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A new western Atlantic species of *Eurysquilla* (Crustacea: Stomatopoda: Eurysquilloidea) with a key to the world species

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A new species of eurysquilloid stomatopod, Eurysquilla petronioi *sp. nov., is described from the tropical western Atlantic.* Eurysquilla petronioi *sp. nov. is the fourteenth species of the genus to be recognized worldwide, the fifth species from the western Atlantic and the second from Brazilian waters. It is most closely related to* E. maiaguesensis *from Puerto Rico, but differs chiefly in having an unarmed versus apically spinous rostral plate and 6 or 7 rather than 8–10 teeth on dactylus of raptorial claw. A key to the species of the genus is provided.*

Keywords: Hoplocarida, Eurysquillidae, South Atlantic, western Atlantic, Barbados, north-east Brazil, taxonomy

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INTRODUCTION

The stomatopod crustacean superfamily, Eurysquilloidea Manning, 1977, is supported as monophyletic by the ventrally originating outer intermediate and lateral denticles of the telson (Ahyong & Harling, 2000). Eurysquilloidea includes a single family Eurysquillidae Manning, 1977, with 31 living species and one fossil, distributed in six genera worldwide (Ahyong, 2001, 2010; De Angeli & Beschin, 2006), with only *Eurysquilla* represented in the Americas. Preliminary studies of the phylogeny of *Eurysquilla* (Cappola & Manning, 1999; Ahyong & Harling, 2000) found the genus to be paraphyletic and requiring further research. A comprehensive phylogenetic analysis of the Eurysquilloidea is currently in preparation by the second author.

Prior to the present study, *Eurysquilla* Manning, 1963 included thirteen species worldwide. Four species are known from the Indo-Pacific: *E. crosnieri* Moosa, 1991; *E. foresti* Moosa, 1986; *E. pacifica* Manning, 1975; and *E. sewelli* (Chopra, 1939). Three species are known from the Eastern Pacific: *E. pumae* Hendrickx & Salgado-Barragán, 1987; *E. veleronis* (Schmitt, 1940); and *E. solari* Manning, 1970. Two species, *E. galatheae* Manning, 1977 and *E. leloeuffi* Manning, 1977 occur in the eastern Atlantic and four species are known from the western Atlantic Ocean: *E. chacei* Manning, 1969; *E. holthuisi* Manning, 1969; *E. maiaguesensis* (Bigelow, 1901); and *E. plumata* (Bigelow, 1901). A new western Atlantic species is described herein.

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MATERIALS AND METHODS

Specimens studied herein are deposited in the carcinological collection of the Museu de Oceanografia Petrônio Alves Coelho of Universidade Federal de Pernambuco, Recife, Brazil (MOUFPE) and the National Museum of Natural History, Washington, DC (USNM). The Brazilian specimen was collected by N/RB 'Astro Garoupa' of PETROBRAS (Petróleo do Brasil S/A), as part of the Project 'Monitoramento da Bacia Potiguar/Rio Grande do Norte/ BR' (BPot). The sampling design consisted of 69 stations, collected between 2002 and 2004 with a 70-l rectangular dredge pulled for 5 minutes at a speed of 2 knots. The specimen studied herein was preserved in 70% ethanol. Total length (TL) is measured along the dorsal midline from the apex of the rostral plate to the apices of the submedian teeth of the telson. Carapace length (CL) is measured along the dorsal midline. The propodal index (PI) of the raptorial claw is given as 100CL/propodus length. Morphological terminology and the systematic classification follow those of Ahyong *et al.* (2008) and Ahyong (2012).

