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On *Mixtadopsis namiotkoi*, new genus and species (Crustacea: Ostracoda: Cyprididae) from Northeast Thailand

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Abstract. *Mixtadopsis namiotkoi*, new genus and species, is described from a reservoir in Bueng Kan Province, Northeast Thailand. The new genus shares characters with several genera of the subfamily Cypridopsinae Kaufmann, 1900 and it is plausibly placed in the tribe Cyprettadopsini Savatenalinton, 2020 mainly due to the presence of marginal septa on both valves, a strongly serrated G2 claw on the second antenna (A2), an undivided penultimate segment of the second thoracopod, a completely separated terminal segment of the third thoracopod and a reduced caudal ramus. In addition, its other key characters include strong ornamentation with concentric deep pits and ridges on the valve surface, a well-developed anterior groove on the right valve, a flat space on the postero-ventral part of the left valve, internal knob-like structures on the ventral side of both valves, the distal pseudosegmentation of the A2 natatory setae, a large striated last segment of the aesthetasc Y and a large α-seta on the mandibular palp. The new species is only the second representative of the tribe Cypettadopsini described from Thailand. A concise comparison on detailed morphology of valves and soft parts among three genera of the tribe and a key to genera of the Thai Cypridopsinae are provided.

Key words. crustacean, ostracod, Southeast Asia, systematics, taxonomy

INTRODUCTION

Meisch et al. (2024) recently published a checklist of living non-marine ostracods of the world, in which Cypridopsinae is the most speciose subfamily of Cyprididae, comprising 216 species. Although this subfamily has a wide geographical distribution, most genera display a more restricted distribution. For example, *Bryocypris* Røen, 1956, *Malawidopsis* Jacobs & Martens, 2022, and *Tanganyikacypridopsis* Martens, 1985 are endemic to the Afrotropical region, while *Pseudocypridopsis* Karanovic, 1999 is endemic to the Palaearctic and three genera (*Brasilodopsis* Almeida, Higuti, Ferreira & Martens, 2021, *Paranadopsis* Almeida, Higuti, Ferreira & Martens, 2021, and *Cabelodopsis* Higuti & Martens, 2012) are restricted to the Neotropical region.

Recent studies on Cypridopsinae have not only increased the morphological information available but also extended their previously known distribution. For instance, most species of *Sarscypridopsis* McKenzie, 1977 were restricted to Africa (Meisch et al., 2019), but recently, Smith et al. (2023) also found this genus in Japan. *Pseudocypretta* Klie, 1932 that has been reported from South Asia (Battish, 1978, 1982; Victor & Fernando, 1979) and Southeast Asia (Klie, 1932; Victor & Fernando, 1981; Savatenalinton & Suttajit, 2016; Savatenalinton et al., 2022), was recently encountered in Hainan Island (southern China) (Ma & Yu, 2020). It had been considered an Oriental genus for a long time, but recent works revealed its presence in other regions, namely South America (Ferreira et al., 2022) and Africa (Ferreira et al., 2023).

Subfamily Cypridopsinae is presently composed of 26 genera belonging to seven tribes: Cyprettadopsini Savatenalinton, 2020, Cypridopsini Kaufmann, 1900, Paranadopsini Almeida et al., 2021, Plesiocypridopsini Jacobs & Martens, 2022, Potamocypridini Ghetti & McKenzie, 1981, Songkhramodopsini Savatenalinton, 2023 and Zonocypridini Higuti & Martens, 2012 (Meisch et al., 2024; Savatenalinton, 2024a). A key to the tribes was provided by Savatenalinton (2023), in which Potamocypridini is easily recognised because of its unique character of a spatulate shaped terminal segment of the maxillular palp (cylindrical shape in other tribes). In addition, Cyprettadopsini is characterised mainly by the marginal septa that is absent in all other tribes. Tribe Cyprettadopsini was erected with *Cyprettadopsis* Savatenalinton, 2020 as the type genus, to accommodate species with marginal septa, reduced caudal ramus, and completely separated terminal segment of the third thoracopod (Savatenalinton, 2020). *Pseudocypretta* that resembles *Cyprettadopsis*, was originally placed in the subfamily Cyprettinae Hartmann, 1963. Savatenalinton (2019) was the first to point out that its morphology is more similar to that of Cypridopsinae than of Cyprettinae and it was recently transferred to the tribe Cyprettadopsini

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(Savatenalinton et al., 2022). Thus far, two genera (*Cyprettadopsis* and *Pseudocypretta*) belong to this tribe, with one and four species, respectively (Meisch et al., 2024).

In Thailand, living freshwater ostracods have been surveyed in several areas resulting in the discovery of many new taxa in different taxonomic categories, such as at subfamily, tribe, generic, and species levels (e.g., Savatenalinton & Martens, 2009, 2010; Savatenalinton & Suttajit, 2016; Savatenalinton, 2017, 2022a, 2024a, b). Among these discoveries, there were nine representatives from Cypridopsinae, while five genera (*Siamopsis* Savatenalinton, 2017, *Thaicypridopsis* Savatenalinton, 2018, *Cyprettadopsis* Savatenalinton, 2020, *Songkhramodopsis* Savatenalinton, 2023, *Neopotamocypris* Savatenalinton, 2024) were new to science (Savatenalinton, 2017, 2018, 2020, 2022a, 2023, 2024a). All are endemic to the country, except for *Siamopsis* that is also found in Japan (Smith, 2023). These reflect the high diversity of the ostracod faunas in Thailand, particularly the subfamily Cypridopsinae. Nonetheless, some areas of the country with diverse types of wetlands have been poorly studied, such as Bueng Kan, a northeastern province where two Ramsar sites are also situated. To fill the gap and also enhance knowledge of the taxonomy and systematics of Thai ostracods, a new taxon of Cypridopsinae is described in the present contribution, based on material from Bueng Kan Province.

MATERIAL AND METHODS

Ostracods were taken from the littoral zone of a reservoir (Huai Bang Bat Reservoir**)** in Bueng Kan Province in the northeastern part of Thailand. The sample was collected with a hand net (mesh size 200 µm) and immediately preserved in 70% ethanol in the field. Later, ostracods were picked out under a binocular microscope in the laboratory. Valves and soft parts were separated under a stereo-microscope (Olympus SZ40). Valves were dried and stored in micropalaeontological slides prior to examination using a scanning electron microscope (HITACHI TM4000Plus at the laboratory equipment center of Mahasarakham University, Thailand). Dissection of soft parts was done in glycerine on glass slides that were later sealed. The limbs were drawn with the aid of a camera lucida, attached to a compound microscope. The chaetotaxy follows Broodbakker & Danielopol (1982), adjusted for the second antenna by Martens (1987) and for the thoracopods by Meisch (2000). All type material is kept in the ostracod collection of the Faculty of Science, Mahasarakham University, Maha Sarakham, Thailand.

The following abbreviations are used in the text and figures: MSU-ZOC, Ostracod Collection of the Faculty of Science, Mahasarakham University, Thailand; MSU, Mahasarakham University; Cp, carapace; g, groove; H, height of valve/carapace; ila, inner lamella; ili, inner list; ilid, double inner list; L, length of valve/carapace; LV, left valve; ol, outer list; RV, right valve; s, space; sc, concave space; STc, complete septa; STi, incomplete septa; 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; R, Rome organ.

TAXONOMY

Family Cyprididae Baird, 1845

Subfamily Cypridopsinae Kaufmann, 1900

Tribe Cyprettadopsini Savatenalinton, 2020

Genus *Mixtadopsis*, new genus

Type species. *Mixtadopsis namiotkoi*, new species (present designation)

Etymology. The genus name is a combination of "Mixta" referring to a combination of characters of several genera and a root suffix "dopsis" of the subfamily Cypridopsinae.

