

A new species and record of *Biancolina* Della Valle, 1893 (Amphipoda, Senticaudata, Ampithoidae) from the Southwestern Atlantic

Renan de Melo Andrade^{1,2} & Jesser Fidelis Souza-Filho^{1,3}

¹ Universidade Federal de Pernambuco (UFPE), Centro de Tecnologia e Geociências (CTG), Departamento de Oceanografia, Museu de Oceanografia “Prof. Petrônio Alves Coelho” Recife, PE, Brasil.

² ORCID: <https://orcid.org/0000-0002-0874-6769>. E-mail: renan_andrade16@hotmail.com

³ ORCID: <https://orcid.org/0000-0001-5248-2134>. E-mail: jesser.fidelis@ufpe.br

Abstract. Here we describe a new species of *Biancolina* from Pernambuco, Brazil, found in association with the brown algae *Sargassum* spp., between 0.5 and 1.0 m depth. The new species differs from its congeners mainly by the following combination of characters: antenna 1 twice the length of antenna 2, *lacinia mobilis* present in both mandibles, article 4 of the maxilliped bulbous; coxa 6 with anteroventral lobe well developed as in posteroventral lobe, peduncle of uropod 1 weakly setose, palm of pereopods 5-7 lacking robust seta. This is the first record of *Biancolina* from the southwestern Atlantic.

Keywords. Gammaridea; Senticaudata; Benthos; *Sargassum*; Phytal fauna.

INTRODUCTION

The species of *Biancolina* Della Valle, 1893 are minute amphipods (> 2 mm in adults) (Hughes & Poore, 2016). They live in association with macroalgae, boring tunnels into the algal tissue using its modified conical-shape mouthparts. Moreover, they have subglobular head, semicylindrical body, prehensile pereopods, and reduced urosomites (with modified uropods and telson). Such body modifications are considered convergent morphologies also observed in other boring amphipods (Mejaes *et al.*, 2015). Some species are host-specific, living in one or two species of brown algae, such as *B. japonica* Ishimaru, 1996 which is found exclusively in *Sargassum linearifolium* and *S. vestitum*, whereas *S. brassicacephala* lives in the floating *Sargassum natans* and *S. fluitans*.

Biancolina was first described as part of the family Dexaminidae by Della Valle (1893) and transferred to Ampithoidae by Stebbing (1899). Stebbing (1906) synonymized *B. algicola* Della Valle, 1893 with *Amphithoe cuniculus* Stebbing, 1874 (= *Amphitholina cuniculus*). Years later, Ruffo (1953) revalidated *B. algicola*, erected the genus *Amphitholina* within Ampithoidae, and transferred *Biancolina* to the family Prophiantidae Nicholls, 1939. Then, Gurjanova (1958) transferred *Biancolina* to the newly described fam-

ily Eophliantidae. Barnard (1972), erected a monotypic family Biancolinidae, highlighting the differences between two closely related genera: *Biancolina* and *Amphitholina* Ruffo, 1953. Bousfield (1978) transferred Biancolinidae to the Corophioidea Leach, 1814, but did not discuss it. Ishimaru (1996) reviewed the family and followed Bousfield classification. Myers & Lowry (2003) excluded Biancolinidae from their phylogenetic analysis of the Corophioidea Myers & Lowry, 2003, due to the absence of some of the most important synapomorphies of the group, such as silk glands on the basis of pereopods 3 and 4; slender and robust setae on the rami of uropod 3; and a dorsoventrally thickened telson, characters observed by Barnard (1972) and Bousfield (1978). However, Serejo (2004) and Lowry & Myers (2013) show that the Biancolinidae was related to Talitrida Rafinesque, 1815, the later authors recognized it as a monotypic superfamily, 'based on the loss of palps of mandible and maxilla 1 and the presence of curl-tipped setae on the oostegites', but with uropod 3 biramous (Myers & Lowry, 2003). Recently, Sotka *et al.* (2017) performed molecular analysis and based on that transferred the genus *Biancolina* back to Amphithoidae.

Up to date, there are seven described species in the genus. A wide geographical distribution, such as North Atlantic (USA and Cuba);

Pap. Avulsos Zool., 2022; v.62: e202262048

<http://doi.org/10.11606/1807-0205/2022.62.048>

<http://www.revistas.usp.br/paz>

<http://www.scielo.br/paz>

Edited by: Marcos Domingos Siqueira Tavares

Received: 05/08/2021

Accepted: 30/05/2022

Published: 01/09/2022

ISSN On-Line: 1807-0205

ISSN Printed: 0031-1049

ISNI: 0000-0004-0384-1825

<http://zoobank.org/8F4B446E-0BC2-4026-829F-C12D4B19503A>



Mediterranean Sea, Black Sea; Pacific Ocean, Japan, Australian, Hawaii, Fiji, (Hughes & Poore, 2016), however, none of them known from South Atlantic Ocean. In this paper, we describe a new species of the genus *Biancolina* from Northeast Brazil, Pernambuco state, comprising the first record of the genus from the Southwestern Atlantic. Also, this record increases to four the number of genera of the family Ampithoidae known from Brazilian waters.

