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# Cretaceous and Cenozoic decapod crustaceans of Jamaica

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## Abstract

In the last decade, a rebirth in interest of Jamaican fossil crustaceans has occurred. A summary of known material is provided together with some indications of the directions that future studies should take.

## Introduction

The past ten years have seen a renaissance in the study of the fossil shrimps and crabs of Jamaica. Previously, the only publications on the island's decapod crustaceans were a trio of papers by Withers (1922, 1924, 1927), which described taxa from the Upper Cretaceous and Eocene. After this flurry of activity in the 1920s, Jamaican fossil shrimps and crabs were largely ignored until the late 1980s, when Ms Carla Gordon of the University of the West Indies (UWI) collected abundant fragmentary material from the Falmouth Formation (Late Pleistocene, last interglacial). This material formed a significant part of the new collections reported on by Morris (1993) in the first paper on Jamaican crabs in 66 years. Since then the authors, aided by Mr H.L. Dixon (formerly UWI) and other collectors, have been describing the locally abundant decapod remains found in Miocene and younger deposits of the island (Collins et al., 1997, 2001; Collins & Donovan, 1998; Collins & Portell, 1998; Donovan & Dixon, 1998; Portell & Collins, in press). Our current knowledge of Jamaican fossil shrimps and crabs is summarized in Table 1, to which should be added the indeterminate specimens listed in Morris (1993) and new, but as yet undescribed, collections mentioned below.

## Overview of material

The range of depositional settings shown by the decapod-bearing units studied by the authors precludes any suggestion of a recurrent mode of preservation. Complete carapaces are rare, except in the Lower Miocene Montpelier Formation, where a diverse fauna has been collected within slide blocks of scleractinian corals. Although derived from a shallow-water setting, they are preserved in deep-water chalks (Portell & Collins, in press), with a depositional depth in excess of 200 m (Underwood & Mitchell, in press). Of particular interest here is the presence of the symbiotic genus *Trapezia* Latreille, a genus commensal with pocilloporid scleractinians, a group of corals no longer present in the Caribbean (with the exception of *Madracis*). Other deposits include the Bowden shell bed (submarine mass flow, laid down in 100-200 m water depth; Pickerill et al., 1998) of Late Pliocene age, the raised reef of the Late Pleistocene Falmouth Formation (Larson, 1983), coeval shallow-water siliciclastic lagoonal deposits of the Port Morant Formation (Mitchell et al., 2001) and a land crab claw in a fissure fill of terra rosa (Donovan & Dixon, 1998).

That the early studies of Withers gave an incorrect impression of the true stratigraphic and taxonomic diversity of Jamaican decapod crustaceans was determined by the research interests of the

*Table 1.* Fossil shrimps and crabs from the Cretaceous and Cenozoic of Jamaica; Morris (1993) listed localities and horizons that have yielded indeterminate crab specimens. Data from Morris (1993) unless stated otherwise. Higher classification follows Martin & Davis (2001). Key: + = present; cf. = confer; aff. = affinity (see Bengtson, 1988, for a discussion of cf. and aff. in open nomenclature); 1 = Upper Cretaceous (horizon unknown); 2 = '*Veniella* Shales' (Campanian); 3 = Guinea Corn Formation (Campanian-Maastrichtian); 4 = Chapelton Formation, Yellow Limestone Group (Early-Middle Eocene); 5 = White Limestone Group formation unknown (Eocene-Oligocene); 6 = Montpelier Formation, White Limestone Group (Early Miocene) (Portell & Collins, in press); 7 = Bowden shell bed, Bowden Formation, Lower Coastal Group (Late Pliocene) (Collins & Portell, 1998); 8 = Old Pera beds, Manchioneal Formation, Upper Coastal Group (Early Pleistocene) (Collins et al., 2001); 9 = Falmouth Formation, Upper Coastal Group (Late Pleistocene); 10 = Port Morant Formation, Upper Coastal Group (Late Pleistocene) (Collins et al., 1997; Collins & Donovan, 1998); 11 = fissure fill (Quaternary) (Donovan & Dixon, 1998). For a general discussion of the geology of Jamaica, see Robinson (1994).