Diagnosis. Cp with LV>RV overlap anteriorly and ventrally, valve surface with strong ornamentation, RV with complete marginal septa and anterior groove, LV with incomplete marginal septa, poster-ventral part of LV with flat space (not concave) and with well-developed inner list (but not double), both RV and LV with knob-like structures ventrally, A1 seven-segmented, A2 natatory setae long with distal pseudosegmentation, claw G2 of A2 strongly serrated, last segment of aesthetasc Y large and striated, one of t setae well-developed (large and long), α and β setae on Md-palp large, terminal segment of Mx1-palp cylindrical, T1 with a-setae (b, c, and d setae absent), T2 with d2 seta (d1 seta absent), penultimate segment undivided, h2 claw long, T3 with completely separated terminal segment, without pincer organ, CR reduced with cylindrical base.

Mixtadopsis namiotkoi, new species
(Figs. 1–6)

Holotype. THAILAND, Huai Bang Bat Reservoir, Bueng Kan Province (18.2769°N, 103.8812°E), 19 March 2024, coll. S. Savatenalinton, female (MSU-ZOC.417)

Paratypes. Same location data as for holotype, eight females (MSU-ZOC.418 to 425)

Etymology. The species is named in honour of Prof. Dr. Tadeusz Namiotko (University of Gdansk, Poland) in recognition of his prominent work on Ostracoda and also for his kind assistance during the meeting (EOM9) in Poland.

Measurements (µm). Cp (N = 3), L = 378–381, H = 238–239, W = 283–291; LV (N = 2), L = 392–393, H = 253–254; RV (N = 2), L = 380–381, H = 240–241.

Diagnosis. Cp in lateral view subtriangular, Cp in dorsal view subglobular, LV overlapping RV anteriorly and ventrally, valve surface strong ornamentation with concentric deep pits and ridges and scattering long thin setules, RV with complete

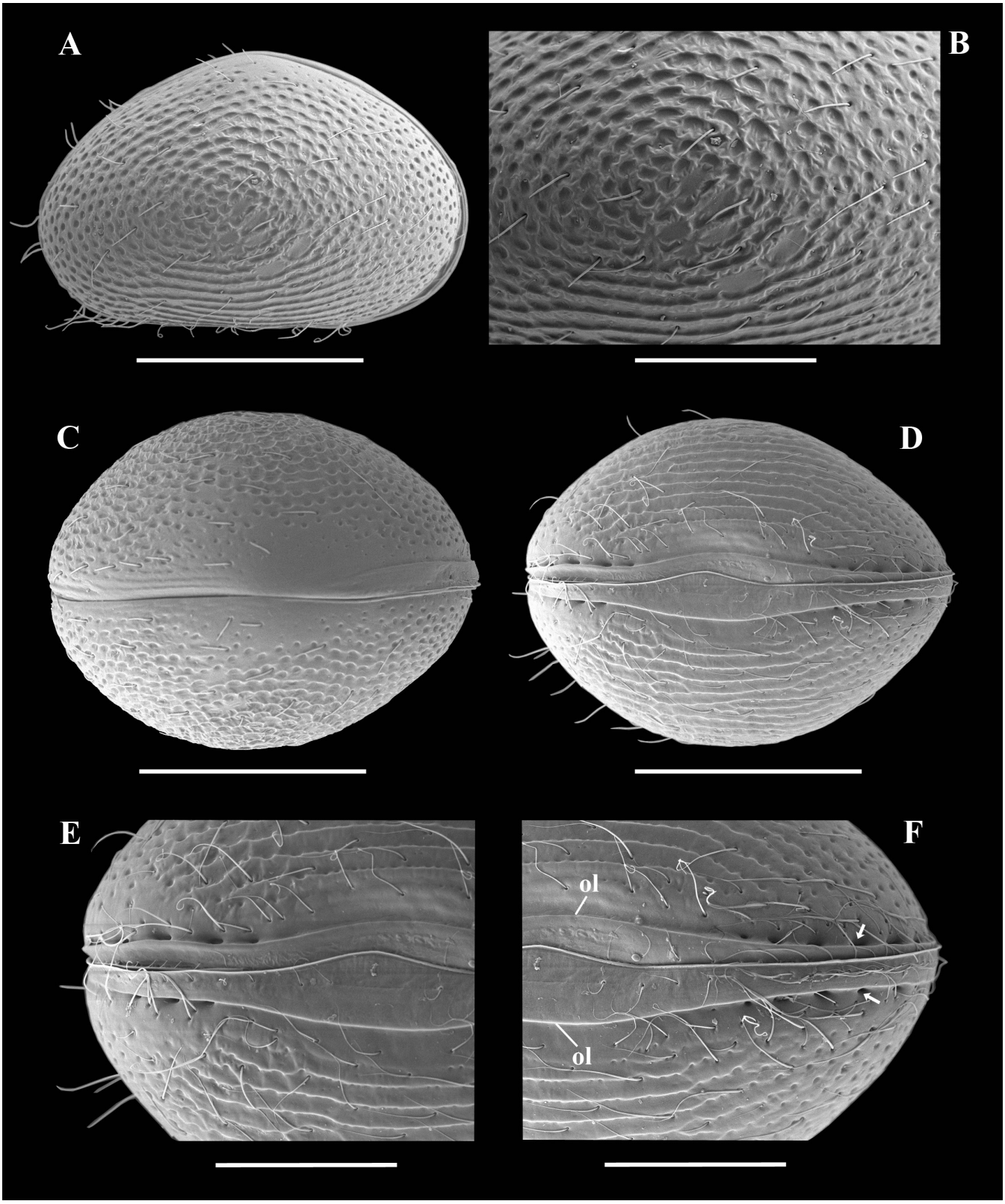

Fig. 1. *Mixtadopsis namiotkoi*, new genus and species, female. A, Cp, lateral right-side view (paratype, MSU-ZOC.418). B, Valve surface (ditto). C, Cp, dorsal view (paratype, MSU-ZOC.423). D, Cp, ventral view (paratype, MSU-ZOC.420). E, Posterior part of Cp, ventral view (ditto). F, Anterior part of Cp, ventral view (ditto). Scale bars: A, C, D = 200 μm, B, E, F = 100 μm. Arrows indicate tiny pores along postero-ventral and antero-ventral parts of both valves.

