

Range extensions along western Atlantic for Epialtidae crabs (Brachyura, Majoidea) genera *Acanthonyx* Latreille, 1828 and *Epialtus* H. Milne Edwards, 1834

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Abstract

The present study provided information extending the known geographical distribution of three species of majoid crabs, the epialtids *Acanthonyx dissimulatus* Coelho, 1993, *Epialtus bituberculatus* H. Milne Edwards, 1834, and *E. brasiliensis* Dana, 1852. Specimens of both genera from different carcinological collections were studied by comparing morphological characters. We provide new data that extends the geographical distributions of *E. bituberculatus* to the coast of the states of Paraná and Santa Catarina (Brazil), and offer new records from Belize and Costa Rica. *Epialtus brasiliensis* is recorded for the first time in the state of Rio Grande do Sul (Brazil), and *A. dissimulatus* is reported from Quintana Roo, Mexico. The distribution of *A. dissimulatus*, previously known as endemic to Brazil, has a gap between the states of Espírito Santo and Rio de Janeiro. However, this restricted southern distribution is herein amplified by the Mexican specimens.

Key words: Geographic distribution, majoid, new records, spider crabs.

Introduction

The family Epialtidae MacLeay, 1838 includes 76 genera, among them *Acanthonyx* Latreille, 1828 and *Epialtus* H. Milne Edwards, 1834 with 17 and 11 valid species, respectively (Empananza *et al.*, 2007; Ng *et al.*, 2008).

Acanthonyx dissimulatus Coelho, 1993 is a small crab known to occur from Piauí to Bahia (Coelho and Torres, 1993; Melo, 1996; Coelho *et al.*, 2008) and São Paulo State (Mantelatto and Corrêa, 1996). It lives in shallow waters until depths of 25m, and can be found on hard substrates, sandy bottoms or mostly associated to aquatic vegetation

(Melo, 1996). *Epialtus bituberculatus* H. Milne Edwards, 1834 has been from Florida (USA), Gulf of Mexico, West Indies, Colombia, Venezuela and Brazil (Ceará to São Paulo State) (Melo, 1996); *E. brasiliensis* Dana, 1852 occurs in Colombia and Brazil (Ceará, Espírito Santo to Paraná State) (Fausto-Filho, 1970; Melo, 1996; Masunari and Dubiaski-Silva, 1998; Coelho *et al.*, 2008). Both *Epialtus* species inhabit the intertidal zone until 10m and can be frequently found associated with seagrasses (*Sargassum* sp.) and algae, on hard substrates or sandy bottoms (Coelho, 1971; Mantelatto and Corrêa, 1996; Melo, 1996;).

Here, we provide new data that extend

the geographical distributions of three species of epialtid crabs: *Acanthonyx dissimulatus* is reported from Mexico; *Epialtus bituberculatus* to the coast of the states of Paraná and Santa Catarina (Brazil), and offer new records from Belize and Costa Rica; and *E. brasiliensis* is recorded for the first time in the state of Rio Grande do Sul (Brazil).

Material and Methods

As part of a research project on the systematic of decapod crustaceans, specimens of both genera collected by us and from different carcinological collections were studied by comparing morphological characters based on Rathbun (1925, 1933), Coelho and Torres (1993), Melo (1996) and Hendrickx (1999).

The examined material was deposited in the Crustacean Collection of the Department of Biology (CCDB), Faculty of Philosophy, Sciences and Letters of Ribeirão Preto (FFCLRP), University of São Paulo (USP). Complementary specimens for analysis were obtained by loans from the following crustacean collections: Universidade Federal de Pernambuco (DOUFPE), Museu Nacional do Rio de Janeiro (MNRJ), Universidade Federal do Rio Grande do Sul (UFRGS), University of Louisiana-Lafayette, Zoological Collections (ULLZ), Universidad Nacional Autónoma de México (UNAM), and Museum of Zoology of Universidad de Costa Rica (UCR). We measured the carapace length (CL) with a vernier caliper (0.01 mm) in all specimens analyzed, from the posterior to the anterior margin, including the rostrum.

Results

Systematics

Section Eubrachyura Saint Laurent, 1980
 Subsection Heterotremata Guinot, 1977
 Infraorder Brachyura Linnaeus, 1758

Superfamily Majoidea Samouelle, 1819
 Family Epialtidae MacLeay, 1838
 Subfamily Epialtinae MacLeay, 1838

Acanthonyx dissimulatus Coelho, 1993
 (Fig. 1A)

Material examined: MEXICO, Quintana Roo, La Mancha Rodes: 1 male (CL 15.9 mm), 1 ovigerous female (CL 8.2 mm), 02/VII/2002, coll. not available (CCDB 2430).