| **Taxon** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Infraorder Thalassinidea | | | | | | | | | | | |
| Family Callianassidae | | | | | | | | | | | |
| '*Callianassa*' spp. | | | | + | + | | + | | + | | |
| '*Callianassa*' *gigantea* Withers | | | | + | | | | | | | |
| '*Callianassa*' *subplana* Withers | | | | + | | | | | | | |
| '*Callianassa*' *trechmanni* Withers | | | | + | | | | | | | |
| *Neocallichirus peraensis* Collins et al. | | | | | | | | | | + | |
| *Glypturus acanthochirus* Stimpson | | | | | | | | | | + | |
| Family Ctenochelidae | | | | | | | | | | | |
| *Ctenocheles* sp. | | | | | | | + | | | | |
| Infraorder Anomura | | | | | | | | | | | |
| Family Porcellanidae | | | | | | | | | | | |
| *Petrolisthes* sp. | | | | | | | | | + | | |
| Family Albuneidae | | | | | | | | | | | |
| *Albunea* sp. | | | | | | | | | + | | |
| Family Diogenidae | | | | | | | | | | | |
| *Paguristes* sp. | | | | | | | + | | | | |
| *Petrochirus* sp. | | | | | | | | | + | | |
| *Petrochirus bahamensis* (Herbst) | | | | | | | cf. | | | + | |
| Infraorder Brachyura | | | | | | | | | | | |
| Family Dromiidae | | | | | | | | | | | |
| *Kromtitis* sp. nov. | | | | | | + | | | | | |
| Family Dynomenidae | | | | | | | | | | | |
| *Dynomene* sp. nov. | | | | | | + | | | | | |
| Family Raninidae | | | | | | | | | | | |
| *Cretacoranina trechmanni* (Withers) | | + | | | | | | | | | |
| *Raninoides louisianensis* Rathbun | | | | | | | | | | + | |
| Family Calappidae | | | | | | | | | | | |
| *Calappa gallus* (Herbst) | | | | | | | | | cf. | | |
| *Calappa springeri* Rathbun | | | | | | | aff. | | | + | |
| Family Hepatidae | | | | | | | | | | | |
| *Eriosachila bartholomaeensis* (Rathbun) | | | | + | | | | | | | |
| *Hepatus* sp. | | | | | | | + | | | | |
| *Hepatus praecox* Collins et al. | | | | | | | | | | + | |
| Family Necrocarcinidae | | | | | | | | | | | |
| *Necrocarcinus* sp. | + | | | | | | | | | | |
| *Paranecrocarcinus*? sp. | + | | | | | | | | | | |
| Family Leucosiidae | | | | | | | | | | | |
| leucosiid gen. et sp. nov. | | | | | | + | | | | | |
| *Persephona punctata punctata* (Linné) | | | | | | | aff. | | | + | |
| *Uhlias limbatus* Stimpson | | | | | | | | | cf. | | |
| Family Mithracidae | | | | | | | | | | | |
| *Mithraculus forceps* A. Milne Edwards | | | | | | | | | cf. | | |
| *Mithrax* sp. | | | | | | | + | | | + | |

*Table 1.* Continued.

