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Review of the leafhopper genus *Thaia* Ghauri and related genera (Hemiptera: Cicadellidae: Typhlocybinae: Erythroneurini)

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Abstract

The leafhopper genus *Thaia* Ghauri, 1962 and two related genera, *Parathaia* Kuoh, 1982 and *Pseudothaia* Kuoh, 1982, are revised. *Nlunga* Dworakowska, 1974, previously treated as a subgenus of *Thaia*, is elevated to the genus level, and *Parathaia* Kuoh, 1982, previously treated as a synonym of *Thaia*, is reinstated to valid status. The Oriental species lacking foveae on the pronotum are excluded from *Nlunga* and transferred to a new genus, *Etmaria* **gen. n.** Two species, *Pseudothaia caudata* Song & Li, 2013 and *Thaia* (*Nlunga*) *leishanensis* (Song & Li, 2007), are treated as *Incertae sedis* within Erythroneurini. Moreover, nine additional new species are described and illustrated: *Nlunga parareeneni*, *Etmaria brevis*, *E. chaiyaphumica*, *E. dentata*, *E. indonesica*, *E. magna*, *E. triquetra*, *E. ulterior* and *Pseudothaia forcipis* **spp. nov.**

Key words: Homoptera, Auchenorrhyncha, morphology, taxonomy, new taxa, new status

Introduction

The Old World erythroneurine genus *Thaia* Ghauri, 1962 is a large group consisting of three subgenera and 42 species (Dmitriev, 2003 + updates). Many species were placed in this genus often based solely on the presence of two large triangular impressions on the pronotum, well-developed anal tube appendages and presence of the pygofer ventral appendages (which are the main characters of this genus). Among the three subgenera, the least speciose, *Thaia* (*Niema*) Dworakowska, 1979, is distinctive in having a pygofer dorsal appendage. However, criteria used by previous researchers to distinguish the nominotypical subgenus and *Thaia* (*Nlunga*) Dworakowska, 1974 are confusing. For instance, the position of the anal tube appendages was considered an important diagnostic character to distinguish *Thaia* (*Thaia*) (basally) and *Thaia* (*Nlunga*) (apically) by Dworakowska (1976) and Song and Li (2012). However, *Thaia* (*Thaia*) *vulgaris* Dworakowska, 1994a and *Thaia* (*Nlunga*) *ryukyuensis* Ohara, 2010 have apical and basal anal tube appendages respectively, contradicting the diagnosis above. Chiang and Knight (1990) and Song and Li (2008) used a key to separate the Chinese species of *Thaia* (*Thaia*) from *Thaia* (*Nlunga*) based on whether the pygofer lobe is produced (in the former) or rounded apically (in the latter). This key cannot, however, be applied to the species of *Thaia* from other regions. Besides, the Afrotropical species of *Nlunga* are apparently different from most of the species in this group in view of their foveate pronotum. Kuoh (1982) established two genera related to *Thaia*, *Parathaia* and *Pseudothaia*, both with the characters mentioned above. *Parathaia* was later considered as a synonym of *Thaia* by Song and Li (2014), causing even more heterogeneity in *Thaia*.

In this work, we revise the morphological concepts of these groups, except for the subgenus *Thaia* (*Niema*). *Nlunga* is elevated to genus level and restricted to include species having a foveate pronotum. A new genus *Etmaria* **gen. n.** is established to encompass species excluded from *Nlunga*, as well as seven new species. *Parathaia* is also

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reinstated to genus status, but only contains the type species *P. bimaculata* Kuoh, 1982. *Pseudothaia* is redefined based on the type species and a new species. *Thaia* (*Nlunga*) *anchora* Song & Li, 2008 **syn. n.** is recognized as a junior synonym of *Etmaria infumata* (Kuoh, 1982) **comb. n.** Nine new combinations are proposed: *Etmaria australis* (Dworakowska & Viraktamath, 1979), *E. decembris* (Dworakowska, 1984), *E. formosana* (Matsumura, 1932), *E. infumata* (Kuoh, 1982), *E. maxima* (Dworakowska, 1976), *E. mengyanga* (Song & Li, 2012), *E. obtusa* (Dworakowska & Viraktamath, 1979), *E. ryukyuensis* (Ohara, 2010) and *E. sinuata* (Chiang & Knight, 1990) **combs. n.** Nine new species are described: *Nlunga parareeneni*, *Etmaria brevis*, *E. chaiyaphumica*, *E. dentata*, *E. indonesica*, *E. magna*, *E. triquetra*, *E. ulterior* and *P. forcipis* **spp. nov.** Two species are treated as *Incertae sedis* within Erythroneurini: *Pseudothaia caudata* Song & Li, 2013 and *Thaia* (*Nlunga*) *leishanensis* (Song & Li, 2007).

Materials and methods

The morphological terminology follows Young (1952) except for the abdominal apodemes and the wing: the definitions of the abdominal apodemes refer to Ross (1959), and the nomenclature for the wing veins is adopted from Dworakowska (1993). Habitus photos were taken using Canon EOS 5D equipped with Canon MP-E 1–5x 65mm lens. Multiple photographs were compressed into final images by CombineZP. Abdomens and genitalia were removed from specimens and cleared in a 10% KOH solution heated for 1–2 minutes. Cleared material was then rinsed in water and stored in glycerine. A Nikon SMZ1500 dissecting microscope was used for viewing and an Olympus BH-2 stereoscopic microscope for drawing.

Specimens are deposited in Entomological Museum, Northwest A&F University (NWAFU), Yangling, China, Illinois Natural History Survey (INHS), Champaign, USA, Queen Sirikit Botanical Garden (QSBG), Chiang Mai, Thailand, and Taiwan National Museum of Natural Science (TNMNS), Taichung, Taiwan, China.

Nlunga Dworakowska, 1974 stat. n.

Nlunga Dworakowska, 1974: 191
Thaia (*Nlunga*) Dworakowska, 1976: 50

Type species: *Nlunga reeneni* Dworakowska, 1974, by original designation

Description. Body robust, ground color testaceous to yellow testaceous. Head slightly narrower than pronotum, crown fore margin subparallel to hind margin, coronal suture indistinct or distinct basally. Ocelli rudimentary. Face convex in profile, anteclypeus relatively long, oval, lorum large. Pronotum and basal part of forewing with numerous conspicuous cavities. Forewing with first and third apical cell widest, fourth apical cell not reached apex of wing, shorter than third apical cell. Hind wing venation usual for Erythroneurini, RA vein absent.

Male abdominal apodemes 2S very small, only slightly surpassing fore margin of sternite III. Anal tube sclerotized, with slender but solid appendages at distal half, appendages short to long, straight or nearly straight.

Pygofer lobe well sclerotized and pigmented at basal half, distal lobe membranous, angulately produced apically, boundary between basal and distal lobes very clear, setosity rudimentary or poorly developed; dorsal appendage absent; ventral appendage slim, directed caudad, fused to pygofer lobe, extended from the lower distal angle of basal sclerotized lobe. Subgenital plate surpassing hind margin of pygofer lobe, wide basally and narrowing towards apex, distal disc somewhat expanded on vertical level; with row of 3–9 macrosetae near outer margin and row of rigid setae along lateral margin from subbase to apex. Style with apical part short and narrowing towards apex, preapical lobe greatly expanded, nearly triangular. Connective lamellate, manubrium broad, central lobe well developed, with or without central ridge of manubrium. Aedeagal shaft tubular with papillose apex, curved dorsad, without process; dorsal apodeme rudimentary to developed; preatrium narrow in lateral view, developed vertically, provided with single solid process far from shaft; gonopore terminal.

Remarks. This genus was established by Dworakowska (1974) and thereafter treated as a subgenus of *Thaia* Ghauri by herself (Dworakowska, 1976). It contained 15 species previously, distributed in the Afrotropical and Oriental regions. However, we found that the Afrotropical species and three species from South Asia are remarkably different from the other Oriental species in pronotum texture, the pygofer ventral appendage and the aedeagus.

Therefore, we exclude most of the Oriental species and retain only the species with pits on the pronotum in this genus. The new list of species can be subdivided into the African group (*N. parareeneni* **sp. nov.**, *N. reeneni* and *N. theroni*) and the Oriental group (*N. drutoidea*, *N. indica* and *N. lankaensis*). All the African species have a widened atrium of the aedeagus and developed lamellae on sides. Besides, they have a shorter anal tube appendage, less expanded preapical lobe of the style, and thicker, shorter preatrial process compared to the Oriental group.

Distribution. Republic of Congo; India; Sri Lanka.

Diagnosis. This genus resembles *Thaia* (*Thaia*) Ghauri in body shape, wing venation and style shape, and in having well-developed anal tube and pygofer ventral appendages but lacking the pygofer dorsal appendage. *Nlunga* differs in having the pronotum with numerous pits, the anal tube appendage on the distal half, the pygofer lobe sclerotized only in the basal half, the pygofer ventral appendage slim and extended from the middle lower margin of the lobe, and the aedeagal shaft shorter.

Species checklist of *Nlunga*
N. drutoidea Dworakowska, 1994a
N. indica (Ramakrishnan & Menon, 1974)
N. lankaensis Dworakowska, 1994a
N. parareeneni Cao & Dietrich **sp. nov.**
N. reeneni Dworakowska, 1974
N. theroni Dworakowska, 1974

1. *Nlunga drutoidea* Dworakowska, 1994

Thaia (*Nlunga*) *drutoidea* Dworakowska, 1994a: 19, Figs 175–186

Distribution. India; Sri Lanka.

2. *Nlunga indica* (Ramakrishnan & Menon, 1974)

Sirosoma indica Ramakrishnan & Menon, 1974: 435, Plate XIX, Fig. 35
Thaia (*Nlunga*) *indica*: Dworakowska 1976: 50; Dworakowska & Viraktamath, 1979: 51, Figs 16–26; Sohi & Dworakowska, 1983: 183

Distribution. India.

3. *Nlunga lankaensis* Dworakowska, 1994

Thaia (*Nlunga*) *lankaensis* Dworakowska, 1994a: 20, Figs 187–194

Distribution. Sri Lanka

4. *Nlunga parareeneni* Cao & Dietrich sp. nov.
Figs 1, 18a–d

Description. Ground color pale, eyes grey, without patches.

Anal tube appendage near middle, short, thorn-like.

Pygofer lobe without setae; ventral appendage slim and long, slightly expanded subapically in ventral view, apex pointed. Subgenital plate with about 5 macrosetae. Style with relatively small preapical lobe. Connective long, without central ridge of manubrium. Aedeagal shaft short; atrium very wide in caudal view, lateral lamellae of atrium reduced; dorsal apodeme developed, lamellate in lateral view; preatrium large, preatrial process thick and straight.

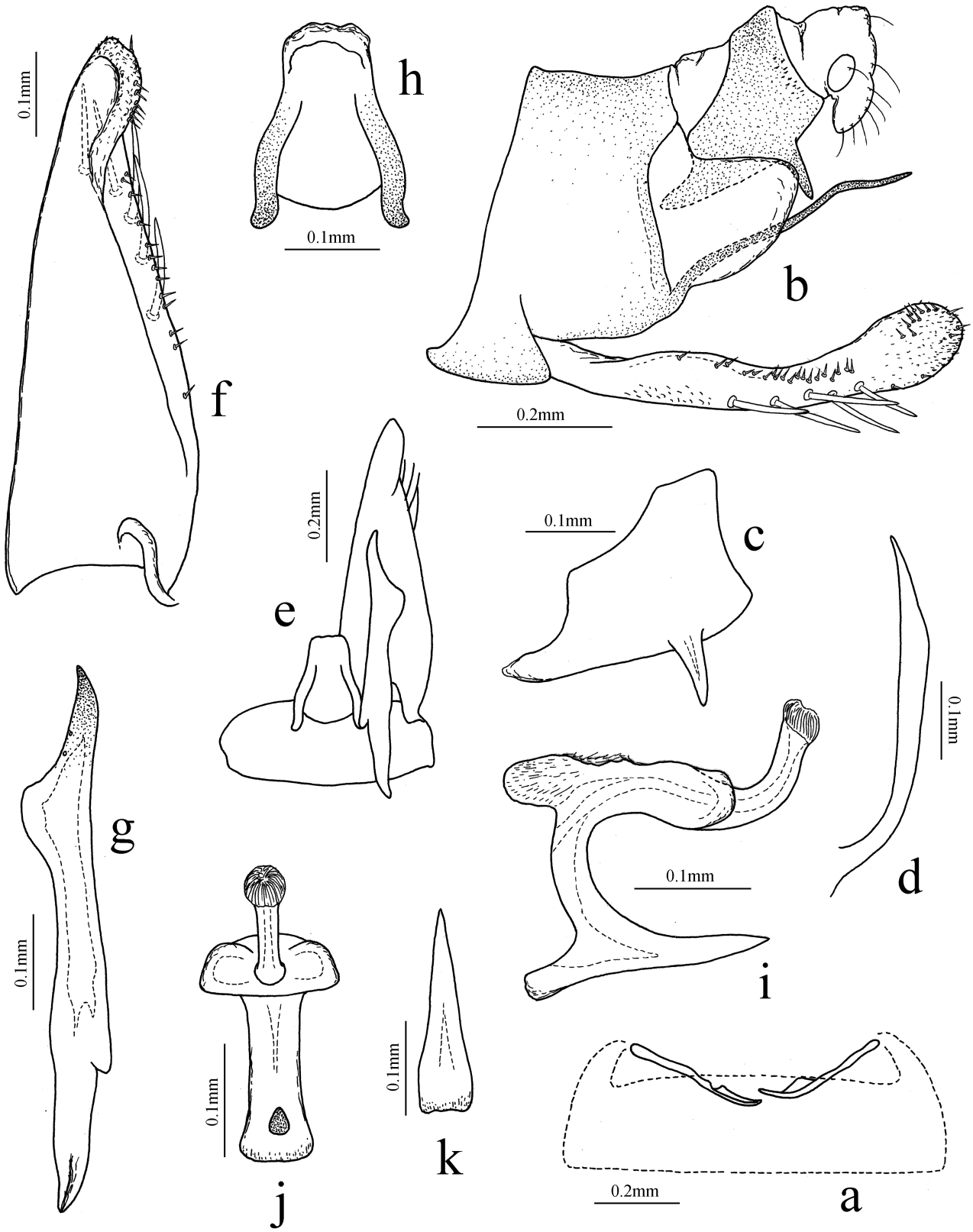

FIGURE 1. *Nlunga parareeneni* Cao & Dietrich **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube and appendage, lateral view; d. pygofer ventral appendage, ventral view; e. subgenital plate, style, connective and sternite IX; f. subgenital plate, dorsal view; g. style, dorsal view; h. connective; i. aedeagus, lateral view; j. aedeagus, caudal view; k, preatrial process, ventral view.

Measurement. Male length 3.80–3.90 mm, female length 3.70 mm.

Material examined. Holotype: ♂, GHANA, Western Region, Ankasa Resource Reserve, Nkwanta Camp, 5°16'54.2"N, 2°38'27.1"W; 7-9 vi 2005, ~350' elev., coll. J.R. Cryan & J.M. Urban. Paratypes: 1♂1♀, same as the holotype. [INHS].

Etymology. The new specific epithet combines the Latin prefix "*para*" with the species name "*reeneni*", in view of the similarity of the new species to the type species of this genus *N. reeneni*.

Diagnosis. The new species is similar to the other African species of *Nlunga*, but the aedeagus is longer and has reduced lateral lamellae of the atrium.

5. *Nlunga reeneni* Dworakowska, 1974

Figs 2, 18e–h

Nlunga reeneni Dworakowska, 1974: 193, Figs 460–469

Remarks. The examined specimens have slightly longer and narrower pretrial process of the aedeagus compared to the original illustration (Dworakowska, 1974: Fig. 465), the other structures are almost identical.

Material examined. 1♂, REPUBLIC OF CONGO, Dept. Pool, Iboubikro site, Lesio-Loun Pk, 330 m, 03°06.020'S, 015°31.440'E, 19–26 viii 2008, Malaise trap, coll. Braet; 1♂1♀, same locality as former, 340 m, 11–18 viii 2008, coll. Braet & Sharkey. [INHS].

Distribution. Republic of Congo.

