Ampharetidae (Polychaeta) of the Far Eastern Seas

I.A. Jirkov

Department of General ecology and hydrobiology, Moscow Lomonosov State University, Moscow 119234 Russia.
Igor Jirkov: e-mail: ampharete@yandex.ru http:// orcid.org/0000-0003-1110-4027

ABSTRACT: The number of Ampharetidae species recorded in Russia's Far Eastern seas is growing rapidly: 24 in 1955, 33 in 2013, and 79 in 2026. A new user-friendly key has been compiled for most genera of world fauna, and new user-friendly keys for all species of Ampharetidae from the Far Eastern seas identified to species are proposed. A new species, *Amythas temerevae* sp.n., is described.
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KEY WORDS: identification key, Polychaeta, new species, *Amythas*, generic synonymy.

Дальневосточные Ampharetidae (Polychaeta)

И.А. Жирков

Кафедра общей экологии и гидробиологии, Биологический факультет Московского государственного университета им. М.В. Ломоносова, Ленинские горы 1, строение 12, Москва 119234 Россия.
E-mail: ampharete@yandex.ru

РЕЗЮМЕ: Число видов Ampharetidae, отмеченных в дальневосточных морях России быстро растёт: 24 в 1955, 33 в 2013 и 79 в 2026. Составлен новый удобный ключ для большинства родов мировой фауны и для всех видов Ampharetidae из дальневосточных морей, определённых до вида. Описан новый вид *Amythas temerevae* sp.n..
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KEY WORDS: определительный ключ, Polychaeta, новый вид, *Amythas*, синонимия родов.

Introduction

The keys cover the Far Eastern seas. The full list of species is given in the Appendix.

Ampharetidae are bristle worms of small to medium size. The largest species are less than 10 cm in length, but most species are 2–3 cm in length. Ampharetidae is a group of marine annelids that inhabit the World Ocean from the tropics to the Arctic and Antarctic, from the intertidal zone to a depth of 8,292 m (according to our data). Such a wide distribution is not unique among annelids. But at the same time, Ampharetidae is one of few families of polychaetes that includes truly freshwater species that can not only live in fresh water, but also go through their entire life cycle in it, achieving high biomass and numbers per unit area up to several tens of thousands of individuals per square meter in both sea and fresh water. They feed mainly on bottom sediments, sometimes filter water. All Ampharetidae build tubes, that sometimes species-specific, but usually not.

According to Uschakov's (1955) monograph 24 ampharetid species inhabit Far Eastern seas of Russia. The latest summary (Buzhinskaya, 2013), listed 685 species of polychaetes, Ampharetidae fauna comprises 33 (5%). Alalykina (2015, 2018) doubled this number by mainly deep-water species often listed as sp. Alalykina, Polyakova (2020) described three new deep water species of *Anobothrus* and I described

four more species (Jirkov, 2016, 2019, 2023a,b). So currently 79 species are known in the area, but a significant increase in numbers are still expected and not only due to the deep-sea fauna: the species described here is upper sublittoral. Therefore, the proposed key is two-stages: first, a key to the genera is provided, including, where possible, genera not found in the waters under consideration, but whose presence in the region is possible. Because, after the discovery of a new species off Sakhalin, belonging to a genus previously known only from the waters of Antarctic and Argentina, the only unlikely occurrence seems of fresh and brackish-water species of the genera *Hypania* and *Hypaniola*, but their presence in estuarine and freshwater environments also is possible, as a result of an invasion. Only in the second stage can species be identified in separate keys for genera with several species have been found in the region. And even then, in most genera, not all species can be identified. This is because species other than those already found in the region were noted but not identified to species level, and because some species groups undoubtedly require revision (for example, the *Ampharete* superspecies *lindstroemi*). A two-step key (first a key for identifying genera, then species) is less convenient than a key for identifying species directly. A two-step key requires using taxonomic characters, essentially following the taxonomy. A single-step key, on the other hand, allows to use key characters directly, making the key much more friendly. I understand that the identification key is not a summary of phylogeny, but in such a poorly studied fauna, in my opinion, one has to sacrifice convenience in order to ensure the possibility of identifying still unknown species, at least down to the genus level.

Material and methods

Photographs were produced at our department (DGEH), the P.P. Shirshov Institute of Oceanology, at the Russian Academy of Science, Moscow (IO RAN), using a Leica DFC490 camera mounted on either a Leica M165C stereomicroscope or a TOUPCAM U31S PM camera mounted on a Carlton SPZT50 stereomicroscope, and at the Department of Invertebrate Zoology MSU using a Leica DFC425C camera mounted on a Leica DMI 5000B compound microscope at the MNCN. In order to increase contrast, specimens were stained with methylene blue (water solution) then photos were processed in Corel Photopaint and CorelDRAW. For scanning electron microscopy (SEM), specimens stored in 70–75% ethanol were placed in 100% ethanol, transferred to100% acetone then critical point dried, using CO_2 as a transition fluid. Once dry, the specimens were mounted on aluminum or titanium stubs and sputter coated with gold. SEM micrographs were taken with a Camscan S-2 Cambridge instrument Scanning Electron Microscope and Quatro S Thermoscientific at the M.V. Lomonosov User Facilities Center, Moscow State University.

Specimens, used in photos in keys are from collections of DHEG, Zoologiczl museum of MSU (ZMUM), IO RAN, and Zoological Institute of Russian Academy of Science, St-Petersburg (ZIN).

Abbreviations

AU — abdominal unciniger;
C — chaetiger;
S — segment;
TC — thoracic chaetiger;
TU — thoracic unciniger.

Abbreviation with number means this very segment, i.e. S2 means the second segment. Numbers in brackets referring to ranges.

External morphology (Fig. 1)

The body of Ampharetidae subdivided into thorax and abdomen. In Terebellomorpha the most commonly accepted definition of thoracic segments is any segments with notochaetae. Probably so Reuscher *et al.* (2009) suggest counting thoracic chaetigers including the paleal chaetiger. However, some species have one or two achetous segment next to the paleal segment, so it is not possible to count them as chaetigers or even as thoracic segments. In my opinion, the paleal segment and segments with notochaetae need to be counted separately in order to avoid confusion. Herein paleae are considered notochaetae situated in the S2, irrespective of size. Prostomium is not included in the numbering of segments due to its completely different origin. The abdomen is the posterior part of the body that has no notopodial with chaetae (rudimental notopodia without chaetae can be present).

Most likely, the uncini of Ampharetidae start on the same segment throughout the family. Some authors argue that the paleae are located in the S2 and uncini start in the S6 (Orrhage, 2001; Reuscher *et al.*, 2009), while others suggest S3 and S7, respectively (Malmgren, 1867; Fauvel, 1927). However, for distinguishing between genera, is the correct number TU1=S6 or S7 does not matter.

Explanation of terms, used in keys (Fig. 1).

