

A new freshwater crab of the genus *Brasiliothelphusa* Magalhães and Türkay, 1986 from Rio Aripuanã, southern Amazon Region, Brazil (Decapoda: Pseudothelphusidae)

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Abstract

A second species belonging to the genus *Brasiliothelphusa* Magalhães and Türkay, 1986 is described and illustrated. *Brasiliothelphusa dardanelosensis*, new species, was collected from cachoeira de Dardanelos, in the upper Rio Aripuanã, Mato Grosso State, Brazil. The new species is characterized by the morphology of the first male gonopod, as follows: a mesial process well separated by a wide, rounded concavity from the apical plate, latter strongly bent caudally, partially covering the marginal process and bearing an apical crest on its mesiocephalic side. The affinities with the only other known species of the genus are discussed and their distributional patterns provided.

Key words: Brachyura, new species, Mato Grosso, Brazil, taxonomy, Neotropical region.

Introduction

The monotypic genus *Brasiliothelphusa* was proposed by Magalhães and Türkay (1986) to include *B. tapajoense* Magalhães and Türkay, 1986, based on specimens from the middle Rio Tapajós, in Brazil. This was the first record of a species of pseudothelphusid crab to be recorded from a southern tributary of the Amazon River. Magalhães (1986) verified that the distribution of this freshwater crab family did indeed extend to the southern Amazon Region. More recently, other species of the family have been described from southern tributaries of the Amazon by Magalhães (2003, 2005, 2009).

Specimens of an undescribed species of freshwater crab of the genus *Brasiliothelphusa* were found during faunistic surveys carried out in the Cachoeira de Dardanelos and Cachoeira das Andorinhas, a complex of waterfalls in the Rio Aripuanã (Mato Grosso State, Brazil) that would be threatened by the planned construction of a hydroelectrical plant. This new species is herein described and compared to the only other species of the genus.

The holotype is deposited in the crustacean collections of the Instituto Nacional de Pesquisas da Amazônia, Manaus (INPA). Paratypes are deposited in the Museu de Zoologia de Universidade de São Paulo, São Paulo (MZUSP), and the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main (SMF). The description is based on the male holotype. The following abbreviations are used: carapace breadth (cb), measured across the carapace at its widest point; carapace length (cl), measured along the midline, from the frontal to the posterior margin; carapace height (ch), the maximum height of the cephalothorax; frontal breadth (fb), the breadth of the front measured along the upper border; pereopods (P); thoracic sternite (s). Measurements, in millimeters, are given in parentheses after the number of specimens examined. The term “gonopod”, when used alone, refers to the first male gonopod, and “cachoeira” means waterfall in Portuguese. Terminology for describing the gonopod morphology follows Smalley (1964) and Magalhães and Türkay (1986).

Systematic account**Pseudothelphusidae Ortmann, 1893****Kingsleyini Bott, 1970*****Brasiliothelphusa* Magalhães and Türkay, 1986*****Brasiliothelphusa dardanelosensis* new species****Figs. 1-3**

Material examined – Holotype: Male (cb 65.3, cl 38.8, ch 21.2, fb 17.1), INPA 1474; Brazil, Mato Grosso State, Rio Aripuanã, upstream from cachoeira de Dardanelos, municipality of Aripuanã, 10°09'40.6"S, 59°27'41.9"W, 25.vi.2006, leg. B. Perillo. Paratypes: Brazil, Mato Grosso State: 1 male (cb 37.7, cl 24.2), SMF 36258, Rio Aripuanã, Porto das Coves, upstream from cachoeira Andorinhas and cachoeira Dardanelos, municipality of Aripuanã, 10°10'08.6"S, 59°27'20.8"W, 05.vii.2007, leg. D. M. Pimpão, N. Flausino Jr. and J. A. S. Zuanon; 2 females (cb 35.3, cl 21.6; cb 33.0, cl 21.1), INPA 1764, same locality, 05.vii.2007, leg. D. M. Pimpão, N. Flausino Jr., N. Estevão; 1 male (cb 58.5, anterior part of carapace partially broken), INPA 1762, same locality, upstream from cachoeira Andorinhas, 10°09'50.6"S, 59°27'55.9"W, 09.vii.2007, leg. D. M. Pimpão, N. Flausino, J. A. S. Zuanon, F. A. Machado and N. Estevão; 1 female (cb 36.8, cl 23.1), INPA 1763, same locality, just downstream from cachoeira Andorinhas, in a rock crevice, 10°10'59.8"S, 59°27'20.2"W, 08.vii.2007, leg. D. M. Pimpão, and N. Flausino Jr.; 1 male (cb 37.8, cl 24.5); 2 females (cb 50.7, cl 31.8; cb 52.0, cl 33.2), MZUSP 21427, same locality, sandy beach downstream from cachoeira Andorinhas, 10°09'59.8"S, 59°27'20.2"W, 10.vii.2007, leg. D. M. Pimpão and N. Flausino Jr., J. A. S. Zuanon and R. C. Salgado.

