

Shallow-water Marine Shells from the Mouth of Baoli River, Southern Taiwan

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Abstract. A coral reef is at the mouth of the Baoli river, Kenting National Park, southern Taiwan. The river brings nutrients to the coast for the abundant shells that collect at its mouth. From 1993 to 2005, marine shells were collected from the mouth of this river yielding a total of 120 species in 51 families. Forty-six species are new records from the national park. Of these, three species are new records from Taiwan. This paper includes color figures of the 46 species.

Key words: Baoli river, Kenting National Park, Marine shells, Taiwan.

INTRODUCTION

Marine shells from the coast of Kenting National Park, southern Taiwan, were studied by several authors in recent years (Yang 1980, Chang 1985, Chang and Chen 1987, Lee and Chao 2004). Although Lee and Chao (2004) tabulated 470 species in 73 families from the coast of the national park, they concluded that the record is incomplete as no paper focusing on marine shells is available.

Baoli river is one of two large rivers in Kenting National Park. The southern bank of the river mouth is the northern boundary of the park. At the mouth of this river is a coral reef. The river supplies nutrients to the reef habitats nearby, making this area the source of the many marine shells collected over the years.

This paper presents the marine shells collected from this site from 1993 to 2005, and reviews the marine shell fauna from Kenting National Park. We include pictures of the new records from Kenting National Park and from Taiwan.

MATERIALS AND METHODS

From 1993 to 2005, marine shells were

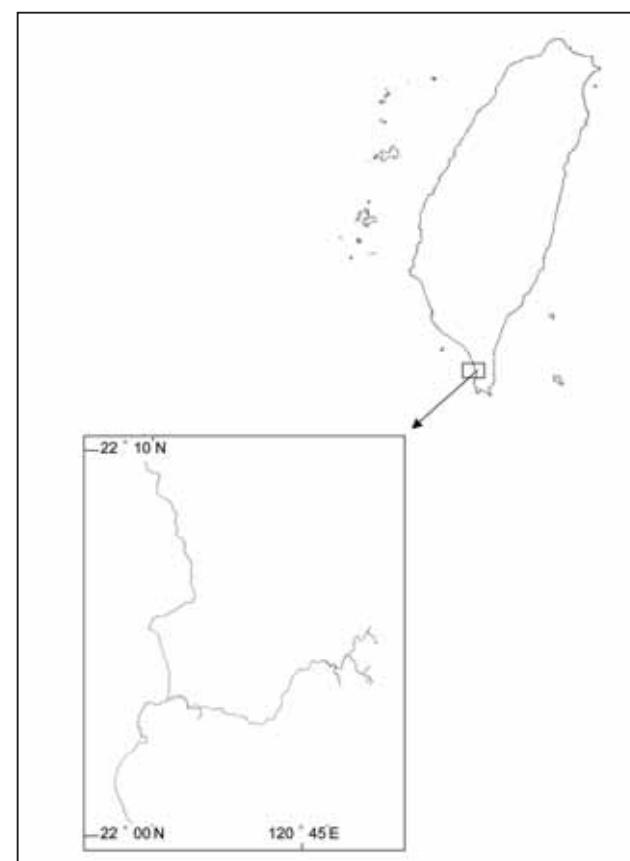
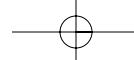


Fig. 1. Map showing the study site.

collected at irregular intervals by snorkeling at the mouth of Baoli river, southern Taiwan (Fig. 1). Shells and living animals were also collected at

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low tide during the day and night. Living animals were frozen before preservation in 75% alcohol. All specimens were deposited in the National Museum of Natural Science (NMNS), Taichung, Taiwan.

Identification of specimens followed Habe (1977, 1989), Abbott and Dance (1998), Lai (1986, 1987, 1990, 1998), Springsteen and Leobrera (1986), Kira (1989), Habe and Ito (1991), Habe and Kosuge (1991), Wilson (1993, 1994), Okutani (1996, 2000), Higo *et al.* (1999, 2001), Lee (2002), and Robin and Martin (2004). The Chinese names of the shells were based primarily on Wu (1999).