Additional material: BRAZIL, Rio Grande do Norte, Potiguar Basin: 1 ovigerous female (CL 9.9 mm), 23/XI/2003, coll. not available (DOUFPE 13837); Rio Grande do Norte, Potiguar Basin: 2 males (CL 7.1 and 10.7 mm), 23/XI/2003, coll. not available (DOUFPE 13906); Rio Grande do Norte, Potiguar Basin: 1 male (CL 15.4 mm), 21/XI/2003, coll. not available (DOUFPE 13920); Rio Grande do Norte, Potiguar Basin: 1 female (CL 8.6 mm), 2 ovigerous females (CL 10.5 and 13.5 mm), 21/XI/2003, coll. not available (DOUFPE 13927); Pernambuco, Santo Aleixo Island: 1 female (CL 8.14 mm), 06/II/2007, coll. not available (DOUFPE 13523); Pernambuco, Santo Aleixo Island: 1 ovigerous female (CL 11.5 mm), 2 juveniles (CL 2.9 and 3.6 mm), 06/II/2007, coll. not available (DOUFPE 13524); Bahia, Corumbau, Itacolomis: 3 males (CL 4.9 - 8.0 mm), 16/II/2000, coll. P.C. Paiva (MNRJ 16748); Rio de Janeiro, Arraial do Cabo, Anjos Beach: 1 male (CL 24.3 mm), 1 ovigerous female (CL 20.2 mm), 06/IX/2003, coll. C.E.L. Ferreira (MNRJ 19254); São Paulo, Ubatuba, Grande Beach: 1 male (CL 11.75 mm), 04/V/2004, coll. F.L. Mantelatto (CCDB 1421); São Paulo, Ubatuba, Itaguá Beach: 2 males (CL 8.8 and 18.7 mm), 1 female (CL 8.5 mm), 2 ovigerous females (CL 17.2 and 18.5 mm), 1 juvenile (CL 9.3 mm), XII/1995, coll. not available (CCDB 103).

Type locality: Tambaú, João Pessoa County, Paraíba State, Brazil

Distribution: Western Atlantic: Mexico (present study) and Brazil (from Piauí to São Paulo) (Coelho and Torres, 1993; Melo, 1996; Almeida and Coelho, 2008; Coelho *et al.*, 2008).