| **Taxon** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Mithrax* sp. nov. A | | | | | | + | | | | | |
| *Mithrax* sp. nov. B | | | | | | + | | | | | |
| *Mithrax caribbaeus* Rathbun | | | | | | | | | cf. | | |
| *Mithrax hispidus* (Herbst) | | | | | | | | | | + | |
| *Mithrax spinosissimus* Lamarck | | | | | | | | | + | | |
| *Mithrax verrucosus* H. Milne Edwards | | | | | | | | | | + | |
| *Teleophrys* sp. nov. | | | | | | + | | | | | |
| Family Pisidae | | | | | | | | | | | |
| *Chlorilia* sp. | | | | | | | aff. | | | | |
| *Hyas* sp. | | | | | | | aff. | | | | |
| *Rochinia* sp. | | | | | | | aff. | | | | |
| Family Tychidae | | | | | | | | | | | |
| *Pitho* sp. | | | | | | | + | | | | |
| *Pitho anisodon* (von Martins) | | | | | | | | | | + | |
| Family Dairidae | | | | | | | | | | | |
| *Daira* sp. nov. | | | | | | + | | | | | |
| Family Parthenopidae | | | | | | | | | | | |
| *Mesorhoea sexspinosa* Stimpson | | | | | | | aff. | | | | |
| *Platylambrus* sp. | | | | | | | + | | | | |
| Family Cancridae | | | | | | | | | | | |
| *Cancer* sp. | | | | | | | aff. | | | | |
| Family Portunidae | | | | | | | | | | | |
| *Callinectes jamaicensis* Withers | | | | + | | | | | | | |
| *Callinectes sapidus* Rathbun | | | | | | | aff. | | | | |
| *Callinectes toxodes* Ordway | | | | | | | | | | cf. | |
| *Euphylax fortispinosus* Collins et al. | | | | | | | | + | | | |
| *Ovalipes* sp. | | | | | | | aff. | | | | |
| *Portunus* sp. | | | | | | + | | | | | |
| portunid gen. et sp. nov. | | | | | | | + | | | | |
| Family Carcineretidae | | | | | | | | | | | |
| *Carcineretes woolacotti* Withers | | | + | | | | | | | | |
| Family Carpiliidae | | | | | | | | | | | |
| *Carpilius corallinus* Herbst | | | | | | | | | | + | |
| Family Goneplacidae | | | | | | | | | | | |
| *Nanoplax xanthiformis* (A. Milne Edwards) | | | | | | | | | | cf. | |
| Family Panopeidae | | | | | | | | | | | |
| *Eurypanopeus* sp. | | | | | | | + | | | | |
| *Eurypanopeus abbreviatus* (Stimpson) | | | | | | | | | + | | |
| *Eurypanopeus depressus* (Smith) | | | | | | | | | | cf. | |
| *Hexapanopeus caribbaeus* (Stimpson) | | | | | | | | | | cf. | |
| *Lophopanopeus* sp. nov. A | | | | | | + | | | | | |
| *Lophopanopeus* sp. nov. B | | | | | | + | | | | | |
| *Micropanope nuttingi* (Rathbun) | | | | | | | aff. | | | | |
| *Micropanope polita* Rathbun | | | | | | | | | cf. | | |
| *Micropanope spinipes* A. Milne Edwards | | | | | | | | | cf. | | |
| *Micropanope* sp. nov. | | | | | | + | aff. | | | | |
| *Neopanope* sp. | | | | | | | | | + | cf. | |
| *Panopeus herbstii* H. Milne Edwards | | | | | | | + | | | + | |
| *Panopeus rugosus* A. Milne Edwards | | | | | | + | | | | | |
| *Panopeus* sp. nov. | | | | | | | aff. | | | | |

*Table 1*. Continued.

| Taxon | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Family Pilumnidae | | | | | | | | | | | |
| *Pilumnus pannosus* Rathbun | | | | | | | aff. | | | | |
| *Pilumnus sayi* Rathbun | | | | | | | | | | cf. | |
| *Pilumnus spinossimus* Rathbun | | | | | | | aff. | | | | |
| Family Trapeziidae | | | | | | | | | | | |
| *Trapezia* sp. nov. | | | | | | + | | | | | |
| Family Xanthidae | | | | | | | | | | | |
| xanthid gen. et sp. nov. | | | | | | + | | | | | |
| *Chlorodiella* sp. nov. | | | | | | + | | | | | |
| *Eriphia* sp. | | | | | | | + | | | | |
| *Eriphia gonagra xaymacaensis* Collins & D'n | | | | | | | | | | + | |
| "*Eurypoda*" sp. | | | | | | | | | | cf. | |
| *Eurytium limosum* (Say) | | | | | | + | aff. | | | | |
| *Leptodius* sp. nov. | | | | | | | | | cf. | | |
| *Phymodius maculatus* (Stimpson) | | | | + | | | | | | | |
| *Xanthilites*? *rathbunae* Withers | | | | | | | | | | | |
| Family Ocypodidae | | | | | | | | | | | |
| *Uca* sp. | | | | | | | | | + | | |
| Family Gecarcinidae | | | | | | | | | | | |
| *Cardisoma guanhumi* Latreille | | | | | | | | | | + | + |
| Family Grapsidae | | | | | | | | | | | |
| *Pachygrapsus* sp. | | | | | | | | | + | | |
| *Varuna*? sp. | | | | + | | | | | | | |

collectors of these specimens, D. Woolacott and C.T. Trechmann. It could be argued that the bias of earlier studies towards the Upper Cretaceous and Eocene has now been overcompensated by our focus on the younger Cenozoic. However, the mid-Cenozoic White Limestone Group (Middle Eocene-Middle Miocene), with its commonly mold-like preservation and low yield of fossils, has deterred many macropaleontologists over the years. The description of abundant carapace material from the Early Miocene Montpelier Formation (Portell & Collins, in press) must be regarded as a triumph, rather than a failure to find crabs in the rest of the White Limestone Group. New collections of Pliocene and Pleistocene crabs await description by one of us (RWP), particularly from the Late Pliocene Hopegate Formation (dolomitized raised reef) and further taxa from the Falmouth Formation. However, it is anticipated that our program of fieldwork will now shift to the Paleogene, notably the Early-Middle Eocene Chapelton Formation, Yellow Limestone Group, which has already yielded a small diversity of taxa (Table 1). Also high on the agenda is the re-examination of the long-neglected Cretaceous deposits that yielded the material described by Withers.