Abdomen — posterior segments with neuropodia, but without notopodia with chaetae

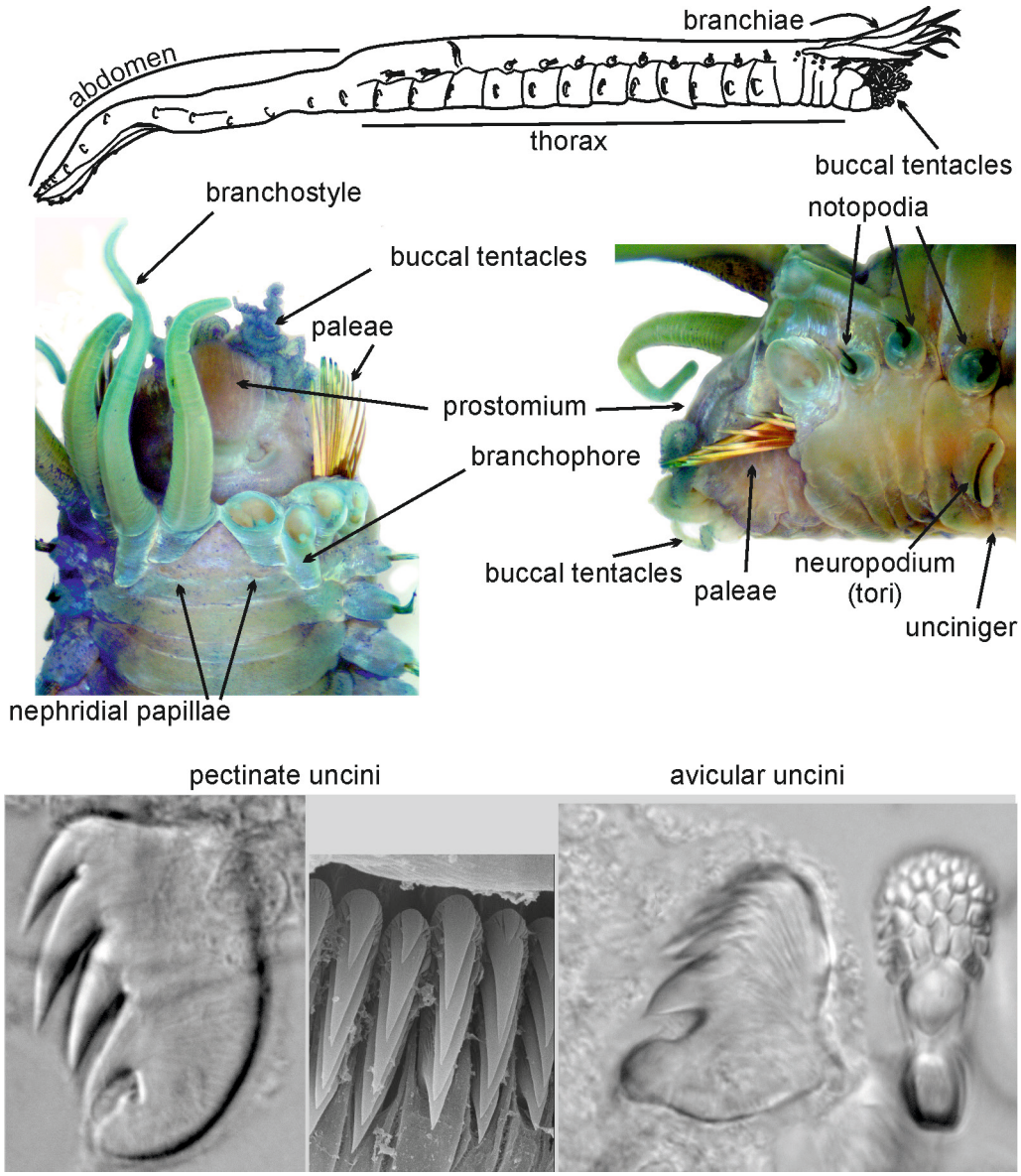


Fig. 1. External morphology of Ampharetidae.

(notopodia without chaetae may be present, usually as rudiments like tubercule).

Avicular uncini — a flattened uncini with large rostrum (also called a beak or a fang) surmounted by one or more rows of secondary teeth.

Branchiae — notopodial cirri of anterior segments, they can have different shape.

Branchophore and ***branchostyle*** — as branchiae of Ampharetidae are obviously kind of dorsal cirri these terms are used for basal and distal joint of branchiae analogical to cirrophore and cirrostyle.

Buccal tentacles — tentacles attached in or near mouth.

Nephridial papilla — a papilla with the external opening of one of the excretory organs (usually invisible).

Nuchal organs — used in relation to paired sense organs in the form of more or less transversely oriented slit-like openings, pits, or ridges in the middle prostomium.

Paleae (single — palea) — a simple, often

enlarged, usually forward-pointing chaetae of the first chaetiger. Paleae are homologous to notochaetae but unlike notochaetae, the surface of the paleae is smooth (this difference is only visible under SEM).

Pectinate uncini — a small flattened chaetae (in terebellomorphs always neurochaetae) with a short shaft and one or more vertical rows of large teeth giving it a comb-like appearance.

Pinnuli — neuropodia with uncini are located on the very edge.

Prostomium — the first segment, located above the mouth.

Thorax — anterior segments with notopodia with notochaetae, excluding segment with paleae.

Tori — neuropodia with uncini located in the slits slightly at a small distance from the edge.

Uncini (single — uncinus) — neuropodial chaetae that looks like plates with teeth.

Unciniger — segment with neuropoida with uncini.

Identification (how to use keys)

All characters mentioned in the first sentence of key steps are obligate. Characters mentioned in the second sentence (if present) are not obligate but often can help in identification. To shorten and simplify the keys, not all steps have only two alternatives, so take care. It is strongly recommended to identify several specimens together rather than a single individual. Use of methylene blue makes morphological characters much more visible. The concentration of the solution is not essential. To stain the worm, simply dip it in methylene blue, rinse it in water, and examine it under a stereomicroscope. In alcohol, methylene blue completely dissolves, and after a few days, no staining remains on the specimens examined. Methylene blue is completely harmless to the humans and is widely used in medicine, including in the selection of suitable sperm for subsequent fertilization of human eggs. I was told of a case where a person accidentally drank 0.5 liters of methylene blue solution without any consequences.

The most important characters for different families of Polychaeta differ considerably. During identification of Ampharetidae it is necessary to count segments with different types of parapodia. For most characters mentioned in the key it is not necessary to prepare slides and use a compound microscope. Some additional remarks for identification are given in appropriate places in the keys.

Given upper/left figures refer to the first part of step, lower/right refer to second one. If only one figure present it refers to the first part of step. In all the figures in the keys the head is facing up or to the right.

No one key is complete and perfect, the genera *Ampharete*, *Amphicteis*, and *Melinna* especially require revision. So, if you have any difficulties or troubles, do not hesitate to contact me by e-mail or by any other means.

Taxonomy

Generic definition and the number of genera is a matter for discussion that has already been raised earlier (Day, 1964; Jirkov, 2001, 2011, 2018a,b, 2023a,b; Reucher *et al.*, 2009).

Ampharetinae: 87 nominal genera have been described.

Given below key to genera includes the 24 genera of Ampharetinae that are valid to my mind. Other 49 are not valid (some with some doubt), of this synonymy in 42 cases is proposed by me.

The species *Tanseimaruana* Imajima, Reuscher et Fiege, 2013 was erected into a separate genus for two species: the type species *Amphicteis vestis* Hartman, 1965 and *T. boninensis* Imajima, Reuscher et Fiege, 2013. According to the original description: "Prostomium without notches or glandular ridges, with occipital slits" (p. 158). But at the same time, the authors, having studied the holotype of *A. vestis*, designated it as the type species of their new genus. However, Hartman (1965: 215) describes the prostomium of *A. vestis* as "weakly trilobed". The studied worms, initially identified as *Tanseimaruana vestis* (Alalykina, 2018), were collected not too far from the type locality of *T. boninensis* (27°18′N, 142°44′E, 2840–2855 m). Their prostomium had nuchal slits (Fig. 2A, E), creating the impression of a trilobed prostomium, however, this is quite different from the actual trilobed prostomium of *Ampharete*, which has a U-shaped groove (Fig. 2G). The prostomium of investigated specimens *Ymerana pteropoda* Holthe, 1986 (Fig. 2 I–K) has a similar structure. All three species have avicular uncini of the thorax and abdomen, which is unusual for Ampharetidae. In *T. boninensis* and *Y. pteropoda*, the thoracic neuropodia are tori and the abdominal neuropods are pinnulae. All three species have 17 TCs. In this case, there are no characters distinguishing *Tanseimaruana* from *Ymerana*, and *Tanseimaruana* should be accepted as a junior synonym of *Ymerana*. Pacific worms identified by Alalykina as *T. vestis* pending a reex-