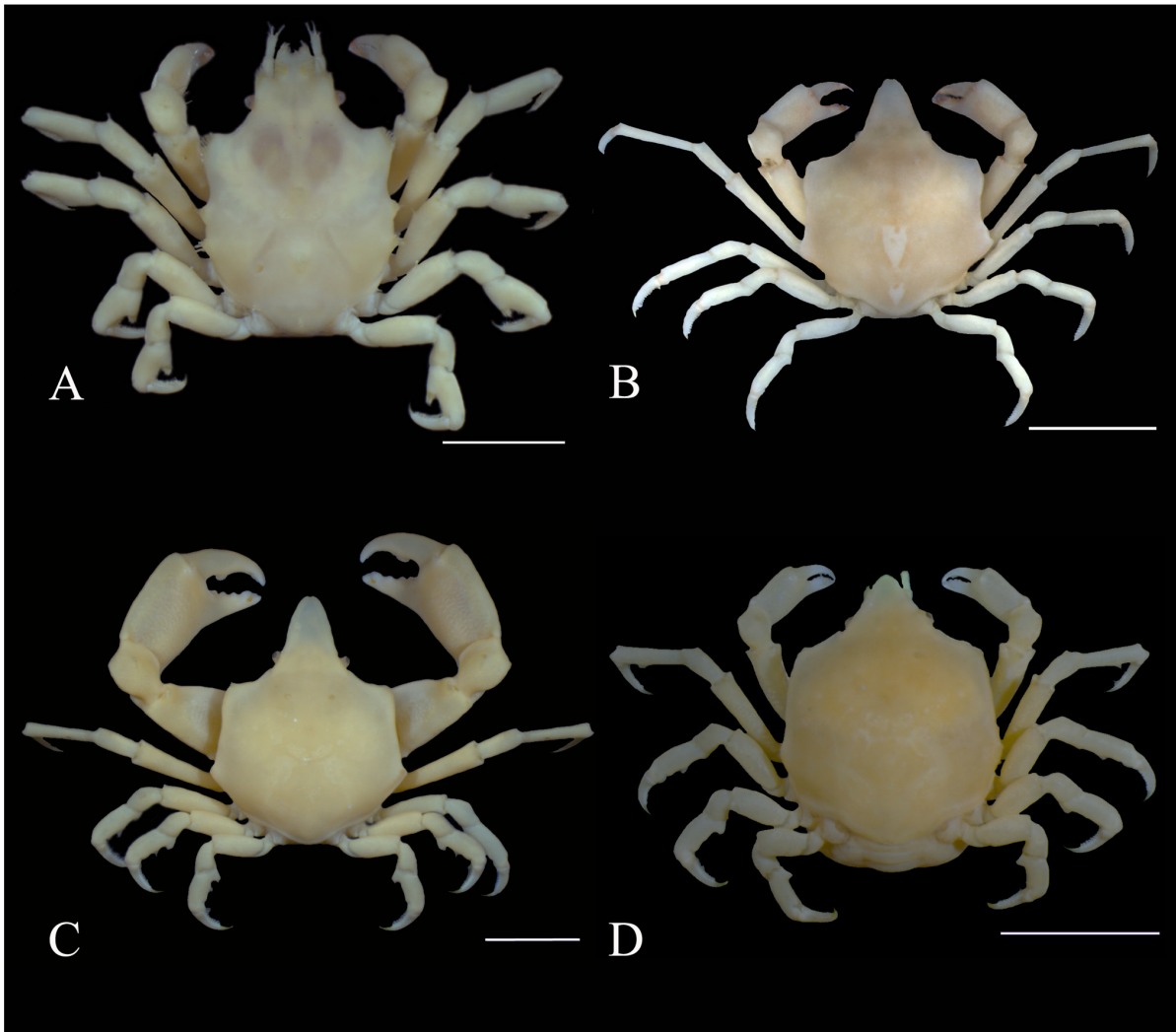


Figure 1. Dorsal view of epialtid crabs. (A) *Acanthonyx dissimulatus* Coelho, 1993, male CL 12.2 mm (CCDB 1421). (B) *Epialtus bituberculatus* H. Milne Edwards, 1834, male CL 8.9 mm (CCDB 2441). (C) *Epialtus brasiliensis* Dana, 1852, male CL 13.2 mm (CCDB 0437). (D) *Epialtus brasiliensis*, ovigerous female CL 9.0 mm (CCDB 0437). Scale bars: 5 mm.

Remarks: The distribution of *A. dissimulatus*, previously known as endemic to Brazil (Coelho and Torres, 1993), has a gap between the states of Espírito Santo and Rio de Janeiro. However, this restricted southern distribution is herein amplified by the Mexican specimens (CCDB 2430). Furthermore, *A. dissimulatus* is very similar to *A. petiverii* H. Milne Edwards, 1834 (Coelho and Torres, 1993), another species that also occurs in Brazil and Mexico (Retamal, 1981; Hiyodo *et al.*, 1994; Hendrickx, 1999; Marcano and Bolaños, 2001; Empanza *et al.*, 2007; present study). *Acanthonyx dissimulatus* has not been cited from Mexico possibly because of misidentification for *A. petiverii*. In larger

males of *A. dissimulatus*, the propodus of chelipeds with fingers considerably gaping when closed, and fixed finger and dactylus are smooth. In *A. petiverii*, fingers are denticulate, and the propodus of chelipeds with fingers slightly gaping when closed both in male and female (Garth, 1958; Coelho and Torres 1993; pers. obs.). Such characters are used to differentiate between the two species, although there is a lot of variation relying on the size and sex (pers. obs.). In addition, molecular analysis using different genes is under way to confirm and refine this aspect.

Epialtus bituberculatus H. Milne Edwards, 1834 (Fig. 1B)

Material examined: BELIZE, Dondriga, Pelican Beach Resort: 1 male (CL 11.0 mm), 1 female (CL 7.8 mm), undated, coll. D.L. Felder (ULLZ 12624); Dondriga, Pelican Beach Resort: 1 ovigerous female (carapace damaged), 10/V/2006, coll. S. Fredericq (ULLZ 6695); COSTA RICA, Puerto Viejo: 1 male (CL 7.9 mm), 2 ovigerous females (CL 7.3 and 7.4 mm), 12/II/1981, coll. D. Moron (UCR 1038); BRAZIL, Paraná, Matinhos, Caiobá, Mansa Beach: 1 female (CL 4.3 mm), 10/II/2002, coll. F.L. Mantelatto and E.C. Mossolin (CCDB 2263); Santa Catarina, Florianópolis, Ponta Norte, Sambaqui Beach: 1 male (CL 5.6 mm), 1 ovigerous female (CL 6.7 mm), 16/IV/2007, coll. F.L. Mantelatto, L.G. Pileggi, L.S. Torati and E.C. Mossolin (CCDB 1887).

