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AN ILLUSTRATED CHECKLIST OF BIVALVES
FROM PMBC BEACH WITH A REEF-FLAT
AT BHUKET, THAILAND

by

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AN ILLUSTRATED CHECKLIST OF BIVALVES FROM PMBC BEACH WITH A REEF-FLAT AT PHUKET, THAILAND

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ABSTRACT

Ninety-one species of bivalves from the sandy beach with shale patches and from the reef-flat in front of the Phuket Marine Biological Center, Phuket, Thailand, are pictured and listed with notes on habitats.

I. INTRODUCTION

During a stay as a consultant to DANIDA (Danish Foreign Ministry) at the Phuket Marine Biological Center, Phuket, Thailand, the author collected bivalves from the sandy beach and the reef-flat in front of the Center. With few exceptions only living specimens were collected and in most cases only the shells were kept. A few additional specimens were kindly lent to me by Prof. R.D. Parchon (Department of Zoology, Chelsea College, University of London) who visited Phuket in 1972, and by Dr. Claus Heinberg (Institute for Historical Geology and Paleontology, University of Copenhagen) who visited Phuket in 1974.

The material (in most cases only two specimens of each species) was brought to Chelsea College, where tentative identifications were made by Prof. Parchon, and then to British Museum (Natural History) where Mrs. Solene Whybrow spared no effort to make final identifications based on the extensive collections and the available literature. Dr. Mary E. Rice, Smithsonian Institution, Washington, D.C., identified the sipunculid. I wish to express my sincere thanks for all this help.

The list of species given below is probably not complete, although a thorough coverage has been attempted.

Taxonomic revisions have not been carried out, but it is hoped that the names chosen can be used safely until more detailed studies have been undertaken. Especially the families Plicatulidae, Ostreidae and Chamidae are badly in need of revision.

An almost complete collection of the species mentioned below is deposited at Phuket Marine Biological Center and the rest of the material is kept at the British Museum (Natural History), London.

II. THE LOCALITY

The Phuket Marine Biological Center is situated at the small peninsula, Laem Pan Wa, about 10 km. south of Phuket Town on the south-east side of Phuket Island. The beach of the center faces west and the bay in front of the beach is just at the edge of the Malacca Strait; the west coast of Phuket Island faces the Andaman Sea.

The beach is a few metres wide and consists of rather coarse sand with patches of shale (phyllite); at the southern end there is an extensive pavement of shale fragments; plane areas of fine sand with some mud are found between the more steep beach and the innermost corals. The reef-flat has a maximum width of about 200 metres; its inner parts are dominated by the large flat colonies of Porites, while the outer parts have a diverse fauna of corals with many types of Acropora. A pier crosses the reef-flat, and its concrete base as well as some large shale promotions are dominated by various oysters.

III. THE BIVALVES

In the following check-list remarks are given on the habitat of the species.
Most of the borrowing species were found in coarse sand in crevices in the shale or between loose shale blocks, but a few were only found in the sand of the reef-flat. Further collecting may well reveal that more of these species occur in both areas. Three species, viz. Donax faba, Atactodea glabrata and Caecella transversalis, seem however to be restricted to the coarse sand of the upper part of the tidal zone of the beach. Several species were found attached to or bored into Porites; they may also occur on or in other of the more massive corals. The two species of Pinctada were distinguished on basis of prodssooch measurements (see Ranson, G. 1961. Les espèces d’huitres perlières du genre Pinctada. Mém. Inst. r. Sci. nat. Belg., 2. ser., 67: 1-95, pls. 1-42).

In the plates the outside of the left valve is illustrated (or in some cases both valves seen from the left side) when nothing else is noted.

CHECKLIST OF BIVALVES FROM PMBC BEACH

Subclass CRYPTODONTA

Order SOLEMYOIDA

Superfamily SOLEMYACEA

Family SOLEMYIDAE

Acharax japonica (Dunker, 1883) (Fig. 5). Reef-flat, in muddy sand between corals. Ph. 203/2*

Subclass PTERIOMORPHIA

Order ARCOIDA

Superfamily ARCAEAE

Family ARCIDAE

Arca avellana Lamarck, 1819 (Fig. 6). In crevices in shale, byssate. Ph. 169/2
Ar. ventricosa Lamarck, 1819 (Fig. 1). In holes in shale and Porites, byssate. Ph. 204/2
Barbatia fusca (Bruguière, 1789) (Fig. 2). On the lower surface of Porites, byssate. Ph. 171/2
B. helblingi Bruguière, 1789 (Fig. 4). On the lower surface and in crevices of Porites, byssate. Ph 205/2
? B. yamamotoi Sakurai & Habe, 1961 (Fig. 3). On the lower surface of Porites, byssate. Ph. 206/2