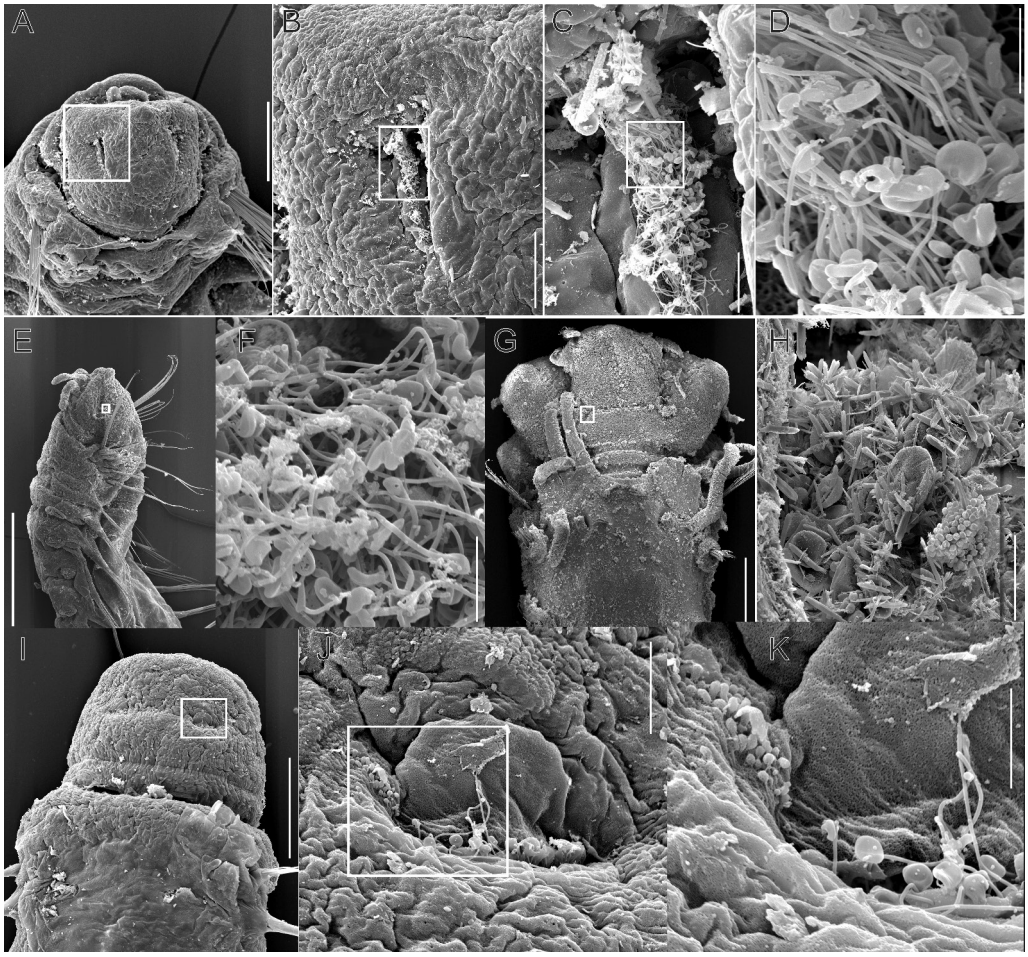


Fig. 2. Nuchal organs of different Ampharetinae.
A — *Ymerana boninensis* prostomium dorsally; B — detail of A; C — detail of B; D — detail of C; E — *Ymerana boninensis* anterior end laterally; F — detail of E; G — *Ampharete borealis* anterior end, dorsally; H — detail of G; I — *Ymerana pteropoda* prostomium dorsally, J — detail of I, K — detail of J. A–F — Sokhobio 2015, st. 7-4 EBS 22/07/2015 46°57.47′N 151°05′E 3300 m, G, H — "Maslov" 10.24 (68°45′N 50°00′E 48 m); I–K — SP-41_39B North Polar Basin, 85°32.486′N 133°39.229′E 4286 m. Scales: A — 0.2 mm, B — 50 μm, C — 10 μm, D — 3 μm, E —0.4 mm, F — 3 μm, G — 0.5 mm, H — 30 μm, I — 0.1 mm, J — 10 μm, K — 5 μm.

amination of the type material of *A. vestis* may be more cautiously identify as *Ymerana boninensis*. Nuchal organs in the form of slits or pits are present in many ampharetids. Similar organs are also present in *Ampharete*, located in the groove dividing the lobes of the prostomium (Fig. 2G, H). These organs contain cilia, often with discs at the apex. The presence of these discs clearly indicates that this is not a contamination. This also confirms the similarity in the structure of the nuchal organs in taxonomically distant genera (Fig. 2D, F, H). However, the amount of discs varies, they are almost absent in *Neosabellides uschakovi* (Jirkov, 2018b, Fig. 2C).

Also Imajima *et al*. (2013: 158) wrote: "a notopodial origin of the dermal fold or lobes [of AU1] seems unlikely. They rather seem to be dermal protrusions from a transverse dermal fold across the dorsum". However, there is no much differences in rudimental notopoida of AU1 of *Ymerana* and *Jugamphicteis* and modified notopodia of *Sosane* (besides presence/absence of notochaetae), so to my mind there is no reason to consider them as something other than modified rudimental notopodia. Enlarged rudimental notopodia of anterior AU, although not so modified, are also characteristic for some *Ampharete* (see below in the keys).

The description of *Rytocephalus* Quatrefages, 1866 is so incomplete that it is even impossible to understand to which family it belongs. Also, I have not seen specimens of 13 more genera while their description is not clear for me, these monotypic genera are known mainly from original descriptions and have not been reported from Far Eastern seas, so they are not included in the generic key.

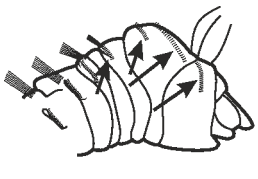
As to *Uschakovius* Laubier, 1973 it is undoubtfully Chaetopteridae (Jirkov, 2001: 429).

Melinninae: 11 nominal genera have been described. *Melinna*, *Isolda*, *Irana*, and *Moyanus* with highly probable are synonyms. However, if these four genera are combined into one, *Melinna* will become a junior synonym of the much lesser-known genus *Isolda*, which will require not only changing the usual names of a large number of species, but also changing the name of the subfamily Melinninae. Since I have not seen a single species of the genus *Isolda*, my opinion about the synonymy of these genera may be erroneous. Therefore, until additional data are obtained, I believe it is better to consider these genera valid, with the exception of *Moyanus*, which, however, due to the presence of hooks and a dorsal fold, I consider a synonym of *Melinna*, and not *Melinnopsis*, as indicated in WORMs (Read, Fauchald, 2026), following the opinion of Hartman (1960).

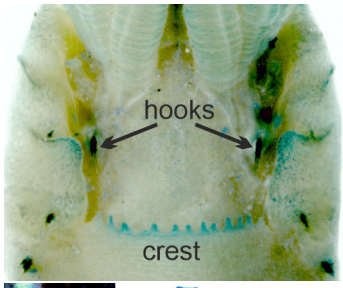
So, in fact, the generic key allows the identification of almost all genera of the family, with the exception of listed in Appendix.

Key to genera

Genera not yet recorded in the Far Eastern seas are marked *. If several species are already recorded from the Far Eastern seas, then the genus name is followed by a reference. If only one species is recorded from the Far Eastern seas, then its epithet is given after the genus name.




1. Three or four anterior segments with vertical rows of minute acicular chaetae (arrowed) .... **Melinninae**…2
— Minute acicular chaetae absent..... ..... **Ampharetinae**…3

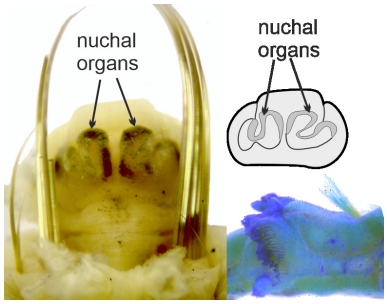


2. Hooks (usually one pair) and dorsal crest (usually one and dentate) behind the branchiae present, prostomium trilobed, without nuchal organs ..... ***Melinna***…see key for species

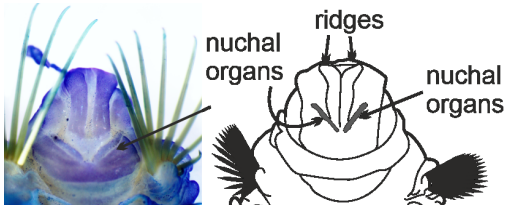
— Dorsal crest present, hooks absent; prostomium unilobed, without nuchal organs ..... ****Melinnides***

— Dorsal crest and hooks absent; prostomium unilobed, with pair of transversal nuchal organs ..... ***Melinnopsis annenkovae***

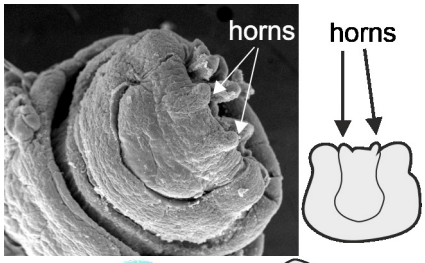
3. Ventral glandular shields of anterior thoracic segments (well stained by methylene blue) like squares, occupied only the middle of the ventral side.. ..... ***Noanelia***
— Ventral glandular shields of anterior thoracic segments like stripes running between neuropodia..... 4



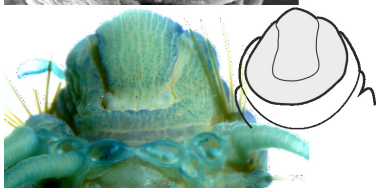
4. Prostomium with transversal nuchal organs, semicircular, undulating or more complicate, not straight; middle lobe anteriorly rounded, without any trace of longitudinal ridges. AU1 always with foliaceous rudimental notopodia, rudimental notopodia of subsequent AU segments small ..... ****Jugamphicteis***



— Prostomium with transversal nuchal organs like straight or slightly curved ridges; middle lobe anteriorly incised, usually with pair of longitudinal ridges. AU1 rudimental notopodia small, similar to notopodia of subsequent AU, not foliaceous.....
.....***Amphicteis***…see key for species

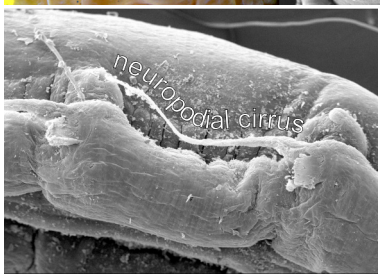


—Prostomium trilobed, middle lobe anteriorly incised or with horns, sometimes with pair of longitudinal ridges; nuchal organs absent. AU1 rudimental notopodia, if present, similar to notopodia of subsequent AU, not foliaceous..... 5

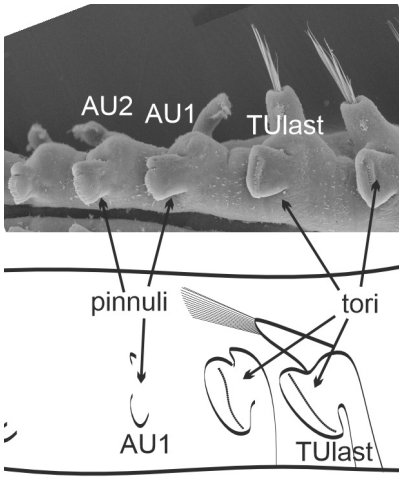


— Prostomium trilobed, middle lobe anteriorly rounded or pointed, without nuchal organs and ridges. AU1 rudimental notopodia, if present, usually not foliaceous, similar to notopodia of subsequent AU
..... 8

— Prostomium without lobes and ridges, transversal nuchal organs present or absent. Rudimental notopodia of AU1, if present, usually similar to notopodia of subsequent AU..... 16

