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Secrets from the deep: Pseudotanaidae (Crustacea: Tanaidacea) diversity from the Kuril–Kamchatka Trench

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Abstract

A combination of morphological and genetic data (subunit I of the cytochrome c oxidase: COX1) was used to study the diversity and distribution of pseudotanaids in the Kuril-Kamchatka Trench and adjacent abyssal plain. Our results uncovered the presence of an undescribed species of *Mystriocentrus* (*M. hollandae*) and five new species of *Pseudotanais* (*P. chanelae*, *P. monroeeae*, *P. curieae*, *P. szymborskae* and *P. locueloae*). The most abundant species was *P. curieae* (N=182), followed by *P. monroeeae* (N=34), *P. szymborskae* (N=31) and *P. chanelae* (N=20). The number of individuals sampled was highest in shallower stations, but all four taxa could be found across the studied bathymetric range (4800–5500 m). Pseudotanaid abundance and bottom currents appear to be inversely related, which might be due to lower currents favouring sedimentation and, consequently, successful settlement of tanaids. Results are compared with previous studies on peracarid crustaceans from the Northwestern Pacific.

Keywords: Tanaidacea; DNA barcoding; deep sea; integrative taxonomy.

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Introduction

In terms of small peracarid crustacea, the NW Pacific Ocean abyssal plain is one of the richest and more densely populated deep-sea regions of the world (Błażewicz-Paszkowycz et al., 2015; Brandt et al., 2019; Golovan et al., 2019). The Kuril-Kamchatka Trench (KKT) is a submarine ditch that belongs to the Ring of Fire or circum-Pacific belt, a nearly continuous series of oceanic trenches and volcanic arcs. Extending with NE-SW direction for ~3,000 km, the KKT has a maximum depth of over 10,000 m and covers an area of 264,000 km² (Cadet et al., 1987). Sedimentation within this large area is determined by tectonic and volcanic processes, the peripheral position of the Kuril island arc, as well as the hydrographic regime and high biological productivity. The macrobenthos composition on the abyssal plain of the Northwest Pacific Basin adjacent to the KKT was intensively studied during the KuramBio expedition in 2012 (Kuril-Kamchatka Biodiversity Studies), with samples obtained at depths between 4830 and 5780 m (Brandt and Malyutina, 2015). Almost 2000 invertebrate taxa were collected, and this number is continuing to increase, as material from several taxa is still being processed. The diversity of tanaidaceans of the KKT studied by world-leading experts is high, particularly after the well-known R/V Vitjaz expedition (Kudinova-Pasternak, 1970), and the Japanese KH-01-2 expedition (Larsen and Shimomura, 2007). More tanaid species are known from Japan and KKT than have been recorded in the entire North Atlantic and, according to previous authors, trenches have yet to give up their last secrets (Larsen and Shimomura, 2007; Stępień et al., 2019).

The NW Pacific is a particularly interesting area for studying the Pseudotanaidae family, a frequent and diverse element of deep-sea benthic assemblages, only exceeded by polychaetes (Pabis et al., 2015, 2014). Pseudotanaids are inhabitants of abyssal plains, trenches (Kudinova-Pasternak, 1966), seamounts (Jakiel et al. 2015), shallow waters (Bamber et al., 2009) or caves (García-Herrero et al., 2019). The family comprises four genera (*Akanthinotana* Sieg 1976, *Mystricentrus* Bird & Holdich 1989, *Parapseudotana* Bird & Holdich 1989 and *Pseudotana* Sars 1882), and from ~70 pseudotanaid species described to date, eight are reported from NW Pacific waters. Six of those species seem to be restricted to the Kuril–Kamchatka area (i.e. *Pseudotana* *abathogastor* Błażewicz-Paszkowycz et al., 2013; *P. inflatus* Kudinova-Pasternak, 1973; *P. intortus* Błażewicz-Paszkowycz et al., 2013; *P. soja* Błażewicz-Paszkowycz et al., 2013; *P. nipponicus* McLelland, 2007; *P. vitjazi* Kudinova-Pasternak, 1966; see WoRMS 2018). Two other taxa were reported by Kudinova-

Pasternak from the KKT area (*P. affinis* Hansen, 1887; *P. nordenskioldi* Sieg, 1977), but they are unlikely because these species originally described from the Atlantic Ocean. Within the KKT zone, half of the species are found in comparatively shallow waters, around 400–1300m depth (*Pseudotanaïs abathogastor*, *P. intortus* and *P. soja*), and the other half are found below 3000m (*P. nipponicus*, *P. vitjazi* and *P. inflatus*) (Błażewicz-Paszkowycz et al., 2013).

The present study was designed to characterize the diversity and distribution of pseudotanaids in the Kuril–Kamchatka region. The mitochondrial gene coding for the subunit I of the cytochrome c oxidase was selected to identify different taxonomical units. A combination of morphological and molecular genetic data uncovered the presence of five new species of *Pseudotanaïs* and a new species of *Mystriocentrus*, which is the first representative of this genus in the Pacific Ocean. The abundance, spatial and bathymetric distribution of pseudotanaids are compared against previous studies on peracarid crustaceans from the NW Pacific. Additionally, an identification key for *Pseudotanaïs* species present in the NW Pacific is included as well.

Material and Methods

Sampling during the Kuril-Kamchatka Biodiversity Studies

The tanaidacean materials for this study were collected on the KKT area during the German–Russian deep-sea expedition KuramBIO (Kuril-Kamchatka Biodiversity Studies), carried out from July to September of 2012 on board of RV *Sonne* (Brandt *et al.* 2015). Sampling stations were distributed along the abyssal plain next to the Kuril Islands archipelago between 4800 m and 5800 m depth (Fig.1). An epibenthic sledge (EBS) was used to collect material at each sampling site as in Brandt and Barthel (1995). Additionally, environmental data (i.e. temperature, pressure, salinity, oxygen saturation and conductivity) were measured at each station using a CTD probe. Samples were washed with cold seawater on 300µm mesh, fixed in pre-cooled 96% EtOH, and stored at -20°C. Detailed on board and laboratory sample-processing procedures were described by Rhiel et al. (2014).

Phylogenetic and genetic distance analyses

A whole specimen was taken using sterile needles as starting material for DNA extraction using the Chelex (InstaGene Matrix, Bio-Rad) method as in Palero et al. (2010a). The cytochrome c oxidase I (COX1) gene was amplified using a 25 μ L volume reaction containing 22 μ L H₂O, 0.5 μ L of each primer (10 pmol/ μ L) polyLCO and polyHCO (Carr et al., 2011), 1U of Illustra PuReTaq Ready-To-Go PCR Beads (GE Healthcare) and 2 μ L of DNA template. The PCR protocol was 94°C for 3 min, 40 cycles of 94°C for 40 s, 42°C for 30 s, 72°C for 1 min, and a final elongation step of 72°C for 10 min. A 2 μ L aliquot of the PCR products was visualized in Midori Green-stained (Nippon Genetics) 1.5% agarose gels to verify PCR product quality and length. PCR purification and sequencing using forward and reverse primers was carried out by MACROGEN (Amsterdam, Netherlands). Consensus sequences were built using Geneious version 9.1.3 (www.geneious.com) and compared with the GenBank database using BLAST (Altschul et al., 1990) to discard contamination from non-arthropod sources. Sequences were aligned using MAFFT (Katoh and Standley, 2013) as implemented in Geneious. To improve reliability, we extracted conserved (ungapped) blocks of sequence from the alignment by using Gblocks server with default settings (Castresana, 2000; Talavera and Castresana, 2007). Selection of the best nucleotide substitution model was performed according to the AICc and BIC criteria as implemented in MEGA v7 (Kumar et al., 2016). The aligned sequences and selected evolutionary model were used to estimate genetic distances and the corresponding Maximum Likelihood phylogenetic tree in RAxML v8.0.22 (Stamatakis, 2014). Nodal support was assessed using 500 bootstrap replicates. Patristic distances (i.e., sum of the length of all branches connecting two lineages in an evolutionary tree) were estimated using Geneious version 9.1.3 (www.geneious.com).

Morphological analyses and species description

All 273 individuals were morphologically identified using a microscope (Nikon Eclipse 50i). After distinguishing morphospecies, the best-preserved specimens were selected as holotypes and paratypes. Paratypes selected for drawing were dissected with chemically-sharpened tungsten needles, and dissected appendages were mounted on slides using glycerine. Drawings were prepared using a light microscope equipped with a *camera lucida*. Digital drawings were obtained using a graphic tablet following Coleman (2003). Total body length (BL) was measured along the main axis of symmetry, from frontal margin to end of telson. Body width (BW) was measured at the widest point along the main axis. To simplify species

descriptions, the expression ‘ Nx ’ replaces ‘ N times as long as’ and ‘ $N L:W$ ’ replaces ‘ N times as long as wide’. The measurements were made with a camera connected to the microscope (Nikon Eclipse Ci-L) and using the NIS-Elements View software (www.nikoninstruments.com). Body width and length of carapace, pereonites, pleonites, and pleotelson were measured on whole specimens. The length was measured along the axis of symmetry, whereas the width, perpendicular to the axis of symmetry, was measured at the widest point. The morphological terminology follows Bird and Holdich (1989), Błażewicz-Paszkowycz *et al.* (2013) and Błażewicz-Paszkowycz and Bamber (2012). The unique blade-like spine of *Pseudotanaïs* and *Parapseudotanaïs* is recognized as ‘long’ when it is at least 0.6x propodus, ‘semilong’ when it is 0.5x propodus and ‘short’ when it is at most 0.3x propodus. The sensory seta occurring on carpus of pereopod 4-6 is defined as “rod seta” following Thomas (1970) and Garm (2004) because it is a simple seta slightly inflated distally and with a pore. This rod seta is recognized here as ‘long’ when it is at least 0.8x propodus, ‘semilong’ when it is 0.5x propodus and ‘short’ when it is at most 0.25x propodus. Four setae types are recognized besides simple setae (= without ornamentation): (1) serrate – with serration or denticulation, (2) plumose – with any type of plumose or delicate setulae tufts distributed along the main axis, (3) penicillate – with a tuft of setules located distally and with a small knob on which a seta is fixed to the tegument and, (4) rod setae – slightly inflated distally and with a pore. Taxonomic descriptions and the corresponding identification key were prepared using Delta software (DEscription Language for TAXonomy) (Dallwitz *et al.*, 1993). The examined material was deposited in Senckenberg Research Institute and Natural History Museum (Hamburg, Germany) with the museum codes presented in Table S1.

Results

Pseudotanaïdæ diversity and spatial and bathymetric distribution

A total of 273 individuals were used for molecular analyses, but only 68 provided positive DNA barcoding results, being assigned to eight distinct haplotypes (Table 1). These haplotypes correspond to two genera and six species in total, one *Mystriocentrus* and five *Pseudotanaïs* species. All of them are new to science and their description is given in the Appendix. *Pseudotanaïs curieae* n. sp., with a total of 182 specimens, was the most abundant and widespread species and it was found at 86% of the surveyed stations (18 out of 21)

(Table 1; Figure 1). Other taxa, like *P. monroae* n. sp. (N=34), *P. szymborskae* n. sp. (N=31) and *P. chanelae* n. sp. (N=20) were less abundant, and found on 15, 13 and 7 stations respectively. The number of individuals was highest in shallower stations (Table 1; Figure 2), but some taxa were most abundant below 5300m. The four taxa were present across the bathymetric range studied (4800–5700m), but the proportion of *Pseudotanaeis curieae* individuals decreased with increasing depth whereas *P. chanelae* became more frequent. Given their low abundances and therefore limited distribution, no clear pattern can be observed for *Mystriocentrus hollandae* n. sp. (N=4) or *Pseudotanaeis locueloae* n. sp. (N=2)

Phylogenetic and genetic distance analyses

Eight different COX1 haplotypes were obtained, representing five *Pseudotanaeis* species and one *Mystriocentrus* species (Genbank accession numbers: XXXX-XXXX). The sequence alignment spanned 572 bp after running Gblocks. Haplotypes for *Pseudotanaeis monroae*, *P. locueloae*, *P. curieae* and *P. chanelae* had 572 bp, while *P. szymborskae* (534 bp) and *Mystriocentrus hollandae* (529 bp) were slightly shorter. The General Time Reversible (GTR+G+I) model showed the lowest AICc (16282.62) and BIC (16775.88) scores and it is considered the best description of the substitution pattern. A larger proportion of transitions over transversions was observed ($R = 1.64$). Non-uniformity of evolutionary rates among sites was modelled using a Gamma distribution (+G = 1.23). The rate variation model allowed for some positions to be evolutionarily invariable (+I = 25.07% sites). The Maximum Likelihood tree with the highest log likelihood value ($\ln L = -8076.02$) is shown in Figure 3. Pseudotanaeid species formed a well-supported clade, with all *Pseudotanaeis* species except *P. locueloae* grouping together. This clustering of COX1 sequences in the ML tree corresponds to the morphological identification of taxa (see comments on the morphology section below). Pairwise COX1 patristic distances between all the pseudotanaeid specimens ranged between 0.035 and 1.416, while K2P distances between species ranged from 0.202 ± 0.023 to 0.587 ± 0.054 (Table S2). Net evolutionary divergences over sequence pairs were largest between *Mystriocentrus hollandae* and any *Pseudotanaeis* species. In agreement with the phylogenetic reconstruction result, *P. locueloae* showed the largest divergences within the *Pseudotanaeis* clade and is clearly distinct from the other species collected in the KKT area. Estimates of average evolutionary divergence over sequence pairs within *Pseudotanaeis* species showed comparatively high divergences (compared with other crustacean groups; see Discussion) and the lowest divergences were observed between *P.*

curieae and *P. szymborskae* (0.202 ± 0.023). Finally, intraspecific genetic variation was very low, as expected given the limited sample size per species, and only *P. monroeeae* showed several haplotypes.