6. *Nlunga theroni* Dworakowska, 1974

Nlunga theroni Dworakowska, 1974: 193, Figs 470–473

Distribution. Republic of Congo.

Etmaria Cao & Dmitriev gen. nov.

Type species: *Parathaia infumata* Kuoh, 1982, here designated.

Description. Body robust, ground color pale grey to black, sometimes dark orange, usually without patches. Head narrower than pronotum, crown fore margin subparallel to hind margin, usually with distinct coronal suture. Face convex in profile, anteclypeus oval, short to long, lorum large. Pronotum with pair of large triangular impressions. Forewing with third apical cell widest, fourth apical cell not reached apex of wing, slightly shorter than third apical cell. Hind wing venation usual for Erythroneurini, RA vein absent.

Male abdominal apodemes 2S very small, not extended to hind margin of sternite III. Anal tube well sclerotized, with solid, long appendages usually extended from distal half, slightly curved ventro-cephalad, additional pair of short appendages sometimes present near base of the anal tube, rarely with basal appendages only.

Pygofer lobe well sclerotized in basal half, distal lobe membranous, rounded or truncate apically, usually with clear boundary between basal and distal lobes, setosity rudimentary; dorsal appendage absent; ventral appendage articulated with pygofer lobe at boundary between basal sclerite and apical membrane, tubular or lamellate, basal part enlarged, with numerous small tubercles or rigid setae basally. Subgenital plate surpassing hind margin of pygofer lobe, wide basally and narrowing towards apex, distal disc usually expanded vertically; with row of 2–5 macrosetae near outer margin and row of rigid setae along lateral margin from subbase to apex. Style with apical part slender, short to long, preapical lobe greatly expanded, nearly triangular. Connective lamellate, manubrium narrow to broad, with distinct central ridge, central lobe well developed. Aedeagal shaft tubular, usually with papillae apically, atrium well developed, elongated or widened; dorsal apodeme rudimentary to large; preatrium long, with or without pair of preatrial processes, process usually present in species with widened atrium; gonopore terminal.

Etymology. The new generic name is an arbitrary combination of letters; the gender is feminine.

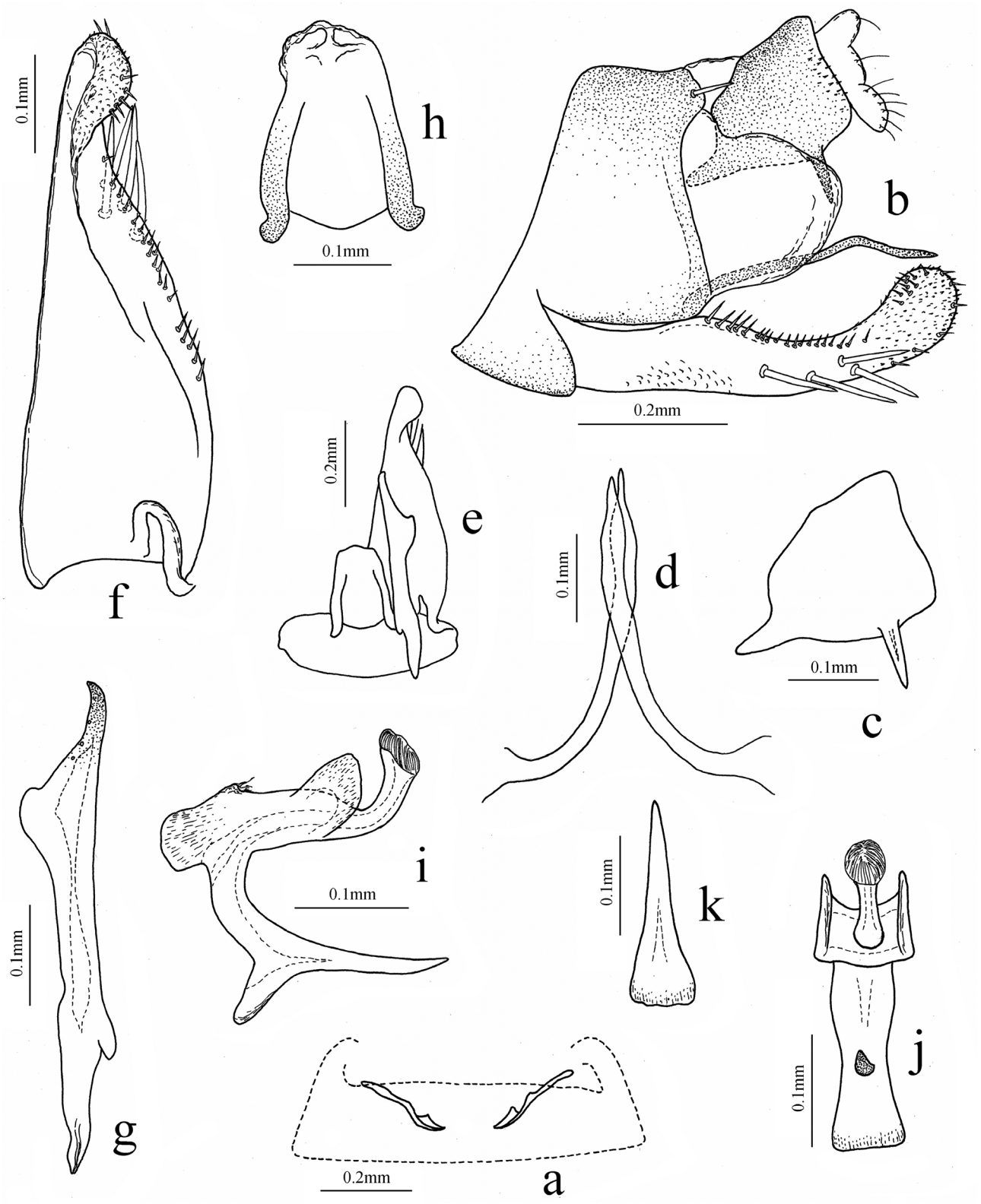

FIGURE 2. *Nlunga reeneni* Dworakowska, 1974. a. abdominal apodemes 2S; b. genital capsule; c. anal tube and appendage, lateral view; d. pygofer ventral appendage, ventral view; e. subgenital plate, style, connective and sternite IX; f. subgenital plate, dorsal view; g. style, dorsal view; h. connective; i. aedeagus, lateral view; j. aedeagus, caudal view; k, preatrial process, ventral view.

Diagnosis. This new genus resembles *Thaia* Ghauri in external morphology and its male genitalia are most similar to *Nlunga* Dworakowska, but it can be distinguished from both genera by the pygofer ventral appendage articulated to the lobe and with small tubercles or setae basally. Compared to *Nlunga*, species of *Etmaria* **gen. n.** lack the foveate sculpture on the pronotum, have the base of the pygofer ventral appendage expanded and have 0-1 pair of preatrial processes on the aedeagus. The new genus differs from *Thaia* (*Thaia*) in the position of the anal tube appendage (usually on ventral margin of distal half in *Etmaria*, basal in *Thaia*, sometimes even separate from the 1st segment of the anal tube), the texture of the pygofer lobe (sclerotized basally and membranous apically in *Etmaria*, entirely sclerotized in *Thaia* or only membranous at the area between the lobe and the ventral appendage), the position of the pygofer ventral appendage (extended from the middle of the ventral margin in *Etmaria*, extended from the distal angle of the ventral margin in *Thaia*) and the length of the aedeagus shaft (usually much longer in *Thaia*).

Species checklist of *Etmaria* gen. nov.
E. australis (Dworakowska & Viraktamath, 1979) **comb. n.**
E. brevis Cao & Dmitriev **sp. nov.**
E. chaiyaphumica Cao & Dmitriev **sp. nov.**
E. decembris (Dworakowska, 1984) **comb. n.**
E. dentata Cao & Dmitriev **sp. nov.**
E. formosana (Matsumura, 1932) **comb. n.**
E. indonesica Cao & Dietrich **sp. nov.**
E. infumata (Kuoh, 1982) **comb. n.**
E. magna Cao & Dietrich **sp. nov.**
E. maxima (Dworakowska, 1976) **comb. n.**
E. mengyanga (Song & Li, 2012) **comb. n.**
E. obtusa (Dworakowska & Viraktamath, 1979) **comb. n.**
E. ryukyuensis (Ohara, 2010) **comb. n.**
E. sinuata (Chiang & Knight, 1990) **comb. n.**
E. triquetra Cao & Zhang **sp. nov.**
E. ulterior Cao & Zhang **sp. nov.**

1. *Etmaria australis* (Dworakowska & Viraktamath, 1979) comb. n.

Thaia (*Nlunga*) *australis* Dworakowska & Viraktamath, 1979: 52, Figs 27–36; Sohi & Dworakowska, 1983: 183

Distribution. India.

2. *Etmaria brevis* Cao & Dmitriev sp. nov.
Figs 3, 18i–l

Description. Ground color light tawny, dorsum infuscated (specimen preserved in ethanol before examined), eyes grey, frontoclypeal area and anteclypeus tawny. Crown fore margin parallel to hind margin, coronal suture distinct; anteclypeus relatively broad.

Anal tube appendage broad, extended from apex of anal tube.

Pygofer with oblique boundary between basal and distal lobes; ventral appendage tubular, curved inwards, not surpassing hind margin of lobe, without rigid setae at base. Subgenital plate with about 3 macrosetae. Style with apical part slim and long, curved outwards in dorsal view. Connective with manubrium long and relatively broad, widened apically, margin of central lobe straight. Aedeagal shaft long, curved dorso-cephalad, atrium long but narrow in lateral view, broadened in caudal view, with serrated lamellae on dorso-lateral edges near base; dorsal apodeme rudimentary; paired preatrial processes short and straight, shifted to base of shaft, near each other.

Measurement. Male length 3.10 mm.

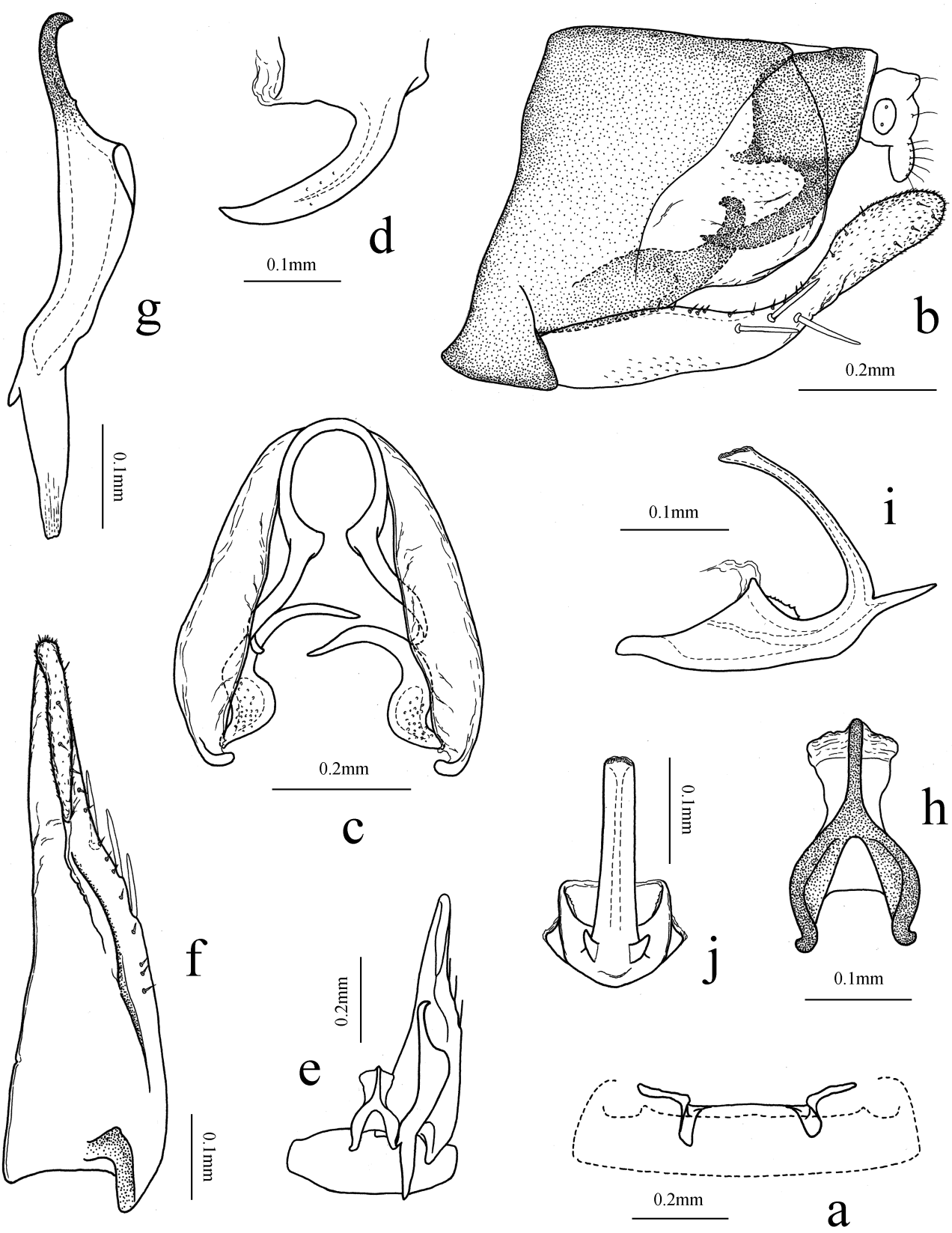

FIGURE 3. *Etmaria brevis* Cao & Dmitriev **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube, pygofer lobe and pygofer ventral appendages, caudal view; d. anal tube appendage, lateral view; e. subgenital plate, style, connective and sternite IX; f. subgenital plate, dorsal view; g. style, dorsal view; h. connective; i. aedeagus, lateral view; j. aedeagus, caudal view.

Material examined. Holotype: ♂, THAILAND, Prachuab Khiri Khan, Khao Sam Roi Yot NP, 200m/s of Checkpoint1, 12°12.789'N, 99°58.662‘E, 19–26 x 2008, Malaise trap, coll. Yai & Amnad. [QSBG].

Etymology. The new specific epithet is derived from the Latin adjective “*brevis*” which means short, small, referring to the short preatrial processes.

Diagnosis. The new species is similar to *E. decembris* (Dworakowska), but the anal tube appendage is broader and curved, the pygofer ventral appendage is curved, the style has a much longer apex, and the aedeagal shaft is curved dorso-cephalad with the dorso-lateral edges serrated and lamelliform.

3. *Etmaria chaiyaphumica* Cao & Dmitriev sp. nov.

Figs 4, 18m–p

Description. Ground color light tawny (specimen preserved in ethanol before examined), eyes grey, frontoclypeal area and anteclypeus tawny. Crown fore margin parallel to hind margin, coronal suture distinct; anteclypeus relatively broad.

Anal tube appendage narrow, almost straight, extended from nearly apex of anal tube.

Boundary between basal and distal pygofer lobes almost vertical, except the upper part; ventral appendage tubular, slightly sinuated, apex extended to hind margin of lobe, without rigid setae at base. Subgenital plate with about 2 macrosetae. Style with apical part thick and short, straight in dorsal view, apex pointed and slightly curved in lateral view. Connective with manubrium long and relatively narrow, margin of central lobe convex. Aedeagal shaft long, curved dorsad, atrium long and wide in lateral view, broadened in caudal view, with serrated lamellae on dorso-lateral edges near base; dorsal apodeme rudimentary; paired preatrial processes long, curved dorso-caudad, extended from sides, far from each other.

Measurement. Male length 3.20 mm.

Material examined. Holotype: ♂, THAILAND, Chaiyaphum, Tat Tone NP Entrance/Pha Eang waterfall, 15°57.52'N, 101°54.442‘E, 26 x–03 xi 2006, Malaise trap, coll. Tawit Jaruphan. [QSBG].

Etymology. The new species is named for its type locality Chaiyaphum (Thailand).

Diagnosis. The new species is similar to *E. obtusa* (Dworakowska & Viraktamath), but the anal tube appendage is narrower, smooth and almost straight, the style has shorter apical part, and the preatrial processes are close to the aedeagal shaft in lateral view.

4. *Etmaria decembris* (Dworakowska, 1984) comb. n.

Thaia (*Nlunga*) *decembris* Dworakowska, 1984: 15, Figs 105–112

Distribution. Malaysia.