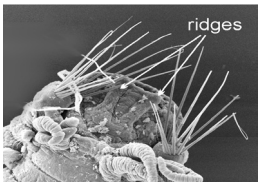


5. Abdominal neuropodia with very long cirri, longer than width of segment .....***Samythopsis grubei***
—Abdominal neuropodial cirri, if present much shorter than width of segment 6

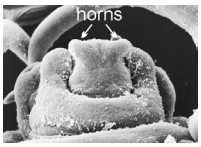


6. Thoracic neuropodia tori, abdominal neuropodia pinnuli; thoracic uncini pectinate 7

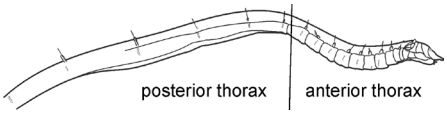
— Thoracic and AU1 neuropodia tori, starting from AU2 neuropodia pinnuli; thoracic uncini avicular.....
.....***Grubianella antarctica***



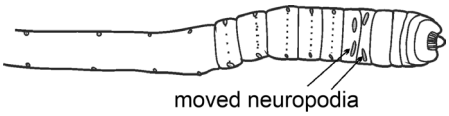
7. Middle lobe of prostomium with a pair of longitudinal ridges. 14 TU; fresh and brackish water species ..... ***Hypania***



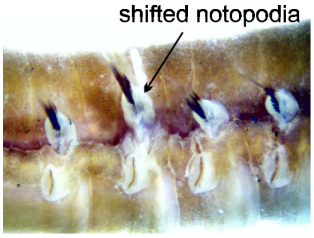
— Middle lobe of prostomium without a pair of longitudinal ridges. 11–12 TU; marine species ..... ***Amage***…see key for species



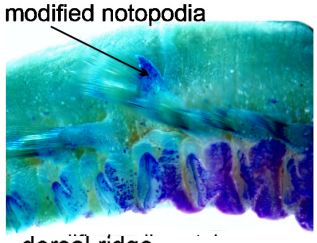
8. Thorax sharply subdivided into two regions: (1) anterior 9–10 TC short with entirely glandular ventrum, (2) last 5 TU very long, glandular pads not developed 9
— The shape of the thoracic segments, if it changes, then smoothly; glandular pads reduce more or less gradually 10



9. Neuropodia of TU2 or/and TU1 enlarged and moved ventrally ..... ***Auchenoplax***
— Anterior neuropodia not enlarged and not moved ventrally ..... ***Eclysippe*** sp.

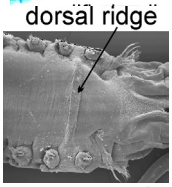


10. One, usually 5th (4th–6th) from last, pair of posterior notopodia slightly shifted dorsally and connected by low transversal ridge (ridge sometimes visible only after staining), but otherwise similar to other. ..... ***Anobothrus***…see key for species

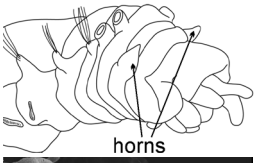


— One pair of posterior notopodia (last, 2nd or 3rd from last) flattened and shifted dorsally ..... ***Sosane holthei***

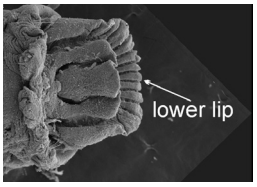
— Posterior notopodia neither flattened, nor shifted dorsally, ridges also absent 11



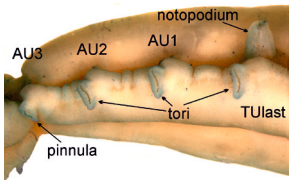
11. Distinct transversal dorsal ridge between TC3 and TC4 present (do not mix with segmentation!) ..... ***Melinnampharete eoa***
— Dorsal ridge absent 12



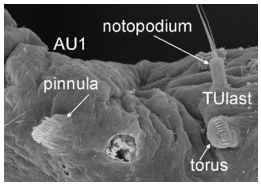
12. 1st segment with ‘horns’ ..... ***Abderos***
— 1st segment without ‘horns’ 13



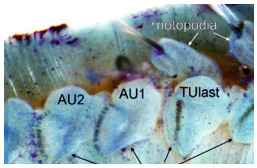
13. Lower lip enlarged, longitudinally grooved ..... ***Lysippe***…see key for species
— Lower lip not enlarged 14



14. Thoracic and first two abdominal neuropodia tori, starting from AU3 neuropodia pinnuli; there is a pair of nephridial papillae middorsally behind branchiae. Sea water species 15

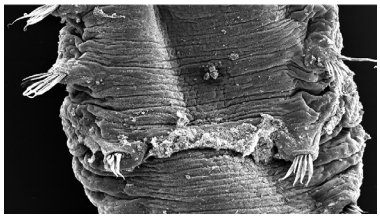


— Thoracic neuropodia tori, all abdominal ones pinnuli; nephridial papillae middorsally behind branchiae absent. Fresh and brackish water species . ..... ***Hypaniola***



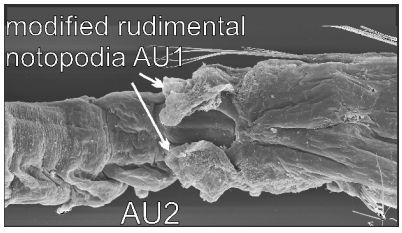
— The differences between the neuropodia of the thoracic and abdominal regions are not so sharp. Sea water species..... ***Amythas temerevae***

15. Numerous jaws present (not visible without dissection) ..... ***Gnathampharete***
— Jaws absent..... ***Ampharete***…see key for species



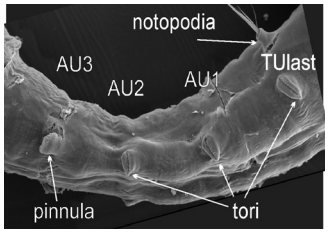
16. 2nd from last notopodia slightly shifted dorsally and connected by low ridge ..... ***Zatsepinia***
— Dorsally shifted notopodia and dorsal transverse ridges absent..... 17

17. 11–12 TU 18
— 14–17 TU ..... ***Amphisamytha***

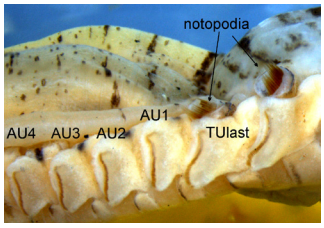


18. AU1 with foliaceous rudimental notopodia .. ***Ymerana sp.***

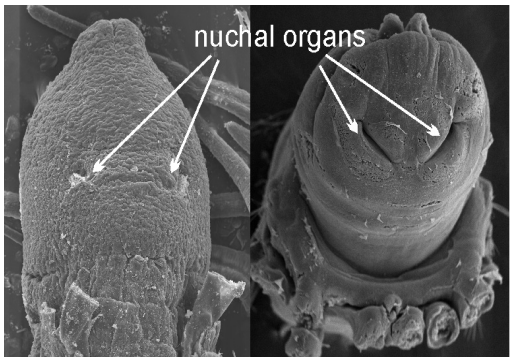
— Foliaceous rudimental notopodia absent..... 19



19. Thoracic and first two abdominal neuropodia tori, the rest abdominal
— pinnuli..... 20

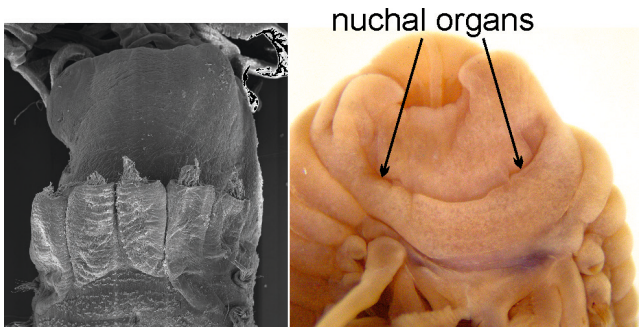


— The shape of the neuropodia is the same in all thoracic and abdominal segments and does not change near the thorax–abdomen junction. 21



20. Nuchal organs as small holes (usually invisible under stereomicroscope); tube annulated .... ***Glyphanostomum pallescens***

— Nuchal organs as slits (visible under stereomicroscope); tube not annulated..... .....***Neosabellides uschakovi***



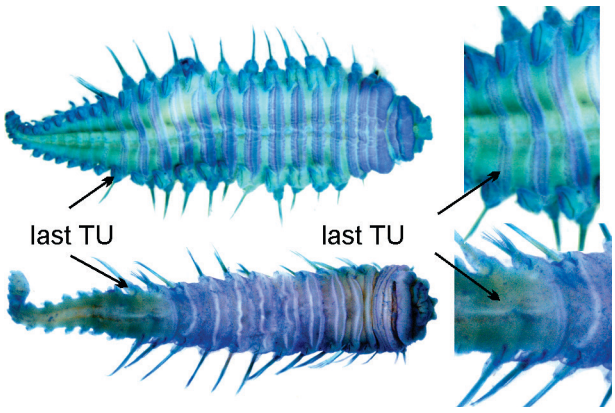
21. Prostomium without nuchal organs .....***Samythella elongata***

— Prostomium with nuchal organs as slits ..... ***Phyllocomus sovjeticus***

Identification key for species of *Amage*

DIAGNOSIS. Middle lobe of prostomium anteriorly incised or with horns, without longitudinal ridges. Nephridial papillae behind and ventrally few anterior notopodia, absent mid-dorsally posterior to branchiae, usually hardly visible. Modified notoand neuropoida absent. Neuropodia of two types: all thoracic tori, all abdominal pinnuli. Uncini pectinate and similar throughout the body, without a sharp change when changing the type of neuropodial structure.