Morphological analyses and species descriptions

A detailed morphological description of each new pseudotanaid taxon is presented in the Appendix and only a short account of the morphology results is presented here. Within the material sampled during KuramBIO, the most abundant and diverse taxa belong to a single morphogroup. Four *Pseudotanaids* species (*Pseudotanaids curieae*, *P. szymborskae*, *P. chanelae* and *P. monroeeae*) show a long or semilong blade-like spine on carpus of pereopods 2–3 or long rod seta on carpus of pereopods 5–6 and they can be assigned to the ‘affinis+longisetosus’ morphogroup. The fifth species (*P. locueloae*) can be distinguished from members of the ‘affinis+longisetosus’ clade by the slender cheliped, no seta on merus of pereopod-1, elongate propodus of pereopods 1–3 and short rod seta on pereopods 4–6, being classified in the ‘denticulatus + abathagastor’ morphogroup.

Key for NW Pacific *Pseudotanaids* species (modified from Bird and Holdich (1989) and Jakiel et al. (2018)):

1. Chela shape
 - a) forcipate2.
 - b) non-forcipate (Fig. 9A).....3.
2. Mandible
 - a) acuminate.....*P. soja*
 - b) coronal.....*P. inflatus*
3. Antenna article-2 with
 - a) seta.....4.
 - b) spine (Fig. 12C).....5.
4. Cephalothorax; antenna article-3; pereopod 2–3 carpus
 - a) as long as pereonites 1–3; seta; short blade-like spine.....*P. intortus*
 - b) 0.75x pereonites 1–3; spine; long blade-like spine.....*P. abathagastor*
5. Pereopods 5 –6 carpus rod seta
 - a) short (<0.3x propodus).....6.

- b) long ($\geq 0.8 \times$ propodus) (Fig. 9F).....7.
- 6. Mandible; chela carpus; pereopods 4–6 merus:
 - a) acuminate; as long as palm; with two spines and seta.....*P. vitjazi*
 - b) coronal (Fig. 14D); $1.2 \times$ palm (Fig. 15A); with spine.....*P. locueloae* n. sp.
- 7. Pereopod-1 carpus seta
 - a) short ($\leq \frac{1}{2}$ of carpus) (Fig. 11B).....8.
 - b) long ($\geq \frac{1}{2}$ of carpus) (Fig. 9B).....9.
- 8. Cephalothorax; pereopod-1 merus seta
 - a) $1.1 \times$ pereonites 1–3 (Fig. 12A); long ($\geq \frac{1}{2}$ merus).....*P. monroeae* n. sp.
 - b) $0.9 \times$ pereonites 1–3 (Fig. 10A); short ($\leq \frac{1}{2}$ merus).....*P. chanelae* n. sp.
- 9. Pereopod-1 basis
 - a) few setae (1–4) (Fig. 7B).....*P. curieae* n. sp.
 - b) many setae (6–7) (Fig. 9B).....10.
- 10. Mandible; pereopods 4–6 merus
 - a) acuminate; spine.....*P. nipponicus*
 - b) coronal (Fig. 8D); spine and seta (Fig. 9G).....*P. szymborskae* n. sp.

Discussion

The pseudotanaids collected in the KKT and adjacent waters during the KuramBIO expedition include six new species belonging to two genera. *Mystriocentrus* is collected from Pacific waters for the first time in this study, with the two species of the genus previously described being collected from North Atlantic waters (*Mystriocentrus biho* Jakiel *et al.*, 2018; *M. serratus* Bird & Holdich 1989). A thorough review of the published literature suggests that two individuals recorded by McLelland (2007) as *Pseudotanaïs* sp. may be in fact conspecific to *Mystriocentrus hollandae*, showing similar serrate margins on the chela and semi-long blade-like spines on the carpus of pereopods 2–3. The lack of a full description and detailed drawings of the appendages in McLelland (2007) excludes the possibility of further comparison among those individuals and *M. hollandae*. The present study increases our current knowledge on the diversity and distribution of Pseudotanaidae from the NW Pacific Ocean. Although some pseudotanaids are found in shallow waters (e.g. some species of *Akanthinotanaïs* or *Pseudotanaïs*), most of them are found in deep sea waters (e.g. Porcupine Seabight and North Biscay; Bird and Holdich (1989)). For example,

Pseudotanaïs was the most abundant taxon in samples collected from SW Pacific waters, with relative abundance ranging between 12.5% and 72.7%, (Kaiser et al., 2018). Pseudotanaidae are particularly abundant and diverse in the Southern Ocean, being present in 73.6% and 94% of all samples collected in Scotia and Amundsen Sea, respectively (Pabis et al., 2014).

Morphological identification of tanaidaceans is difficult because of their small size and sexual dimorphism, but reverse taxonomy (i.e. using sequencing techniques before thorough morphological analyses) can facilitate the identification of cryptic taxa (Held and Wägele, 2008; Palero et al. 2017). Intraspecific variation in NW Pacific pseudotanaids was low compared with values observed in an apseudomorph (*Mesokalliapseudes macsweenyi*) (Drumm and Kreiser, 2012), but they are in agreement with those observed in Pseudotanaidae from Central Pacific (Jakiel et al., 2019) or other deep sea peracarids (Riehl and Kaiser, 2012). Although results are based on a single gene (COX1) and should be considered preliminary, the main clades recovered are congruent with previous hypotheses based on morphology (Bird and Holdich, 1989; Jakiel et al., 2018). The phylogenetic tree obtained shows Paratanaoidea families to be monophyletic with high bootstrap support (except Typhlotanaidae). The reciprocal monophyly of the Pseudotanaidae and other deep-sea Paratanaoidea families is in agreement with the variation observed on the position and number of oostegites in Tanaidomorpha females (Larsen, 2005). Most Paratanaoidea families have a marsupium formed by four pairs of oostegites, but Pseudotanaidae females are unique in forming a marsupium from one pair of oostegites only. The reduced number of oostegites in pseudotanaids could be an adaptation for a more mobile lifestyle (Haupt and Richter, 2008).

Deep-sea crustaceans are generally considered to be rare, sparsely distributed, and to have restricted dispersal abilities (McClain and Hardy, 2010; Ramirez-Llodra et al., 2010). Nevertheless, studies from NW Atlantic and circum-Antarctic waters (Bird and Holdich, 1989; Brandt et al., 2012) and the combination of molecular and morphological data suggest that larger distributions and abundances are possible (see Results; Havermans et al., 2013; Jakiel et al., 2019). Pseudotanaid taxa represented in our samples by 20 individuals or more (i.e. *P. chanelae*, *P. monroae*, *P. curieae* and *P. szymborskae*) show a particularly wide geographical distribution. This distribution pattern may be explained by the small spatial heterogeneity and high food availability of the abyssal plain adjacent to the KKT, a region

with primary production of chemosynthetically derived organic matter (Mordukhovich et al., 2018). Geographical distance or geomorphology characteristics of the seabed, which are considered to be effective predictors of biological community composition, do not seem to be so determinant for pseudotanaids in the KKT area. The total number of pseudotanaid specimens found in the KKT is mostly correlated with depth (decreased in deeper stations), as expected due to lower food availability (Rex et al., 2006). Nevertheless, the relative frequency of some taxa increased with depth and distance from the KKT area (i.e. *P. chanelae*), so the general motto that genetic diversity is lower at increasing depths should be taken with caution (Palero et al., 2010b; Taylor and Roterman, 2017). High relative abundance of pseudotanaids has been observed at bathyal sites and at least five *Pseudotanaids* species were found with overlapping depth ranges in the abyssal zone >4000m (Bird and Holdich, 1989; Kaiser et al., 2018). Understanding the key factors driving the spatial distribution of deep sea fauna is of utmost importance for the efficient management and conservation of abyssal environments (Dunn et al., 2018; Van Dover et al., 2014), and our results suggest that using geomorphological features as the only tool to define seabed habitats and faunal composition may be misleading. Integrative taxonomy studies are still uncovering new pseudotanaid taxa and will continue to improve our understanding of the relative importance of ecological and environmental conditions on the distribution of deep-sea biodiversity.

Conflict of Interest and Authorship Statement

All authors have participated in design, analysis and interpretation of the data; drafting the article or revising it critically for important intellectual content; and approval of the final version. This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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Figure Legends

Figure 1. Contour plot showing the bathymetry of the studied area and the spatial distribution of the newly described Pseudotanaidae.

Figure 2. Bathymetric distribution of Pseudotanaidae taxa collected during the KuramBIO expedition along the KKT zone and adjacent abyssal plain. Numbers on the right hand side of the plot indicate total number of individuals per bathymetric range.

Figure 3. Evolutionary relationships of Pseudotanaidae species inferred by using the COX1 sequences and the Maximum Likelihood method. The percentage of trees in which the associated taxa clustered together (bootstrap support) is shown next to the branches. Only values above 70% are shown.

Figure 4. *Mystriocentrus hollandae* n. sp., neuter type. A, holotype (ZMH K-57039); B-G paratype (ZMH K-57038). A, lateral view; B, antennule; C, antenna; D, left mandible; E, right mandible; F, maxillule; G, maxilliped. Scale bars: A, 1 mm; B–G, 0.1 mm.

Figure 5. *Mystriocentrus hollandae* n. sp., neuter type (ZMH K-57038). A, cheliped; B, pereopod-1; C, pereopod-2; D, pereopod-3; E, pereopod-4; F, pereopod-5; G, pereopod-6; H, pleopod; I, uropod. Scale bar: 0.1 mm.

Figure 6. *Pseudotanaeis curieae* n. sp., neuter type. A, holotype (ZMH K-57133); B–H paratype (ZMH K-57127). A, dorsal view; B, antennule; C, antenna; D, labium; E, left mandible; F, right mandible; G, maxillule; G', endit; H, maxilliped. Scale bars: A, 1 mm; B–G, 0.1 mm.

Figure 7. *Pseudotanaeis curieae* n. sp., neuter type (ZMH K-57127). A, cheliped; B, pereopod-1; C, pereopod-2; D, pereopod-3; E, pereopod-4; F, pereopod-5; G, pereopod-6; H, pleopod; I, uropod. Scale bar: 0.1 mm.

Figure 8. *Pseudotanaeis szymborskae* n. sp., neuter type. A, ZMH K-57272; B–H, ZMH K-57281. A, dorsal view; B, antennule; C, antenna; D, labium; E, left mandible; F, right mandible; G, maxillule; H, maxilliped. Scale bars: A, 1mm; B–G, 0.1 mm.

Figure 9. *Pseudotanaïs szymborskae* **n. sp.**, neuter type (ZMH K-57276). A, cheliped; B, pereopod-1; C, pereopod-2; D, pereopod-3; E, pereopod-4; F, pereopod-5; G, pereopod-6; H, pleopod; I, uropod. Scale bar: 0.1 mm.

