



Southwestern Atlantic species of *Austinixa* Heard & Manning, 1997 (Brachyura, Pinnotheridae): redescription of *A. leptodactyla* (Coelho, 1997) and *A. patagoniensis* (Rathbun, 1918), and remarks on the taxonomic status of *A. aidae* (Righi, 1967)

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Abstract

The genus *Austinixa* is one of the most studied pinnotherid genera from both taxonomic and phylogenetic perspectives. However, the three species from the southwestern Atlantic, *A. aidae*, *A. leptodactyla* and *A. patagoniensis* have been underrepresented or absent from phylogenetic analyses. Recently, *A. leptodactyla* was redescribed and *A. roblesi* was determined to be its junior synonym. We have analyzed specimens belonging to all three species and constructed a rediagnosis and redescription of *A. leptodactyla* and *A. patagoniensis*. The distribution of *A. aidae* is restricted to southern São Paulo (Brazil), given that no specimens from any localities further south of this area were found. *Austinixa leptodactyla* is distinct from *A. roblesi*, and although they share several morphological characteristics, we propose herein that the latter it is not a junior synonym of *A. leptodactyla*. These two species, along with *A. marianae*, are very similar with all possessing a depression on the pereopod 4 merus. *Austinixa leptodactyla* can be distinguished from *A. marianae* by the shape of the male pleon and first male gonopod, and from *A. roblesi* by the shape and proportions of the male telson. Lastly, the morphology of *A. patagoniensis* is very distinct from that of all other species of the genus, including the branchial ridge that extends to the orbits or nearly so, and the overall morphology of the first male gonopod.

Key words: Brazil, morphological data, Pinnixinae, species distribution, taxonomic review

Introduction

Austinixa Heard & Manning, 1997 is one of the most studied pea crab genera from a taxonomic, phylogenetic, and ecological perspective (e.g., Manning & Felder 1989; Heard & Manning 1997; Harrison 2004; Harrison & Hanley 2005; Peiró *et al.* 2013; Peiró *et al.* 2014; Palacios Theil & Felder 2020; Salgado-Barragán *et al.* 2021; João & Hernáez 2021; Almeida *et al.* 2023; Souza *et al.* 2025; Oliveira *et al.* 2026). It was described to accommodate species belonging to the *Pinnixa cristata* complex (see Manning & Felder 1989; Heard & Manning 1997), and with the addition of some recently described species, and with *A. bragantina* Coelho, 2005 being classified as a junior synonym of *A. aidae* (Righi, 1967) and *A. roblesi* Palacios Theil & Felder, 2020 a junior synonym of *A. leptodactyla* (Coelho, 1997), 11 species are currently recognized (Palacios Theil & Felder 2020a; Salgado-Barragán *et al.* 2021; Almeida *et al.* 2023; Oliveira *et al.* 2026). Although Poore & Ahyong (2023) classify *Pinnixa transversalis* H. Milne Edwards & Lucas, 1842 as part of *Austinixa*, Palacios Theil & Felder (2020a) had already stated several reasons as to why this species should not be included in the genus, and thus, herein, we do not recognize it as part of *Austinixa*.

Although several comprehensive studies have clarified the phylogeny and taxonomic status of most species in the group (see Harrison 2004; Palacios Theil & Felder 2020a), some South American species remain underrepresented or absent, likely due to challenges in obtaining specimens from the region. Nonetheless, targeted molecular studies have shed light on the taxonomy of one South American species, *A. aidae* (see Harrison & Hanley 2005; Almeida *et al.* 2023), while *A. leptodactyla* and *A. patagoniensis* (Rathbun, 1918) remain largely understudied from a molecular phylogenetic perspective.

Austinixa aidae was described by Righi (1967) based on specimens collected near the mouth of the Juqueriquerê River, on the coast of the Brazilian state of São Paulo. Later, Heard & Manning (1997) described *Austinixa hardyi* Heard & Manning, 1997 from Trinidad & Tobago, with one of the diagnostic characters being the large tufts of setae on the posterior portion of the carapace. However, Harrison (2004) raised questions about the validity of *A. hardyi* after molecular data was used to construct a phylogenetic hypothesis, which also helped to elucidate the relationships of *A. aidae* to other species of the genus. Afterwards, Harrison & Hanley (2005) proposed that *A. hardyi* is a junior synonym of *A. aidae*, based on morphological, morphometric, and molecular data. Around the same time, Coelho (2005) described a new species from northern Brazil, *Austinixa bragantina*. Palacios Theil *et al.* (2009) provided molecular data that suggested that *A. aidae* and *A. hardyi* are distinct, but later Palacios Theil & Felder (2020a) accepted the previously proposed synonymy. Almeida *et al.* (2023), using both morphological and molecular data, proposed that *A. bragantina* is a junior synonym of *A. aidae*, further supported the synonymy of *A. hardyi*, and provided a redescription of *A. aidae*. Additionally, Almeida *et al.* (2023) also detected a separation of *A. aidae* into two subclades, one with specimens from South America and another with samples from Panama.

The Brazilian endemic *Austinixa leptodactyla* was described by Coelho (1997) (originally as *Pinnixa leptodactyla*) based on type material from northeastern Brazil and additional specimens from other regions of northern and northeastern Brazil; Coelho (2005) then transferred this species to the genus *Austinixa*. This species was not included in the very robust analysis by Palacios Theil & Felder (2020a) because no molecular data for this species was available. Concomitantly to the review process of the present work, another study was published redescriving and shedding light on the taxonomic status of *A. leptodactyla*, with *A. roblesi* being deemed a junior synonym of the former based solely on morphology (Oliveira *et al.* 2026).

The species with the southernmost occurrences, *A. patagoniensis*, was originally described from Gulf of San Matías, Argentina, by Rathbun (1918). Righi (1967), although unknowingly, reported this species in southeastern Brazil for the first time, but described it as a separate species, *Pinnixa angeloi* Righi, 1967. Fenucci (1975) later proposed that the latter is a junior synonym of *A. patagoniensis*, based on an analysis of type material of both taxa. Although other studies discuss the taxonomy and occurrences of this species (e.g. Manning & Felder 1989; Martins & D’Incao 1996; Coelho 1997), its phylogenetic position remained unknown until Harrison (2004) used molecular data to elucidate its relationships, recovering a hypothesis in which this taxon is the sister species of all other members of *Austinixa*. Palacios Theil & Felder (2020a) also proposed a molecular phylogenetic hypothesis in which this species is also the sister group of all other members of the genus.

In light of this, further research into the taxonomy of these southwestern Atlantic species of *Austinixa* is essential. Thus, herein, we provide remarks on the taxonomic status and distribution of *A. aidae*, morphological evidence that supports the status of *A. leptodactyla* and *A. roblesi* as separate species, and a redescription of *A. patagoniensis*. Since the redescription of *A. leptodactyla* provided by Oliveira *et al.* (2026) was published concomitantly to the final stages of the review process of the present study, we have decided to keep the redescription to not drastically change our work.

Material and Methods

Specimens, including types and toptotypical material, from the following collections were examined (sometimes via photographs, see Material examined for each species): Coleção de Crustáceos do Departamento de Biologia (CCDB), Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto (FFCLRP), Ribeirão Preto, São Paulo, Brazil; Coleção Carcinológica, Museu de Oceanografia Prof. Petrônio Alves Coelho (MOUFPE), Universidade Federal de Pernambuco (UFPE), Recife, Pernambuco, Brazil; and Invertebrate Zoology Collection, Museum of Comparative Zoology (MCZ), Harvard University, Cambridge, Massachusetts, USA.

Specimens that were examined were photographed and measured under a Leica[®] M205 C stereomicroscope equipped with a digital camera Leica[®] DFC295 and the image capturing software Leica Application Suite v. 3.8.0. The individuals were identified based on recent literature (Coelho 1997; Palacios Theil & Felder 2020a; Almeida *et al.* 2023) and comparisons with type or topotypical material.

Abbreviations include cl = carapace length; coll. = collected by; cw = carapace width; G1 = male first gonopod; G2 = male second gonopod; Mxp3 = third maxilliped; P2–P5 = pereopods 2–5, respectively.

Taxonomy

Family Pinnotheridae De Hann, 1833

Subfamily Pinnixinae Števcíć, 2005

Genus *Austinixa* Heard & Manning, 1997

Austinixa aidae (Righi, 1967)

(Figures 1, 2)

Pinnixa aidae Righi, 1967: 107, figs. 21–26.—Coelho & Ramos 1972: 196.—Schmitt *et al.* 1973: 101.—Manning & Felder 1989: 4, fig. 2.—Melo 1996: 431.—Coelho 1997: 168; Calado *et al.* 1998: 112.—Melo 1998: 495.—Melo *et al.* 2003: 432.

Pinnixa cristata – Coelho 1967/9: page not numbered.—Coelho & Ramos 1972: 196.—Coelho *et al.* 1980: 39.—Barreto *et al.* 1993: 651.—Melo 1996: 431, 1 fig. (not numbered).—Melo 1998: 495.—Barros & Pimentel 2001: 31 [not *Austinixa cristata* (Rathbun, 1900), see Coelho 1997].

Austinixa aidae – Heard & Manning 1997: 393.—Boschi 2000: 69.—Coelho *et al.* 2002: 446.—Coelho *et al.* 2004: 89.—Dall’Occo *et al.* 2004: 459.—Harrison 2004: 744.—Harrison & Hanley 2005: 3650, fig. 1.—Coelho *et al.* 2008: 43.—Palacios-Theil *et al.* 2009: 460, table 1.—Almeida *et al.* 2010: 356, fig. 6.—Mantelatto & Cuesta 2010: 343, figs. 1, 2 (description of zoea 1).—Pachelle *et al.* 2016: 33.—Mantelatto *et al.* 2020: 54, fig. 17A.—Palacios Theil & Felder 2020a: 104.—Almeida *et al.* 2023: 234, figs. 1–9.—Poupin 2024: 144.

Austinixa hardyi? Heard & Manning, 1997: 395, fig. 2–4.—Harrison 2004: 744.—Harrison & Hanley 2005: 3650, fig. 1.—Palacios Theil *et al.* 2009: 468.—Palacios Theil & Felder 2020a: 101.

Austinixa bragantina Coelho, 2005: 552, figs. 1–13.—Bezerra *et al.* 2006: 1039, fig. 1.—Coelho *et al.* 2008: 43.—Lima 2009: 143, figs. 1–63 (description of larval development).—Almeida *et al.* 2023: 230.

Material examined. BRAZIL: Pará: 1 male, 1 female (CCDB 4541), Bragança, Ilha de Canela, Península Bragantina, coll. Lima, J. F., 13 July 2003.—1 male, 1 female (CCDB 4543), Bragança, Ilha de Canela, Península Bragantina, coll. Lima, J. F., 13 July 2003.—3 males, 2 females (CCDB 4542), Bragança, Ilha de Canela, Península Bragantina, coll. Lima, J. F., 06 November 2006. Ceará: 1 male, 1 female (CCDB 4501), Fortaleza, Praia do Futuro, 03°44'26.91"S 38°27'3.35"W, coll. Mantelatto, F. L. & Mantelatto, F. B., 16 February 2013. Paraíba: 3 females (MOUFPE 9322), Pitimbu, Praia de Acaú, coll. not informed, 19 March 1996. Pernambuco: 3 males (CCDB 7182), Ilha de Itamaracá, Vila Velha, Praia do Forte Orange, 07°50'40"S 34°50'33"W, colls. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., Almeida, A., 30 August 2022.—1 male, 2 females (CCDB 7183), Ilha de Itamaracá, Vila Velha, Praia do Forte Orange, 07°50'40"S 34°50'33"W, colls. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., Almeida, A., 30 August 2022.—10 males, 14 females (CCDB 7185), Ilha de Itamaracá, Vila Velha, Praia do Forte Orange, 07°50'40"S 34°50'33"W, colls. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., Almeida, A., 30 August 2022.—1 male, 3 females (CCDB 3095), Jaboatão dos Guararapes, Praia da Piedade, coll. not informed, 12 June 2008.—1 female (CCDB 7165), Jaboatão dos Guararapes, Praia da Piedade, 08°09'23"S 34°54'32"W, colls. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 28 August 2022.—1 male (CCDB 7162), Jaboatão dos Guararapes, Praia de Barra de Jangada, 08°13'10"S 34°55'24"W, colls. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 27 August 2022.—16 males, 25 females (CCDB 7163), Cabo de Santo Agostinho, Ilha do Amor, 08°13'48"S 34°55'22"W, colls. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 27 August 2022.—3 males, 2 females (CCDB 7172), Cabo de Santo Agostinho, Praia de Suape, 08°21'30"S 34°57'24"W, colls. Mantelatto, F. L., Balbino, F. C., 29 August 2022.—4 males (CCDB 7174), Cabo de Santo Agostinho, Praia de Suape, 08°21'30"S 34°57'24"W, colls. Mantelatto, F. L., Balbino, F. C., 29 August 2022.—6 males, 1 female (CCDB 7169), Cabo de