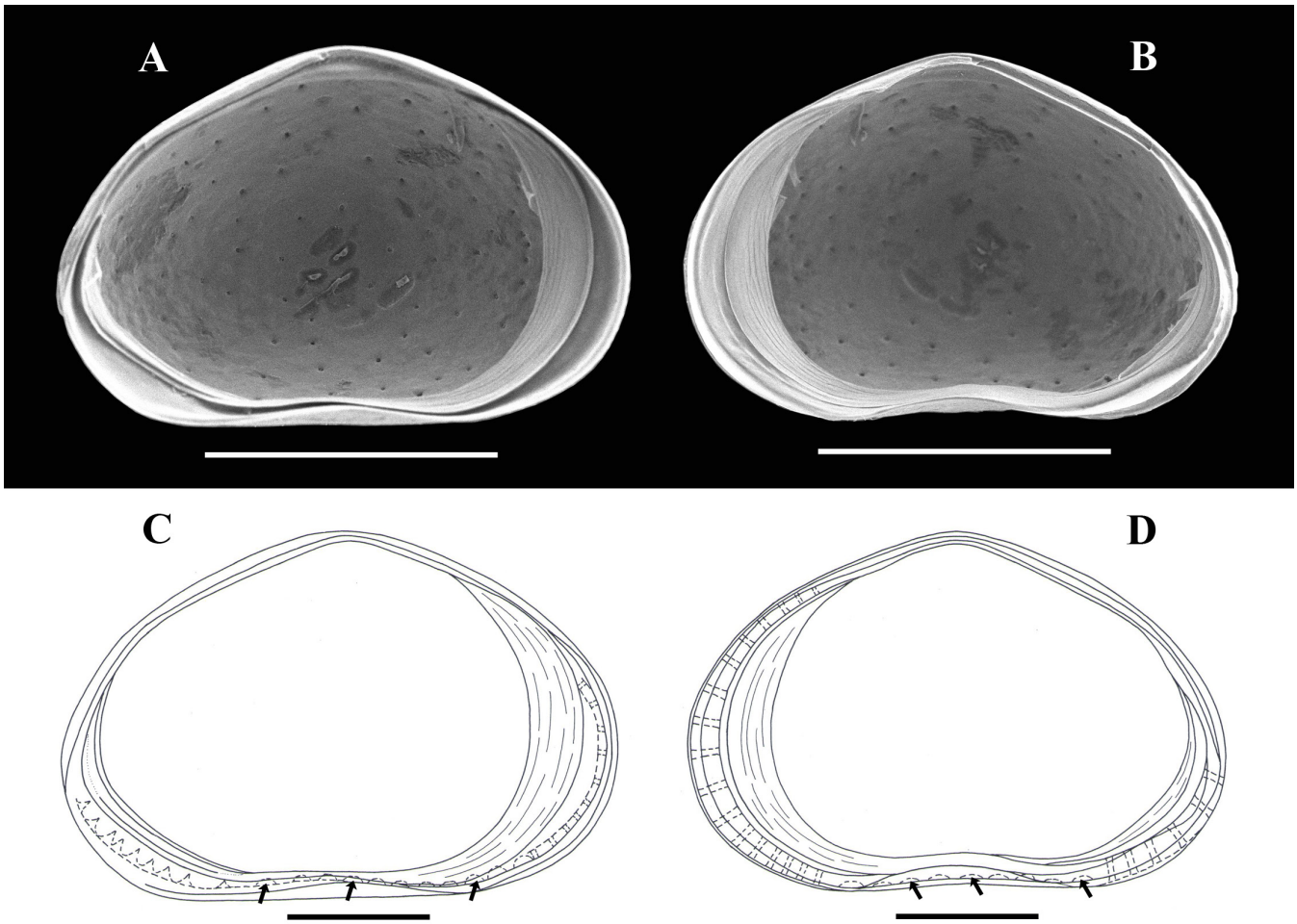

Fig. 2. *Mixtadopsis namiotkoi*, new genus and species, female. A, LV, internal view (holotype, MSU-ZOC.417). B, RV, internal view (ditto). C, Line drawing of LV (ditto). D, Line drawing of RV (ditto). Scale bars: A, B = 200 μm, C, D = 100 μm. Arrows indicate internal knob-like structures on ventral parts of both valves.

marginal septa anteriorly and posteriorly and with knob-like structures ventrally, RV with well-developed anterior groove and poorly developed posterior groove, LV with incomplete marginal septa anteriorly and posteriorly and with knob-like structures ventrally, LV with well-developed posterior inner list but not doubled and with postero-ventral space appearing not concave, A1 seven-segmented, A2 natatory setae long with distal pseudosegmentation, claw G2 of A2 strongly serrated, claws G1–G3 long (length ca. 2.9 times of that of penultimate segment), aesthetasc Y four-segmented with large and striated last segment, t2 seta large and long, Md-palp with large α and β setae, the former with long flagellum-like tip, the latter plumose with needle-like tip, terminal segment with four large claws and two thin setae, Mx1-palp with cylindrical terminal segment and with subapical seta on basal segment, T1 with unequal a-setae, T2 with intermediate-length d2 seta, penultimate segment undivided, E seta present, g and h3 setae tiny, spine-like, h2 claw long and strongly curved, T3 with completely separated terminal segment, without pincer organ, F seta tiny, spine-like, reduced CR with cylindrical base and moderate length flagellum-like seta.

Description of female. Cp in lateral view subtriangular (Fig. 1A), anterior and posterior ends widely rounded, dorsal margin strongly arched, maximum height at mid-length, ventral margin straight, LV slightly larger than RV, LV overlapping RV anteriorly and ventrally, valve surface strong ornamentation with concentric deep pits and ridges and long thin setules dispersedly (Fig. 1B).

Cp in dorsal and ventral views subglobular (Fig. 1C, D) with evenly curved lateral margins, maximum width situated ca. mid-length, posterior and anterior extremities rounded, ventral outer lists well-developed with tiny pores along postero-ventral and antero-ventral margins of both valves, tiny pores without accompanying setae (Fig. 1D–F).

LV in internal view subtriangular (Fig. 2A, C, 6I, J) with greatest height at mid-length, ventral margin straight. Anterior part (Fig. 6J) with submarginal selvage, anterior calcified inner lamella wide with one well-developed inner list and a groove. Posterior part (Fig. 6I) with calcified inner lamella very narrow, one well-developed (not doubled) posterior inner list. This posterior inner list oblique and straight, neither curved nor parallel to valve margin, consequently a wide space appearing between inner list and valve margin at postero-ventral part, this space flat (not concave). Marginal septa (Fig. 2C) not well-developed (incomplete) anteriorly and posteriorly, posterior ones with pointed tips. Ventral margin with knob-like structures.

