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Ilyocypris thailandensis, a new species of freshwater ostracod (Crustacea: Ostracoda: Cypridoidea) from Thailand

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Abstract. The present paper describes *Ilyocypris thailandensis*, new species, from the northern part of Thailand. The new species resembles *I. angulata* Sars, 1903, and *I. dentifera* Sars, 1903, in the carapace shape and ornamentation. The outstanding discriminating features of *I. thailandensis*, new species, are recognised in the morphology of the hemipenis, namely the distinctive middle lobe appearing subquadrate in shape with a tiny pointed inner corner, the short and rounded knob-like inner lobe, and the presence of gaps between the three lobes. In addition, the distal end of the copulatory process is more slender than those in the blade-type taxa. Also, the Zenker organ of the new species displays clear differences from that in related species: a relatively small number of spiny whorls (12) and the proximal end being inflated and larger than the distal end. *Ilyocypris thailandensis*, new species, is only the second identified species of this genus to be reported from Thailand, after *I. monstrifica* (Norman, 1862).

Key words. Ilyocyprididae, microcrustacean, taxonomy, Southeast Asia

INTRODUCTION

The diversity of non-marine ostracods in Thailand has been reported for the last decade in particular (e.g., Savatenalinton & Suttajit, 2016; Savatenalinton, 2017a–c, 2018a, b; Moonchaisook & Savatenalinton, 2020; Savatenalinton, 2020a, b, 2021). Most of the Thai ostracod fauna belongs to four subfamilies of the family Cyprididae Baird, 1845: Cypricercinae McKenzie, 1971, Cypridopsinae Kaufmann, 1900, Cyprinotinae Bronstein, 1947, and Herpetocypridinae Kaufmann, 1900 (tribe Stenocypridini Ferguson, 1964) while other groups have few members, including the Ilyocypridinae Kaufmann, 1900 in the family Ilyocyprididae Kaufmann, 1900. Ilyocypridinae comprises only one genus, *Ilyocypris* which so far has 39 described species (Meisch et al., 2019; Smith et al., 2019). The Oriental *Ilyocypris* composes of 10 species, four of which are endemic to this region. In Southeast Asia, only two representatives of the genus have been recorded: *I. dentifera* Sars, 1903 and *I. monstrifica* (Norman, 1862). The former was recorded from the Philippines (Victor & Fernando, 1980) and Indonesia (Victor & Fernando, 1981a) while the latter was found in Thailand (Savatenalinton, 2014; Savatenalinton & Suttajit, 2016). The present contribution reveals and describes a new species of *Ilyocypris*, which is the third representative of this genus in Southeast Asia and the second one in Thailand.

MATERIAL AND METHODS

Samples were collected using a hand net with 200 µm mesh and immediately fixed in 70% ethanol. Specimens were sorted in the laboratory and then soft parts and valves were separated under an Olympus SZ40 stereo-microscope. Soft parts were dissected in glycerine and later sealed on glass slides using rapidly solidifying varnish. Soft parts were drawn with the aid of a camera lucida. Carapace and valves were stored dry on micropalaeontological slides and later observed and illustrated using a Scanning Electron Microscopy (JEOL JSM6460LV, at the Faculty of Science, Mahasarakham University (MSU), Maha Sarakham, Thailand; and Philips XL30, at the Royal Belgian Institute of Natural Sciences (RBINS), Brussels, Belgium). The limb chaetotaxy follows the model proposed by Broodbakker & Danielopol (1982). The revised model for the antenna and the thoracopods follow the work of Martens (1987) and Meisch (2000), respectively. The type material of the new species is deposited in the Science Faculty Museum, MSU (Maha Sarakham, Thailand) and the Lee Kong Chian Natural History Museum (Singapore).

The following abbreviations are used in the text and figures: MSU-ZOC, Ostracod Collection of the Science Faculty Museum, MSU, Maha Sarakham, Thailand; Cp, carapace; H, height of valves; L, length of valves; LV, left valve; RV, right valve; W, width of carapace; A1, first antenna; A2, second antenna; Md, mandibula; Mx1, maxillula; T1, first thoracopod; T2, second thoracopod; T3, third thoracopod; CR, caudal ramus.

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TAXONOMY

Family Ilyocyprididae Kaufmann, 1900

Subfamily Ilyocypridinae Kaufmann, 1900

Ilyocypris Brady & Norman, 1889

Ilyocypris thailandensis, new species
(Figs. 1–6)

Material examined. Holotype: Male, soft parts dissected in glycerine on a sealed slide, valves stored dry on a micropalaeontological slide (MSU-ZOC.307), Phadang Reservoir, Muang District, Phetchabun Province, Thailand, 16°26′46″N 101°05′16″E, coll. S Savatenalinton, 14 February 2006.
Allotypes: one female, stored like the holotype (MSU-ZOC.311), same data as holotype.
Paratypes: two dissected males (MSU-ZOC.308–309) stored like the holotype, one undissected male (MSU-ZOC.310) stored dry on micropalaeontological slides, one dissected female (MSU-ZOC.312) stored like the holotype, one undissected female (MSU-ZOC.313) stored dry on a micropalaeontological slide, c. 7 males and 10 females in 70% ethanol, deposited in the Science Faculty Museum (MSU, Thailand) and 5 males and 5 females in 70% ethanol deposited in the Lee Kong Chian Natural History Museum (Singapore), same data as holotype.

Measurements (µm). Male. Cp: L = 607, W = 248; LV (n=3): L = 586–656, H = 327–361; RV (n=3): L = 569–645, H = 315–355. Female. Cp: L = 657, W = 327; LV (n=3): L = 654–676, H = 369–387; RV (n=3): L = 639–666, H = 358–376.

