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The first record of an association between a pontoniine shrimp (Crustacea: Decapoda: Palaemonidae: Pontoniinae) and a thalassematid spoon worm (Echiura: Thalassematidae), with the description of a new shrimp species

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Abstract

A new pontoniine shrimp species, *Eupontonia nudirostris* **sp. nov.** (Crustacea: Decapoda: Palaemonidae: Pontoniinae), was found in association with the thalassematid spoon worm *Listriolobus* sp. (Echiura: Thalassematidae) in the mangrove littoral of Dam Bay of Tre Island, Nhatrang Bay, Vietnam. This is the first record of an association between symbiotic pontoniine shrimp and spoon worm as their host. The new shrimp species clearly differs from other representatives of the genus *Eupontonia* Bruce, 1971 by the unarmed rostrum with a blunt tip and the reduced antennal tooth on the carapace, which can be considered as an adaptation to symbiotic lifestyle inside cramped burrows of the host. A revised key to the genus *Eupontonia* Bruce, 1971 is presented.

Key words: Crustacea, Decapoda, Caridea, Palaemonidae, Pontoniinae, *Eupontonia*, shrimp, new species, spoon worms, Echiura, Thalassematidae, *Listriolobus*, Pacific, South-China Sea, Nhatrang Bay, Vietnam

INTRODUCTION

Four pontoniine shrimp genera, *Palaemonella* Dana, 1852, *Exoclimenella* Bruce, 1995, *Eupontonia* Bruce, 1971 and *Vir* Holthuis, 1952, are known to possess a mandibular palp (e.g. Bruce, 1971; Holthuis, 1993; Ďuriš & Bruce, 1995; De Grave & Fransen, 2011), often considered to be an ancestral character. Members of these genera possess a slender cylindrical body and slender appendages, both characteristic of free-living species. Nevertheless, some species are known as symbionts. *Palaemonella aliska* Marin, 2008 and *Palaemonella pottsi* (Borradaile, 1915) are known as associates of burrowing snapping shrimps (Crustacea: Decapoda: Alpheidae) and crinoids (Echinodermata: Crinoidea: Comasteridae), respectively (Marin & Savinkin, 2007; Marin, 2008, 2012), while *Palaemonella rotumana* (Borradaile, 1898), *Exoclimenella* spp., and *Eupontonia oahu* Bruce, 2010 are known as facultative and *Vir* spp. as obligate associates of scleractinian corals (Marin & Savinkin, 2007; Marin, 2007; 2008; Marin & Anker, 2006; Bruce, 2010). Herewith a new species of the genus *Eupontonia* is described from Dam Bay of Tre Island, Nhatrang Bay, Vietnam (12°12′19.53″N 109°18′11.12″E), with unusual morphology possibly as an adaptation to a symbiotic lifestyle in association with thalassematid innkeeper or spoon worms (Echiura: Thalassematidae), representing the first record of pontoniine shrimps with echiurian hosts (review in Anker et al, 2005). Mangrove littoral of Dam Bay presenting an interesting biotope with numerous new burrowing species observed (e.g. Dworschak et al, 2006; Anker et al, 2006; Anker & Marin, 2007; Marin, 2008).

The genus *Eupontonia* Bruce, 1971 currently includes 3 known species: *Eupontonia noctalbata* Bruce, 1971 (type species), known from the Seychelles and Xisha Islands in the South China Sea (Bruce, 1971; Li, 1997), *Eupontonia oahu* Bruce, 2010, known from Oahu, Hawaii only (Bruce, 2010) and the recently described *Eupontonia gracilipes* Komai & Minemizu, 2014, only known from the southern Ryukyu Islands, Japan (Komai & Minemizu, 2014).

Postorbital carapace length (pcl., in mm), the length from the orbit to the distal margin of the telson, and total body length (tl., in mm), the length from the tip of the rostrum to the distal margin of the telson, are used as standard measurements of size. The examined material is deposited in Zoological Museum of Moscow State University, Moscow (ZMMU).