5. *Etmaria dentata* Cao & Dmitriev sp. nov.

Figs 5, 18q–t

Description. Ground color light tawny (specimen preserved in ethanol before examined), eyes grey, midline of frontoclypeal area and anteclypeus tawny. Crown fore margin parallel to hind margin, coronal suture distinct; anteclypeus relatively broad.

Anal tube appendage relatively short, minutely denticulate on distal edge, extended from middle of anal tube.

Pygofer basal lobe obviously larger than distal lobe, boundary between lobes oblique; ventral appendage tubular with furrows, sinuated, long and far surpassing hind margin of lobe, without rigid setae at base. Subgenital plate with distal disc large in lateral view, with about 3 macrosetae. Style with apical part thick and short, almost straight in dorsal view, apex pointed and curved in lateral view. Connective with manubrium short and narrow, margin of central lobe nearly straight. Aedeagal shaft short, directed dorsad, atrium long and wide in lateral view, relatively narrow in caudal view, sides rounded and smooth; dorsal apodeme well developed, lamellate; without preatrial processes.

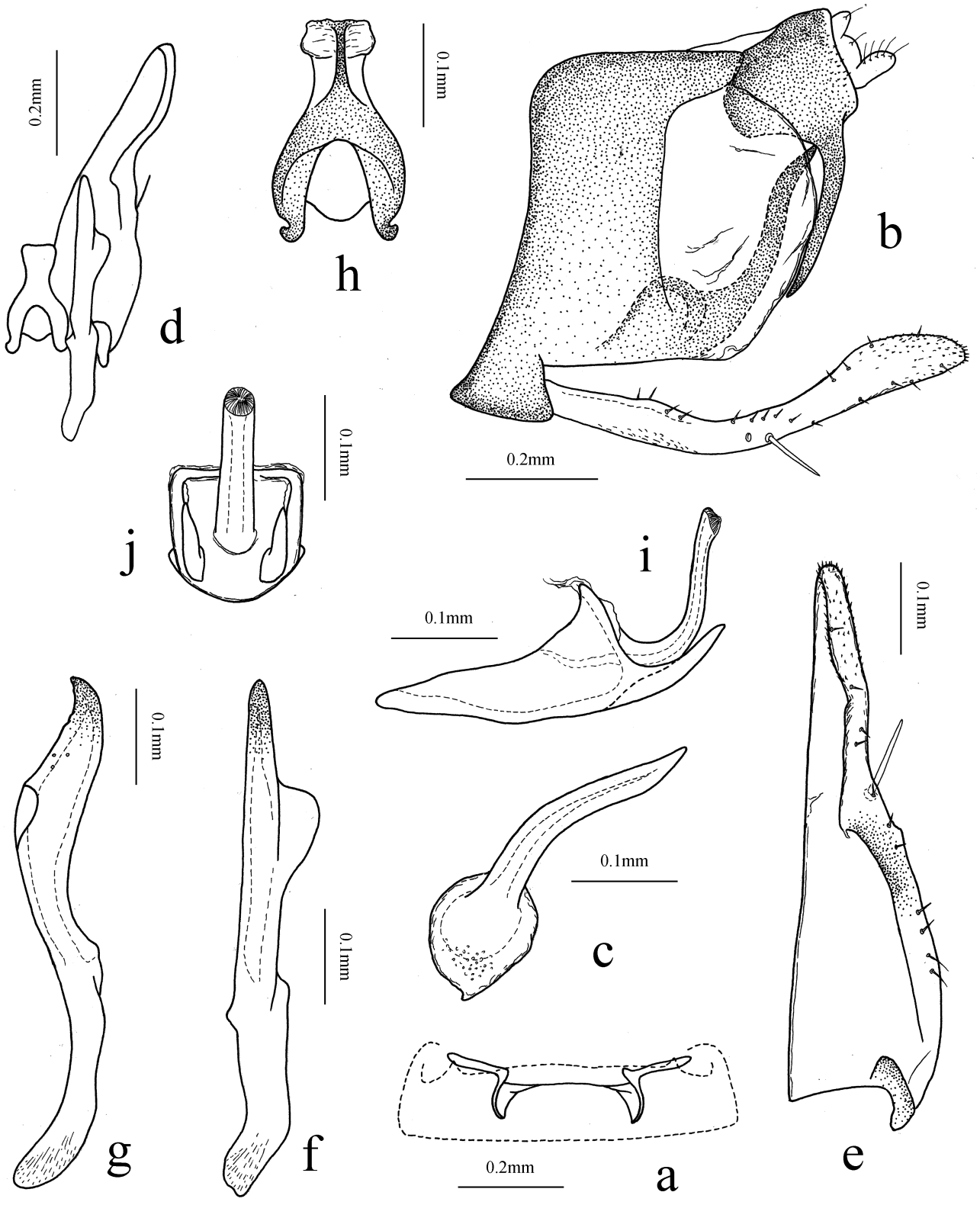

FIGURE 4. *Etmaria chaiyaphumica* Cao & Dmitriev **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. pygofer ventral appendage, caudal view; d. subgenital plate, style and connective; e. subgenital plate, dorsal view; f. style, dorsal view; g. style, lateral view; h. connective; i. aedeagus, lateral view; j. aedeagus, caudal view

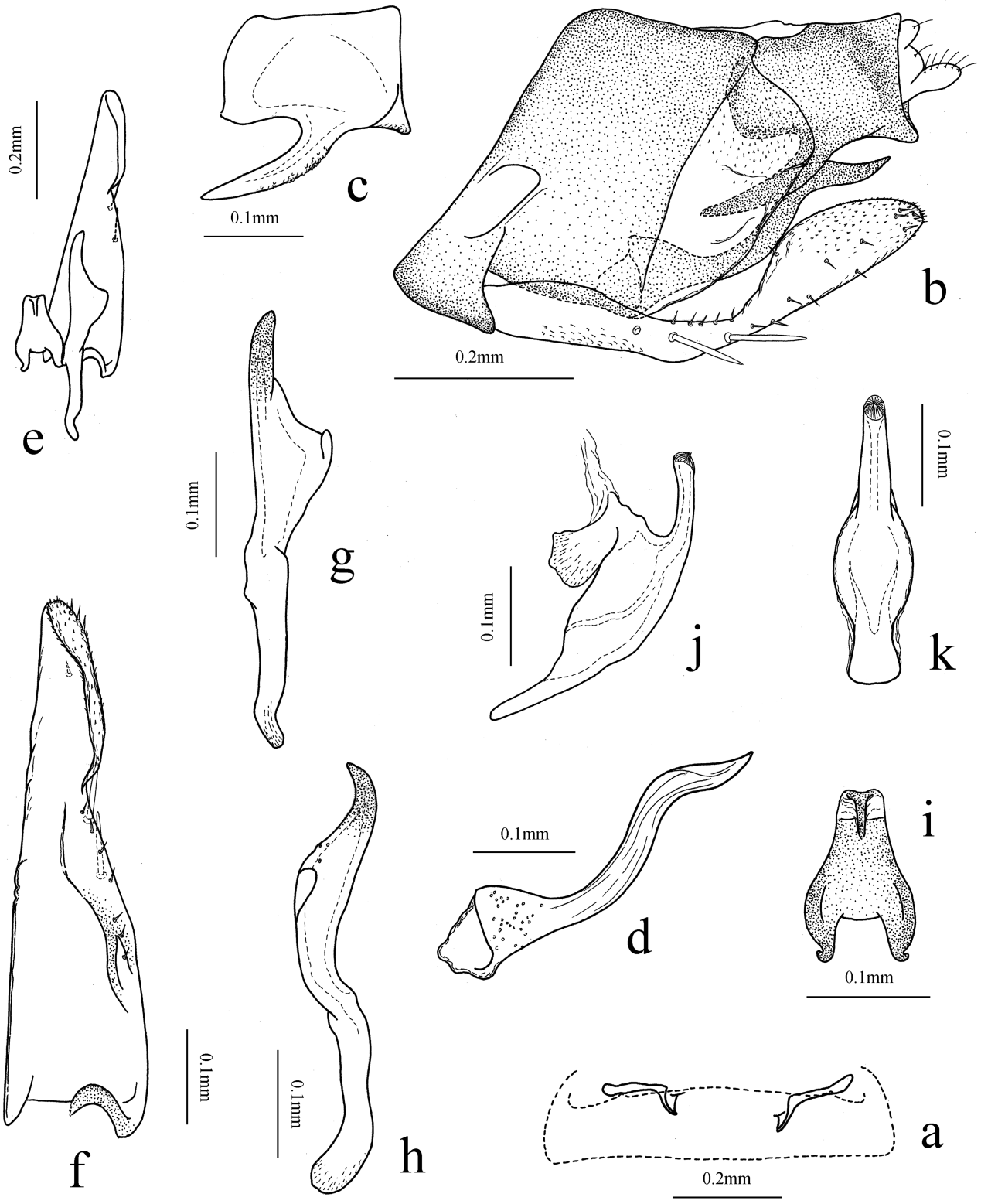

FIGURE 5. *Etmaria dentata* Cao & Dmitriev **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube and appendage, lateral view; d. pygofer ventral appendage, lateral view; e. subgenital plate, style and connective; f. subgenital plate, dorsal view; g. style, dorsal view; h. style, lateral view; i. connective; j. aedeagus, lateral view; k. aedeagus, caudal view

Measurement. Male length 3.00 mm.

Material examined. Holotype: ♂, THAILAND, Phetchabun, Nam Nao NP Pine forest/Sambon 1, 16°42.47'N, 101°35.26'E, 872 m, 16–23 x 2006, Malaise trap, coll. Noopean Hongyothi. [QSBG].

Etymology. The new specific epithet is derived from Latin adjective "*dentatus*" which means toothed, referring to the denticulate anal tube appendage.

Diagnosis. The new species is similar to *E. sinuata* (Chiang & Knight), but the anal tube has only one pair of appendages which are much thicker, the pygofer ventral appendage is longer, the subgenital plate has a larger apical disc, the connective has a narrower manubrium, the aedeagal shaft is thicker and shorter, and the aedeagal atrium is smooth laterally in caudal view.

6. *Etmaria formosana* (Matsumura, 1932) comb. n.

Zygina formosana Matsumura, 1932: 110
Erythroneura formosana: Esaki & Ito, 1954: 215
Thaia formosana: Dworakowska, 1972: 117, Figs 20–25
Thaia (*Thaia*) *formosana*: Chiang & Knight, 1990: 246; Song & Li, 2008: 335, Fig. 12; Song & Li, 2014: 187

Distribution. China (Taiwan); Japan.

7. *Etmaria indonesica* Cao & Dietrich sp. nov.

Figs 6, 18u–x

Description. Ground color yellowish-brown, eyes black, gena and lorum pale. Crown fore margin parallel to hind margin, coronal suture distinct basally; anteclypeus very broad.

Anal tube appendage narrow and relatively short, moderately curved, located near middle of anal tube.

Pygofer basal lobe larger than distal lobe, boundary between lobes rounded; ventral appendage tubular with furrows, strongly bent mesad or dorso-mesad, apex exceeding hind margin of lobe, with rigid setae at base. Subgenital plate with about 3 macrosetae. Style with apical part slim and long, slightly curved outwards in dorsal view, apex pointed and slightly curved in lateral view. Connective with manubrium long and narrow, central ridge greatly expanded in lateral view, margin of central lobe straight. Aedeagal shaft long, curved dorso-cephalad, atrium wide but relatively short in lateral view, broadened in caudal view, with serrated lamellae on dorso-lateral edges elongated; dorsal apodeme small, lamellate; paired preatrial processes long, curved dorso-caudad, extended from sides, far from each other.

Measurement. Male length 3.30–3.40 mm

Material examined. Holotype: ♂, INDONESIA, N. Sumatra, Landkat District, Bekulab River, Tambunan-A, 02 viii 1985, Malaise trap, coll. M. E. Irwin. Paratypes: 1♂, same data as holotype; 4♂, same locality and collector as holotype, collecting dates are 30 vii 1985, 06 viii 1985, 08 viii 1985 and 09 viii 1985. [INHS].

Etymology. The new species is named for its type locality, Indonesia.

Diagnosis. The new species is similar to *E. obtusa* (Dworakowska & Viraktamath), but the anal tube appendage is narrower and smooth, the style has a slimmer apical part, and the preatrial processes are longer and close to the aedeagal shaft in lateral view.

8. *Etmaria infumata* (Kuoh, 1982) comb. n.

Figs 7, 19a–d

Parathaia infumata Kuoh, 1982: 400, Fig. 4
Thaia (*Nlunga*) *anchora* Song & Li, 2008: 338, Figs 1–10; Song & Li, 2014: 184, Fig. 2.124 **syn. n.**
Thaia (*Nlunga*) *infumata*: Song & Li, 2014: 185

Description. Ground color light tawny, dorsum infuscated, eyes black, midline of frontoclypeal area and anteclypeus dark. Crown fore margin parallel to hind margin, coronal suture distinct; anteclypeus broad.

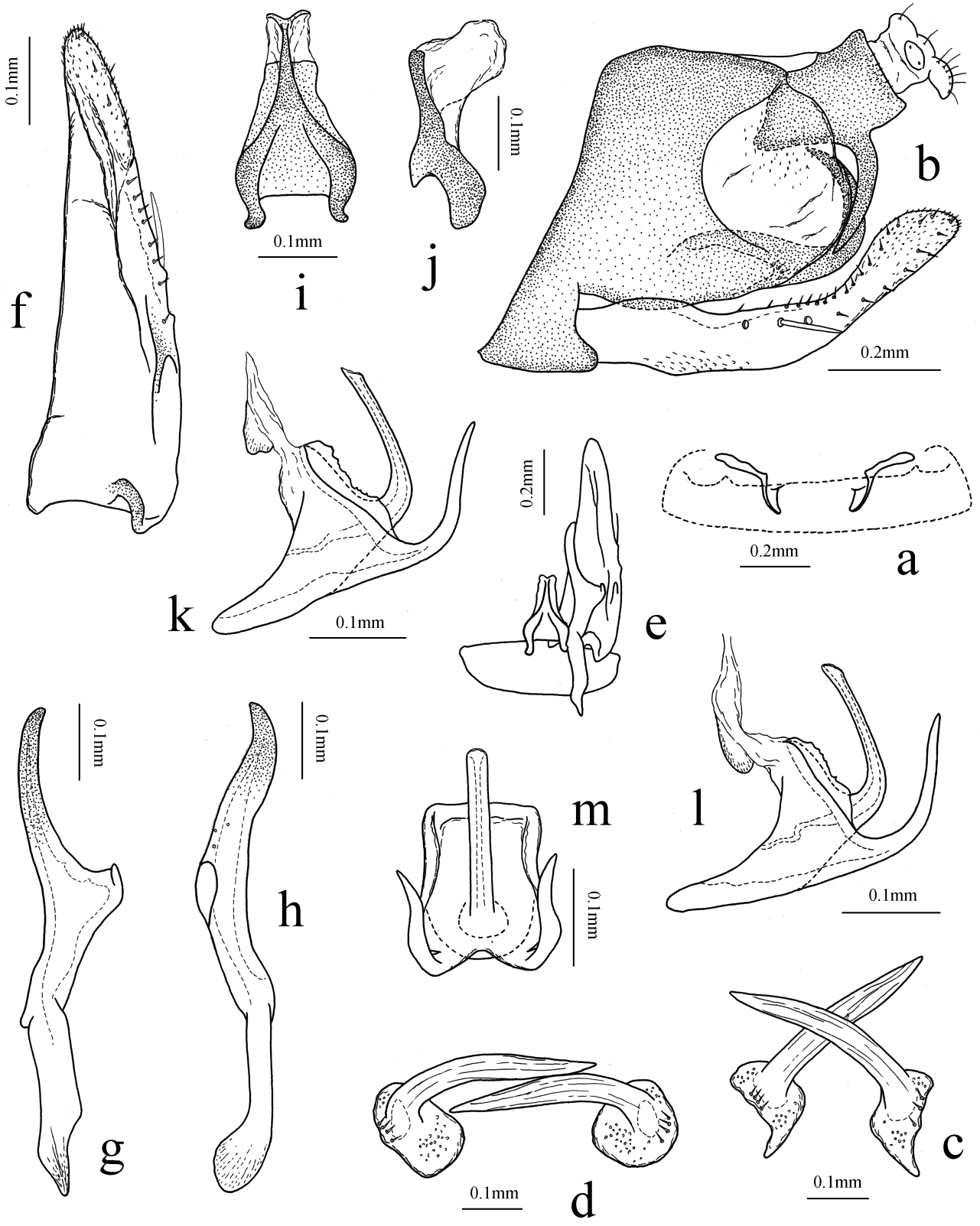

FIGURE 6. *Etmaria indonesica* Cao & Dietrich **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. pygofer ventral appendages of holotype, caudal view; d. pygofer ventral appendages of paratype, caudal view; e. subgenital plate, style, connective and sternite IX; f. subgenital plate, dorsal view; g. style, dorsal view; h. style, lateral view; i. connective, dorsal view; j. connective, lateral view; k. aedeagus of holotype, lateral view; l. aedeagus of paratype, lateral view; m. aedeagus, caudal view.