Santo Agostinho, Praia de Suape, 08°21'44"S 34°57'26"W, colls. Balbino, F. C., Mantelatto, F. L., 29 August 2022.—5 males (CCDB 7814), Ipojuca, Porto de Galinhas, Praia da Gambôa, 08°24'53"S 34°58'16"W, colls. Mantelatto, F. L., Bochini, G. L., Rios A. S., Pereira-Santos, A., Geremias, H., Zani, P., Oliveira-Rogeri, L., Balbino, F. C., 28 February 2024.—2 females (CCDB 5862), Ipojuca, Praia de Serrambi, 08°33'39.91"S 35°00'45.15"W, colls. Mantelatto, F. L., Mantelatto, F. B., Biagi, R., 20 July 2015. Alagoas: 1 female (CCDB 5861), Maragogi, Japaratinga, Praia de Bitingui, 09°06'06.7"S 35°15'34.45"W, colls. Mantelatto, F. L., Mantelatto, F. B., 23 July 2015.—3 males, 2 females (CCDB 6555), São Miguel dos Milagres, Porto da Rua, 09°14'15"S 35°20'32"W, colls. Mantelatto, F. L., Mantelatto, F. B., 21 January 2020. Bahia: 1 male, 1 female (CCDB 3093), Uruçuca, Praia do Pé da Serra, colls. Mantelatto, F. L., Almeida, A. O., 31 March 2009.—2 males, 2 females (CCDB 3094), Prado, Praia de Cumuruxatiba, 17°06'18.6"S 39°10'50.4"W, coll. not informed, 23 November 2007. Espírito Santo: 1 female (CCDB 4071), Anchieta, Praia de Iriri, 20°49'57.1"S 40°41'36.7"W, colls. Carvalho, F. L., Peiró, D., Robles, R., 19 June 2012.—1 female (CCDB 4073), Piúma, Praia de Piúma, 20°50'35.5"S 40°43'53.8"W, colls. Carvalho, F. L., Peiró, D., Robles, R., 19 June 2012. São Paulo: 1 male, 3 females (CCDB 7071), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., 17 July 2004.—3 males, 3 females (CCDB 7072), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., 17 September 2004.—1 damaged individual (CCDB 5065), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., 17 September 2004.—1 female (CCDB 2643), Ubatuba, Praia do Perequê-Açu, coll. not informed, 10 November 2004.—1 female (CCDB 2645), Ubatuba, Praia do Perequê-Açu, 23°25'01"S 45°03'17"W, coll. Mantelatto, F. L., Esposito, D., 10 November 2004.—1 female (CCDB 2647), Ubatuba, Praia do Perequê-Açu, coll. not informed, 10 November 2004.—2 males, 1 female (CCDB 2187), Ubatuba, Praia do Perequê-Açu, colls. Peiró, D. and LBSC team, 29 November 2005.—4 males, 7 females (CCDB 2194), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., 13 March 2005.—>100 individuals (CCDB 2102), Ubatuba, Praia do Perequê-Açu, colls. Peiró, D. and LBSC team, 2006.—1 male, 1 female (CCDB 6933), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., May 2007.—1 male, 2 females (CCDB 6876), Ubatuba, Praia do Perequê-Açu, 23°25'01.09"S 45°03'16.56"W, colls. Mantelatto, F. L., Peiró, D., 16 September 2008.—7 males, 13 females, 1 juvenile (CCDB 6877), Ubatuba, Praia do Perequê-Açu, 23°25'01.09"S 45°03'16.56"W, colls. Mantelatto, F. L., Peiró, D., 16 September 2008.—1 female (CCDB 2657), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., 22 July 2009.—1 female (CCDB 6925), Ubatuba, Praia do Perequê-Açu, coll. not informed, 22 July 2009.—1 male (CCDB 4696), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 male (CCDB 6926), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 male (CCDB 6927), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 male (CCDB 6928), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 female (CCDB 6929), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 female (CCDB 6930), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 female (CCDB 6931), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 male (CCDB 6935), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—1 male (CCDB 6936), Ubatuba, Praia do Perequê-Açu, colls. Mantelatto, F. L., Peiró, D., 23 July 2009.—6 males, 4 females (CCDB 7134), Ubatuba, Praia do Perequê-Açu, 23°25'02"S 45°03'22"W, colls. Alonso, J. V., Balbino, F. C., Bochini, G. L., Mantelatto, F. L., Teles, J. N., 02 April 2022.—2 females (CCDB 7133), Ubatuba, Praia de Itaguá, 23°27'24"S 45°03'31"W, colls. Alonso, J. V., Balbino, F. C., Bochini, G. L., Mantelatto, F. L., Teles, J. N., 02 April 2022.—1 female (CCDB 6937), Ubatuba, Praia do Lázaro, coll. not informed 12 March 2005.—1 male, 1 female (CCDB 7132), Caraguatatuba, Foz do Rio Santo Antônio, 23°37'53"S 45°24'57"W, colls. Alonso, J. V., Balbino, F. C., Bochini, G. L., Mantelatto, F. L., Teles, J. N., 01 April 2022.—13 males, 13 females (CCDB 3100 – type locality), Caraguatatuba, Foz do Rio Juqueriquerê, 23°42'29"S 45°25'34"W, colls. Peiró, D., Mossolin, E., 01 May 2009.—1 male, 3 females (CCDB 4697), São Sebastião, Araçá, colls. Mantelatto, F. L., Peiró, D., 24 July 2009.—1 female (CCDB 6843), São Sebastião, Praia do Segredo, coll. Robles, R., 20 February 2011.—1 female (CCDB 7225), São Sebastião, Praia de Baraqueçaba, coll. not informed, 09 November 2004.—1 male, 3 females (CCDB 6938), São Sebastião, Praia de Baraqueçaba, coll. Mantelatto, F. L., 09 November 2007.—1 male (CCDB 5624), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—4 males (CCDB 6010), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—1 female (CCDB 6015), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—1 male (CCDB 6016), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—1 female (CCDB 6017), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—1 female (CCDB 6018), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—2 males, 9 females

(CCDB 6019), São Sebastião, Praia de Baraqueçaba, colls. Mantelatto, F. L. *et al.*, 02 December 2014.—6 males, 7 females (CCDB 7586), São Sebastião, Praia de Baraqueçaba, 23°49'42"S 45°26'03"W, colls. Mantelatto, F. L., Balbino, F. C., Tamburus, A. F., Geremias, H., Bochini, G. L., 02 September 2023.—1 male (CCDB 6840), Guarujá, Praia de Guaiúba, 24°00'59.1"S 46°17'39.7"W, colls. Carvalho, F. L., Costa, A., Leone, I., Rossi, N., 22 October 2011.—1 female (CCDB 7853), Itanhaém, Praia do Sonho, 24°11'46.16"S 46°48'03.96"W, colls. Balbino, F. C., Udinal, V., 01 February 2023.

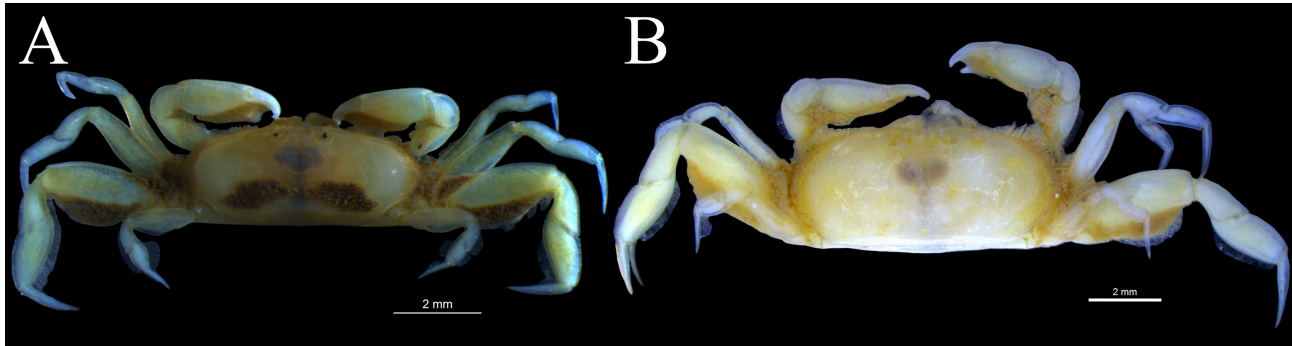


FIGURE 1. *Austinixa aidae* (Righi, 1967), dorsal view of entire specimen. A, male (CCDB 3100), Foz do Rio Juqueriquerê, Caraguatatuba, São Paulo, Brazil (type locality); B, female (MOUFPE 9322), Praia de Acaú, Pitimbu, Paraíba, Brazil. Scale bars shown in image.

Diagnosis. From Almeida *et al.* (2023): Male carapace with two patches of setae anterior to cardiac ridge not in contact with lateral setae; male, apart from posterior patches, and female carapace with setae restricted to lateral and anterolateral margins, not extending onto lateral and anterolateral regions. Branchial ridges usually absent in adult specimens, when present never reaching orbit. Gape between fixed finger and dactylus of the chelipeds with dense tuft of setae; fixed finger long in males and females. G1 tip strongly curved, with triangular structure on the median portion.

Remarks. *Austinixa aidae* was originally described by Righi (1967) (at the time *Pinnixa aidae*) based on specimens collected in Caraguatatuba, in the state of São Paulo, Brazil. Later, Heard & Manning (1997) described *Austinixa hardyi* from Trinidad & Tobago, stating that the presence of a dense bilobed tuft of setae on the cardiac region of the carapace of males, body size, and carapace proportions were useful in distinguishing this species from *A. aidae*. However, Righi (1967) previously described the presence of such a tuft in males of *P. aidae*, which was overlooked by Heard & Manning (1997). Harrison (2004), studying the phylogeny of *Austinixa* using the mitochondrial markers 16S rRNA and COI, found that sequences of *A. hardyi* and *A. aidae* were identical. Later, Harrison & Hanley (2005) placed *A. hardyi* as a junior synonym of *A. aidae* based on traditional morphology, morphometrics, and molecular data. Recently, Almeida *et al.* (2023) used 16S rRNA gene sequence data to further confirm this synonymy, as a specimen from Tobago previously identified as *A. hardyi* grouped with specimens of *A. aidae* from Venezuela and São Paulo (where the type locality is situated). However, all of the sequences belonging to Brazilian specimens identified as *A. aidae* generated by Almeida *et al.* (2023) (16 in total) grouped together in a separate clade, whereas the sequence from São Paulo, which grouped with *A. hardyi*, and the specimen from Venezuela were generated by Harrison (2004). A specimen originally identified as *A. hardyi* collected from Pará, Brazil, was also grouped with the Brazilian specimens. Additionally, specimens from Panama also form a separate, well-structured clade, and are the sister group of the clade including all specimens from South America. All these subgroups have high support (86 or above), whereas the clade encompassing all specimens of *A. aidae* was recovered with slightly lower support (83). Another linked study to which this paper is related (Balbino *et al.* in revision), using molecular data for three genes (two mitochondrial, 16S rRNA, 12S rRNA and one nuclear, H3) also detected a conspicuous separation between the specimens assigned to *A. aidae* from Panama, and those from South America. Within the South American group, a specimen from Venezuela was recovered as the sister group of all the Brazilian specimens with a high support, which might hint at the presence of another separate lineage. Thus, given this situation, and our limited available material, more studies comparing specimens from Venezuela, Tobago and Panama are necessary to further elucidate the taxonomic status of this taxon and to investigate the possible presence of multiple species classified under the name *A. aidae*.

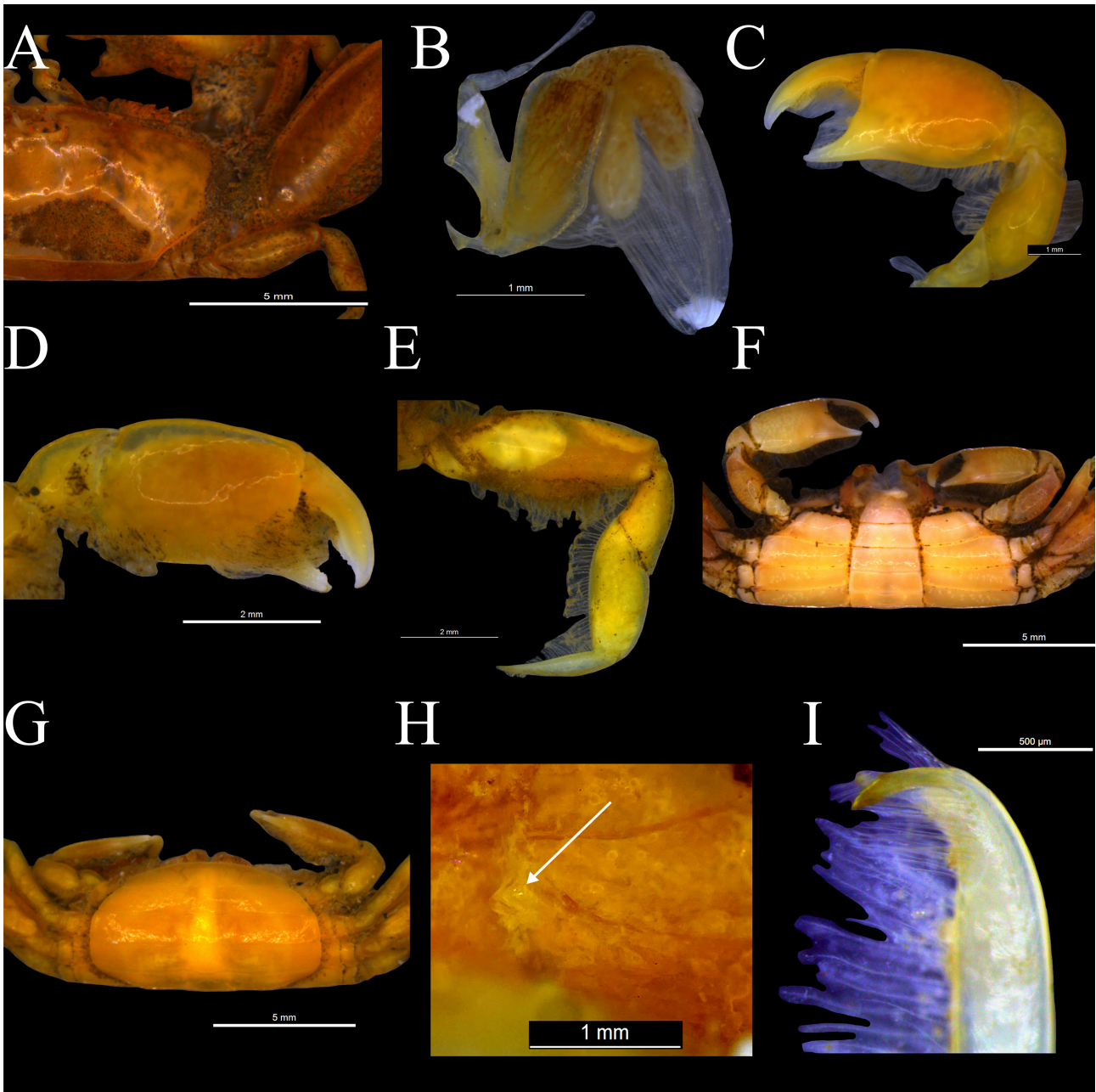


FIGURE 2. *Austinixa aidae* (Righi, 1967). A, male (CCDB 6555), Porto da Rua, São Miguel dos Milagres, Alagoas, Brazil; B, C, I, male (CCDB 2102); D, G, female (CCDB 2102), Praia do Perequê-Açu, Ubatuba, São Paulo, Brazil; E, male (CCDB 3100); F, male (CCDB 5624), Praia de Baraqueçaba, São Sebastião, São Paulo, Brazil; H, female (CCDB 3100), Foz do Rio Juqueriquerê, Caraguatatuba, São Paulo, Brazil (type locality). A, dorsal view of branchial region of carapace; B, external surface of right Mxp3; C, external surface of left male cheliped; D, internal surface of left female cheliped; E, dorsal view of right P4; F, ventral view of male thoracic sternites and pleon; G, ventral view of female thoracic sternites and pleon; H, left female gonopore; I, pleonal surface of apex of right G1. Scale bars shown in image.