RESULTS AND DISCUSSION

A total of 120 species in 51 families of shallow water shells were collected (Table 1). Of these, 46 species are new records from the national park and three (*Liotina* sp., *Manaria* cf. *kuroharai* Azuma, 1960, and *Anadara* sp.) are new from Taiwan (Table 1). Color figures of 74 species are presented in Lee and Chao (2003, 2004), figures of the remaining 46 species are included here (Plate 1, 2).

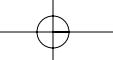
From our own collections and from our review of previous surveys, we concluded that a total of 516 species in 95 families of marine shells are reported from the coral reefs of Kenting National Park. Despite this total, the record of Kenting National Park's shell fauna remains incomplete. This is because the east coast of the park has not yet been surveyed. Systematic collection on the east coast is needed.

ACKNOWLEDGMENTS

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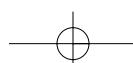


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Table 1. The shallow-water marine shells from the mouth of Baoli river

Taxa	Abundance	Depth (m)
GASTROPODA 腹足綱		
Nacellidae 笠螺科		
<i>Cellana grata</i> (Gould, 1859) 斗笠螺	R	intertidal
<i>Cellana toreuma</i> (Reeve, 1855) 花笠螺	R	intertidal
Trochidae 鐘螺科		
<i>Clanculus margaritarius</i> (Philippi, 1846) 小草莓鐘螺	R	intertidal
<i>Monilea callifera</i> (Lamarck, 1822) 美臍鐘螺	R	intertidal
<i>Stomatella planulata</i> Lamarck, 1816 廣口螺	R	intertidal
<i>Trochus chloromphalus</i> Adams, 1853 綠臍鐘螺	R	intertidal
<i>Trochus maculatus</i> Linnaeus, 1758 花斑鐘螺	R	intertidal
<i>Trochus stellatus</i> Gmelin, 1791 血斑鐘螺	R	intertidal
Turbinidae 蟻螺科		
⁺ <i>Liotina</i> sp.	R	intertidal
<i>Turbo cinerea</i> (Born, 1778) 美珠螺	R	intertidal
<i>Turbo petholatus</i> Linnaeus, 1758 貓眼蠑螺	R	intertidal
<i>Turbo setosus</i> Gmelin, 1791 圓蠑螺	R	intertidal
Neritidae 蟺螺科		
<i>Clithon faba</i> (Sowerby, 1836) 豆石蜋螺	R	intertidal
<i>Nerita albicilla</i> Linnaeus, 1758 漁舟蜋螺	R	intertidal
<i>Nerita chamaeleon</i> Linnaeus, 1758 大圓蜋螺	R	intertidal
<i>Nerita plicata</i> Linnaeus, 1758 白肋蜋螺	R	intertidal
<i>Nerita reticulate</i> Karsten, 1789 紅唇蜋螺	R	intertidal
Septariidae 壁蜋螺科		
<i>Septaria porcellana</i> (Linnaeus, 1758) 壁蜋螺	R	intertidal
Cerithiidae 蟹守螺科		
<i>Cerithium liguensis</i> Melvill & Standen, 1895 太平洋蟹守螺	R	intertidal
<i>Rhinoclavis kochi</i> (Philippi, 1848) 柯氏蟹守螺	R	intertidal
Siliquariidae 蚕蚓螺科		
<i>Siliquaria cumingii</i> (Mörch, 1860) 蚕蚓螺	R	intertidal
Littorinidae 玉黍螺科		
<i>Echininus cumingii spinulosus</i> (Philippi, 1847) 棘玉黍螺	R	intertidal
Strombidae 凤凰螺科		
<i>Strombus aurisdianae</i> Linnaeus, 1758 緋袖凤凰螺	R	-3
<i>Strombus canarium</i> Linnaeus, 1758 水晶凤凰螺	O	-3
<i>Strombus luhuanus</i> Linnaeus, 1758 紅嬌凤凰螺	R	-3
<i>Strombus minimus</i> Linnaeus, 1771 肋肩凤凰螺	R	-3
<i>Strombus microurceus</i> (Kira, 1959) 小花瓶凤凰螺	R	intertidal
Cypraeidae 寶螺科		
<i>Cypraea arabica</i> Linnaeus, 1758 阿拉伯寶螺	A	intertidal
<i>Cypraea argus</i> Linnaeus, 1758 百眼寶螺	R	-3