Figure 10. *Pseudotanaïs chanelae* **n. sp.**, neuter type. A, ZMH K-57051; B-I, ZMH K-57042. A, dorsal view; B, antennule; C, antenna; D, labium; E, left mandible; F, right mandible; G, maxillule; H, Labrum; I, maxilliped. Scale bars: A, 1mm; B–G, 0.1 mm.

Figure 11. *Pseudotanaïs chanelae* **n. sp.**, neuter type (ZMH K-57042). A, cheliped; B, pereopod-1; C, pereopod-2; D, pereopod-3; E, pereopod-4; F, pereopod-5; G, pereopod-6; H, pleopod; I, uropod. Scale bar: 0.1 mm.

Figure 12. *Pseudotanaïs monroeeae* **n. sp.**, neuter type. A, holotype (ZMH K-57259); B–I, paratype (ZMH K-57254). A, dorsal view; B, antennule; C, antenna; D, labium; E, left mandible; F, right mandible; G, maxillule; H, Labrum; I, maxilliped. Scale bars: A, 1mm; B–G, 0.1 mm.

Figure 13. *Pseudotanaïs monroeeae* **n. sp.**, neuter type (ZMH K-57254). A, cheliped; B, pereopod-1; C, pereopod-2; D, pereopod-3; E, pereopod-4; F, pereopod-5; G, pereopod-6; H, pleopod; I, uropod. Scale bar: 0.1 mm.

Figure 14. *Pseudotanaïs locueloae* **n. sp.**, neuter type, holotype (ZMH K-57238). A, antennule; B antenna; C, labium; D, left mandible; E, right mandible; F, maxillule; G, maxilliped. Scale bars: A, 1mm; B–G, 0.1 mm.

Figure 15. *Pseudotanaïs locueloae* **n. sp.**, neuter type (ZMH K-572379). A, cheliped; B, pereopod-1; C, pereopod-2; D, pereopod-3; E, pereopod-4; F, pereopod-5; G, pereopod-6. Scale bar: 0.1 mm.

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Table 1 – Pseudotanaidae species abundance on the KuramBIO stations surveyed. N = Total number of specimens.

Station	Latitude	Longitude	Depth range	Trawling distance (m)	Bottom current	<i>M. hollandae</i>	<i>P. curieae</i>	<i>P. monroeeae</i>	<i>P. szymborskae</i>	<i>P. chanelae</i>	<i>P. locueloae</i>	N
4–3	46°58.34′	154°33.03′	5681–5780	1574	3.5 ± 1.7	0	2	0	3	2	0	7
1–10	43°58.35′	157°18.23′	5418–5429	2222	7.4 ± 1.8	0	0	1	0	0	0	1
1–11	43°58.44′	157°18.29′	5412–5418	2161	4.3 ± 1.6	0	2	0	0	0	0	2
9–9	40°34.51′	150°59.92′	5399–5408	2315	3.3 ± 3.2	0	0	2	4	13	0	19
9–12	40°34.49′	150°59.85′	5392–5397	2377	2.3 ± 1.7	1	2	4	4	1	1	13
5–9	43°34.46′	153°58.13′	5376–5379	2469	3.1 ± 0.8	0	1	0	0	0	0	1
5–10	43°34.44′	153°58.06′	5375–5379	2624	3.8 ± 1.7	0	1	3	0	0	0	4
11–9	40°12.49′	148°05.40′	5362–5362	2408	12.4 ± 18.8	0	1	3	2	0	0	6
11–12	40°12.32′	148°05.73′	5348–5351	2346	11.2 ± 9.9	0	5	0	1	0	0	6
6–12	42°28.49′	153°59.54′	5291–5307	2562	4.4 ± 3.2	0	0	2	0	0	0	2
6–11	42°28.61′	153°59.68′	5291–5305	2624	6.2 ± 6.5	0	3	1	3	0	1	8

10–9	41°11.37′	150°05.63′	5248–5265	2778	5.5 ± 2.6	0	4	2	0	1	0	7
10–12	41°12.80′	150°6.162′	5249–5262	2778	3.7 ± 2	0	16	1	0	0	0	17
12–4	39°42.78′	147°09.55′	5215–5228	2716	5 ± 2.8	0	23	6	2	1	0	32
7–9	43°01.78′	152°58.61′	5216–5223	2994	2.3 ± 1.2	0	2	1	2	1	0	6
7–10	43°01.82′	152°58.55′	5218–5221	2624	4 ± 2.5	1	13	0	0	0	0	14
8–9	42°14.32′	151°42.68′	5125–5140	2840	3.3 ± 1.3	0	29	1	1	0	0	31
8–12	42°14.38′	151°43.12′	5115–5124	2408	2.6 ± 2	0	23	0	2	0	0	25
2–10	46°14.77′	155°32.79′	4859–4863	2932	8 ± 4.8	0	7	4	2	0	0	13
3–9	47°14.66′	154°42.88′	4859–4863	2840	2.1 ± 1.2	2	43	2	4	1	0	52
2–9	46°14.78′	155°32.63′	4830–4864	3117	5.9 ± 2.6	0	5	1	1	0	0	7

Table S1. Unique catalogue numbers (material deposited in Senckenberg Research Institute and Natural History Museum in Hamburg, Germany) for the dissected specimens. The type status and sampling details are included as well.

Catalogue number	Species	Type	Dissection	Genbank accession	Station	Depth	Date
ZMH K-57036	<i>Mystriocentrus hollandae</i>				3-9	4987-4991	05/08/12
ZMH K-57037	<i>Mystriocentrus hollandae</i>		-	XXXX	3-9	4987-4991	05/08/12
ZMH K-57038	<i>Mystriocentrus hollandae</i>		dissected	XXXX	7-10	5218-5221	17/08/12
ZMH K-57039	<i>Mystriocentrus hollandae</i>	holotype	dissected		9-12	5399	24/08/12
ZMH K-57040	<i>Pseudotanaïs chanelae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57041	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57042	<i>Pseudotanaïs chanelae</i>		dissected	XXXX	9-9	5399-5408	23/08/12
ZMH K-57043	<i>Pseudotanaïs chanelae</i>		dissected	XXXX	9-9	5399-5408	23/08/12
ZMH K-57044	<i>Pseudotanaïs chanelae</i>		-	XXXX	4-3	5681	06/08/12
ZMH K-57045	<i>Pseudotanaïs chanelae</i>		dissected	XXXX	4-3	5681-5780	06/08/12
ZMH K-57046	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57047	<i>Pseudotanaïs chanelae</i>	holotype	-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57048	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57049	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57050	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57051	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57052	<i>Pseudotanaïs chanelae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57053	<i>Pseudotanaïs chanelae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57054	<i>Pseudotanaïs chanelae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57055	<i>Pseudotanaïs chanelae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57056	<i>Pseudotanaïs chanelae</i>		-		10-9	5265-5643	26/08/12
ZMH K-57057	<i>Pseudotanaïs chanelae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57058	<i>Pseudotanaïs chanelae</i>		-		7-9	5216-5223	17/08/12
ZMH K-57059	<i>Pseudotanaïs chanelae</i>		-		9-12	5399	24/08/12
ZMH K-57060	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57061	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57062	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57063	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57064	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12
ZMH K-57065	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57066	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57067	<i>Pseudotanaïs curieae</i>		-		1-11	5412-5418	30/07/12
ZMH K-57068	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57069	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57070	<i>Pseudotanaïs curieae</i>		-		2-9	4830-4863	02/08/12
ZMH K-57071	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57072	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57073	<i>Pseudotanaïs curieae</i>		-		7-9	5216-5223	17/08/12
ZMH K-57074	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57075	<i>Pseudotanaïs curieae</i>		-		11-12	5348-5351	31/08/12
ZMH K-57076	<i>Pseudotanaïs curieae</i>		-		7-9	5216-5223	17/08/12
ZMH K-57077	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57078	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12

ZMH K-57079	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57080	<i>Pseudotanaïs curieae</i>		-		5-9	5376	11/08/12
ZMH K-57081	<i>Pseudotanaïs curieae</i>		-	XXXX	3-9	4987-4991	05/08/12
ZMH K-57082	<i>Pseudotanaïs curieae</i>		-		6-11	5291-5305	15/08/12
ZMH K-57083	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57084	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57085	<i>Pseudotanaïs curieae</i>		-	XXXX	3-9	4987-4991	05/08/12
ZMH K-57086	<i>Pseudotanaïs curieae</i>		-		11-12	5348-5351	31/08/12
ZMH K-57087	<i>Pseudotanaïs curieae</i>		-	XXXX	6-11	5291-5305	15/08/12
ZMH K-57088	<i>Pseudotanaïs curieae</i>		-		6-11	5291-5305	15/08/12
ZMH K-57089	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57090	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57091	<i>Pseudotanaïs curieae</i>		-	XXXX	4-3	5681-5780	06/08/12
ZMH K-57092	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57093	<i>Pseudotanaïs curieae</i>		-	XXXX	3-9	4987-4991	05/08/12
ZMH K-57094	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57095	<i>Pseudotanaïs curieae</i>		dissected		8-9	5125-5140	20/08/12
ZMH K-57096	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57097	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57098	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57099	<i>Pseudotanaïs curieae</i>		-	XXXX	3-9	4987-4991	05/08/12
ZMH K-57100	<i>Pseudotanaïs curieae</i>		-	XXXX	7-10	5218-5221	17/08/12
ZMH K-57101	<i>Pseudotanaïs curieae</i>		-	XXXX	7-10	5218-5221	17/08/12
ZMH K-57102	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57103	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57104	<i>Pseudotanaïs curieae</i>		-	XXXX	9-12	5399	24/08/12
ZMH K-57105	<i>Pseudotanaïs curieae</i>		dissected		8-12	5115-5124	21/08/12
ZMH K-57106	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57107	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12
ZMH K-57108	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12
ZMH K-57109	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57110	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57111	<i>Pseudotanaïs curieae</i>		-	XXXX	7-10	5218-5221	17/08/12
ZMH K-57112	<i>Pseudotanaïs curieae</i>		-	XXXX	12-4	5215-5228	31/08/12
ZMH K-57113	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57114	<i>Pseudotanaïs curieae</i>		-	XXXX	8-12	5115-5124	21/08/12
ZMH K-57115	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57116	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12
ZMH K-57117	<i>Pseudotanaïs curieae</i>		-	XXXX	12-4	5215-5228	31/08/12
ZMH K-57118	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57119	<i>Pseudotanaïs curieae</i>		-		5-10	5375-5378	11/08/12
ZMH K-57120	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57121	<i>Pseudotanaïs curieae</i>		-	XXXX	3-9	4987-4991	05/08/12
ZMH K-57122	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12
ZMH K-57123	<i>Pseudotanaïs curieae</i>		-	XXXX	9-12	5399	24/08/12
ZMH K-57124	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57125	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57126	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12

ZMH K-57127	<i>Pseudotanaïs curieae</i>		dissected	XXXX	7-10	5218-5221	17/08/12
ZMH K-57128	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57129	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57130	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57131	<i>Pseudotanaïs curieae</i>		-	XXXX	7-10	5218-5221	17/08/12
ZMH K-57132	<i>Pseudotanaïs curieae</i>		-		7-10	5218-5221	17/08/12
ZMH K-57133	<i>Pseudotanaïs curieae</i>	holotype	-	XXXX	7-10	5218-5221	17/08/12
ZMH K-57134	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57135	<i>Pseudotanaïs curieae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57136	<i>Pseudotanaïs curieae</i>		-		10-9	5643-5264	26/08/12
ZMH K-57137	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57138	<i>Pseudotanaïs curieae</i>		-		10-9	5643-5264	26/08/12
ZMH K-57139	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57140	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57141	<i>Pseudotanaïs curieae</i>		-		11-12	5348-5351	31/08/12
ZMH K-57142	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57143	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57144	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57145	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57146	<i>Pseudotanaïs curieae</i>		-		11-12	5348-5351	31/08/12
ZMH K-57147	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57148	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57149	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57150	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57151	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57152	<i>Pseudotanaïs curieae</i>		-		2-9	4830-4863	02/08/12
ZMH K-57153	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57154	<i>Pseudotanaïs curieae</i>		-	XXXX	10-9	5643-5264	26/08/12
ZMH K-57155	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57156	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57157	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57158	<i>Pseudotanaïs curieae</i>		-		2-9	4830-4863	02/08/12
ZMH K-57159	<i>Pseudotanaïs curieae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57160	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57161	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57162	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57163	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57164	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57165	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57166	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57167	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57168	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57169	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57170	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57171	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57172	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57173	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57174	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12