MATERIAL AND METHODS

The studied specimens were found in association with brown algae of the genus *Sargassum* collected between 2018 and 2020 at the Praia do Paraíso, Suape Bay, Pernambuco (08°21'23.178"S, 34°57'06.386"W), at depths ranging from 0.5 to 1.0 meters. In order to better separate amphipods from the macroalgae, the algal frond was placed in water with a few drops of formalin for 10 minutes and after washed with seawater and fixed with buffered 4% formalin. At the laboratory, the specimens were transferred 75% alcohol. The type material is deposited in Crustacea Collection of Museu de Oceanografia Prof. Petrônio Alves Coelho (MOUFPE). Appendages and mouthparts of dissected specimens were mounted on glass slides and sealed with glycerol gelatin, after stained with Chlorazol Black. The crustacean setae classification proposed by Watling (1989) is here adopted. Digital illustrations were made up using CorelDRAW X7 following Coleman (2003) modified method.

Follows the abbreviations used in figures: A = antenna; G = gnathopod; HB = habitus; LL = lower lip; Md = mandible; Mx = maxilla; Mxp = maxilliped; P = pereopod; T = telson; UL = upper lip; Ur = uropod; f = female; m = male; l = left; r = right.

RESULTS

Taxonomy

Order Amphipoda Latreille 1816

Suborder Senticaudata Lowry & Myers 2013

Infraorder Corophiida Leach 1814

(sensu Lowry & Myers 2013)

Family Ampithoidae Boeck 1871

Genus *Biancolina* Della Valle (1893)

***Biancolina suassunai* sp. nov.**

(Figs. 1-5)

Type material: Holotype, male, 2.1 mm, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), between 0.5 and 1.0 m depth, MOUFPE 19604.

Paratypes: 1 female (dissected and drawn), same from holotype, MOUFPE 19605. 1 male, same from holotype, MOUFPE 19606. 1 female, same from holotype, MOUFPE 19607. 23 female and 2 males, same from holotype, MOUFPE 19608. MOUFPE 20014, 8 unsexed, 15

May 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W). 4 unsexed, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20015. 2 unsexed, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20016. 3 unsexed, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20017. 7 unsexed, 21 December 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20018. 3 unsexed, 21 December 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20019. 6 unsexed, 21 December 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20020. 4 unsexed, 21 December 2018, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20021. 1 unsexed, 24 January 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20022. 13 unsexed, 30 June 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20023. 16 unsexed, 30 June 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20024.

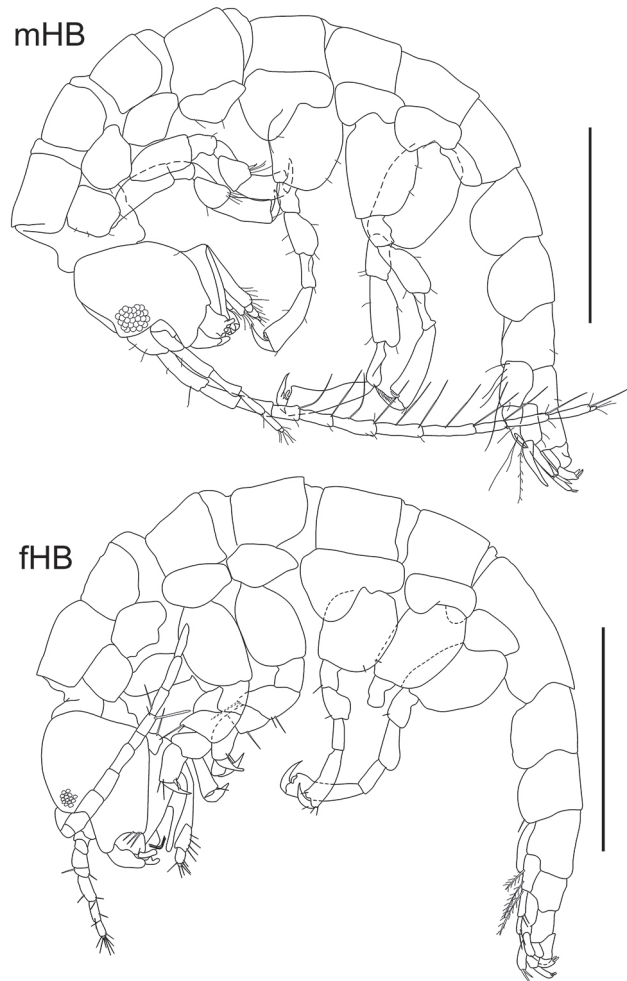


Figure 1. *Biancolina suassunai* sp. nov. Holotype, male, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco (08°21'23.178"S, 34°57'06.386"W), MOUFPE 19604. Paratype, female, MOUFPE 19605. Scale bars = 0.5 mm.