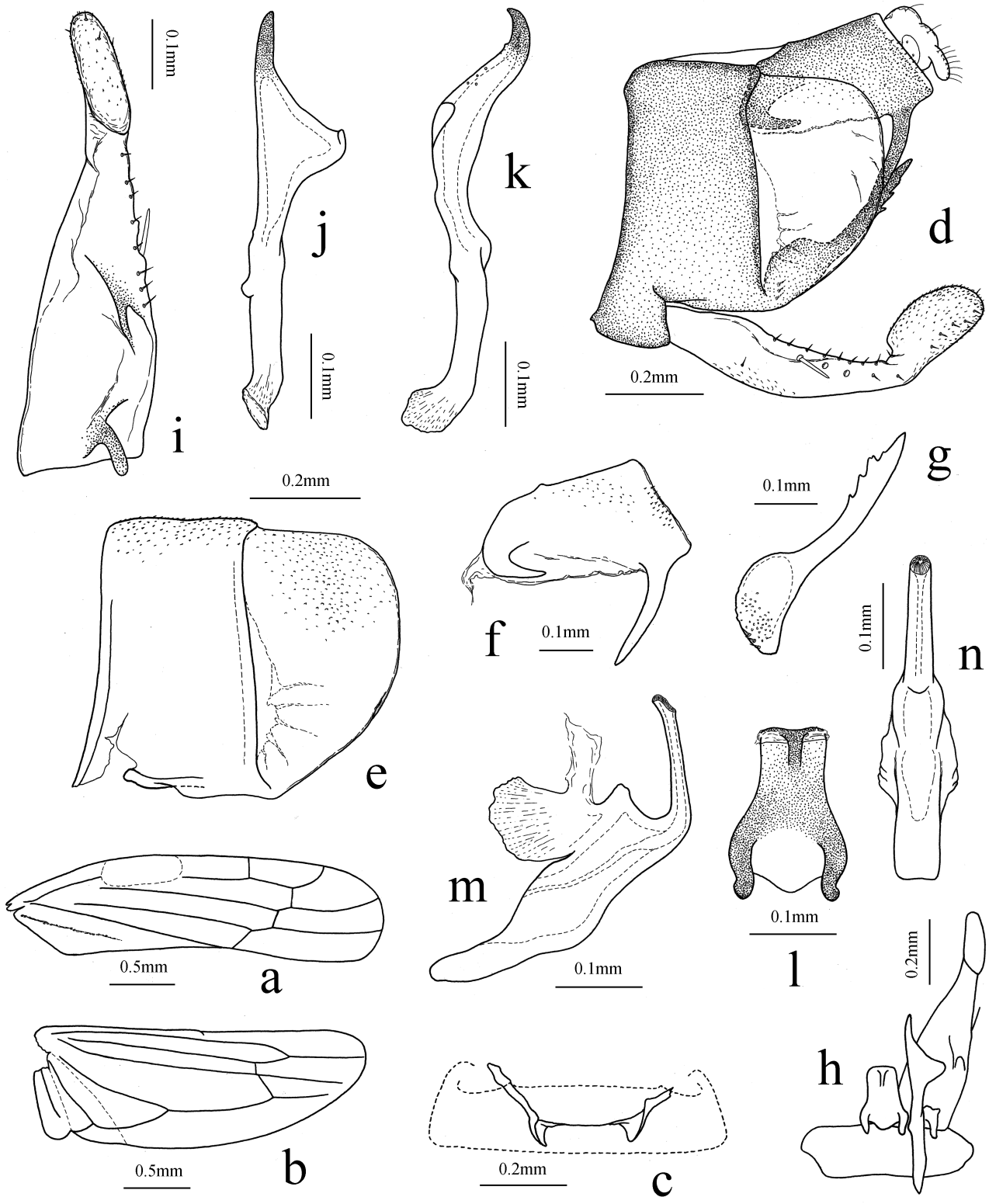

FIGURE 7. *Etmaria infumata* (Kuoh, 1982) **comb. n.** a. forewing; b. hind wing; c. abdominal apodemes 2S; d. genital capsule; e. pygofer lobe; f. anal tube and appendage, lateral view; g. pygofer ventral appendage, caudal view; h. subgenital plate, style, connective and sternite IX; i. subgenital plate, dorsal view; j. style, dorsal view; k. style, lateral view; l. connective; m. aedeagus, lateral view; n. aedeagus, caudal view.

Anal tube with two pairs of appendages, subapical pair slim and slightly curved, basal pair thick and very short, hooked, directed caudad.

Boundary between basal and distal pygofer lobes vertical, distal membrane folded on inner side; ventral appendage more lamellate than tubular, almost straight, with one side distinctly serrated, apex surpassing hind margin of lobe, with rigid setae at base. Subgenital plate with about 3 macrosetae. Style with apical part slim and short, straight in dorsal view, apex pointed and curved in lateral view. Connective with manubrium long and broad, margin of central lobe convex. Aedeagal shaft relatively long, directed dorsad, atrium wide and very long in lateral view, relatively narrow in caudal view, sides folded; dorsal apodeme well developed, lamellate; without preatrial processes.

Material examined. 2♂1♀, CHINA, Jiangxi Prov., Suichuan, Mt. Wuzhi, 760m, 11 viii 2004, coll. Cong Wei, Meixia Yang; 1♂1♀, CHINA, Fujian Prov., Shaowu, Jiangshi, 28 vii 2009, coll. Yanghui Cao; 1♂1♀, CHINA, Fujian Prov., Mt. Wuyi, Tongmu, 03–04 viii 2009, coll. Yanghui Cao. [NWAFU].

Distribution. China (Fujian, Guizhou, Jiangxi, Taiwan).

9. *Etmaria magna* Cao & Dietrich sp. nov.

Figs 8, 19e–h

Description. Ground color dark (specimen preserved in ethanol before examined), vertex and face lighter, midline of frontoclypeal area infuscated, eyes dark grey. Crown fore margin parallel to hind margin, coronal suture indistinct; anteclypeus relatively narrow.

Anal tube appendage very slim, located near middle of anal tube.

Boundary between basal and distal pygofer lobes rounded; ventral appendage tubular with furrows, sinuated, only expanded at very base, with rigid setae at base, apex surpassing hind margin of lobe. Subgenital plate with about 4 macrosetae. Style with apical part slim and short, apex slightly curved inwards in dorsal view, pointed and curved in lateral view. Connective with manubrium long and relatively narrow, central lobe with fore margin slightly concave, extended to tip of lateral arms. Aedeagal shaft relatively short, directed dorsad, atrium wide and very long in lateral view, expanded medially in caudal view, mushroom-shaped; dorsal apodeme well developed, lamellate; preatrium elongated, without processes.

Measurement. Male length 5.05 mm.

Material examined. Holotype: ♂, CHINA, Taiwan, Taichung, Dashuishan Forest Rd. km 20, 1250m, 24°15'6"N, 120°54'58"E, 18 vi 2004, sweeping, coll. C.H. Dietrich. [TNMNS].

Etymology. The new specific epithet is derived from Latin adjective "*magnus*" which means large, big, referring to that the large body size of this species.

Diagnosis. The new species is similar to *E. dentata* **sp. nov.**, but the anal tube appendage is much slimmer, the pygofer ventral appendage is only expanded at the very base, the central lobe of the connective is extended to the tip of the lateral arms, and the aedeagal atrium is mushroom-shaped.

10. *Etmaria maxima* (Dworakowska, 1976) comb. n.

Thaia (*Nlunga*) *maxima* Dworakowska, 1976: 50, Figs 418–425; Chiang & Knight, 1990: 249, Fig. 35; Song & Li, 2008: 338, Figs 18, 19; Song & Li, 2014: 186

Distribution. China (Taiwan).

11. *Etmaria mengyanga* (Song & Li, 2012) comb. n.

Thaia (*Nlunga*) *mengyanga* Song & Li, 2012: 68, Figs 1–9; Song & Li, 2014: 186, Fig. 2.125

Distribution. China (Yunnan).

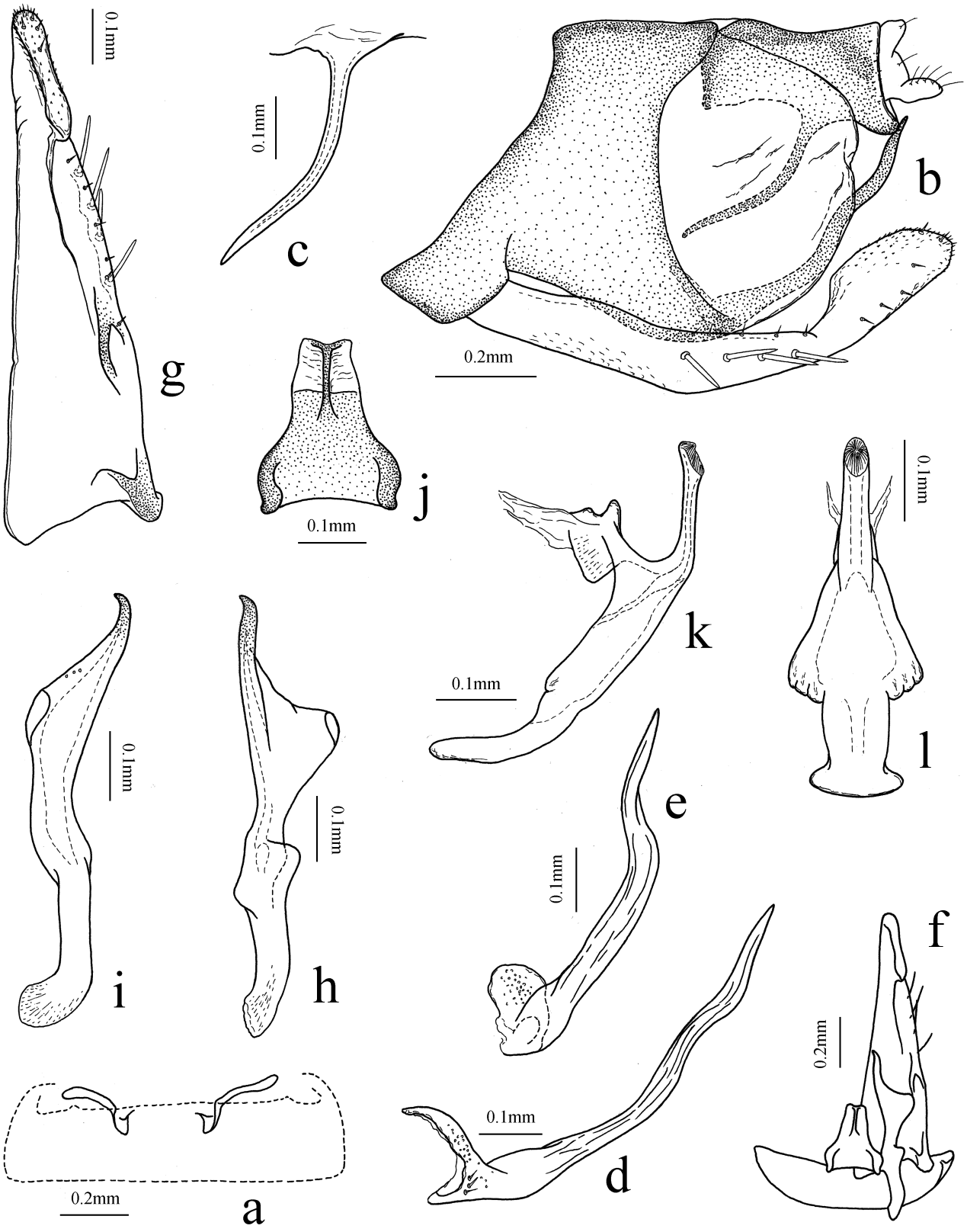

FIGURE 8. *Etmaria magna* Cao & Dietrich **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube appendage, lateral view; d. pygofer ventral appendage, lateral view; e. pygofer ventral appendage, caudal view; f. subgenital plate, style, connective and sternite IX; g. subgenital plate, dorsal view; h. style, dorsal view; i. style, lateral view; j. connective; k. aedeagus, lateral view; l. aedeagus, caudal view.

12. *Etmaria obtusa* (Dworakowska & Viraktamath, 1979) comb. n.

Thaia (*Nlunga*) *obtusa* Dworakowska & Viraktamath, 1979: 52, Figs 37–45; Dworakowska, 1980: 172; Sohi & Dworakowska, 1983: 184

Distribution. India.

13. *Etmaria ryukyuensis* (Ohara, 2010) comb. n.

Thaia (*Nlunga*) *ryukyuensis* Ohara, 2010: 255, Figs 1, 2, 4–15

Host. *Rhaphiolepis indica*, *Vitis ficifolica*, *Antidesma pentandrum*, *Evodia meliifolia*.

Distribution. Japan.

14. *Etmaria sinuata* (Chiang & Knight, 1990) comb. n.

Figs 9, 19i–l

Thaia (*Nlunga*) *sinuata* Chiang & Knight, 1990: 251, Fig. 36; Song & Li, 2008: 338, Figs 20, 21; Song & Li, 2014: 187

Remarks. The examined specimen has an unbranched anal tube appendage and about 3 macrosetae on the subgenital plate but the other structures are identical to those described by Chiang & Knight (1990).

Material examined. 1♂, CHINA, Taiwan, Taichung, Wufeng, Xiang-Bilu Rd. 3 km E Rt. 3, 300m, 24°1'4"N, 120°43'8"E, 19–21 vi 2004, Malaise trap, coll. Dietrich, et al. [INHS].

Distribution. China (Taiwan).

15. *Etmaria triquetra* Cao & Zhang sp. nov.

Figs 10, 19m–p

Description. Vertex, face and mesonotum pale yellow with orange tint, vertex with pair of dark patches on transition to face, midline of frontoclypeal area and anteclypeus dark, eyes black. Pronotum dark orange. Basal triangles on mesonotum orange brown. Forewing light brown. Crown fore margin rounded apically, coronal suture distinct basally, anteclypeus long.

Anal tube very short, appendage extended from base, broad, slightly serrated on cephalic margin.

Boundary between basal and distal pygofer lobes oblique and rounded; ventral appendage tubular, slightly sinuated, directed caudad, surpassing hind margin of lobe, without rigid setae at base. Subgenital plate with large distal disc, with about 3 macrosetae. Style with apical part thick and long, straight in dorsal view, apex pointed and curved in lateral view. Connective with manubrium long and narrow, margin of central lobe almost straight. Aedeagal shaft short and very slim, directed dorsad, with pair of tiny triangular processes near base, atrium very long in lateral view, nearly rectangular in caudal view; dorsal apodeme well developed; preatrial processes short and straight.

Measurement. Male length 3.30 mm.

Material examined. Holotype: ♂, CHINA, Yunnan Prov., Yingjiang, Mangxian, 1089 m, 24°28'33"N, 97°45'02"E, 30 iv 2012, coll. Yanghui Cao. [NWAFU].

Etymology. The new specific epithet is derived from Latin adjective "*triquetrus*" which means triangular, referring to the pair of basal triangular processes of the aedeagal shaft.

Diagnosis. The new species can be distinguished by the long anal tube appendage shifted basad and the presence of tiny triangular processes near the base of the aedeagal shaft.