Coelho (2005) described *A. bragantina* based on a set of specimens from Ilha Canela, Bragança, Pará, Brazil. The author proposed that the presence of branchial ridges was useful in distinguishing the newly described species from *A. aidae*. Recently, Almeida *et al.* (2023), using sequence data for the 16S rRNA gene, detected that specimens of *A. bragantina*, including those from the type locality, are nested within *A. aidae* and thus proposed the synonymy. Thus, the presence or absence of branchial ridges is not necessarily a distinguishing characteristic for *A. aidae*. However, most specimens analyzed herein and by Almeida *et al.* (2023) lacked the branchial ridge, whereas some

have an incomplete or less conspicuous ridge. A few specimens, especially juveniles, possess a conspicuous and complete branchial ridge. Almeida *et al.* (2023) also stated that the tufts of setae on the male carapace, cheliped and G1 morphology can be used as diagnostic characteristics, which we confirm herein.

Coelho (1997) mentioned that *A. aidae* ranges into southern Brazil, south to Rio Grande do Sul, and even analyzed two specimens collected in this state that were supposedly deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP). However, these specimens were not found (pers. comm. Marcos Tavares in April, 2023) and no additional specimens from localities further south of Itanhaém, São Paulo, were encountered by us in field expeditions and other collections. Efforts to collect specimens from Cananéia, a region of São Paulo further south of Itanhaém, were successful in finding many individuals of *A. patagoniensis*, whereas no specimens of *A. aidae* were found, even though these species are known to co-occur in several other areas of the state of São Paulo, including Itanhaém, São Sebastião and Ubatuba. Checklists for the carcinofauna of the southernmost Brazilian states, Santa Catarina and Rio Grande do Sul, have not recorded any confirmed occurrences of *A. aidae*, even though ecologically similar species, such as *A. patagoniensis*, have been encountered (Martins & D’Incao 1996; Boos *et al.* 2012). Thus, it is unclear whether Coelho (1997) misidentified the specimens from Rio Grande do Sul or if this species occasionally occurs in this area. Thus, based on the current evidence presented herein, São Paulo is the southernmost confirmed occurrence of *A. aidae*.

Habitat and host. Found on beaches with sandy to mud-sandy bottoms, from 0–32m in depth in burrows of ghost shrimps of the family Callichiridae Manning & Felder, 1991 (Righi 1967; Coelho 1997; Peiró *et al.* 2013). In the present study, some specimens were also collected by us from the burrows of the stomatopod *Alachosquilla floridensis* (Manning, 1962) in Pernambuco (CCDB 7172), widening the scope of possible hosts to include beach-dwelling burrowing malacostracans, not just ghost shrimps.

Type locality. Mouth of Juqueriquerê River, Caraguatatuba, São Paulo, Brazil.

Distribution. Possibly Panama, Trinidad & Tobago, Venezuela (see Remarks), occurrences are confirmed from Brazil, in the states of Amapá, Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro and São Paulo (Coelho 1997; Bezerra *et al.* 2006; Coelho *et al.* 2008; Mantelatto *et al.* 2020; Palacios Theil & Felder 2020a; Almeida *et al.* 2023; present study).

Austinixa leptodactyla (Coelho, 1997)

(Figures 3–7)

Pinnixa sp. A – Coelho & Ramos 1972: 197.—Barreto *et al.* 1991/93: 302 (partially).—Barreto *et al.* 1993: 651 (partially).

Pinnixa leptodactyla Coelho, 1997: 178, fig. 5.

Austinixa leptodactyla – Coelho 2005: 1.—Bezerra *et al.* 2006: 1039, fig. 2.—Coelho *et al.* 2008: 43.—Almeida *et al.* 2010: 356.—Palacios Theil & Felder 2020a: 103, table 1.—Oliveira *et al.* 2026: 3, figs. 1–5.

Type material examined. Paratypes: 2 males (cw 8.8 mm; cw 5.8 mm) (MOUFPE 15146), Brazil, Rio Grande do Norte, Natal, Alagamar, coll. not informed, 12 January 1989.

Other material examined: BRAZIL: Pernambuco: 1 male (MOUFPE 3417), Ilha de Itamaracá, coll. not informed, 06 April 1989.—15 males, 2 females (CCDB 7184), Ilha de Itamaracá, Praia do Forte Orange, 07°50'40" S 34°50'33" W, coll. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., Almeida, A., 30 August 2022.—6 males, 3 females (CCDB 7161), Jaboatão dos Guararapes, Praia Barra de Jangada, 08°13'10" S 34°55'24" W, coll. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 27 August 2022.—1 male (CCDB 7164), Cabo de Santo Agostinho, Praia do Paiva, 08°13'48" S 34°55'24" W, coll. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 27 August 2022.—3 males, 1 female (CCDB 7173), Cabo de Santo Agostinho, Praia de Suape, 08°21'30" S 34°57'24" W, coll. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 29 August 2022.—3 males, 3 females (CCDB 7170), Cabo de Santo Agostinho, Praia de Suape, 08°21'44" S 34°57'26" W, coll. Mantelatto, F. L., Bochini, G. L., Rios, A. S., Balbino, F. C., 29 August 2022.

Diagnosis. Male carapace with one large bilobed patch of setae anterior to cardiac ridge, not in contact with lateral setae. Branchial ridges present, mostly parallel to anterolateral margins, sharply bending towards posterolateral margins, becoming less conspicuous after bending. Chelipeds robust, inflated, a large gape between fixed finger and dactylus lined by setae; fixed finger long in males and females, female fixed finger with a large triangular tooth slightly anterior to median portion; dactylus slightly deflected downwards in both sexes. P4 merus with a large

dorsodistal depression. Male pleon overall subtrapezoidal, with margins tapering slightly towards distal end; telson subtriangular with rounded margins, longer than sixth pleonite. G1 tip straight, not bifurcated, distal end slightly bilobed.

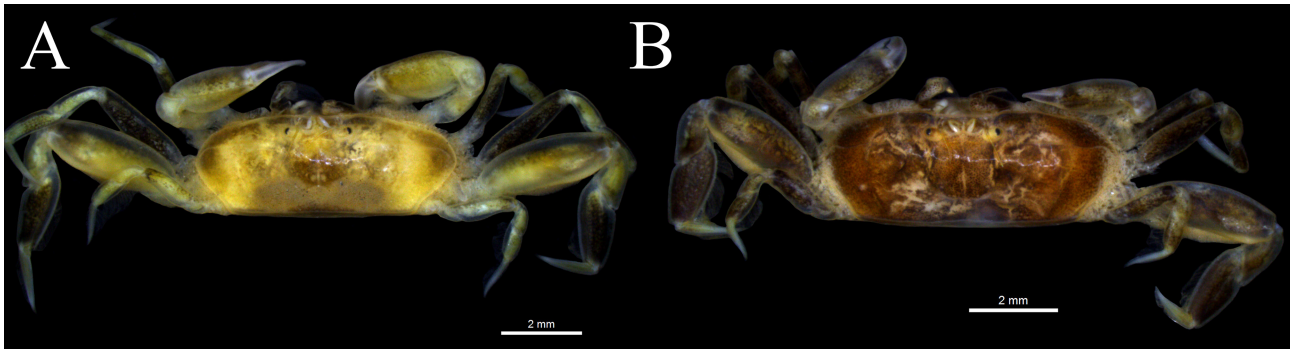


FIGURE 3. *Austinixa leptodactyla* (Coelho, 1997), dorsal view of entire specimen. A, male (CCDB 7173), Praia de Suape, Cabo de Santo Agostinho, Pernambuco, Brazil; B, female (CCDB 7184), Praia do Forte Orange, Ilha de Itamaracá, Pernambuco, Brazil. Scale bars shown in image.

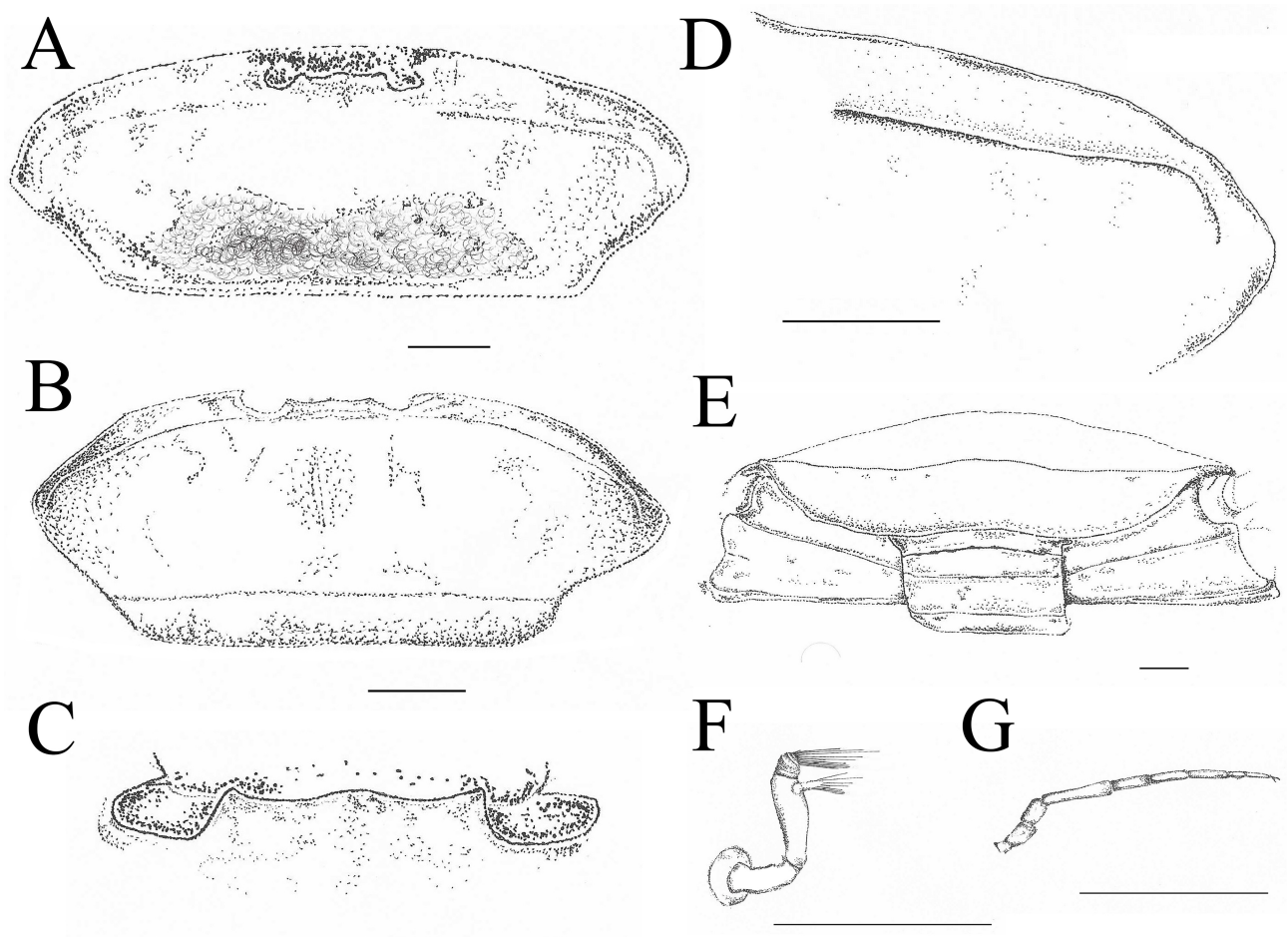


FIGURE 4. *Austinixa leptodactyla* (Coelho, 1997). A, C–G, male paratype (MOUFPE 15146), Alagamar, Natal, Rio Grande do Norte, Brazil; B, female (CCDB 7184), Praia do Forte Orange, Ilha de Itamaracá, Pernambuco, Brazil. A, B dorsal view of carapace; C, dorsal view of front; D, dorsal view of right branchial region of carapace with branchial ridge; E, posterior view of cardiac region with cardiac ridge; F, left antennule; G, left antenna. Scale bars: A–G = 1 mm.

Redescription. Carapace 1.9–2.8 times as wide as long (Fig. 4A, B); transversally oblong, narrowing close to lateral margins, finely punctate, regions poorly defined; front (Fig. 4C) not protruding, dorsally almost truncate, trilobed when viewed frontally, with two slightly projected small lateral lobes, median region rounded and slightly projected, with a shallow median sulcus; orbits (Fig. 4C) small, subequal in width to half of frontal width, completely filled by eyes, margins slightly elevated; anterolateral margins mostly straight, with long plumose setae; hepatic region mostly smooth, with a slight hepatic depression close to orbits; branchial regions (Fig. 4D, 7A) crossed by a continuous elevated ridge, extending from anterolateral margins to hepatic depression, ridge parallel to anterolateral margins of carapace for most of its extension, sharply bending towards posterolateral margins laterally, becoming less conspicuous after bending; posterolateral margins almost straight, slightly dented near last pair of pereopods; gastric and cardiac regions with a shallow transverse gastro-cardiac groove, extending across most of carapace width, in males gastro-cardiac groove covered by a large tuft of setae, tuft usually conspicuously bilobed, in females tufts completely absent; cardiac region crossed by a straight transverse cardiac ridge, extending across entire carapace width, carapace dropping abruptly posterior to ridge (Fig. 4E).