1. 11 TU 2
— 12 TU .....***Amage levensteinae***
— 14 TU .....***Amage scutata***
2. 11–12 AU 3
— 13–15 AU.....***Amage anops***



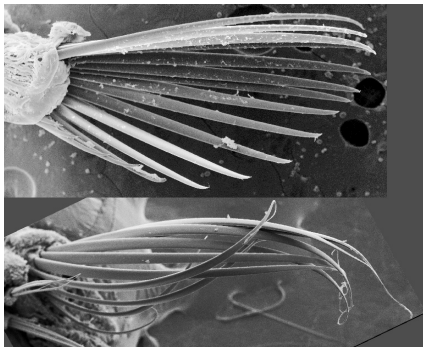
3. Ventral shields present on all TCs. Usually 12 AU ..... ***Amage asiaticus***

— The last TU do not have methylene blue-stained bands between the neuropodia. Ususally 11 AU..... ..... ***Amage ceshici***

REMARK. Two other *Amage* further not identified species have been reported by Alalykina (2015) without any additional data. Species from Far Eastern region recently described by Jirkov (2023).

Identification key for species of *Ampharete*

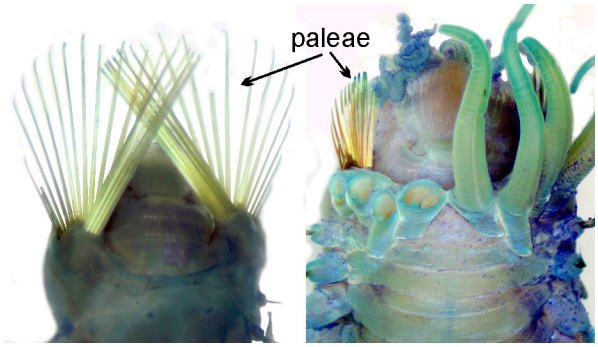
DIAGNOSIS. Prostomium trilobed, middle lobe anteriorly rounded. A pair of nephridial papillae mid-dorsally posterior to branchiae, usually easily visible. Neuropodia of two types, all thoracic and AU1 and AU2 tori, remaining abdominal neuropodia pinnuli. Uncini pectinate, i.e. with series of equal teeth arranged like a comb (Fig. 1), in general, uncini are similar throughout the body, without a sharp change when changing the type of neuropodial type. Modified noto- and neuropodia absent.



1. Paleal chaetae several times thicker than the most developed notochaetae, sharply pointed into a short filiform tip (may break off). Usually 13 AU .... ***A.*** (superspecies ***finmarchica***)…2

– Paleal chaetae thicker the most developed notochaetae, more or less gradually taper into a long filiform tip. The number of AU varies, but is never equal to 13 6

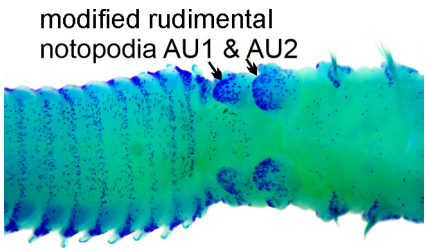
– Paleal chaetae, if present, smaller and thinner the most developed notochaetae, not numerous (usually less than 10). The number of AU varies, but is never equal to 13 7



2. Paleal chaetae significantly exceed body width, protrude far beyond anterior margin of prostomium .... ***A. longipaleolata***

– Paleal chaetae are less than or equal to the body width, if they protrude beyond the anterior edge of the prostomium, then not significantly 3

3. Less than 20 paleal chaetae 4
– 20–30 paleal chaetae (Figs 7, 9) ..... ***A. eupalea***
– More than 40 paleal chaetae ..... ***A. britayevi***
4. 13 AU 5
– 16–18 AU ..... ***A. goesi***
5. Tube inlay is covered by muddy-detritus, limbation of notochaetae narrow and equal ..... ***A. finmarchica***
– Tube inlay is covered by exclusively fragments of bryozoans, shells, sea urchin spines, mica, etc., without trace of mud and detritus, limbation of at least some notochaetae wide and unequal..... ***A. kudenovi***



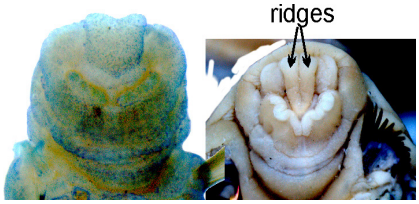
6. Rudimental notopoda of AU1 and AU2 enlarged, 24–28 AU ..... ***A. vega***
– Rudimental notopoda of AU1 and AU2 are the same size as the following, 12 AU ..... ***A.*** (superspecies ***lindstroemi***)

Group includes besides ***A. lindstroemi*** also ***A. acutifrons, A. brevibranchiata, A. crassiseta, A. reducta*** and unknown number of dsribed, but not found yet in region as well as undescribed species. Some of already described species are poor described. Species of the group badly needs in revision and cannot be correctly identified to species level at the present time.

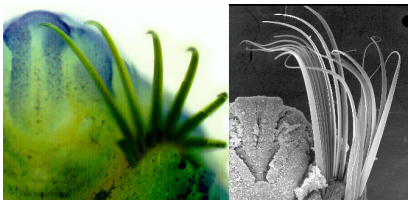
7. 11 TU. Paleal chaetae smaller and thinner the most developed notochaetae..... ***A. borealis***
— 12 TU. Paleal chaetae absent or present 8
8. 12 AU. Paleae absent ..... ***A. litoralis***
— 14 AU. Paleae absent or present ..... ***A. saphronovae***
— More than 20 AU. Paleae absent..... ***A. orientalis, A. sibirica***

Identification key for species of *Amphicteis*

DIAGNOSIS. Prostomium with prominent transverse nuchal ridges, and usually with more or less developed longitudinal ridges. Neuropodia of two types: thoracic tori and abdominal pinnules; no abdominal segments with tori. Thoracic and abdominal uncini generally similar, with one row of teeth; heel at center of uncinus. Uncini pectinate, i.e. with series of equal teeth arranged like a comb (Fig. 1), in general, uncini are similar throughout the body, without a sharp change when changing the type of neuropodial type. Modified noto- and neuropodia absent.



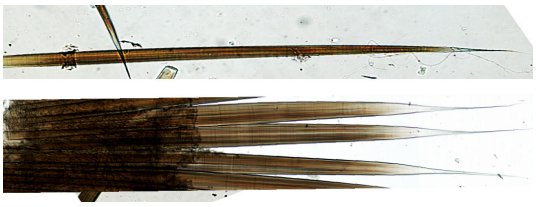
1. Longitudinal ridges almost absent... ***A.*** cf. ***wesenbergae***
— Longitudinal ridges well developed 2



2. Paleal chaetae stout and abruptly tapered to very short filiform tips (usually missing) ..... ***A. mederi***

— Paleael chaetae stout and gradually tapering to long filiform tips (rarely missing)..... 3

3. 15 AU 4
— 18–20 AU ..... ***A. sundevalli***
4. All branchiae cirriform..... ***A. japonica***
— At least one pair of branchiae is leaf-shaped and expanded 5



5. Paleal chaetae very gradually taper into a long filiform tip; two pairs of gills are leaf-shaped, the rest are cirriform ..... ***A. bifolium***

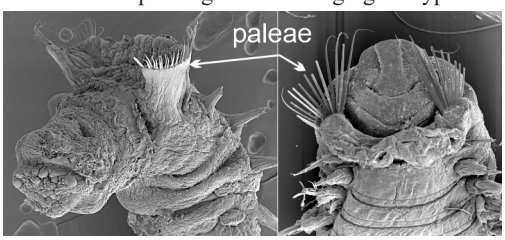
— Paleal chaetae gradually but quickly tapering terminally to comparatively long filiform tips (rarely missing); one pair of gills (innermost anterior) is leaf-shaped, the others are cirriform 6

6. 7–17 paleal chaetae..... ***A. scaphobranchiata***
— More than 20 paleal chaetae ..... ***A. nikiti***

REMARK. Three other *Amphicteis* species further not identified have been reported by Alalykina (2015, 2018) without any additional data.

Identification key for species of *Anobothrus*

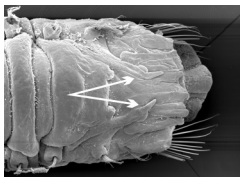
DIAGNOSIS. Prostomium *Ampharete*-type. One pair of notopodia in posterior thorax (usually TU8 or TC5 of the latter) slightly elevated, connected by a low ciliated band (sometimes visible only after staining), their notochaetae usually do not differ from other notochaetae. Circular band in anterior thorax, anterior to notopodia of TU3 or more rarely TU2 or TU1. A pair of large nephridial papillae situated behind branchiae. Neuropodia of two types: thoracic tori and abdominal pinnules; no abdominal segments with tori. Thoracic and abdominal uncini generally similar, with one row of teeth; heel at center of uncinus. Uncini pectinate, i.e. with series of equal teeth arranged like a comb (Fig. 1), in general, uncini are similar throughout the body, without a sharp change when changing the type of neuropodial type. Modified noto- and neuropodia absent.