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## References

**Bengtson P. 1988**. Open nomenclature. *Palaeontology* **31:** 223-227.

**Collins JSH, Donovan SK. 1998**. Some new crab records (Crustacea: Decapoda) from the late Pleistocene Port Morant Formation of southeast Jamaica. *Bull. Mizunami Fossil Mus.* **24 (1997)** : 73-77.

**Collins JSH, Donovan SK, Dixon HL. 1997**. Crabs and barnacles (Crustacea: Decapoda & Cirripedia) from the late Pleistocene Port Morant Formation of southeast Jamaica., *Bull. Mizunami Fossil Mus.* **23 (1996):** 51-63.

**Collins JSH, Donovan SK, Lindsay W, Simpson GA. 2001**. A new species of portunid crab from the early Pleistocene Old Pera beds of Jamaica. *Proc. Geol. Ass.* **112:** 7-12.

**Collins JSH, Portell RW. 1998**. Decapod, stomatopod and cirripede Crustacea from the Pliocene Bowden shell bed, St. Thomas parish, Jamaica. In: Donovan SK (ed.). The Pliocene Bowden shell bed, southeast Jamaica. *Contr. Tert. Quatern. Geol.* **35:** 113-127.

**Donovan SK, Dixon HL. 1998**. A fossil land crab from the late Quaternary of Jamaica (Decapoda, Brachyura, Gecarcinidae). *Crustaceana* **71:** 824-826.

**Larson DC. 1983**. *Depositional facies and diagenetic fabrics in the late Pleistocene Falmouth Formation of Jamaica.* Norman: University of Oklahoma (unpubl. MS thesis).

**Martin JW, Davis GE. 2001**. An updated classification of the Recent Crustacea. *Nat. Hist. Mus. Los Angeles Co. Sci. ser.* **39:** 124 pp.

**Mitchell SF, Pickerill RK, Stemann TA. 2001**. The Port Morant Formation (Upper Pleistocene, Jamaica): high resolution sedimentology and paleoenvironmental analysis of a mixed carbonate clastic lagoonal succession. *Sedim. Geol.* **144:** 291-306.

**Morris SF. 1993**. The fossil arthropods of Jamaica. In: Wright RM, Robinson E (eds). Biostratigraphy of Jamaica. *Geol. Soc. Amer. Mem.* **182:** 115-124.

**Pickerill RK, Mitchell SF, Donovan SK, Keighley DG. 1998**. Sedimentology and palaeoenvironment of the Pliocene Bowden Formation, southeast Jamaica. In: Donovan SK. (ed.). The Pliocene Bowden shell bed, southeast Jamaica. *Contr. Tert. Quatern. Geol.* **35:** 9-27.

**Portell RW, Collins JSH. in press**. Decapod crustaceans of the Lower Miocene Montpelier Formation, White Limestone Group of Jamaica. In: Donovan SK. (ed.). The mid-Cainozoic White Limestone Group of Jamaica. *Cainozoic Res.* **3**

**Robinson E. 1994**. Jamaica. In: Donovan SK, Jackson TA. (eds). *Caribbean Geology: An Introduction*: 111-127. Kingston: University of the West Indies Publishers' Association.

**Underwood CJ, Mitchell SF. in press**. Sharks, bony fishes and endodental borings from the Miocene Montpelier Formation (White Limestone Group) of Jamaica. In: Donovan SK (ed.), The mid-Cainozoic White Limestone Group of Jamaica. *Cainozoic Res.* **3**

**Withers TH. 1922**. On a new brachyurous crustacean from the Upper Cretaceous of Jamaica. *Ann. Mag. Nat. Hist.* **10:** 534-541.

**Withers TH. 1924**. Some Cretaceous and Tertiary decapod crustaceans from Jamaica. *Ann. Mag. Nat. Hist.* **13:** 81-93.

**Withers TH. 1927**. *Ranina trechmanni*, a new Cretaceous crab from Jamaica. *Geol. Mag.* **64:** 176-180.

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