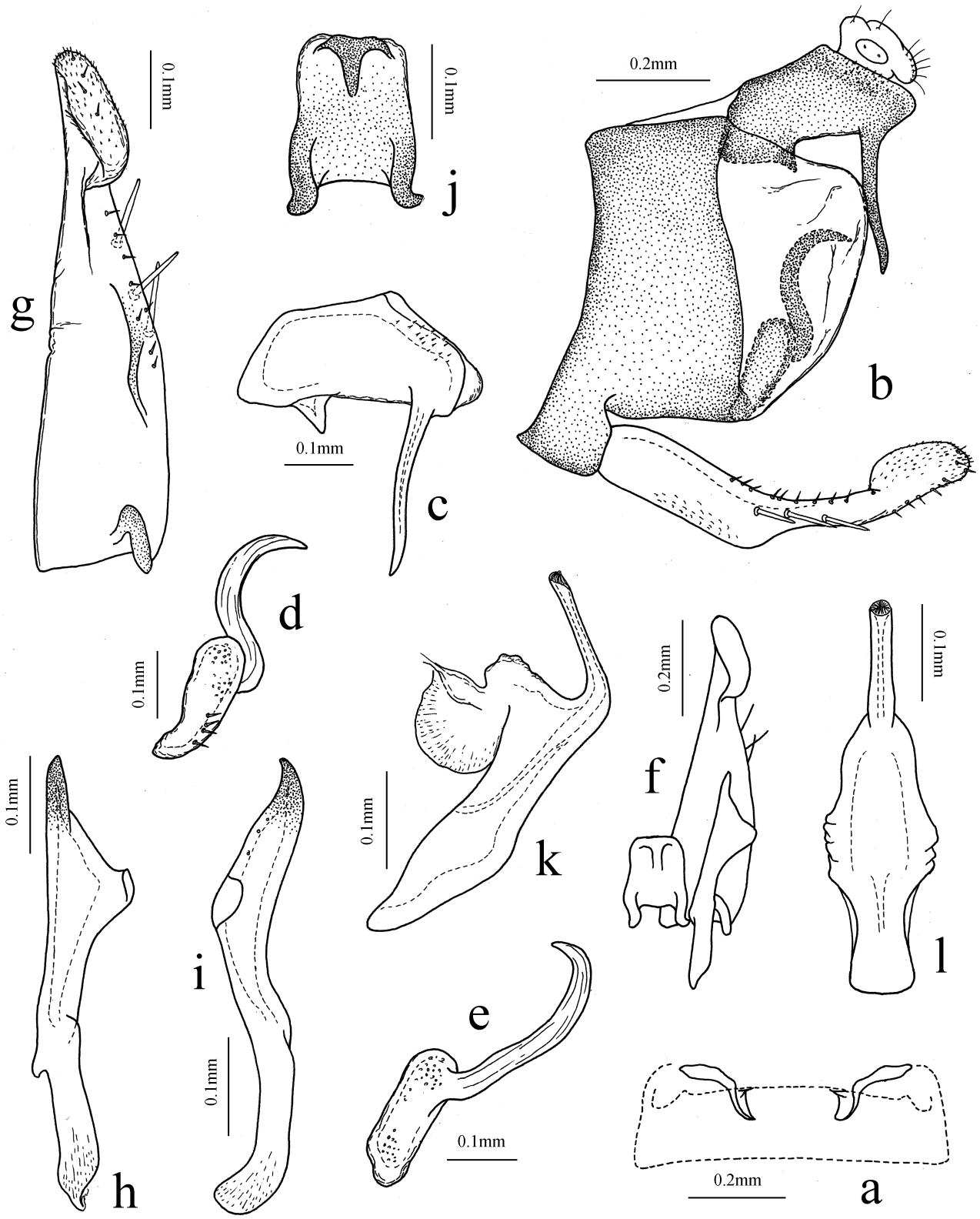

FIGURE 9. *Etmaria sinuata* (Chiang & Knight, 1990) **comb. n.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube and appendage, lateral view; d. pygofer ventral appendage, lateral view; e. pygofer ventral appendage, caudal view; f. subgenital plate, style and connective; g. subgenital plate, dorsal view; h. style, dorsal view; i. style, lateral view; j. connective; k. aedeagus, lateral view; l. aedeagus, caudal view.

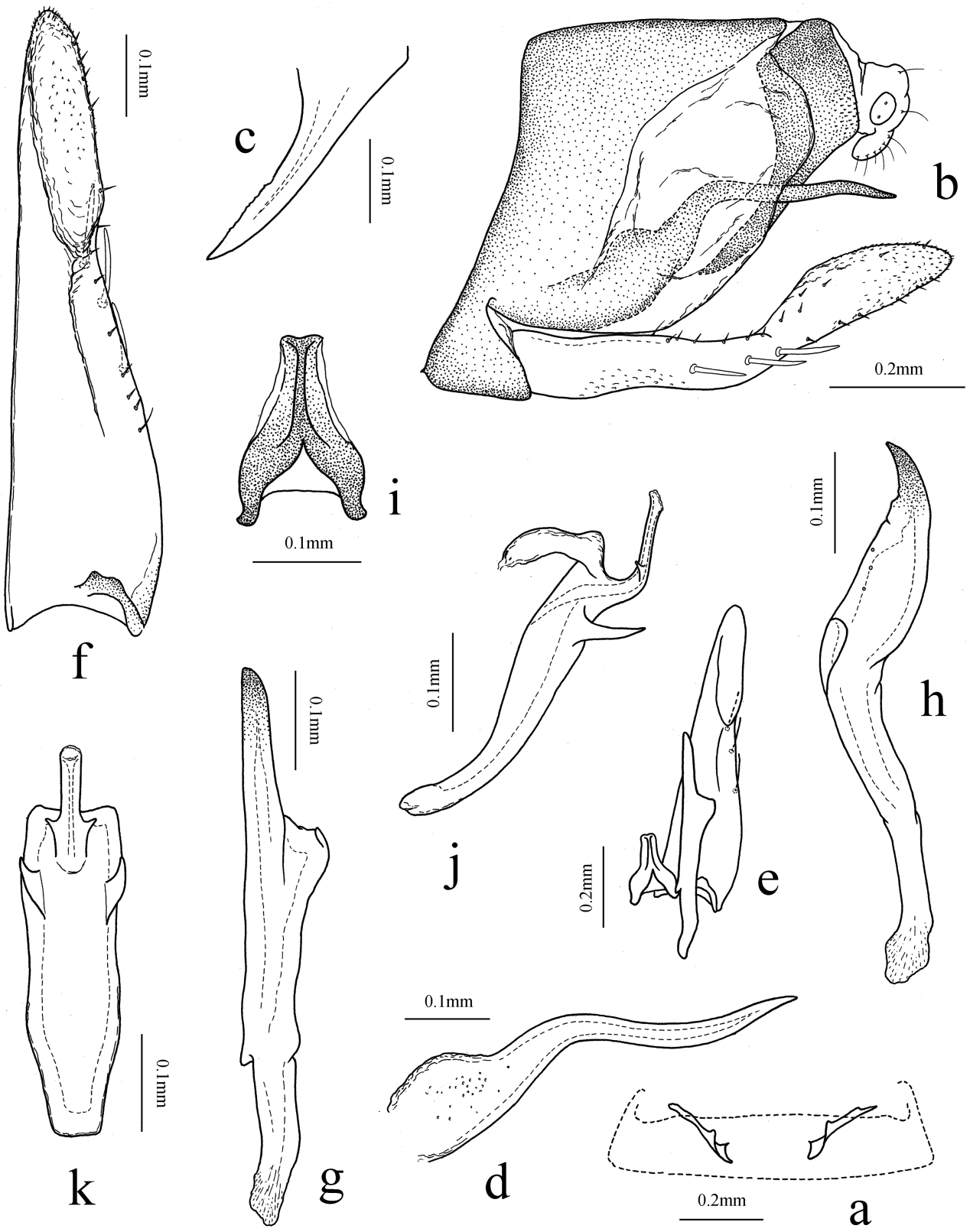

FIGURE 10. *Etmaria triquetra* Cao & Zhang **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube appendage, lateral view; d. pygofer ventral appendage, lateral view; e. subgenital plate, style and connective; f. subgenital plate, dorsal view; g. style, dorsal view; h. style, lateral view; i. connective; j. aedeagus, lateral view; k. aedeagus, caudal view.

16. *Etmaria ulterior* Cao & Zhang sp. nov.
Figs 11, 19q–t

Description. Ground color light yellowish-brown, eyes black. Crown fore margin rounded apically, coronal suture distinct basally, anteclypeus relatively short.

Anal tube appendage slim, slightly serrated on cephalic margin, located near middle of anal tube.

Boundary between basal and distal pygofer lobes rounded; pair of ventral appendages asymmetrical, tubular, one directed caudad, other bent cephalad, without rigid setae at base. Subgenital plate with about 3 macrosetae. Style with apical part thick and very short, straight in dorsal view, apex pointed and hooked in lateral view. Connective broad and short, manubrium very short, central lobe with fore margin slightly convex. Aedeagal shaft thick and slightly sinuated, directed dorsad, atrium very long in lateral view, widened medially in caudal view; dorsal apodeme rudimentary; preatrial processes slim and straight, far from aedeagal shaft.

Measurement. Male length 3.30 mm.

Material examined. Holotype: ♂, CHINA, Yunnan Prov., Yingjiang, Nabang, 284m, 24°46'12"N, 97°54'35"E, 03 v 2012, coll. Yanghui Cao. [NWAFU].

Etymology. The new specific epithet is derived from Latin adjective "*ulterior*" which means far, referring to that the preatrial processes far from the aedeagal shaft.

Diagnosis. The new species can be distinguished by the asymmetrical pygofer ventral appendages, the shortened, widened connective and the slim preatrial processes which are far from the aedeagal shaft.

Thaia Ghauri, 1962

Thaia (*Thaia*) Ghauri, 1962

Thaia Ghauri, 1962: 253; Dworakowska, 1970: 87; Chiang & Knight, 1990: 246; Song & Li, 2008: 334
Hardiana Mahmood, 1967: 14, synonymized by Dworakowska, 1970

Type species: *Thaia oryzivora* Ghauri, 1962, by original designation

Description. Head as wide as or slightly narrower than pronotum, crown fore margin subparallel to posterior margin, coronal suture distinct. Face convex in profile, anteclypeus broad and short, lorum large. Pronotum with pair of large triangular impressions. Forewing with first and third apical cell wide, second and fourth apical cell narrow, fourth apical cell not extended to apex of wing, almost as long as third. Hind wing venation usual for Erythroneurini, RA vein present.

Male abdominal apodeme 2S small, usually not extended to hind margin of sternite III. Anal tube well sclerotized, with well-developed basal appendages, usually extended from dorso-basal part or on the cephalic segment of anal tube, slim and hooked.

Male genital capsule spherical, pygofer lobe well sclerotized except area between lobe and ventral appendage membranous, setosity rudimentary; dorsal appendage absent; ventral appendage extended from ventro-caudal angle of lobe and fused to it, directed inwards, greatly expanded basally, forming large base, apical part usually narrow. Subgenital plate wide basally and narrowing towards apex, distal disc expanded vertically, sometimes forming small tooth-like process on dorsal margin subapically, with 5 to numerous macrosetae near outer margin, with row of rigid setae along lateral margin and some setae scattered on distal disc. Style slender apically, preapical lobe well developed, triangular or slightly hooked. Connective lamellate, with or without central lobe. Aedeagal shaft very long, apex papillose or not, atrium developed but short, many species with pair of long lamellate atrial processes dorso-basally; dorsal apodeme small to large, usually transversely expanded; preatrium short; gonopore terminal.

Remarks. This subgenus currently consists of 22 species, which vary in the shape and position of the anal tube appendage, the shape of the pygofer ventral appendage and the aedeagus. The generic characteristics are described based on the *T. subrufa* group, including *T. oryzivora*, *T. assamensis*, *T. ghaurii*, *T. longipenia*, *T. thaiosimilis*, *T. subrufa*, *T. variegata*, *T. barbata* and *T. nigra*. The *T. orientalis* group, containing *T. confusa*, *T. orientalis* and *T. similis*, resembles the type species group, but the anal tube appendage is curved cephalad, the pygofer ventral appendage lacks an expanded base and the aedeagus has a much longer preatrium. *T. balbinae* is also similar to the *T. subrufa* group, but the anal tube appendage is very broad and the subgenital plate is entirely flattened. The other

species seem quite different from typical *Thaia* species. However, since the holotypes of these questionable species were not studied, they are here retained in *Thaia*. Further study of these previously described species is needed to improve their classification.

Distribution. Bangladesh; Burma; China; Republic of Congo; India; Indonesia; Japan; Java; Malaysia; Pakistan; Sri Lanka; Thailand; Vietnam.

Diagnosis. This subgenus is most similar to *Etmaria* **gen. n.**, but the anal tube appendage usually arises from the base, the pygofer lobe is not divided into a basal sclerite and apical membrane, the pygofer ventral appendage is fused to the ventro-caudal angle or the entire hind margin of the lobe, the subgenital plate usually has more macrosetae and the aedeagus has a shorter atrium and longer shaft.

Species checklist of *Thaia* (*Thaia*)
T. (*T.*) *albida* Dworakowska, 1980
T. (*T.*) *assamensis* (Mahmood, 1967)
T. (*T.*) *balbinae* Dworakowska, 1972
T. (*T.*) *barbata* Dworakowska, 1979
T. (*T.*) *bifurcata* (Li & Wang, 1991)
T. (*T.*) *confusa* Dworakowska, 1976
T. (*T.*) *ghaurii* Dworakowska, 1970
T. (*T.*) *lincanga* Song & Li, 2014
T. (*T.*) *longipenia* Thapa & Sohi, 1982
T. (*T.*) *nigra* Dworakowska, 1970
T. (*T.*) *orientalis* Dworakowska, 1970
T. (*T.*) *oryzivora* Ghauri, 1962
T. (*T.*) *perfecta* Dworakowska, 1994a
T. (*T.*) *producta* Dworakowska, 1976
T. (*T.*) *septima* Dworakowska & Viraktamath, 1979
T. (*T.*) *similis* Dworakowska, 1970
T. (*T.*) *subrufa* (Motschulsky, 1863)
T. (*T.*) *tata* Dworakowska, 1976
T. (*T.*) *thaiosimilis* (Ramakrishnan & Menon, 1974)
T. (*T.*) *typica* Dworakowska, 1976
T. (*T.*) *variegata* Dworakowska, 1994b
T. (*T.*) *vulgaris* Dworakowska, 1994a

1. *Thaia (Thaia) barbata* Dworakowska, 1979

Figs 12, 19u–x

Thaia (*Thaia*) *barbata* Dworakowska, 1979: 1, Figs 1–7; Song & Li, 2008: 335, Fig. 11; Song & Li, 2014: 187

Material examined. CHINA, Yunnan Prov.: 1♂, Jinghong, 23 x 1987, coll. Yonghui Chai & Jinian Feng; 11♂29♀, Mengbang Reservoir, 01 viii 2011, coll. Huining Zhang; 1♂, Yingjiang, Mangxian Village, 24°28'33"N, 97°45'02"E, 1089m, 30 iv 2012, coll. Yanghui Cao; 1♂, Jinghong, Yexianggu, 16 v 2012, light trap, coll. Yanghui Cao. [NWAFU].

Distribution. China (Guangxi, Yunnan); Vietnam.