Diagnosis – Male first gonopod with marginal process wide, rounded, curved in cephalic direction, not projected distally over the field of apical spines; apical plate well developed, strongly bent caudally, partially covering marginal process; apical plate subcircular, showing rounded crest projecting apically in mesocephalic view; cephalic side of apical plate partially folded distally, showing shallow sulcus between apical crest and caudal border; mesial border with sharp, triangular spine proximally. Mesial process, apical plate well separated by wide, rounded concavity. Field of apical

spines developed, open, delimited only by cephalic border of apical plate, forming elongated semicircular patch on lateral side, densest at basal fold. Terminal article of second male gonopod slender, flagellum-like, nearly as long as first gonopod, with numerous spinules distally.

Description – Carapace outline ellipsoid, widest in middle (cb/cl: 1.68); dorsal surface smooth, slightly convex, regions ill defined. Pair of gastric pits barely distinct, very close to each other on metagastric region. Cervical grooves wide, shallow, nearly straight; extremities barely reaching anterolateral margin. Postfrontal lobules low; median groove indistinct between postfrontal lobules. Surface of carapace between frontal, postfrontal lobules smooth, slightly inclined anteriorly. Upper border of front about one fourth of carapace breadth (fb/cb: 0.26), straight in dorsal view, slightly concave in frontal view, with faint notch in middle, marked with row of faint papillae; lower border of front carinate, not visible in dorsal view, sinuous in frontal view. Upper, lower orbital margins marked by row of very faint papillae; exorbital angle obtuse. Anterolateral margins of carapace with faint notch just behind exorbital angle, second notch at end of cervical groove; row of several minute, low, blunt teeth extending to middle of posterolateral margins, posterior part smooth, rounded. Epistome thin, rather pilose, lower margin trilobed with triangular epistomial tooth in center. Suborbital, subhepatic regions of carapace sidewall smooth; pterygostomial regions covered by somewhat thin pubescence around mouthparts, otherwise smooth. Aperture of efferent branchial channel wide, subtrapezoidal.

Endopod of third maxilliped with outer margin of ischium slightly convex, inner margin straight, fringed with small, subrectangular corneous protuberances, few bristles; merus subtrapezoidal, outer margin gently rounded, inner margin with elevated crest, distal margin oblique with triarticulated palm inserted distally; external face of third maxilliped smooth. Exopod about one third the length of outer margin of ischium.

Thoracic sternites of third maxillipeds, first pereopods completely fused, except for small notches at lateral edges of sternum; sternal sulci s4/s5, s5/s6, s6/s7 distinct, ending just before reaching midline of thoracic sternum; sternal sulcus s7/s8 reaching midline. Midline of thoracic sternum distinct in sternites VII, VIII.