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Pleopods normal, without specific features; pleopod II with appendix interna (Fig.2*k*). Uropods relatively stout, exceeding telson (Fig. 2*e, f*); distolateral margin of uropodal exopod (Fig. 2*f*) with sharply produced distolateral margin and small movable distolateral spine.

Coloration.—Generally body and appendages generally transparent, covered with tiny orange-red bars and bands; cornea black, eyestalk transparent; pereiopods II (chelipeds) covered with particularly broad orange-red band along all segments (Fig. 5*a, b*).

Host.—The species was found in association with the thalassematid spoon worm *Listriolobus* sp. (Echiura, Thalassematidae) (Fig. 5*c*). The other shrimp collected in the same echiurian hole was a male specimen of *Alpheus* sp. (Crustacea: Decapoda: Alpheidae), probably a new specialized echurian-associated species (Anker & Marin, in prep.). All animals were collected with the help of yabby-pump.

Distribution.—The species is presently known exclusively from its type locality, Dam Bay of Tre Island, Nhatrang Bay, Vietnam.

Discussion.—The new species can be easily differentiated from congeners by the unarmed rostrum and the reduced antennal tooth on the carapace (see Fig. 2*a, b*). Such morphological features differ greatly from the other three species and likely present an adaptation to the symbiotic lifestyle in the cramped confines of the burrow of a thalassematid spoon worm, the host of the species. The rostrum of *Eupontonia nudirostris* sp. nov. resembles that of other echiurian-associates, namely the alpheid shrimp genus *Athanopsis* Coutière, 1897 (Crustacea: Decapoda: Alpheidae) (Berggren, 1991; Anker & Ahyong, 2007; Marin et al, 2014) and highly-specialized bivalve-associated pontoniine shrimps, such as some *Anchistus* spp., *Conchodytes* spp., *Neoanchistus cardiodytes* Bruce, 1975, *Bruceonia ardea* (Bruce, 1981) and *Pinnotherotonia rumphiusi* Marin & Paulay, 2010 living inside the narrow mantle cavity space of bivalve shells (Bruce, 1972; 1975, 1981; 1989; Marin & Paulay, 2010; Anker et al, 2010; Britayev & Marin, 2011) or some ascidian-associated species living inside their hosts (see Fransen, 2002). From representatives of the genera *Exoclimenella*, *Palaemonella* and *Vir* the species can be separated by the absence of a hepatic tooth on the carapace (characteristic for the genus *Palaemonella*), stripes on eyestalk (characteristic for all species of the genus *Vir*) and the simple chela of the first pereiopod (vs. spatulated in *Exoclimenella*). The new species undoubtedly belongs to the genus *Eupontonia*, as demonstrated by the presence of a 2-segmented mandibular palp and the sharp processes on the fourth and fifth thoracic sternites (see diagnosis in Bruce, 1971 and Komai & Minemizu, 2014).

Revised key to species of *Eupontonia* Bruce, 1971

1. Dorsal and ventral margin of rostrum armed with well-developed teeth 2
– Rostrum unarmed . . . . . *E. nudirostris* **sp. nov.**
1. Carapace with supraorbital tooth. . . . . *E. noctalbata*
– Carapace without supraorbital tooth 2
2. Posteriormost tooth of dorsal rostral series distinctly postrostral; pereiopod II with carpus distinctly longer than palm, unarmed . . . . . *E. gracilipes*
– Posteriormost tooth of dorsal rostral series not postrostral; pereiopod II with carpus distinctly shorter than carpus, armed with small distomesial tooth . . . . . *E. oahu*

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LITERATURE CITED

Anker, A. & Ahyong, S. (2007) A rediagnosis of *Athanopsis australis* Banner & Banner, 1982, a rare alpheid shrimp from southern Australia, with a phylogeny of *Athanopsis* Coutière, 1897 and remarks on antitropical distributions in the Alpheidae (Decapoda, Caridea). *Crustaceana*, 80 (6), 685–698.

