Fossil Crustacea of the Late Pleistocene Port Morant Formation, west Port Morant Harbour, southeastern Jamaica

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The Late Pleistocene Port Morant Formation of southeast Jamaica is particularly rich in fossil marine crustaceans. A new locality on the west side of Port Morant Harbour, parish of St. Thomas, has yielded decapods including the callianassids *Lepidophthalmus jamaicense*? (Schmitt), *Neocallichirus peraensis* Collins *et al*. and *Neocallichirus*? sp.; anomurans *Petrochirus bahamensis* (Herbst) and *Paguristes* sp. cf. *P. lymanni* A. Milne-Edwards & Bouvier; and brachyurans *Hepatus praecox* Collins *et al*., *Persephona* sp., *Mithrax acuticornis* Stimpson, *Mithrax verrucosus* H. Milne Edwards, *Mithraculus forceps* A. Milne-Edwards, aff. *Hyas* sp., *Portunus vocans* (A. Milne-Edwards), *Achelous sebae* (H. Milne Edwards), *Actaea* sp. cf. *A. bifrons* Rathbun, *Actaea acantha* (H. Milne Edwards), *Micropanope* sp. aff. *M. truncatiformis* Rathbun and *Carpilius corallinus* Herbst. Of the 17 species of decapod, only four, sparsely represented, are also common to southeast Port Morant Harbour, where they are relatively common; two species are known from other deposits in Jamaica; two from other Caribbean islands; and eight are Recent species new to the fossil record of the Caribbean. Balanomorph cirripedes include three species, *Chthalamus fragilis*? Darwin, *Balanus eburneus* Gould and *Ceratochoncha* sp. aff. *C. barbadensis* (Withers).

Contents

Introduction

The best known fossil record of Plio-Pleistocene crustaceans of the Antillean region is undoubtedly that of Jamaica (reviewed in Donovan *et al*., 2003; Collins *et al*., 2009b). Available specimens are mainly disarticulated chelae, but identification to at least generic level is commonly possible. Many species of decapod have been described from units such as the Upper Pliocene Bowden shell beds (Collins & Portell, 1998), and the upper Pleistocene Falmouth and Port Morant formations (Morris, 1993; Collins *et al*., 1997; Collins & Donovan, 1998); these same successions have yielded a small diversity of barnacles (Collins & Donovan, 1996). More complete decapods are rare, the best

known coming from the lower Pleistocene Old Pera Beds (Collins *et al*., 2001), although moderately diverse carapace specimens are now known from the Upper Pliocene Hopegate Formation (R.W. Portell, research in progress). To these mainly marine species may be added the sparse record of land crabs (Donovan & Dixon, 1998; Collins *et al*., 2009a). Sub-fossil remains in archeological sites remain poorly known (e.g., Scudder, 2006, table 8.3).

The decapod record of the Port Morant Formation is greatly enhanced by new collections from the west side of Port Morant Harbour. Specimens discussed herein are deposited in the Nationaal Natuurhistorisch Museum, Leiden, The Netherlands (RGM). Our philosophy of open nomenclature follows Bengtson (1988). Miscellaneous unidentified fragments, including some decapod material, are registered as RGM 211 765.

Locality and horizon

The specimens documented herein were collected from the upper Pleistocene Port Morant Formation, Upper Coastal Group, exposed in a coastal section on the southwest side of Port Morant Harbour, parish of St. Thomas, southeast Jamaica (Fig. 1), approximately between grid references 588 763 and 587 765, Jamaican 1:50,000 topographic sheet 19 "Morant Harbour", metric (new) edition. Mitchell *et al*. (2006, fig. 1) provided a further locality map for the study area. The sedimentology of this mixed carbonate-siliciclastic succession, infilling a Pleistocene lagoon, was discussed in detail by Cant (1971) and Mitchell *et al*. (2001); see also James *et al*. (2006). Mitchell *et al*. (2000) obtained electron spin resonance measurements from corals in the Port Morant Formation on the southeast side of Port Morant Harbour that indicate deposition was during latest Oxygen Isotope Stage 6 to, probably, earliest Oxygen Isotope Stage 5e, that is, last interglacial.

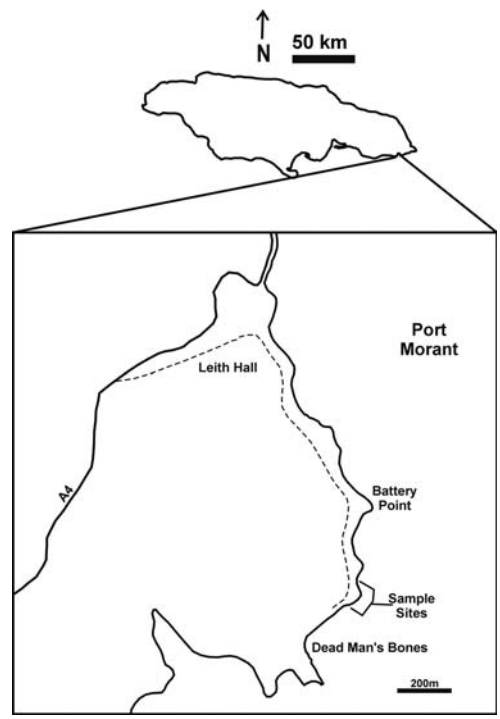

Fig. 1. Sample sites on the western coastline of Port Morant Harbour, parish of St. Thomas, southeast Jamaica. The main south coast road (A4) is indicated and the track leading to the sample sites is shown as a dashed line.

The sample described herein represents the result of one day of fieldwork by five collectors. All specimens were removed by hand from surface exposure by S.K.D., T.A.S. and three student assistants. The rocks were too well lithified for effective bulk sampling and processing by sieving.

Three sampling sites were particularly productive. Most specimens were collected from an area of coarse-grained bioclastic sandstone with abundant bry-

ozoa (*Schizoporella* sp.), red algae, and scattered fragments of benthic molluscs and scleractinian corals (GPS 17°52.07'N 76°20.0'W).

A fossil reef yielded the large carapace of *Carpilius corallinus* Herbst (RGM 211 744). This came from a sandstone rich in mollusc debris between large (diameter *c*. 0.5 m) heads of the scleractinian corals *Colophyllia natans* Müller, *Montastraea cavernosa* (Linné), *Montastraea annularis* (Ellis & Solander) and *Diploria strigosa* (Dana) (GPS 17°52.12'N 76°19.98'W).

Most of the large balanids were collected at GPS 17°52.15'N 76°19.97'W. These were preserved in finer grained sandstones with fewer large molluscs and stringers of bioclastic debris.

Systematic palaeontology

Order Decapoda Latreille, 1802
Infraorder Thalassinidea Latreille, 1831
Family Callianassidae Dana, 1852
Subfamily Callianassinae Dana, 1852
Genus *Lepidophthalmus* Holmes, 1904

Type species – *Lepidophthalmus eiseni* Holmes, 1904, p. 310 (= *Callianassa boucourti* A. Milne-Edwards, 1870), by monotypy.

Lepidophthalmus jamaicense? (Schmitt, 1935)
Pl. 1, figs. 1, 2.

Material – A left propodus, RGM 211 708.