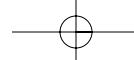


Table 1. Continued

Taxa	Abundance	Depth (m)
Cypraeidae 寶螺科		
<i>Cypraea asellus</i> Linnaeus, 1758 漮標寶螺	R	intertidal
<i>Cypraea bistrinotata</i> Schilder & Schilder, 1937 花珠寶螺	R	-3
<i>Cypraea carneola</i> Linnaeus, 1758 紫口寶螺	A	intertidal
<i>Cypraea depressa</i> Gray, 1824 扁緣寶螺	R	intertidal
<i>Cypraea erosa</i> Linnaeus, 1758 腰斑寶螺	A	intertidal
<i>Cypraea helvolia</i> Linnaeus, 1758 紅花寶螺	A	intertidal
<i>Cypraea lynx</i> Linnaeus, 1758 山貓寶螺	R	intertidal
<i>Cypraea nucleus</i> Linnaeus, 1758 疣唇寶螺	R	intertidal
Naticidae 玉螺科		
<i>Mammilla mammata</i> (Röding, 1798) 褐帶玉螺	R	-10
<i>Natica gualteriana</i> Récluz, 1844 小灰玉螺	R	intertidal
<i>Polinices mammilla</i> (Linnaeus, 1758) 白玉螺	R	intertidal
Bursidae 蛙螺科		
<i>Bursa cruentata</i> (Sowerby, 1841) 血跡蛙螺	R	-3
<i>Bursa granularis</i> (Röding, 1798) 果粒蛙螺	O	intertidal
<i>Tutufa rubeta</i> (Röding, 1798) 金口蛙螺	R	-5
Cassidae 唐冠螺科		
<i>Casmaria erinaceus</i> (Linnaeus, 1758) 小鬚螺	R	-5
Tonnidae 鶡螺科		
<i>Tonna allium</i> (Dillwyn, 1817) 寬溝鶡螺	R	-5
<i>Tonna canaliculata</i> (Linnaeus, 1758) 平凹鶡螺	R	-5
<i>Tonna perdix</i> (Linnaeus, 1758) 鶡螺	R	intertidal
Ranellidae 法螺科		
<i>Cymatium aquatile</i> (Reeve, 1844) 矮毛法螺	R	intertidal
Muricidae 骨螺科		
<i>Chicoreus brunneus</i> (Link, 1807) 黑千手螺	R	intertidal
<i>Cronia margariticola</i> (Broderip, 1833) 條結螺	R	intertidal
<i>Haustellum haustellum</i> Linnaeus, 1758 鶯頭骨螺	R	-20 *
<i>Homalocantha anatomica</i> (Perry, 1811) 銀杏螺	R	-10
<i>Mancinella bufo</i> (Lamarck, 1822) 臺灣岩螺	R	intertidal
<i>Morula anaxeres</i> (Kiener, 1835) 白瘤結螺	R	intertidal
<i>Murex pecten</i> Lightfoot, 1786 維納斯骨螺	R	-20 *
<i>Purpura panama</i> (Röding, 1798) 羅螺	R	intertidal
<i>Thais clavigera</i> (Kuster, 1858) 蚵岩螺	R	intertidal
Coralliophilidae 珊瑚礁科		
<i>Magilus antiquus</i> Montfort, 1810 珊瑚礁螺	R	intertidal
Columbellidae 麥螺科		
<i>Euplica scripta</i> (Lamarck, 1822) 花麥螺	R	intertidal
<i>Pyrene turturina</i> (Lamarck, 1822) 球麥螺	R	-3
Nassariidae 織紋螺科		
<i>Telasco velatus</i> (Gould, 1850) 彈頭織紋螺	R	intertidal
<i>Zeuxis castus</i> (Gould, 1850) 花織紋螺	R	intertidal
Buccinidae 峨螺科		
<i>Babylonia areolata</i> (Link, 1807) 象牙鳳螺	R	-20 *
+ <i>Manaria cf. kuroharai</i> Azuma, 1960 黑原峨螺	R	-100*
<i>Phos senticosus</i> (Linnaeus, 1758) 木賊峨螺	R	-20 *

