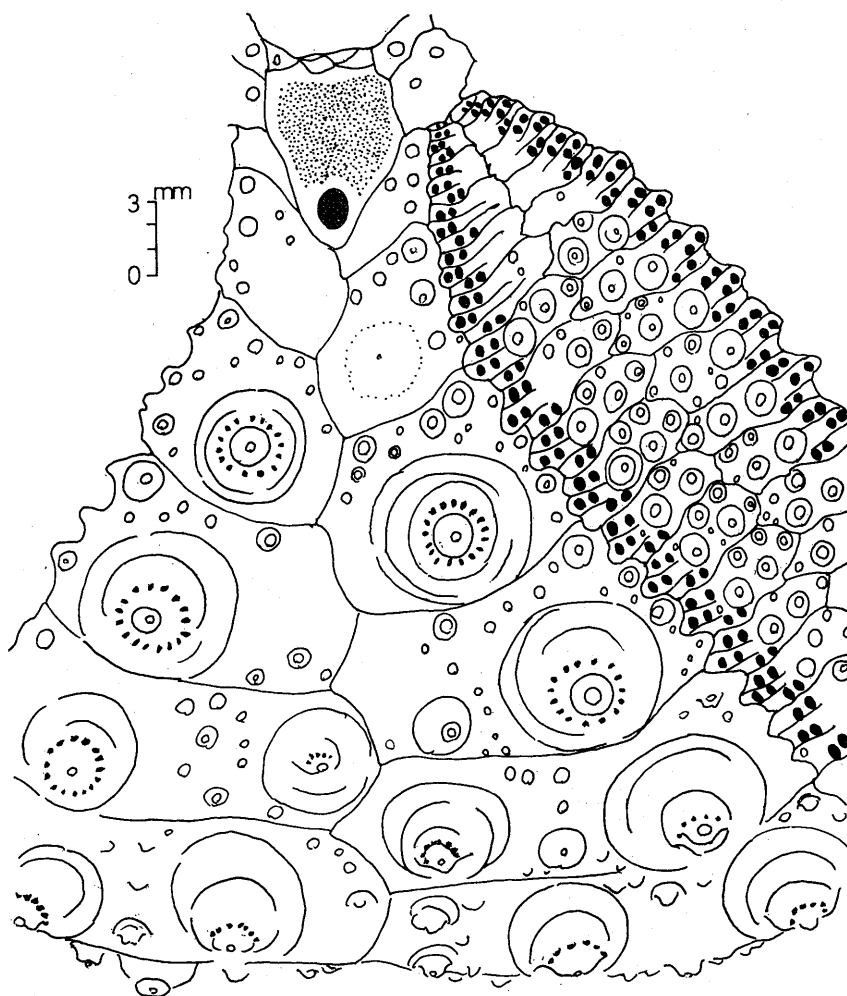


Fig. 4. The oral ambulacrum of *Echinothrix diadema*.

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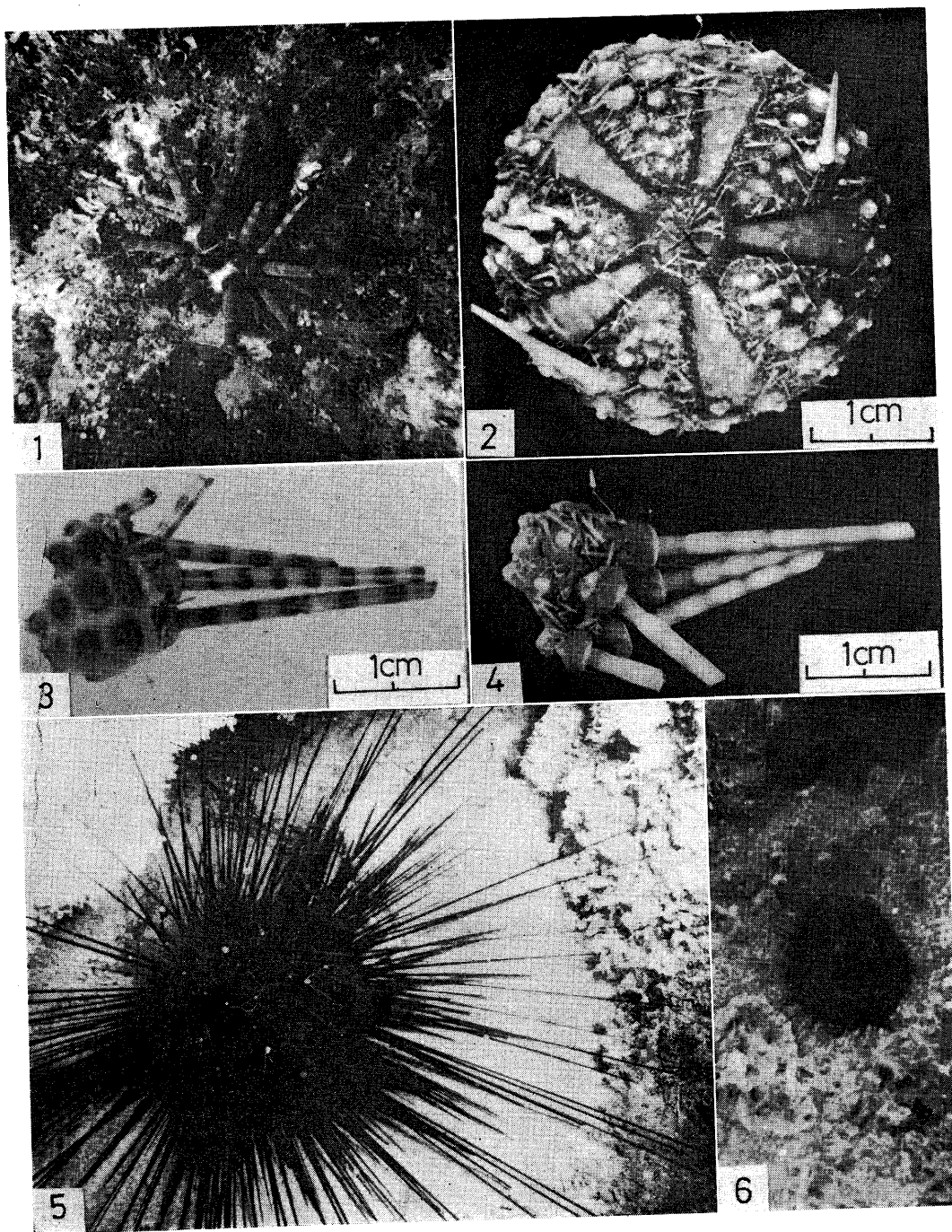