Remarks – The specimen closely resembles that figured by Felder & Manning (1997, fig. 3), but differs in that the interdigital margin is more regularly rounded and rimmed with fine granules. Setal pores similar to those figured by Felder & Manning (1997, fig. 3a) are set near the tip of the fixed finger and closely behind it, and there is an additional pore at mid length. A few pores line the lower margin. Illustrations of the chela are more convincing in Felder & Manning (1997, fig. 3) than Manning & Felder (1991, fig. 13). New to the fossil record of the Caribbean, the present distribution of this extant species includes the Caribbean Sea, Jamaica, Belize and Honduras (Sakai, 1988, p. 67).

Genus *Neocallichirus* Sakai, 1988

Type species – *Neocallichirus horneri* Sakai, 1988, p. 61, by original designation.

Neocallichirus peraensis Collins, Donovan & Dixon, 1997
Pl. 1, figs. 4, 5.

Material – Left dactylus, RGM 211 710.

Remarks – Apparently less common here than from the section of the Port Morant

Formation on the southeast coast of the harbour (Collins *et al*., 1997, p. 54, pl. 12, figs. 3-6, pl. 13, fig. 5, pl. 14, fig. 1).

***Neocallichirus*? sp.**
Pl. 1, fig. 3.

Material – Abraded left propodus, RGM 211 709.

Remarks – This specimen differs from common forms of *N. peraensis* in having a line of setae pores above a smooth, rather than finely granulated lower margin and a more distinct depression before the fixed finger. Lined with denticles and rather steeply inclined, a shorter fixed finger than *N. peraensis* is suggested.

Infraorder Anomura MacLeay, 1838
Superfamily Paguroidea Latreille, 1802
Family Paguridae Latereille, 1802
Subfamily Diogeninae Ortmann, 1892
Genus *Petrochirus* Stimpson, 1859

Type species – *Pagurus granulatus* Olivier, 1811, p. 8 (= *Cancer bahamensis* Herbst, 1796 (for 1791 *in* Herbst, 1782-1804)), by original designation.

***Petrochirus bahamensis* (Herbst, 1791)**
Pl. 1, figs. 6-8.

Material – A natural pair of chelae and associated pereiopod fragments, RGM 211 711.

Remarks – This is the first recorded occurrence of fossil pereiopods for this species. It is apparently less common here than from the other side of the harbour (Collins *et al*., 1997, p. 55, pl. 14, figs. 2-4, pl. 16, fig. 4).

Genus *Paguristes* Dana, 1851

Type species – *Paguristes hirtus* Dana, 1853, p. 346, by the subsequent designation of Stimpson (1859, p. 73).

***Paguristes* sp. cf. *Paguristes lymanni* A. Milne-Edwards & Bouvier, 1893**
Pl. 2, figs. 1, 3.

Material – A right propodus, RGM 211 712.

Description – Manus subtrapezoidal, the straight upper margin half the length of the lower. Lower margin gently convex and continuous with the fixed finger. Carpal margin is bounded by a deep groove; the interdigital margin is oblique with a finely granu-

lated edge. The outer surface is flattened before the fixed finger where it is densely granulated, the surface becoming almost smooth above proximally, the granules forming again over the upper margin; the inner surface is smooth. Fixed finger about half the length of the basal margin and as high as long; the proximal part of the occludent margin is inwardly oblique and the cutting edge finely denticulate; the lower, presumably corneous cusp, is missing.

Remarks – The propodus has all the basic characters of the right chela figured by Milne-Edwards & Bouvier (1893, pl. 4, fig. 7) (which has all the aspects of being a left chela!), but differs in the absence of the four prominent spines lining the upper internal margin. New to the fossil record of the Caribbean, the specimens of *P. lymanni* examined by Milne-Edwards & Bouvier (1893) ranged from Grenada, Guadeloupe and Barbados.

A left dactylus recorded as *Paguristes* sp. (Collins & Portell, 1998, pl. 1, fig. 3), from the Bowden shell bed, was likened to *P. lymani* and could well be conspecific with the present propodus.

Infraorder Brachyura Linnaeus, 1758
Section Eubrachyura de Saint Laurent, 1980
Superfamily Calappoidae De Haan, 1833
Family Calappidae De Haan, 1833
Subfamily Matutinae MacLeay, 1838
Genus *Hepatus* Latreille, 1802

Type species – *Cancer pubibundus* Herbst, 1785, p. 199 (= *Cancer princeps* Herbst, 1794, p. 154), by original designation (Rathbun, 1937, pp. 234, 235).

***Hepatus praecox* Collins, Donovan & Dixon, 1997**
Pl. 2, figs. 2, 4.

Material – Carapace fragment, RGM 211 713; fragmentary right propodus, RGM 211 714.

Remarks – Founded on a carapace (Collins *et al*., 1997), the original discussion referred to relationships with *Hepatus princeps* (Herbst, 1794), found in Jamaican waters (Rathbun, 1937, p. 326), its Pacific anologue, *Hepatus kossmani* Neumann, 1878, and to *Hepatus lineatus* Rathbun, 1937, with a possible bias towards the two first named species. However, in both of these species the chelae have thin, more or less continuous ridges, whereas, although much abraded, the surface ornament of the new manus consists of lines of separated nodes similar to those of *H. lineatus* (Rathbun, 1937, pl. 74, fig. 2). Thus, it would seem that *H. praecox* may have been an ancestral form of three Recent species.

Partial left and right propodi assigned to *Hepatus* sp. (Collins & Portell, 1998, pl. 1, fig. 5a, b), from the Upper Pliocene Bowden shell bed of southeast Jamaica agree, as far as preservation allows comparison, with the present specimens and could be conspecific. Such being the case, the downward range of *H. praecox* is marginally extended.

Family Leucosiidae Samouelle, 1819
Genus *Persephona* Leach, 1817

Type species – *Persephona latreillii* Leach, 1817, pp. 18, 22 (= *Cancer punctatus* Linnaeus, 1758); by subsequent designation of Rathbun (1922, p. 28).

***Persephona* sp.**
Pl. 2, figs. 5, 6.

Material – Male sternites, RGM 211 715; a limb fragment, RGM 211 716.

Remarks – Comparisons with figures in Rathbun (1937, pl. 42, figs. 3, 6) indicate a closer affinity of the sternites to those of *Persephona punctata acquilonaris* Rathbun, 1933, than to the nominate subspecies. The present range of *P. punctata acquilonaris* appears restricted to New Jersey to Texas. The finding of a well preserved carapace retaining sternites could well lead to a reappraisal of fossil specimens presently assigned to *P. punctata punctata.* The limb fragment is of a juvenile, but otherwise typical of those found at Old Pera.

Superfamily Majoidea Samouelle, 1819
Family Majidae Samouelle, 1819
Genus *Mithrax* Desmarest, 1823

Type species – *Cancer aculeatus* Herbst, 1790, p. 248 (= *Mithrax pilosus* Rathbun, 1892), by subsequent designation of H. Milne Edwards (1838, p. 9).

Range – Lower Miocene to Recent (Portell & Collins, 2004, p. 116).

***Mithrax acuticornis* Stimpson, 1870**
Pl. 2, figs. 7, 8.

Material – Two partial carapaces, RGM 211 717, 211 718.

Remarks – The dorsal sculpture is close to that of *M. acuticornis* as depicted in Rathbun (1925, pl. 136, figs. 1, 2), the outline of the carapace being more circular than that of the superficially similar *Mithrax spinipes* (Rathbun, 1925, pl. 136, figs. 3, 4). New to the fossil record of the Caribbean, the present range of *M. acuticornis* extends from the west coast of Florida westwards to off Bahia, Brazil (Rathbun, 1925, p. 389).