Additional material: MEXICO, Quintana Roo, Cozumel: 2 males (CL 9.9 and 10.9 mm), 1 female (CL 6.0 mm), 1 ovigerous female (CL 6.0 mm), 15/I/1985, coll. J.C. Nates, J.L. Villalobos and A. Cantu (UNAM 3710); Quintana Roo, José María Morelos: 1 male (CL 5.2 mm), 1 ovigerous female (CL 6.2 mm), 27/I/1987, coll. not available (UNAM 21051); Quintana Roo, Solidaridad: 2 males (CL 5.7 and 12.5 mm), 1 ovigerous female (CL 7.4 mm), 26/VI/1988, coll. not available (UNAM 9578); PANAMA, Bocas del Toro: 1 male (CL 7.9 mm), 2 females (CL 3.1 and 5.9 mm), 1 ovigerous females (CL 5.9 mm), 09/VIII/2004, coll. D.L. Felder (ULLZ 10755); Bocas del Toro, Playa Paunch: 1 male (CL 7.0 mm), 1 female (CL 4.7 mm), 05/VIII/2011, coll. F.L. Mantelatto (CCDB 917); VENEZUELA, Isla Margarida, Boca Chica: 4 males (CL 3.1 - 7.8 mm), 3 females (CL 3.8 - 6.1 mm), 3 ovigerous females (CL 6.3 - 6.8 mm), 03/XI/2010, coll. R. Lopez (CCDB 2429); Playa Valdez: 1 ovigerous female (CL 7.6 mm), 27/VIII/2006, coll. F.L. Mantelatto and L.G. Pileggi (CCDB 1786). BRAZIL, Rio Grande do Norte, Potiguar Basin: 4 males (CL 5.5 - 6.1 mm), 6 females (CL 3.9 - 6.3 mm), 23/XI/2003, coll. not available (DOUFPE 13890); Rio Grande do Norte, Potiguar Basin: 1 female (CL 4.9 mm), 1 ovigerous female (CL 6.0 mm), 23/XI/2003, coll. not available

(DOUFPE 13899); Pernambuco, Recife, Boa Viagem Beach: 6 males (CL 5.1 - 12.4 mm), 5 females (CL 4.7 - 5.6 mm), 06/IV/2012, coll. F.L. Mantelatto (CCDB 3813); Pernambuco, Santo Aleixo Island: 2 males (CL 4.1 and 7.1 mm), 06/II/2007, coll. A.O. Almeida (DOUFPE 13525); Bahia, Ilhéus, Badusca Beach: 1 ovigerous female (CL 6.9 mm), 06/XI/2010, coll. F.L. Mantelatto, F.L. Carvalho and L.G. Pileggi (CCDB 2426); Rio de Janeiro, Paraty, Jurumirim Beach: 1 ovigerous female (CL 7.7 mm), 24/IV/2012, coll. I.C. Leone, M. Negri and A.F. Tamburus (CCDB 3861); São Paulo, Ubatuba, Flamengo Bay: 9 males (CL 3.3 - 15 mm), 7 females (CL 3.2 - 7.1 mm), 2 ovigerous females (CL 8.7 and 9.4 mm), 12/V/2010, coll. F.L. Mantelatto (CCDB 2441); São Paulo, Ubatuba, Itaguá Beach: 1 male (CL 6.2 mm), 6 females (CL 5.0 - 7.8 mm), 17/II/2010, coll. F.L. Mantelatto (CCDB 2431).

Type locality: Chile (?) or the Atlantic.

Distribution: Western Atlantic: Florida, Gulf of Mexico, Mexico, West Indies, Belize (present study), Costa Rica (present study), Panama (Atlantic coast) (Powers, 1977), Colombia, Venezuela, Brazil (Ceará to Santa Catarina) (Coelho, 1971; Powers, 1977; Coelho *et al.*, 1986; Melo, 1996; Hernández-Aguilera *et al.*, 1997; Marcano and Bolaños, 2001; Hernández-Ávila *et al.*, 2007; Coelho *et al.*, 2008; Felder *et al.*, 2009; Lima Júnior *et al.*, 2010; present study), and Chile (Garth, 1958).