http://dx.doi.org/10.1163/156854007781360612
Anker, A. & Marin, I. (2009) The alpheid shrimp genus *Leptalpheus* Williams, 1965 in the tropical western Pacific, with description of two new species (Crustacea: Decapoda: Caridea). *Raffles Bulletin of Zoology*, 57 (1), 91–107.
Anker, A., Naderloo, R. & Marin, I. (2010) On a new species of the shrimp genus *Athanas* Leach, 1814 (Crustacea, Decapoda, Alpheidae) from Iran. *Zootaxa*, 2372, 53–60.
Anker, A., Poddoubtchenko, D. & Marin, I. (2006) On the presence of the alpheid shrimp genus *Bermudacaris* Anker & Iliffe, 2000 (Crustacea: Decapoda: Caridea) in the Pacific Ocean, with description of a new species from Vietnam. *Journal of Natural History*, 40 (27–28), 1675–1686.
http://dx.doi.org/10.1080/00222930600937734
Anker, A., Murina, G.-V., Lira, C., Caripe, J.A.V., Palmer, R. & Jeng, M.-S. (2005) Macrofauna associated with echiuran burrows: a review with new observations of the innkeeper worm, *Ochetostoma erythrogrammon* Leuckart and Ruppel, in Venezuela. *Zoological Studies,* 44 (2), 157–190.
Berggren, M. (1991) *Athanopsis rubricinctuta*, new species (Decapoda: Natantia: Alpheidae), a shrimp associated with an echiuroid at Inhaca Island, Moçambique. *Journal of Crustacean Biology*, 11, 166–178.
http://dx.doi.org/10.2307/1548555
Britayev, T.A. & Marin, I. (2011) The second record of *Neoanchistus cardiodytes* (Bruce, 1975) (Decapoda, Caridea, Palaemonidae) a rare pontoniine shrimp associated with burrowing bivalve mollusks. *Marine Biodiversity Records*, 4, 1–3.
http://dx.doi.org/10.1017/s175526721000117x
Bruce, A.J. (1971) Notes on some Indo-Pacific Pontoniinae. XVII. *Eupontonia noctalbata* gen. nov., sp. nov., a new pontoniinid shrimp from Mahé, the Seychelle Islands. *Crustaceana*, 20, 225–236.
http://dx.doi.org/10.1163/156854071x00012
Bruce, A.J. (1972) Shrimps that live with mollusks. *Sea Frontiers*, 18 (4), 218–227.
Bruce, A.J. (1975) Notes on some Indo-Pacific Pontoniinae. XXVI. *Neoanchistus cardiodytes* gen. nov., sp. nov., a new mollusk-associated shrimp from Madagascar (Decapoda, Palaemonidae). *Crustaceana*, 29, 149–165.
http://dx.doi.org/10.1163/156854075x00162
Bruce, A.J. (1981) Notes on some Indo-Pacific Pontoniinae, XXXVI. *Pontonia ardeae* sp. nov., a new bivalve associate from the Capricorn Islands (Decapoda, Natantia). *Crustaceana*, 40, 113–126.
http://dx.doi.org/10.1163/156854081x00516
Bruce, A.J. (1989) Notes on some Indo-Pacific Pontoniinae, XLV. *Conchodytes maculatus* sp. nov., a new bivalve associate from the Australian northwest shelf. *Crustaceana,* 56, 182–192.
http://dx.doi.org/10.1163/156854089x00077
Bruce, A.J. (2010) *Eupontonia oahu* sp. nov., a second species of the genus *Eupontonia* Bruce, 1971, (Crustacea: Decapoda: Pontoniinae) from Oahu, Hawaiian Islands. *In*: De Grave, S. & Fransen, C.H.J.M. (Eds.), Contributions to Shrimp Taxonomy. *Zootaxa*, 2372, 405–414.
De Grave, S. & Fransen, C.H.J.M. (2011) Carideorum Catalogus: The recent species of the dendrobranchiate, stenopodidean, procaridideanand caridean shrimps (Crustacea, Decapoda). *Zoologische Mededelingen*, 85, 195–589.