***Mithrax verrucosus* H. Milne Edwards, 1832**
Pl. 3.

Material – One right cheliped, RGM 211 719; one left (RGM 211 720) and two right propodi, RGM 211 721, 211 722; two left (RGM 211 723, 211 724) and three right dactyli, RGM 211 725-211 727; three chela carpi, RGM 211 728-211 730; one pereiopod carpus, RGM 211 731; and one spinose merus, RGM 211 732. A further propodus may belong to this species, RGM 211 733.

Remarks – Previously recorded from Old Pera (Collins *et al*., 1997) from a single right chela, the new material includes the first record of fossil chela-carpi attributable to this species, which is also known from the Pleistocene Coral Rock of Barbados (Collins & Morris, 1976).

Genus *Mithraculus* White, 1847

Type species – *Mithraculus coronatus* White, 1847, p. 7 (= *Maia sculpta* Lamarck, 1818), (*non Cancer coronatus* Herbst, 1785), by original designation.

***Mithraculus forceps* A. Milne-Edwards, 1875**
Pl. 4, fig. 1.

Material – A right chela-carpus, RGM 211 734.

Remarks – The presence of two spines on the lower margin as well as three on the upper margin (Rathbun, 1925, pl. 156), common to *M. forceps*, distinguishes this carpus from those of *M. verrucosus*. This species has previously been tentatively recorded from Jamaica from the Upper Pliocene Bowden shell bed (Collins & Portell, 1998) and from the upper Pleistocene Falmouth Formation (Morris, 1993).

Genus *Hyas* Leach, 1814

Type species – *Cancer araneus* Linnaeus, 1758, p. 431, by original designation; Recent.

aff. *Hyas* sp.
Pl. 4, fig. 2.

Material – Fragment of a pereiopod merus, RGM 211 735.

Remarks – This marks the first occurrence of the genus from the Port Morant Formation of Jamaica. Similarly designated limb fragments are known from the Upper Pliocene Bowden shell beds of Jamaica (Collins & Portell, 1998) and the Upper Miocene Tuira Formation of Panama (Todd & Collins, 2006).

Superfamily Portunoidea Rafinesque, 1815
Family Portunidae Rafinesque, 1815
Subfamily Portuninae Rafinesque, 1815
Genus *Portunus* Weber, 1795

Type species – *Cancer pelagicus* Linnaeus, 1758, by the subsequent designation by Rathbun (1926, p. 75) (International Commission on Zoological Nomenclature, 1956). This decision appears to have overlooked the selection of H. Milne Edwards (July 1840) of *Portunus puber* (Linnaeus, 1767) (Morris & Collins, 1991, p. 7).

***Portunus vocans* (A. Milne-Edwards, 1878)**
Pl. 4, figs. 3, 4

Material – A fragmentary right propodus and associated dactylus, RGM 211 736.

Remarks – Both elements conform with Rathbun (1930, pl. 25, p. 60). A species new to the fossil record of the Caribbean, it presently ranges from the West Indies and eastern Atlantic (Cape Verde Islands) to the South Atlantic (Ascension Island) (Rathbun, 1930, p. 80).

Genus *Achelous* De Haan, 1833

Type species – *Portunus spinimanus* Latreille, 1819, p. 47, by original designation of De Haan (1833, p. 8).

***Achelous sebae* (H. Milne Edwards, 1834)**
Pl. 4, figs. 5, 6.

Material – Right fixed finger, RGM 211 737; right fixed finger and fragment of dactylus, RGM 211 738; posterior of manus, RGM 211 739.

Remarks – A species new to the fossil record of the Caribbean, it presently occurs in the Gulf of Mexico, Florida Straits to Brazil (Rathbun, 1930, p. 80).

Superfamily Xanthoidea MacLeay, 1838
Family Xanthidae De Haan, 1833
Genus *Actaea* De Haan, 1833

Type species – *Actaea savignii* H. Milne Edwards, 1834, pp. 4, 18, by subsequent designation of Rathbun (1922, p. 26).

***Actaea* sp. cf. *Actaea bifrons* Rathbun, 1898**
Pl. 4, fig. 7.

Material – A carapace lacking basal margin, RGM 211 740.

Remarks – The lack of anteromarginal lobes falls within the degree of their development figured by Rathbun (1930, pl. 104, figs. 3-6); the right hand margin of Rathbun's figure 6, in particular, is comparable with that of the present carapace. Also, the juxtaposition of lobes 5L and 6L of Rathbun (1930, p. 6, fig. 3) agree more closely to *A. bifrons* than to the allied *Actaea setigera* in which L4 is distinctly lozenge-shaped. The dorsal granulation of RGM 211 740 is coarser than that of *A. bifrons*.

New to the fossil record of the Caribbean, the present distribution of *A. bifrons* ranges from Florida to the north coast of South America and Panama (Rathbun, 1930, p. 256).

Actaea acantha (H. Milne Edwards, 1834)

Pl. 4, fig. 8.

Material – A left propodus, slightly damaged posteriorly, RGM 211 741.

Description – Manus almost quadrate; outer surface convex, inner surface medially tumid. The upper margin is weakly spinose, bounded by another, converging row of spines. Almost vertical interdigital margins are lined with granules. There is a shallow depression in the lower margin before the fixed finger which is rather more than half the length of the manus, weakly deflexed and turned inwards; a quadrate cusp on the proximal half is about one third the height of the manus. A short median ridge on the fixed finger leads to a curving row of six tubercles, with straighter rows of six, and three above, across the manus. A few smaller tubercles are scattered towards the upper and lower margins. Apart from a few granules on the upper inner quadrant, the inner surface in smooth. There are two setal pores distally on the outer surface and one on the lower margin.

Remarks – The above characters equate with those on the claws figured by Rathbun (1930, pl. 106, figs. 1, 2) and, in particular, with the enlarged view of the right chela illustrated by Rathbun's figure 1, the damaged, foreshortened, specimen accounting for the apparent difference in length/width ratios.

Prominent among differences of the present claw and those of *Actaea bifrons* (Rathbun, 1930, pl. 104, fig. 3) are the deeper indentation before the fixed finger, the relative length and dentition of the fixed finger and distribution of tubercles on the manus.

As well as being more prominently lobulated than that of *A. bifrons*, the carapace of *Actaea acanthi* is more coarsely granulated, the granules tending to obliterate the lateral course of the cervical furrow. New to the fossil record of the Caribbean, the present distribution ranges from Florida Keys to Fernando Noronha, Brazil (Rathbun, 1930, p. 255).

Family Panopeidae Ortmann, 1893

Genus *Micropanope* Stimpson, 1871a

Type species – *Micropanope stultipes* Stimpson, 1871a, by original designation.

Range – Pliocene(?) to Recent.

Micropanope sp. aff. *Micropanope truncatiformis* Rathbun, 1898

Pl. 5, figs. 1-4.

Material – A part decorticated/part cast of a left propodus and a right propodus with an associated carpus, RGM 211 742, 211 743, respectively.

Remarks – Although somewhat abraded, the granulation of the propodi approximates that of the corresponding elements of *M. truncatiformis* (Rathbun, 1930, pl. 178, figs. 7, 8). Although the groove extending the length of the fixed finger of the left propodus is apparently weaker, depressions either side of the upper margin are common to both forms.

Albeit tentatively assigned, this is the first fossil record of *M. truncatiformis* in the Caribbean, which currently ranges from off Havana to Yucatan (Rathbun,1930, p. 436). There is also a resemblance to the Pacific analogue, *Micropanope xanthusi* Stimpson, 1871a, in which the fixed finger appears not to be grooved (Rathbun, 1930, pl. 179, fig. 3), but otherwise has an overall coarser granulation.