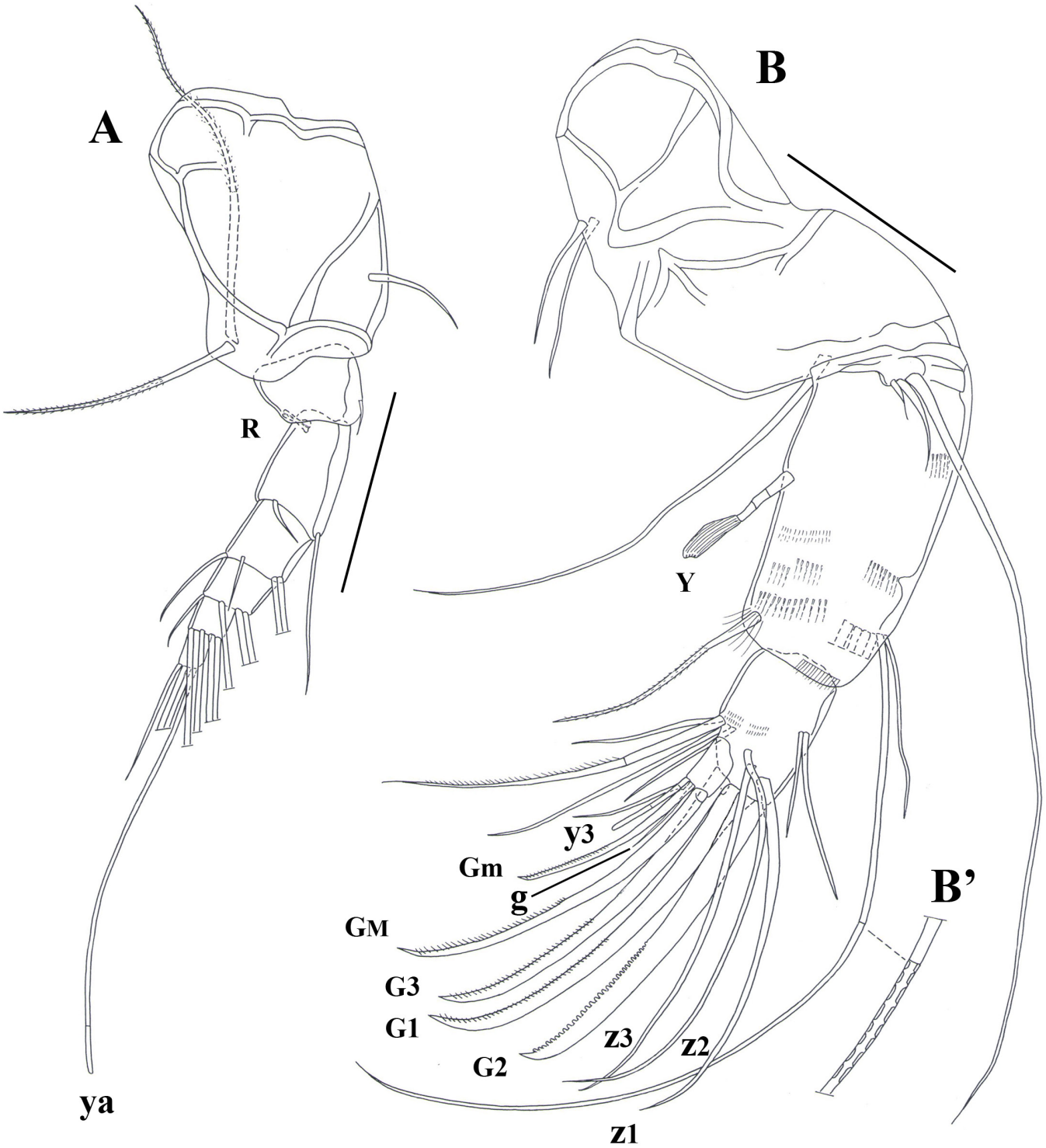

Fig. 3. *Mixtadopsis namiotkoi*, new genus and species, female (holotype, MSU-ZOC.417). A, A1. B. A2. B'. Details of distal parts of long natatory setae with discontinuously thickened lateral margins appearing pseudosegmentation. Scale bars: A = 20 μm, B = 50 μm.

RV in internal view triangular (Fig. 2B, D, 6K, L) with greatest height at mid-length, ventral margin slightly sinuate. Anterior part (Fig. 6K) with marginal selvage, anterior calcified inner lamella wide with well-developed groove. Posterior part (Fig. 6L) with calcified inner lamella narrow, poorly developed groove. Marginal septa (Fig. 2D) well-developed (complete) anteriorly and posteriorly. Ventral margin with knob-like structures.

A1 (Fig. 3A) seven-segmented, first segment with one short dorso-subapical seta (not reaching tip of next segment) and two unequally long ventro-apical setae, Wouters organ absent. Second segment c. two times wider than long, with one very short dorso-apical seta (reaching slightly beyond tip of its segment) and Rome organ. Third segment bearing two setae: one long dorso-apical (reaching tip of terminal segment) and one very short ventro-apical setae (reaching half of next segment). Fourth segment with two long dorsal setae and two short ventral setae (longer seta reaching slightly

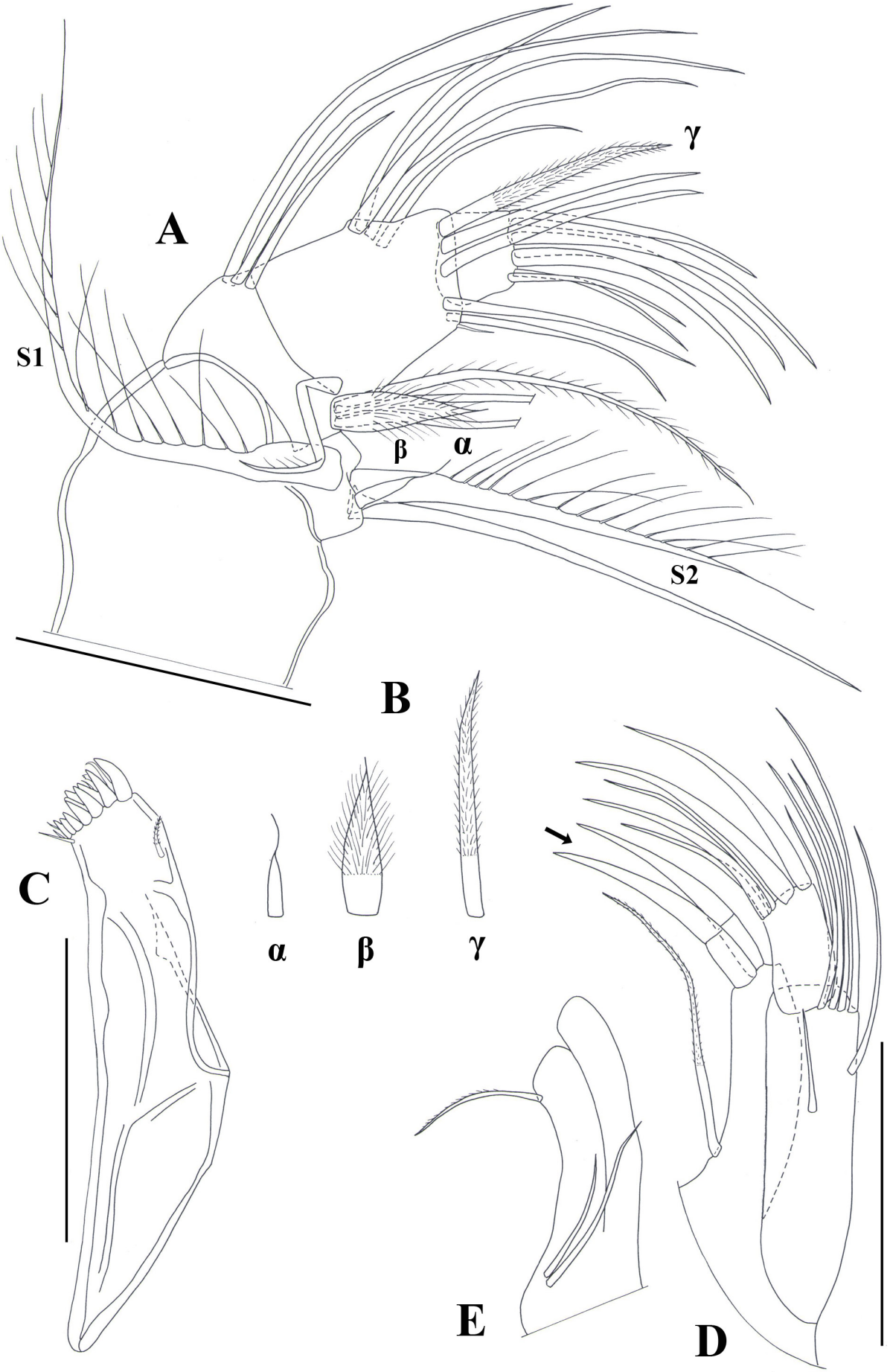

Fig. 4. *Mixtadopsis namiotkoi*, new genus and species, female (holotype, MSU-ZOC.417). A, Md-palp. B, α, β, γ setae of Md-palp. C, Md-coxa. D, Mx1-palp and third endite. E, First and second endites of Mx1. Scale bars: 40 μm. Arrow indicates large bristles on the third endite.

beyond tip of penultimate segment, shortest seta reaching tip of next segment). Fifth segment dorsally with two long setae, medially with one long seta, ventrally with one short seta (not reaching tip of terminal segment). Penultimate segment with four long apical setae (two dorsally, one medially and one ventrally), small seta (α) absent. Terminal segment with three (two long, one short) apical setae and remarkably long aesthetasc ya, length of aesthetasc ya ca. more than that of last six segments, length of short seta ca. ⅓ that of aesthetasc ya.