First pereiopods distinctly heterochelous, right cheliped larger than left. Larger cheliped with merus subtriangular in cross section; outer side rounded, smooth, inner side concave with scattered minute setae, lower side smooth; upper border rounded, bearing transverse rows of small, faint

granules, inner lower border delimited by row of rounded tubercles, outer lower border rounded, smooth. Carpus with row of four faint tubercles; prominent spine on middle of inner side; outer side rounded, smooth. Palm moderately (length/breadth: 1.77) swollen, smooth, shiny on both

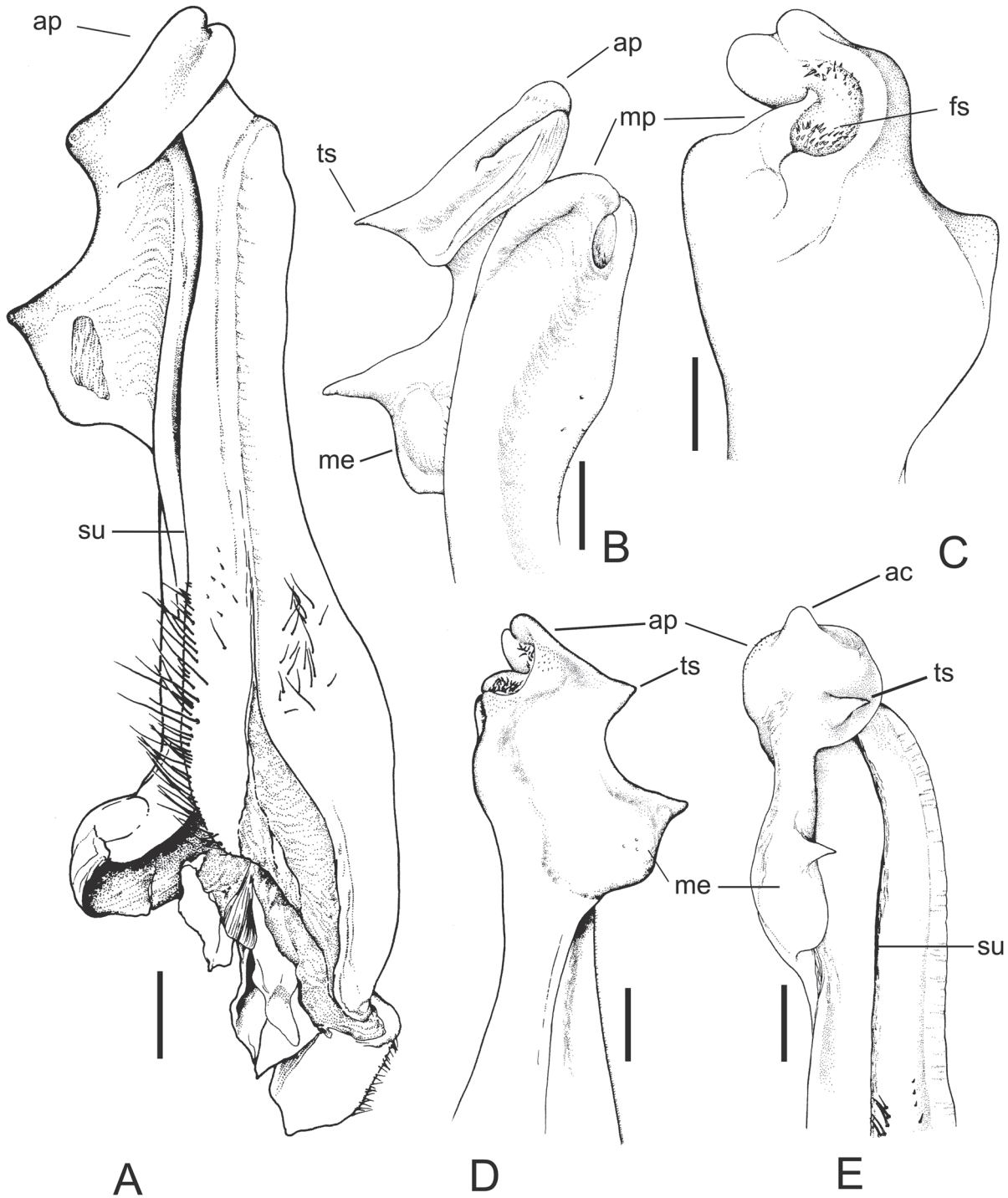


Figure 1. *Brasiiothelphusa dardanelosensis*, n. sp., male holotype (INPA 1474): A, left first gonopod, whole limb, mesocaudal view; B, distal part of left first gonopod, caudal view; C, distal part of left first gonopod, lateral view; D, distal part of left first gonopod, cephalic view; E, distal part of left first gonopod, mesocephalic view; ac = apical crest; ap = apical plate; fs = field of apical spine; me = mesial process; mp = marginal process; ts = triangular spine of the apical plate; su = marginal suture. Scale bars: A, 10 mm; B-F, 1 mm.