10 unsexed, 30 June 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20025. 5 unsexed, 30 June 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20026. 11 unsexed, 30 August 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20027. 71 unsexed, 30 August 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20028. 29 unsexed, 30 August 2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20029. 7 unsexed, 30 August

2019, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20030. 1 unsexed, 11 January 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20031. 6 unsexed, 11 January 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20032. 12 unsexed, 11 January 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20033. 5 unsexed, 11 January 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20034. 1 unsexed, 10 February 2020, Praia do

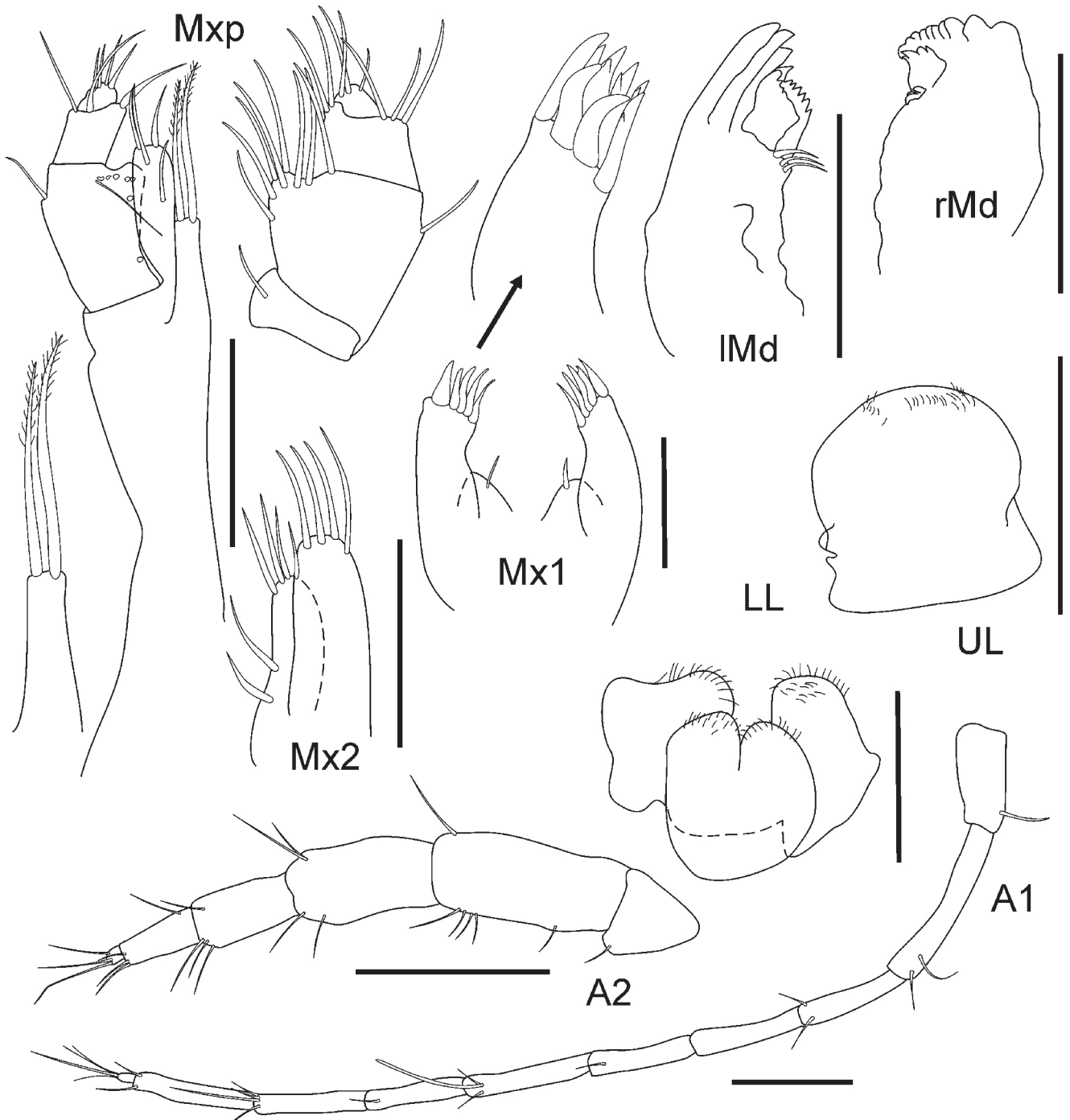


Figure 2. *Biancolina suassunai* sp. nov. Paratype, female, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco (08°21'23.178"S, 34°57'06.386"W), MOUFPE 19605. Scale bars = 0.1 mm.

Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20035. 1 unsexed, 10 February 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20036. 3 unsexed, 10 February 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20037. 2 unsexed, 10 February 2020, Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W), MOUFPE 20038.

Type locality: Praia do Paraíso, Suape Bay, Pernambuco state (08°21'23.178"S, 34°57'06.386"W).