Antennules small, short, stouter than antennae, tucked under front (Fig. 4F); basal article stoutest, large, fitting inside crevice below front; second article subcylindrical, slender, shorter than first; third article 1.5 times longer than second, slenderer, subcylindrical; inner ramus small, elongated, less than 1/3 as long as third article, spearhead-shaped, setose; outer ramus four segmented, segments tapering towards distal end, setose. Antennae short, slender, about as long as width of front and one orbit, nine segmented; first segment the stoutest, widest; second segment subequal in length to first, less stout and wide; third segment slenderer, elongated, longest, about as long as first and second combined, fourth to ninth segments slender, tapering towards distal end, progressively shorter (Fig. 4G).

Mxp3 large, relatively slender; ischium and merus fused forming an ischiomerus without a visible external suture, ischiomerus shorter than palpus, relatively slender, subrectangular, inner and distal margins straight, outer margin mostly straight, slightly convex distally (Figs. 5A, 7B); palpus large, robust, longer than ischiomerus, setose; carpus subtrapezoidal, shorter than propodus, with a setose distolateral projection on inner margin; propodus long, 2/3 to 3/4 length of ischiomerus, sublanceolate, tapering towards distal end, proximal, inner and outer margins straight, distal margin rounded, with long setae distally; dactylus articulating proximolaterally on outer surface of propodus, leaf-shaped, slender proximally, widening until 3/4 of its length, tapering again towards distal end, longer than propodus, distal margin rounded, with many long setae.

Chelipeds large, robust, sexually dimorphic, more robust in males (Figs. 5B, C, 7C, D); merus similar in males and females, elongated, shorter than palm, slender, with slightly convex margins; carpus similar in males and females, short, robust, outer margin broadly convex, concave on inner margin; male palm tall, robust, with mostly convex margins, dorsal margin with a straight continuous ridge, ventral margin mostly convex, concave close to fixed finger, lined by long setae on inner surface (Figs. 5B, 7C); male fixed finger long, slightly deflected downwards, slender, cutting edge lined by dense plumose setae, a small blunt tooth present on proximal slope, median portion mostly serrated with a larger tooth followed by another serrated region and a larger triangular to semicircular tooth close to distal end, teeth sometimes serrated, fixed finger slopes down abruptly after distal tooth, tip slightly curved upwards; male dactylus long, deflected downwards and meeting tip of fixed finger, slender, cutting edge lined by dense plumose setae, proximal portion of cutting edge smooth, concave, a large serrated elevation present at about median portion, distal third of cutting edge serrated, tip slightly curved inwards; female palm similar to that of male, not as tall (Figs. 5C, 7D); fingers slender, a large hiatus between fingers lined by plumose setae, denser in male; female fixed finger long, slightly deflected downwards, slender, cutting edge lined by setae, not as dense as in male, a blunt tooth present on proximal slope, median portion sometimes serrated with a large blunt to conical tooth, distal portion also serrated with a triangular to semicircular tooth, distal end abruptly sloping down like in male, tip slightly curved upwards; female dactylus long, deflected downwards and meeting tip of fixed finger, stouter than that of male, proximal portion of cutting edge smooth, very concave, more so than that of male, median portion with serrated elevation like that of male, distal third of cutting edge serrated, less conspicuously than in male, tip slightly curved inwards.

Walking pereopod relative sizes $P4 > P3 > P2 > P5$ (Figs. 5D–G, 7E); dactyli with corneous tips. P2 mostly smooth, slender, sparsely setose, especially proximally; merus slender, four to five times longer than wide, smooth, dorsal margin slightly concave, sparsely setose, ventral margin convex; carpus smooth, slender, about 2.5 times longer than wide, dorsal margin convex, ventral margin almost straight; propodus smooth, slender, subequal in length to carpus, slightly more than 2.5 times longer than wide, dorsal margin convex, ventral margin slightly

concave; dactylus slender, slightly flattened laterally, subequal in length to propodus, anterior surface proximal third serrated, tip slightly curved anteriorly, lined by short setae on posterior surface (Fig. 5D). P3 mostly smooth, slender, sparsely setose, especially proximally; merus slender, four to five times longer than wide, mostly smooth, dorsal margin straight, with an elevated crest extending from proximal to distal margin, ventral margin slightly convex; carpus slender, slightly more than twice as long as wide, mostly smooth, dorsal margin slightly convex, with an elevated crest, ventral margin almost straight; propodus slender, slightly longer than carpus, about 2.5 times longer than wide, mostly smooth, with small setae present distoventrally and sparse setae present on dorsal margin, dorsal margin slightly convex, ventral margin straight; dactylus slender, slightly flattened laterally, subequal in length to propodus, anterior surface proximal third serrated, tip slightly curved anteriorly, lined by short setae on posterior surface (Fig. 5E). P4 longest, most robust, inflated, sparsely setose; merus robust, inflated, sparsely setose, slightly more than twice as long as wide, dorsal margin convex with an elevated serrated crest, posterior surface with a large oval dorsodistal depression, surface below depression tuberculate, ventral surface delimited by an anterior and a posterior tuberculated ridge, space between ridges covered in thick tuft of setae; carpus robust, inflated, sparsely setose, slightly longer than wide, dorsal margin slightly convex with an elevated crest, distal portion of crest tuberculated, ventral margin slightly concave, a few tubercles present distally; propodus robust, about twice as long as wide, dorsal margin convex, with a setose elevated crest, opposable margin bicarinate, anterior carina sharp and serrated, lined by long plumose setae, posterior carina not sharp, tuberculated; dactylus slightly slender, flattened laterally, between 2/3 to 3/4 of length of propodus, anterior and posterior surfaces lined by plumose setae, anterior surface with a proximally serrated elevated ridge, lateral surfaces with elevated ridges, tip slightly curved posteriorly (Fig. 5F). P5 shortest, slender, more setose than other pereopods; merus slender, over twice as long as wide, sparsely setose, dorsal margin slightly convex, without ornamentation, ventral margin strongly convex proximally, slightly concave distally, with a low tuberculated crest extending from basi-ischium junction to distal third of merus; carpus short, only slightly longer than wide, proportionally stout, sparsely setose, dorsal margin convex, ventral margin concave; propodus proportionally short, stout, about twice as long as wide, dorsal margin convex with a sparsely setose tuberculated crest, opposable margin with a single tuberculated carina along posterior portion, carina lined by long plumose setae; dactylus slender, longer than propodus, lined by setae on dorsal surface and by plumose setae on ventral surface, lined by short spine-like setae along dorsal, ventral and lateral margins, more concentrated distally, tip curved outwards and posteriorly (Fig. 5G).

Male thoracic sternites 1–4 (1–3 bearing maxillipeds and 4 bearing chelipeds) fused into a single plate, sternites 1–4 plate with a vertical indentation at about half of its width, with a transverse depression at about 1/3 of its height; sternites 5–8 (bearing walking pereopods) free, subtrapezoidal to subrectangular, sometimes slightly wider near pereopods, smooth (Figs. 6A, 7H). Female thoracic sternites 1–4 mostly similar to that of male, lined by long setae just outside of pleon (Fig. 7F); sternites 5–8 subrectangular to subtrapezoidal, mostly covered by pleon, sternite 6 bearing female gonopore (Fig. 7G); gonopore projected forward, elevated, dropping abruptly towards median region of sternite, margin of drop angled at about 45°, a slight indentation at about 1/3 of the length of inner margin.

Male pleon slender, smooth, overall subtrapezoidal, with margins overall tapering slightly towards distal end, pleonites free, lined by small setae (Figs. 6C, 7H); first pleonite subtrapezoidal, widest, wider proximally, tapering towards distal end, short; second pleonite subtrapezoidal, slightly narrower proximally, as wide as distal margin of first pleonite, widening slightly towards distal end, short, as long as first pleonite; third pleonite subtrapezoidal, widest proximally, as wide as distal margin of second pleonite, tapering towards distal end, twice as long as first and second pleonites; fourth and fifth pleonites subtrapezoidal, widest proximally, as wide as distal margin of previous pleonite, tapering towards distal end, as long as third pleonite; sixth pleonite subtrapezoidal, narrowest, wider proximally, tapering towards distal end more abruptly than other pleonite, margins slightly concave, as long as third pleonite. Telson subtriangular with rounded margins, longer than sixth pleonites, as wide as distal margin of sixth pleonite, lined by longer setae compared to rest of pleon.

G1 slender, flattened dorso-ventrally, slightly curved towards sternum at about mid-length, lined on outer surface by long setae, inner surface with sparse short setae; apex stout, not curved, lined by relatively long setae, larger setae present on outer surface, a projection present distolaterally on mesial side, with one lobe facing towards sternal surface, the other facing towards pleonal surface, lobes separated by a slight indentation (Figs. 6D, Fig. 7I, J). G2 small, relatively stout proximally, tapering considerably towards distal end, apex curved (Fig. 6E).

Female pleon wide, horizontally oval, with overall convex outline, margins lined by setae, pleonites free (Figs. 6B, 7F); first pleonite subtrapezoidal, slightly wider proximally, tapering towards distal end, short; second pleonite

subtrapezoidal, margins more angled than those of first pleonite, much narrower proximally, widening towards distal end, short, slightly longer than first pleonite; third pleonite subtrapezoidal, margins angled like that of second pleonite, much narrower proximally, widening towards distal end, about twice as long as second pleonite; fourth somite the widest, subrectangular, as long as third pleonite; fifth pleonite subtrapezoidal, wider proximally, tapering towards distal end, as long as fourth pleonite; sixth pleonite subtrapezoidal, margins angled, wider proximally, tapering towards distal end, as long as fifth pleonite. Telson subtriangular with round margins, as wide as distal margin of sixth pleonite, lined by fewer setae compared to rest of pleon along proximal portion of lateral margins.

Remarks. *Austinixa leptodactyla* was originally described (as *Pinnixa leptodactyla*) by Coelho (1997) based on type material collected around Natal, Rio Grande do Norte, and additional material from Pará, Pernambuco and Sergipe, in Brazil. However, the original description lacks diagnostic characteristics, such as the shape of the male pleon and telson, and the morphology of the G1. Additionally, the illustrations do not thoroughly represent the species morphology. Coelho (2005), following Heard & Manning (1997) but without an in-depth discussion, then assigned *P. leptodactyla* to *Austinixa*.

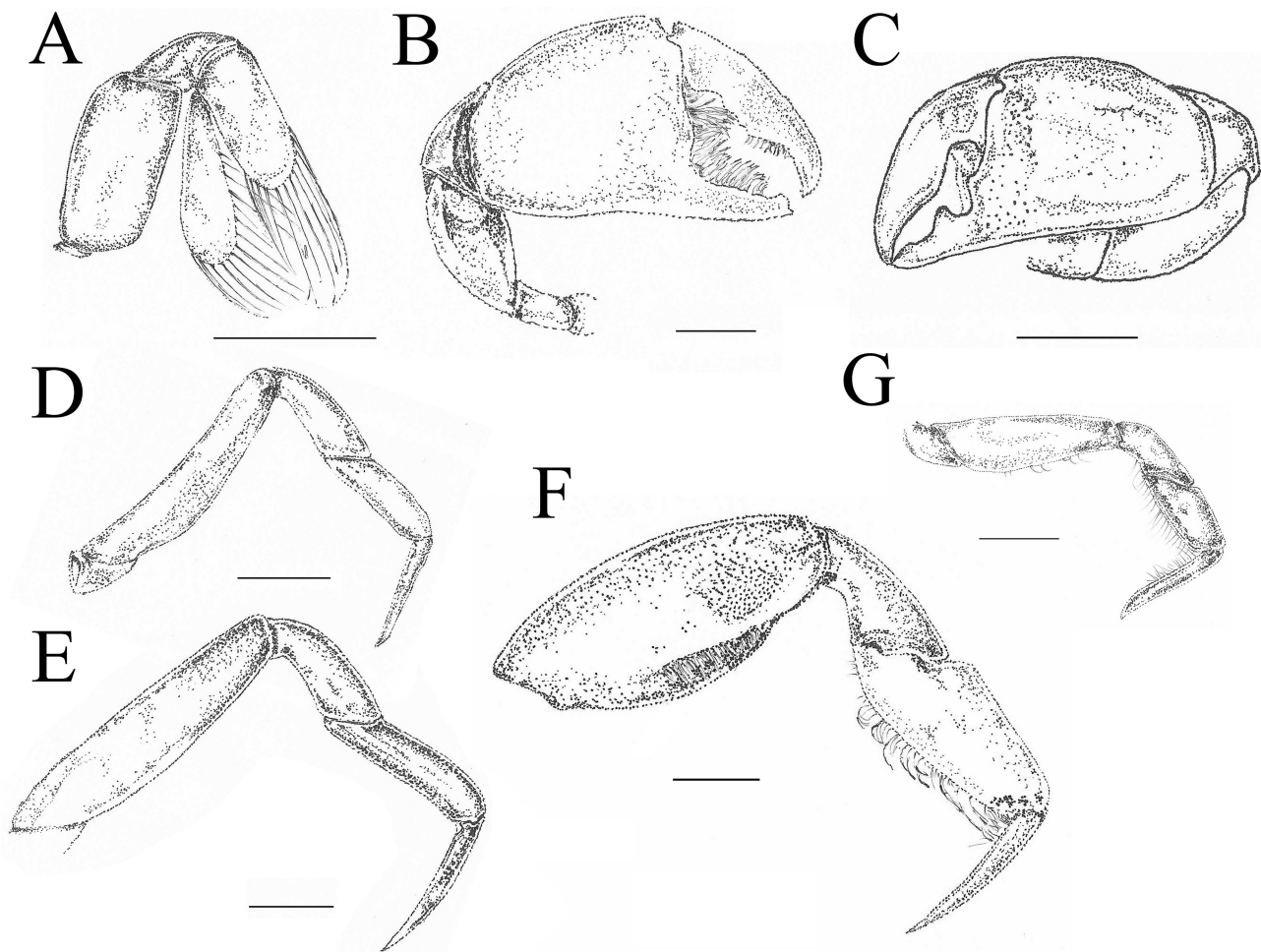


FIGURE 5. *Austinixa leptodactyla* (Coelho, 1997). A, B, D–G, male paratype (MOUFPE 15146), Alagamar, Natal, Rio Grande do Norte, Brazil; C, female (CCDB 7184), Praia do Forte Orange, Ilha de Itamaracá, Pernambuco, Brazil. A, external surface of right Mxp3; B, external surface of right male cheliped; C, external surface of left female cheliped; D, dorsal view of right P2; E, dorsal view of right P3; F, dorsal view of right P4; G, dorsal view of right P5. Scale bars: A–G = 1 mm.