Family Carpilidae Ortmann, 1894
Genus *Carpilius* Leach *in* Desmarest, 1823

Type species – *Carpilius maculatus* Linnaeus, 1758, by monotypy.

***Carpilius corallinus* Herbst, 1783**
Pl. 5, figs. 5-8.

Material – Fragmentary carapace and chelae, RGM 211 744; one right fixed finger, RGM 211 745; two right free fingers, RGM 211 746, 211 747; and one left free finger, RGM 211 748.

Remarks – Well known from limb segments from the locality on the southeast side of Port Morant Harbour, the new material provides the first known (fragmentary) fossil evidence of the carapace. The species is represented by a fine carapace from the Pleistocene Coral Rock of Barbados (Collins & Morris, 1976).

Class Cirripedia Burmeister, 1834
Suborder Balanomorpha Pilsbry, 1916
Family Chthalamalidae Darwin, 1854
Subfamily Chthalamalinae Darwin, 1854
Genus *Chthalamus* Ranzini,1818

Type species – *Lepas stellata* Poli, 1791, p. 29, by original designation of Ranzani (1818, p. 276) (Newman *et al*., 1969, p. R283).

***Chthalamus fragilis*? Darwin, 1854**
Pl. 6, figs. 1, 5, 6.

Material – Numerous specimens on 13 chips of rock, RGM 211 749-211 753.

Remarks – One author (J.S.H.C.) noted that these barnacles could all too easily be Recent specimens. However, the collectors (S.K.D., T.A.S. and students) accumulated specimens from above the high tide mark on a coastline where no extant barnacles were apparent. More than one specimen preserved round borings (Pl. 1, fig. 6), *Oichnus simplex* Bromley, 1981, suggesting gastropod predation.

Family Balanidae Leach, 1817
Subfamily Balaninae Leach, 1817
Genus *Balanus* da Costa, 1778

Type species – *Lepas balanus* Linnaeus, 1758, p. 667 (= *Balanus porcatus* Costa, 1778), by the subsequent designation of Pilsbry (1916, p. 49) (Newman *et al*., 1969, p. R284).

Balanus eburneus Gould, 1841
Pl. 6, figs. 2-4.

Material – Seven individual specimens, RGM 211 754-211 758.

Remarks – The new specimens correspond in all respects with those recorded from the Port Morant Formation at southeast Old Pera Harbour (Collins *et al*., 1997, p. 58, pl. 12, figs. 7, 9, pl. 19, figs. 1-5).

Family Pyrgomatidae Gray, 1825
Subfamily Ceratochonchinae Newman & Ross, 1976
Genus *Ceratoconcha* Kramberger-Gorjanović, 1889

Type species – *Ceratoconcha costata* Kramberger-Gorjanović, 1889, p. 50, by monotypy.

Table 1. Wider occurrence of decapod crustacean taxa discussed herein. Key: PM = Port Morant Formation, southeast Port Morant Harbour (Collins *et al*., 1997; Collins & Donovan, 1998); JF = other Jamaican rock formations (Collins & Portell, 1998); OI = fossil records of other Antillean islands; RR = new fossil record of a Recent species; x = present; 1 = *P. P. punctata* (Linnaeus) known from southeast Port Morant Harbour (Collins *et al*., 1997, p. 56).

	PM	JF	OI	RR
Lepidophthalmus jamaicense? (Schmitt)				x
Neocallichirus peraensis Collins *et al*.	x			
Neocallichirus? sp.				
Petrochirus bahamensis (Herbst)	x			
Paguristes sp. cf. *P. lymanni* Milne-Edwards & Bouvier				x
Hepatus praecox Collins *et al*.	x			
Persephona sp.	1			
Mithrax acuticornis Stimpson				x
Mithrax verrucosus H. Milne Edwards			x	
Mithraculus forceps A. Milne-Edwards		x		
aff. *Hyas* sp.		x		
Portunus vocans (A. Milne-Edwards)				x
Achelous sebae (H. Milne Edwards)				x
Actaea sp. cf. *A. bifrons* Rathbun				x
Actaea acantha (H. Milne Edwards)				x
Micropanope sp. aff. *M. truncatiformis* Rathbun				x
Carpilius corallinus Herbst	x		x	

***Ceratochoncha* sp. aff. *C. barbadensis* (Withers, 1926)**
Pl. 6, fig. 7; Pl. 7.

Material – At least ten individuals on six rock fragments, RGM 211 759-211 763.

Remarks – The new specimens correspond in all respects with those recorded from the Port Morant Formation at southeast Old Pera Harbour (Collins *et al*., 1997, p. 58, pl. 15, fig. 2, pl. 17, fig. 3).

Discussion

Of the 17 species (albeit seven only tentatively) determined from this new site in the Port Morant Formation, only four, sparsely represented species are common to the same formation at Old Pera on the eastern side of Port Morant Harbour, where they are relatively common. Two species are known from other deposits in Jamaica and two from other Caribbean islands, whereas eight are Recent species new to the fossil record of the Caribbean (Table 1).

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Plate 1

Figs. 1, 2. *Lepidophthalmus jamaicense*? (Schmitt, 1935), RGM 211 708., left propodus, inner (1) and outer (2) surfaces. Both x 3.6.
Fig. 3. *Neocallichirus*? sp., RGM 211 709, left propodus, outer surface. × 3.3.
Figs. 4, 5. *Neocallichirus peraensis* Collins *et al*., 1997, RGM 211 710, left dactylus, inner (4) and outer (5) surfaces. × 3.3.
Figs. 6-8. *Petrochirus bahamensis* (Herbst, 1791), RGM 211 711. (6) Paired chelae and associated pereiopods. × 1.6. (7) Detail of pereiopod. × 2.5. (8) Apertural view of hermit crab (shell lost due to diagenesis). × 1.6.

All specimens whitened with ammonium chloride.