ZMH K-57175	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57176	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57177	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57178	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57179	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57180	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57181	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57182	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57183	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57184	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57185	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57186	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57187	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57188	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57189	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57190	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57191	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57192	<i>Pseudotanaïs curieae</i>		-		2-9	4830-4863	02/08/12
ZMH K-57193	<i>Pseudotanaïs curieae</i>		-		11-9	5362	30/08/12
ZMH K-57194	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57195	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57196	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57197	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57198	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57199	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57200	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57201	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57202	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57203	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57204	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57205	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57206	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57207	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57208	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57209	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57210	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57211	<i>Pseudotanaïs curieae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57212	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57213	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57214	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57215	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57216	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57217	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57218	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57219	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57220	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57221	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57222	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12

ZMH K-57223	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57224	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57225	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57226	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57227	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57228	<i>Pseudotanaïs curieae</i>		-		2-9	4830-4864	02/08/12
ZMH K-57229	<i>Pseudotanaïs curieae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57230	<i>Pseudotanaïs curieae</i>		-		10-9	5643-5264	26/08/12
ZMH K-57231	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57232	<i>Pseudotanaïs curieae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57233	<i>Pseudotanaïs curieae</i>		-		11-12	5348-5351	31/08/12
ZMH K-57234	<i>Pseudotanaïs curieae</i>		-		4-3	5681-5780	06/08/12
ZMH K-57235	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57236	<i>Pseudotanaïs curieae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57237	<i>Pseudotanaïs curieae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57238	<i>Pseudotanaïs locueloae</i>	holotype	-		6-11	5291-5305	15/08/12
ZMH K-57239	<i>Pseudotanaïs locueloae</i>		dissected	XXXX	9-12	5399	24/08/12
ZMH K-57240	<i>Pseudotanaïs monroae</i>		dissected		7-9	5216-5223	17/08/12
ZMH K-57241	<i>Pseudotanaïs monroae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57242	<i>Pseudotanaïs monroae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57243	<i>Pseudotanaïs monroae</i>		-		10-12	5249-5262	27/08/12
ZMH K-57244	<i>Pseudotanaïs monroae</i>		-	XXXX	9-12	5399	24/08/12
ZMH K-57245	<i>Pseudotanaïs monroae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57246	<i>Pseudotanaïs monroae</i>		-		11-9	5362	30/08/12
ZMH K-57247	<i>Pseudotanaïs monroae</i>		-	XXXX	9-12	5399	24/08/12
ZMH K-57248	<i>Pseudotanaïs monroae</i>		dissected	XXXX	3-9	4987-4991	05/08/12
ZMH K-57249	<i>Pseudotanaïs monroae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57250	<i>Pseudotanaïs monroae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57251	<i>Pseudotanaïs monroae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57252	<i>Pseudotanaïs monroae</i>		-		5-10	5375-5378	11/08/12
ZMH K-57253	<i>Pseudotanaïs monroae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57254	<i>Pseudotanaïs monroae</i>		-	XXXX	5-10	5375-5378	11/08/12
ZMH K-57255	<i>Pseudotanaïs monroae</i>		dissected	XXXX	6-12	5304-5307	15/08/12
ZMH K-57256	<i>Pseudotanaïs monroae</i>		-	XXXX	8-9	5125-5140	20/08/12
ZMH K-57257	<i>Pseudotanaïs monroae</i>		-	XXXX	1-10	5423-5429	30/07/12
ZMH K-57258	<i>Pseudotanaïs monroae</i>		-	XXXX	9-12	5399	24/08/12
ZMH K-57259	<i>Pseudotanaïs monroae</i>	holotype	dissected	XXXX	9-12	5399	24/08/12
ZMH K-57260	<i>Pseudotanaïs monroae</i>		dissected	XXXX	10-9	5643-5265	26/08/12
ZMH K-57261	<i>Pseudotanaïs monroae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57262	<i>Pseudotanaïs monroae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57263	<i>Pseudotanaïs monroae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57264	<i>Pseudotanaïs monroae</i>		-		2-9	4830-4863	02/08/12
ZMH K-57265	<i>Pseudotanaïs monroae</i>		-		11-9	5362	30/08/12
ZMH K-57266	<i>Pseudotanaïs monroae</i>		-		11-9	5362	30/08/12
ZMH K-57267	<i>Pseudotanaïs monroae</i>		-		5-10	5375-5378	11/08/12
ZMH K-57268	<i>Pseudotanaïs monroae</i>		-		6-12	5304-5307	15/08/12
ZMH K-57269	<i>Pseudotanaïs monroae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57270	<i>Pseudotanaïs monroae</i>		-		12-4	5215-5228	31/08/12

ZMH K-57271	<i>Pseudotanaïs monroëae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57272	<i>Pseudotanaïs szymborskae</i>		-		6-11	5291-5305	15/08/12
ZMH K-57273	<i>Pseudotanaïs szymborskae</i>		-		6-11	5291-5305	15/08/12
ZMH K-57274	<i>Pseudotanaïs szymborskae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57275	<i>Pseudotanaïs szymborskae</i>		-		4-3	5681-5780	06/08/12
ZMH K-57276	<i>Pseudotanaïs szymborskae</i>		dissected	XXXX	11-9	5263	30/08/12
ZMH K-57277	<i>Pseudotanaïs szymborskae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57278	<i>Pseudotanaïs szymborskae</i>		-	XXXX	4-3	5681-5780	06/08/12
ZMH K-57279	<i>Pseudotanaïs szymborskae</i>		-	XXXX	9-9	5399-5408	23/08/12
ZMH K-57280	<i>Pseudotanaïs szymborskae</i>			XXXX	4-3	5681-5780	06/08/12
ZMH K-57281	<i>Pseudotanaïs szymborskae</i>		dissected	XXXX	9-12	5399	24/08/12
ZMH K-57282	<i>Pseudotanaïs szymborskae</i>		-	XXXX	9-12	5399	24/08/12
ZMH K-57283	<i>Pseudotanaïs szymborskae</i>	holotype	-	XXXX	9-12	5399	24/08/12
ZMH K-57284	<i>Pseudotanaïs szymborskae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57285	<i>Pseudotanaïs szymborskae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57286	<i>Pseudotanaïs szymborskae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57287	<i>Pseudotanaïs szymborskae</i>		-		12-4	5215-5228	31/08/12
ZMH K-57288	<i>Pseudotanaïs szymborskae</i>		-		3-9	4987-4991	05/08/12
ZMH K-57289	<i>Pseudotanaïs szymborskae</i>		-		8-9	5125-5140	20/08/12
ZMH K-57290	<i>Pseudotanaïs szymborskae</i>		-		6-11	5291-5305	15/08/12
ZMH K-57291	<i>Pseudotanaïs szymborskae</i>		-		11-9	5263	30/08/12
ZMH K-57292	<i>Pseudotanaïs szymborskae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57293	<i>Pseudotanaïs szymborskae</i>		-		9-9	5399-5408	23/08/12
ZMH K-57294	<i>Pseudotanaïs szymborskae</i>		-		7-9	5216-5223	17/08/12
ZMH K-57295	<i>Pseudotanaïs szymborskae</i>		-		7-9	5216-5223	17/08/12
ZMH K-57296	<i>Pseudotanaïs szymborskae</i>		-		11-12	5348-5351	31/08/12
ZMH K-57297	<i>Pseudotanaïs szymborskae</i>		dissected		8-12	5115-5124	21/08/12
ZMH K-57298	<i>Pseudotanaïs szymborskae</i>		-		9-12	5399	24/08/12
ZMH K-57299	<i>Pseudotanaïs szymborskae</i>		-		4-9	5681	06/08/12
ZMH K-57300	<i>Pseudotanaïs szymborskae</i>		-		8-12	5115-5124	21/08/12
ZMH K-57301	<i>Pseudotanaïs szymborskae</i>		-		2-10	4859-4863	03/08/12
ZMH K-57302	<i>Pseudotanaïs szymborskae</i>		-		2-9	4830-4864	02/08/12
ZMH K-57303	<i>Pseudotanaïs szymborskae</i>		-		2-10	4859-4863	03/08/12

Table S2 – K2P (above diagonal) and patristic distances (below diagonal) among Pseudotanaidae COX1 sequences.

	<i>P. locueloae</i>	<i>P. chanelae</i>	<i>P. szymborskae</i>	<i>P. monroeae</i>	<i>P. curieae</i>	<i>M. hollandae</i>
<i>P. locueloae</i>		0.392±0.035	0.376±0.034	0.420±0.036	0.396±0.034	0.543±0.048
<i>P. chanelae</i>	0.903		0.261±0.027	0.248±0.025	0.248±0.026	0.587±0.054
<i>P. szymborskae</i>	0.78	0.436		0.253±0.026	0.202±0.023	0.531±0.047
<i>P. monroeae</i>	0.908	0.463	0.441		0.256±0.026	0.535±0.046
<i>P. curieae</i>	0.808	0.464	0.286	0.469		0.544±0.048
<i>M. hollandae</i>	1.166	1.400	1.277	1.405	1.305	

Appendix 1 - Morphological analyses and species descriptions

Family: Pseudotanaidae Sieg, 1976

Genus: *Mystriocentrus* Bird & Holdich, 1989

Diagnosis: Antenna article-6 and maxilliped palp article-4 with thickened seta. Chela forcipate, cutting edge serrate.

Species included: *Mystriocentrus biho* Jakiel, Stępień & Błażewicz, 2018; *M. serratus* Bird & Holdich, 1989; *Mystriocentrus* sp. A McLelland, 2008; *Pseudotanaïs* sp. McLelland, 2007.

Mystriocentrus hollandae n. sp.

Figs. 4–5

Material examined. Holotype: neuter (partially dissected), BL = 1 mm (ZMH K-57039), St. 9–12, 40°34.49' N 150°59.85' E, 5392–5397 m, EBS, 24 Aug 2012.

Paratypes: Two neuters, St. 3–9. Neuter, St. 7–10.

Diagnosis: Pereopods 2–3 merus without spatulate setae; pereopods 2–3 carpus with blade-like spine 0.5x propodus. Pereopods 4–6 carpus without spatulate setae. Uropod exopod with one article, 0.5x endopod.

Etymology: The species is dedicated to Agnieszka Holland, Polish film director and screenwriter, one of Poland's most recognized filmmakers.

Description of neuter: BL = 1 mm. Body, lateral view (Fig. 4A).

Antennule (Fig. 4B) article-1 4.7 L:W, 3.1x article-2, with simple mid-length seta, two penicillate setae and two simple distal setae; article-2 1.9 L:W, 0.7x article-3, with two distal setae; article-3 5 L:W, with three simple setae, one bifurcate seta, two rod setae and one aesthetasc.

Antenna (Fig. 4C); article-2 0.9x article-3, with distodorsal seta (0.9x the article-2); article-3 1.2 L:W, 0.17x article-4, with distodorsal seta (0.6x the article-3); article-4 11.1 L:W, 3x article-5, with one simple and two penicillate setae subdistally, two simple and one penicillate setae distally; article-5 4.1 L:W, 8.2x article-6, with seta; article-6 0.7 L:W, with three simple and one thick seta.

Mouth parts. Labrum not observed. Left mandible (Fig. 4D) *lacinia mobilis* well developed, distally serrate, incisor distal margin serrate, molar acuminate, simple. Right mandible (Fig. 4E) incisor unequally bifid, distal margin serrate, molar acuminate, as in

left mandible. Maxillule endite (Fig. 4F) with nine terminal spines and two fine subdistal setae. Maxilliped (Fig. 4G) basis and endites broken; palp article-2 inner margin with robust seta; article-3 with four setae (two long and two short); article-4 with five simple and one thick seta distally and subdistally.

Cheliped (Fig. 5A) slender; basis 1.4 L:W; merus with ventral seta; carpus 3.3 L:W, 1.5x palm, with midventral seta; chela forcipate; palm 1.6 L:W, with small folds (crenulation) in distodorsal corner and small ventral seta; fixed finger 6.1 L:W; 1.7x palm, cutting edge finely serrate with three setae; dactylus 11.7 L:W, cutting edge serrate.

Pereopod-1 (Fig. 5B) coxa with seta; basis 10 L:W, 0.8x merus with midventral seta; ischium with seta; merus 2.4 L:W, 0.6x carpus, naked; carpus 5.2 L:W, 0.7x propodus, with distal seta; propodus 6 L:W, 1.4x dactylus and unguis combined length, with one subdistal dorsal and distal ventral simple setae; dactylus 0.5x unguis.