Diagnosis. Carapace in dorsal view narrowly elongated (length c. 2.5 times of width in male), with small angular tubercles situated behind mid-length (larger in female), anterior end more compressed and posterior end narrowly rounded; LV in external view elongated (length c. 1.5 times of height), greatest height situated at c. 1/3 of length, dorsal margin straight, sloping towards posterior end, each valve set with three tubercles (two rounded, one angular) and shallow pits; anterior calcified inner lamella of LV with ripplets arranged into two rows and with two inner lists, posterior calcified inner lamella of LV with two inner lists and two main rows of ripplets and minor and short row of ripplets at postero-ventral margin; A1 with very long α-seta (length c. four times of penultimate segment); accompanying seta of A2 natatory setae long (reaching far beyond tip of terminal segment), in male claw G3 reduced to short seta and z1 seta developed to claw-like, female z1 seta markedly short; T2 with long g-seta; hemipenis with subquadrate middle lobe containing tiny pointed corner, inner lobe elongated, rounded knob-like, outer lobe rounded dome-shaped, gaps between lobes present; copulatory process slender with pointed tip; Zenker's organ length about 2.7 times the width, set with 12 spiny whorls, proximal end remarkably inflated and larger than distal end.

Description of male. Carapace in dorsal view (Fig. 1D) narrowly elongated (length c. 2.5 times of width), with small angular tubercles situated behind mid-length. Dorso-median sulci situated at mid-length and before mid-length. LV slightly overlapping RV anteriorly and posteriorly. Anterior end more compressed and posterior end narrowly rounded.

LV in external view (Fig. 1E) elongated (length c. 1.5 times of height), greatest height situated at c. 1/3 of length, anterior margin widely rounded, posterior margin narrowly rounded, dorsal margin straight sloping down toward posterior end, ventral margin sinuated at mid-length, anterior and posterior regions with small secondary tubercles; valve surface set with three (two rounded, one angular) tubercles in middle area of valve and upper half of height, no tubercles on lower half of height, and ornamented with shallow pits throughout surface, adductor muscle scars depression situated in central region of valve.

RV in external view (Fig. 1F) same as in LV, except for anterior and posterior regions with larger secondary tubercles than those on LV.

LV in interior view (Fig. 2D, F): Anterior calcified inner lamella with ripplets arranged into two rows and with two inner lists, posterior calcified inner lamella with two inner lists and with two main rows of ripplets and minor and short row of ripplets at postero-ventral margin.

RV in interior view (Fig. 2E) same as in LV, except for anterior calcified inner lamella with one row of ripplets (more robust than those in LV) and postero-ventral margin without ripplets.

A1 (Fig. 3A): First segment with one long, dorsal seta (reaching tip of next segment) and two long ventro-apical setae, Wouters organ not seen. Second segment subquadrate with one long dorso-apical seta (reaching beyond tip of next segment), Rome organ not seen. Third segment bearing two setae: one short dorso-apical seta (reaching tip of fifth segment), and one shorter ventro-apical seta (reaching mid-length of fifth segment). Fourth segment with two long dorsal apical setae and two ventral apical setae, one long (reaching tip of terminal segment) and one shorter (reaching beyond tip of next segment). Fifth segment with two long dorsal apical setae and two ventral apical setae, one long, one shorter (short one reaching beyond tip of terminal segment). Penultimate segment with four long apical setae and very long α-seta (length c. four times of penultimate segment). Terminal segment with three (one long, two shorter) apical setae and an aesthetasc ya, the latter c. two times of terminal segment.

A2 (Fig. 3B): Exopodite with three (one long, two short) setae, the long one reaching slightly beyond tip of first endopodal segment. First endopodal segment with five long natatory setae (reaching far beyond tip of terminal claws) and accompanying seta also long (reaching far beyond tip of terminal segment), aesthetasc Y short, ventro-apical seta long (reaching beyond tip of terminal segment). Penultimate segment undivided, medially with two (one long, one shorter)