Etymology: The epithet is in honor of the famous writer Ariano Vilar Suassuna for his efforts towards promoting and strengthening cultural awareness of the northeast Brazilian region. Also, the first author (RMA) was born on the same date as Ariano Suassuna (June 16th).

Diagnosis: *Antenna 2* article 4 longer than article 5 (1.4 ×). Left and right *mandible* with *lacinia mobilis*. *Maxilla 2* outer lobe with rounded apex. *Maxilliped* inner plate with two apical plumose setae. *Gnathopod 1* and 2 propodus with palm transverse. *Coxae 5* and 6 anterolobate. *Uropod 1* peduncle 1.25 × longer than outer ramus.

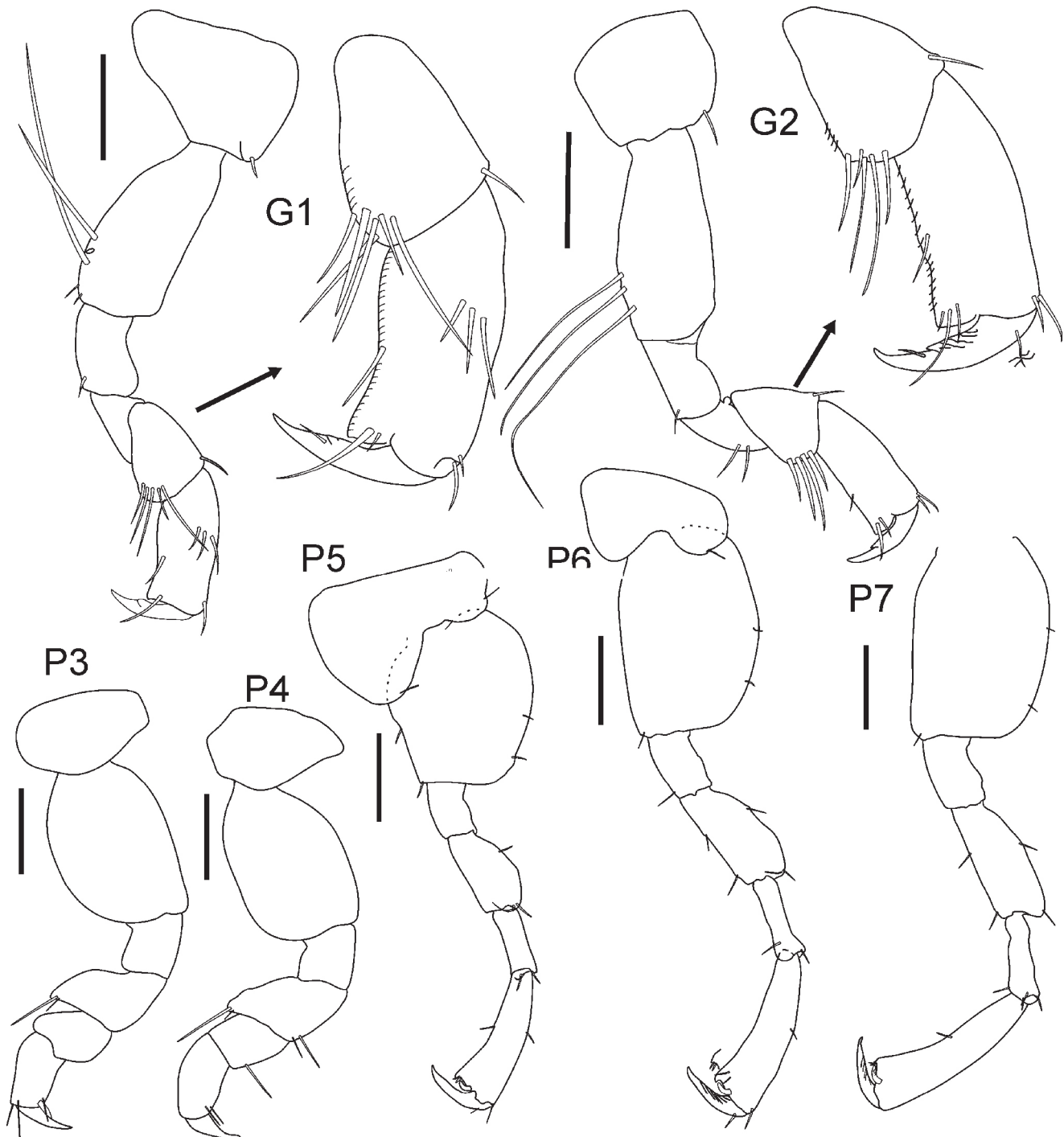


Figure 3. *Biancolina suassunai* sp. nov. Paratype, female, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco (08°21'23.178"S, 34°57'06.386"W), MOUFPE 19605. Scale bars = 0.1 mm.

Uropod 2 outer ramus $2.4 \times$ longer than inner ramus. *Telson* distally notched.