A2 (Fig. 3B) basal segment with two subequally long proximal setae and one long ventro-apical seta. Exopodite with three (one long, two short) setae, long seta with exceptional length (reaching tip of terminal claws), shortest seta with needle-like tip. First endopodal segment with five very long natatory setae (reaching beyond tips of terminal claws) and one shorter accompanying seta (reaching tip of penultimate segment), distal parts of long natatory setae with discontinuously thicken lateral margins appearing pseudosegmentation, aesthetasc Y four-segmented with large and striated last segment, ventro-apical seta long, extending beyond tip of terminal segment. Penultimate segment short, undivided, medially with two subequally long dorsal setae, and four ventral setae of unequal length (t1–t4), t2 seta more developed than other t setae appearing large and long; this segment distally with three large, long, serrated claws (G1–G3) (length of G1–G3 ca. 2.9 times of that of penultimate segment), G2 with strong serration apically (serration appearing ca. half of its length), aesthetasc y2 not seen, z1–z3 setae long (almost reaching tip of terminal claws), z1 clearly larger than other z setae. Terminal segment with two serrated claws GM and Gm (length of Gm ca. ⅔ of that of GM), short g seta (almost reaching tip of aesthetasc y3) and aesthetasc y3, length of the latter ca. half of that of Gm and shorter than accompanying seta (ca. ⅔ of accompanying seta).

Md-palp (Fig. 4A–B) first segment with two large setae (S1 and S2), one long and slender seta, and large, smooth α seta with long flagellum-like tip. Second segment dorsally with three unequally long apical setae, shortest seta almost reaching tip of next segment; ventrally with a group of three long hirsute setae, one shorter hirsute seta and large, plumose, cone-shaped β seta with needle-like tip. Penultimate segment dorsally with a group of four unequal, long, subapical setae; laterally with slightly plumose apical γ seta (length ca. three times of terminal segment) and three long apical setae; ventrally with two subapical setae, one long (length ca. three times of terminal segment), one very short (reaching mid-length of terminal segment). Terminal segment short (subquadrate shape) bearing four large claws and two shorter, thin setae, length of largest claw ca. 4.5 times that of terminal segment.

Md-coxa (Fig. 4C) elongated, distally with rows of teeth and small setae, largest tooth on dorsal side and other teeth gently decreasing in size toward ventral side, and with slender subapical dorsal seta.

Mx1 (Fig. 4D–E) with two-segmented palp, terminal segment elongated (length ca. two times its width), distally with three claws and two setae, basal segment of palp dorsally with a group of five unequally long apical setae and one long subapical seta; laterally with one short subapical seta (not reaching tip of its segment). Two large bristles on third endite smooth with pointed-tip (without spatula-shaped apex), this endite ventrally with one long basal seta.

T1 (Fig. 5A–B) protopodite with two unequally long a-setae (length of short one ca. ⅔ that of long one), b, c, and d setae absent, distally with 8–9 hirsute apical setae of unequal length, subapical setae absent. Endopodite weakly built palp with one very long, hirsute seta and two unequally shorter apical setae.

T2 (Fig. 5C) with long and very thin d2 seta, d1 absent. Second segment distally with long e seta (almost reaching tip of next segment) and accompanying E seta, length of the latter ca. ⅗ of that of e seta. Penultimate segment undivided, medially with long f seta (reaching beyond tip of terminal segment), distally with tiny, spine-like apical g seta. Terminal segment apically with one dorsal seta (h1) and serrated claw (h2), subapically with one tiny, spine-like ventral seta (h3). Claw h2 very long (length ca. that of last three segments) and strongly curved.

T3 (Fig. 5D–E) first segment with three setae (d1, d2, dp), d1 shortest seta (ca. half-length of dp), d2 and dp setae longer (not reaching tip of next segment). Second segment with short apical e-seta (reaching ca. ⅓ of next segment). Third segment with short f seta (not reaching tip of segment) and tiny, spine-like F seta. Terminal segment completely separated from previous segment, bearing short seta (h1), long claw-like seta (h2) and one reflexed subapical seta (h3), length of h1 less than half length of h2, length of h2 ca. ⅘ of third segment, h3 slightly shorter than h2, pincer organ absent.

CR (Fig. 5F) reduced with cylindrical base and moderate length flagellum-like seta and medially with very short seta, length of ramus ca. ⅚ of that of flagellum-like seta.

Male unknown.

Remarks. *Mixtadopsis namiotkoi*, new species, is the second species of the tribe Cypettadopsini described from Thailand. The species *Potamocypris* sp., which was reported in the Thai ostracod checklist (Savatenalinton & Suttajit, 2016), was recently identified as *Neopotamocypris indivisa* (see Savatenalinton, 2024a). Hence, the genus *Potamocypris* sensu stricto has not yet been found in Thailand. Two species of *Zonocypris,* which were also mentioned in the Thai checklist, were eventually classified as other genera. *Zonocypris* sp. 1 has been placed as a member of *Sarscypridopsis*, but due to limitation in terms of the number of specimens and the quality of specimens available, its nomenclature is left open for now. The identity of *Zonocypris* sp. 2 was eventually clarified as being *Cyprettadopsis sutura* Savatenalinton, 2020 (see Savatenalinton, 2020). *Zonocypris* is therefore