1. Paleae huge, originating from high epidermal fold resembling ear..... ***A. auriculatus***

— Paleae well developed, however they are not high epidermal fold resembling ear 2

— Paleae absent..... 5



2. Four pair of branhciae, three equal and forth greatly reduced, much smaller others (arrowed) ..... ***A. patersoni***
— Three pair of similar branchiae..... 3
— Four pair of branchiae, inner pairs may be smaller and slimmer, however, the differences do not exceed two times..... 4

3. Circular glandular band before neuropodia of TU2..... ***A. sonne***
— Circular glandular band before neuropodia of TU3..... ***A. jirkovi***
4. 12 AU..... ***A. mironovi***
— 13 AU ..... ***A. gracilis***
5. Lower lip crenulated ..... ***A. fimbriatus***
— Lower lip not crenulated ..... ***A. apaleatus***

Identification key for species of *Lysippe*

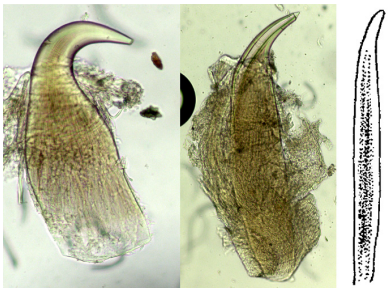
DIAGNOSIS. Prostomium Ampharete-type; middle lobe anteriorly rounded. Lower lip enlarged, longitudinally grooved. Neuropodia of two types: 14 uncinigers with neuropodia tori, other neuropodia pinnula, their uncini generally similar. Modified noto- and neuropodia absent.

The species of the genus are easily identified by the number of pairs of branchiae, TU and AU using the table below.

species	pairs of branchiae	TU	AU
L. gurjanovae	3	14	19
L. labiata	4	13	14
L. nikiti	3	14	10
L. sexcirrata	3	14	13

Identification key for species of *Melinna*

Three or four anterior segments with vertical rows of minute acicular chaetae. There are hooks (usually one pair) and dorsal crest (usually one and dentate) behind the branchiae.



— Dorsal hooks strogly curved ..... ***M. elisabethae***

— Dorsal hooks slightly curved..... ***M. cristata***

— Dorsal hooks almost straight..... ***M. ochotica***

REMARK. One other *Melinna* species further not identified has been reported by Alalykina (2015) without any additional data.

Amythas Benham, 1921 emended

DIAGNOSIS. Prostomium trilobed, middle lobe anteriorly broadly rounded; any additional structures (nuchal organs, ridges, horns etc.) absent. Enlarged and modified noto- and neuropodia absent. Buccal tentacles of two types: long, attached inside the mouth, above which are attached much more numerous (several tens at least) short tentacles, these two types of tentacles are separated by a lobe.

NOTE. The presence of two types of buccal tentacles has not previously been described for Ampharetidae; perhaps this character has not been adequately studied. In fact, in most species, the buccal tentacles were completely invisible, being retracted or lost. However, in *Amythas*, the short buccal tentacles located above the lobe are always visible, so it is safe to say that the other species I examined also lacked such tentacles. The upper row of short tentacles by its localization is very similar to those of Terebellidae, while the lower tentacles are quite typical for Ampharetidae; by this feature, the genus occupies an intermediate position between the two main families of the order, although its belonging to Ampharetidae is not in doubt.

Amythas temerevae sp.n. Figs 3–5.

MATERIAL: A single specimen collected nine years ago. Attempts to obtain additional material have been unsuccessful.

The holotype is in excellent condition, but there is only one, so only a few preparations of chaetae have been made.

Length 13 mm, width 3 mm. Oral tentacles smooth, of two types. Those attached inside the mouth are much longer, covered from above by a upper lip, above which numerous short tentacles are attached. Prostomium unlobed, without ridges and nuchal organs. Three pairs of branchiae with short cylindrical branchostylies. The places of attachment of the first two pairs form a transverse row, middorsally separated by a gap equal to the diameter of the branchophore, the place of attachment of the branchostyles of the third pair are located behind the attachment of the inner one, they are clearly connected with the notopodia of TC2 by a low ridge. Paleae absent. Their segment is not stained ventrally. 17 TC, the first pair of notopodia is the smallest, but fully formed. The second is larger, and, starting with the notopodia of TC3, the size of the notopodia is approximately the same. The distance between the notopodia increases from the first pair to the fourth and then remains approximately constant. Ventrally, TC3 and TC4 are fused into a single ridge, staining in methylene blue as thin, sharp transverse stripes separated by nonstaining bands. The ventral surfaces of subsequent segments up to and including TU8 are convex and stain completely, with an even

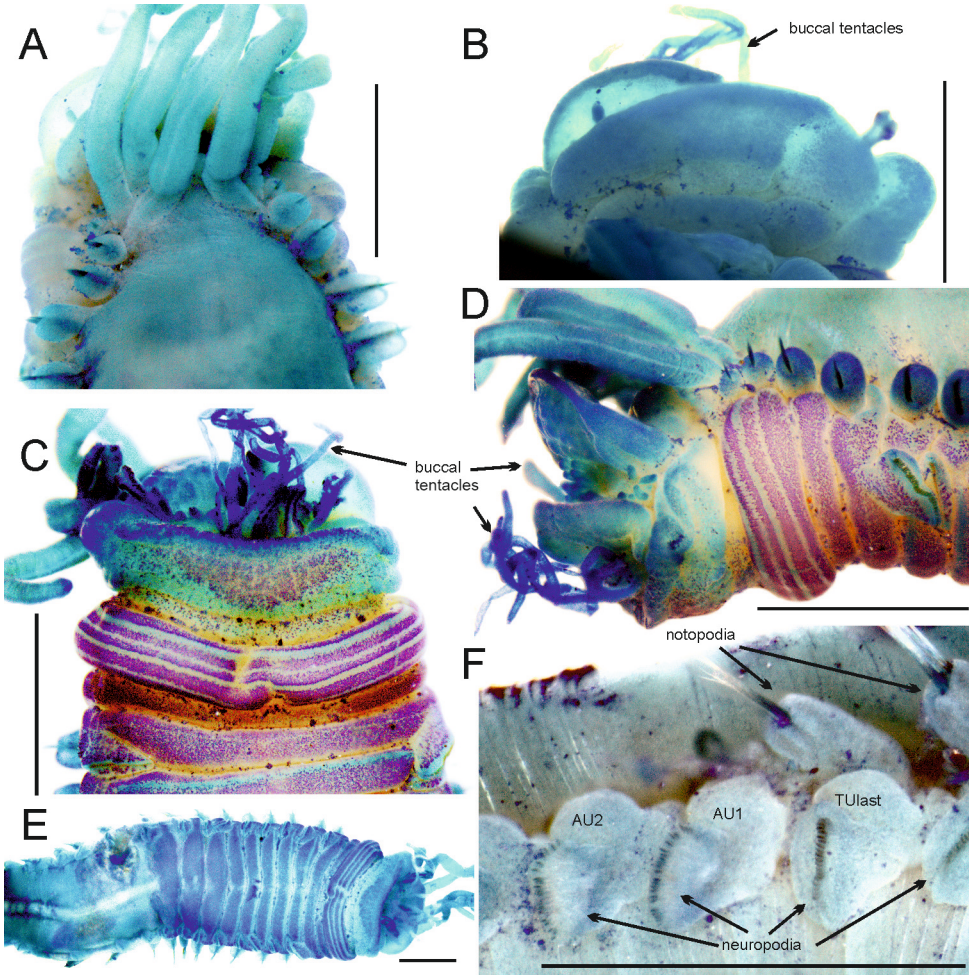


Fig. 3. ***Amythas temerevae*** sp.n. extermal morphology.
A — anterior part dorsally, B — prostomium, C — anterior part ventrally, D — anterior part laterally, E — thorax ventrally, F — thorax–abdomen junction. All scales 1 mm. Holotype.