Plate I. (1) *Eucidaris metularia*, (2) aboral test of *Cozlopleurus maculatus*, (3) spines of *C. maculatus*, (4) same as (3), (5) *Diadema savignyi*, (6) *Echinostrephus molaris*.

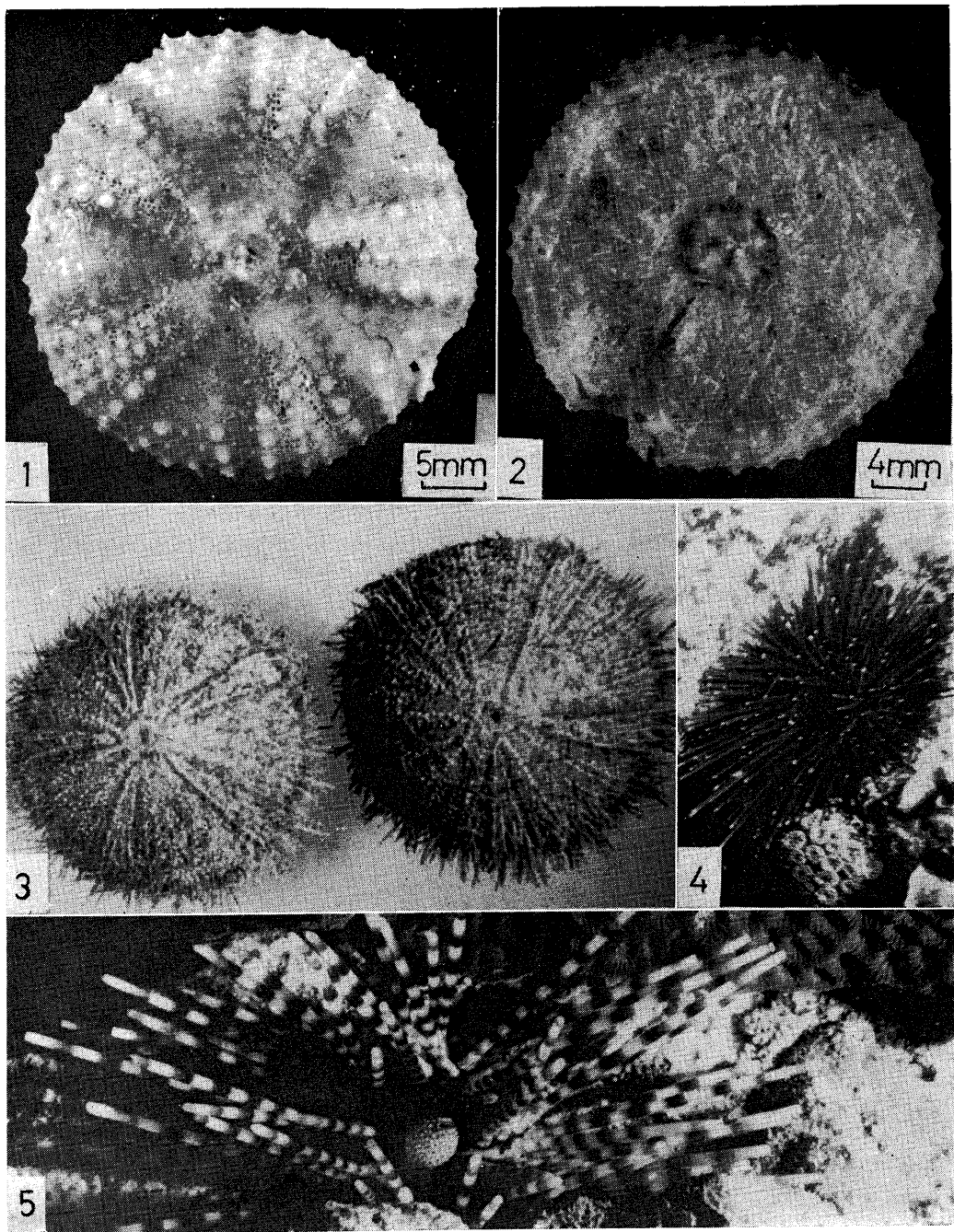


Plate II. (1) aboral test of *Chaetodiadema granulatum*, (2) same as above, oral, (3) *Salmacis bicolor*, (4) *Echinostrephus aciculatus*, (5) *Diadema savignyi*.

臺灣的正型海膽

陳章波 張崑雄

本文綜合整理臺灣產正型海膽，共計 21 種，分屬 7 科，18 屬。並簡述其中 8 種臺灣新紀錄種。