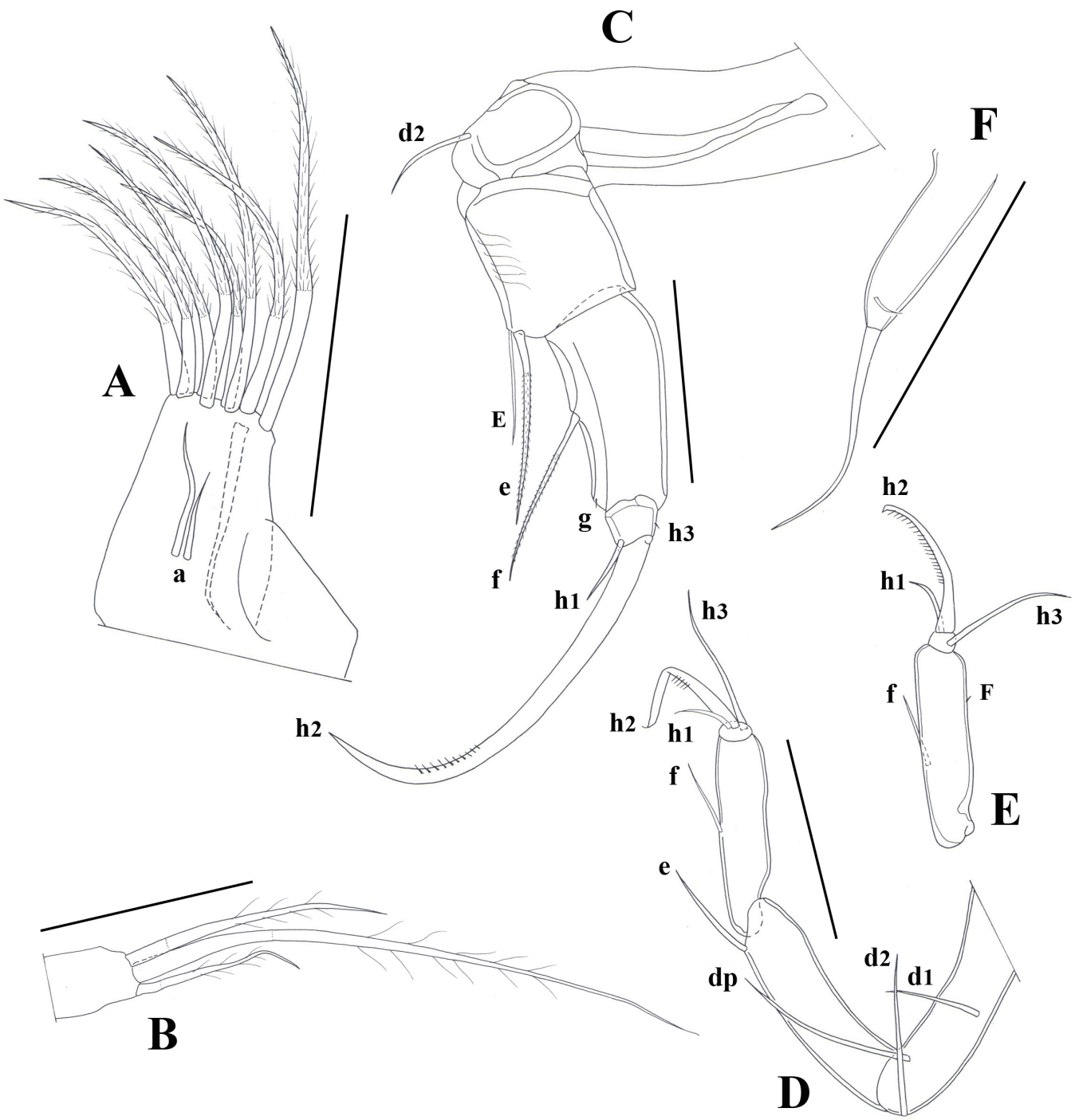

Fig. 5. *Mixtadopsis namiotkoi*, new genus and species, female. A, T1-protopodite (holotype, MSU-ZOC.417). B, T1-palp (ditto). C, T2 (ditto). D, T3 (paratype, MSU-ZOC.419). E, Last two segment of T3 (holotype, MSU-ZOC.417). F, CR (paratype, MSU-ZOC.419). Scale bars: A, B, F = 40 μm, C–E = 20 μm.

no longer known from Thailand. The new taxon brings the numbers of Cypridopsinae species and genera in Thailand to 13 and nine, respectively. A key to the genera of the Thai Cypridopsinae is here provided.

DISCUSSION

The new taxon is peculiar as it shares many characters with several genera of the subfamily Cypridopsinae. At first sight, the new species is very similar to members of *Zonocypris* G.W. Müller, 1898 due to its ornamentation of its valve surface, which is strong and possesses concentric ridges, together with the strongly serrated claw G2 of the A2 (e.g., Müller, 1898; Sars, 1924; Klie, 1936; Rome, 1965; Külköylüoğlu et al., 2021). However, several features of both the soft parts and valves are different from *Zonocypris* species, mainly the presence of the marginal septa, the tiny suture-like pores along the anterior and posterior margins, the undivided penultimate segments of the T2, and the absence of the T3 pincer organ. Following the key to tribes of Cypridopsinae (see Savatenalinton, 2023), this new species belongs to Cyprettadopsini. As this tribe comprises two genera, *Cyprettadopsis* and *Pseudocypretta*, the most

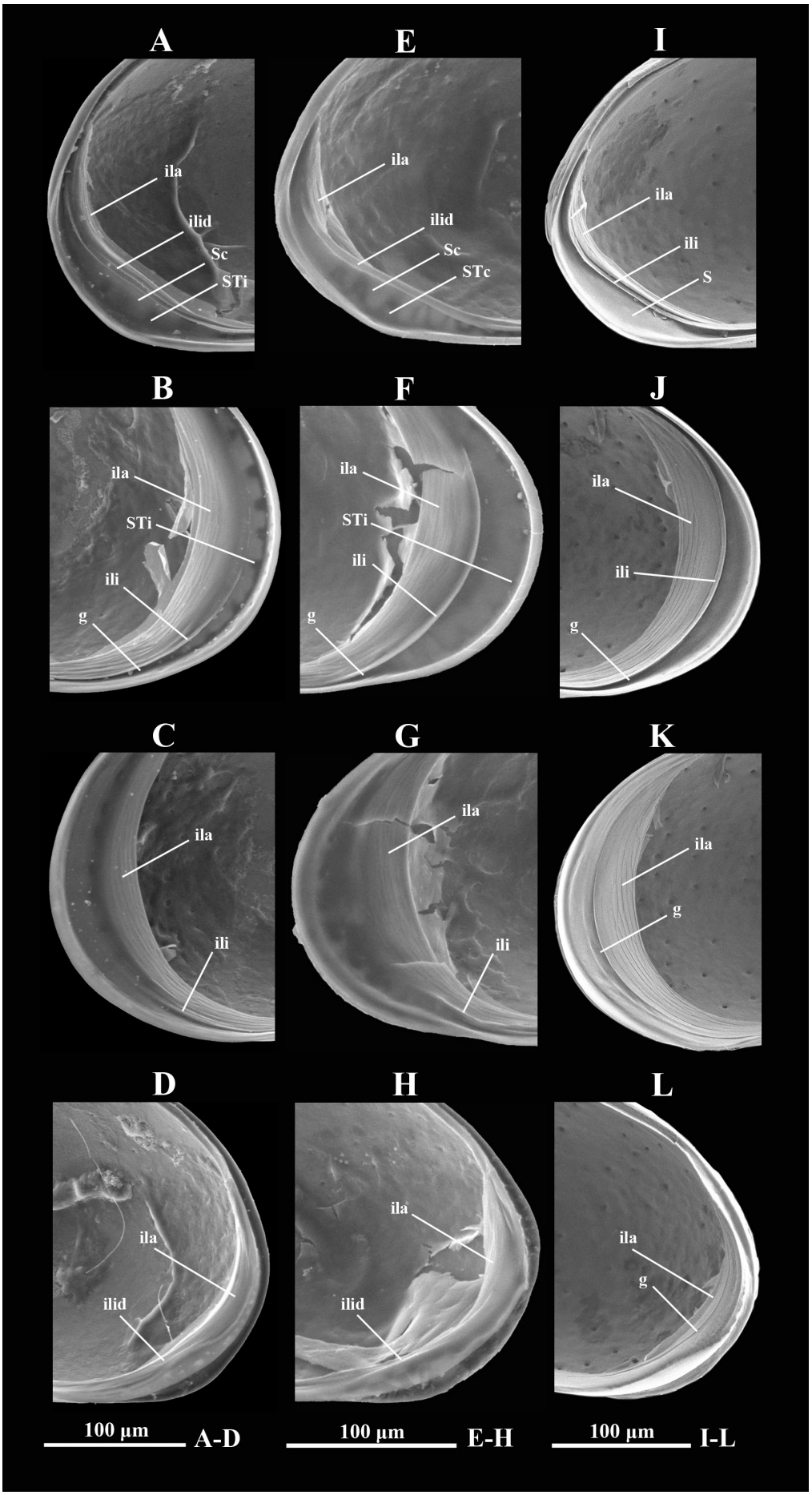

Fig. 6. Comparative morphology of valves of Cyprettadopsini genera. A–D, *Pseudocypretta maculata* Klie, 1932. E–H, *Cyprettadopsis sutura* Savatenalinton, 2020. I–L, *Mixtadopsis namiotkoi*, new genus and species (holotype, MSU-ZOC.417).

important question concerns the proper genus that the new species should be placed in. Although the new species resembles both *Cyprettadopsis* and *Pseudocypretta*, based on the morphology of the soft parts and valves (see discussion below), it also has many different taxonomic characters and thus cannot be placed in either of them. To harbour this new species, a new genus, *Mixtadopsis*, is therefore established.