sides; upper, lower borders rounded, smooth. Fingers markedly gaping when closed, tips not crossing, bearing molar-like teeth, larger proximally (smaller cheliped with gap much less pronounced and some teeth more triangular shaped). Second to fifth pereopods slender, P2 longest, P5 shortest; ischia, meri and propodi of P2-P5 smooth; dactyli in average about 1.5 times the length of propodi, bearing five longitudinal rows of small, blunt, corneous spines.

Abdomen with all somites free, third abdominal somite broadest. Telson triangular, proximal margin slightly sinuous, lateral margins rather straight, apex rounded.

In caudal view, first male gonopod nearly straight, lateral border slightly concave, broader at base, slightly narrower at middle, widened at distal half due to distal processes; distal processes extending through nearly 40% of gonopod length. Marginal suture situated on mesial side, nearly straight proximally, medianly sinuous, gently curved caudally at distal end (Fig. 1A, E). Marginal process wide, rounded, curved towards cephalic direction, not projected distally over field of apical spines (Fig. 1B, C). Mesial process well developed, with large, sharp, triangular spine, pointing mesially (Fig. 1A-B, D). Apical plate developed, strongly bent in caudal direction, partially covering marginal process (Fig. 1A-B); apical plate, in mesial view, subcircular, bearing rounded apical crest projected apically (Fig. 1E); cephalic side of apical plate partially folded distally, showing shallow sulcus between apical crest, and caudal border; mesial border with sharp, triangular spine in proximal position pointing mesocaudally (Fig. 1B, D, E). Mesial process, and apical plate well separated by wide, rounded concavity. Field of apical spines developed, open, delimited only by cephalic border of apical plate, forming elongated semicircular patch on lateral side, denser at basal fold (Fig. 1C). Terminal article of second male gonopod slender, flagellum-like, nearly as long as first gonopod, with numerous spinules on distal portion.

Type locality – Brazil, Mato Grosso State, rio Aripuanã, upstream from the cachoeira de Dardanelos, 10°09'40.6"S, 59°27'41.9"W.

Distribution – The new species is currently only known from the waterfall complex of the cachoeira das Andorinhas and cachoeira de Dardanelos, in the Rio Aripuanã, northwestern Mato

Grosso State. The Rio Aripuanã is a tributary of the middle Rio Madeira Basin and has its headwaters in the Central Brazilian Shield. It is likely that the new species is restricted to the upper course of the Rio Aripuanã and possibly its tributaries. Although the actual distribution of this species is unknown, it may well prove to be stenotopic, judging by the narrow distributions of most of the pseudothelphusid species that occur in the upland areas of the Guyana and Brazilian Shields, especially those that prefer rocky substrates.

Indeed, the new species was absent in collections made recently during extensive surveys of the aquatic fauna in the middle and lower parts of the Rio Aripuanã and Rio Madeira (Rapp Py-Daniel *et al.*, 2007) and in the upper course of the other nearby river basins of Rio Tapajós and Rio Xingú (C. Magalhães, unpublished data). The other species of the genus, *B. tapajoense*, is known from the middle of the Rio Tapajós, which has a watershed contiguous with the Rio Aripuanã Basin to the East. However, it is not known whether *B. tapajoense* is restricted to that area, or whether it can reach the upland stretch of the Rio Tapajós Basin in the Brazilian Shield because further collections of *B. tapajoense* have not been made since its description.

Etymology – The species is named after the cachoeira de Dardanelos, the locality where it was firstly collected, which is part of a complex of waterfalls of tremendous scenic beauty that are threatened by the construction of a hydroelectric plant.