Souza *et al.* (2025) published the first study on the ecology of this species, focusing on its mating system. Nonetheless, information regarding this species' morphology and phylogenetic position was still lacking. *A. leptodactyla* was the only at-the-time described species to be left out of the phylogenetic trees proposed by Palacios Theil & Felder (2020a). With the description of *A. marianae* without the use of molecular data, both species remain as the only ones in the genus that have not been included in a phylogenetic hypothesis, which will be addressed in a linked study (Balbino *et al.* in revision). Concomitantly to the final stages of the review process of the present

study, a redescription of *A. leptodactyla* was published, addressing its taxonomic status for the first time since the original description (Oliveira *et al.* 2026). Therein, the authors proposed that *A. roblesi* is a junior synonym of *A. leptodactyla*. However, they did not include important well-established characteristics for pinnotherid taxonomy in the diagnosis, including the shape of the male telson, which was overlooked by the authors. Although very morphologically similar, *A. roblesi* is herein determined to not be a junior synonym of *A. leptodactyla*, since differences were detected in taxonomically important characteristics. Additionally, a study with molecular data linked to the present study (Balbino *et al.* in revision) further supports this hypothesis.

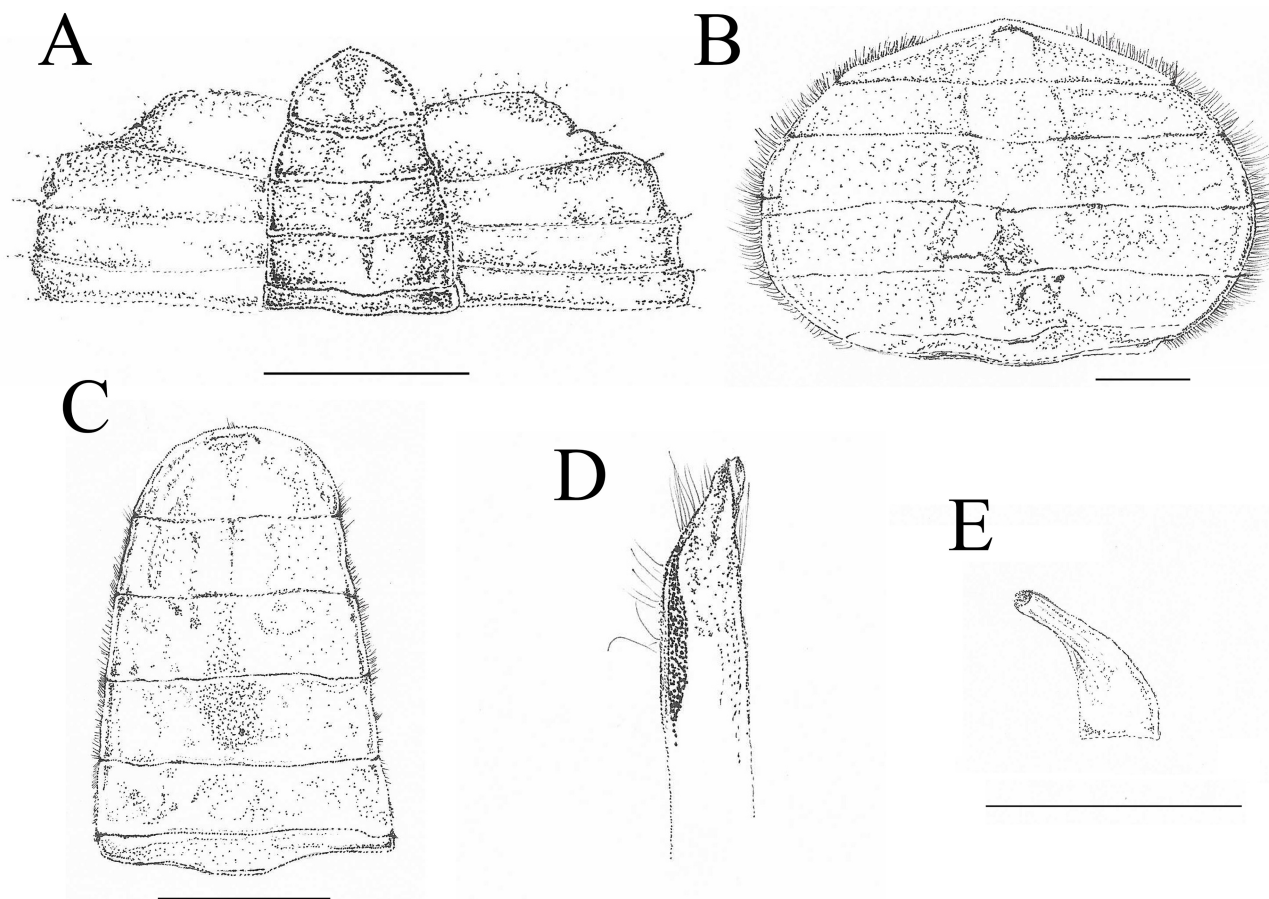


FIGURE 6. *Austinixa leptodactyla* (Coelho, 1997). A, male paratype (MOUFPE 15146), Alagamar, Natal, Rio Grande do Norte, Brazil; B, female (CCDB 7184), Praia do Forte Orange, Ilha de Itamaracá, Pernambuco, Brazil; C–E, male (CCDB 7170), Praia de Suape, Cabo de Santo Agostinho, Pernambuco, Brazil. A, ventral view of male thoracic sternites and pleon; B, C, outer surface of pleon; D, pleonal surface of apex of male G1; E, sternal surface of male G2. Scale bars: A = 2 mm; B–D = 1 mm; E = 0.4 mm.

Austinixa leptodactyla, the Caribbean *A. roblesi* and the eastern Pacific *A. marianae* share many features, including a tuft of setae on the cardiac region of carapace, a dorsodistal depression on the P4 merus, and overall pleon and G1 morphology. *Austinixa leptodactyla* can be distinguished from *A. marianae* by the following characteristics: shape of the male pleon that is slightly subtrapezoidal and tapers only slightly towards the distal end in *A. leptodactyla* (Fig. 6C) (versus male pleon conspicuously subtrapezoidal and tapering consistently towards the distal end in *A. marianae*; see Salgado-Barragán *et al.* 2021: fig. 3E); and the G1 apex in *A. leptodactyla* has a slight indentation, giving it a bilobed appearance (Fig. 6D) (versus G1 apex clearly bifurcated in *A. marianae*; Salgado-Barragán *et al.* 2021: fig. 3J, K). However, the male telson of *A. leptodactyla* (Fig. 6A, C) and *A. marianae* (see Salgado-Barragán *et al.* 2021: fig. 3E) is similar, being longer than the sixth pleonite and having a rounded subtriangular shape.

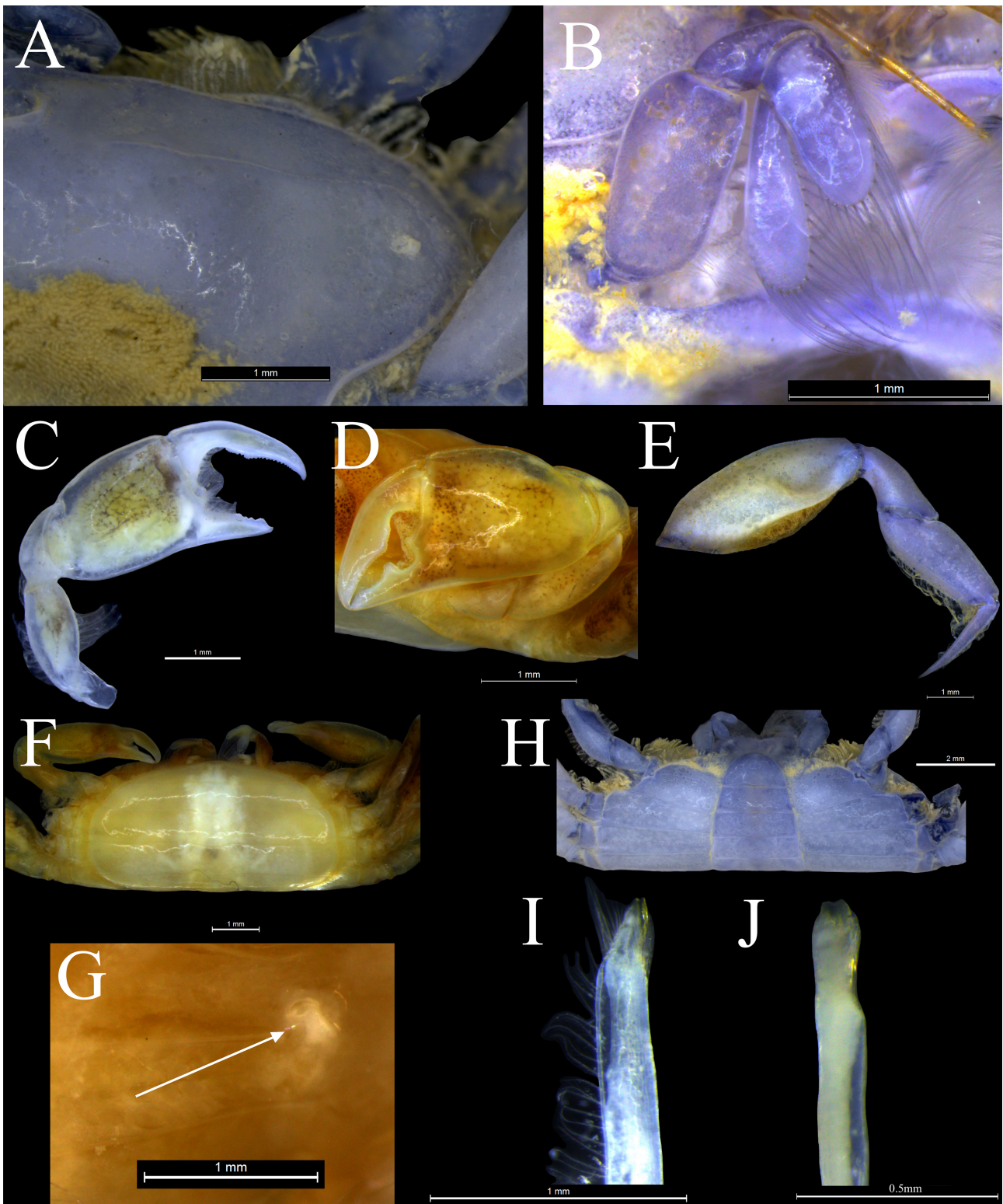


FIGURE 7. *Austinixa leptodactyla* (Coelho, 1997). A, B, E, H, male paratype (MOUFPE 15146), Alagamar, Natal, Rio Grande do Norte, Brazil; C, male (CCDB 7173), Praia de Suape, Cabo de Santo Agostinho, Pernambuco, Brazil; D, F, G, female (CCDB 7184), Praia de Forte Orange, Ilha de Itamaracá, Pernambuco, Brazil; I, J, male (CCDB 7170), Praia de Suape, Cabo de Santo Agostinho, Pernambuco, Brazil. A, dorsal view of branchial region of carapace; B, external surface of right Mxp3; C, internal surface of left male cheliped; D, external surface of left female cheliped; E, dorsal view of right P4; F, ventral view of female thoracic sternites and pleon; G, right female gonopore; H, ventral view of male thoracic sternites and pleon; I, pleonal surface of apex of right G1; mesial surface of apex of right G1. Scale bars shown in image.

Comparisons with figures in the literature (Palacios Theil & Felder 2020a: figs. 8, 9) show that *A. leptodactyla* is very similar to *A. roblesi*, with which it shares a similar overall morphology, including in important characteristics in pinnotherid taxonomy, such as the pleon shape and G1 morphology. However, the telson shape, which is widely used in genus-level and species-level taxonomy in pinnixines (e.g., Palacios Theil & Felder 2020a; Palacios Theil & Felder 2020b; Balbino & Mantelatto 2024), can be used to distinguish between these taxa, with *A. roblesi* possessing an almost semi-ellipsoid telson, which is about as long as the sixth pleonite (Palacios Theil & Felder 2020a: fig. 8G), whereas in *A. leptodactyla*, the telson is subtriangular with rounded margins and clearly longer than the last pleonite (Fig. 6A, C; Oliveira *et al.* 2026: fig. 4A). Oliveira *et al.* (2026) in the redescription of *A. leptodactyla* state that telson is subtriangular, like what we have observed herein, however, the authors later state that it is semicircular in a paragraph that discusses the differences between the species of *Austinixa* (see Oliveira *et al.* 2026: Remarks). Nonetheless, given our results, the figure provided by Oliveira *et al.* (2026: fig. 4A), and the redescription provided therein, it is clear that the telson is subtriangular, thus being different from the quasi semi-ellipsoid telson in *A. roblesi* (Palacios Theil & Felder 2020a: fig.8G). Furthermore, molecular data, integrated with the morphological data provided herein, in a linked study (Balbino *et al.* in revision) indicate that these are different species. Thus, this evidence highlights the validity of both species, even though they are morphologically very similar.

These morphological similarities between these three species suggest a close relationship between them, pending further phylogenetic studies using morphological and molecular data. Thus, this highlights the importance of more detailed descriptions and illustrations, like the ones provided by Palacios Theil & Felder (2020a), Salgado-Barragán *et al.* (2021), Oliveira *et al.* (2026), and herein, for comparisons between different species.

Habitat and host. Found on sand or mud bottoms on beaches or areas close to estuaries, from 0–39m in depth. This species lives in galleries of ghost shrimps of the family Callichiridae (Coelho 1997; Souza *et al.* 2025). Coelho (1997) also mentioned that this species can be associated with polychaete worms, however, Souza *et al.* (2025) did not mention this possible association, even though large samplings were carried out. We have also not observed this association during our field expeditions.

Type locality. Alagamar, Natal, Rio Grande do Norte, Brazil.

