

# A new genus and new species of Portunidae Rafinesque, 1815 (Decapoda, Brachyura) from the Colón Formation, Cuba

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## Abstract

*Paraeuphylax cubaensis*, a new genus and new species of decapod, is described from the Colón Formation (Oligocene–Miocene) in the Matanzas province, Cuba. The Podophthalminae was a diverse subfamily during the late Paleogene and early Neogene.

*Key words:* Oligocene, Miocene, Decapoda, Brachyura, Portunidae, Podophthalminae

## Introduction

Studies of the Cuban fossil decapod fauna have been sparse. Schweitzer et al. (2006) first recorded fossil decapods from Oligocene–Miocene deposits in Cuba. In more recent years, Varela and Rojas-Consuegra (2009 and in press) and Collins et al. (2009) made new contributions to the Cuban fossil decapod fauna. The purpose of this paper is to describe a new genus and new species of a portunid crab from the Matanzas province.

The material described herein is deposited in the Paleontological Collection of the Museo Nacional de Historia Natural de Cuba (MNHNCu), Ciudad de La Habana, Cuba.

## Colón Formation

The fossil decapod crustaceans examined here were collected from the fossiliferous limestone of the upper Oligocene–lower Miocene Colón Formation (Brödermann, 1945) in the quarries of Jagüey Grande, Matanzas province, Cuba. The limestone consists of medium to fine grained calcarenites, biogenic sand, biodetrital silty chalk, and calcareous marls. From this locality (Varela and Rojas-Consuegra, 2009) recorded *Portunus oblongus* Rathbun, 1920, and Varela and Rojas-Consuegra (in press) recorded additional taxa.

The fossils associated with the decapods comprise a diverse fauna, with invertebrates including pelecypods, gastropods, and corals; an abundant and diverse fauna of microfossils (Bermúdez, 1961; Franco et al., 1992); and vertebrates including dugongs, turtles, sharks, rays, and fishes.

## Systematics

Order Decapoda Latreille, 1802

Infraorder Brachyura Linnaeus, 1758

Section Eubrachyura de Saint Laurent, 1980

Superfamily Portunoidea Rafinesque, 1815

Family Portunidae Rafinesque, 1815

Subfamily Podophthalminae Dana, 1851

*Diagnosis:* Carapace much broader than long, widest about one-quarter to one half the distance posteriorly on carapace; front narrow to extremely narrow at base and broadening distally to form a “T-shape;” orbits extremely broad, occupying about 70 percent to nearly entire anterior margin of carapace, entire or with fissures or notches; eyestalks very long, sometimes wider than carapace; anterolateral margin with two to nine spines including outer-orbital spine; carapace often with transverse ridges on protogastric and branchial regions; epistomial spine well developed, visible dorsally; “antennules not completely retractile in fossae beneath front” (Davie, 2002, p. 456); basal article of antennae short and flagellum slender and long; sternum very broad, very broad portion of sternite 8 visible in ventral view, sternal suture 7/8 terminating well before sterno-abdominal cavity, sternal sutures 4/5, 5/6, 6/7, and 7/8 discontinuous; chelipeds very long, merus, carpus, and manus with spines, manus sometimes with keels; fifth pereopod with paddle-like dactylus and postero-distal spines of meri (modified after Ng, 1998; Apel and Spiridonov, 1998; Davie, 2002; Schweitzer et al., 2006).

*Included genera:* *Euphylax* Stimpson, 1862; *Paraeuphylax* new genus; *Pheophthalmus* Feldmann et al., 2010; *Podophthalmus* Lamarck, 1801; *Psygmophthalmus* Schweitzer et al., 2006; *Sandomingia* Rathbun, 1919; *Saratunus* Collins et al., 2003;

### Genus *Paraeuphylax* new genus

**Diagnosis:** Carapace wider than long; ovate, position of maximum width about half the distance posteriorly on carapace. Orbits shallow, each about 33 percent maximum width, with two open fissures; fronto-orbital width about 70 percent maximum width; front narrow, projected beyond orbits, base about 10 percent maximum width, T-shaped, ending in two reduced medial spines and sides with two small spines; anterolateral margin long, bearing 8 small spines not including outer-orbital spine. Carapace regions moderately defined; epigastric ridge extending from mesogastric region and curving to anterolateral margin, extending beyond as well developed eighth spine, weak transverse ridge on protogastric and hepatic regions.

**Etymology:** This genus is named *Paraeuphylax* for its similarity to *Euphylax*. The gender is masculine.

**Discussion:** The new genus is clearly referable to the Podophthalminae based upon its T-shaped front, very broad orbits, wider than long carapace, and overall portunoid countenance. However, two open orbital notches; lack of straight, well-developed, transverse carapace ridges; anterolateral margins with eight spines not including the outer-orbital spines; and fronto-orbital width occupying about 70 percent the maximum carapace width, distinguish it from the other genera within the subfamily. No other genus within the Podophthalminae possesses this combination of characters.