Description: Based on holotype (male, 2.1 mm).

Head: Head longer than deep; inferior margin produced. *Antenna 1* longer than antenna 2 (more than $2 \times$); peduncular article 1 shorter than article 2; article 2 longer than article 3; article 3 subequal to article 1; primary flagellum with 10 articles; accessory flagellum absent. *Antenna 2* slender, similar to antenna 1; peduncle articles 3 to 5 not densely setose on ventral margin; peduncle article 4 subequal in length to article 5; flagellum subequal to peduncular article 5, flagellum 3 articles. *Upper lip* directed forwards, at around 45 degrees, lateral margins without midlateral notches. *Mandible* molar absent, accessory setal row with 3 robust setae; palp absent. *Lower lip* outer plates entire, lateral lobe distinctly longer than medial lobe, without an apical nipple; mandibular lobe with straight margins, rounded apically. *Maxilla 1* inner plate with 1 slender setae;

palp absent. *Maxilla 2* inner plate narrower than outer plate; inner plate without oblique setal row. *Maxilliped* outer plate without a row of robust setae along medial margin.

Pereon: *Gnathopod 1* not sexually dimorphic, subequal in size to gnathopod 2, without long, dense, plumose setae on margins; coxa 1 subequal to coxa 2; broader than deep; anteroventral corner not produced, anterior margin convex, anteroventral corner rounded, with one seta; basis longer than coxa, posterior margin with long, slender setae, anterodistal lobe absent; ischium anterior margin with small lobe; merus anterodistal lobe rounded, posterodistal corner rounded; carpus about $1.5 \times$ as long as broad, subequal in length to merus, shorter than propodus ($0.6 \times$); carpus subtriangular, lobe absent, anterior margin with slender setae, posterior margin convex; propodus narrow, length $2.5 \times$ width, propodus subrectangular; palm transverse or nearly so, straight, palm defining corner, subquadrate, without robust setae defining palm; dactylus overreaching palm, inner mar-