Pereopod-2 (Fig. 5C) larger than pereopod 1; basis 7.8 L:W, 2.9x merus, with one simple proximal seta, one simple and one penicillate middlelength seta; ischium with ventral seta; merus 2.7 L:W, 0.8x carpus, with two simple ventrodiscal setae; carpus 2.8 L:W, as long as propodus, with two simple and blade-like spine (0.5x propodus); propodus 5.0 L:W, 1.4x dactylus and unguis combined length, with ventrodiscal serrate seta shorter than dactylus; dactylus 0.8x unguis with subproximal seta.

Pereopod-3 (Fig. 5D) coxa with seta; basis 7.7 L:W, 4.6x merus; ischium with seta; merus 1.6 L:W, 0.5x carpus, with two simple setae; carpus 2.8 L:W, 0.8x propodus, with two simple setae and one blade-like spine (0.6x propodus); propodus 8.0 L:W, 1.3x dactylus and unguis combined length, with serrate seta as long as dactylus; dactylus 1.1x unguis.

Pereopod-4 (Fig. 5E) basis 11.4 L:W, 8.1x merus, with penicillate ventral seta and simple ventrodiscal seta; merus 1.6 L:W, 0.4x carpus, with seta; carpus 4.5 L:W, 0.9x propodus, with two simple setae, and one blade-like spine (0.2x propodus); propodus-6 L:W, with two distoventral and one distodorsal setae; dactylus and unguis fused to a small hook.

Pereopod-5 (Fig. 5F) basis 7.7 L:W, 5.2x merus, with two penicillate ventral setae; ischium with seta; merus 2.5 L:W, 0.7x carpus, with seta; carpus 5 L:W, 0.9x propodus, with seta and blade-like spine (0.3x propodus); propodus 8.0 L:W, with two ventrodiscal and one dorsodiscal setae; dactylus and unguis fused to a small hook.

Pereopod-6 (Fig. 5G) basis 8.1 L:W, 4.7x merus, with penicillate seta; merus 2.4 L:W, 0.5x carpus, with seta; carpus 5.5 L:W, 1x propodus, with simple seta and blade-like spine (0.4x propodus); propodus 7.3 L:W, 1.6x dactylus and unguis combined length, with three setae; dactylus and unguis fused to a small hook.

Pleopods (Fig. 5H) exopod and endopod with nine distal plumose setae.

Uropod (Fig. 5I) peduncle broken; exopod with one article, 6.6 L:W, with one middle and one strong distal seta; endopod with two articles, article-1 4.3 L:W, with middle seta, article-2 3.3 L:W, with three simple and two penicillate setae. Exopod 0.7x endopod.

Distribution. Kuril-Kamchatka abyssal plain; depth range 4859–5397 m.

Remarks: *Mystriocentrus hollandae* n. sp. is assigned to *Mystriocentrus* because it has a thick seta on maxilliped palp article-4 and on antenna article-6. Furthermore, *M. hollandae*, with 1-article exopod of uropod, can be distinguished from *M. biho* that has 2-article exopod. A blade-like spine on the pereopods 2–3 carpus, at least half as long as the propodus, makes *M. hollandae* different from its two congeners (*M. serratus* has this spine only 0.2x propodus and *Mystriocentrus* sp. A not longer than 0.3x propodus). Finally, the new species can be distinguished from *M. serratus* and *Mystriocentrus* sp. A. by the absence of spatulate setae on the pereopods 2–3 merus and pereopods 4–6 carpus. *M. hollandae* is the third species representing the genus, although *Pseudotanaïs* sp. recorded by McLelland (2008) from the North Pacific is considered conspecific to *M. hollandae*, sharing serrate margins of the chela, missing the spatulate setae on merus of pereopods 2–3 and carpus of pereopods 4–6 and semilong blade-like spines on the carpus pereopods 2–3. The individuals reported by McLelland (2008) were collected from a shallower depth range (3146–3272 m) than *M. hollandae* (4987–5399 m).

Genus: *Pseudotanaïs* G.O. Sars, 1882

Diagnosis (after Sieg (1976) and Bird and Holdich (1989), modified by Jakiel *et al* 2018): Antennule with three articles. Antenna with six articles. Maxilliped palp article-4 without rod (thickened) seta. Chela cutting edges smooth; fixed finger with one ventral seta. Pereopods 2–6 carpus with blade-like spine.

‘affinis + longisetosus’ group

Diagnosis: Antenna article 2–3 with spines. Mandible acuminate or wide. Chela non-forcinate. Pereopod-1 basis with few (0–3) or many (5–7) setae; merus with seta; carpus with or without setae. Pereopod-2 carpus with long blade-like spine. Pereopods 5–6 carpus with short or long rod seta. Uropod slender, with exopod uropod about 0.75 of endopod, or equal to endopod.

Species included: *Pseudotanaïs affinis* Hansen, 1887; *P. gaiae* Jakiel, Palero & Błażewicz 2019; *P. geraldii* Jakiel, Palero & Błażewicz, 2019; *P. julietae* Jakiel, Palero & Błażewicz, 2019; *P. longisetosus* Sieg, 1977; *P. longispinus* Bird & Holdich, 1989; *P. macrocheles* Sars, 1882; *P. nipponicus* McLelland, 2007; *P. nordenskioldi* Sieg, 1977; *P. romeo* Jakiel, Palero & Błażewicz, 2019; *P. spatula* Bird & Holdich, 1989; *P. scalpellum* Bird & Holdich, 1989; *P. svavarssoni* Jakiel, Stępień & Błażewicz, 2018; *P. uranos* Jakiel, Palero & Błażewicz, 2019; *P. vitjazi* Kudinova-Pasternak, 1966; *P. yenneferae* Jakiel, Palero & Błażewicz, 2019; *Pseudotanaïs* sp. O (see McLelland, 2008); *Pseudotanaïs* sp. P (see McLelland 2008); *P. curieae* n. sp., *P. szymborskae* n. sp., *P. chanelae* n. sp., *P. monroeae* n. sp.

Pseudotanaïs curieae n. sp.

Figs 6–7.

Material examined. Holotype: neuter, BL = 1.7 mm (ZMH K-57133), St. 7-10, 42°14.38' N 151°43.12' E, 5115–5124 m, EBS, 21 Aug 2012.

Paratypes: BL = 1.2–2 mm; two neuters, St. 1-11. Five neuters, St. 2-9. Seven neuters, St. 2-10. 43 neuters, St. 3–9. Two neuters, St. 4-3. Neuter, St. 5-9. Neuter, st 5–10. Three neuters, St. 6-11. Two neuters, St. 7-9. 13 neuters (dissected), St. 7-10. 29 neuters, St. 8-9. 23 neuters, St. 8-12. Two neuters, St. 9-12. Four neuters, St. 10-9. 15 neuters, St. 10-12. Neuter, St. 11-9. Five neuters, St. 11-12. 22 neuters, St. 12-4.

Diagnosis. Pereopod-1 basis with two simple setae; merus and carpus with long seta. Pereopods 2–3 merus with two setae; carpus with long blade-like spine. Pereopods 4–6 carpus with long seta.

Etymology. The species is dedicated to Maria Skłodowska-Curie, a Polish physicist and chemist; the first woman who was Nobel Prize Laureate in two categories.

Description of neuter. BL = 1.6 mm. Body slender (Fig. 6A), 3.6 L:W. Cephalothorax 1.6 L:W, as long as pereonites 1–3, 0.2x BL. Pereonites 0.5x BL,

pereonites 1–6: 0.1, 0.2, 0.3, 0.5, 0.5 and, 0.3x L:W, respectively. Pleon short, 0.3x BL. Pleonites 0.7x L:W. Pleotelson 0.5x pereonite-6.

Antennule (Fig. 6B) article-1 5.5 L:W, 1.7x article-2, with one simple (longer than article 2) and two penicillate setae; article-2 3.8 L:W, 0.8x article-3, with distal seta; article-3 6.7 L:W, with two simple setae, two trifurcated and one aesthetasc.

Antenna (Fig. 6C) 1.5 L:W, article-2 0.8x article-3, with distodorsal spine (0.6x the article-2); article-3 2.3 L:W, 0.3x article-4, with distodorsal spine (0.7x the article-3); article-4 8 L:W, 2.6x article-5, with three simple and one penicillate setae; article-5 3.5 L:W, 9.3x article-6, with distal seta; article-6 0.6 L:W, with four setae.

Mouth parts. Labrum (Fig. 6D) hood-shape, weakly setose. Left mandible (Fig. 6F) *lacinia mobilis* well developed and distally serrate, incisor distal margin irregularly serrate, molar coronal. Right mandible (Fig. 6E) incisor unequally bifid distal margin serrate. Maxillule (Fig. 6G) with nine distal spines and three subdistal setae, endite with two distal setae. Maxilliped (Fig. 6H) basis 1.5 L:W, naked, endites partly fused, distal margin naked (without gustatory cusps and without setae); palp article-2 inner margin with two setae, outer margin with one seta; article-3 with four inner setae; article-4 with five distal and subdistal setae.

Cheliped (Fig. 7A) slender; basis 1.7 L:W, naked; ischium with one seta; carpus 2.7 L:W; 1.2x palm, with two ventral setae, one subdistal and one subproximal setae; chela non-forcipate; palm 2.0x L:W, with one ventral seta; fixed finger distal spine pointed, regular size, 4.3x palm, with three setae on cutting margin; dactylus 7.4 L:W, cutting margin with two spines.

Pereopod-1 (Fig. 7B) basis 7.8 L:W, with three ventral and one dorsal setae; ischium with ventral seta; merus 3.6 L:W, 0.9x carpus, with two simple ventrodistal seta (short and long); carpus 3.2 L:W, 0.6x propodus, with three setae (two short one long); propodus 8 L:W, 1.1x dactylus and unguis combined length, naked; dactylus 0.5x unguis.

Pereopod-2 (Fig. 7C) basis 7.1 L:W, 3.3x merus, with dorsal seta; ischium with seta; merus 2.1 L:W, 0.8x carpus, with two ventrodistal setae (longer seta twice as long as shorter seta); carpus 2.6 L:W, 0.7x propodus, with two simple setae, one spine, and long blade-like spine (0.8x propodus); propodus 6.2 L:W, 1.4x dactylus and unguis combined length, with robust distoventral serrate seta and microtrichia; dactylus 0.6x unguis.

Pereopod-3 (Fig. 7D) basis 5.6x L:W, 3.2x merus, with dorsal seta; ischium with seta; merus 2.3 L:W, 0.8x carpus, with two setae (longer seta twice as long as shorter seta); carpus 2.8 L:W, 0.8x propodus, with two simple setae and long blade-like spine (0.8x propodus); propodus 5.5 L:W, 1.8x dactylus and unguis combined length, with two distal serrate setae and microtrichia on ventral margin; dactylus as long as unguis.

Pereopod-4 (Fig. 7E) basis 7 L:W, 3.7x merus; ischium with seta; merus 3 L:W, 0.6x carpus, with seta; carpus 5.2 L:W, as long as propodus, with one simple and one rod setae (1.2x propodus), and blade-like spine (0.4x propodus); propodus 6.5 L:W, 2.2x dactylus and unguis combined length, with one simple and one serrate setae (0.8x propodus); dactylus 1.2x unguis.

Pereopod-5 (Fig. 7F) basis 5.1 L:W, 1.3x merus, with one simple and one penicillate setae; ischium with seta; merus 2.3 L:W, with seta; carpus 4.7 L:W, 1.1 x propodus, with rod seta (1.3x propodus), two serrate setae and blade-like spine (0.5x propodus); propodus 6.5 L:W, 2.2x dactylus and unguis combined length, with one penicillate, one simple, two serrate setae (dorsal serrate seta 1.1x propodus), and microtrichia on ventral margin; dactylus 0.1 x unguis.

Pereopod-6 (Fig. 7G) 5.9x merus; ischium naked; merus 1.1 L:W, 0.4x carpus, with seta; carpus 3.1 L:W, 1.2x propodus, with one simple and one serrate seta, blade-like spine 0.7x propodus, and one rod seta (1.3x propodus); propodus 4.5 L:W, with one simple and two serrate setae (dorsal serrate seta 1.2x propodus), and microtrichia on ventral margin; dactylus 1.2x unguis.