Distribution. Endemic to the northern and northeastern coast of Brazil, along the states of Pará, Ceará, Rio Grande do Norte, Pernambuco, Sergipe, and Bahia (Coelho 1997; Bezerra *et al.* 2006; Almeida *et al.* 2010).

Austinixa patagoniensis (Rathbun, 1918)

(Figures 8–12)

Pinnixa patagoniensis Rathbun, 1918: 135, fig. 79, pl. 30 figs. 1–3.—Boschi 1964: 55.—Fenucci 1975: 175, pl. 2 fig. C, D, pl. 3 fig. E, H.—Manning & Felder 1989: 20, figs. 13, 14.—Schmitt *et al.* 1973: 116.—Boschi *et al.* 1992: 79, fig. 92.—Melo 1996: 432.—Martins & D’Incao 1996: 21, figs. 12, 15E, F.—Coelho 1997: 179.

Pinnixa angeloi Righi, 1967: 110, fig. 27–32.—Rodrigues da Costa 1971: 262.—Coelho & Ramos 1972: 196.—Schmitt *et al.* 1973: 102.

Austinixa patagoniensis – Heard & Manning 1997: 393.—Bertini *et al.* 2004: 2202.—Harrison 2004: 744.—Boos *et al.* 2012: 1031.—Mantelatto *et al.* 2020: 55, fig. 17B.—Palacios Theil & Felder 2020: 103, tables 1, 2.

Type material examined. Holotype: male (MCZ-IZ-CRU 5741) (photographs), Argentina, Rio Negro, Gulf of San Matías, coll. Hassler Expedition, 07 March 1872.

Other material examined. BRAZIL: São Paulo: 1 juvenile (CCDB 7073), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., 17 July 2004.—1 male, 2 females (CCDB 6934), Ubatuba, Praia do Perequê-Açu, coll. Mantelatto, F. L., May 2007.—1 male (CCDB 7583), São Sebastião, Araçá, 23°48'56.86" S 45°24'26.24" W, coll. Mantelatto, F. L. *et al.*, 02 September 2023.—1 male (CCDB 3850), São Sebastião, Praia do Segredo, coll. Robles, R., 20 February 2011.—1 male, 2 females (CCDB 6916), São Sebastião, Praia de Guacécá, 23°49'29.62" S 45°27'08.3" W, coll. Mantelatto, F. L., Mantelatto, F. B., Mantelatto, H., Mantelatto, R., 24 December 2021.—1 damaged individual (CCDB 2191), São Sebastião, Praia de Baraqueçaba, coll. not informed, 09 November 2004.—1 male, 1 female (CCDB 5922), São Sebastião, Praia de Baraqueçaba, coll. not informed, 09 November 2004.—3 males, 1 female (CCDB 6939), São Sebastião, Praia de Baraqueçaba, coll. Mantelatto, F. L., 09 November 2007.—3 males, 2 females (CCDB 4351), São Sebastião, Praia de Baraqueçaba, coll. Mantelatto, F. L., 11 November 2007.—1 male (CCDB 5626), São Sebastião, Praia de Baraqueçaba, coll. Mantelatto, F. L. *et al.*, 02 December 2014.—15 males, 11 females, 1 damaged individual (CCDB 6011), São Sebastião, Praia de Baraqueçaba, coll. Mantelatto

F. L. *et al.*, 02 December 2014.—3 females (CCDB 7585), São Sebastião, Praia de Baraqueçaba, 23°49'42" S 45°26'03" W, coll. Mantelatto, F. L., Balbino, F. C., Tamburus, A. F., Geremias, H., Bochini, G. L., 02 September 2023.—1 female (CCDB 6842), São Vicente, Praia Itararé, coll. Leone, I., Rossi, N., Rocha, T. C., Carvalho, F. L., Zara, F. J., Costa, A., 23 October 2011.—1 female (CCDB 6841), Guarujá, Praia da Guaiuba, 24°00'59.1" S 46°17'39.7" W, coll. Carvalho, F. L., Costa, A., Leone, I., Rossi, N., 22 October 2011.—1 male, 1 female (CCDB 1527), Mongaguá, coll. not informed, October 2003.—1 male, 1 female (CCDB 7292), Itanhaém, Praia do Sonho, 24°11'36.96" S 46°47'46.32" W, coll. Balbino F. C., Udinal, V., 31 January 2023.—2 males, 2 females (CCDB 7293), Itanhaém, Praia do Sonho, 24°11'46.16" S 46°48'03.96" W, coll. Balbino F. C., Udinal, V., 01 February 2023.—2 males (CCDB 6028), Ilha Comprida, Praia do Boqueirão Norte, coll. Robles, R., Mantelatto, F. L., 22 July 2012.—7 males (CCDB 3209), Ilha Comprida, Praia do Boqueirão Norte, 24°45'04.7" S 47°33'16.0" W, coll. Robles, R., Mantelatto, F. L., 18 April 2011.—6 males, 1 female, 3 juveniles (CCDB 3667), Ilha Comprida, Praia do Pontal, 25°01'51.9" S 47°53'01" W, coll. Carvalho, F. L., Costa, A., Magalhães, T., Souza-Carvalho, E., Zupolini, L., 09 November 2011.—7 males, 7 females (CCDB 7588), Ilha Comprida, Praia do Boqueirão Sul, 25°01'53.57" S 47°53'02.54" W, coll. Mantelatto, F. L. *et al.*, 01 September 2023.—1 male (CCDB 3183), Ilha Comprida, Praia do Boqueirão Sul, 25°1'42.06" S 47°53'0.18" W, coll. Mantelatto, F. L., Robles, R., Rossi, N., Buranelli, R., Negri, M., 17 April 2011. Rio Grande do Sul: 1 male (MOUFPE 3435), Rio Grande, coll. not informed, 29 October 1988. ARGENTINA: Buenos Aires: 2 males, 2 females (CCDB 8022), Bahía Blanca, coll. Ocampo, E., January 2023.

Diagnosis. Male carapace lacking any tufts of setae on cardiac region; female carapace with two dense lateral tufts of setae covering lateral angles. Branchial ridges present, extending from lateral angles to orbits or almost so. Male chelipeds robust, inflated, fixed finger very reduced, digitiform, deflected downwards; female chelipeds not as robust, fixed finger long, barely deflected downwards. P4 merus with a ventral ridge composed of large tubercles. Male pleon with margins tapering slightly towards distal end; telson subtriangular with rounded margins, longer than sixth pleonite. G1 tip curved outwards, with a long laterally flattened projection.

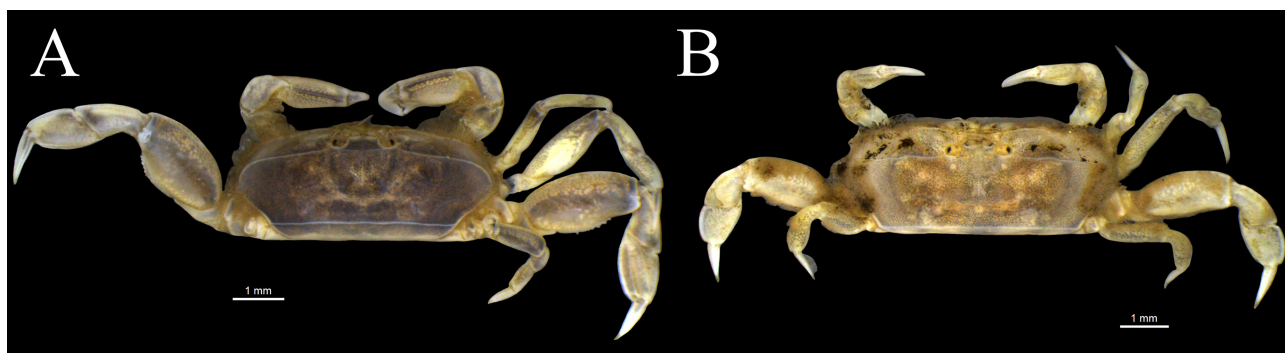


FIGURE 8. *Austinixa patagoniensis* (Rathbun, 1918), dorsal view of entire specimen. A, male (CCDB 8022), Bahía Blanca, Buenos Aires, Argentina; B, female, same information as male. Scale bars shown in image.

Redescription. Carapace 1.9–2.5 times as wide as long; transversally oblong, narrowing close to lateral margins, with small well-spaced punctae, regions poorly defined (Fig. 9A, B); front not protruding, dorsally almost truncate, trilobed when viewed frontally, with two slightly projected small lateral lobes, median region rounded and slightly projected, with a shallow median sulcus, front delimited posteriorly by an elevated crest extending from the edge of one orbit to another (Fig. 9C); orbits small, subequal in width to half of frontal width, not completely filled by eyes, orbit margins elevated, with a very short oblique ridge at mid-length of orbit pointing towards pterygostomial region (Fig. 9C); anterolateral margins almost straight to slightly convex proximally, becoming rounder laterally, lined by long plumose setae; hepatic region mostly smooth, with a broad, very shallow and almost inconspicuous depression at about two-thirds of the length between lateral margins and orbits; branchial regions crossed by a continuous elevated ridge, extending from anterolateral margins to orbits or almost so, ridge parallel to anterolateral margins of carapace (Figs. 9D, 12A); posterolateral margins almost straight to slightly concave, slightly dented near last pair of pereopods, female posterolateral margins with dense tufts of setae extending from branchial ridge to P5 junction, tufts denser and more conspicuous in larger specimens; gastric and cardiac regions with a shallow transverse gastrocardiac groove, extending across most of carapace width; cardiac region crossed by a straight transverse cardiac ridge, extending across entire carapace width, carapace dropping abruptly posterior to ridge (Fig. 9E).

Antennules small, short, stouter than antennae, tucked under front; basal article stoutest, large, fitting inside crevice below front; second article subcylindrical, slender, shorter than first; third article slightly longer than second, slenderer, subcylindrical; inner ramus small, elongated, less than 1/3 as long as third article, spearhead-shaped, setose; outer ramus four segmented, segments tapering towards distal end, setose (Fig. 9F). Antennae short, slender, about as long as width of front and one orbit, nine segmented; first segment the stoutest; second segment subequal in length to first, less stout; third segment slenderer, elongated, longest, about as long as first and second combined; fourth segment slenderer than third, slightly shorter than third; fifth and sixth segments progressively shorter and slenderer; seventh segment longer and slenderer than sixth, eighth and ninth segments minute, short, tapering towards distal end (Fig. 9G).

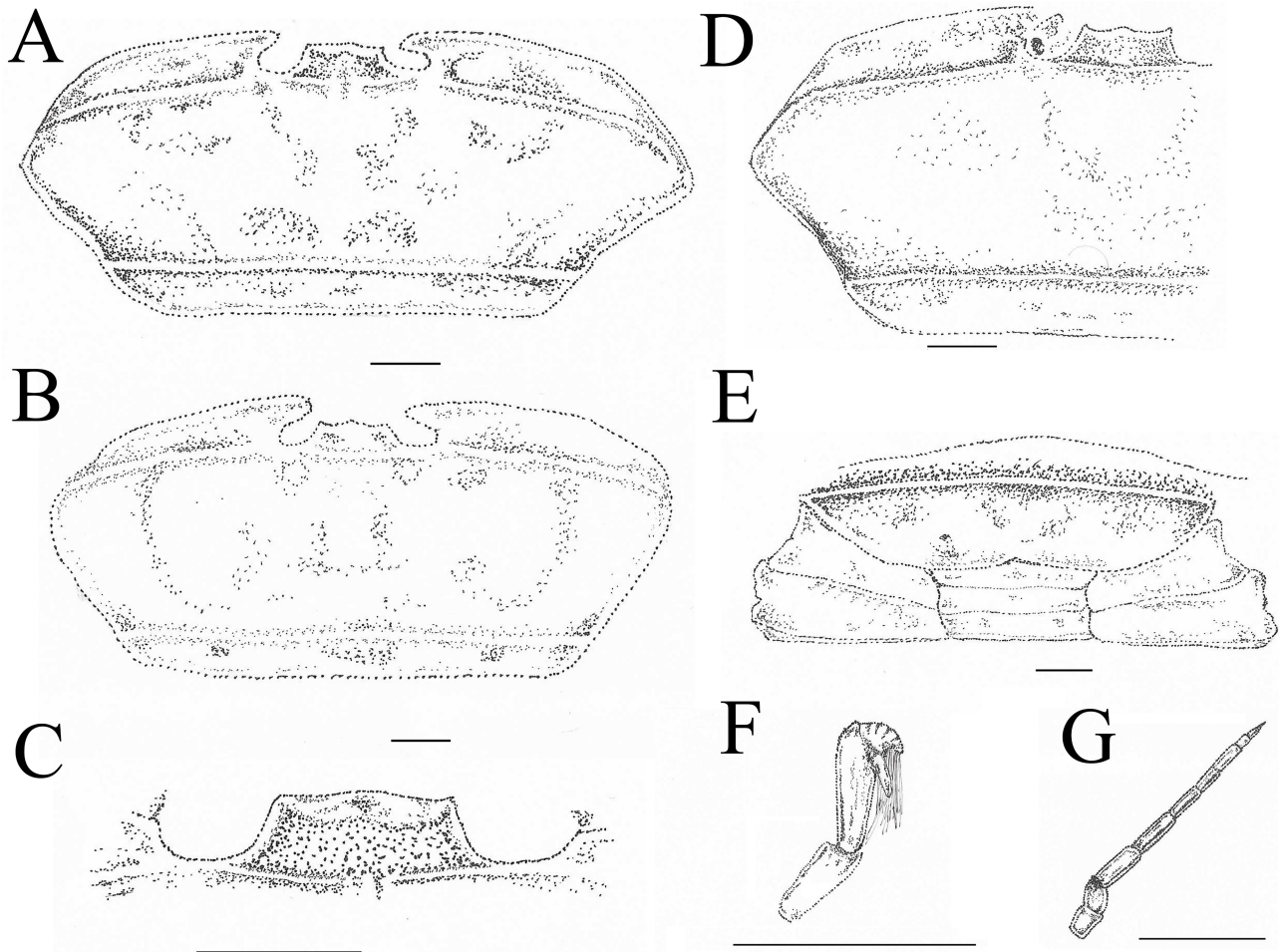


FIGURE 9. *Austinixa patagoniensis* (Rathbun, 1918). A, C–G, male (CCDB 8022), Bahía Blanca, Buenos Aires, Argentina; B, female (CCDB 8022), same information as male. A, B, dorsal view of carapace; C, dorsal view of front; D, dorsal view of left branchial region of carapace with branchial ridge; E, posterior view of cardiac region with cardiac ridge; F, left antennule; G, left antenna. Scale bars: A–G = 1 mm.