Family NOETIIDAE

Striarca afra (Gmelin, 1791) (Fig. 7). On the lower surface of Porites, byssate. Ph. 207/2

* Phuket Marine Biological Center reference collection numbers.
Order MYTILOIDA

Superfamily MYTILACEA

Family MYTILIDAE

*Septifer bilocularis* (Linnaeus, 1758) (Fig. 8). Reef-flat, byssate. Ph. 78/4

*Gregariella coralliophaga* (Gmelin, 1791) (= *Botula c.* ) (Fig. 9). Boring in *Porites*, byssate. Ph. 257/1

*G. striatula* (Hanley, 1844) (Fig. 11). Reef-flat, byssate. Ph. 208/2

*Lithophaga malaccana* (Reeve, 1858) (Fig. 10). Boring in *Porites*, byssate. Ph. 173/2

*L. nasuta* (Philippi, 1846) (Fig. 13). Boring in *Porites* and shale, byssate. Ph. 172/2

*L. teres* (Philippi, 1846) (Fig. 12). Boring in *Porites*, byssate. Ph. 174/2

*Modiolus flavidus* (Dunker, 1856) (Fig. 18). Reef-flat, byssate. Ph. 176/2

*M. plumescens* (Dunker, 1868) (Fig. 15). Reef-flat, byssate. Ph. 209/2

*Botula cinnamomea* (Lamarck, 1819) (Fig. 16). Boring in *Porites*, byssate. Ph. 175/2

Superfamily PINNACEA

Family PINNIDAE

*Pinna bicolor* Gmelin, 1791 (Fig. 14). In sand between shale fragments, byssate. Ph. 92/3

*Atrina vexillum* (Born, 1778) (Fig. 17). In sand between shale fragments, byssate. Ph. 94/3

Order PTEROIDA

Superfamily PTERIACEA

Family PTERIIDAE

*Pinctada chemnitzii* (Philippi, 1849) (Fig. 20). On *Porites*, byssate.†

*P. radiata* (Leach, 1814) (Fig. 19). On *Porites*, byssate. Ph. 201/2

Family ISOGNOMONIDAE

*Isognomon ephippium* (Linnaeus, 1758) (Fig. 24). In crevices in shale, byssate. Ph. 85/3

*I. isognomon* (Linnaeus, 1758) (Fig. 22). Reef-flat, byssate. Ph. 84/4

*I. legumen* (Gmelin, 1791) (Fig. 26). Reef-flat, byssate. Ph. 211/2

*I. perna* (Linnaeus, 1767) (Fig. 21). On the lower surface of shale fragments in coarse sand, byssate. Ph. 179/2

Family MALLEIDAE

*Malleus malleus* (Linnaeus, 1758) (Fig. 23). Reef-flat, byssate. Ph. 83/1

*M. regula* (Forskal, 1775) (Fig. 25). Reef-flat, byssate. Ph. 212/1

† Not registered in PMBC reference collection.
Superfamily **PECTINACEA**

Family **PECTINIDAE**

*Chlamys albolineata* (Sowerby, 1825) (Fig. 27). On corals, byssate. Ph. 213/2

*Pedum spondyloideum* (Gmelin, 1791) (Fig. 28). Outer region of reef-flat on *Porites*, byssate. Ph. 214/2

Family **PLICATULIDAE**

*Plicatula australis* Lamarck, 1819 (Fig. 31). Cemented on lower surface of shale fragments in coarse sand. Ph. 215/2

*P. imbricata* Menke, 1843 (Fig. 32). On a dead branch of *Acropora*. Ph. 216/2

*P. sp.* (Fig. 33). Cemented on the lower surface of shale fragments in coarse sand. Ph. 217/1

Family **SPONDYLIDAE**

*Spondylus ducalis* Röding, 1798 (Fig. 29). Cemented on the lower surface of *Porites*. Ph. 218/2

*S. hystrix* Röding, 1798 (Fig. 30). Cemented on the lower surface of *Porites*. Ph. 219/2

Superfamily **LIMACEA**

Family **LIMIDAE**

*Lima lima* (Linnaeus, 1767) (Fig. 35). On *Porites*, byssate. Ph. 258/1

*L. cfr. orientalis* Adams & Reeve, 1850 (Fig. 38). On *Porites*, byssate. Ph. 220/1