Pleopods (Fig. 7H) basis 1.1 L:W; exopod with five plumose setae, endopod with eight plumose setae.

Uropod (Fig. 7I) basis naked, peduncle 0.9 L:W; exopod with two articles; article-1 3 L:W; article-2 5 L:W, with two setae; endopod article-1 5.5 L:W, with two penicillate setae; article-2 4 L:W, with one penicillate and three simple setae. Exopod 0.7x endopod.

Distribution. Kuril-Kamchatka abyssal plain; depth range 4830–5780 m.

Remarks. *Pseudotanaïs curieae* n. sp. that has a spine on antenna articles 2–3, long seta on pereopod 5–6, and uropod exopod at least 0.8 as long as endopod, is classified to ‘longisetosus’ morphogroup.

Currently nine species of ‘affinis + longisetosus’ morphogroup have long setae on pereopod 5–6 (*P. gaiae*, *P. julietae*, *P. longisetosus*, *P. longispinus*, *P. nipponicus*, *P. spatula*, *P. romeo*, *P. uranos*, and *Pseudotanaïs* sp. O.). The only species that has the

same long seta on pereopod-4 as *P. curieae* is Antarctic *P. longisetosus* Sieg 1977. *P. curieae* can be distinguished from *P. longisetosus* by the presence of long and short distoventral setae on merus of pereopods 2–3 (longer seta twice as long as shorter seta). Moreover, the antennule article-3 is 6.7 L:W, while in *P. longisetosus* the article is 3.5 L:W. *P. curieae* cephalothorax is as long as pereonites 1–3 and it can be distinguished from *P. longisetosus*, with cephalothorax 1.5 as long as pereonites 1–3 combined length. The presence of few (3) setae on dorsal margin of pereopod-1 basis, distinguishes the new species from *P. julietae*, *P. longispinus*, *P. nipponicus*, *P. romeo* and *P. spatula*, which have more setae (6, 6, 7, 5, 4, respectively). *P. curieae* with one seta on ischium of pereopods 4–6 is distinct from *P. longisetosus*, *P. longispinus*, *P. nipponicus* and *Pseudotanaïs* sp. O, which have two setae. Finally, the mandible coronal molar present in this new species distinguishes it from all other species mentioned above, with an acuminate molar.

Pseudotanaïs szymborskae n. sp.

Fig. 8–9

Material examined. Holotype: neuter (ZMH K-57283). BL = 1.4 mm, St. 11–12, 40°12.32'N 148°05.73'E, 5348–5351 m, EBS, 31 Aug 2012.

Paratypes: BL = 1.4–2.1 mm. Neuter, St. 2–9. Two neuters, St. 2–10. Four neuters, St. 3–9. Three neuters, St. 4–3. Three neuters, St. 6–11. Two neuters, St. 7–9. Neuter, St. 8–9. Two neuters, St. 8–12. Four neuters, St. 9–9. Four neuters (one dissected), St. 9–12. Two neuters (one dissected), St. 11–9. Two neuters, St. 12–4.

Diagnosis. Mandible molar coronal, with one longer spine. Pereopod-1 basis with six setae; merus and carpus with long setae (0.9x merus, 0.7x carpus, respectively). Pereopods 2–3 carpus with long (0.7x propodus) blade-like spine. Pereopod-6 carpus with long (1.4x propodus) rod seta.

Etymology. The species is dedicated to Wisława Szymborska, a Polish poet and essayist, a Nobel Prize Laureate in literature.

Description of neuter. BL = 1.4 mm. Body slender (Fig. 8A), 3.2 L:W. Cephalothorax 1.5 L:W, 0.8x pereonites 1–3, 0.2x BL. Pereonites 0.6x BL, pereonites 1–6: 0.1, 0.3, 0.3, 0.4, 0.6, and 0.3x L:W, respectively. Pleon short, 0.2x BL. Pleonites 0.7x L:W. Pleotelson 0.8x pereonite-6.

Antennule (Fig. 8B) article-1 7.3 L:W, 2.7x article-2, with two groups of three and four penicillate setae, one simple midlength seta and one simple distal seta; article-2 2.7 L:W, 0.7x article-3, naked; article-3 8 L:W, with three simple and two bifurcate setae.

Antenna (Fig. 8C) article-1 1.3 L:W; article-2 0.8x article-3, with distodorsal spine (0.4x article-2); article-3 1.7 L:W, 0.3x article-4 with distodorsal spine (0.3x article-3); article-4 8.3 L:W, 2.6x article-5, with simple midlength seta, one simple, three penicillate and two serrate setae, distally; article-5 3.6 L:W, 9.7x article-6, with distal seta; article-6 0.6 L:W, with four setae.

Mouth parts. Labium not observed. Left mandible (Fig. 8E) *lacinia mobilis* well developed and distally serrate, incisor distal margin weakly serrate, molar wide with serrate distal spines. Right mandible (Fig. 8D) incisor unequal bifid, dorsal margin serrate. Labium (Fig. 8F) typical of genus. Maxillule (Fig. 8G) with seven distal spines (two bifurcate) and row of four fine setae; endite with two setae. Maxilla (Fig. 8H) oval. Maxilliped (Fig. 8I) basis lost during dissection; palp article-1 naked, article-2 with one simple and two serrate setae; article-3 with three inner setae, article-4 with four serrate distal and one simple subdistal setae. Epignath (Fig. 8J) sausage shape.

Cheliped (Fig. 9A) slender; basis 1.1 L:W; merus with seta; carpus 1.7 L:W, as long as palm, with two ventral setae, one distal and one subproximal setae dorsally; chela non-forcipate, palm 1.8 L:W, with simple seta near dactylus insertion; fixed finger distal spine pointed, regular size, cutting edge weakly chitinised, with three setae, ventral margin with seta, dactylus with dorsoproximal setae, cutting edge smooth.

Pereopod-1 (Fig. 9B) basis 7.1 L:W, with six ventral setae; ischium with ventral seta; merus 2 L:W; 0.7x carpus, with simple and long distodorsal seta; carpus 2.8 L:W, 0.5x propodus, with one long and one minute distodorsal setae; propodus 8.0 L:W, 1.1 x dactylus and unguis combined length, with two subdistal setae; dactylus 0.7x unguis, without proximal seta.

Pereopod-2 (Fig. 9C) basis 6.6 L:W, 3.4x merus, with seven simple and one penicillate ventral seta; ischium with ventral seta; merus 2.0 L:W, 0.7x carpus, with one simple and one serrate distoventral setae; carpus 3.4 L:W, 0.9x propodus, with one wide-base seta and one blade-like spine (0.6x propodus); propodus 5.8 L:W, 1.7x dactylus and unguis combined length, with serrate seta longer than dactylus, and microtrichia along the margin; dactylus 0.5x unguis.

Pereopod-3 (Fig. 9D) basis 10.2x L:W, 3.6x merus, with one ventral and five dorsal setae; ischium with seta; merus 4.7 L:W, 0.6x carpus, with ventral simple and serrate

setae; carpus 3.7 L:W, 0.9x propodus, with distal simple seta and blade-like spine (0.7x propodus); propodus 6.2 L:W, 1.8x dactylus and unguis combined length, with seta as long as dactylus and unguis, and microtrichia along the margin; dactylus 0.5x unguis.

Pereopod-4 (Fig. 9E) basis 6.2 L:W, 4.1x merus, with three ventral and three dorsal setae; ischium with serrate ventral seta; merus 2.5 L:W, 0.6x carpus, with one simple and one serrate ventrodorsal setae; carpus 4.5 L:W, 1.0x propodus, with one rod seta (0.3x propodus) and blade-like spine (0.7x propodus); propodus 8.7 L:W, 2.9x dactylus and unguis combined length, with one dorsal penicillate seta, one distoventral seta (broken), one long serrate distodorsal seta, and microtrichia on ventral margin; dactylus 2.7x unguis.

Pereopod-5 (Fig. 9F) basis 5.2 L:W, 4.1x merus, with dorsal seta and one simple and one penicillate setae ventrally; ischium with two setae; merus 2.8 L:W, 0.5x carpus, naked (seta/ae possibly lost); carpus 6 L:W, 1.2x propodus, with one simple, one rod seta (1.2x propodus) and blade-like spine (0.4x propodus); propodus 6.2 L:W, 2.7x dactylus and unguis combined length, with one distal and two subdistal setae; dactylus 2.7x unguis.

Pereopod-6 (Fig. 9G) basis 3.9 L:W, 3.9x merus, with two ventral setae; ischium with seta; merus 0.9 L:W, 0.5x carpus, with two (long and short) distoventral setae; carpus 3.0 L:W, 1.2x propodus, with one serrate seta, one rod seta (broken) and blade-like spine; propodus 5.2 L:W, 3.5x dactylus and unguis combined length, with two distoventral setae, one long serrate distodorsal seta; dactylus 3.5x unguis.

Pleopods (Fig. 9H) basis 0.8x L:W; exopod with five plumose setae, endopod with ten plumose setae.

Uropod (Fig. 9I) peduncle 0.8 L:W; exopod with two articles; article-1 3.7 L:W, with seta; article-2 7 L:W, seta broken; endopod article-1 1.4 L:W, with one simple and one penicillate setae; article-2 4 L:W, with one simple and two penicillate setae. Exopod 0.8x endopod.

Distribution. Kuril-Kamchatka abyssal plain; depth range 4830–5780 m.

Remarks. *Pseudotanaïs szymborskae* n. sp., has a spine on antenna articles 2–3, a long rod seta on pereopods 5–6, and an exopod at least 0.75x endopod, is assigned to the ‘affinis + longisetosus’ morphogroup. Its short distodorsal rod seta on the carpus of pereopod-4 distinguishes it from *P. curieae* and *P. longisetosus* which have a long seta. Additionally, the new species has many seta (6) on dorsal margin of basis of pereopod-1 can be distinguished from the mentioned species, which have fewer setae (3 and 2,

respectively). A short rod seta on pereopod-4 is also present in: *P. gaiae*, *P. julietae*, *P. longispinus*, *P. nipponicus*, *P. spatula*, *P. romeo*, *P. uranos* and *Pseudotanaïs* sp. O. New species with cephalothorax 0.8x pereonites 1–3 is different from *P. julietae*, *P. longiestosus*, *P. longispinus*, *P. romeo*, *P. spatula*, *P. uranos* and *Pseudotanaïs* sp. O that have this proportion different (1.2x, 1.5x, 1.0x, 1.2x, 1.0x, 1.0x, 1.0x, respectively). Only *P. nipponicus* has the same length of the carapace as *P. szymborskae*, however two setae on merus of pereopods 4–6 in *P. nipponicus* differentiated from *P. szymborskae* that has a spine on this article. Finally, the coronal mandible molar of *P. szymborskae* distinguishes it from *P. gaiae*, *P. longispinus*, *P. nipponicus*, *P. spatula*, *P. uranos*, *Pseudotanaïs* sp. O, which have an acuminate mandible molar, albeit similarly spinose-tipped. Although coronal mandible molars have been observed in Atlantic species of the denticulatus morphogroup, *P. szymborskae* molar has a different number of terminal denticles. The uropod exopod, that is just shorter than the endopod, separates the new species from *P. julietae* and *P. romeo*, which have uropod exopod as long as endopod.

Pseudotanaïs chanelae n. sp.

Figs 10–11

Material examined. Holotype: BL = 1.6 mm. (ZMH K-57047), St. 9-9, 40°34.51' N 150°59.92' E, 5399–5408 m, EBS, 23 Aug 2012.

Paratypes: BL= 1.3–1.8 mm. Neuter, St. 3-9. Two neuters, St. 4-3. Neuter, St. 7-9. 12 neuters (one dissected), St. 9-9. Neuter, St. 9-12. Neuter, St. 10-9. Neuter, St. 12-4.

Diagnosis. Mandible molar acuminate. Maxilliped endites without gustatory cusps and setae. Pereopod-1 merus and carpus with short seta. Pereopods 2–3 carpus blade-like spine long (0.6x and 0.7x propodus, respectively). Pereopods 4–6 carpus with long rod seta (0.8–1.0x propodus).

Etymology. The species is dedicated to Coco Chanel, the French fashion icon, founder of the Chanel brand.

