

Short Communication

New Records of Decapods in Pirabas Formation (Miocene), Pará State, Brazil

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Submitted: 19 August 2016

Accepted: 06 September 2016

Published: 30 September 2016

ISSN: 2379-0881

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Abstract

This work deals the systematic study of the decapods from Pirabas formation (Lower Miocene) at Pará state. Herein are present the first records of the species *Piloslambrus guerini* [1], *Portunus (Portunus) oblongus* Rathbun, [2] and *Palaeopinnixa porornata* [3].

Keywords

- Decapoda crustaceans
- Miocene
- Pirabas formation
- Brazil

INTRODUCTION

The story of study of fossil decapod crustaceans allow to recognize high specific diversity in some regions of the world. The Miocene record present twenty-seven genera in the paleotropical region at localities in Brazil, Venezuela, Trinidad, Barbados, Ecuador and Peru, time of considerable interchange of taxa between the Southern and Northern hemispheres. Decapod crustaceans records in the Pirabas Formation was initially made by Beurlen [4] and according to Távora et al. [5], 40 different species are recognized at the biggest expositions of this lithostratigraphic unit. This paper deals with systematic studies on three specimens deposited in the paleoinvertebrates collection at Museu de Geociências- Universidade Federal do Pará (MG/UFPa), from the Atalaia beach, Salinópolis city (0° 36' 5" S, 47° 18' 48" W), Aricuru district, Maracanã city (0° 42' 10" S, 47° 30' 43" W) and B-17 Mine, Capanema city (1° 02' 47" S, 47° 9' 26" W), Pará state (Figure 1).

MATERIAL AND METHODS

Carapace measurements are given as carapace width (cw) and carapace length (cl) adopted by Tan and Ng [6]. The analyzed samples were carried out by a Leika S6E binocular microscope, with a precision caliper for obtaining measurements. Photographs were obtained by Sony DSC-HX1 digital camera.

Geology

Pirabas Formation [7], with broadly outcrops along northeastern region of the Pará, Maranhão, and Piauí states, provides some of the best marine Cenozoic paleontological occurrences in Brazil. The Pirabas Formation- type location is the Pirabas River estuary, next the Salinópolis city, northeastern of Pará state in the Bragantina platform east of Salinas County in Pará state [8]. The Pirabas Formation consists of richly fossiliferous limestones that indicate a warm, shallow marine depositional environment where lived foraminifera, ostracods,

porifera, corals, bryozoans, bivalvs, gastropods, cephalopods, decapoda and cirripedia crustaceans, echinoderms, fishes, reptiles and mammals all of Lower Miocene age [9,10,5,11].

RESULTS AND DISCUSSION

The systematic classification, descriptions and nomenclature

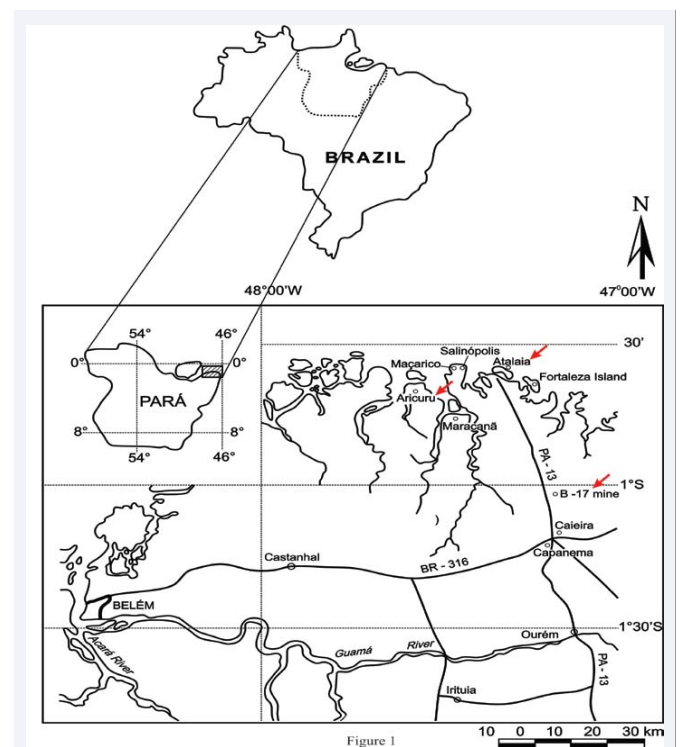


Figure 1 Study area in Pará state, with localities where the fossil decapods were collected.