Mxp3 large, relatively wide; ischium and merus fused forming an ischiomerus without a visible external suture, ischiomerus longer than palpus, wide, subpentagonal, outer margin almost straight to slightly convex, inner margin with an obtuse angle, distal margins straight; palpus large, robust, shorter than ischiomerus, setose; carpus subtrapezoidal, shorter than propodus, with convex dorsal margin, with a setose distolateral projection on inner surface; propodus long, between 2/3 to 3/4 length of ischiomerus, subrectangular to sublanceolate, tapering slightly towards distal end, proximal and lateral margins straight, distal margin rounded, with long setae distally; dactylus articulating proximolaterally on outer surface of propodus, leaf-shaped, relatively wide, slenderer proximally, widening until 3/4 of its length, tapering again towards distal end, subequal in length to propodus, distal margin rounded, with many long setae (Figs. 10A, 12B).

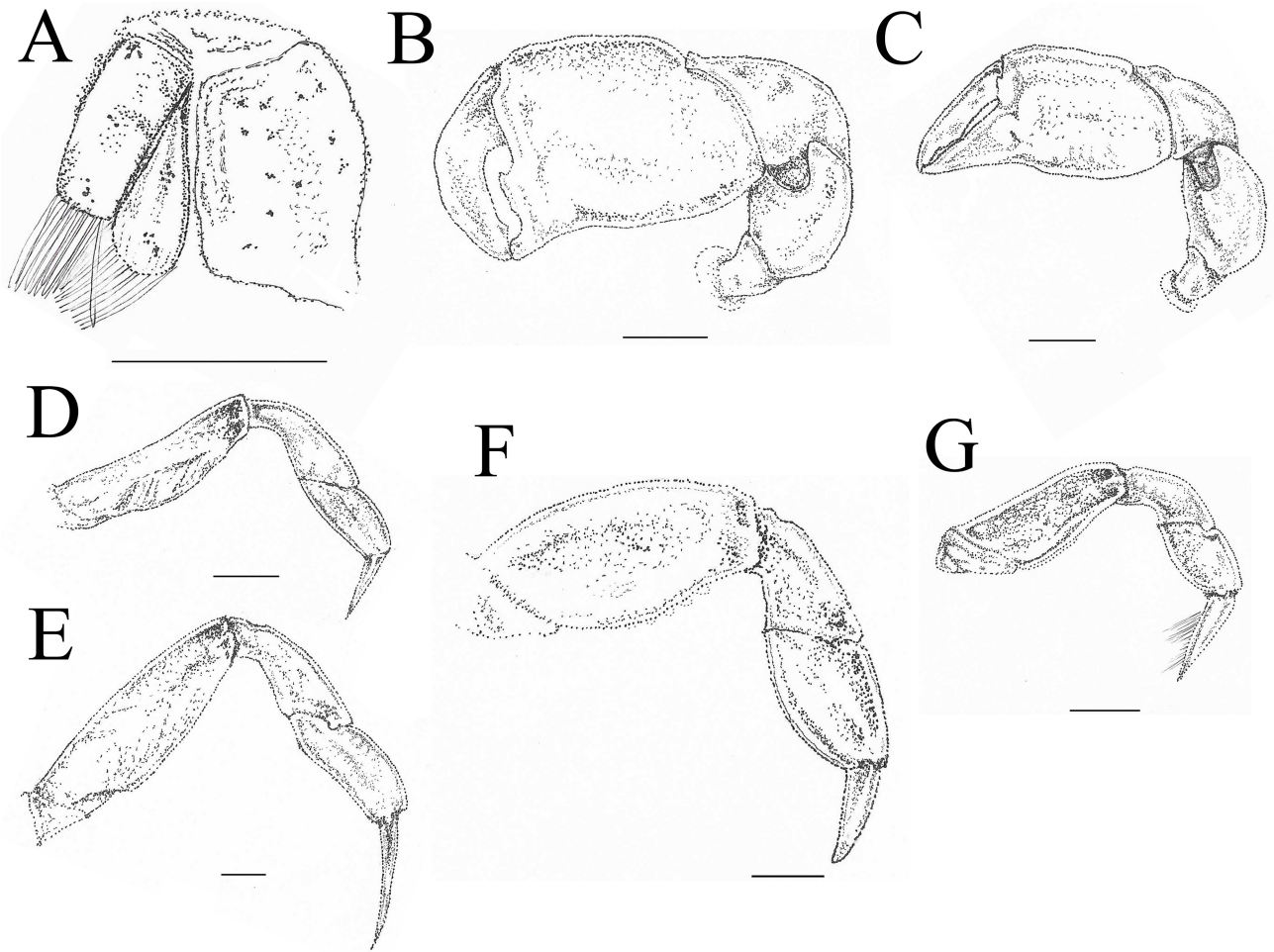


FIGURE 10. *Austinixa patagoniensis* (Rathbun, 1918). A, B, D–G, male (CCDB 8022), Bahía Blanca, Buenos Aires, Argentina; C, female (CCDB 8022), same information as male. A, external surface of left Mxp3; B, C, external surface of left cheliped; D, dorsal view of right P2; E, dorsal view of right P3; F, dorsal view of right P4; G, dorsal view of right P5. Scale bars: A–G = 1 mm.

Chelipeds large, robust, sexually dimorphic, conspicuously more robust in adult males (Figs. 10B, 12C), similar in females and small males (Figs. 10C, 12D), fingers thick in both sexes; merus mostly similar in males and females, slenderer in females, setose, relatively stout, shorter than palm, with convex margins, a tuberculated crest present along dorsal surface of inner margin, from mid-length to junction with carpus; carpus similar in small males and females, stouter in adult males, setose, short, robust, external margin broadly convex, concave on internal margin; adult male palm tall, robust, with mostly convex margins, ventral margin with a straight continuous ridge, concave close to fixed finger, lined by long setae on inner surface (Figs. 10B, 12C); adult male fingers with a large hiatus between them; adult male fixed finger extremely reduced, deflected downwards, thick, with slightly elevated ridge lined by small setae crossing middle of outer surface of finger, extending almost to tip, proximal part of cutting edge of fixed finger with small tuft of plumose setae, median portion with large truncated subrectangular tooth, distal portion with small elevation, small indentation separating elevation from tip; adult male dactylus extremely deflected downwards, curved, thick, not setose, proximal portion of cutting edge smooth, median portion progressively more conspicuously serrated, leading to a larger tubercle, distal portion tapering towards distal end; female palm not as tall as male, much smaller and less robust (Fig. 10C, D); female fingers with very small hiatus; female fixed finger long, as long as dactylus, not reduced, not deflected, with an slightly elevated ridge lined by small setae crossing middle of outer surface of finger, extending almost to tip, cutting edge gradually sloping down towards distal end, proximal portion of cutting edge with plumose setae, median portion slightly serrated, distal portion sloping down more abruptly, tip slenderer than rest of finger; female dactylus slenderer than that of male, slightly deflected downwards,

dorsal margin with a setose tuberculated ridge, outer surface with another parallel setose tuberculated ridge, proximal portion of cutting edge setose, median portion with a triangular tooth, elevating gradually from proximal margin, dropping more abruptly towards distal end, distal portion smooth, tip slightly curved downwards.

Walking pereopod relative sizes $P4 > P3 > P2 > P5$ (Fig. 10D–G, 12E); dactyli with corneous tips. P2 mostly smooth, relatively robust, sparsely setose, especially proximally; merus relatively robust, three to four times longer than wide, mostly smooth, dorsal margin straight, sparsely setose, ventral margin convex, dorso-distal portion with small tubercles; carpus mostly smooth, slender, about 2.5 times longer than wide, dorsal margin convex, with an elevated ridge, ventral margin concave proximally, almost straight distally; propodus mostly smooth, slender, shorter than carpus, slightly more than 2.5 times longer than wide, dorsal margin convex, with a slightly elevated ridge, ventral margin slightly concave; dactylus slender, slightly flattened laterally, especially at distal portion, subequal in length to propodus, dorsal surface with an elevated ridge, lateral surfaces with tuberculated ridges, posterior surface bearing setae, ventral surface with an oblique tuberculated ridge, tip curved anteriorly, lined by setae (Fig. 10D). P3 mostly smooth, relatively robust, sparsely setose, especially proximally; merus relatively robust, three to four times longer than wide, mostly smooth, dorsal margin slightly convex with an elevated ridge, sparsely setose, ventral margin convex, dorso-distal portion with small tubercles; carpus mostly smooth, slender, about 2.5 times longer than wide, dorsal margin convex, with an elevated ridge, ventral margin proximally concave, almost straight distally; propodus mostly smooth, slender, subequal in length to carpus, slightly more than 2.5 times longer than wide, dorsal margin convex, with an elevated ridge, ventral margin slightly concave; dactylus similar to that of P2, less curved anteriorly (Fig. 10E). P4 longest, most robust, inflated, sparsely setose; merus very robust, inflated, sparsely to densely setose proximally, dorsally and ventrally, more so proximally, slightly less than twice as long as wide, dorsal margin convex with an elevated setose tuberculated crest, anterior surface smooth, posterior surface with very small densely packed tubercles, sloping down towards ventral surface, ventral margin with a ridge bearing large tubercles, ridge straight proximally, distally oblique, extending from junction with basi-ischium to antero-distal portion of junction with carpus; carpus robust, inflated, sparsely setose, slightly longer than wide, covered in densely packed small tubercles, dorsal margin slightly convex with an elevated crest, ventral margin slightly concave; propodus robust, less than twice as long as wide, sparsely setose, covered in small densely packed tubercles, dorsal margin convex, with a setose elevated crest, opposable margin bicarinate, anterior carina extending from junction with propodus to junction with dactylus, tuberculated, with long plumose setae in smaller specimens, posterior carina blunter, almost inconspicuous proximally, becoming more visible distally; dactylus relatively robust, dorsal and ventral surfaces lined by long setae in smaller specimens, dorsal and lateral surfaces with one carina each, ventral surface with two carinas, tip almost straight (Figs. 10F, 12E). P5 shortest, relatively robust, setose, more so than other pereopods; merus relatively robust, about 2.5 times as long as wide, setose, dorsal margin slightly convex, with an elevated tuberculated crest, ventral margin convex proximally, almost straight distally, with a tuberculated crest extending from basi-ischium junction to distal third of merus; carpus short, about 1.5 times longer than wide, proportionally stout, setose, dorsal margin convex, with a tuberculated crest, ventral margin concave; propodus proportionally short, stout, about 1.5 times as long as wide, dorsal margin convex with a setose low tuberculated crest, opposable margin with a single tuberculated carina along posterior portion, carina lined by long plumose setae; dactylus relatively slender, longer than propodus, lined by setae on dorsal surface and by long plumose setae on ventral surface, lined by short spine-like setae along dorsal, ventral and lateral margins, more concentrated distally, dorsal surface with a tuberculated ridge lined by setae anteriorly and an elevated ridge posteriorly, tip curved posteriorly (Fig. 10G).

Male thoracic sternites 1–4 (1–3 bearing maxillipeds and 4 bearing chelipeds) fused into a single plate, sternites 1–4 plate with a vertical indentation at about half of its width, with a transverse depression at about 1/3 of its height, anterolateral and lateral margin tuberculated with a serrated appearance (Figs. 11A, 12H); sternites 5–8 (bearing walking pereopods) free, subtrapezoidal to subrectangular, sometimes slightly wider near pereopods, smooth. Female thoracic sternites 1–4 mostly similar to male, lined by long setae just outside of pleon (Fig. 12F); sternites 5–8 subrectangular to subtrapezoidal, mostly covered by pleon, sternite 6 bearing female gonopore (Fig. 12G); gonopore projected mesially, elevated, with bifid outline.

Male pleon slender, smooth, with margins slightly tapering towards distal end, pleonites free, fringed with small setae; first pleonite subtrapezoidal, widest, wider proximally, tapering towards distal end, short; second pleonite subtrapezoidal, slightly narrower proximally, as wide as distal margin of first pleonite, widening slightly towards distal end, short, as long as first pleonite; third pleonite subtrapezoidal, widest proximally, as wide as distal

margin of second pleonite, tapering towards distal end, twice as long as first and second pleonites; fourth and fifth pleonites subtrapezoidal, widest proximally, as wide as distal margin of previous pleonite, tapering towards distal end, as long as third pleonite; sixth pleonite subtrapezoidal, narrowest, wider proximally, tapering towards distal end more abruptly than other pleonites, margins slightly concave, as long as third pleonite (Figs. 11C, 12H). Telson subtriangular with round margins, as wide as distal margin of sixth pleonite, lined by longer setae compared to rest of pleon.

G1 slender, flattened dorso-ventrally, slightly curved towards sternum at about mid-length, lined on outer surface by long setae, inner surface with sparse short setae; apex stout, long, lined by long setae, sharply curved outwards and towards sternites, with a long laterally flattened projection, not flattened perpendicularly to axis of rest of G1 (Figs. 11D, 12I, J). G2 small, relatively stout proximally, tapering considerably towards distal end, apex curved (Fig. 11E).