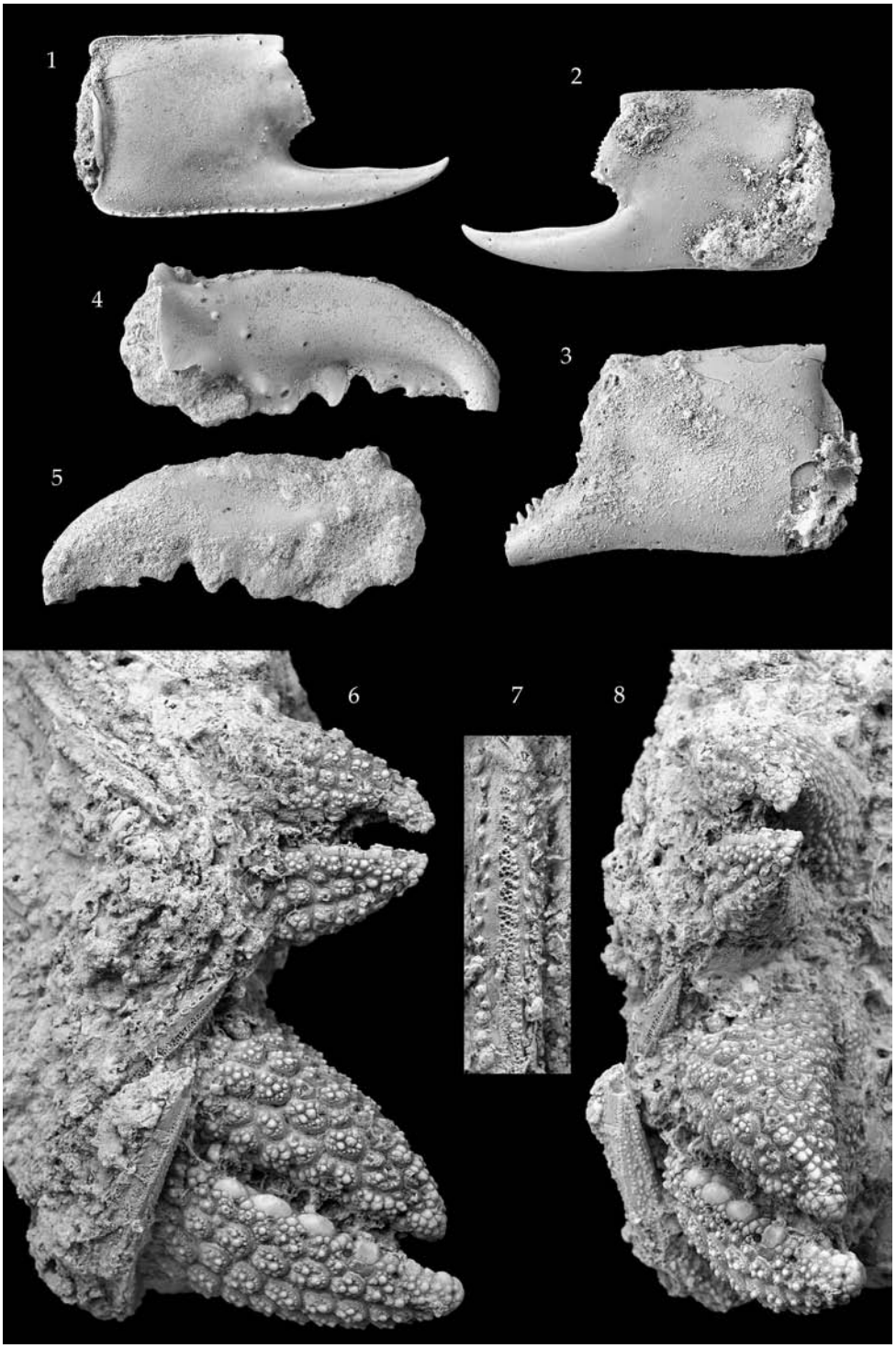
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Plate 2

Figs. 1, 3. *Paguristes* sp. cf. *Paguristes lymanni* A. Milne-Edwards & Bouvier, 1893, RGM 211 712, right propodus, outer (1) and inner (3) surfaces. Both × 3.2.
Figs. 2, 4. *Hepatus praecox* Collins *et al*., 1997. (2) RGM 211 713, carapace fragment. (4) RGM 211 714, right propodus, inner surface. Both × 3.2.
Figs. 5, 6. *Persephona* sp. (5) RGM 211 715, male sternite. × 4.8. (6) RGM 211 716, limb fragment. × 5.6.
Figs. 7, 8. *Mithrax acuticornis* Stimpson, 1870, partial carapaces. (7) RGM 211 717, note encrusting bryozoan. × 4.6. (8) RGM 211 718. × 3.8.

All specimens whitened with ammonium chloride.

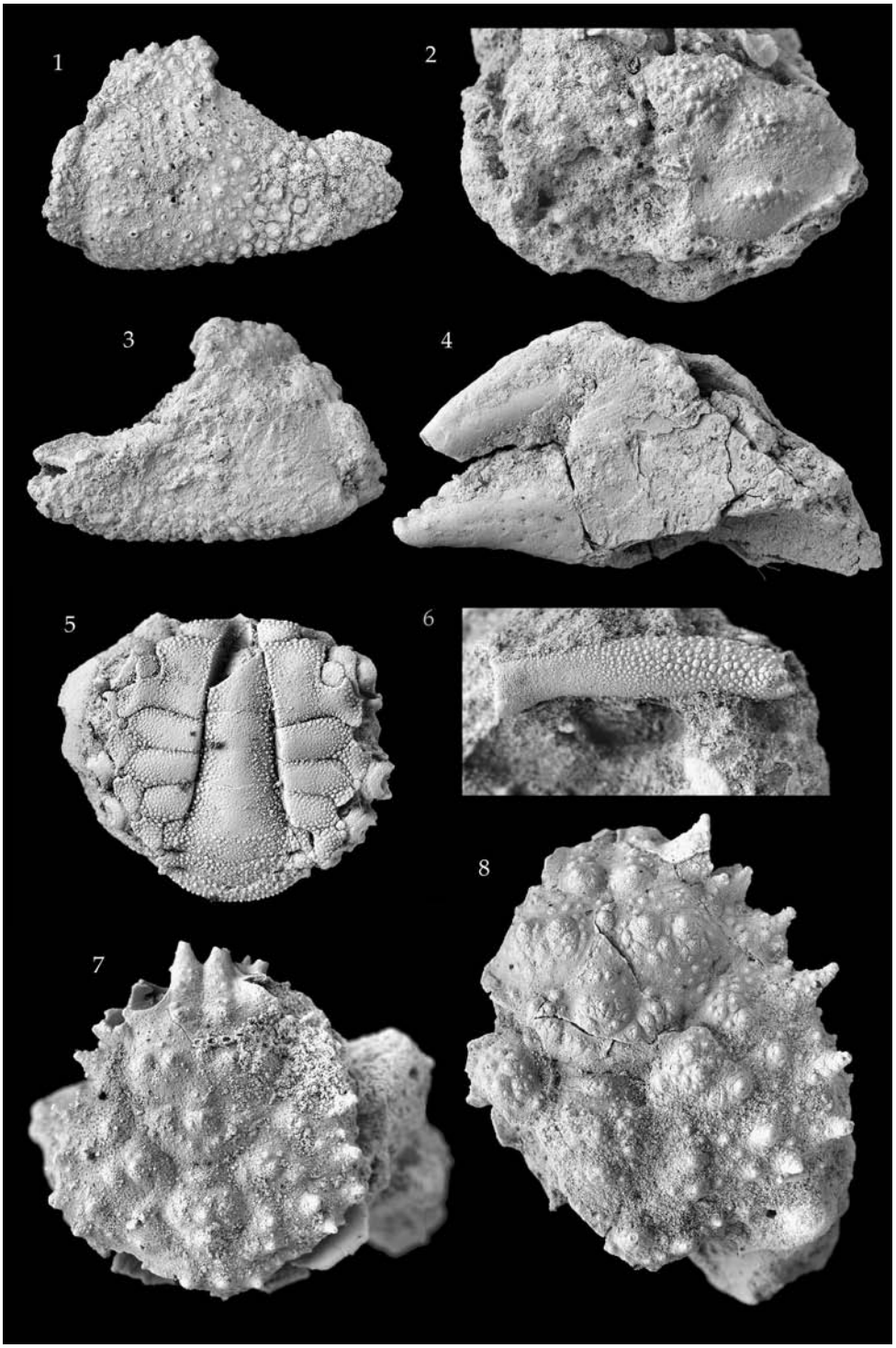
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Plate 3

Figs. 1-8. *Mithrax verrucosus* H. Milne Edwards, 1832. (1, 2) RGM 211 723, left dactylus, inner (1) and outer (2) surfaces. Both × 2.7. (3, 4) RGM 211 728, chela carpus, inner (3) and outer (4) surfaces. Both × 4.1. (5, 6) RGM 211 720, left propodus, inner (5) and outer (6) surfaces. Both × 2.8. (7) RGM 211 719, right cheliped, inner surface. × 3.3. (8) RGM 211 732, spinose merus. × 4.2.