Dworschak, P., Marin, I. & Anker, A. (2006) A new species of *Naushonia* Kingsley, 1897 (Decapoda: Thalassinidea: Laomediidae) from Vietnam and the Philippines with notes on the genus Espeleonaushonia Juarrero & Martínez-Iglesías, 1997. *Zootaxa*, 1372, 1–16.
Ďuriš, Z. & Bruce, A.J. (1995) A revision of the *`petitthouarsii'* species group of the genus *Periclimenes* Costa, 1844 (Crustacea: Decapoda: Palaemonidae). *Journal of Natural History,* 29, 610–671.
http://dx.doi.org/10.1080/00222939500770221
Fransen, C.H.J.M. (2002) Taxonomy, phylogeny, historical biogeography, and historical ecology of the genus *Pontonia* Latreille (Crustacea: Decapoda: Caridea: Palaemonidae). *Zoologische Verhandelingen,* 336, 1–433.
Holthuis, L.B. (1993) *The Recent Genera of the Caridean and Stenopodidean Shrimps (Crustacea, Decapoda) with an Appendix on the Order Amphionidacea*. Nationaal Natuurhistorisch Museum, Leiden, 328 pp.
Komai, T. & Minemizu, R. (2014) A new species of the pontoniine shrimp genus *Eupontonia* (Crustacea: Decapoda: Caridea: Palaemonidae) from the Ryukyu Islands, Japan. *Zootaxa*, 3784 (2), 171–178.
http://dx.doi.org/10.11646/zootaxa.3784.2.6
Li, X. (1997) Report on Gnathophyllidae and Pontoniinae (Decapoda, Palaemonoidea) shrimps from the Xisha Islands and adjacent waters, South China Sea. *Studia Marina Sinica*, 38, 223–250.
Marin, I.N. (2007) Notes on taxonomy and biology of the symbiotic shrimp *Vir euphyllius* Marin & Anker, 2005 (Decapoda, Palaemonidae, Pontoniinae), associated with hammer corals *Euphyllia* spp. (Cnidaria, Caryophyllidae). *Invertebrate Zoology*, 4 (1), 15–23.
Marin, I.N. (2008) Description of two new species from genera *Palaemonella* Dana, 1852 and *Vir* Holthuis, 1952 (Caridea: Palaemonidae: Pontoniinae). *Zoologische Mededelingen*, 82, 375–390.
Marin, I.N. (2012) New records and associations of pontoniine shrimps (Crustacea: Decapoda: Caridea: Palaemonidae: Pontoniinae) from the Nhatrang Bay, Vietnam; with taxonomic remarks on some species from the Indo-West Pacific region. *In*: Britayev, T.A. & Pavlov, D.S. (Eds.), *Benthic fauna of the Bay of Nhatrang, Southern Vietnam. Vol. 2.* Moscow. KMK, 345–405.
Marin, I. & Anker, A. (2006) Two new species of the genus *Vir* Holthuis, 1952 from Vietnam (Crustacea: Decapoda:

Palaemonidae). *Arthropoda Selecta*, 14 (2), 117–128.
Marin, I. & Paulay, G. (2010) *Pinnotherotonia rumphiusi* gen. et sp. nov., a new furry bivalve-associated pontoniine shrimp (Crustacea: Decapoda: Palaemonidae) from Palau. *Zootaxa*, 2636, 37–48.
Marin, I.N. & Savinkin, O.V. (2007) Further records and preliminary list of pontoniine (Caridea: Palaemonidae: Pontoniinae) and hymenocerid (Caridea: Hymenoceridae) shrimps from Nhatrang Bay. *In*: Britayev, T.A. & Pavlov, D.S. (Eds.), *Benthic fauna of the Bay of Nhatrang, Southern Vietnam. Vol. 1.* Moscow. KMK, 175–208.
Marin, I., Sheibani, R. & Sari, A. (2014) Re-description of rare alpheid shrimp *Amphibetaeus jousseaumei* Coutière, 1896 (Decapoda: Caridea: Alpheidae) and description of a new species of the genus *Athanopsis* Coutière, 1897 (Alpheidae) from Iranian coast of the Persian Gulf. *Zootaxa*, 3846 (3), 398–410.
http://dx.doi.org/10.11646/zootaxa.3846.3.4