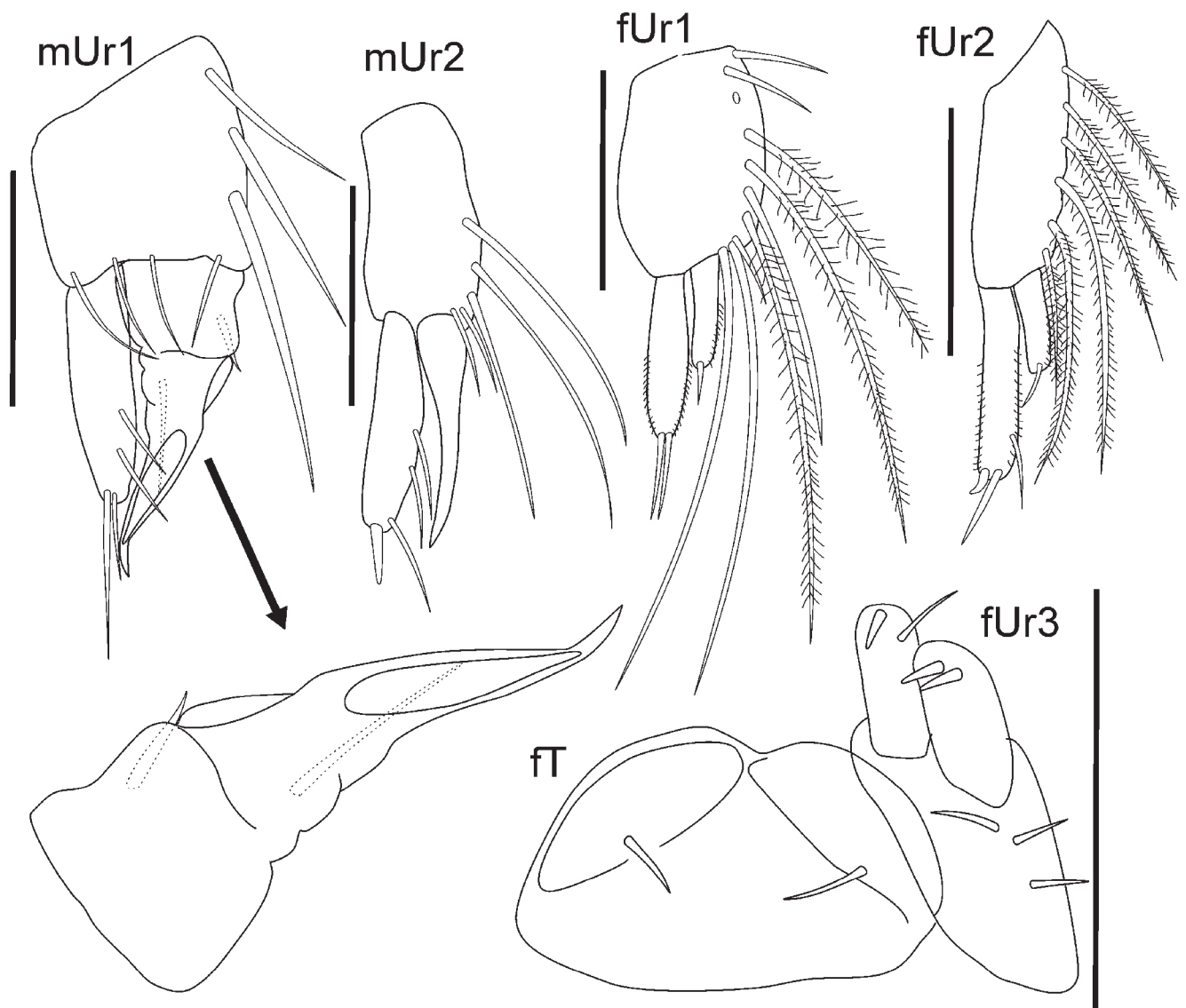


Figure 4. *Biancolina suassunai* sp. nov. Holotype, male, 16 July 2018, Praia do Paraíso, Suape Bay, Pernambuco ($08^{\circ}21'23.178''S$, $34^{\circ}57'06.386''W$), MOUFPE 19604. Paratype, female, MOUFPE 19605. Scale bars = 0.1 mm.

gin with a spine. *Gnathopod* 2 not sexually dimorphic, with long, simple setae on margins, coxa without long, plumose setal fringe on ventral margin, without any setae or with a simple seta on anteroventral corner, basis longer than coxa, basis with long, slender setae, basis anterodistal lobe vestigial or absent; ischium anterior margin without lobe; merus margin without lobe; carpus shorter than propodus, ($0.6 \times$ length), subtriangular, anterior margin with a single robust seta; propodus narrow, greater than $1.5 \times$ as long as broad, ($2.5 \times$ width), subrectangular, not produced into an anterodistally setose lobe; palm transverse or nearly so, palm entire and slightly convex, without proximal or midmedial tooth, defining corner subquadrate, lacking robust setae; dactylus overreaching palm, tapering evenly, apically acute, dactylus without unguis, inner margin with a spine. *Pereopod* 3 basis expanded; merus distally expanded; carpus about $1.5 \times$ as long as broad. *Pereopod* 4 basis similar to pereopod 3. *Pereopods* 5-7 strongly prehensile. *Pereopod* 5 coxa anterolobate (lobe long and rounded distally); merus subrectangular; distal articles slender; propodus slightly expanded distally, 2 distal striated robust setae, defining robust setae simple; dactylus slightly curved. *Pereopod* 6 basis posterior margin rounded, without marginal robust setae, with medial slender setae; merus subrectangular; distal articles slender; propodus slightly expanded distally; with 1 proximal robust setae; 2 distal striated robust setae; dactylus slightly curved. *Pereopod* 7 similar to pereopod 6; basis without marginal robust setae, without medial slender setae; distal articles slender; with 1 proximal robust seta; with 1-2 striated robust setae.

Pleon: *Epimeron* 3 posteroventral corner broadly rounded. *Uropod* 1 sexually dimorphic; short, reaching end of uropod 2 peduncle; peduncle $0.7 \times$ longer than wide; peduncle without robust setae, peduncle without slender setal fringe; peduncle outer margin with 3 very long simple setae; peduncle distal margin with 4 slender setae; distoventral spur vestigial or absent; inner ramus shorter than outer ramus, robust setae absent, slender setae present; outer ramus broad with fluted like water spout, connected with ductular

structure originated from inside of $\frac{1}{3}$ of the distal part; outer ramus broad, length about $2-4 \times$ as long as broad, marginal without robust setae, slender setae present. *Uropod* 2 not sexually dimorphic; peduncle $2 \times$ longer than wide; peduncle without distolateral projection, peduncle robust setae absent, slender setae fringe absent; rami subequal in length; inner ramus marginal robust setae absent, slender setae present (3 long setae); outer ramus marginal robust setae absent, slender setae present. *Uropod* 3 peduncle longer than broad, $1.4 \times$ width, $0.7 \times$ outer rami length, without marginal robust setae, outer margin with 3 slender setae, without distal slender setae; outer ramus subequal in length to inner ramus, with 2 small, straight or weakly curved distal robust setae, without patch of small lateral denticles; inner ramus with 1 distal robust setae and 1 distal slender setae, lacking lateral robust setae. *Telson* suboval, apically rounded; notched; without apical cusps, with dorsal slender setae (1 pair), without lateral plumose setae; denticles absent.