2. *Thaia (Thaia) longipenia* Thapa & Sohi, 1982

Figs 13, 20a–d

Thaia (*Thaia*) *longipenia* Thapa & Sohi, 1982: 98; Song & Li, 2008: 336, Fig. 13; Song & Li, 2014: 189
Thaia rustica Kuoh, 1987: 122, Fig. 14, synonymized by Song & Li, 2008

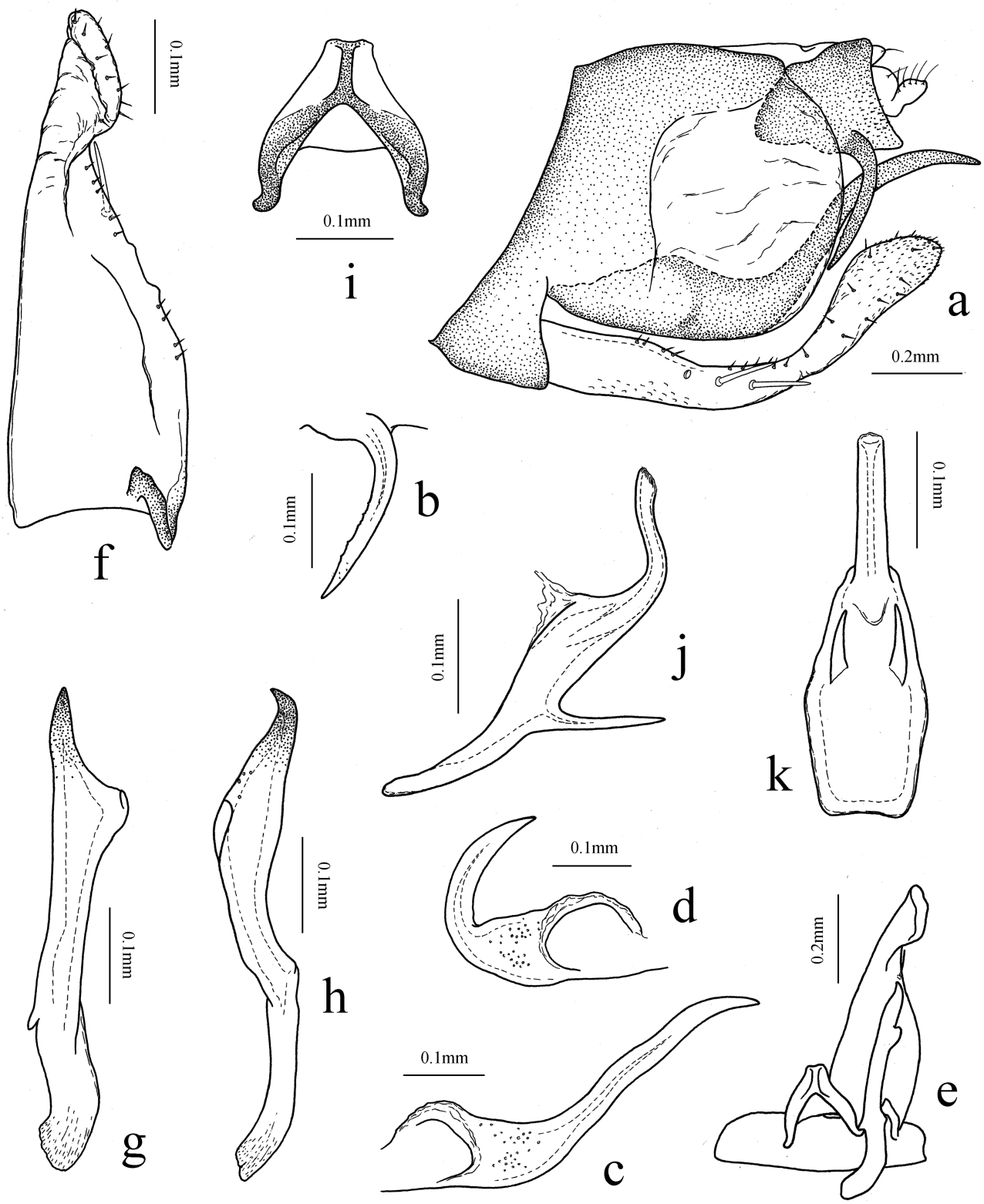

FIGURE 11. *Etmaria ulterior* Cao & Zhang **sp. nov.** a. genital capsule; b. anal tube appendage, lateral view; c. d. pygofer ventral appendage, lateral view; e. subgenital plate, style, connective and sternite IX; f. subgenital plate, dorsal view; g. style, dorsal view; h. style, lateral view; i. connective; j. aedeagus, lateral view; k. aedeagus, caudal view.

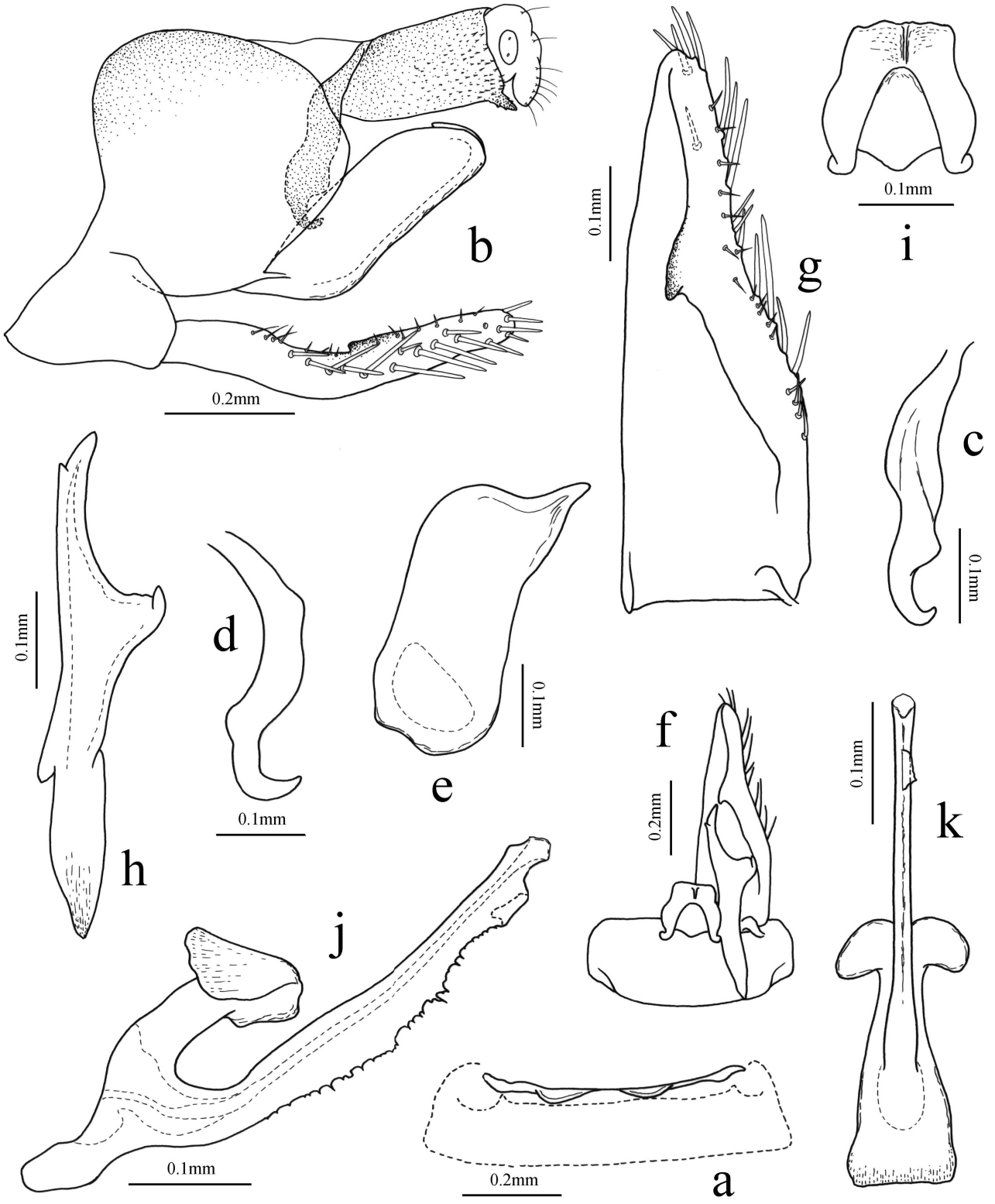

FIGURE 12. *Thaia* (*Thaia*) *barbata* Dworakowska, 1979. a. abdominal apodemes 2S; b. genital capsule; c. anal tube appendage, lateral view; d. anal tube appendage, caudal view; e. pygofer ventral appendage, posterior view; f. subgenital plate, style, connective and sternite IX; g. subgenital plate, dorsal view; h. style, dorsal view; i. connective; j. aedeagus, lateral view; k. aedeagus, ventral view.

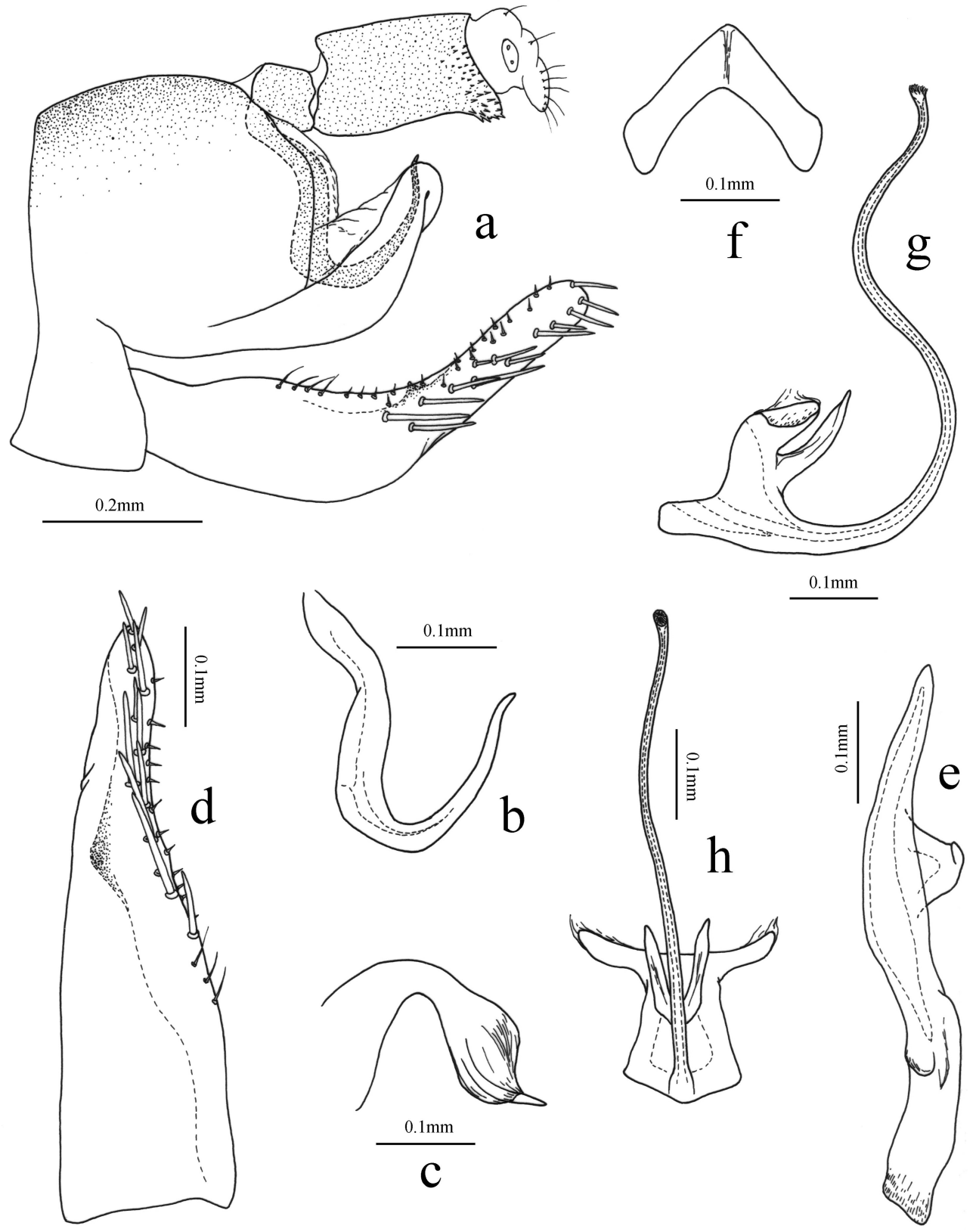

FIGURE 13. *Thaia* (*Thaia*) *longipenia* Thapa & Sohi, 1982. a. genital capsule; b. anal tube appendage, lateral view; c. pygofer ventral appendage, caudal view; d. subgenital plate, ventral view; e. style, dorsal view; f. connective; g. aedeagus, lateral view; h. aedeagus, caudal view.

Material examined. 1♂, CHINA, Yunnan Prov., Jinghong, Yaoqu, 05 ix 2010, light trap, coll. Meng Zhang. [NWAFU].

Host plant. *Oryza sativa*.

Distribution. China (Tibet, Yunnan).

3. *Thaia (Thaia) oryzivora* Ghauri, 1962

Figs 14, 20e–h

Thaia oryzivora Ghauri, 1962: 255; Chiang & Knight, 1990: 246, Fig. 33; Song & Li, 2008: 336, Fig. 15; Song & Li, 2014: 189

Thaia katoi Dworakowska, 1976: 48, Figs 367–376, synonymized by Sohi, 1983

Thaia rubiginosa Kuoh, 1982: 396, Fig. 1, synonymized by Chiang & Knight, 1990

Material examined. CHINA: 7♂1♀, Guangdong Prov., Zhaoqing, Mt. Dinghu, 19 vi 1983, light trap, coll. Yalin Zhang; 1♂2♀, Yunnan Prov., Daluo, 26 x 1987, coll. Jinian Feng & Li Li; 2♀, same data as former, coll. Zengzhao Xu & Yonghui Chai; 14♂, Yunnan Prov., 23 x 1987, coll. Yonghui Chai & Jinian Feng; 1♂1♀, Hainan Prov., Baisha, Mt. Yingge, 24 v 2007, coll. Yani Duan; 4♂, Hainna Prov., Mt. Limu, 650 m, 19 iv 2008, coll. Qiulei Men; 4♂1♀, Hainna Prov., Mt. Bawang, 126 m, 15 v 2008, light trap, coll. Qiulei Men; 1♂1♀, Sichuan Prov., Ya'an, Mt. Huwu, 1100 m, 20 vii 2009, coll. Xinmin Zhang; 1♂, Yunnan Prov., Jinghong, Yexianggu, 30 viii 2010, light trap, coll. Juan Han; 1♂, Yunnan, Jinghong, Bubeng Village, 04 ix 2010, light trap, Juan Han; 4♂, Yunnan Prov., Yingjiang, Nabang, 24°45'45"N, 97°33'56"E, 284 m, 02 v 2012, light trap, coll. Yanghui Cao; 1♂, Yunnan Prov., Jinghong, Yexianggu, 16 v 2012, light trap, coll. Yanghui Cao. [NWAFU].

Host plants. *Oryza sativa*, *Triticum aestivum*.

Distribution. China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang); Thailand.

Parathaia Kuoh, 1982

Parathaia Kuoh, 1982: 398

Type species: *Parathaia bimaculata* Kuoh, 1982, by original designation

Description. Body robust, ground color light brown. Head slightly narrower than pronotum, crown fore margin subparallel to posterior margin, coronal suture visible. Face convex in profile, anteclypeus broad, oval. Pronotum with large impressions. Forewing with first and third apical cell wide, second and fourth apical cell narrow, fourth apical cell not reached apex of wing, shorter than third apical cell. Hind wing venation usual for Erythroneurini, RA vein absent.

Anal tube sclerotized, with robust appendages basally, tubular, base of appendage connected with dorsal apodeme of aedeagus.

Male genital capsule spherical, with some fine setae at lower basal angle and near dorsal margin; dorsal appendage absent; ventral appendage tubular, extended from lower basal angle, fused to lobe basally. Subgenital plate surpassing hind margin of pygofer lobe, base wide and narrowing toward apex, distal disc expanded vertically; with row of about 5 macrosetae near outer margin and row of rigid setae along lateral margin and some rigid setae scattered on distal disc. Style with apical part slender, preapical lobe greatly expanded, nearly triangular. Connective lamellate, central lobe well developed. Aedeagal shaft tubular, apex not papillary, atrium relatively small; dorsal apodeme large, lamellate; preatrium short; gonopore terminal.

Remarks. *Parathaia* Kuoh was treated as a junior synonym of *Thaia* Ghauri by Song & Li (2014). However, the type species of *Parathaia* is very different from most species of *Thaia* in the male genitalia. As mentioned above, species of *Thaia* are quite variable. To avoid further expanding the concept of *Thaia*, we proposed keeping *Parathaia* as a separate genus.

Distribution. China.