Ecological aspects – The holotype was collected just a little upstream of the Dardanelos waterfall, in a shallow marginal area with rocky bottom and large patches of aquatic macrophytes of the family Podostemaceae (Figs. 4-5). Paratype specimens were found among and under the rocks and boulders along or downstream from the waterfalls (Figs. 6-7), usually associated to the rocky bottom covered by Podostemonaceae plants or, sometimes, in small patches of sandy bottom among the rocks.

Comparative material examined of *Brasiliothelphusa tapajoense* – 1 male paratype, INPA 150, Brazil, Pará, rio Tapajós, Monte Cristo, 20-28.vii.1973, leg. Expedição Permanente na Amazônia.

Remarks – *Brasiliothelphusa dardanelosensis* is assigned to this genus due to the enlarged apical plate and the open apical field of spines that it is

not bordered by two longitudinal crests along the lateral surface of the gonopod. Other species of Kingsleyini from the Amazon River Basin (Mag-



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Figures 2-7. 2, *Brasiliothelphusa dardanelosensis*, n. sp., male holotype (INPA 1474), dorsal view (Photo: Senckenberg-Museum S. Tränkner). 3, *Brasiliothelphusa dardanelosensis*, n. sp., male holotype (INPA 1474), ventral view (Photo: Senckenberg-Museum S. Tränkner). 4, Rio Aripuanã, just upstream from Cachoeira de Dardanelos, type locality of *Brasiliothelphusa dardanelosensis* sp. n. (Photo: J. Zuanon). 5, Rio Aripuanã, just upstream from Cachoeira de Dardanelos, type locality of *Brasiliothelphusa dardanelosensis* sp. n. (Photo: J. Zuanon). 6, Rio Aripuanã, panoramic view from downstream of the Cachoeira das Andorinhas, collecting place of some of the paratypes of *Brasiliothelphusa dardanelosensis* sp. n. (Photo: J. Zuanon). 7, Rio Aripuanã, downstream from Cachoeira das Andorinhas, detailed view of the rocky substrate, collecting place of some of the paratypes of *Brasiliothelphusa dardanelosensis* sp. n. (Photo: J. Zuanon).

alhães, 2003) have a gonopod with an apical field of spines that is located either longitudinally or obliquely on the lateral surface, but its caudal and cephalic borders are marked by distinct crests that are fused distally.

The new species can be easily distinguished from *B. tapajoense* by characters of the gonopod. The main difference between the two species is the conformation of the structures in the apical plate of the gonopod. In *B. dardanelosensis*, the apical plate is distinctly bent caudally giving it a narrow appearance in mesocaudal view (Fig. 1A) and a subcircular shape in mesocephalic view (Fig. 1E); in *B. tapajoense*, the apical plate is straight and broadly subtriangular in mesio-caudal view, and narrow in mesiocephalic view (see Magalhães and Türkay, 1986: 374, Fig. 2). The apical plate of *B. dardanelosensis* also bears a distinct longitudinal crest that is slightly projected apically, and its mesial spine is directed towards the mesocaudal side (Fig. 1A, E). In *B. tapajoense*, the apical crest is much reduced and barely seen as a thickening of the plate's distal border.

In *B. dardanelosensis* the apical plate is broadly separated from the mesial process by a large concavity (best seen in mesocaudal view, Fig. 1A) versus a deep, sharp incision in *B. tapajoense*. The border of the mesial process between the distal spine and the proximal lobe mesial process is smooth and continuous in *B. dardanelosensis* (Fig. 1B), while there is a short, spinulose lobule between them in *B. tapajoense* (see Magalhães and Türkay, 1986: 374, Fig. 2a, c).

The Dardanelos waterfall complex is currently threatened by plans to dam the rivers upstream of the waterfall in order to construct a hydroelectric plant. Although the conservation status of the new species has not yet been formally assessed, it is likely to be in a threatened category due to clearly identifiable and immediate threats to its only known habitat posed by the planned hydroelectric dam project that would severely reduce the flow of the river serving the waterfall.

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