*L. sp.* (Fig. 34). On *Porites*, byssate, nest building. Ph. 221/1

*Ctenoides annulatus* (Lamarck, 1819) (Fig. 37). On *Porites*, byssate. Ph. 186/2

Suprafamily **OSTREACEA**

Family **GRYPHAEIIDAE**

*Hyotissa hyotis* (Linnaeus, 1758) (Fig. 40). Cemented on shale. Ph. 99/3

Family **OSTREIDAE**

*Ostrea* sp. A (Fig. 39). Cemented on the lower surface of shale blocks. Ph. 222/2

*O. sp. B* (Fig. 45). Cemented on the lower surface of shale blocks. Ph. 223/1

*Lopha cristagalli* (Linnaeus, 1758) (Fig. 43). Cemented on corals and *Malleus vulgaris*. Ph. 189/2

*Alectryonella plicatula* (Gmelin, 1791) (Fig. 36). Cemented on the lower surface of shale blocks. Ph. 188/2

*Saccostrea cucullata* (Born, 1778) (Fig. 41). Cemented on shale and concrete. Ph. 224/2

*S. echinata* (Quoy & Gaimard, 1835) (Fig. 42). Cemented on shale and concrete. Ph. 225/2
Subclass **HETERODONTA**

Order **VENEROIDA**

Superfamily **LUCINACEA**

Family **LUCINIDAE**

*Codakia tigerina* (Linnaeus, 1758) (Fig. 46). In coarse sand between shale blocks. Ph. 226/2

*Epicodakia divergens* (Philippi, 1850) (Fig. 44). In coarse sand between shale blocks. Ph. 195/2

*Anodonta cfr. edentula* (Linnaeus, 1767) (Fig. 47). In sand between corals. Ph. 227/1

Family **UNGULINIDAE**

*Diplodonta* sp. (Fig. 48). On coarse sand between shale blocks. Ph. 228/1

Superfamily **CHAMACEA**

Family **CHAMIDAE**

*Chama asperella* Lamarck, 1819 (Fig. 50). Cemented on corals. Ph. 229/2

*C. aspera* Reeve, 1846 (Fig. 51). Cemented on the lower surface of shale fragments in coarse sand. Ph. 230/2

*C. brassica* Reeve, 1847 (Fig. 52). Cemented on corals†

*C. multisquamosa* Reeve, 1846 (Fig. 53). Cemented on corals. Ph. 231/2

*C. pacifica* Broderip, 1834 (Fig. 49). Cemented on the lower surface of *Porites*. Ph. 185/2

*C. reflexa* Reeve, 1846 (Fig. 54). Cemented on the lower surface of *Porites*. Ph. 232/1

Superfamily **LEPTONACEA**

Family **LEPTONIDAE**

*Mysella* sp. (Fig. 55). Reef-flat, attached to the sipunculid *Siphonosoma cumanense* (Keferstein) from coarse sand. Ph. 233/1

Family **GALEOMMATIDAE**

About 20 species which will be treated separately.

Superfamily **CARDITACEA**

Family **CARDITIDAE**

*Cardita variegata* Bruguière, 1792 (Fig. 60). — — ? Ph. 82/3
Superfamily CARDIACEA

Family CARDIIDAE

*Trachycardium flavum* (Linnaeus, 1758) (Fig. 56). In coarse sand. Ph. 103/3

*Fragum carinatum* (Lynge, 1909) (Fig. 58). Reef-flat, in coarse sand. Ph. 234/2

*F. unedo* (Linnaeus, 1758) (Fig. 57). Reef-flat, in coarse sand. Ph. 105/3

*Corculum cardissa* (Linnaeus, 1758) (Fig. 61). Reef-flat, on muddy sand. Ph. 104/1

Superfamily TRIDACNACEA

Family TRIDACNIDAE

*Tridacna crocea* Lamarck, 1819 (Fig. 59). Embedded in *Porites*, byssate. Ph. 235/2

Superfamily MACTRACEA

Family MACTRIDAE

*Mactra angulisfera* Deshayes, 1854 (Fig. 62). Reef-flat, in sand between corals. Ph. 236/2

Family MESODESMATIDAE

*Atactodea glabrata* (Gmelin, 1791) (Fig. 63). Uppermost part of the tidal zone, in coarse sand. Ph. 113/3

*Caecella transversalis* Deshayes, 1854 (Fig. 64). Uppermost part of the tidal zone, in coarse sand. Ph. 237/2

Superfamily TELLINACEA

Family TELLINIDAE

*Tellina* (*Cyclotellina*) *remics* Linnaeus, 1758 (Fig. 66). In coarse sand between shale blocks. Ph. 116/3