Description of neuter. BL = 1.6 mm. Body robust (Fig. 10A), 2.9 L:W. Cephalothorax 0.7 L:W, 0.9x pereonites 1–3, 0.2x BL. Pereonites 0.6x BL; pereonites 1–6: 0.1, 0.2, 0.2, 0.4, 0.5, and 0.3x L:W, respectively. Pleon short, 0.2x BL. Pleonites 0.6x L:W.

Antennule (Fig. 10B) article-1 5.9 L:W, 2.9x article-2, with five penicillate setae; article-2 1.7 L:W, 0.7x article-3, with two setae; article-3 6.1 L:W, with four simple, two bifurcate setae and one aesthetasc.

Antenna (Fig. 10C) 1.2 L:W; article-2 1.1x article-3, with distodorsal spine (0.4x article-2); article-3 1.4 L:W, 0.2x article-4, with distodorsal spine (0.4x article-3); article-4 8.7 L:W, 2.5x article-5, with one subdistal and five distal penicillate setae; article-5 3.1 L:W, 9.3x article-6, with distal seta; article-6 0.5 L:W, with five setae.

Mouth parts. Labrum (Fig. 10D) hood-shape, setose. Left mandible (Fig. 10E) *lacinia mobilis* well developed, distally serrate, incisor distal margin serrate, molar acuminate, with a few distal spines. Right mandible (Fig. 10F) incisor unequally bifid, distal margin serrate. Maxillule (Fig. 10G) with nine terminal spines and a group of fine setae distally. Labium (Fig. 10H) margins smooth, naked and truncate. Maxilliped (Fig. 10I) endites separate, distal margin naked (without gustatory cusps and setae); palp article-1 naked; article-2 inner margin with three inner setae, outer margin with seta; article-3 with four inner setae; article-4 with six distal and subdistal setae.

Cheliped (Fig. 11A) slender; basis 1.9 L:W, naked; carpus 1.4 L:W, as long as palm, with two ventral setae; chela non-forcipate; palm 1.3 L:W, with inner row of four plumose setae; fixed finger distal spine pointed, 1.1x palm, with one ventral seta and three setae on cutting edge; dactylus 7.7 L:W, cutting edge smooth, proximal seta present.

Pereopod-1 (Fig. 11B) basis 7.7 L:W, with one ventral and one dorsal setae; ischium with ventral seta; merus 3.2 L:W, 0.7x carpus; with distoventral seta; carpus 3.1 L:W, 0.6x propodus, with two short dorsal setae; propodus 6.5 L:W, 1.2x dactylus and unguis combined length, with seta; dactylus 0.5x unguis.

Pereopod-2 (Fig. 11C) larger than pereopod-1, basis 6.4 L:W, 3.7x merus, with two subproximal and subdistal ventral setae and penicillate dorsal seta; ischium with seta; merus 1.7 L:W, 0.8x carpus, with ventrodorsal seta; carpus 2.7 L:W, 0.8x propodus, with two simple setae and blade-like spine (0.6x propodus); propodus 7.5 L:W, 1.6x dactylus and unguis combined length, with distoventral seta longer than dactylus, and microtrichia on ventral margin; dactylus 0.7x unguis.

Pereopod-3 (Fig. 11D) basis 6.3x L:W, 3.3x merus, with ventral seta; ischium with seta; merus 3.3 L:W, 0.9x carpus, with ventral seta; carpus 2.2 L:W, 0.7x propodus, with two simple setae and blade-like spine (0.7x propodus); propodus 4.8 L:W, with distoventral seta longer than dactylus, and microtrichia on ventral margin; dactylus broken.

Pereopod-4 (Fig. 11E) basis 5.6 L:W, 3.1 x merus, with long penicillate ventral seta and proximal dorsal seta; ischium with seta; merus 2.8 L:W, 0.7x carpus, with ventral

seta; carpus 3.2 L:W, 0.9x propodus, with simple seta, long rod seta (0.8x propodus) and blade-like spine (0.3x propodus); propodus 6 L:W, 2.5x dactylus and unguis combined length, with one ventral and one dorsodistal setae (as long as propodus), and microtrichia on ventral margin; dactylus 2.0x unguis.

Pereopod-5 (Fig. 11F) basis 6.8 L:W, 1.6x merus, with penicillate ventral seta; ischium with seta; merus 2.4 L:W, 0.6x carpus, with ventral seta; carpus 4.1 L:W, as long as propodus, with simple seta, rod seta (0.9x propodus) and blade-like spine 0.3x propodus; propodus 5.8 L:W, 2.4x dactylus and unguis combined length, with two setae; dactylus 2.0x unguis.

Pereopod-6 (Fig. 11G) basis 7.7 L:W, 4.4x merus; ischium with seta; merus 3.2 L:W, 0.5x carpus, with ventral seta; carpus 3.7 L:W, with simple seta, long rod seta (as long as propodus), serrate seta and blade-like spine (0.4x propodus); propodus 6.7 L:W, 3x dactylus and unguis combined length, with four serrate setae (dorsal seta 1.1x propodus); dactylus 3.0x unguis.

Pleopods (Fig. 11H) basis 0.7 L:W; exopod with five, endopod with eight plumose setae.

Uropod (Fig. 11I) basis naked, peduncle 0.7 L:W; exopod with two articles; article-1 2.6 L:W, with seta; article-2 4.5 L:W, with two setae; endopod article-1 3 L:W, with seta; article-2 4.2 L:W, with three setae. Exopod 0.7x endopod.

Distribution. Kuril-Kamchatka abyssal plain; depth range 4859–5780 m.

Remarks. *Pseudotanaïs chanelae* n. sp. with a spine on antenna articles 2–3, long rod seta on carpus of pereopod 5–6, exopod at least 0.7 as long as endopod, is assigned to ‘affinis + longisetosus’ morphogroup. *P. chanelae* is the third species that has long rod seta on pereopod-4. From *P. curieae* and *P. longisetosus*, which share this character with the new species, it can be distinguished by: presence of acuminate molar of mandible (coronal in *P. curieae*), short distodorsal setae on merus and carpus of the pereopod-1 (long in *P. curieae*), and by the presence of one seta on the ischium of pereopods 4–6 (two in *P. longisetosus*), and the proportion of the propodus of pereopod-1, that is 1.2x dactylus and unguis combined length (0.8x in *P. longisetosus*). From the all species that have long rod seta on pereopods 5–6, *P. chanelae* can be distinguished by the presence of spine and seta on merus of pereopods 5–6, while the congeners have a single spine (*P. curieae*, *P. gaiae*, *P. julietae*, *P. longisetosus*, *P. longispinus*, *P. spatula*, *P. szymborskae* and *Pseudotanaïs* sp. O) or two setae (*P. nipponicus* and *P. uranos*). The only species that share a spine and a seta on merus of pereopods 5–6 is *P.*

romeo, both species can be separated by the proportion of the exopod to endopod in uropod, that is 0.7 in *P. chanelae* and 1.0 in *P. romeo*.

Pseudotanaïs monroeeae n. sp.

Fig. 12–13

Material examined. Holotype: neuter. BL= 1.4 mm. (ZMH K-57259), St. 12-4, 39°42.78' N 147°09.55' E, 5215–5228m, EBS, 31 Aug 2012.

Paratypes: BL= 1.2–1.9 mm. Neuter, St. 1-0. Neuter, St. 2-9. Four neuters, St. 2-10. Two neuters, St. 3-9. Three neuters (one dissected), St. 5-10. Neuter, St. 6-11. Two neuters, St. 6-12. Neuter, St. 7-9. Neuter, St. 8-9. Two neuters, St. 9-9. Four neuters (three partially dissected), St. 9-12. Two neuters, St. 10-9. Neuter, St. 10-12. Three neuters, St. 11-9. Five neuters, St. 12-4.

Diagnosis. Mandible molar acuminate. Maxilliped endites with two gustatory cusps and one seta. Pereopod-1 merus with long seta, carpus with short seta. Pereopods 2–3 carpus blade-like spines semilong (0.5x propodus). Pereopods 5–6 carpus rod seta long (0.9x and 1.0x propodus, respectively).

Etymology. The species is dedicated to Marilyn Monroe, an American actress, model, and singer who was perhaps the most famous sex symbols and iconic person in popular culture.

Description of neuter. BL= 3.6 mm. Body robust (Fig. 12A) 4.5 L:W. Cephalothorax 0.9 L:W, 1.1x pereonites 1–3, 0.2x BL. Pereonites 0.6x BL, pereonites-1–6: 0.1, 0.3, 0.4, 0.6, 0.6, and 0.5 L:W, respectively. Pleon short, 0.2x BL. Pleonites 0.9 L:W.

Antennule (Fig. 12B) article-1, 7.3 L:W, 2.3x article-2, with five penicillate subdistal setae and two simple distal setae; article-2 3.4 L:W, 0.9x article-3, with two setae (short and long); article-3 10 L:W, with six simple (one broken), two bifurcate setae and one aesthetasc.

Antenna (Fig. 12C) article-2 1.4 L:W, 0.8x article-3, with distodorsal spine (0.4x article-2); article-3 1.7 L:W, 0.3x article-4, with distodorsal spine (0.3x article-3); article-4 12.3 L:W, 2.5x article-5, with midlength seta and four distal setae; article-5 3.7 L:W, 15x article-6, with seta; article-6 0.3 L:W, with five setae.

Mouth parts. Labrum (Fig. 12D) hood-shape, naked. Left mandible (Fig. 12E) *lacinia mobilis* well developed, distally serrate, incisor distal margin irregularly serrate, molar acuminate, with two distal spines. Right mandible (Fig. 12F) incisor unequally bifid, distal margin regularly serrate. Maxillule (Fig. 12G) with eight terminal spines.

Labium (Fig. 12H) distolateral corner of lobes naked. Maxilliped (Fig. 12I) basis 1 L:W, with two sub-posterior setae, endites partly fused, distal margin with two gustatory cusps and seta; palp article-2 inner margin with three setae and outer margin with seta; article-3 with three inner setae; article-4 with six distal and subdistal setae.

Cheliped (Fig. 13A) slender, basis 1.7 L:W; carpus 1.9 L:W, 1.2x palm with two ventral and two dorsal setae (subproximal and subdistal); chela non-forcepate, palm 1.6 L:W, fixed finger distal spine pointed, with three setae on poorly calcified cutting edge, inner comb row setae not seen; dactylus 7 L:W, ventral margin smooth, proximal inner seta present.

Pereopod-1 (Fig. 13B) basis 3.2 L:W, with subproximal dorsal seta; merus 1.9 L:W; 0.8x carpus, with two setae (distodorsal longer than distoventral); carpus 2.4 L:W, 0.6x propodus, with two distal setae; propodus 6.8 L:W, 1.1x dactylus and unguis combined length, with distoventral seta; dactylus 0.5x unguis.

Pereopod-2 (Fig. 13C) basis 6 L:W, 4.1x merus; with ventral seta; ischium with seta; merus 2.3 L:W, 0.7x carpus, with distoventral seta; carpus 2.2 L:W, 0.7x propodus, with simple seta, wide-base seta and blade-like spine (0.5x propodus); propodus 6 L:W, 0.6x dactylus and unguis combined length, with distoventral serrate seta longer than dactylus, and microtrichia on ventral margin; dactylus 0.5x unguis.

Pereopod-3 (Fig. 13D) basis 5.4 L:W, 3.4x merus, with ventral seta; ischium with ventral seta; merus 1.6 L:W, 0.7x carpus, with serrate distoventral seta; carpus 2.3 L:W, 0.8x propodus, with simple seta, wide-base seta and blade-like spine (0.5x propodus); propodus 5.2 L:W, 0.6x dactylus and unguis combined length, with serrate distoventral seta longer than dactylus, and with microtrichia on ventral margin; dactylus 0.9x unguis.

Pereopod-4 (Fig. 13E) basis 5 L:W, 3.1x merus; ischium with ventral seta; merus 1.8 L:W, 0.6x carpus, with two setae; carpus 3.6 L:W, as long as propodus, with simple seta, rod seta short (0.3x propodus), spine and blade-like spine (0.4x propodus); propodus 6.2 L:W, 0.6x dactylus and unguis combined length, with midlength dorsal penicillate seta, simple distoventral seta, short simple seta and long serrate distodorsal seta (broken), and microtrichia on ventral margin; dactylus 2.5x unguis.