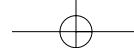
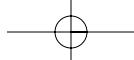


Table 1. Continued

Taxa		Abundance	Depth (m)
Colubrariidae 布紋螺科			
<i>Colubraria cumingii</i> (Dohrn, 1861) 卡明氏布紋螺	R	-3	
Fasciolariidae 旋螺科			
<i>Fusinus colus</i> (Linnaeus, 1758) 紡軸長旋螺	R	-20 *	
Olividae 梅螺科			
<i>Oliva carneola</i> Gmelin, 1791 少女梅螺	A	-20 *	
<i>Oliva mustelina</i> Lamarck, 1811 臺灣梅螺	C	-10	
Mitridae 筆螺科			
<i>Mitra pica</i> (Dillwyn, 1817) 細焰筆螺	R	intertidal	
<i>Neocancilla granatina</i> (Lamarck, 1811) 虛線筆螺	R	-20 *	
Costellariidae 蜂筆螺科			
<i>Vexillum cavea</i> (Reeve, 1844) 染帶蜂筆螺	R	-10	
<i>Vexillum melongena</i> (Lamarck, 1811) 茄色蜂筆螺	R	-10	
Cancellariidae 核螺科			
<i>Cancellaria sinensis</i> Reeve, 1856 中華核螺	R	-20 *	
Conidae 芋螺科			
<i>Conus auricomus</i> Hwass, 1792 金箔芋螺	R	intertidal	
<i>Conus capitaneus</i> Linnaeus, 1758 船長芋螺	R	intertidal	
<i>Conus coffeae</i> Gmelin, 1791 咖啡芋螺	R	intertidal	
<i>Conus coronatus</i> Gmelin, 1791 花冠芋螺	O	intertidal	
<i>Conus monachus</i> Linnaeus, 1758 花瑪瑙芋螺	R	-3	
<i>Conus textile</i> Linnaeus, 1758 織錦芋螺	R	-3	
<i>Conus vexillum</i> Gmelin, 1791 旗幟芋螺	R	-5	
Turridae 捲管螺科			
<i>Lophiotoma leucotropis</i> (A.Adams & Reeve, 1850) 白線捲管螺	R	-20 *	
Terebridae 筒螺科			
<i>Terebra dimidiata</i> (Linnaeus, 1758) 紅筒螺	R	-10	
<i>Terebra</i> sp.	R		
<i>Terebra subulata</i> (Linnaeus, 1767) 黑斑筒螺	R	-10	
Architectonicidae 車輪螺科			
<i>Architectonica trochlearis</i> (Hinds, 1844) 車輪螺	R	-20 *	
Haminoeidae 長葡萄螺科			
<i>Atys noucum</i> (Linnaeus, 1758) 白葡萄螺	R	intertidal	
Bullidae 壶螺科			
<i>Bulla vernicosa</i> Gould, 1859 壶螺	R	-3	
Dentaliidae 象牙貝科			
<i>Dentalium aprinum</i> Linnaeus, 1766 青象牙貝	R	-20 *	
BIVALVIA 雙殼綱			
Arcidae 魁蛤科			
⁺ <i>Anadara</i> sp.	R		
<i>Anadara cf. clathrata</i> (Reeve, 1844)	R		
<i>Barbatia decussata</i> (Sowerby, 1833) 髮魁蛤	A	intertidal	
Mytilidae 賀菜蛤科			
<i>Gregariella coralliphaga</i> (Gmelin, 1791) 珊瑚蛤	R	intertidal	

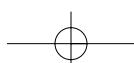


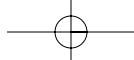
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Table 1. Continued