RESULTS

SYSTEMATICS

Order STOMATOPODA Latreille, 1817
Suborder UNIPELTATA Latreille, 1825
Superfamily EURYSQUILLOIDEA Manning, 1977
Family EURYSQUILLIDAE Manning, 1977
Eurysquilla petronioi sp. nov.
(Figure 1)

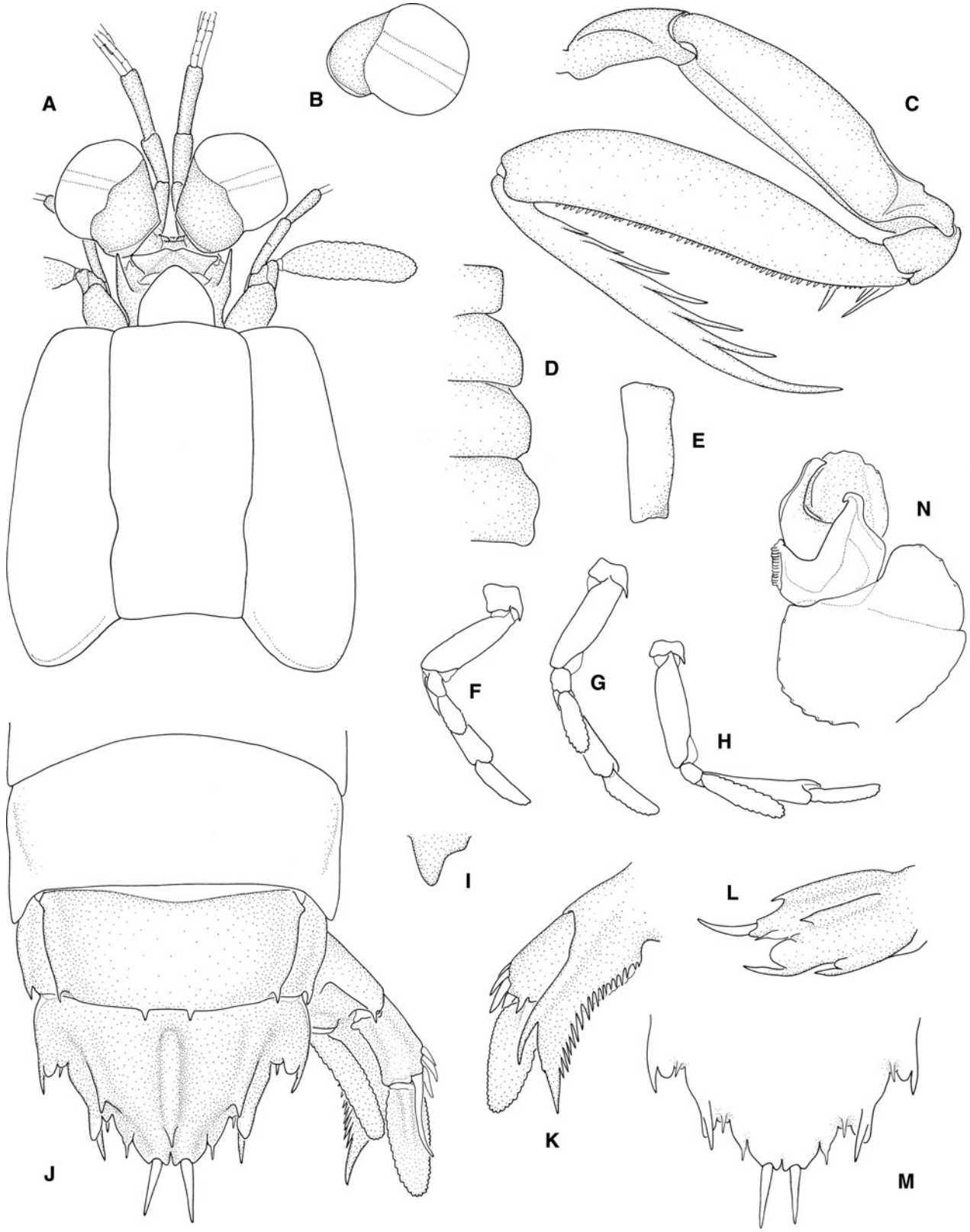

Fig. 1. *Eurysquilla petronioi* sp. nov.: (A–M) female holotype, total length (TL) 20 mm, USNM 111111; (N) male paratype, TL 11 mm, MOUFPE 14201. (A) Carapace and anterior appendages; (B) right eye; (C) right raptorial claw; (D) right lateral processes of thoracic somites 5–8; (E) thoracic somite 5, right lateral view; (F–H) right pereopods 1–3, posterior view; (I) thoracic somite 8 sternal keel; (J) posterior abdominal somites, telson and right uropod; (K) right uropod, ventral view; (L) telson, right lateral view; (M) telson, ventral view; (N) right pleopod 1 endopod, anterior view. Scale bars: A–H, J–M = 1.0 mm; I = 0.5 mm; N = 0.3 mm.