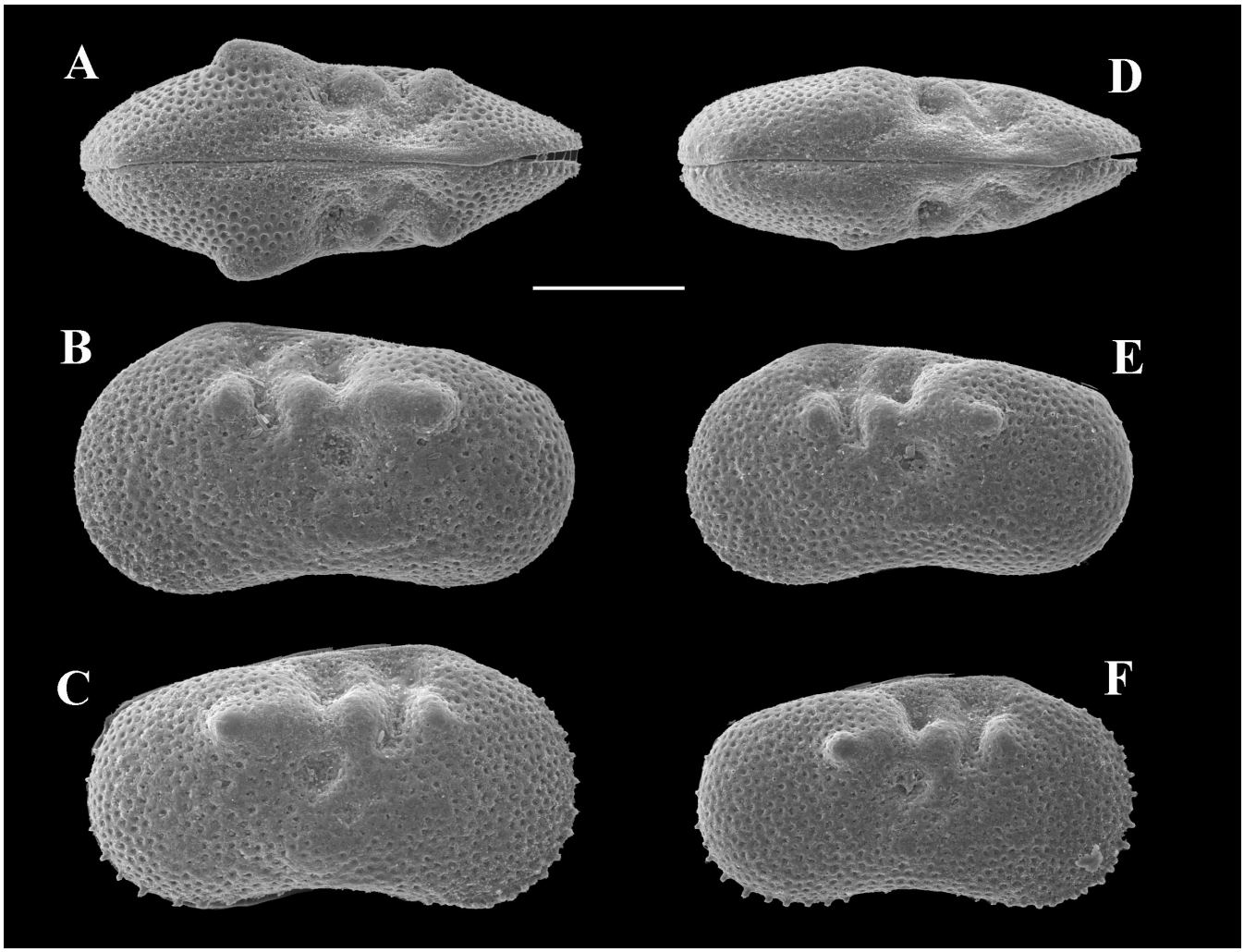

Fig. 1. *Ilyocypris thailandensis*, new species. A–C, female; D–F, male. A, carapace, dorsal view (MSU-ZOC.313); B, LV, external view (MSU-ZOC.311); C, RV, external view (ditto); D, carapace, dorsal view (MSU-ZOC.310); E, LV, external view (MSU-ZOC.307); F, RV, external view (ditto). Scale bar: A–F = 200 μm.

dorsal setae (length of the short one c. half that of the long one) and four ventral setae of unequal length (t1–t4), t1 seta longest (reaching slightly beyond tip of terminal segment), y1 long, situated at 1/3 of segment; this segment distally with two claws G1–G2 and claw G3 reduced to short seta, aesthetasc y2 long, z1 seta claw-like, z2 and z3 setae long (reaching beyond tip of terminal claws). Terminal segment with two claws (GM and Gm), aesthetasc y3 with accompanying seta, length of Gm c. 6/7 of that of GM, length of aesthetasc y3 c. 3/4 of accompanying seta, the latter slightly shorter than half length of Gm.

Md-coxa (Fig. 4A) elongated, distally set with rows of teeth (large dorsally and smaller ventrally) and small setae, and with one dorso-subapical seta, the latter reaching slightly beyond tip of coxa.

Md-palp (Fig. 4B): First segment with two large setae (S1 and S2), one long seta and long, smooth α-seta. Second segment dorsally with two unequal long subapical setae; ventrally with a group of three long hirsute setae, one shorter seta and small, plumose β-seta. Penultimate segment dorsally with a group of four unequal, long, subapical setae; laterally with one apical seta; ventrally with three long setae of subequal length. Terminal segment distally bearing three claws and three setae, medially with one long seta (length c. two times of that of terminal segment).

Mx1 (Fig. 4C) with two-segmented palp, three endites and large branchial plate; basal segment of palp with a group of four long, unequal apical setae and one subapical seta, the latter reaching tip of terminal segment, terminal segment subquadrate (length as long as width), apically with three claws and three setae.

T1 (Fig. 4D, E): Endopodite forming slender prehensile palp. Palp proximally with elongated segment bearing two apical setae, distal part narrower, and with one long subapical seta. Left and right palps symmetrical.

T2 (Fig. 5A): First segment with seta d1, seta d2 absent. Second segment with short e-seta (not reaching mid-length of penultimate segment). Penultimate segment undivided, medially with short f-seta (not reaching tip of segment) and long apical g-seta (reaching beyond tip of terminal segment). Terminal segment with two (one anterior, one posterior)