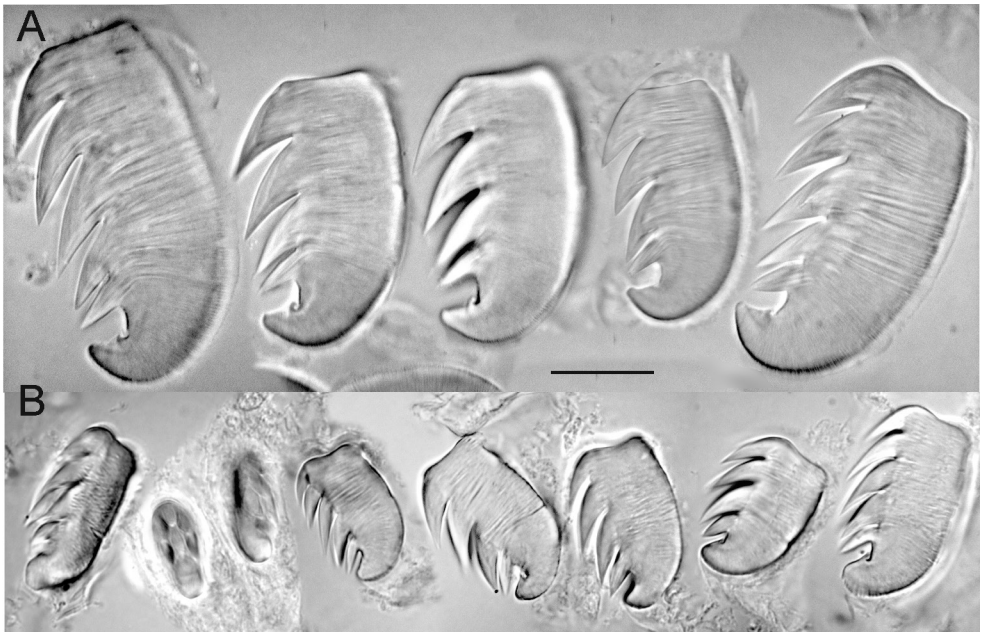


Fig. 4. ***Amythas temerevae*** sp.n uncini.
A — TU9, B — AU2. Scale 20 μm. Holotype.

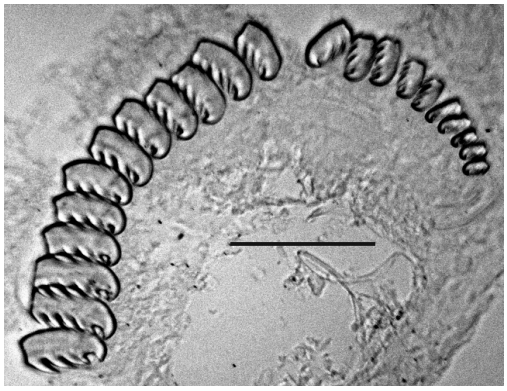


Fig. 5. ***Amythas temerevae*** sp.n. Variation of uncini size within single neuropodia. Scale 0.1 mm.

Fig. 6. Elena Nikolaevna Temereva.

more intensely staining narrow transverse stripe appearing anteriorly on each segment. The ventral surface of the last five segments is unstained; midventrally, a longitudinal stripe appears on them, located in a notch on the last two TUs that continues onto the abdomen. Modified notopodia and dorsal ridges are absent. Nephridial papillae are not visible. 14 TU, all neuropodia are tori, the first neuropodia are the largest, caudally the size of the neuropodia gradually decreases, and the neuropodia of the last TU are three times smaller than the first ones; modified neuropodia are absent. 20 AU, all neuropodia pinnuli, no rudimentary notopodia. Thoracic and abdominal uncini are similar, but the thoracic (Fig. 4A) are significantly larger than the abdominal (Fig. 4B). Uncini in a single neuropodia vary in size several times (Fig. 5), with large uncini having 5 teeth in a single row, and small ones having teeth in several rows, with 3–4 teeth in each row. Pygidium with two short lateral papillae. Tube unknown.

ETYMOLOGY. The species is named after beautiful Dr. Elena Temereva, well known invertebrate zooligist Professor, Dr.Sci., Professor RAS, Head of Departmant Evolutionary Biology, Biological faculty (Fig. 6).

TYPE LOCALITY: Sakhalin, Aniva bay, Prigorodnaya, 2017.

DIFFERENTIAL DIAGNOSIS. Two other species of the genus are known from waters off Antarctica and Argentina. All three species have 17 TC and 14 TU. But *A. septemdecima* (Schüller, Jirkov, 2013) has 4 pairs of branchiae. *A. membranifera* Benham, 1921 has 3 pairs of branchiaes separated by a wide gap, while the new species has almost no gap.

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Appendix

List of Ampharetidae species reported from the Far Eastern seas

Synonymy is limited to Uschakov (1955) only. Only valid binomen are numbered.

Ampharetinae

1. *Abderos* sp. according to Alalykina (2018)
2. *Amage anops* (Johnson, 1901)
3. *Amage asiaticus* Uschakov, 1955 = ?*Amage perfecta* Moore, 1923
4. *Amage ceshici* Jirkov, 2023
5. *Amage levensteinae* Jirkov, 2023
6. *Amage scutata* Moore, 1923
7. *Amage* sp. 1 according to Alalykina (2015)
8. *Amage* sp. 2 according to Alalykina (2015)
9. *Ampharete acutifrons* (Grube, 1860)

– *Ampharete arctica* Malmgren, 1865 see *Ampharete finmarchica*

– *Ampharete arctica* var. *gagarae* Uschakov, 1950 see *Anobothrus gracilis*

10. *Ampharete borealis* M. Sars, 1856
11. *Ampharete brevibranchiata* Treadwell, 1926
12. *Ampharete britayevi* Jirkov, 2023
13. *Ampharete crassiseta* Annenkova, 1929
14. *Ampharete finmarchica* Sars, 1865
15. *Ampharete goesi* (Malmgren, 1866)

– *Ampharete goesi brazhnikovi* Annenkova, 1929 see *Ampharete goesi*

16. *Ampharete kudenovi* Jirkov, 1994
17. *Ampharete lindstroemi* Malmgren, 1867
18. *Ampharete litoralis* (Annenkova, 1934)
19. *Ampharete longipaleolata* Uschakov, 1950
20. *Ampharete reducta* Chamberlin, 1920
21. *Ampharete saphronovae* Jirkov, 1994
22. *Ampharete sibirica* (Wirén, 1883) = *A. orientalis* Annenkova, 1929
23. *Ampharete* sp. according to Alalykina (2018)
24. *Ampharete* sp. 1 according to Alalykina (2015)
25. *Ampharete* sp. 2 according to Alalykina (2015)
26. *Ampharete* sp. 3 according to Alalykina (2015)
27. *Ampharete* sp. 4 according to Alalykina (2015)
28. *Ampharete vega* Wirén, 1883
29. *Amphicteis bifolium* Kucheruk, 1976
30. *Amphicteis* cf. *wesenbergae* Parapar, Helgason, Jirkov et Moreira, 2011 according to Alalykina (2018)

– *Amphicteis gunneri* var. *japonica* Mclntosh, 1885 see *Amphicteis japonica*

31. *Amphicteis japonica* McIntosh, 1886
32. *Amphicteis mederi* Annenkova, 1929
33. *Amphicteis scaphobranchiata* Moore, 1906
34. *Amphicteis* sp. 1 according to Alalykina (2015)
35. *Amphicteis* sp. 2 according to Alalykina (2015)
36. *Amphicteis* sp. n. according to Alalykina (2018)
37. *Amphicteis sundevalli* Malmgren, 1865
38. *Amythas temerevae* **sp.n.**
39. *Anobothrus apaleatus* Reuscher, Fiege et Wehe, 2009 according to Alalykina (2018)
40. *Anobothrus fimbriatus* Imajima, Reuscher et Fiege, 2013 according to Alalykina (2018)
41. *Anobothrus auriculatus* Alalykina et Polyakova, 2020
42. *Anobothrus gracilis* (Malmgren, 1865)
43. *Anobothrus jirkovi* Alalykina et Polyakova, 2020
44. *Anobothrus mironovi* Jirkov, 2009
45. *Anobothrus patersoni* Jirkov, 2008
46. *Anobothrus sonne* Alalykina et Polyakova, 2020

Asabellides sibirica Wirén, 1883 see *Ampharete sibirica*

Asabellides orientalis Annenkova, 1929 see *Ampharete sibirica*

47. *Eclysippe* sp. our unpublished data
48. *Glyphanostomum pallescens* (Théel, 1879)
49. *Glyphanostomum* sp. n.1 according to Alalykina (2018)
50. *Glyphanostomum* sp. n.2 according to Alalykina (2018)
51. *Grubianella antarctica* McIntosh, 1885
52. *Grubianella* sp. according to Alalykina (2015)
53. *Lysippe gurjanovae* (Uschakov, 1950)
54. *Lysippe labiata* Malmgren, 1865
55. *Lysippe nikiti* Jirkov, 2016
56. *Lysippe sexcirrata* (M. Sars, 1856)
57. *Lysippe* sp. 1 according to Alalykina (2015)
58. *Lysippe* sp. 2 according to Alalykina (2015)

59. *Lysippe* sp. 3 according to Alalykina (2015)
60. *Melinnampharete eoa* Annenkova, 1937
61. *Neosabellides uschakovi* Kuznetzov et Levenstein, 1988
62. *Noanelia* cf. *hartmanae* Desbruyères et Laubier, 1977 according to Alalykina (2018)
63. *Neosabellides litoralis* Annenkova, 1934 see *Ampharete litoralis*
64. *Phyllocomus sovjeticus* (Annenkova, 1937)

– *Sabellides borealis* M. Sars, 1856 see *Ampharete borealis*
– *Samytha gurjanovae* Uschakov, 1950 see *Lysippe gurjanovae*
– *Samythella bathycola* Uschakov, 1950 see *Samythella elongata*

65. *Samythella elongata* Verrill, 1873
66. *Samythopsis grubei* McIntosh, 1885
67. *Samythopsis* sp. n. according to Alalykina (2018)