All specimens whitened with ammonium chloride.

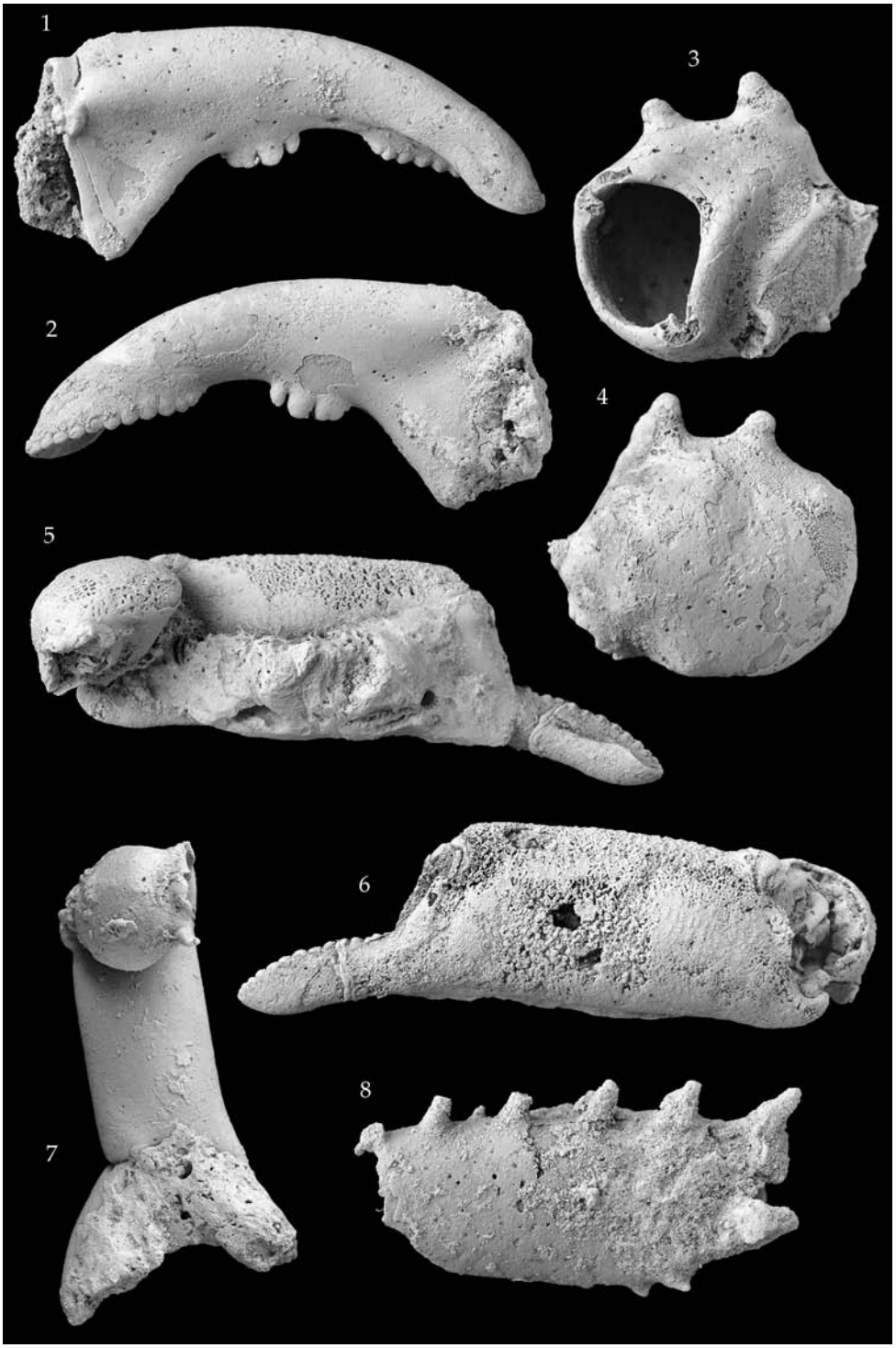
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Plate 4

Fig. 1. *Mithraculus forceps* A. Milne-Edwards, 1875, RGM 211 734, right chela-carpus. × 2.7.
Fig. 2. aff. *Hyas* sp., RGM 211 735, fragment of a pereiopod merus. × 3.9.
Figs. 3, 4. *Portunus vocans* (A. Milne-Edwards, 1878), RGM 211 736, inner (3) and outer (4) surfaces. Both × 3.3.
Figs. 5, 6. *Achelous sebae* (H. Milne Edwards, 1834). (5) RGM 211 738, right fixed finger (right) and fragment of dactylus, outer surface. (6) RGM 211 737, right fixed finger, outer surface. Both × 3.2.
Fig. 7. *Actaea* sp. cf. *Actaea bifrons* Rathbun, 1898, RGM 211 740, carapace lacking basal margin. × 3.2.
Fig. 8. *Actaea acantha* (H. Milne Edwards, 1834), RGM 211 741, left propodus, outer surface. × 2.9.

All specimens whitened with ammonium chloride.

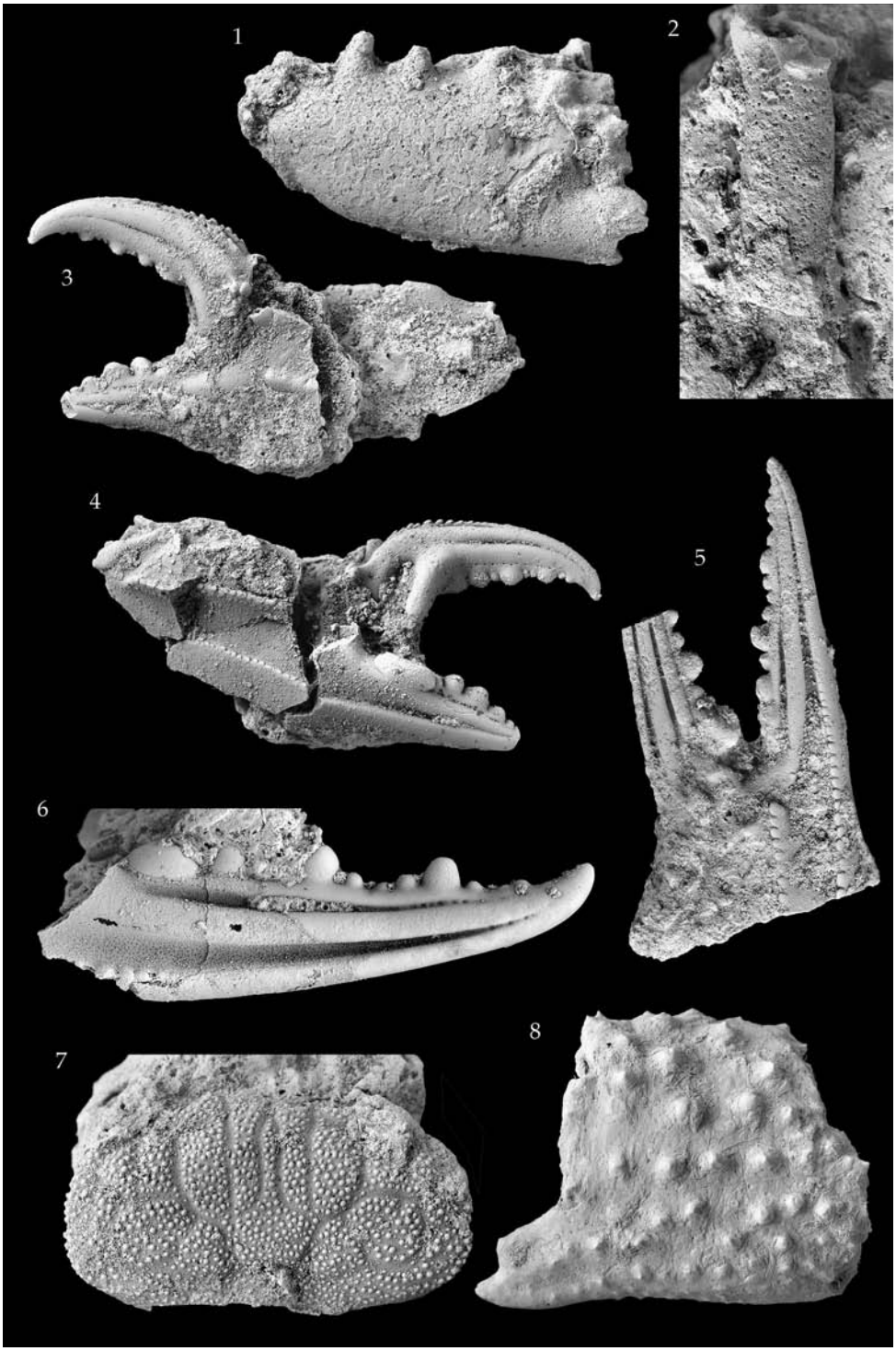
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Plate 5