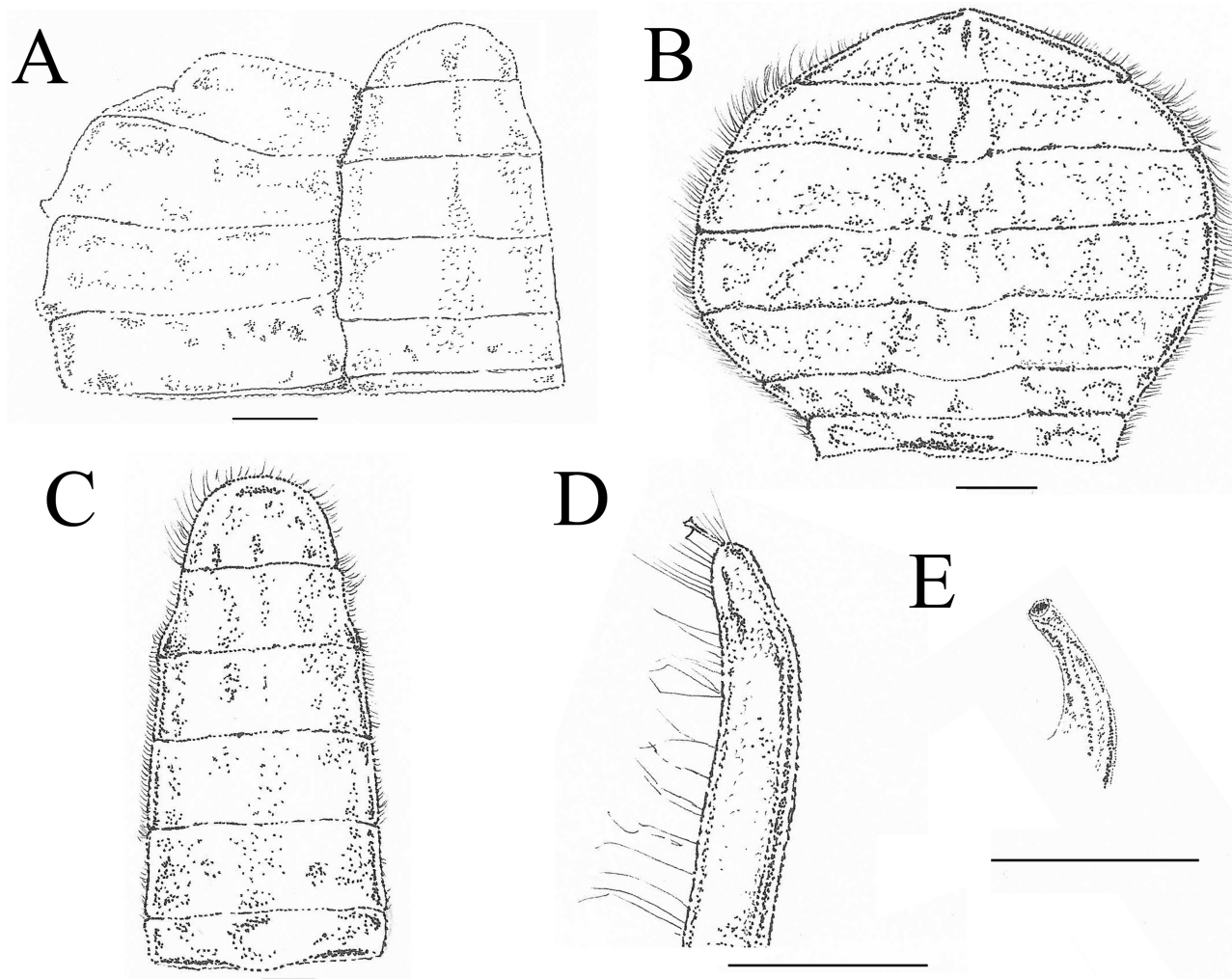


FIGURE 11. *Austinixa patagoniensis* (Rathbun, 1918). A, C–E, male (CCDB 8022), Bahía Blanca, Buenos Aires, Argentina; B, female (CCDB 8022), same information as male. A, ventral view of right male thoracic sternites and pleon; B, C, outer surface of pleon; D, pleonal surface of apex of male G1; E, sternal surface of male G2. Scale bars: A–D: 1 mm; E = 0.5 mm.

Female pleon wide, horizontally oval, with overall convex outline, margins lined by setae, pleonites free (Figs. 11B, 12F); first pleonite subtrapezoidal, slightly wider proximally, tapering towards distal end, short; second pleonite subtrapezoidal, margins more angled than first pleonite, much narrower proximally, widening towards distal end, short, slightly longer than first pleonite; third pleonite subtrapezoidal, margins angled like second pleonite, much narrower proximally, widening towards distal end, about twice as long as second pleonite; fourth pleonite subrectangular, widest, as long as third pleonite; fifth pleonite subtrapezoidal, wider proximally, tapering towards distal end, as long as fourth pleonite; sixth pleonite subtrapezoidal, margins angled, wider proximally, tapering

towards distal end, as long as fifth pleonite. Telson subtriangular with round margins, as wide as distal margin of sixth pleonite, margins discontinuous with pleon, lined by fewer setae compared to rest of pleon.

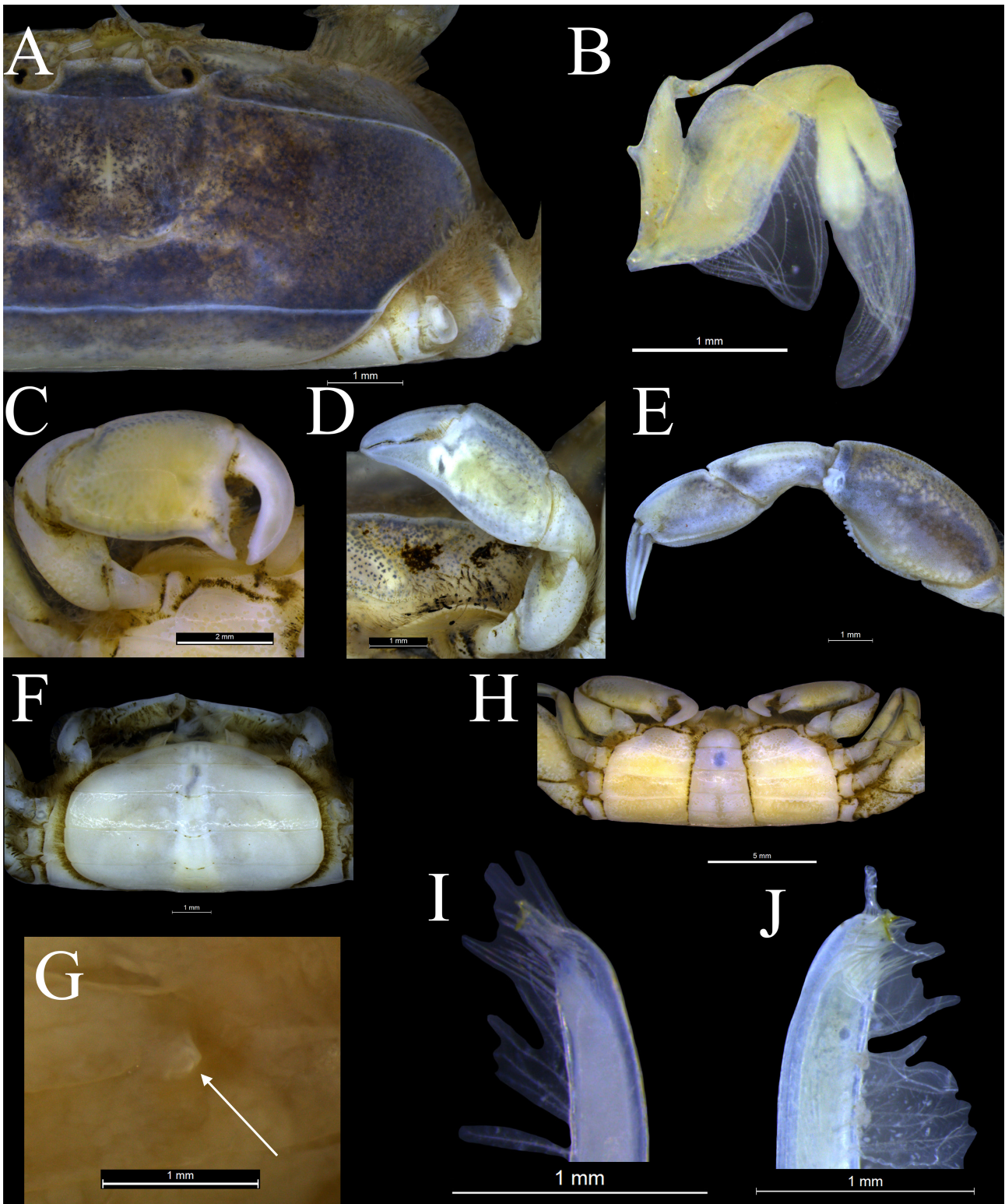


FIGURE 12. *Austinixa patagoniensis* (Rathbun, 1918). A, E, J, male (CCDB 8022), Bahía Blanca, Buenos Aires, Argentina; D, female (CCDB 8022), same information as male; B, I, male (CCDB 4351), Praia de Baraqueçaba, São Sebastião; C, H, male (CCDB 3209), Praia do Boqueirão Norte, Ilha Comprida, São Paulo, Brazil; F, G, female (CCDB 7293), Praia do Sonho, Itanhaém, São Paulo, Brazil. A, dorsal view of branchial region of carapace; B, external surface of right Mxp3; C, external surface of right male cheliped; D, external surface of left female cheliped; E, dorsal view of left P4; F, ventral view of female thoracic sternites and pleon; G, right female gonopore; H, ventral view of male thoracic sternites and pleon; I, pleonal surface of apex of right G1; lateral surface of apex of right G1. Scale bars shown in image.

Remarks. *A. patagoniensis* was originally described as *Pinnixa patagoniensis* by Rathbun (1918) based on specimens collected from Rio Negro, Argentina. Later, Righi (1967) described *P. angeloi* based on specimens collected in São Paulo, Brazil, arguing that in *P. angeloi* the branchial ridges reach the orbits, the orbits are completely filled by the eyes, along with other supposedly diagnostic characters. However, Fenucci (1975) considered *P. angeloi* as a junior synonym of *P. patagoniensis*, arguing that, after analyzing specimens of *P. angeloi* determined by Righi and a male paratype of *P. patagoniensis*, no sufficient morphological differences were found to support their separation into two species. Manning & Felder (1989) provided a more thorough description and good illustrations of *P. patagoniensis* and further supported the synonymy. Later, Heard & Manning (1997) included this species in *Austinixa* when describing the genus.

The distinctive morphology of *A. patagoniensis*, including the branchial ridges reaching the orbits or nearly so, the lateral tufts of setae on the female carapace, and the G1 morphology, sets it apart from all other species of the genus. This is further supported by both studies regarding the phylogeny of *Austinixa*, in which *A. patagoniensis* was recovered as the sister group of all other species (see Harrison 2004; Palacios Theil & Felder 2020a). However, even though these studies had already provided important information regarding this species, some morphological characteristics that are important for comparisons with other taxa remained without a thorough description. Thus, further description and illustration of these characters and the construction of a proper rediagnosis were necessary and are provided herein.

This species was also previously reported from northern Brazil by Coelho & Ramos (1972) with some later studies still considering these records valid (see Palacios Theil & Felder 2020a; Poupin 2024). However, Coelho (1997) in an extensive review of the species at-the-time assigned to *Pinnixa* of Brazil states that *A. patagoniensis* ranges from Rio de Janeiro (Brazil) to Rio Negro (Argentina), contradicting his previous record of this species in the northern portion of the country. This distribution proposed by Coelho (1997) is consistent with all the confirmed records of this species that we were able to find and examine from different collections. Thus, the original record of this species from northern Brazil was very likely a misidentification. This species appears to be a cold-water taxon, ranging further south than any other known species of the genus.

Habitat and host. Found on sandy or muddy bottoms on beaches and areas close to estuaries in shallow water. This species lives in galleries of ghost shrimps of the family Callichiridae (Righi 1967; Fenucci 1975; Martins & D’Incao 1996; Coelho 1997; Alves & Pezzuto 1998; João & Hernáez 2023) and may also be symbiotic with *Glossobalanus* Spengel, 1901 (Enteropneusta) or free living (Fenucci 1975; Coelho 1997).

Type locality. Gulf of San Matías, Rio Negro, Argentina.

Distribution. Known from southeastern and southern Brazil (states of Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul, and likely Paraná), Uruguay, and northern Argentina (provinces of Buenos Aires and Rio Negro) (Martins & D’Incao 1996; Coelho 1997; Bezerra *et al.* 2006; Boos *et al.* 2012; Mantelatto *et al.* 2020; Palacios Theil & Felder 2020a, present study).

Discussion

Within Pinnixinae, *Austinixa* is one of the most thoroughly studied genera from taxonomic, phylogenetic, and ecological perspectives (e.g., Manning & Felder 1989; Harrison 2004; Peiró *et al.* 2013; Palacios Theil & Felder 2020a; Oliveira *et al.* 2026; Balbino *et al.* in revision), whereas other genera remain poorly understood and not well-delimited taxonomically (see Palacios Theil & Felder 2020b; Balbino & Mantelatto 2024; Balbino *et al.* 2025). Species of *Austinixa* have been recorded as the most abundant macroinvertebrates in certain regions, such as *A. gorei* in Miami, FL, USA (Manning & Felder 1989; Harrison 2004), and this is possibly why they are much more studied than other pinnotherid groups. Given that several new species have been described very recently (see Palacios Theil & Felder 2020a; Salgado-Barragán *et al.* 2021), it is very likely that more species remain to be discovered, especially in regions that have not been thoroughly explored, such as the southwestern Atlantic and the tropical eastern Pacific.

The southwestern Atlantic coast is characterized by high species diversity, though it remains poorly explored taxonomically (Miloslavich *et al.* 2011). The pinnixines fit within this scenario, with several species still being described, synonymized, and assigned to different genera in recent years (see Coelho 1997; Coelho 2005; Almeida *et al.* 2023; Balbino & Mantelatto 2024; Balbino *et al.* 2025; Oliveira *et al.* 2026). The genus *Austinixa*, however, is possibly the best known within the pinnixines of the southwestern Atlantic, with many studies having addressed

the species' taxonomy, phylogeny, and ecology (e.g., Coelho 1997; Alves & Pezzuto 1998; Coelho 2005; Peiró *et al.* 2013; Peiró *et al.* 2014; Palacios Theil & Felder 2020a; João & Hernáez 2021; Almeida *et al.* 2023; Souza *et al.* 2025; Oliveira *et al.* 2026). Nonetheless, all three species occurring in the southwestern Atlantic remained relatively understudied when compared to species of *Austinixa* from North America and the Caribbean. Thus, a more thorough analysis of these taxa, like we have done herein, was necessary to fill the gaps in the knowledge about the genus.

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