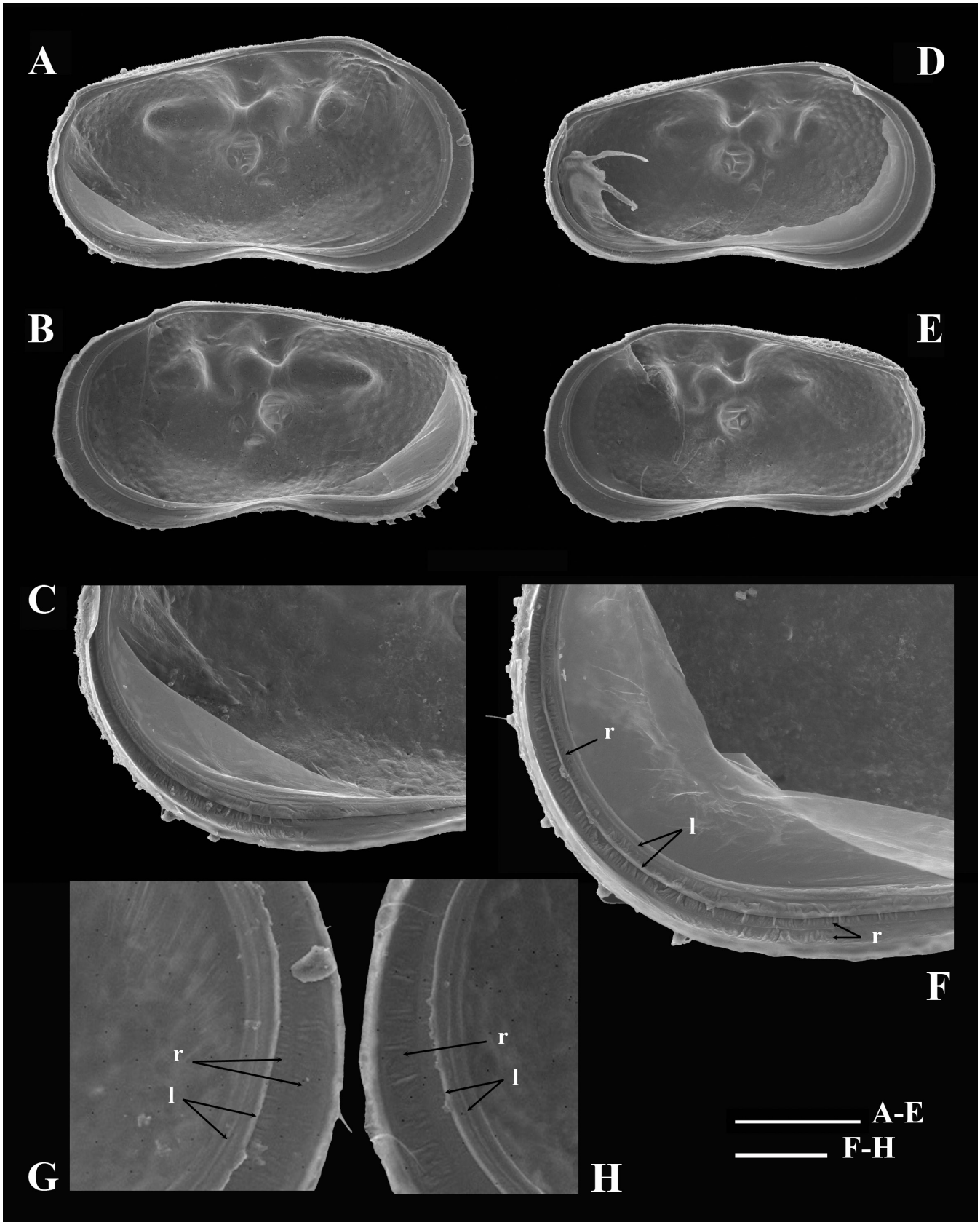

Fig. 2. *Ilyocypris thailandensis*, new species. A–C, G–H, female; D–F, male. A, LV, internal view (MSU-ZOC.312); B, RV, internal view (ditto); C, LV, internal view, postero-ventral part (ditto); D, LV, internal view (MSU-ZOC.308); E, RV, internal view (ditto); F, LV, internal view, postero-ventral part (MSU-ZOC.309); G, LV, internal view, anterior part (MSU-ZOC.312); H, RV, internal view, anterior part (ditto). Arrows indicate lists (l) and rows of ripplets (r). Scale bar: A, B, D, E = 200 μm, C = 94 μm, F–H = 50 μm.

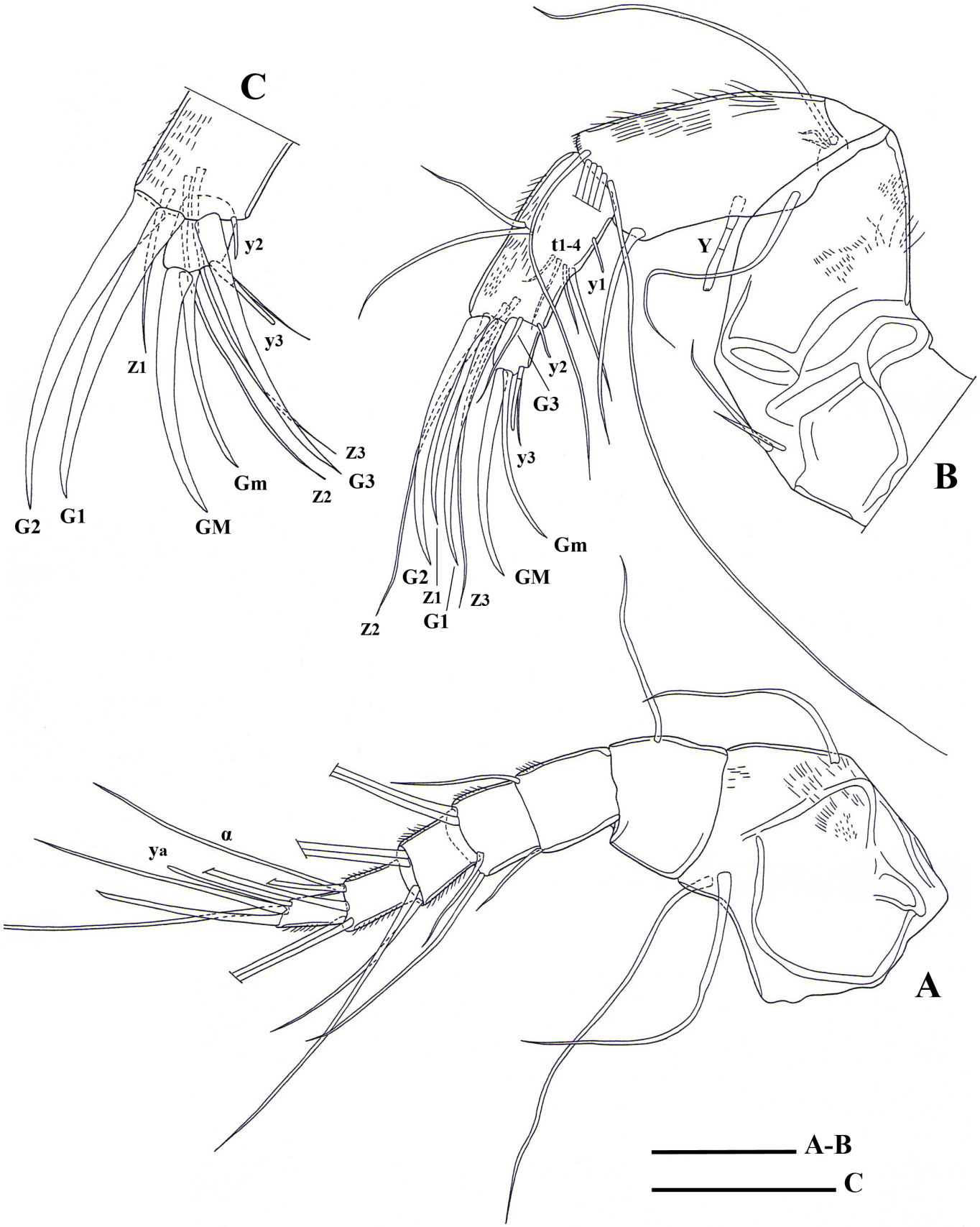

Fig. 3. *Ilyocypris thailandensis*, new species. A, B, male (MSU-ZOC.307); C, female (MSU-ZOC.311). A, A1; B, A2; C, terminal part of A2. Scale bars: A–C = 50 μm.