*Paraeuphylax* is similar to *Euphylax*, but the two genera are readily distinguished based on the features just mentioned. Besides, the front on *Euphylax* is much narrower proximally, occupying about three percent of the maximum carapace width, as compared to *Paraeuphylax*, in which it occupies about ten percent of the maximum carapace width. In *Pheophthalmus* Feldmann et al., 2010, the anterolateral margins have eight spines excluding the outer-orbital spine but the orbital margins are finely serrate and the carapace is widest at the position of the outer-orbital spines. *Psymmophthalmus* Schweitzer et al., 2006, has a relatively narrow fronto-orbital width for the subfamily as does *Paraeuphylax*, but it only has five anterolateral spines including the outer-orbital spine and a distinctly crenulated frontal margin.

The addition of a new genus from the Oligocene–Miocene of Cuba does not expand the geographic or geologic range for the subfamily. It is one of the older occurrences of the subfamily, as most are Miocene and younger in age (Feldmann et al., 2010). It does reinforce the Caribbean and Indo–Pacific distribution of the family and its peak diversity in the Neogene as previously hypothesized (Feldmann et al., 2010).

### *Paraeuphylax cubaensis* new species

(Figs. 1–3)

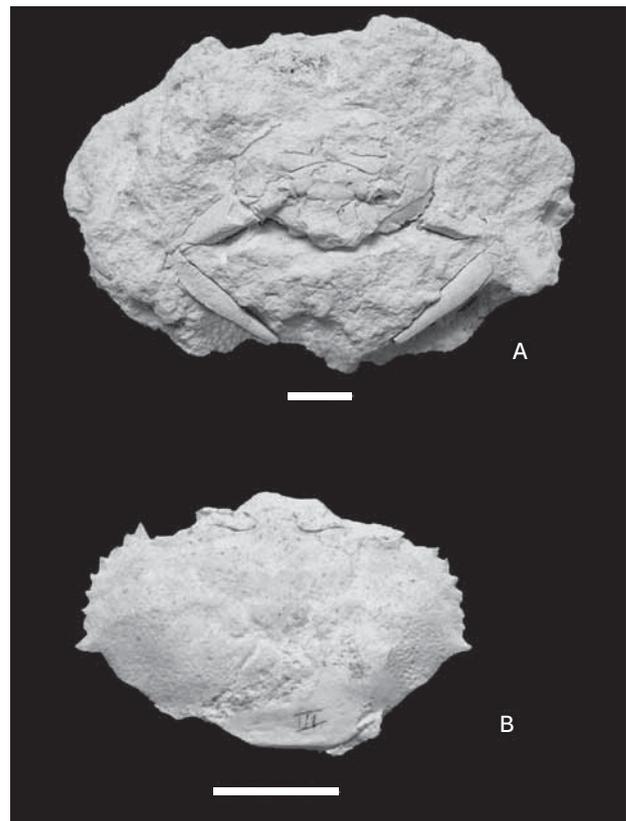


Fig. 1. *Paraeuphylax cubaensis* new genus and species; holotype MNHNCu-93.002395, carapace in lithified matrix (A) and carapace of same specimen, dorsal view, but released of the matrix (B). Scale bars = 2 cm.

**Diagnosis:** As for genus.

**Description:** Carapace ovate, wider than long, maximum width about 1.5 times maximum length positioned at about half the distance posteriorly on carapace. Front narrow, projected beyond orbits, base about 10 percent maximum width; T-shaped, ending in two reduced medial spines and sides with two small spines. Orbits shallow, each about 30 percent maximum width, with two fissures near the proximal region of the orbits; outer-orbital spine large, triangular, directed forward; fronto-orbital width about 70 percent maximum width. Anterolateral margin long, bearing seven small spines and one long spine excluding outer-orbital spine; small spines very similar in shape and form, triangular with sharp triangular teeth; last spine long, directed laterally. Posterolateral margin about as long as anterolateral margin. Posterior margin almost twice as long as anterolateral margin, concave, with well defined posterolateral reentrants.

Carapace regions moderately defined. Protogastric region inflated, with well defined transverse ridges parallel to posterior margin of protogastric region. Hepatic region flattened, with weak transverse ridges. Mesogastric region with long anterior process, well-developed muscle scars posteriorly; urogastric region with concave lateral margins; cardiac region elevated and divided into