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Eurysquilla maiaguesensis.—Manning, 1969: 254, 257 (Barbados specimen only; not *Lysiosquilla maiaguesensis* Bigelow, 1901).

TYPE MATERIAL

Holotype: USNM 111111, female (TL 20 mm), Barbados (~13°00′N 59°30′W), Caribbean Sea, Station NR1-3, 91.5–366 m (originally recorded as 50–200 fathoms), coll. J.B. Lewis, summer, 1960. Paratype: MOUFPE 14201, male (TL 11.25 mm), Rio Grande do Norte, Brazil, 04°36.64′S 36°44.89′W, 368 m, BPot II No. 33, dredge, 20 May 2003.

COMPARATIVE MATERIAL

Eurysquilla maiaguesensis (Bigelow, 1901): USNM 64824, male lectotype (TL 23 mm), Mayaguez Harbor, 294.6–314.8 m (originally recorded as 161–172 fathoms), sand and mud, beam trawl, U.S.F.C. Steamer 'Fish Hawk', Station 6066, 20 January 1899; USNM 110939, 1 male paralectotype (TL 20 mm), 1 female paralectotype (broken), USNM 119137, male (TL 20.5 mm), Atlantic Ocean, north of Puerto Rico (18°31′30″N 66°14′55″W), 219.4 m (originally recorded as 120 fathoms), Johnson–Smithsonian Deep-Sea Expedition, Station 105, coll. P.S. Bartsch, 8 March 1933.

DIAGNOSIS

Cornea slightly broadened, subglobular, with 6 rows of midband ommatidia. Antennal protopod without papillae. Rostral plate slightly wider than long; apex rounded. Raptorial claw dactylus with 6 or 7 teeth on occlusal margin. Mandibular palp absent. Maxillipeds 1–4 each with epipod. Thoracic somites 5–8 and abdominal somites 1–5 posterolaterally unarmed. Male pleopod 1 endopod posterior endite without lateral lobe. Telson dorsal surface with posteriorly spined median and anterior intermediate carinae, surface otherwise smooth. Uropodal protopod broad, flattened, terminating in 2 primary spines; protopod inner margin lined with spines. Endopod length 4 or more times breadth.

DESCRIPTION

Dorsal integument smooth. Eye extending slightly beyond antennal peduncle segment 2; cornea slightly broadened, subglobular, set obliquely on stalk, with 6 rows of midband ommatidia. Ophthalmic somite anterior margin unarmed. Ocular scales broad, triangular, anteriorly convex, apices inclined directed laterally.

Antennular peduncle length 0.81–0.83 CL; segment 1 with small rounded lateral proximal lobe. Antennular somite dorsal processes spiniform, directed anteriorly. Antennal protopod without papillae; dorsally unarmed. Antennal scale length 3.17–3.50 times width, 0.37–0.49 CL; setose on anterior distal three-quarters and entire posterior margin.

Rostral plate slightly wider than long; subtriangular apex rounded, unarmed; lacking dorsal or ventral carina.

Carapace anterolateral angles broadly rounded; marginal carina faintly indicated posterolaterally.

Raptorial claw dactylus with 6 or 7 teeth on occlusal margin; outer margin broadly curved, uninflated, without proximal notch. Propodus longer than carapace length, when folded, distal margin extending posteriorly beyond ischium; occlusal margin fully pectinate, with 3 moveable spines proximally; PI 75 (male), 69 (female). Carpus unarmed dorsally; merus outer inferodistal angle rounded.

Mandibular palp absent. Maxillipeds 1–4 each with epipod. Maxilliped 5 basal segment unarmed; epipod absent.

Body dorsoventrally flattened, somites loosely articulated.

Thoracic somites 5–8 without dorsal carinae. Thoracic somite 5 lateral process obsolete, truncate, ventral lobe blunt. Thoracic somites 6–8 lateral process rounded, posterolaterally unarmed. Thoracic somite 8 sternal keel narrow, blunt, directed ventrally.