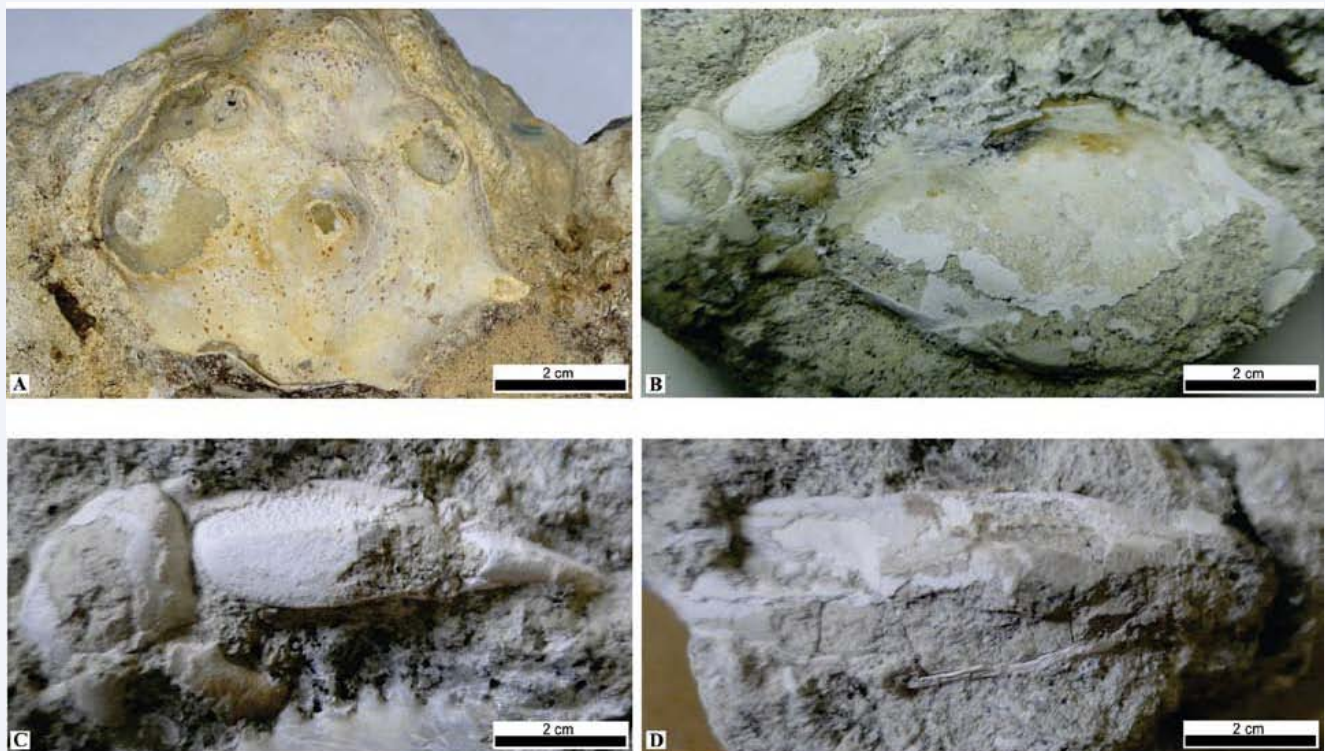


Figure 2 Family Parthenopidae MacLeay, [16]

Subfamily Parthenopinae MacLeay, [16]

Genus *Piloslambrus* Tan and Ng, [6]

Piloslambrus guerini [1]

Figure 2A: *Piloslambrus guerini* [1]; *Portunus (Portunus) oblongus* Rathbun, [2]: (B) general view; (C) and (D) chelipeds

Description: Carapace subpentagonal slightly broader than long, region inflated, rounded sides and without angles; epibranchial margin rounded not expanded to cover ambulatory legs area no produced beyond base of abdomen. Exorbital tooth acute. Regions moderately prominent, cardiac region mostly separated by shallow, rounded cervical groove; surface recovered with punctae, scattered serried tubercles, irregular in size. Branchial region broadly expanded, with straight, slender, acute spines at the lateral angles in the widest part of carapace. Intestinal region broad slightly projected beyond line of posterolateral angles. Cardiac region no prominent; proto-, meso- and metagastric regions conspicuous, without ridge. Subhepatic region moderately guttered, hepatic region slightly inflated at lower level of the gastric and epibranchial areas. Frontal region concave, rostrum small, triangular, acute, narrow, tapering, smooth and projected. The four biggest tubercles spiniform, simetric with rounded base and angular tops situated at epibranchial, mesogastric and cardiac areas; three smaller tubercles rounded and located at the intestinal, murogastric and hepatic regions.

Occurrence, material and dimensions: West Indies to States of São Paulo, Brazil- Recent [14]; Brazil- Pirabas formation, Miocene (present work). A torax (MG-6997-I) from Atalaia beach, Salinópolis city, Pará state, Brazil; cw 38 mm and cl 36 mm.