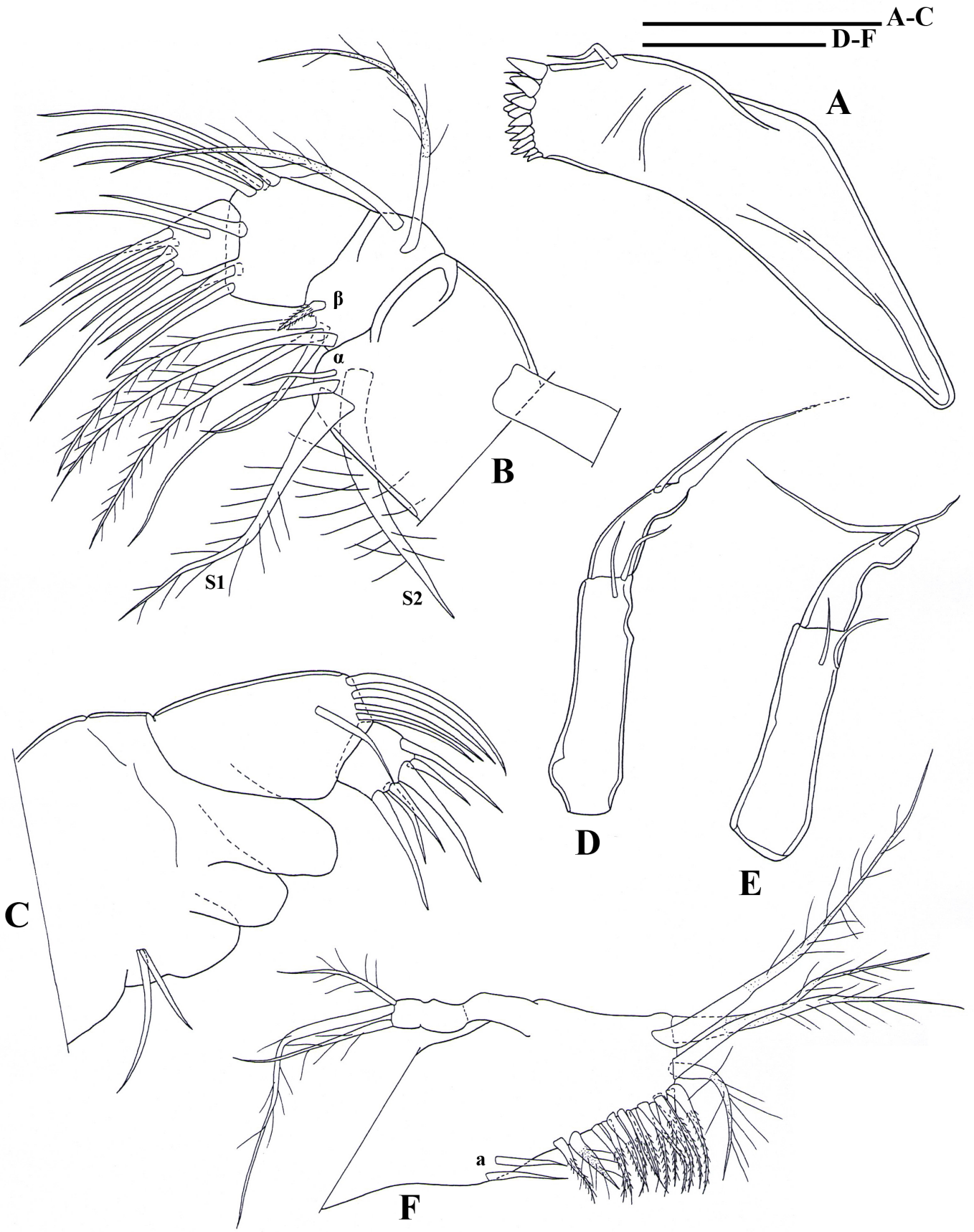

Fig. 4. *Ilyocypris thailandensis*, new species. A–E, male (MSU-ZOC.307); F, female (MSU-ZOC.311). A, Md-coxa; B, Md-palp; C, Mx1; D–E, T1-palp; F, T1. Scale bars: A = 67 μm, B, C, F = 50 μm, D, E = 46 μm.