– *Shistocomus sovjeticus* Annenkova, 1937 see *Phyllocomus sovjeticus*

68. *Sosane holthei* Jirkov, 1994
69. *Sosane* sp.1 according to Alalykina (2018)
70. *Sosane* sp.2 according to Alalykina (2018)
71. *Ymerana vestis* (Hartman, 1965) according to Alalykina (2018)
72. *Ymerana* sp. n. according to Alalykina (2018)
73. Ampharetidae gen. sp. according to Alalykina (2018)
74. Ampharetidae gen.sp. according to Alalykina (2015)

Melinninae

75. *Melinna cristata* (M. Sars, 1851)
76. *Melinna elisabethae* McIntosh, 1914
77. *Melinna ochotica* Uschakov, 1950
78. *Melinna* sp. according to Alalykina (2015)

– *Melinnexis annenkovae* Uschakov, 1952 see *Melinnopsis annenkovae*

79. *Melinnopsis annenkovae* (Uschakov, 1952)

Accepted here synonymy of nominal Ampharetinae genera

1. *Adercodon* Mackie, 1994 = *Gnathampharete* Desbruyères, 1978 source of synonymy Jirkov (2011).
2. *Alkmaria* Horst, 1919 = *Hypania* Ostroumoff, 1897 source of synonymy Jirkov (2001).
3. *Amagopsis* Pergament et Khlebovich, 1964 = *Grubianella* McIntosh, 1885 source of synonymy Jirkov (2001).
4. *Amathys* Desbruyères, Laubier, 1996 = *Amphisamytha* Hessle, 1917 WORMs unaccepted, but source is not mentioned.
5. *Amythasides* Eliason, 1955 = ?*Ampharete* Malmgren, 1866
6. *Anobothrella* Hartman, 1967 = *Anobothrus* Levinsen, 1884 source of synonymy Jirkov (2009).
7. *Aryandes* Kinberg, 1867 (uncertain > nomen dubium, indeterminable)
8. *Asabellides* Annenkova, 1929 = *Ampharete* Malmgren, 1866 source of synonymy Jirkov (1994).
9. *Crossostoma* Gosse, 1855 = *Amphicteis* Grube, 1850 source of synonymy Grube (1860).
10. *Egamella* Fauchald, 1972 = *Amage* Malmgren, 1866 source of synonymy Jirkov (2011).
11. *Eusamytha* Hartman, 1967 non McIntosh, 1885 = *Melinnampharete* Annenkova, 1937 source of synonymy Jirkov (2011).
12. *Eusamytha* McIntosh, 1885 non Hartman, 1967 = *Samythella* Verrill, 1873 source of synonymy Jirkov (1986).
13. *Eusamythella* Hartman, 1971 = *Melinnampharete* Annenkova, 1937 source of synonymy Jirkov (2011).
14. *Grassleia* Solis-Weiss, 1993 = *Neosabellides* Hessle, 1917 source of synonymy Jirkov (2026a).
15. *Heterobranchus* Wagner, 1885 = *Ampharete* Malmgren, 1866 WORMs unaccepted but source is not mentioned.
16. *Hobsonia* Banse, 1979 = *Hypania* Ostroumoff, 1897 source of synonymy Jirkov (2026b).
17. *Lysippides* Hessle, 1917 = *Lysippe* Malmgren, 1866 source of synonymy Jirkov (2001).
18. *Melinnata* Hartman, 1965 = ?*Sosane* Malmgren, 1866 source of synonymy Jirkov (2009).
19. *Melythasides* Desbruyères, 1978 = *Anobothrus* Levinsen, 1884 source of synonymy Jirkov (2009).
20. *Mexamage* Fauchald, 1972 = *Amage* Malmgren, 1866 source of synonymy Jirkov (2011).
21. *Microsamytha* Augener, 1928 = *Hypania* Ostroumoff, 1897 source of synonymy Jirkov (2001).
22. *Mooresamytha* Williams, 1987 = *Amphisamytha* Hessle, 1917 source of synonymy Hilbig (2000).
23. *Mugga* Eliason, 1955 = *Sosane* Malmgren, 1866 source of synonymy Jirkov (2001).
24. *Muggoides* Hartman, 1965 = *Sosane* Malmgren, 1866 source of synonymy Jirkov (2001).
25. *Neopaiwa* Hartman et Fauchald, 1971 = *Samythopsis* McIntosh, 1885 source of synonymy Jirkov (2023).
26. *Neosamytha* Hartman, 1967 = *Melinnampharete* Annenkova, 1937 source of synonymy Jirkov (2011).
27. *Paiwa* Chamberlin, 1919 = *Samythopsis* McIntosh, 1885 source of synonymy Jirkov (2023).
28. *Paralysippe* Williams, 1987 = *Lysippe* Malmgren, 1866 source of synonymy Jirkov (2011).
29. *Paramage* Caullery, 1944 = *Amage* Malmgren, 1866 source of synonymy Jirkov (2011).
30. *Parampharete* Hartman, 1978 = *Ampharete* Malmgren, 1866 source of synonymy Jirkov (2011).
31. *Paramphicteis* Caullery, 1944 = *Amphicteis* Grube, 1850 source of synonymy Jirkov (2001).
32. *Parhypania* Annenkova, 1928 = *Hypania* Ostroumoff, 1897 source of synonymy Jirkov (2001).
33. *Pavelius* Kuznetsov et Levenstein, 1988 = *Neosabellides* Hessle, 1917 source of synonymy Jirkov (2018).
34. *Phyllamphictes* Augener, 1918 = *Amphicteis* Grube, 1850 source of synonymy Jirkov (2001).
35. *Pseudampharete* Hilbig, 2000 = *Lysippe* Malmgren, 1866 source of synonymy Jirkov (2011).
36. *Pseudoamphicteis* Hutchings, 1977 = *Amphicteis* Grube, 1850 source of synonymy Jirkov (2001).
37. *Pseudosabellides* Berkeley et Berkeley, 1943 = *Ampharete* Malmgren, 1866 source of synonymy Pettibone (1954).
38. *Pterampharete* Augener, 1918 = *Ampharete* Malmgren, 1866 source of synonymy Day (1964).
39. *Pterolysippe* Augener, 1918 = *Lysippe* Malmgren, 1866 source of synonymy Jirkov (2011).

40. *Rytocephalus* Quatrefages, 1866 indeterminable
41. *Sabellides* Milne Edwards in Lamarck, 1838 = *Ampharete* Malmgren, 1866 source of synonymy Jirkov (2001).
42. *Samytha* Malmgren, 1866 = *Lysippe* Malmgren, 1866 source of synonymy Jirkov (2001).
43. *Schistocomus* Chamberlin, 1919 = *Phyllocomus* Grube, 1877 source of synonymy Day (1964)
44. *Sosanella* Hartman, 1965 = *Sosane* Malmgren, 1866 source of synonymy Jirkov (1994).
45. *Sosanides* Hartmann-Schröder, 1965 = *Anobothrus* Levinsen, 1884 source of synonymy Jirkov (2009).
46. *Sosanopsis* Hessle, 1917 = *Sosane* Malmgren, 1866 source of synonymy Jirkov (1994).
47. *Tanseimaruana* Imajima, Reuscher et Fiege, 2013 = *Ymerana* Holthe, 1986 **syn.n.**
48. *Weddellia* Hartman, 1967 = *Samythopsis* McIntosh, 1885 source of synonymy Jirkov (2023).
49. *Uschakovius* Laubier, 1973 belong to Chaetopteridae source Jirkov (2001: 429).

Genera not included in the key

1. *Ampharana* Hartman, 1967
2. *Andamanella* Holthe, 2002
3. *Decemunciger* Zottoli, 1982
4. *Ecamphicteis* Fauchald, 1972
5. *Emaga* Hartman, 1978
6. *Endecamera* Zottoli, 1982
7. *Melinnoides* Benham, 1927
8. *Orochi* Reuscher, Fiege et Imajima, 2015
9. *Pabits* Chamberlin, 1919
10. *Paedampharete* Russell, 1987
11. *Paramytha* Kongsrud, Eilertsen, Alvestad, Kongshavn et Rapp, 2017
12. *Phyllampharete* Hartman et Fauchald, 1971
13. *Watatsumi* Reuscher, Fiege et Imajima, 2015

Accepted here synonymy of nominal Melinninae genera

1. *Amelinna* Hartman, 1969 = *Melinnopsis* McIntosh, 1885 source of synonymy Jirkov (1989).
2. *Melinantipoda* Hartman, 1967 = *Melinnides* Wesenberg-Lund, 1950 source of synonymy Jirkov (2018).
3. *Melinnexis* Annenkova, 1931 = *Melinnopsis* McIntosh, 1885 source of synonymy Day (1964).
4. *Melinnopsides* Day, 1964 = *Melinnopsis* McIntosh, 1885 source of synonymy Jirkov (1989).
5. *Moyanus* Chamberlin, 1919 = *Melinna* source of synonymy Jirkov (2001). Hartman (1960) synonymized this genus with *Melinnexis.* This is clearly impossible as *Melinnexis* has no dorsal crest and hooks, while *Moyanus* has both.
6. *Oeorpata* Kinberg, 1867 = *Isolda* Müller, 1858 source of synonymy unknown