? *T. (Fabulina) minuta* Lischke, 1874 (Fig. 65). Reef-flat, in sand. Ph. 238/1

*T. (Scutarcopagia) scobinata* Linnaeus, 1758 (Fig. 73). In coarse sand between shale blocks. Ph. 239/1

*T. (Tellinella) staurella* Lamarck, 1818 (Fig. 67). In coarse sand between shale blocks. Ph. 197/2

*T. (Quidnippagus) palatum* (Iredale, 1929) (Fig. 72). Many empty shells in coarse sand between shale blocks. Ph. 240/2

*Macoma* (*Scissulina*) *dispar* (Conrad, 1837) (Fig. 69). In coarse sand between shale blocks. Ph. 241/1

Family DONACIDAE

*Donax faba* Gmelin, 1791 (Fig. 71). Uppermost part of the tidal zone, in coarse sand. Ph. 242/2

Family PSAMMOBIIDAE

*Asaphis dichotoma* (Anton, 1838) (Fig. 68). In coarse sand between shale blocks. Ph. 114/3

Family SEMELIDAE

*Semele carnicolor* (Hanley, 1844) (Fig. 70). In coarse sand between shale blocks. Ph. 243/2
Superfamily **ARCTICACEA**

Family **TRAPEZIIDAE**

*Trapezium angulatum* (Lamarck, 1819) (Fig. 74). On the lower surface of *Porites*, byssate. Ph. 101/1

*? Leptomya spectabilis* Deshayes, 1882 (Fig. 82). Reef-flat, in muddy sand. Ph. 244/2

Superfamily **VENERACEA**

Family **VENERIDAE**

*Periglypta puerpera* (Linnaeus, 1758) (Fig. 75). In coarse sand between shale blocks. Ph. 245/2

*? Callista pilshyri* Habe, 1960 (Fig. 77). Reef-flat, in muddy sand. Ph. 246/1

*Gafarium dispar* (Dillwyn, 1817) (Fig. 79). In coarse sand between shale blocks. Ph. 109/4

*G. divaricatum* (Gmelin, 1791) (Fig. 78). In coarse sand between shale blocks. Ph. 110/4

*G. pectinatum* (Linnaeus, 1758) (Fig. 76). In coarse sand between shale blocks. Ph. 256/2

*G. tumidum* Röding, 1798 (Fig. 81). In coarse sand between shale blocks. Ph. 108/4

*Tapes literatus* (Linnaeus, 1767) (Fig. 84). Reef-flat, in coarse sand. Ph. 121/5

*T. philippinarum* (Adams & Reeve, 1850) (Fig. 83). In coarse sand between shale blocks. Ph. 247/1

*Irus irus* (Linnaeus, 1758) (Fig. 80). In holes in shale, byssate. Ph. 248/2

Family **PETRICOLIDAE**

*Petricola lapicida* (Gmelin, 1791) (Fig. 89). Boring in *Porites*, byssate. Ph. 249/2

*P. (Claudiconcha) monstrosa* (Gmelin, 1791) (Fig. 87). Boring in shale. Ph. 250/1

Order **MYOIDA**

Superfamily **MYACEA**

Family **CORBULIDAE**

*Corbula archaiformis* Lyne, 1909 (Fig. 91). On the lower surface of *Porites*, byssate. Ph. 251/1

*C. crassa* Hinds, 1843 (Fig. 90). In coarse sand between shale blocks, byssate. Ph. 252/2

*C. modesta* Hinds, 1843 (Fig. 85). In coarse sand between shale blocks, byssate. Ph. 253/2

Superfamily **GASTROCHAENACEA**

Family **GASTROCHAENIDAE**

*Gastrochaena cuneiformis* Spengler, 1783 (Fig. 88). Boring in *Porites*. Ph. 254/2

Superfamily **PHOLADACEA**

Family **PHOLADIDAE**

*Jouannetia globulosa* (Quoy & Gaimard, 1835) (Fig. 86). Boring in *Porites*. Ph. 255/2