Pereopod-5 (Fig. 13F) basis 6 L:W, 1.1x merus, with ventral seta; ischium with seta; merus 1.9 L:W, 0.6x carpus, with serrate seta; carpus 2.8 L:W, 1.2x propodus, with simple seta, long rod seta (0.9x propodus) and blade-like spine (0.4x propodus); propodus 4.2 L:W, 0.4x dactylus and unguis combined length, with simple distoventral

seta, short simple seta and long serrate distodorsal seta (0.9x propodus); dactylus 0.2x unguis.

Pereopod-6 (Fig. 13G) basis 6.3 L:W, 3.8x merus; ischium with ventral seta; merus 1.9 L:W, 0.6x carpus, with serrate seta; carpus 3.8 L:W, as long as propodus, with simple seta, long distodorsal rod seta (as long as propodus), one spine and one blade-like spine (0.4x propodus); propodus 5.5 L:W, 0.4x dactylus and unguis combined length, with two simple distoventral setae, one simple seta and one long serrate distodorsal seta (1.3 x propodus) and microtrichia on ventral margin; dactylus 1.5x unguis.

Pleopods (Fig. 13H) basis 0.9 L:W; exopod with five plumose setae, endopod with eight plumose setae.

Uropod (Fig. 13I) peduncle 0.6 L:W; exopod with two articles, article-1 3.4 L:W, with penicillate seta, article-2 4 L:W, with two setae (short and long); endopod article-1 5.2 L:W, with seta, article-2 5 L:W, with three simple and two penicillate setae; exopod 0.7x endopod.

Distribution. Kuril-Kamchatka abyssal plain; depth range 4830–5429 m.

Remarks. *Pseudotanaïs monroae* n. sp. is classified within the ‘affinis + longisetosus’ morphogroup, because of a spine on antenna articles 2–3, a long distodorsal rod seta on the carpus of pereopod 5–6, and an uropod exopod at least 0.7x endopod. A short rod seta on carpus of the pereopod-4 make the new species similar to *P. gaiae*, *P. julietae*, *P. longispinus*, *P. nipponicus*, *P. spatula*, *P. romeo*, *P. uranos* and *Pseudotanaïs* sp. O. The only species that has short seta on the carpus of the pereopod-1 is *P. chanelae*, although it has also a short seta on the merus (long in *P. monroae*), and the semilong blade-like spine on carpus of pereopod-3 (0.5x propodus); *P. chanelae* has blade-like spine on Pereopod-3 0.7x propodus. *P. monroae* with short distal seta on the carpus on pereopod-1 is distinct from *P. gaiae*, *P. longisetosus*, *P. longispinus*, *P. nipponicus*, *P. spatula*, *P. uranos*, *P. curieae*, *P. szymborskae* and *Pseudotanaïs* sp. O, which have long seta on merus and carpus of pereopod-1. *P. monroae* with two setae on ischium of pereopods 4–6 is different from *P. curieae*, *P. chanelae*, *P. julietae*, *P. spatula* and *P. uranos*, which have single seta. Finally, the new species, with two setae on merus of pereopods 4–6, can be distinguished from *P. curieae*, *P. gaiae*, *P. julietae*, *P. longisetosus*, *P. longispinus*, *P. spatula*, *P. szymborska* and *Pseudotanaïs* sp. O. with a spine on that position; *P. chanelae* and *P. romeo* has a spine and a seta. The only two species that have two setae on pereopod 4–6 merus are *P. nipponicus* and *P. uranos*, but

few seta (1) on basis of pereopod-1 can distinguish *P. chanelae* from *P. niponicus* that has many setae (7). Additionally, a proportion of the cheliped carpus of *P. monroae* (cheliped carpus 1.2x palm) separates it from *P. uranos*, with a carpus as long as palm.

'denticulatus + abathagastor' group

Diagnosis: article 2–3 with spines or setae. Mandible molar coronal. Pereopod-1 basis with few (1–3) setae, merus and carpus distodorsal seta short. Pereopod-2 with short, semilong or long blade-like spine on carpus. Pereopods 5–6 carpus distodorsal seta short. Uropod slender, exopod longer or slightly shorter than endopod.

Species included: *Pseudotanaïs corollatus* Bird & Holdich, 1984; *P. denticulatus* Bird & Holdich, 1989; *P. abathagastor* Błażewicz-Paszkowycz, Bamber & Józwiak, 2013; *Pseudotanaïs chopini* Jakiel, Palero & Błażewicz, 2019; *Pseudotanaïs georgesandae* Jakiel, Palero & Błażewicz, 2019; *Pseudotanaïs chaplini* Jakiel, Palero & Błażewicz, 2019; *Pseudotanaïs oloughlini* Jakiel, Palero & Błażewicz, 2019; *P. mariae* Jakiel, Palero & Błażewicz, 2019; *Pseudotanaïs* sp. C (McLelland 2008); *P. locueloae* n. sp.

Pseudotanaïs locueloae n. sp.

Fig. 14–15

Material examined: Holotype: Neuter (dissected), (ZMH K-57238), St. 6-11, 42°28.61' N 153°59.68' E, 5291–5305 m, EBS, 15 Aug 2012.

Paratype: Neuter (dissected), St. 9-12.

Diagnosis. Mandible molar wide. Pereopod-1 merus with short seta, carpus with short seta. Pereopods 2–3 carpus blade-like spines semilong (0.5x propodus).

Etymology. The species is dedicated to the second author closest friend Mevuelvo Locuelo, whom contributed significantly to enjoy the long hours used on the description part of this study.

Description of neuter.

Antennule (Fig. 14A) article-1, 3.7 L:W, 2.1x article-2, with three penicillate subdistal setae, two simple and two penicillate distal setae; article-2 2.1 L:W, 0.9x article-3, with simple seta; article-3 5.5 L:W, with one penicillate, one bifurcate setae, one aesthetasc and three setae (broken).

Antenna (Fig. 14B) article-1 0.8 L:W; article-2 1.3 L:W, 0.9x article-3, with distodorsal spine (0.4x article-2); article-3 1.5 L:W, 0.2x article-4, with broader distodorsal spine (0.3x article-3); article-4 9.3 L:W, 2.6x article-5, with midlength penicillate seta, three simple and two penicillate distal setae; article-5 4.2 L:W, 12.5x article-6; article-6 0.5 L:W, with five setae.

Mouth parts. Labrum (Fig. 14C) hood-shape, naked. Left mandible (Fig. 14D) *lacinia mobilis* well developed and distally serrate, incisor distal margin weakly serrate, molar narrowing distally, but not acute, with distal spines. Right mandible (Fig. 14E) incisor unequally bifid, dorsal margin serrate. Maxillule (Fig. 14F) with seven distal spines and two rows of four fine setae. Maxilliped (Fig. 14G) basis 0.9 L:W, with subdistal seta, endites partly fused, with groove in the midlength, distal margin with two gustatory cusps and seta; palp article-1 naked, article-2 two inner serrate setae and outer simple seta; article-3 with three inner setae, article-4 with six distal and subdistal setae.

Cheliped (Fig. 15A) slender, basis 1.4 L:W; carpus 2.3 L:W, 1.2x palm, with two ventral and two dorsal setae (subproximal and distal); chela non-forcipate, palm 1.8 L:W, fixed finger distal spine pointed, regular size, with three setae on poorly calcified cutting edge; dactylus 6.3 L:W, ventral margin smooth, inner proximal seta present.

Pereopod-1 (Fig. 15B) basis 9.2 L:W, with subproximal dorsal seta; merus 2.5 L:W; 0.9x carpus, naked; carpus 3.4 L:W, 0.4x propodus, with minute seta; propodus elongate and narrow, 11.7 L:W, 1.3x dactylus and unguis combined length, with two subdistal setae; dactylus 0.7x unguis.

Pereopod-2 (Fig. 15C) basis 8.3 L:W, 4.2x merus; ischium naked; merus 1.7 L:W, 0.4x carpus, distoventral spine and seta not observed; carpus 3.8 L:W, 0.8x propodus, with blade-like spine (0.6x propodus); propodus 8.7 L:W, with serrate distoventral seta shorter than dactylus; dactylus broken.

Pereopod-3 (Fig. 15D) basis 8.6 L:W, 4.6x merus; ischium with ventral seta; merus 1.6 L:W, 0.5x carpus, with serrate distoventral seta; carpus 6.7 L:W, 0.8x propodus, with simple seta and blade-like spine (0.6x propodus); propodus 8 L:W, with serrate seta; dactylus broken.

Pereopod-4 (Fig. 15E) basis 5 L:W, 1.4x merus, with ventral seta; ischium with seta; merus 2 L:W, 0.7x carpus, with serrate distoventral seta; carpus 2.6 L:W, 0.8x propodus, with short distodorsal rod seta, two serrate setae and blade-like spine (0.3x propodus); propodus 8.2 L:W, 4.0x dactylus and unguis combined length, with two serrate subdistal and long serrate distodorsal seta (0.6x propodus); dactylus 2.3x unguis.

Pereopod-5 (Fig. 15F) basis 4.0 L:W, 2.5x merus; ischium with two setae; merus 1.2 L:W, 0.4x carpus, with one broken distoventral seta; carpus 2.7 L:W, 0.5x propodus, with short distodorsal rod seta, one serrate seta and one blade-like spine (0.3x propodus); propodus 6.7 L:W, 3.1x dactylus and unguis combined length, with one dorsal penicillate seta, two serrate subdorsal setae and one long distodorsal seta (broken); dactylus 3.3x unguis.

Pereopod-6 (Fig. 15G) basis 5.1 L:W, 3.6x merus; merus 1.8 L:W, 0.5x carpus, with serrate distoventral seta; carpus 6.5 L:W, 0.65x propodus, with short distodorsal rod seta, one serrate seta, blade-like spine broken; propodus 10 L:W, 2.7x dactylus and unguis combined length, with two serrate subdistal setae and one long serrate distodorsal seta (0.7x propodus); dactylus 2.2x unguis.

Pleopods (not illustrated) exopod with seven plumose setae, endopod with ten plumose setae.

Uropod missing.

Distribution. Kuril-Kamchatka abyssal plain; depth range 5291–5397 m.

Remarks. *Pseudotanaïs locueloae* n. sp., with naked merus of pereopod-1 and no long rod distodorsal seta on carpus of pereopods 5–6, is the tenth species described of ‘denticulatus + abathagastor’ morphogroup. *P. locueloae* can be distinguished from other species of the group by the length and proportions of pereopod-1 propodus. The long propodus (11.7 L:W) distinguishes it from *P. chaplini*, *P. chopini*, *P. corollatus*, *P. denticulatus*, *P. georgesandae*, *P. oloughlini*, which have the propodus less than 6 L:W. *P. locueloae* has a spine on antenna article-2 and can be separated from *P. abathagastor* and *P. mariae*, which have a seta (not spine) at the article. The carpus/palm proportion of the cheliped is larger in *P. locueloae* (1.2x), while in *P. abathagastor*, *P. chaplini*, *P. chopini*, *P. corollatus*, *P. denticulatus*, *P. georgesandae*, *P. mariae*, *P. oloughlini* and *Pseudotanaïs* sp. C this proportion is smaller (1.0x, 1.0x, 1.1x, 0.9x, 1.0x, 1.1x, 1.1x, 1.1x, 1.0x, respectively). The spine on merus of pereopods 4–6 allows the new species to be separated from *P. abathagastor* (with seta), *P. corollatus* and *P. mariae* (with two setae), *P. chopini*, *P. denticulatus*, *P. oloughlini* and *Pseudotanaïs* sp. C (with spine and seta); only *P. chaplini* and *P. georgesandae* have a spine, but the acuminate mandible molar in *P. chaplini*, and bifurcated teeth of *P. georgesandae*, separate them from *P. locueloae*, with a simple coronal molar (without additional denticles).

Highlights from manuscript “Secrets from the deep: Pseudotanaidae (Crustacea: Tanaidacea) diversity from the Kuril–Kamchatka Trench”

- Our results uncovered the presence of an undescribed species of *Mystriocentrus* (*M. hollandae*), the first reported from Pacific waters, and five new species of *Pseudotanaïs* (*P. chanelae*, *P. monroeeae*, *P. curieae*, *P. szymborskae* and *P. locueloae*).
- The diversity and distribution of Pseudotanaidae species from the Kuril–Kamchatka Trench and adjacent abyssal plain is revised, and an updated identification key for NW Pacific pseudotanaids is provided.
- The number of specimens collected was highest in shallower stations, but four taxa were found across the whole bathymetric range studied (4800–5500 m), supporting previous observations of high Pseudotanaidae diversity in abyssal waters.