Figs. 1-4. *Micropanope* sp. aff. *Micropanope truncatiformis* Rathbun, 1898. (1, 4) RGM 211 742, left propodus, outer (1) and inner (4) surfaces. Both x 5.3. (2, 3) RGM 211 743, right chela, inner (2) and outer (3) surfaces. Both × 5.5.
Figs. 5-8. *Carpilius corallinus* Herbst, 1783. (5, 6) RGM 211 747, right free finger, outer (5) and inner (6) surfaces. Both × 2.2. (7, 8) RGM 211 748, left free finger, inner (7) and outer (8) surfaces. Both × 2.6.

All specimens whitened with ammonium chloride.

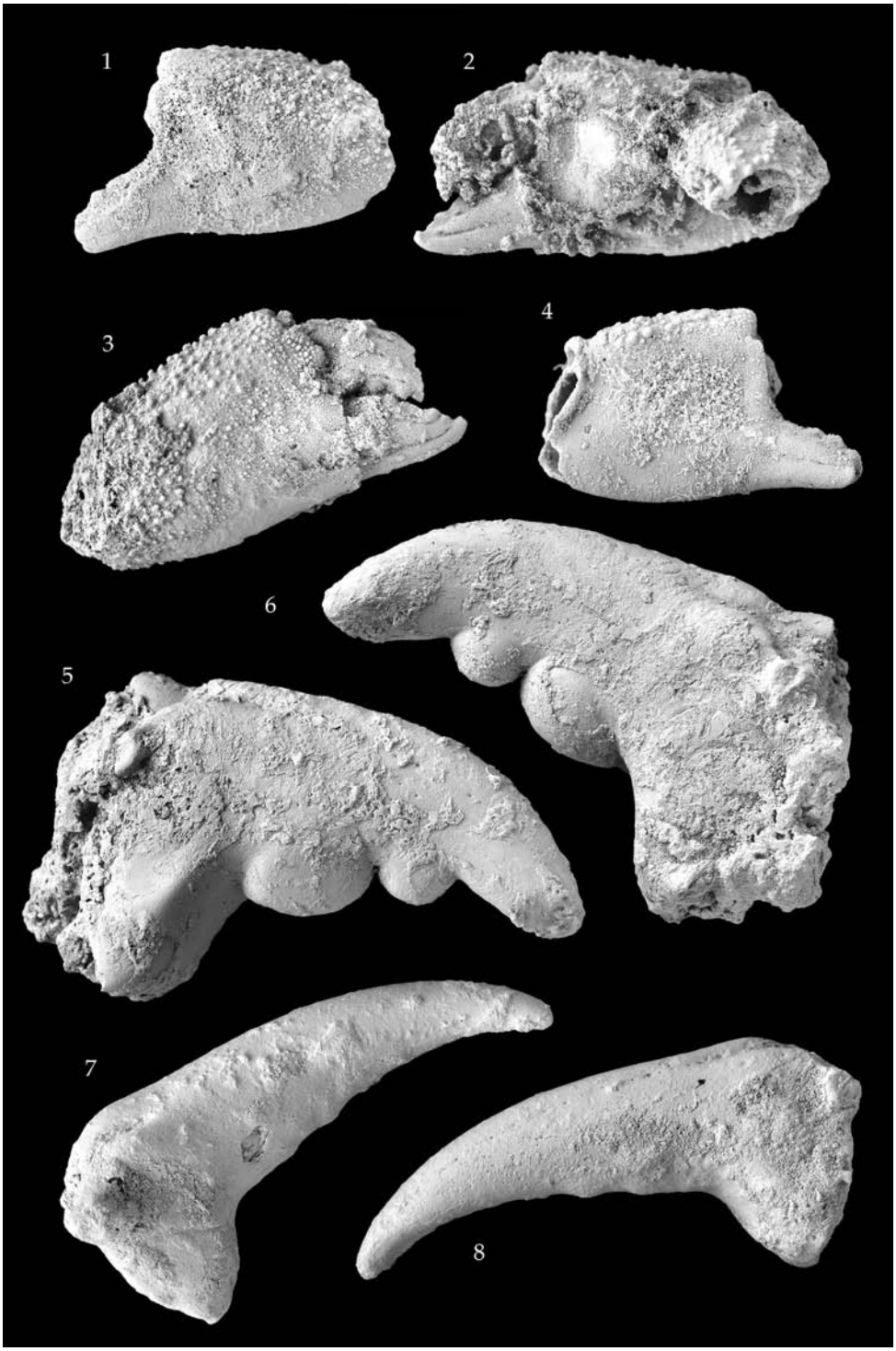
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Plate 6

Figs. 1, 5, 6. *Chthalamus fragilis*? Darwin, 1854. (1) RGM 211 752. × 2.8. (5) RGM 211 749. × 3.7. (6) RGM 211 750, note circular boring, *Oichnus simplex* Bromley, 1981. × 3.7.
Figs. 2-4. *Balanus eburneus* Gould, 1841. (2) RGM 211 756. × 2.9. (3) RGM 211 755. × 2.6. (4) RGM 211 754. × 2.9.
Fig. 7. *Ceratochoncha* sp. aff. *C. barbadensis* (Withers, 1926), RGM 211 762. × 5.5.

All specimens whitened with ammonium chloride.