Pereopods 1–3 basal segment each with outer, ventrally directed spine; endopods elongate, spatulate, 1-segmented, shortest on pereopod 1, longest on pereopod 3, setose on outer margin and margin of inner distal half.

Abdominal somites 1–5 pleura unarmed posterolaterally, with low marginal carina; somite 5 with indistinct intermediate swelling. Abdominal somite 6 smooth, without submedian carina but pair of submedian spines on posterior margin; intermediate and lateral carina with posterior spine; ventrolateral margin anterior to uropodal articulation unarmed; sternum posterior margin unarmed.

Male pleopod 1 endopod with tube process distinctly longer than hook process; posterior endite with outer margin non-setose, without lateral lobe.

Telson wider than long, subtriangular. Submedian teeth moveable, spiniform, separated by narrow fissure; submedian denticles absent. Intermediate teeth slender, apices slightly deflected dorsally, extending posteriorly almost to level of base of submedian teeth; with rounded, upright dorsal lobe; with 2 spiniform intermediate denticles, outer arising ventrally, inner on rounded lobe. Lateral teeth slender; apices slightly deflected dorsally, with rounded, mesially inclined dorsal lobe and 1 spiniform lateral denticle arising ventrally. Telson dorsal surface with median and anterior intermediate carinae, surface otherwise smooth. Median carina low, smooth, uninterrupted; apex spiniform. Anterior intermediate carinae slightly convergent posteriorly, smooth, uninterrupted; apex spiniform. Marginal carina indistinct. Telson ventral surface lacking postanal carina.

Uropodal protopod broad, flattened, distinctly wider than endopod, terminating in 2 primary spines; inner primary spine about twice as long as outer, with small, low spine or lobe at midlength of outer margin; protopod unarmed dorsally except for small dorsal spine above proximal exopod articulation; protopod inner margin lined with 13–20 spines.

Uropodal exopod proximal segment unarmed dorsally; with distoventral spine; inner margin broadly convex; outer margin with 4 or 5 graded, moveable spines, distal spine longest, arcuate, reaching to distal quarter of distal segment. Exopod distal segment ovate, unarmed, longer than proximal segment. Endopod length 4.0–4.5 times breadth, unarmed, entire margin setose.

COLOUR IN LIFE

Not known. In preservation completely faded.

MEASUREMENTS

Male (N = 1) TL 11 mm, female (N = 1) TL 20 mm. Other measurements of holotype: CL 3.5 mm, antennular peduncle length 2.9 mm, antennal scale length 1.7 mm, raptorial claw propodus length 5.1 mm.

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ETYMOLOGY

The specific epithet is in honour of Dr Petrônio Alves Coelho, who recently passed away, for his contribution to the field of carcinology in Brazil.

HABITAT

The Brazilian specimen was found at 368 m depth, with salinity 35.23‰ and temperature 11.1°C. Sediment was stratified, with a light-coloured top layer of silt, fine sand and bioclasts. The base was dark-coloured clay. It has being classified as sandy loam (Freire *et al.*, 1997).

DISTRIBUTION

Presently known only from Barbados and Rio Grande do Norte, Brazil; 91.5–368 m (Figure 2).

REMARKS

Eurysquilla petronioi sp. nov. is the fourteenth species of the genus to be recognized. It is readily separated from *E. foresti*, *E. galatheae*, *E. lelouffi*, *E. plumata*, *E. pumae*, *E. sewelli*, *E. solari* and *E. veleronis* by having a broad, mesially multispinous uropodal protopod, rather than a slender Y-shaped protopod that is armed at most with a single spine on the inner margin. Like *E. petronioi*, the remaining species of *Eurysquilla* have a broad uropodal protopod with a multispinous inner margin. *Eurysquilla petronioi* is separable from *E. chacei*, *E. holthuisi*, *E. crosnieri* and *E. pacifica* by its broadened and subglobular, rather than strongly bilobed cornea.

Fig. 2. Distribution of *Eurysquilla petronioi* sp. nov., in the western Atlantic: holotype (◆) and paratype (●).