Taxa		Abundance	Depth (m)
Pteriidae 鴛蛤科			
<i>Pinctada martensii</i> (Dunker, 1873) 馬丁氏珍珠蛤	R		intertidal
Pinnidae 江珧蛤科			
<i>Atrina pectinata</i> Linnaeus, 1767 牛角江珧蛤	R		-10
Spondylidae 海菊蛤科			
<i>Spondylus</i> sp.	R		
Anomiidae 銀蛤科			
<i>Anomia chinensis</i> Philippi, 1849 銀蛤	R		-5
Ostreidae 牡蠣科			
<i>Dendostrea</i> sp.	R		
Lucinidae 滿月蛤科			
<i>Codakia tigerina</i> (Linnaeus, 1758) 滿月蛤	R		intertidal
Lasaeidae 鈕扣蛤科			
<i>Pythina deshayesiana</i> Hinds, 1845 褶紋鈕扣蛤	O		-5
Carditidae 算盤蛤科			
<i>Cardita leana</i> Dunker, 1860 灰算盤蛤	R		-3
Chamidae 偏口蛤科			
<i>Chama limbula</i> Lamarck, 1819 紫緣偏口蛤	R		intertidal
Cardiidae 鳥尾蛤科			
<i>Fragum unedo</i> (Linnaeus, 1758) 草莓鳥尾蛤	R		intertidal
<i>Lyrocardium lyratum</i> (Sowerby, 1841) 斜紋鳥尾蛤	R		-10
<i>Trachycardium flavum</i> (Linnaeus, 1758) 黃邊鳥尾蛤	R		-10
<i>Vasticardium nigropunctatum</i> Habe et Kosuge, 1966 黑斑鳥尾蛤	R		-20 *
<i>Vasticardium transcendens</i> (Melvil & Standen, 1899) 紫點鳥尾蛤	R		-20 *
Psammobiidae 紫雲蛤科			
<i>Hiatula diphos</i> (Linnaeus, 1771) 西施舌	A		intertidal
Glossidae 同心蛤科			
<i>Meiocardia moltkiana</i> (Gmelin, 1791)	R		-20 *
Tellidae 櫻蛤科			
<i>Cyclotellina remies</i> Linnaeus, 1758 滿月櫻蛤	R		-5
Veneridae 簾蛤科			
<i>Callista erycina</i> (Linnaeus, 1758) 女神長文蛤	A		-20 *
<i>Gafrarium dispar</i> (Dillwyn, 1817) 枝條縱簾蛤	R		intertidal
<i>Gafrarium divaricatum</i> (Gmelin, 1791) 歧紋簾蛤	R		intertidal
<i>Lioconcha castrensis</i> (Linnaeus, 1758) 秀峰文蛤	R		-10
<i>Lioconcha</i> sp.	R		
<i>Periglypta reticulate</i> (Linnaeus, 1758) 山水簾蛤	R		-5
<i>Ruditapes philippinarum</i> (Adams & Reeve, 1850) 菲律賓簾蛤	R		-10
<i>Venus toreuma</i> (Gould, 1850) 維納斯簾蛤	R		-10
Gastrochaenidae 開腹蛤科			
<i>Gastrochaena cuneiformis</i> Spenglea, 1783 開腹蛤	R		intertidal
Pholadidae 鷗蛤科			
<i>Jouannetia cumingii</i> (Sowerby, 1849) 鈴蛤	R		intertidal

The symbol A= Abundance, more than 10 specimens collected; C = Common, 7-9 specimens collected; O = Occasional, 4-6 specimens collected; R = Rare, less than 3 specimens collected. "*" represent empty shell collected on shore; "+" represent new record from Taiwan.





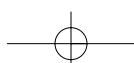
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李淑娟 趙世民

國立自然科學博物館動物學組

保力溪口位於臺灣南端的珊瑚礁區，溪口南岸屬於國家公園範圍，由於溪口帶來豐富的營養鹽及溪口附近多樣的棲地，溪口地區的海生軟體動物相豐富。本文報告在1993年到2005年間不定期於保力溪口南岸所採獲的51科120種水深30公尺以內的海生貝類，其中46種為墾丁海域首次紀錄，3種為臺灣新紀錄種。本報告亦包含此46種新紀錄種的彩色圖片。

關鍵詞：保力溪口，墾丁國家公園，海貝，臺灣。



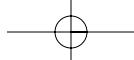
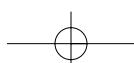
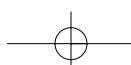
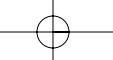