Remarks: *Epialtus bituberculatus* was recorded for the first time in Chile (Milne Edwards, 1834) and that species was considered as part of the Chilean fauna for Rathbun (1925; 1933) and Abele and Kim (1986). But Garth (1958) and Powers (1977) recognized an exclusively Atlantic range, since that species was reported in the Pacific only in a single record for Milne Edwards. In the catalogue of Chilean decapods, this species was not registered (Retamal, 1981) and in Retamal and Moyano (2010) there is no occurrence yet. Thus, that record can be doubtful due to misidentification of some specimens, and other authors did not discuss this question.

Both species of *Epialtus* from Brazil have similar habitat, coexisting on the same algae (Mantelatto and Corrêa, 1996; Melo, 1996; Mantelatto *et al.*, 2004; pers. obs.), suggesting similar habits and structures. Carapace and rostrum morphology are also very similar (Rathbun, 1925; Melo, 1996), and the presence of a proximal spine on the propodus ventral surface in the last three ambulatory pereopods is the most important feature that identifies *E. brasiliensis* (with spine) and *E. bituberculatus* (spine absence).

Epialtus brasiliensis Dana, 1852 (Fig. 1C-D)

Material examined: BRAZIL, Rio Grande do Sul, Torres: 1 male (CL 13.9 mm), 3 ovigerous females (CL 9.7 - 11.6 mm), 08/XII/1981, coll. not available (UFRGS 580).

Additional material: PANAMA, Bocas del Toro: 1 ovigerous female (CL 5.3 mm), 09/VIII/2004, coll. D.L. Felder (ULLZ 10755); BRAZIL, São Paulo, Ubatuba: 3 males (CL 11.8 - 12.8 mm), 11 ovigerous females (CL 7.2 - 9.0 mm), XII/1995, coll. F.L. Mantelatto and E.K. Correa (CCDB 437); São Paulo, Ubatuba, Itaguá Beach: 2 males (CL 9.7 and 10.8 mm), 7 females (CL 6.4 - 7.5 mm), 17/II/2010, coll. F.L. Mantelatto (CCDB 2432); São Paulo, Ubatuba, Vermelha do Sul Beach: 1 male (CL 10.5 mm), 1 ovigerous female (CL 8.64 mm), 30/I/1984, coll. F.R. Marcondes (CCDB 2433); Santa Catarina, Garopaba: 2 males (CL 7.6 and 9.5 mm), 1971, coll. not available (UFRGS 034).

Type locality: Guanabara Bay, Rio de Janeiro, Brazil.

Distribution: Western Atlantic: Panama (present study), Venezuela, Colombia and Brazil (Ceará, and from Espírito Santo to Rio Grande do Sul) (Fausto-Filho, 1966; 1970; Melo *et al.*, 1989; Melo, 1996; Masunari and Dubiaski-Silva, 1998; Marcano and Bolaños, 2001; Hernández-Ávila *et al.*, 2007; Melo, 2008; present study).

Remarks: The material identified as *E. brasiliensis* (ULLZ 12624; ULLZ 6695; CCDB 1887) was examined and identified correctly as *E. bituberculatus*. Therefore, the

extension of the geographic distribution range was possible due to these analyzes, because of the additional material (UCR 1038; UFRGS 580), and analyzes of our own specimens (CCDB 2430). *Epialtus brasiliensis* has been cited from Salvador (Gouvêa, 1986), but in northeast of Brazil this species is only known in Ceará (Fausto-Filho, 1970; Coelho *et al.*, 2008). Thus, Almeida and Coelho (2008) considered the records from Bahia doubtful; it may be the result of insufficient sampling (Lima Júnior *et al.*, 2010) or even mistaken for other species.

Final Comments

Following the carcinological tendency in recent years - due the increase of new projects, new collections and new groups of carcinologists - range extensions of decapod crustaceans have been recorded in many regions worldwide (Rahayu and Ng, 2000; Tavares and Amouroux, 2003), including the Brazilian coast (e.g. Mantelatto and Dias 1999, Mantelatto *et al.*, 2001; Cobo *et al.*, 2002; Alves *et al.*, 2006; Camargo *et al.*, 2010; Almeida *et al.*, in press). Range extensions of the epialtid crabs *A. dissimulatus*, *E. bituberculatus* and *E. brasiliensis* were relevant mainly for biogeographic and taxonomic studies.

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