Family Portunidae Rafinesque, [17]

Subfamily Portuninae Rafinesque [17]

Genus *Portunus* Weber, [18]

Subgenus *Portunus* Weber, [18]

Portunus (Portunus) oblongus Rathbun, [18]

Figure: 2B, 2C, 2D

Description: Carapace broad, twice broad than long, more expanded in front of the lateral spines area; surface pubescent more produced at proto- and mesogastric regions, flattened at cardiac region. Spines of anterolateral margin are small, flattened and upturned, posterior margin slightly convex, anterior margin concave. Cheliped robust; anterior margin of merus denticulate; carpus, propodus and palm with delicated costae; carpus short, subtriangular in section. Orbital region, sternum, abdomen and walking legs no visibles.

Occurrence, material and dimensions: Dominican Republic - Cercado formation, Miocene [2]; Trinidad - Manzanilla bay, Recent; Brazil - Pirabas formation, Miocene (present study). A torax (MG-6998-I) from B-17 mine, Capanema city, Pará state, Brazil; cw 41 mm and cl 60 mm.

Family Pinnotheridae de Haan, [19]

Genus *Palaeopinnixa* Via, [20]

Palaeopinnixa porornata [3]

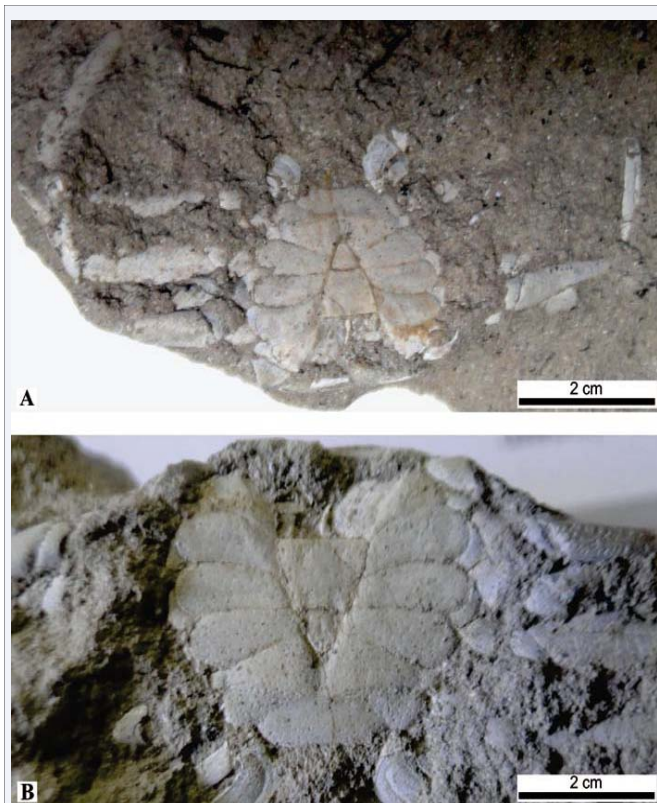


Figure 3

Figure 3 3A, 3B: *Paleopinnixa porornata* [2] (A) general view and similar walking legs; (B) detailed view of abdomen, thoracic sternites and telson.

Description: Carapace much wider than long, broadest at the middle, anterolateral margins arched and rounded; frontal and posterior margins truncate, nearly straight longitudinally and flat in transverse section. Walking legs similar in shape and length, slender and long with margins of ischium and merus sub cylindrical; carpus and propodus compressed with median delicate keel on surface. Only the small, rounded base-merus points are visible on chelipeds. Abdomen is broken but appears to be sub triangular, narrow and acute with distinct segments, constricted at the sides. Thoracic sternites elongate, oval, divergent lateral borders at each side of the abdomen, sterno-abdominal cavity little excavate, flat to shallow and narrow sutures. Telson similar to abdominal segments, transversely sub triangular; very acute, rounded and narrow on distal margin.

Occurrence, material and dimensions: Trinidad - Manzanilla bay, Recent; Brazil - Pirabas formation (present study). A abdomen and walking legs (MG-6999-I) from Aricuru locality, Maracanã city, Pará state, Brazil; cw 20 mm and cl 25 mm.

follow the proposal used in this paper and the essential terminology, is mainly based on Glaessner [12,13], Tan and Ng [14], Rathbun [2,14] and Collins and Morris [9]. In addition other complementary bibliography was used to complete the study.

CONCLUSIONS

During the Oligocene and Miocene, Atlantic, Caribbean and Pacific waters were united, and the Circum-Tropical Marine Current generally drifted westward. This scenario favored the dispersion and evolution of the portunids and others decapods [15]. The majority of decapods reported in cenozoic strata of

Caribbean, Atlantic and Pacific displayed a tethyan diastribution pattern during their history. The abundance and diversity of portunids taxa specially from the Oligocene and Miocene is related to environmental preferences mainly in temperatute and substrate composition, present in Caribbean region [15]. The three species recognized in this research confirm the affinity of the Pirabas formation with the others synchronous litostratigraphic units of the Caribbean region mostly with paleocarcinofaune recorded in Dominican Republic, Trinidad and Panama.