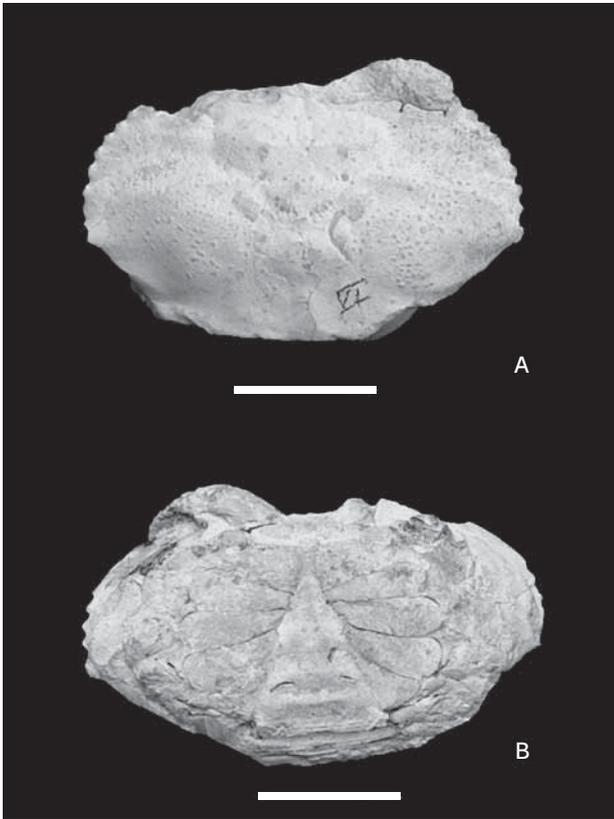


Fig. 2. *Paraeuphylax cubaensis* new genus and species, MNHNCu-93.002396, paratype, dorsal view of carapace (A) and ventral view (B). Scale bars = 2 cm.

two elevated swellings. Epigastric ridge extending from mesogastric region and curving into anterolateral margin, extending beyond as well developed eighth spine.

Male sternum broad, first four sternites fused; enlarged, fifth sternite curving slightly anterolaterally, sternite six directed laterally, sternite seven directed posterolaterally, eighth sternite smallest, clearly visible in ventral view. Telson of male triangular situated partially on fourth and partially on fifth sternites, six somite trapezoidal, almost wide as long, somite three to five fused; somites two and three with transverse ridges.

Chela exhibits a keeled manus; fingers each possess blunt teeth on occlusal surfaces.

*Etymology:* The trivial name *cubaensis* is derived from Cuba, the island on which the material was collected.

*Types:* Holotype, carapace, MNHNCu-93.002395, collected by Lázaro William Viñola, in quarry J-4, Matanzas province, 2007, preserved in fossiliferous limestone of the Colón Formation (Brödermann, 1945), deposited in the Paleontological Collection of the National Museum of Natural History of Cuba, Havana. Paratypes include 7 carapaces, 93.002396 to 93.002401 and 93.002406, and 4 chelae, 93.002402 to 93.002405, collected from the same locality as the holotype.

*Occurrence:* The specimens are late Oligocene to early Miocene in age.

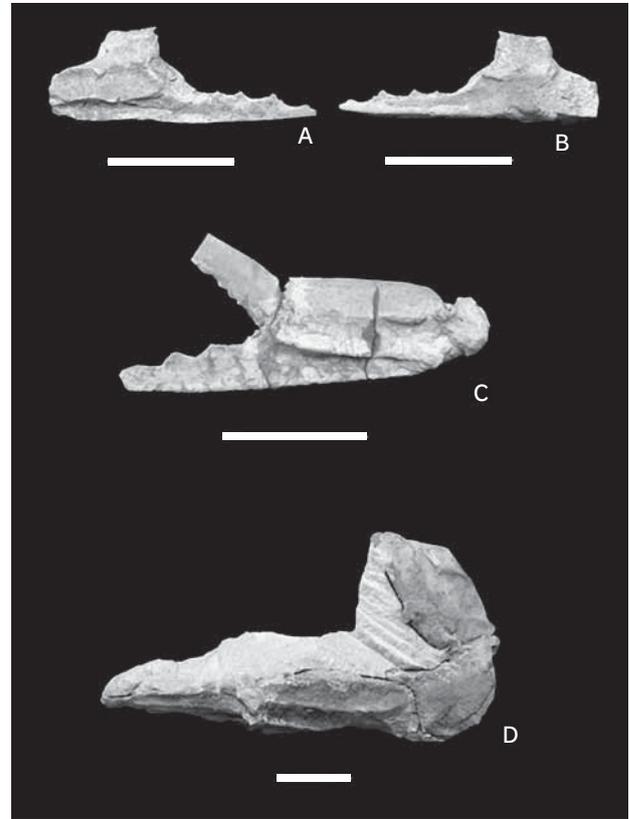


Fig. 3. *Paraeuphylax cubaensis* new genus and species. A–B, MNHNCu-93.002402, paratype, outer surface of right chela (A) and inner surface of right chelae (B); C, MNHNCu-93.002403, paratype, outer surface of left chela; D, MNHNCu-93.002404, paratype, dorsal view of left chela. Scale bars = 2 cm.

## Discussion

The Pododophthalminae was quite diverse in the late Paleogene and early Neogene. Several extinct genera and species are now known from the Americas. The occurrence of yet another new genus from the subfamily confirms its diversity during that time and place. It is notable that the various genera are quite distinct from one another in the carapace shape, orbital ornamentation, and number of anterolateral spines so that it is quite unlikely that they represent one highly morphologically diverse genus. In addition, within the Portunidae, features such as the number of anterolateral spines and orbital ornamentation are used by biologists as generic characters. Schweitzer et al. (2006) discussed the prevalence of portunoid fossils in the Caribbean area and the new genus and species adds to that diversity.

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