PLATE 1

1. *Monilea callifera* (Lamarck, 1822) 美臍鐘螺 (16 mm)
2. *Rhinoclavis kochi* (Philippi, 1848) 柯氏蟹守螺 (31 mm)
3. *Liotina* sp. (13 mm)
4. *Strombus minimus* Linnaeus, 1771 肋肩鳳凰螺 (32 mm)
5. *Cypraea depressa* Gray, 1824 扁緣寶螺 (40 mm)
6. *Mammilla mammata* (Röding, 1798) 褐帶玉螺 (19 mm)
7. *Polinices mammilla* (Linnaeus, 1758) 白玉螺 (28 mm)
8. *Tonna allium* (Dillwyn, 1817) 寬溝鵝螺 (52 mm)
9. *Haustellum haustellum* Linnaeus, 1758 鶴頭骨螺 (66 mm)
10. *Murex pecten* Lightfoot, 1786 維納斯骨螺 (65 mm)
11. *Mancinella bufo* (Lamarck, 1822) 臺灣岩螺 (48 mm)
12. *Babylonia areolata* (Link, 1807) 象牙鳳螺 (51 mm)
13. *Manaria cf. kuroharai* Azuma, 1960 黑原峨螺 (27 mm)
14. *Phos senticosus* (Linnaeus, 1758) 木賊峨螺 (22 mm)
15. *Fusinus colus* (Linnaeus, 1758) 紡軸長旋螺 (121 mm)
16. *Oliva carneola* Gmelin, 1791 少女榧螺 (18 mm)
17. *Oliva mustelina* Lamarck, 1811 臺灣榧螺 (35 mm)
18. *Mitra pica* (Dillwyn, 1817) 細焰筆螺 (36 mm)
19. *Neocancilla granatina* (Lamarck, 1811) 虛線筆螺 (30 mm)
20. *Vexillum cavea* (Reeve, 1844) 染帶蛹筆螺 (18 mm)
21. *Vexillum melongena* (Lamarck, 1811) 茄色蛹筆螺 (44 mm)
22. *Cancellaria sinensis* Reeve, 1856 中華核螺 (19 mm)
23. *Conus auricomus* Hwass, 1792 金箔芋螺 (27 mm)
24. *Lophiotoma leucotropis* (A.Adams & Reeve, 1850) 白線捲管螺 (34 mm)
25. *Terebra* sp. (40 mm)
26. *Architectonica trochlearis* (Hinds, 1844) 車輪螺 (25 mm)
27. *Atys noucum* (Linnaeus, 1758) 白葡萄螺 (23 mm)
28. *Dentalium aprinum* Linnaeus, 1766 青象牙貝 (84 mm)







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PLATE 2

29. *Anadara* sp. (23 mm)
30. *Anadara* cf. *clathrata* (Reeve, 1844) (48 mm)
31. *Gregariella coralliphaga* (Gmelin, 1791) 珊瑚蛤 (8 mm)
32. *Spondylus* sp. (80 mm)
33. *Anomia chinensis* Philippi, 1849 銀蛤 (33 mm)
34. *Dendostrea* sp. (31mm)
35. *Pythina deshayesiana* Hinds, 1845 褶紋鈕扣蛤 (8.5 mm)
36. *Fragum unedo* (Linnaeus, 1758) 草莓鳥尾蛤 (39 mm)
37. *Lyrocardium lyratum* (Sowerby, 1841) 斜紋鳥尾蛤 (42 mm)
38. *Vasticardium transcendens* (Melvil & Standen, 1899) 紫點鳥尾蛤 (18 mm)
39. *Meiocardia moltkiana* (Gmelin, 1791) 縹羊角同心蛤 (35 mm)
40. *Callista erycina* (Linnaeus, 1758) 女神長文蛤 (42 mm)
41. *Gafrarium divaricatum* (Gmelin, 1791) 歧紋簾蛤 (12 mm)
42. *Lioconcha castrensis* (Linnaeus, 1758) 秀峰文蛤 (50mm)
43. *Lioconcha* sp. (25mm)
44. *Venus toreuma* (Gould, 1850) 維納斯簾蛤 (29 mm)
45. *Gastrochaena cuneiformis* Spenglea, 1783 開腹蛤 (39 mm)
46. *Jouannetia cumingii* (Sowerby, 1849) 鈴蛤 (21 mm)