Female (dimorphic characters only)

Head eyes about 50% smaller than the male. *Antenna* 1 reaching posterior margin of pereonite 2; peduncular article 1 about $0.5 \times$ article 2; article 2 about $1.5 \times$ article 3; article 3 subequal to article 1; primary flagellum 7 articles. *Uropod* 1 peduncle $1.5 \times$ longer than wide; peduncle outer margin with 6+ very long simple or plumose setae; outer ramus shortened; inner ramus $1.4 \times$ longer than outer ramus; with 2 apical slender setae; outer ramus not fluted like; outer ramus slender, length about $5-6 \times$ as long as broad, slender setae present (1 apical). *Uropod* 2 sexually dimorphic; peduncle inflated, $3.3 \times$ longer than wide; peduncle with 6+ very long plumose setae; outer ramus shortened; inner ramus longer than outer ramus ($1.5 \times$); 1 apical slender setae present.

Habitat: Living in association with *Sargassum* spp. between 0.5 and 1.0 m depth.

Distribution: Known only from type locality.

Remarks: *Biancolina suassunai* sp. nov. closely resembles *B. japonica* Ishimaru, 1996, known from Japan Sea and Australia (Ishimaru, 1996; Hughes & Poore, 2016), form sharing the following states of characters: (a) antenna 1 at least $2 \times$ longer than antenna 2, (b) *lacinia mobilis* present in both mandibles, (c) article 4 of the maxilliped bulbous; (d) coxae 5 and 6 with anteroventral lobe well developed, (e) outer ramus of the uropods half length of inner ramus, and (f) telson with only a distal notch. However, both species can differ by the following combination of characters (characters of the *B. japonica* in parenthesis): coxa 6 with anteroventral lobe as well developed as posteroventral lobe (vs. anteroventral lobe more developed than posteroventral lobe), peduncle of uropod 1 weakly setose (vs. strongly setose), palm of pereopods 5-7 lacking robust seta (vs. with robust seta).

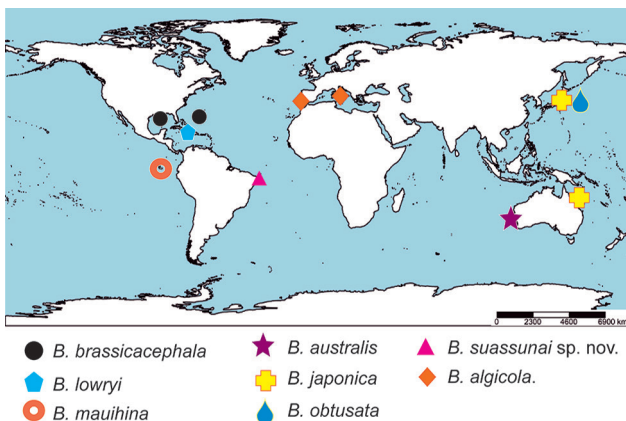


Figure 5. Geographical distribution of all known species of the genus *Biancolina*.

Key to known species of *Biancolina* (adapted from Ishimaru, 1996)

- 1a. Antenna 1 slightly longer than 2; *lacinia mobilis* on left mandible only; palp article 4 of maxilliped long, dactylate; outer rami of uropods 1 and 2 length subequal to inner "*Biancolina*" *australis*
- 1b. Antenna 1 twice as long as 2; *lacinia mobilis* on both mandibles; palp article 4 of maxilliped small, bulbous; outer rami of uropods 1 and 2 half as long as inner 2
- 2a. Coxae 5 and 6 anteroventral lobe as long as posteroventral lobe *Biancolina algicola*
- 2b. Coxae 5 and 6 anteroventral lobe much longer than posteroventral lobe 3
- 3a. Antenna 2, peduncular articles 4 and 5 subequal in length *B. mauihina*, *B. brassicephala* (*)
- 3b. Antenna 2, peduncular article 4 longer than 5 4
- 4a. Maxilliped inner plate with 2 long apical setae; maxilla 2 outer plate round distally; telson slightly notched apically 5
- 4b. Maxilliped inner plate with 4 or 5 apical/subapical setae; maxilla 2 outer plate truncate distally; telson cleft 50% length 6
- 5a. Coxa 6 anteroventral lobe more developed than posteroventral lobe; uropod 1 peduncle densely setose *B. japonica*
- 5b. Coxa 6 anteroventral lobe as well developed as posteroventral lobe; uropod 1 peduncle weakly setose *B. suassunai* **sp. nov.**
- 6a. Pereopod 5, basis posteroventrally expanded; pereopod 7, merus length subequal to carpus; male uropod 2 inner ramus overreaching far beyond uropod 3 rami *B. obtusata*
- 6b. Pereopod 5, basis posteroventrally beveled; pereopod 7, merus 1.7 × carpus length; male uropod 2 inner ramus not reaching apex of uropod 3 rami *B. sachalinensis*

(*) According to Ishmaru (1996) the identity of the two species is dubious.

AUTHORS' CONTRIBUTIONS: **RMA:** Investigation, **JFSF:** Supervision; **RMA, JFSF:** Writing – review & editing. All authors actively participated in the discussion of the results; they reviewed and approved the final version of the paper.

CONFLICTS OF INTEREST: Authors declare there are no conflicts of interest.