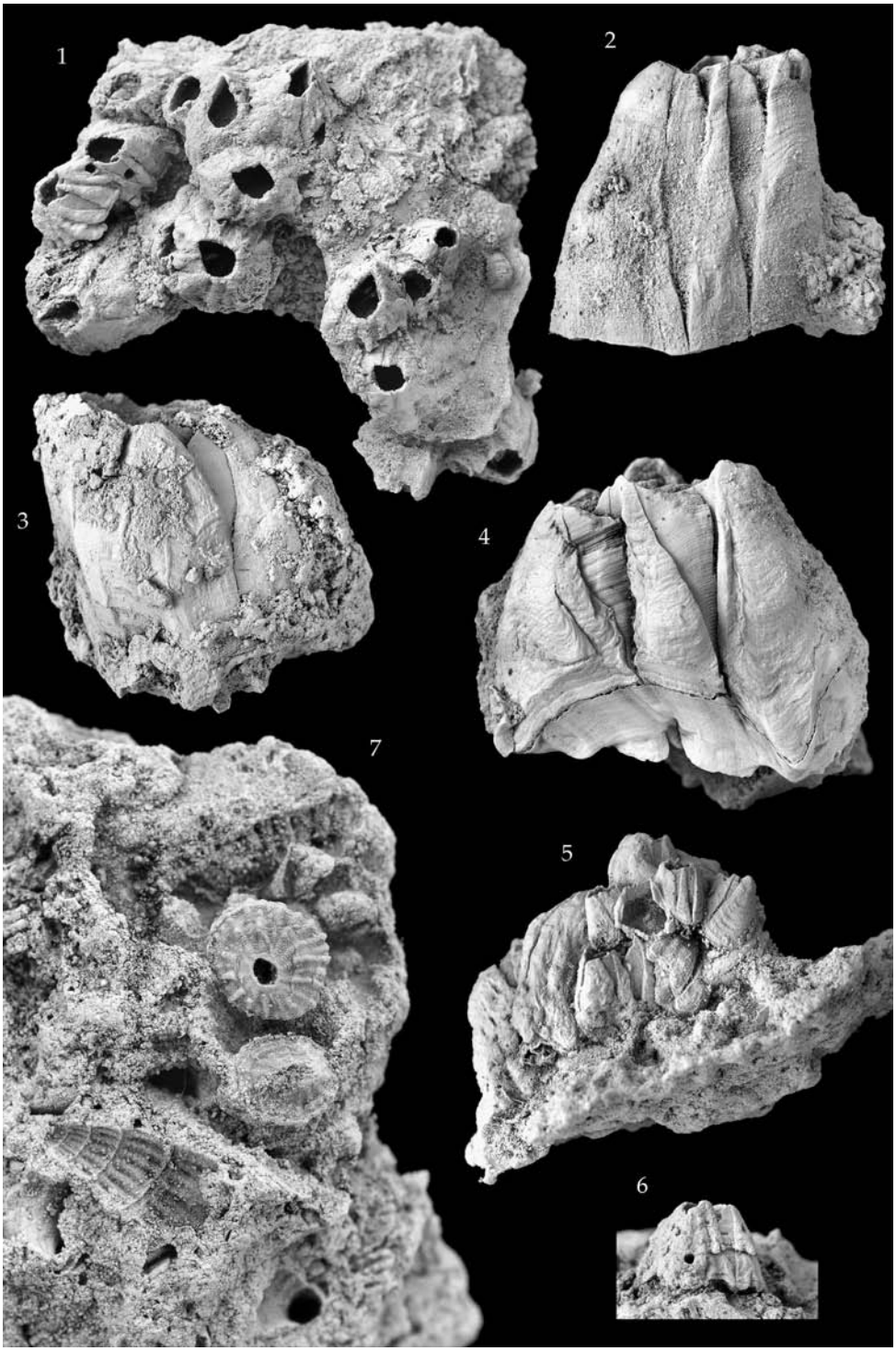
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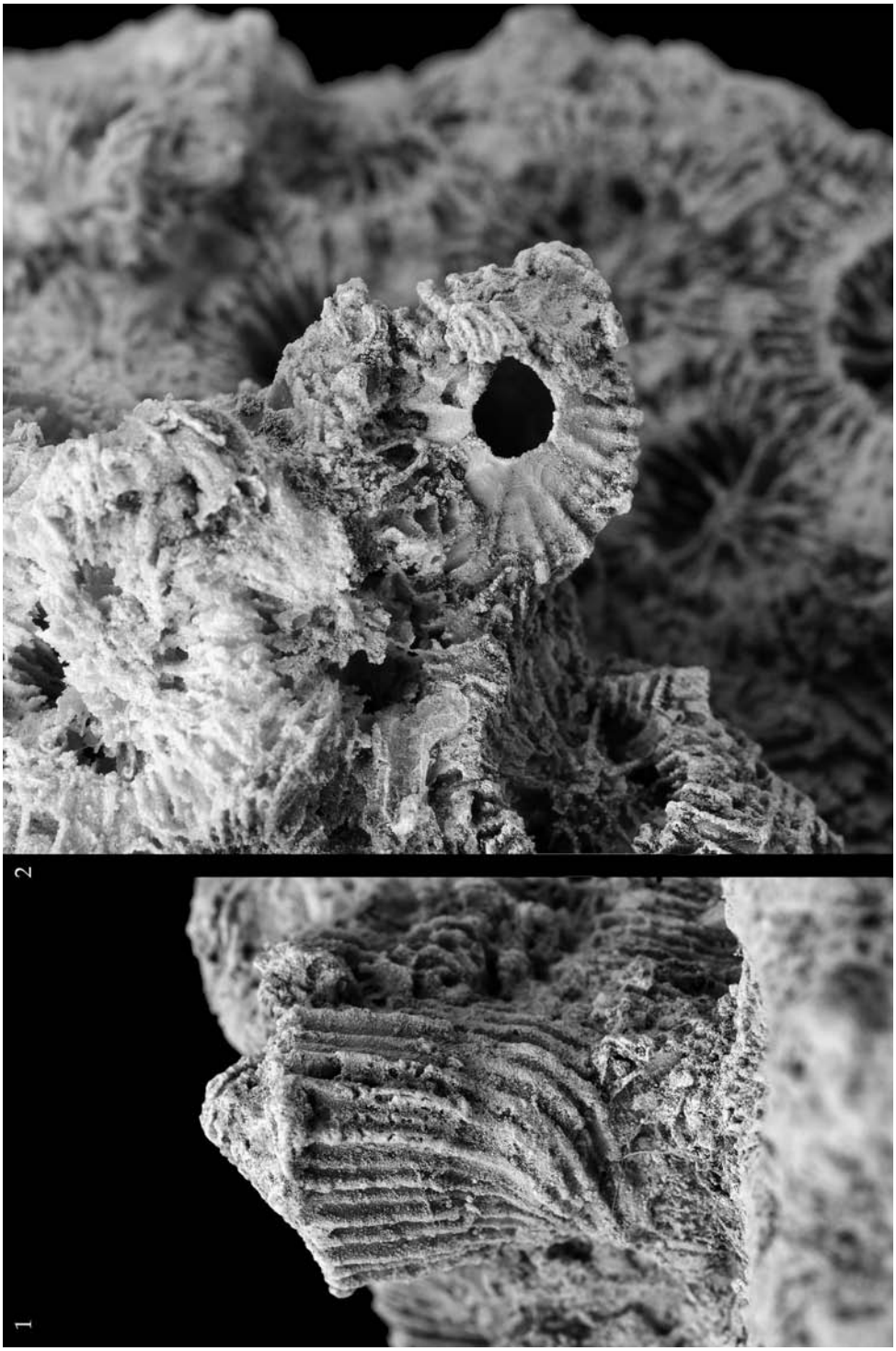
Plate 7

Figs. 1, 2. *Ceratochoncha* sp. aff. *C. barbadensis* (Withers, 1926), RGM 211 760, lateral (1) and apertural (2) views of individual infesting *Siderastrea siderea* (Ellis & Solander). Both × 5.2.

All specimens whitened with ammonium chloride.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