The morphology of *Mixtadopsis,* new genus, is congruent to that of *Cyprettadopsis* and *Pseudocypretta* in terms of the shared characters of the tribe. In addition, a large β seta on the Md-palp and the reduced CR with cylindrical base make *Mixtadopsis,* new genus, close to *Cyprettadopsis,* whereas the aspects of the marginal septa and the strongly curved h2 claw of the T2 in the new genus resemble those of *Pseudocypretta.* The significant characters of *Mixtadopsis,* new genus, that are different from the two congener genera, primarily exist on the valve structures, particularly the postero-ventral part of LV, the RV anterior part and the ventral margins of both valves, the A2 and the Md-palp.

One of the significant characteristics of the tribe Cyprettadopsini is the presence of a space (or gap) between the inner list and the valve margin at the postero-ventral part of the LV. Such a feature results from the inner list being located apart from and unparalleled to the valve margin. In *Cyprettadopsis*, this space is narrow and the inner list is gently curved while in *Pseudocypretta* it is wide and the inner list is straight at the postero-ventral corner. In *Mixtadopsis,* new genus, the shape of the space is superficially similar to that of *Pseudocypretta*, but it is not concave (as in *Pseudocypretta*). Moreover, the well-developed inner list of the new genus is thin (not doubled), which differs from *Cyprettadopsis* and *Pseudocypretta* that have the doubled inner list.

Unlike the LV anterior part, the RV displays a different anterior structure between *Mixtadopsis,* new genus, and the two related genera. *Cyprettadopsis* and *Pseudocypretta* do not have a RV anterior groove, which is clearly seen in the new genus (Fig. 6K). The anterior and posterior grooves in the new genus are similar to those of *Sarscypridopsis* (see Smith et al., 2023), a genus in the tribe Plesiocypridopsini, but the posterior one is poorly developed (well developed in *Sarscypridopsis*).

Although *Mixtadopsis,* new genus, and the two congeners have marginal septa, they are displayed in different aspects. In *Cyprettadopsis*, the complete septa are located only on the postero-ventral ends of both valves, whereas the complete septa exist on the anterior and posterior margins of the RV in *Pseudocypretta* and *Mixtadopsis,* new genus. It should be noted that the tips of the complete septa are also different: pointed in *Cyprettadopsis* but blunt in *Pseudocypretta* and the new genus. The LV of *Mixtadopsis*, new genus, and *Cyprettadopsis* are similar as they have incomplete anterior septa and pointed tips on the posterior septa. However, the anterior septa in the new genus end with blunt tips while they are tiny with pointed tips in *Cyprettadopsis*. Thus, the RV of *Mixtadopsis*, new genus, more closely resemble those of *Pseudocypretta,* while the LV is more similar to that of *Cyprettadopsis*. Such a situation sets the new genus apart from these two genera. Moreover, in *Mixtadopsis,* new genus, the ventral margins of both valves possess internal knob-like structures that can be seen under a light microscope. Such an exceptional valve component is absent in the two related genera and, moreover, recognised in the subfamily for the first time.

In *Cyprettadopsis* and *Pseudocypretta*, the A2 aesthetasc Y is three-segmented and the last segment is normal-sized while *Mixtadopsis*, new genus, has a four-segmented aesthetasc Y with a large and striated last segment. Such an aspect of the last segment in the new genus has also been reported from *Sarscypridopsis* (see Szwarc et al., 2021; Smith et al., 2023) and *Songkhramodopsis* (see Savatenalinton, 2023), and is most likely to be one of the generic characters of these two genera.

All genera of Cyprettadopsini have long A2 natatory setae that extend beyond the tips of the distal claws. However, in *Mixtadopsis,* new genus, the natatory setae show the outstanding feature that is called pseudosegments here. The setal pseudosegments result from the discontinuous thickening of the lateral margins of the setae that make them look like they are segmented, under observation at 400× magnification. This feature has not previously been found in the Cypridopsinae and thus could serve as a generic feature.

The setae on the A2 exopodite can also provide taxonomic characters. Typically, this segment bears two short and one long setae in the Cypridopsinae genera, including all three genera of Cyprettadopsini, but an exception occurs in *Songkhramodopsis* that has two long and one short setae (Savatenalinton, 2023). The longest seta of the exopodite is long in *Cyprettadopsis* and *Pseudocypretta*, but its apex is rather far from the tips of the terminal claws, which is unlike the case of *Mixtadopsis*, new genus. It should be realised that the length of the seta can vary among species within a genus and be considered a specific character. Nonetheless, as this seta in the new genus is exceptionally long (reaching the tips of the terminal claws) and its length is considerably different from that of all other members of the two related genera, it is here tentatively considered a generic feature. Future discoveries of additional species in the new genus will assist in confirming its taxonomic status.

There is no doubt that the number of t setae on the A2 is a generic character of, for example, *Siamopsis* and *Malawidopsis* as they have two t setae (Savatenalinton, 2017; Jacobs & Martens, 2022; Smith, 2023), while other Cypridopsinae genera have four t setae. The morphology of the t setae can also be used as a taxonomic character. In *Cyprettadopsis* and *Pseudocypretta*, all four t setae are slender with different lengths whereas in *Mixtadopsis,* new genus, the t2 seta is markedly large and long, which resembles that of *Sarscypridopsis* (e.g., Szwarc et al., 2021; Smith et al., 2023). This feature is tentatively considered generic as it has not previously been seen in the tribe.

The morphology of the α, β, and γ setae typically serve as generic characters in different lineages of freshwater ostracods, such as *Neocypridella* Hartmann & Puri, 1974 in Neocypridellinae (see Savatenalinton, 2022b). Like *Cyprettadopsis*, *Mixtadopsis*, new genus, has the large β-seta, while this seta is small in *Pseudocypretta*. However, the morphology of the α seta in the new genus is exceptional as it is large with a long flagellum-like tip. Such a feature has not been previously noted in the tribe, and thus constitutes a good generic character. Apart from *Mixtadopsis,* new genus, the large α seta can be found in *Songkhramodopsis*, a genus in the tribe Songkhramodopsini (see Savatenalinton, 2023).

Additionally, *Mixtadopsis,* new genus, also differs from the two related genera in several other aspects. Typically, the second segment of the T2 only bears apical e seta. Unlike other genera of the tribe, or even of the subfamily, the new genus possesses one more seta next to the e seta. This additional seta, which is here named the E seta, is markedly long. Although the taxonomic status of the E seta in the new genus would be confirmed by the further discovery of a second species, it is plausibly considered a derived feature of the tribe. The phenomenon of the E seta is perhaps similar to the account on the third segment of the same limb on which the apical g seta has accompanying seta in many species and genera, such as *Malawidopsis*, *Neopotamocypris*, *Sarscypridopsis*, and *Songkhramodopsis* (see Szwarc et al., 2021; Jacobs & Martens, 2022; Smith et al., 2023; Savatenalinton, 2023, 2024a). Given the fact that this accompanying seta (here called the G seta) can be small (as seen in *Sarscypridopsis harundineti* Szwarc, Martens & Namiotko, 2021, *Neopotamocypris indivisa* Savatenalinton, 2024—see Szwarc et al., 2021; Savatenalinton, 2024a), it can be overlooked in previously described species. Moreover, it should be realised that this detailed structure is often ignored and not illustrated in descriptions of many Cypridopsinae members, whether it exists or not. Nevertheless, the well described and illustrated species suggest that the occurrence of the G seta can be either a generic character as in the case of *Malawidopsis* (presence of G seta) and *Pseudocypretta* (absence of G seta) or a specific one as in the case of *Strandesia* Stuhlmann, 1888, a genus in a different subfamily (Cypricercinae) (see Savatenalinton & Martens, 2009, 2010). In *Mixtadopsis,* new genus, the accompanying G seta is absent. In addition, it should be underlined that the g and h3 setae are very tiny, and can only be seen with 1000× magnification. Thus, it could be misinterpreted that the setae are absent if the observation is done under a lower magnification. Nevertheless, in either case, the scenario of these setae (g and h3 setae) in the new genus is exceptional and clearly differs from *Cyprettadopsis* and *Pseudocypretta*. Although the length of the setae could be an intraspecific aspect, the phenomenon of such considerably reduced setae suggests a significant difference in the tribe and a plausible generic feature. In Cypridopsinae, the reduced form of the setae has been reported from *Paranadopsis* (tribe Paranadopsini) and is a primarily indicative character of the genus (Almeida et al., 2021).