REFERENCES

1. Beurlen K. Contribuição à Paleontologia do estado do Pará. Crustáceos decápodes da Formação Pirabas. Boletim do Museu Paraense Emílio Goeldi, Nova Série Geologia. 1958; 5: 1-48.
2. Collins JSH, Morris SF. Tertiary and Pleistocene crabs from Barbados and Trinidad. Palaeontology. 1976; 19: 107-131.
3. Costa JBS Borges MS, Bemerguy RL, Fernandes JMG, Costa Junior PS, Costa ML. Evolução cenozóica da região de Salinópolis, nordeste do Estado do Pará. Geociências. 1993; 12: 373-396.
4. Feldmann RM, Schweitzer CE. Paleobiogeography of southern hemisphere decapod crustaceans. J of Paleontology. 2006; 80: 83-103.
5. Fernandes ACS. Contribuição à Paleontologia do Estado do Pará. Um novo Flabellum (Anthozoa- Scleractinia) na Formação Pirabas. Boletim do Museu Paraense Emílio Goeldi, nova série, Geologia. 1981; 24: 1-7.
6. Glaessner MF. Decapoda. Treatise on Invertebrate Paleontology, 1st edn. Kansas: The University of Kansas Press. Part R Arthropoda. 1969; 4: 2.
7. Haan W de. 1833-1850. Crustacea. In: Siebold PF, editor. Fauna Japonica sive Descriptio Animalium, quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui Summum in India Batava Imperium Tenent, Suscepto, Annis 1823-1830 Collegit, Notis, Observationibus et Adumbrationibus Illustravit J. Müller et Co. 1833; 109-164.
8. MacLeay W. On the brachyurous decapod Crustacea brought from the Cape by Dr. Smith., In: The Cape of Good Hope Association for Exploring Africa. London: Smith. Elder and Co. 1838; 53-71.
9. Maury CJ. Fósseis terciários do Brasil com descrição de novas formas cretáceas. Monografia do Serviço Geológico e Mineralógico do Brasil. 1925; 4: 1- 665.
10. Rafinesque CS. Analyse de la nature, ou tableau de l'univers et des corps organisés. Palermo: L'Imprimerie de Jean Barravecchia. 1815.
11. Ramalho LV, Távora VA, Tilbrook KJ, Zágorsk K. New species of Hippopleurifera (Bryozoa, Cheilostomata) from the Miocene Pirabas Formation, Pará state, Brazil. Zootaxa. 2015; 3999: 125-134.
12. Rathbun MJ. Additions to the West Indian tertiary decapod crustaceans. Proceedings of the United States National Museum. 1920; 58: 381-384.
13. Rathbun MJ. The spider crabs of America. Bulletin of United States National Museum. 1925; 129: 1- 613.
14. Rossetti DF, Góes, AM. Geologia. In: Rossetti DF, Góes, AM, editors. O Neógeno da Amazônia Oriental. Belém: Editora do Museu Paraense Emílio Goeldi. 2004; 13-52.
15. Schweitzer CE, Iturralde-Vinent M, Hetler JL, Velez-Juarbe J. Oligocene and Miocene decapods (Thalassinidea and Brachyura) from the Caribbean. Annals of Carnegie Museum. 2006; 75: 111- 136.
16. Tan SH, Ng PKL. Descriptions of new genera from the subfamily Parthenopinae (Crustacea: Decapoda: Brachyura: Parthenopidae).

- The Raffles Bulletin of Zoology, supplement. 2007; 16: 95- 119.
17. Távora VA, Santos AAR, Araújo RN. Localidades fossilíferas da Formação Pirabas (Mioceno Inferior). Boletim do Museu Paraense Emílio Goeldi série Ciências Naturais. 2010; 5: 207-224.
18. Via L. Pinnixa (Palaeopinnixa) mytilicola, nuevo braquiuro fósil, en el mioceno marino del Vallés (Barcelona). Acta Geológica Hispánica. 1966; 1: 1-4.
19. Zágoršek K, Ramalho LV, Berning B, De Araújo Távora V. A new genus of the family Jaculinidae (Cheilostomata, Bryozoa) from the Miocene of the tropical western Atlantic. Zootaxa. 2014; 3838: 98-112.
20. Weber F. Nomenclator entomologicus secundum Entomologiam Systematicum ill. Fabricii, adjectis speciebus recens detectis et varietatibus. C.E. Bohn, Chilonii and Hamburgi. 1795.

Cite this article

de Araújo Távora V, Dias JJ (2016) New Records of Decapods in Pirabas Formation (Miocene), Pará State, Brazil. *Ann Aquac Res* 3(2): 1019.