(Manuscript received August 14, 1976)
Fig. 1. *Arca ventricosa* (a. dorsal view). Fig. 2. *Barbatia fusca*. Fig. 3. ?*Barbatia yamamotoi*. Fig. 4. *Barbatia helblingi*. Fig. 5. *Acharax japonica*. Fig. 6. *Arca avellana*. Fig. 7. *Stiara ca astra*. 
Fig. 8, *Septifer bilocularis*. Fig. 9, *Gregariella coralliphaga*. Fig. 10, *Lithophaga malaccana*. Fig. 11, *Gregariella striatula*. Fig. 12, *Lithophaga teres*. Fig. 13, *Lithophaga nasuta*. 
Fig. 14, Pinna bicolor. Fig. 15, Modiolus plumescens. Fig. 16, Botula cinnamomea. Fig. 17, Atrina vexillum. Fig. 18, Modiolus flavidus.
Fig. 19. *Pinctada radiata* (a. inside of right valve). Fig. 20, *Pinctada chemnitz* (a. inside of right valve). Fig. 21, *Isognomon perna* (a. inside of right valve).
Fig. 22, *Isognomon isognomum* (a. inside of right valve). Fig. 23, *Malleus malleus*. Fig. 24, *Isognomon ephippium* (a. inside of right valve). Fig. 25, *Malleus regula* (a. inside of right valve).
Fig. 26, *Isognomon legumen* (a. inside of right valve). Fig. 27, *Chlamys albolineata*. Fig. 28, *Pedum spondyloideum* (a. inside of right valve). Fig. 29, *Spondylus ducalis* (a. inside of right valve). Fig. 30, *Spondylus hystrix* (a. inside of right valve).
Fig. 31, *Plicatula australis* (a. inside of right valve; b. inside of left valve). Fig. 32, *Plicatula imbricata* (a. ventral view; b. inside of left valve). Fig. 33, *Plicatula* sp. (a. ventral view; b. inside of left valve).
Fig. 34, *Lima* sp. Fig. 35, *Lima* lima. Fig. 36, *Alectryonella plicatula* (a. inside of left valve). Fig. 37, *Ctenoides annulatus*. Fig. 38, *Lima* cfr. *orientalis*. Fig. 39, *Ostrea* sp. A (a. inside of left valve; b. ventral view).
Fig. 40, *Hyotissa hyotis* (a. ventral view). Fig. 41, *Saccostrea cucullata* (a. ventral view).
Fig. 42, *Saccostrea echinata*. Fig. 43, *Lopha crista-galli* (a. posterior view). Fig. 44, *Epicodakia divergens*. Fig. 45, *Ostrea* sp.B. Fig. 46, *Codakia tigerina*. Fig. 47, *Anodontia cfr. edentula*. Fig. 48, *Diplodonta* sp.
Fig. 49. *Chama pacifica* (a. ventral view; b. seen from above; c. inside of right valve). Fig. 50. *Chama asperella* (a. ventral view; b. seen from above; c. inside of right valve).
Fig. 51, *Chama aspera* (a. seen from above; b. inside of right valve; c. ventral view). Fig. 52, *Chama brassica* (a. seen from above; b. inside of right valve). Fig. 53, *Chama multisquamosa* (a. seen from above; b. inside of right valve; c. ventral view). Fig. 54, *Chama reflexa* (a. seen from above; b. inside of right valve; c. ventral view).
Fig. 55, *Mysella* sp. Fig. 56, *Trachycardium flavum*. Fig. 57, *Fragum unedo*. Fig. 58, *Fragum carinatum*. Fig. 59, *Tridacna crocea*. Fig. 60, *Cardita variegata*. 
Fig. 61, Corculum cardioides (a. posterior view). Fig. 62, Mactra angulifera. Fig. 63, Atractoides glabrata. Fig. 64, Caecella transversalis. Fig. 65, ? Tellina minuta. Fig. 66, Tellina remies.
Fig. 67, Tellina staurella. Fig. 68, Asaphis dichotoma. Fig. 69, Macoma dispar. Fig. 70, Semele carnicolor. Fig. 71, Donax faba. Fig. 72, Tellina palatum. Fig. 73, Tellina scobinata. Fig. 74, Trapezium angulatum.
Fig. 75, *Periglypta puerpera*. Fig. 76, *Gastrarium pectinatum*. Fig. 77, *Callista pilshryi*. Fig. 78, *Gastrarium divaricatum*. Fig. 79, *Gastrarium dispar*. Fig. 80, *Irus irus*. Fig. 81, *Gastrarium tumidum*. Fig. 82, *Leptomya spectabilis*. 
Fig. 83, Tapes philippinarum. Fig. 84, Tapes literatus. Fig. 85, Corbula modesta. Fig. 86, Jouannetia globulosa. Fig. 87, Petricola monstrosa. Fig. 88, Gastrochaena cuneiformis. Fig. 89, Petricola lapicida. Fig. 90, Corbula crassa. Fig. 91, Corbula archaeiformis.