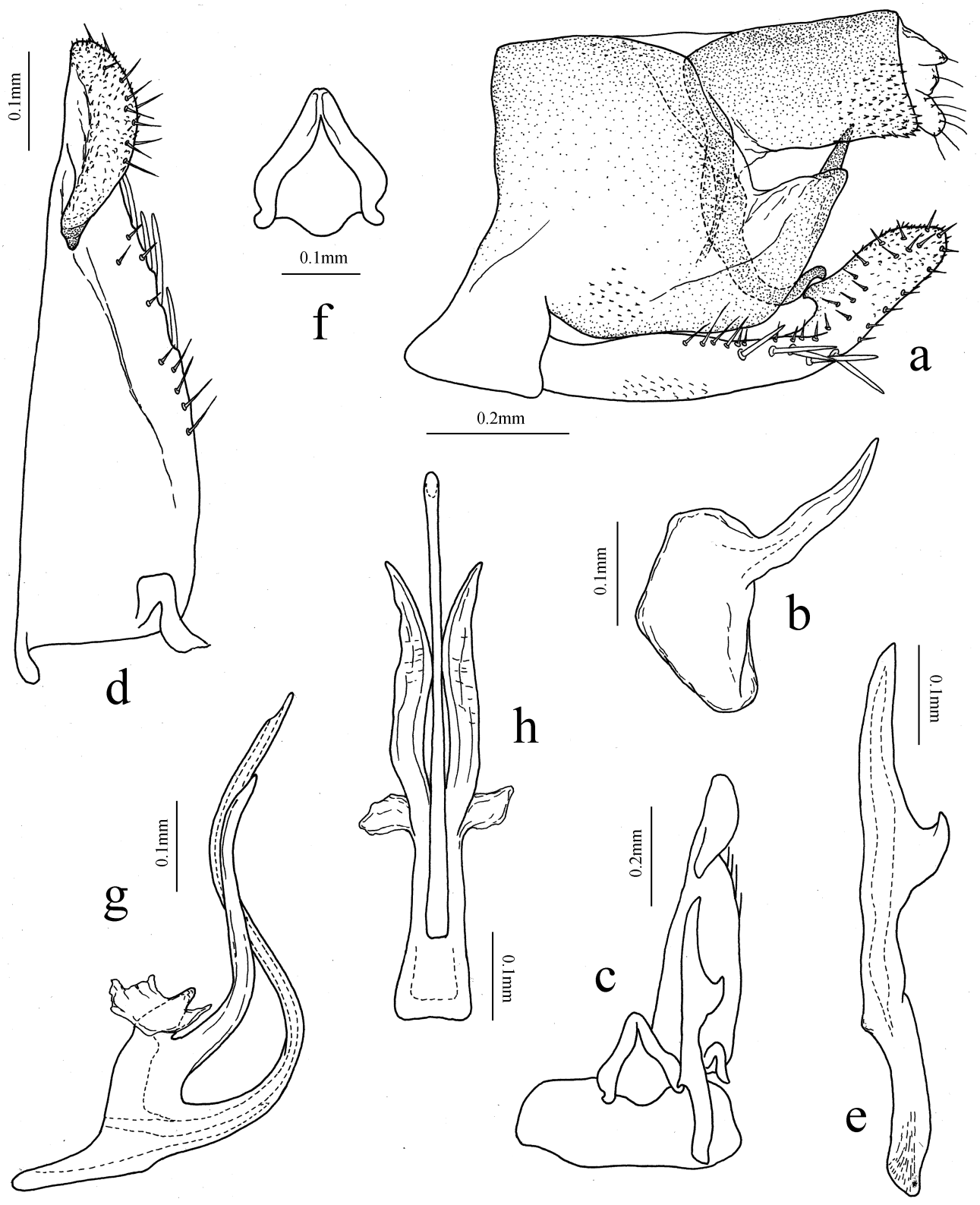

FIGURE 14. *Thaia* (*Thaia*) *oryzivora* Ghauri, 1962. a. genital capsule; b. pygofer ventral appendage, caudal view; c. subgenital plate, style, connective and sternite IX; d. subgenital plate, dorsal view; e. style, dorsal view; f. connective; g. aedeagus, lateral view; h. aedeagus, caudal view.

Diagnosis. This genus is similar to *Thaia* (*Thaia*) Ghauri, but the anal tube appendage, the pygofer ventral appendage and the aedeagus are very different from the *T. subrufa* group of the latter. *Parathaia* has robust appendages extending from the basal lower margin of the anal tube, an unexpanded base of the pygofer ventral appendage and a large, compressed dorsal apodeme of the aedeagus.

Species checklist of *Parathaia*
P. bimaculata Kuoh, 1982

1. *Parathaia bimaculata* Kuoh, 1982
Figs 15, 20i–l

Parathaia bimaculata Kuoh, 1982: 398, Fig. 2; Zhang, 1990: 141, Fig. 154
Thaia (*Thaia*) *bimaculata*: Song & Li, 2014: 187

Description. Ground color light brown, eyes black. Basal triangles of mesonotum dark brown.
Anal tube appendage long and straight, crumpled subapically and pointed apically.

Pygofer lobe well sclerotized basally and less sclerotized at distal half; ventral appendage long, exceeding hind margin of lobe, apex hooked. Connective with broad manubrium, central lobe convex apically. Aedeagal shaft long, straight, with single ventral lamellate process beneath gonopore, asymmetric, Γ-shaped apically, with pair of long slim processes basally on atrium; dorsal apodeme very large in lateral view; preatrium very short, slightly protruded at connection with shaft.

Material examined. 4♂5♀, CHINA, Hunan Prov., Mt. Heng, 11 viii 1985, coll. Yalin Zhang & Yonghui Chai. [NWAFU].

Distribution. China (Guizhou, Hunan, Jiangxi).

Pseudothaia Kuoh, 1982

Pseudothaia Kuoh, 1982: 402; Song & Li, 2014: 120

Type species: *Pseudothaia striata* Kuoh, 1982, by original designation

Description. Body robust, ground color brown. Head as wide as or slightly wider than pronotum, crown fore margin subparallel to posterior margin or rounded apically, coronal suture distinct, extend to tip of vertex. Face convex in profile, anteclypeus oval, length slightly longer than width, lorum large. Pronotum with two large triangular impressions. Forewing with third apical cell widest, fourth apical cell not reached apex of wing, slightly shorter than third apical cell. Hind wing venation usual for Erythroneurini, RA vein absent.

Male abdominal apodemes 2S short and relatively narrow. Anal tube well sclerotized, with appendages basally.

Pygofer lobe with basal half and ventral appendage well pigmented, area between them membranous, setosity rudimentary; dorsal appendage absent; ventral appendage fused to pygofer lobe, extended from ventro-caudal margin, very solid, bifurcated. Subgenital plate flattened in lateral view, surpassing hind margin of pygofer lobe, fused with sternite IX basally but with some furrows, lateral margin nearly straight, apex narrowed and provided with thorn-like process distally; setosity consists of 2–4 macrosetae medially, some rigid setae along lateral margin and scattered on distal disc. Style slender and long, apex curved inwards, basal part short, preapical lobe poorly developed. Connective lamellate, manubrium and lateral arms carinate and pigmented, central lobe well developed. Aedeagus tubular with papillose apex; dorsal apodeme well developed, transversely expanded and extended caudad; preatrium moderately developed; gonopore terminal.

Remarks. The fusion of the subgenital plate to sternite IX is rare in Erythroneurini, but it is a stable character within this genus. *Pseudothaia caudata* Song & Li, 2013 is excluded from this genus due to the lack of this feature and other significant differences with the other two species of *Pseudothaia*, such as the vertically expanded distal disc of the subgenital plate and absence of the apical thorn-like process, the well-developed preapical lobe of the style and the compressed dorsal apodeme of the aedeagus.

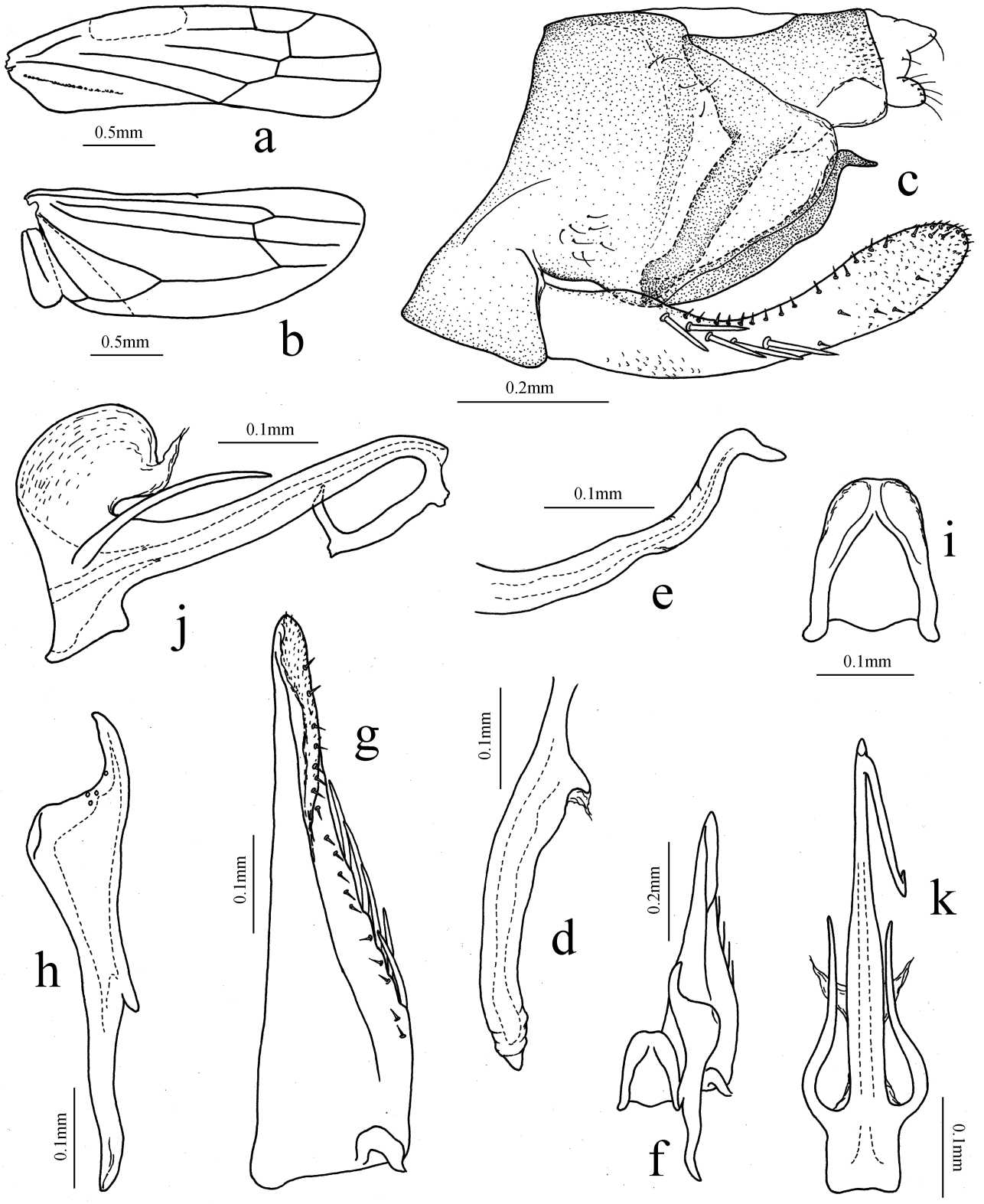

FIGURE 15. *Parathaia bimaculata* Kuoh, 1982. a. forewing; b. hind wing; c. genital capsule; d. anal tube appendage; e. pygofer ventral appendage, lateral view; f. subgenital plate, style and connective; g. subgenital plate, dorsal view; h. style, dorsal view; i. connective; j. aedeagus, lateral view; k. aedeagus, ventral view.

Distribution. China.

Diagnosis. This genus is superficially similar to *Thaia* Ghauri, *Parathaia* Kuoh and *Etmaria* **gen. n.**, but the subgenital plate of *Pseudothaia* is very distinctive: the base is fused to sternite IX and the distal disc is flattened as the base and has a thorn-like process apically. Also, the pygofer ventral appendage is quite solid and the style is much longer and has a rudimentary preapical lobe.

Species checklist of *Pseudothaia*
P. forcipis Cao & Zhang **sp. nov.**
P. striata Kuoh, 1982

1. *Pseudothaia forcipis* Cao & Zhang sp. nov.

Figs 16, 20m–p

Description. Ground color infuscated, face brown, eyes black, basal triangular on mesonotum dark. Head as wide as pronotum, crown fore margin rounded apically, anteclypeus broad.

Male abdominal apodemes 2S nearly reached hind margin of sternite IV. Anal tube appendage clamp-shaped, caudal branch longer than cephalic branch.

Pygofer lobe with ventral appendage C-shaped from lateral view, upper branch long, curved ventrad, lower branch short and straight, pointed apically. Subgenital plate with small apical process, with about 4 macrosetae in oblique row near lateral margin, row of marginal setae from middle part to apex. Style with apex curved inward sharply, preapical lobe indistinct. Connective long, margin of central lobe straight. Aedeagal shaft straight, directed dorso-caudad, slim in lateral view and thick in caudal view, atrium large.

Measurement. Male length 3.50–3.60 mm.

Material examined. Holotype: ♂, CHINA, Zhejiang Prov., Mt. Wuyan, 07 viii 2007, coll. Xinmin Zhang. Paratypes: 1♂, same data as holotype; 1♂, CHINA, Hunan Prov., Mt. Heng, 11 viii 1985, coll. Yalin Zhang & Yonghui Chai. [NWAFU].

Etymology. The new specific epithet is derived from Latin noun "*forcipis*" which means pincer, referring to the clamp-shaped anal tube appendage.

Diagnosis. The new species can be distinguished from the type species by the bifurcated anal tube appendage, the C-shaped pygofer ventral appendage and the much longer connective.

2. *Pseudothaia striata* Kuoh, 1982

Figs 17, 20q–t

Pseudothaia striata Kuoh, 1982: 402, Fig. 5

Material examined. CHINA: 2♂1♀, Hainan Prov., Mt. Diaoluo, 1 v 1983, coll. Yalin Zhang; 1♂, Hainan Prov., Mt. Diaoluo, 4 vi 1983, light trap, coll. Yalin Zhang; 17♂29♀, Hainan Prov., Liangyuan, 30 v 1983, coll. Yalin Zhang; 6♂4♀, Hainan Prov., Yacheng, 8 vi 1983, coll. Yalin Zhang; 1♂, Hainan Prov., Haikou, 13 vi 1983, coll. Yalin Zhang; 31♂28♀, Hainan Prov., Qiongzhong, 4 vi 1983, coll. Yalin Zhang; 6♂11♀, Hainan Prov., Mt. Diaoluo, 1 vi 2007, coll. Yani Duan; 1♂1♀, Hainan, Prov., Mt. Jianfeng, 5 vi 2007, coll. Yani Duan; 4♂1♀, Hainan Prov., Mt. Bawang, 10 vi 2007; coll. Yani Duan; 3♂3♀, Hainan Prov., Mt. Diaoluo, 140m, 09 iv 2008, coll. Qiulei Men; 1♂, Guangdong Prov., Zhaoqing, Mt. Dinghu, 19 vi 1983, light trap, coll. Yalin Zhang; 1♂, Sichuan Prov., Mt. Emei, Xianfeng Temple, 1450 m, 31 x 1999, coll. Daozheng Qin. [NWAFU].

Remarks. In the original description of the genus and the type species, the aedeagus was described as with a pair of long lamellate processes dorso-basad, which may refer to the transversely expanded dorsal apodeme. The aedeagal process is absent for both species examined in this study.

Distribution. China (Guangdong, Hainan, Sichuan).