The primary significant character of Cypridopsinae is the reduced CR and the shape of its base is used for discrimination between genera in the subfamily (Karanovic, 2012; Horne et al., 2019). For example, a triangular shape is seen in *Tanganyikacypridopsis* (see Martens, 1985), *Sarscypridopsis* (see Szwarc et al., 2021; Smith et al., 2023), *Thermopsis* Külköylüoğlu, Meisch & Rust, 2003 (see Külköylüoğlu et al., 2003) and *Pseudocypretta* (see Ma & Yu, 2020; Savatenalinton et al., 2022), whereas a cylindrical shape is reported from *Klieopsis* Martens, Meisch & Marmonier, 1991 (see Martens et al., 1991), *Siamopsis* (see Savatenalinton, 2017), *Plesiocypridopsis* Rome, 1965 (see Meisch, 2000) and *Cyprettadopsis* (see Savatenalinton, 2020). *Mixtadopsis,* new genus, belongs to the latter group and this feature sets the new genus apart from *Pseudocypretta*.

The presence of minute suture-like pores along the anterior and posterior outer lists of the valves was considered to be a diagnostic character of *Cyprettadopsis*. However, since *Pseudocypretta franki* was discovered, in which these pores were also illustrated (Ferreira et al., 2023), such a feature is no longer restricted to the genus *Cyprettadopsis*, but it certainly extends to the tribe as it is also found in *Mixtadopsis,* new genus.

Morphological comparisons between *Cyprettadopsis* and *Pseudocypretta* were given by Ferreira et al. (2022), together with *Cypretta*, a genus of Cyprettinae. More characters, including those of *Mixtadopsis,* new genus, are herein provided in Table 1 to compare morphologies between these three genera of the tribe.

Consequently, *Mixtadopsis,* new genus, is close to *Cyprettadopsis* and *Pseudocypretta* as it has co-features of the tribe Cyprettadopsini, although it also shares some characters with several cypridopsinae genera, particularly *Zonocypris* and *Sarscypridopsis*. The new genus can be primarily distinguished from the two congeners by the flat space at the postero-ventral corner and the thin inner list of the LV, the RV anterior groove, the ventral knob-like structure of both valves, the four-segmented A2 aesthetasc Y with the large and striated last segment, the A2 natatory setae with the distal pseudosegmentation, and the large α-seta with the long flagellum-like tip. In addition, the new genus differs from *Cyprettadopsis* by the marginal septa and the markedly long and strongly curved h2 claw of the T2. The discriminating characters between *Mixtadopsis,* new genus, and *Pseudocypretta* also include the reduced CR (cylindrical base in the new genus, triangular base or absent in *Pseudocypretta*) and the β-seta on the Md-palp (large in the new genus, small in *Pseudocypretta*).

Key to genera of Cypridopsinae in Thailand

1. Terminal segment of Mx1-palp spatula shape, penultimate segment of T2 undivided ..... *Neopotamocypris*
– Terminal segment of Mx1-palp cylindrical shape 2
2. A1 6-segmented, T3 without pincer organ..... *Songkhramodopsis*
A1 7-segmented, T3 with or without pincer organ..... 3
3. Marginal septa present, T3 without pincer organ, T2 penultimate segment undivided..... 4

Table 1. Morphological comparison between genera of the tribe Cyprettadopsini (Based mainly on Klie (1932), Battish (1978, 1982), Victor & Fernando (1979, 1981), Savatenalinton (2020), Ma & Yu (2020), Savatenalinton et al. (2022), Ferreira et al. (2022, 2023), present paper)

Character	***Pseudocypretta***	***Cyprettadopsis***	***Mixtadopsis*, new genus**
*Cp overlap	LV > RV anteriorly, ventrally	LV > RV anteriorly, ventrally	LV > RV anteriorly, ventrally
Cp shape: lateral view	subtriangular	elongated	subtriangular
Valve surface	shallow pits, with tiny setae	somewhat smooth, with tiny shallow pit (at Cp mid-length) and thin setae	strong ornamentation, with long setae, concentric deep pits and ridges
RV anterior marginal septa	complete	incomplete	complete
RV posterior marginal septa	complete	complete	complete
LV anterior marginal septa	no septa / incomplete / complete	incomplete	incomplete
LV posterior marginal septa	no septa / incomplete / complete	complete	incomplete
LV external list	complete, with pore in some species	complete, with pore	complete, with pore
LV postero-ventral inner list	straight, doubled	slightly curved, doubled	straight, not doubled
LV postero-ventral space	wide, concave	narrow, concave	wide, not concave
RV anterior groove	absent	absent	present
RV postero-ventral inner list	well-developed	well-developed	absent
*A2 G2 claw	strongly serrated	strongly serrated	strongly serrated
A2 exopodite: longest seta	shorter (not reaching tips of terminal claws)	shorter (not reaching tips of terminal claws)	very long (reaching tips of terminal claws)
A2 aesthetasc Y: number of segment	3	3	4
A2 aesthetasc Y: last segment	normal	normal	large, striated
*A2 natatory setae	long	long	long
A2 natatory setae: distal pseudosegments	absent	absent	present
A2 t2 seta	slender	slender	large and long
Md-palp α seta	small, slender	small, slender	large, with long flagellum-like tip
Md-palp β seta	small	large	large
*Mx1-palp terminal segment	cylindrical	cylindrical	cylindrical
Mx1-palp: subapical seta on basal segment	present	absent	present
T1 a-setae	subequal	unequal	unequal

Character	*Pseudocypretta*	*Cyprettadopsis*	*Mixtadopsis*, new genus
*T1 b and d setae	absent	absent	absent
*T2 penultimate segment	undivided	undivided	undivided
*T2 d1 seta	absent	absent	absent
T2 d2 seta	long	tiny	long
T2 E seta	absent	absent	present
T2 h2 claw	long, strongly curved	short, slightly curved	long, strongly curved
*T3 terminal segment	completely separated	completely separated	completely separated
*T3 pincer organ	absent	absent	absent
T3 F seta	absent	absent	present
CR	reduced with triangular base / absent	reduced with cylindrical base	reduced with cylindrical base

Remarks * shared characters

– Marginal septa absent, T3 with pincer organ, T2 penultimate segment divided.....6

4. RV anterior groove present, LV postero-ventral space not concave, A2 natatory setae with distal pseudosegments ....*Mixtadopsis* new genus
– RV anterior groove absent, LV postero-ventral space concave, A2 natatory setae without distal pseudosegments.....5
5. RV anterior margin with complete septa, CR with triangular base .....*Pseudocypretta*
– RV anterior margin with incomplete septa, CR with cylindrical base .....*Cyprettadopsis*
6. RV overlapping LV.....7
– LV overlapping RV.....8
7. LV with plate-like protrusion on postero-dorsal part, CR with cylindrical base.....*Siamopsis*
– LV without plate-like protrusion on postero-dorsal part, CR with triangular base.....*Sarscypridopsis*
8. Female A2 with large and strongly serrated claw G2, large setae on Mx1 endites with spatula-shaped apex ....*Thaicypridopsis*
– Female A2 with normal size claw G2, large setae on Mx1endites without spatula-shaped apex ..... *Cypridopsis*

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