The new species most closely resembles *E. maiaguesensis* from Puerto Rico, sharing a similar eye, uropod and telson structure. The two species differ in the form of the rostral plate (distally rounded and slightly wider than long in *E. petronioi*; distally spinous and as long as or longer than wide in *E. maiaguesensis*), the armature of the dactylus of the raptorial claw (6 or 7 in *E. petronioi*; 8–10, usually 9, in *E. maiaguesensis*) and slenderness of the uropodal endopod (4–4.5 times as long as wide in *E. petronioi*; more than 6 times as long as wide in *E. maiaguesensis*). Other differences are in the number of outer uropodal exopod spines (4 or 5 in *E. petronioi*; 6 in *E. maiaguesensis*) and the length of the distal uropodal exopod spine, which reaches the distal quarter of the distal exopod segment in *E. petronioi*, rather than the end in *E. maiaguesensis*.

The holotype and paratype agree in most respects. At TL 11 mm, however, the young male paratype is approximately half the size of the female holotype (TL 20 mm) and exhibits several size related differences: the rostral plate is slightly more triangular in shape, the eyes are more elongate, 6 instead of 7 teeth are present on the dactylus of the raptorial claw, the telson carinae are less pronounced, the dorsal lobes on the intermediate and lateral primary teeth of the telson are less upright and the inner uropodal spines are fewer in number (13–16 versus 18–20). Similar allometric changes are evident in other species of *Eurysquilla* including *E. maiaguesensis*.

Eurysquilla petronioi sp. nov. is the fifth western Atlantic species of the genus and the second from Brazilian waters, alongside *E. plumata*. A key to the species of the genus is given below.

KEY TO THE SPECIES OF *EURYSQUILLA* MANNING, 1963

1. Uropodal protopod distally Y-shaped, slender, about as wide as endopod; inner margin with at most one lobe or spine 2
— Uropodal protopod broad, flattened, distinctly wider than endopod; inner margin lined with row of five or more slender spines 9

2. Uropodal protopod with spine on inner margin 3
– Uropodal protopod without spine on inner margin 4

3. Cornea subglobular . . . . . *E. pumae*
— Cornea elongate, distinctly widened . . . . . *E. veleronis*

4. Telson without carina or tubercles flanking median carina. Maxilliped 5 without epipod . . . . . *E. lelouffi*
— Telson with irregular carina or row of tubercles flanking median carina Maxilliped 5 with epipod 5

5. Rostral plate without apical spine. Cornea subglobular . . . . . *E. plumata*
— Rostral plate with apical spine. Cornea distinctly widened 6

6. Abdominal somite 4 posterior margin with spine above posterolateral spine . . . . . *E. sewelli*
— Abdominal somite 4 posterior margin with posterolateral spine only, otherwise unarmed 7

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7. Abdominal somite 5 posterior margin with 2 pairs of spines (intermediate, lateral) . . . . . *E. foresti*
— Abdominal somite 5 posterior margin with 3 pairs of spines (intermediate, lateral, marginal) 8

8. Rostral plate with carina of distal spine extending onto anterior half of surface. Intermediate carinae of thoracic somites 6—8 distinct . . . . . *E. galatheae*
— Rostral plate with carina of distal spine extending onto anterior one-fifth of surface. Intermediate carinae of thoracic somites 6—8 indistinct, faintly indicated . . . . . *E. solari*

9. Uropodal protopod with rounded lobe between terminal primary spines 10
— Uropodal protopod without rounded lobe between terminal primary spines 11

10. Rostral plate distinctly longer than wide. Telson surface without tubercles between median carina and anterior intermediate carina . . . . . *E. holthuisi*
— Rostral plate as long as wide. Telson surface with tubercles between median carina and anterior intermediate carina . . . . . *E. chacei*

11. Cornea broad, set transversely on stalk. Rostral plate distinctly wider than long 12
— Cornea little broadened, subglobular, set obliquely on stalk. Rostral plate longer than wide to slightly wider than long 13

12. Abdominal somite 6 with 8 posterior spines . . . . . *E. pacifica*
— Abdominal somite 6 with 10 posterior spines . . . . . *E. crosnieri*

13. Rostral plate slightly wider than long, distally rounded, without spine . . . . . *E. petronioi* sp. nov.
— Rostral plate as long as or longer than wide, with apical spine . . . . . *E. maiaguesensis*

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