FUNDING INFORMATION: The first author also thanks to Programa Institucional de Bolsas de Iniciação Científica (Pibic/UFPE/CNPq) for the scholarship.

ACKNOWLEDGMENTS: The authors are thankful to Dr. Ricardo Paiva (UFPE) and MSc. Elinai Santos for making the digital drawings.

REFERENCES

- Barnard, J.L. 1972. The marine fauna of New Zealand: algae-living littoral Gammaridea (Crustacea Amphipoda). *New Zealand Oceanographic Institute Memoir*, 62: 1-216. <https://ia601005.us.archive.org/16/items/nzoimemoir00621972/nzoimemoir00621972.pdf>.
- Bousfield, E.L. 1978. A revised classification and phylogeny of amphipod crustaceans. *Transactions of the Royal Society of Canada*, 4(16): 343-390.
- Coleman, C.O. 2003. "Digital inking": How to make perfect line drawings on computers. *Organism, Diversity and Evolution*, 3(4): 1-14. <https://doi.org/10.1078/1439-6092-00081>.
- Della Valle, A. 1893. Gammarini del Golfo di Napoli. In: Fauna und Flora des Golfes von Neapel und der angrenzenden Meeres-Abschnitte. Berlin, Friedlander & Sohn. 948p. <https://doi.org/10.5962/bhl.title.3710>. (Zoologischer Station zu Neapel *Monographie*, 20)
- Gurjanova, E.F. 1958. Amphipod fauna (Amphipoda) of Macquarie Island. *Information Bulletin, Soviet Antarctic Expedition, 1955-1958*, 3: 55-56. [In Russian]
- Hughes, L.E. & Poore, A.G.B. 2016. *Biancolina japonica* Ishimaru 1996: first record of this burrowing amphipod from Australia and a review of host use in the genus *Biancolina* (Amphipoda: Peracarida: Crustacea). *Marine Biodiversity Records*, 9(32): 1-7. <https://doi.org/10.1186/s41200-016-0040-7>.
- Ishimaru, S. 1996. Taxonomic review of the family Biancolinidae (Amphipoda: Gammaridea), with description of a new species from Japan. *Journal of Crustacean Biology*, 16(2): 395-405. <https://doi.org/10.1163/193724096X00180>.
- Lowry, J.K. 1974. A new species of the amphipod *Biancolina* from the Sargasso Sea. *Transactions of the American Microscopical Society*, 93: 71-78. <https://doi.org/10.2307/3225221>.
- Lowry, J.K. & Myers, A.A. 2013. A phylogeny and classification of the Senticaudata subord. nov. Crustacea: Amphipoda. *Zootaxa*, 3610(1): 1-80. <https://doi.org/10.11646/zootaxa.3610.1.1>.
- Mejaes, B.; Poore, A.G.B. & Thiel, M. 2015. Crustaceans inhabiting domiciles excavated from macrophytes and stone. In: Thiel, M. & Watling, L. (Eds.). *Life styles and feeding biology of the Crustacea. Volume II in the Natural History of the Crustacea*. Oxford, United Kingdom, Oxford University Press. p. 118-139.
- Myers, A.A. & Lowry, J.K. 2003. A phylogeny and a new classification of the Corophiidea Leach, 1814 (Amphipoda). *Journal of Crustacean Biology*, 23(2): 443-485. <https://doi.org/10.1163/20021975-99990353>.
- Ruffo, S. 1953. Studi sui crostacei anfipodi XXXVI. Nota critica su *Biancolina algicola* D.Val. (Amphipoda, Prophiantidae). *Atti dell'Accademia di Agricoltura Scienze e Lettere di Verona*, 6: 1-9.
- Serejo, C.S. 2004. Cladistic revision of talitroidean amphipods (Crustacea, Gammaridea), with a proposal of a new classification. *Zoologica Scripta*, 33(6): 551-586. <https://doi.org/10.1111/j.0300-3256.2004.00163.x>.
- Sotka, E.E.; Bell, T.; Hughes, L.E.; Lowry, J.K. & Poore, A.G.B. 2017. A molecular phylogeny of marine amphipods in the herbivorous family Ampithoidae. *Zoologica Scripta*, 46: 85-95. <https://doi.org/10.1111/zsc.12190>.
- Stebbing, T.R.R. 1899. Revision of Amphipoda (continued). *Annals and Magazine of Natural History, Serie 7*, 4: 205-211. <https://doi.org/10.1080/00222939908678185>.
- Stebbing, T.R.R. 1906. *Amphipoda 1. Gammaridea. Das Tierreich*, Berlin, 21: 1-806. <https://doi.org/10.5962/bhl.title.1224>.
- Watling, L. 1989. A classification system for crustacean setae based on the homology concept. In: Felgenhauer, B.E.; Watling, L. & Thistle, A.B. (Eds.). *Functional morphology of feeding and grooming in Crustacea*. Rotterdam, A.A. Balkema. p. 15-26.