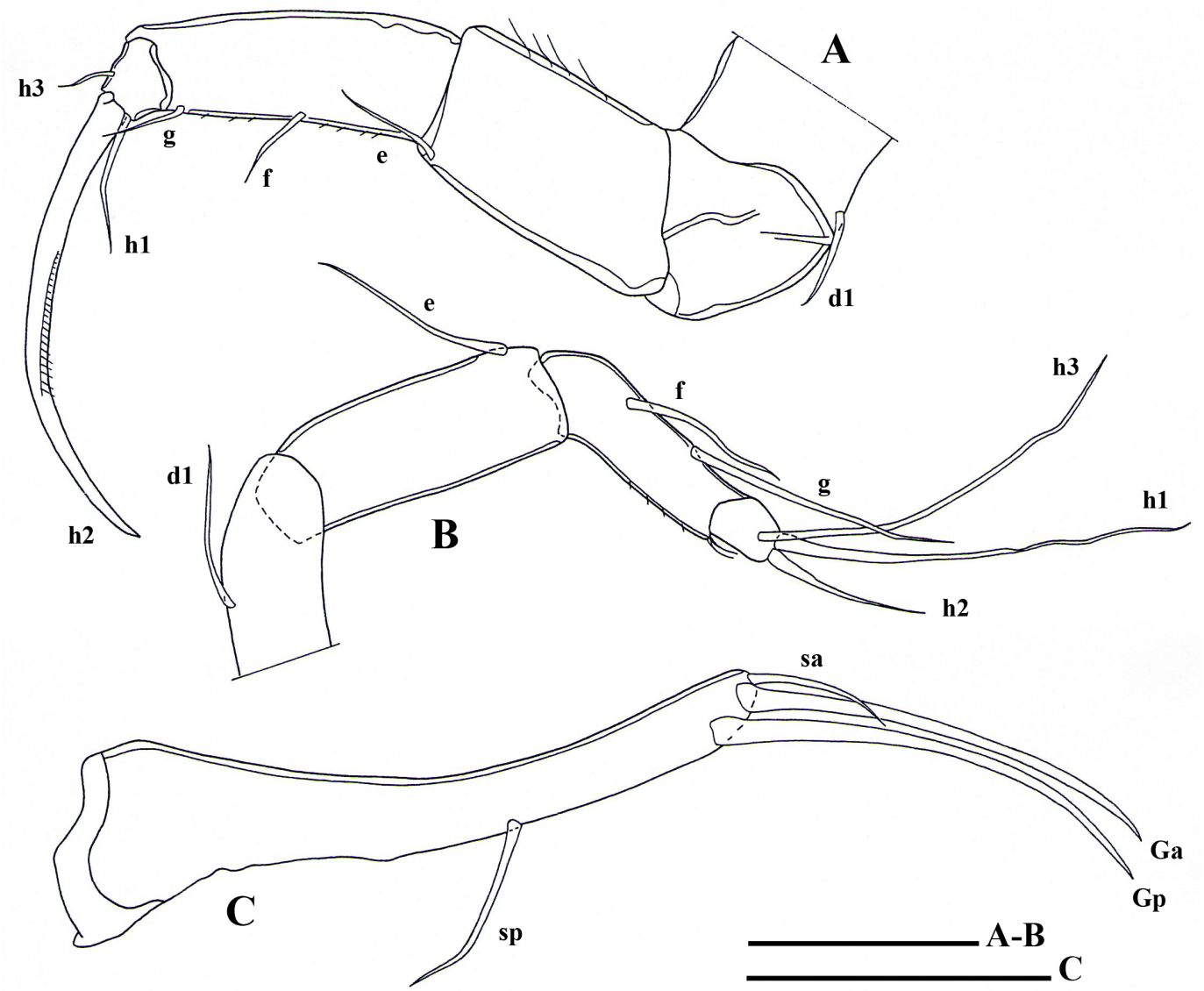

Fig. 5. *Ilyocypris thailandensis*, new species, male (MSU-ZOC.307). A, T2; B, T3; C, CR. Scale bars: A–C = 50 µm.

apical h1 and h3 setae and serrated claw (h2), length of h1 seta less than half of that of h2 claw, h3 seta short (shorter than half length of h1 seta).

T3 (Fig. 5B): First segment with short d1 seta. Second segment with long apical e-seta (extending beyond half of next segment). Third segment with medially long f-seta (reaching beyond tip of segment), long subapical g-seta (reaching tip of h2 seta) and two small apical spines. Terminal segment with three apical h1–h3 setae, h1 and h3 setae long, subequal length, h2 seta shorter (length less than half that of h1 seta).

CR (Fig. 5C) with subequal, long claws Ga and Gp (length c. 0.6 times of ramus), seta sa short (length c. 1/3 of that of Ga), seta sp long, situated c. mid-length of ramus.

Hemipenis (Fig. 6A, B): Middle lobe subquadrate with distally tiny pointed corner, inner lobe elongated, rounded knob-like (extending c. 2/3 of middle lobe), outer lobe rounded dome-shaped; gaps between lobes present; copulatory process with slender end; postlabyrinthal spermiduct curved, with two loops.

Zenker's organ (Fig. 6C, D) set with 12 spiny whorls, length about 2.7 times the width, proximal end remarkably inflated and larger than distal end.

Description of female. Carapace and valves as in male, although somewhat larger and with larger angular tubercles (Figs. 1A–C, 2A–C, G, H). All limbs as in male, except for last two segments of A2 (Fig. 3C) and T1 (Fig. 4F). Penultimate segment of A2 with three claws G1–G3, z2 and z3 setae long (reaching tip of terminal claws), z1 seta shorter (reaching 1/3 of GM claw). T1-protopodite with two long a-setae, distally with 18 hirsute setae of unequal length, endopodite a weakly built-palp with two segments, apically with three unequal hirsute apical setae, length of the shortest seta less than half that of the longest seta. Reproductive organ with large, round lobe anteriorly and slightly smaller, round lobe posteriorly, length of latter lobe about 1/3 of total length of organ.

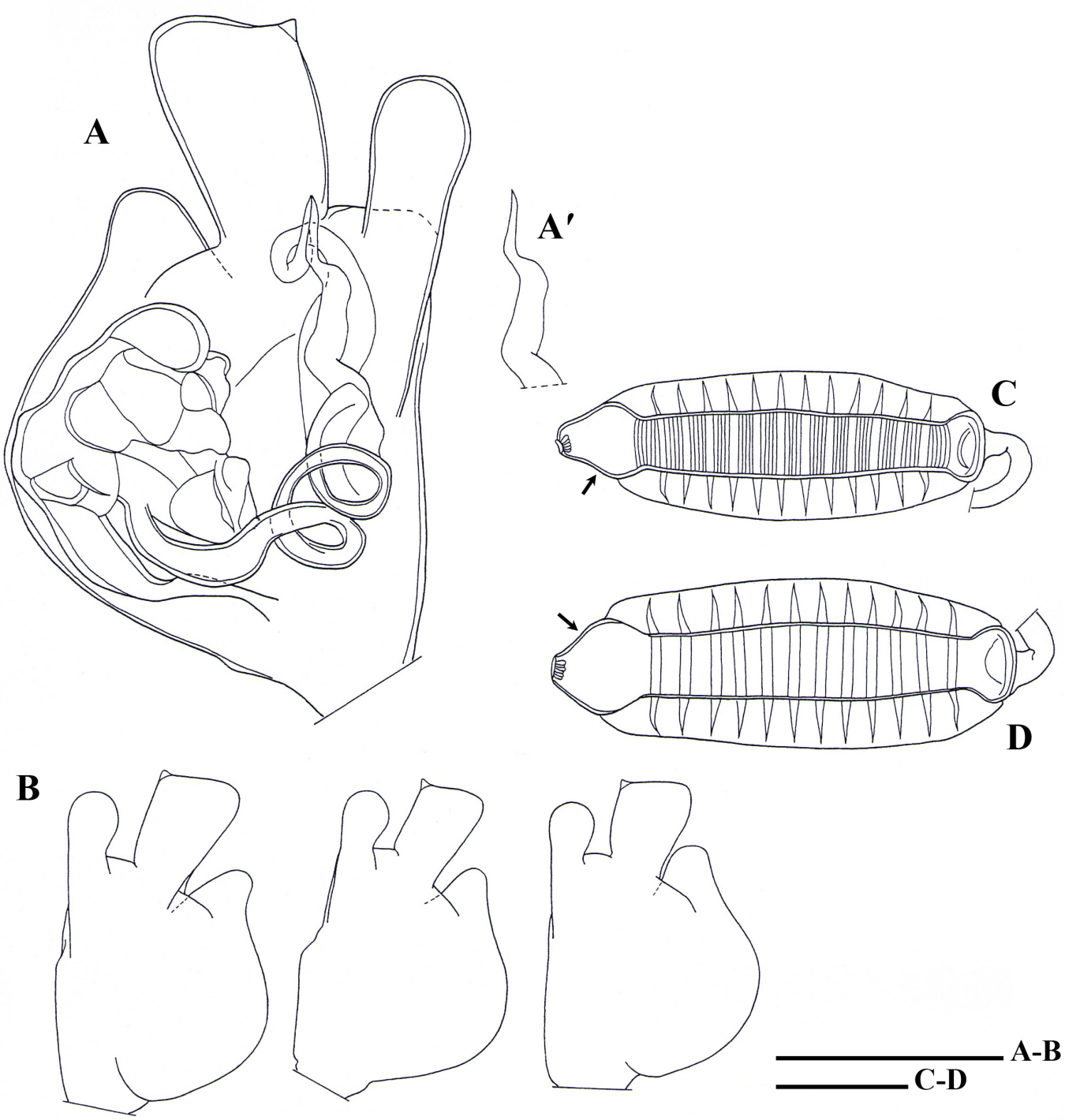

Fig. 6. *Ilyocypris thailandensis*, new species, male. A, hemipenis (MSU-ZOC.309); A′, copulatory process of A (ditto); B, hemipenis outlines (MSU-ZOC.309, 307, 308; left to right); C, Zenker organ (MSU-ZOC.307); D, Zenker organ (MSU-ZOC.308). Arrows indicate proximal ends. Scale bars: A, D = 50 μm, B = 98 μm, C = 55 μm.

Etymology. The species is named after Thailand, where the new species was first collected.

Distribution and ecology. *Ilyocypris thailandensis*, new species, has thus far been collected from one locality (reservoir) which is a permanent water body in the northern part of Thailand. The individuals were collected from the littoral zone in which macrophytes were absent. The vegetation of the shoreline consisted of grasses, most of which were dry. The sediment was a mixture of silt and sand, together with a small quantity of crude dead plant material. Sample was taken from the waters with pH of 7.0 and temperature of 24.2°C.

Remarks. *Ilyocypris thailandensis*, new species, in the present study consisted of a sexual population comprising both males and females. It should be noted that all dissected females were copulated specimens since sperm cells were observed inside their bodies.

DISCUSSION

The representatives of the genus *Ilyocypris* have rarely been reported from Thailand (Savatenalinton & Suttajit, 2016). The first identified species of this genus to be recorded was *I. monstrifica* (Norman, 1862) from Maha Sarakham Province (see Savatenalinton, 2014), making *I. thailandensis*, new species, only the second species to be recorded thus far. *Ilyocypris thailandensis*, new species, is most similar to *I. angulata* Sars, 1903, and *I. dentifera* Sars, 1903, which were described based on specimens from China (Sars, 1903). Although *I. angulata*, and *I. dentifera* (here treated as separate species) have so far been recorded from the Oriental and the Palaearctic regions (Meisch et al., 2019), their occurrences need to be confirmed because they had been previously synonymised into one taxon (Victor & Fernando, 1981b), which could affect their identification in subsequent reports. In Southeast Asia, *I. angulata* has not been recorded yet, whereas *I. dentifera* was reported from the Philippines (Victor & Fernando, 1980) and Indonesia (Victor & Fernando, 1981a). The similarities of *I. thailandensis*, new species, and these two taxa are recognised in the carapace shape in lateral and dorsal views and the presence of angular tubercles on the posterior half of the carapace. The angular tubercles are typically seen in *I. angulata*, but in *I. dentifera* they are found only in the tuberculated form of that species (see Smith et al., 2019). The lower tubercles (the fourth and fifth positions; see Smith et al., 2019: fig. 18) exist in *I. angulata* and the tuberculated form of *I. dentifera*, but they are absent in the new species. As the variation of tubercles on the valve external surface can occur in the same species of the genus *Ilyocypris*, one could argue that *I. thailandensis* is just another form of either *I. angulata* or *I. dentifera*. However, the morphology of the internal surface of the valves and of the soft body parts, especially the male reproductive organs, of *I. thailandensis* are sufficiently distinct to recognise it as a separate species.

Furthermore, the anterior and posterior parts of the carapace in dorsal view differ slightly among these three taxa. *Ilyocypris angulata* has more laterally compressed anterior and posterior parts, while these have a rounded aspect (with or without tubercles) in *I. dentifera*; whereas in *I. thailandensis*, the anterior part is more laterally compressed, but the posterior part is rounded. Also, the comma-shaped depression is absent in *I. thailandensis* (present in *I. dentifera*; see Smith et al., 2019).

The presence of ripplets on the postero-ventral margin of the LV in internal view is one of the taxonomic features in the genus *Ilyocypris*. In *I. thailandensis*, new species, the pattern of ripplets on the postero-ventral margin of the LV is different from that in *I. angulata* and *I. dentifera*. There are two main rows (outer and inner rows) of ripplets (Fig. 2C, F) in *I. thailandensis*, new species, while *I. angulata* and *I. dentifera* have only one main row of ripplets (see Zhai & Zhao, 2014; Smith et al., 2019). However, this feature can display some intraspecific variability (see Mazzini et al., 2014) and, thus, species identification cannot rely on this character alone. Based on the study of Mazzini et al. (2014), some species showed a wide range of variation in the ripplets (e.g., *I. bradyi* Sars, 1890; *I. decipiens* Masi, 1905; *I. getica* Masi, 1906), but some others (e.g., *I. gibba* (Ramdohr, 1808); *I. monstrifica* (Norman, 1862); *I. inermis* Kaufmann, 1900) have slight variation only. Extensive surveys across wide ecological and geographic ranges and species diversity would clarify the range of variability of the marginal ripplets on the LV, thus clearly delineating species boundaries. The internal side of the LV also contains another discriminating character, the aspect of the posterior list. The double lists were recognised in the new species whereas only one list appeared in the two related taxa (*I. angulata* and *I. dentifera*).

The anterior calcified inner lamella of the LV and the RV is smooth in *Ilyocypris*, including *I. angulata* and *I. dentifera* (see Smith et al., 2019), but it has ripplets in some taxa, such as *I. thailandensis*, new species (present study) and *Ilyocypris* cf. *angulata* (see Karanovic & Lee, 2013). In the new species, the ripplets in this region are seen on both valves (Fig. 2G, H) while *Ilyocypris* cf. *angulata* has weak ripplets on the RV only. These aspects (smooth or with ripplets) would serve as a distinguishing character of the species. However, as this part of the valves was not clearly illustrated in most of the previous studies, further investigation is needed in many species to address the specific characteristics.

The variability of the valve morphology largely occurs in the external structures, such as the valve ornamentation (for example, see Yin et al., 1999; Ruiz et al., 2013), while the structures of valves on the internal side constitute the constant taxonomic characters of the species, such as the inner list (e.g., the morphology and number), the marginal groove, the internal tooth (or teeth), the selvage and the marginal tubercles (for example, see Savatenalinton & Martens, 2009a, b; Rossetti & Martens, 1998). However, it should be noted that the opposite is observed in the genus *Ilyocypris*, which shows the variability in the structure of the internal side of the valves, at least in the posteroventral margin, in the same species.

The reproductive organs, especially in males, usually provide discriminating characters at the species level in many ostracod groups, including in the genus *Ilyocypris*. Smith et al. (2019) studied *Ilyocypris* from paddy fields in Northeast Asia and divided them into two groups, the *Ilyocypris japonica* group and the *Ilyocypris dentifera* group, based mainly on the number of T2 segments and the morphology of reproductive organs. While *I. angulata* and *I. dentifera* belong to the latter group, *I. thailandensis*, new species, cannot be assigned to either group as it possesses characters from both groups. In *I. thailandensis*, new species, the T2 has four segments, which is a character of the *I. dentifera* group, whereas its copulatory process and Zenker organ are similar to those in the *I. japonica* group. The tip of the copulatory process is blunt in *I. angulata* and *I. dentifera*, but in *I. thailandensis*, new species, it is pointed which is similar to blade-type of the *I. japonica* group. Nonetheless, the distal part of the copulatory process of the new species lacks a small expansion (see, for example, Smith et al.,

2019: fig. 4). Hence, the copulatory process is more slender in *I. thailandensis*, new species, compared to other species in the *I. japonica* group. In *I. thailandensis*, new species, the number of spiny whorls is 12, which is different from that in *I. angulata* (22–23 whorls) and *I. dentifera* (16–21 whorls), but close to that in *I. mongolica* (13 or 14 whorls) (see Smith et al., 2019). Moreover, the proximal end of Zenker organ is markedly inflated and larger than the distal end in the new species whereas both ends are similar in size in *I. angulata* and *I. dentifera*.

The hemipenis of *I. thailandensis*, new species, is remarkably different from *I. angulata* and *I. dentifera*. The middle lobe of the new species is unique, appearing short and subquadrate with a tiny pointed inner corner, while it is elongated with slightly protruding inner corner in *I. angulata* and subtriangular in *I. dentifera*. In *I. thailandensis*, new species, the inner lobe is short, rounded, and knob-like, whereas *I. angulata* has a long and hook-like inner lobe, while it is short and domed-shape in *I. dentifera*. The inner lobe of *I. thailandensis*, new species, reaches two-thirds of the middle lobe, while it is about half of the middle lobe in the two related species (see Smith et al., 2019). The gaps between the three lobes of the hemipenis are different among these three species. There is no gap in *I. angulata* while *I. dentifera* has the gap between the outer and middle lobes. In *I. thailandensis*, new species, two gaps can be seen: one between the outer and middle lobes, and another one between the middle and inner lobes. The general morphology of the hemipenis of the new species, especially the inner lobe and the presence of two gaps, resembles that of *I. divisa* Klie, 1926, but the pointed inner corner of the middle lobe is missing in *I. divisa* (see Martens et al., 2002).

The differences between *I. thailandensis*, new species, and its congeners also exist in other soft parts, such as A1, A2 and T2. In *I. angulata*, the A1 terminal segment is markedly long, appearing longer than the penultimate segment (see Zhai & Zhao, 2014), whereas it is equal or shorter than the penultimate segment in *I. thailandensis*, new species, and *I. dentifera* (see Smith et al., 2019). It should be noted that *I. thailandensis*, new species, has very long α-seta on the A1 penultimate segment. Among these three species, ya is longest in *I. dentifera* (c. two times the terminal segment length), while in the new species and *I. angulata*, it is about 1.5 times the terminal segment length. In addition, the z1 seta in the female A2 is short in *I. thailandensis*, new species, and *I. angulata* while it is long in *I. dentifera*. The g-seta on the T2 is long in *I. thailandensis*, new species, and *I. dentifera*, but it is short in *I. angulata*.

Consequently, *I. thailandensis*, new species, *I. angulata* and *I. dentifera* can be assigned to a species complex due to the morphological similarity of their carapace shape and valve ornamentation. However, the morphology of the hemipenis and Zenker organ can be primarily used to discriminate among them. These results thus emphasise the reproductive organs as the main source of distinguishing features in the genus *Ilyocypris*, especially in closely related species. The features discussed above indicate that *I. thailandensis*, new species, is an unequivocally separated species due to its morphology containing a combination of unique and shared characters of other *Ilyocypris* species.

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