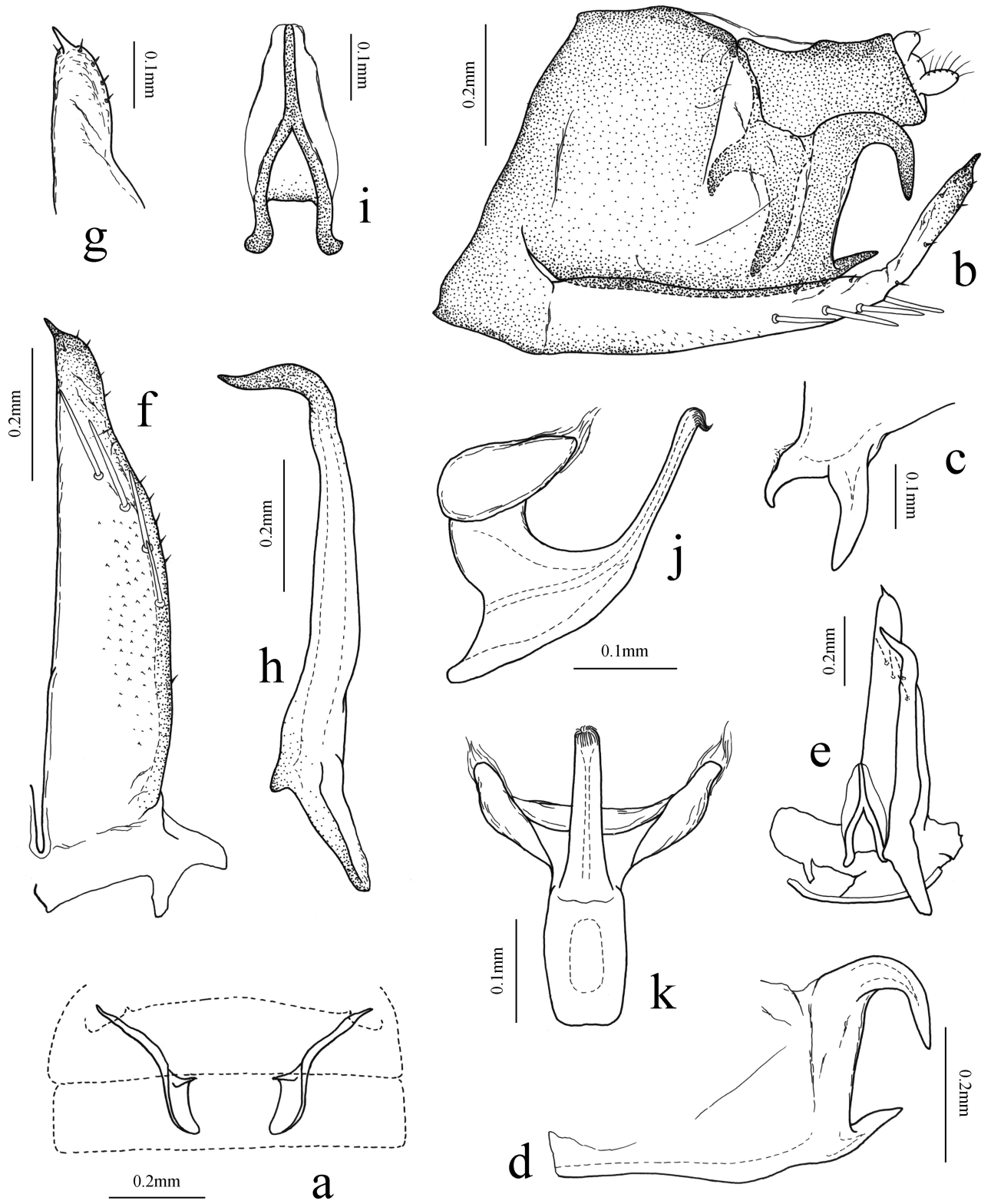

FIGURE 16. *Pseudothaia forcipis* Cao & Zhang **sp. nov.** a. abdominal apodemes 2S; b. genital capsule; c. anal tube appendage, lateral view; d. pygofer ventral appendage, lateral view; e. subgenital plate, style, connective and sternite IX; f. subgenital plate, ventral view; g. apex of subgenital plate; h. style, dorsal view; i. connective; j. aedeagus, lateral view; k. aedeagus, caudal view.

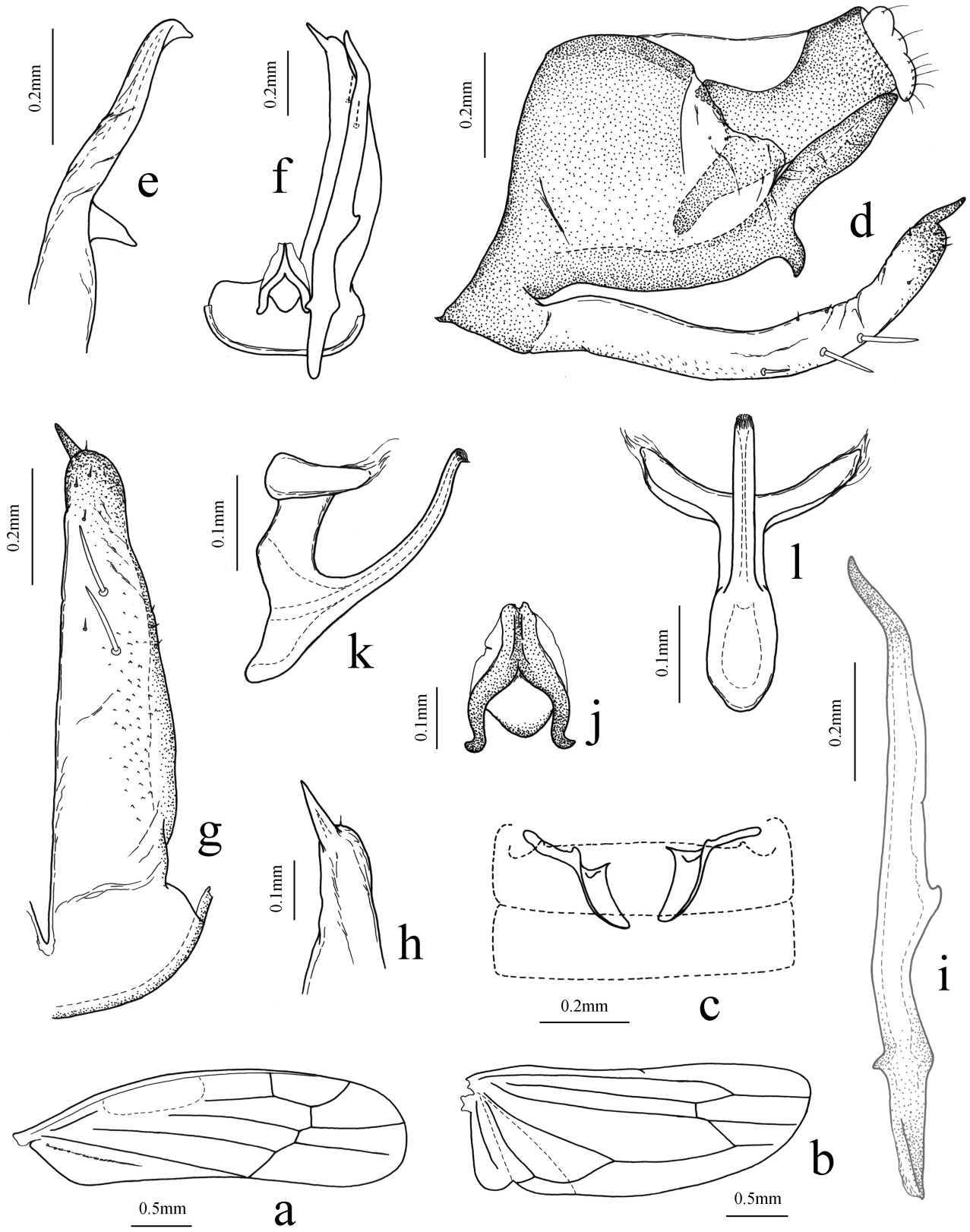

FIGURE 17. *Pseudothaia striata* Kuoh, 1982. a. forewing; b. hind wing; c. abdominal apodemes 2S; d. genital capsule; e. pygofer ventral appendage, ventral view; f. subgenital plate, style, connective and sternite IX; g. subgenital plate, ventral view; h. apex of subgenital plate; i. style, dorsal view; j. connective; k. aedeagus, lateral view; l. aedeagus, caudal view.

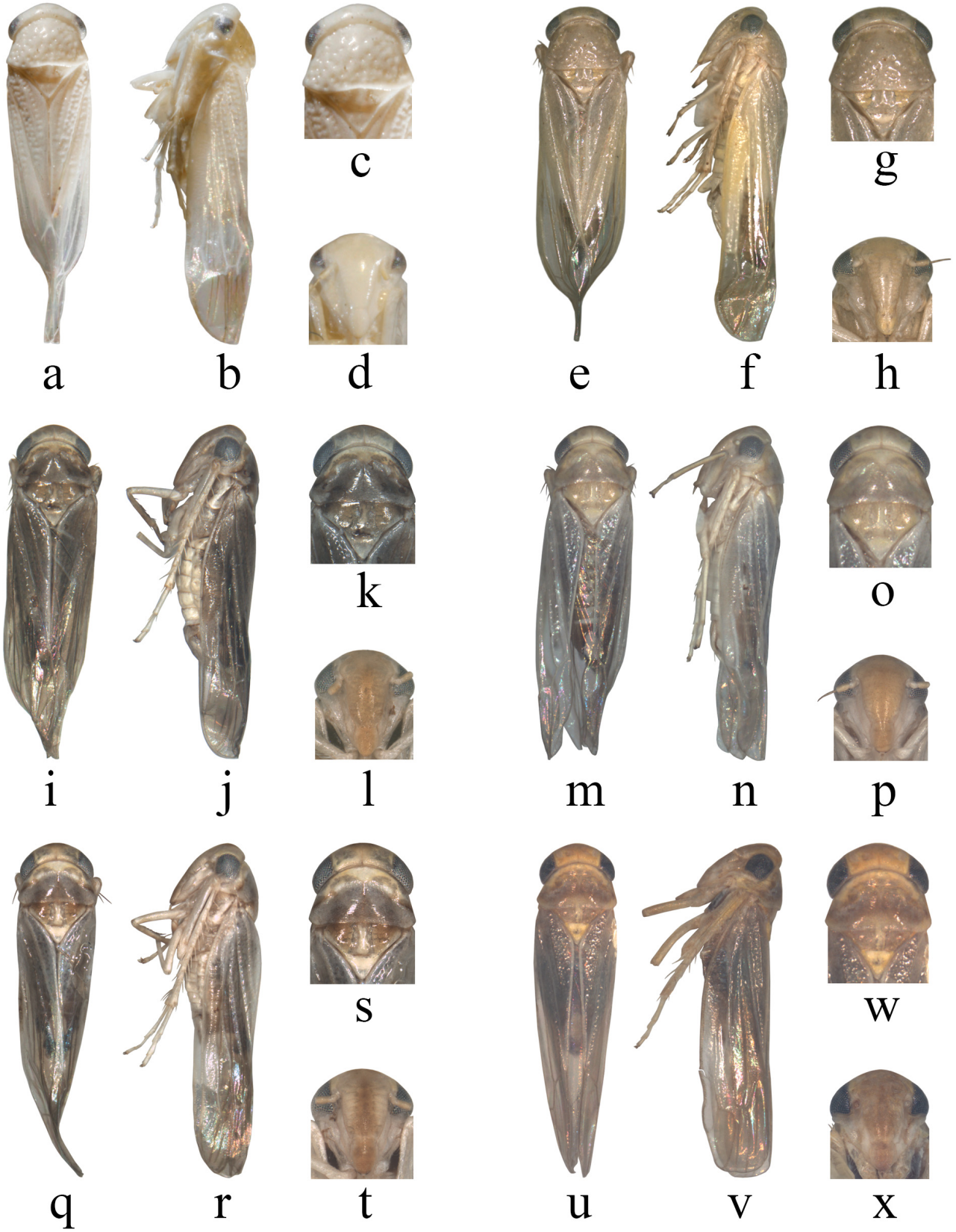

FIGURE 18. a–d. *Nlunga parareeneni* Cao & Dietrich **sp. nov.**; e–h. *Nlunga reeneni* Dworakowska, 1974; i–l. *Etmaria brevis* Cao & Dmitriev **sp. nov.**; m–p. *Etmaria chaiyahumica* Cao & Dmitriev **sp. nov.**; q–t. *Etmaria dentata* Cao & Dmitriev **sp. nov.**; u–x. *Etmaria indonesica* Cao & Dietrich **sp. nov.**

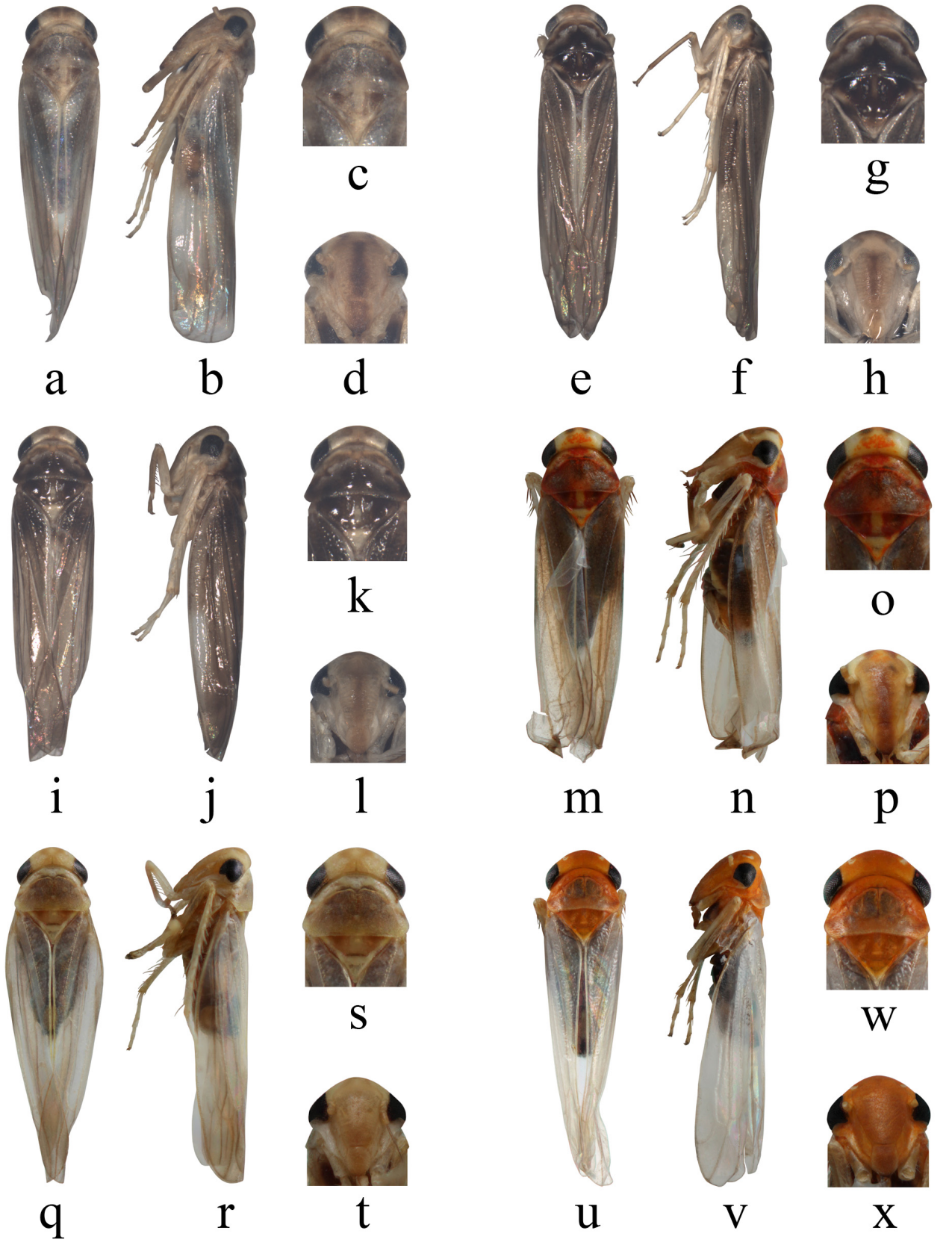

FIGURE 19. a–d. *Etmaria infumata* (Kuoh, 1982) **comb. n.**; e–h. *Etmaria magna* Cao & Dietrich **sp. nov.**; i–l. *Etmaria sinuata* (Chiang & Knight, 1990) **comb. n.**; m–p. *Etmaria triquetra* Cao & Zhang **sp. nov.**; q–t. *Etmaria ulterior* Cao & Zhang **sp. nov.**; u–x. *Thaia* (*Thaia*) *barbata* Dworakowska, 1979

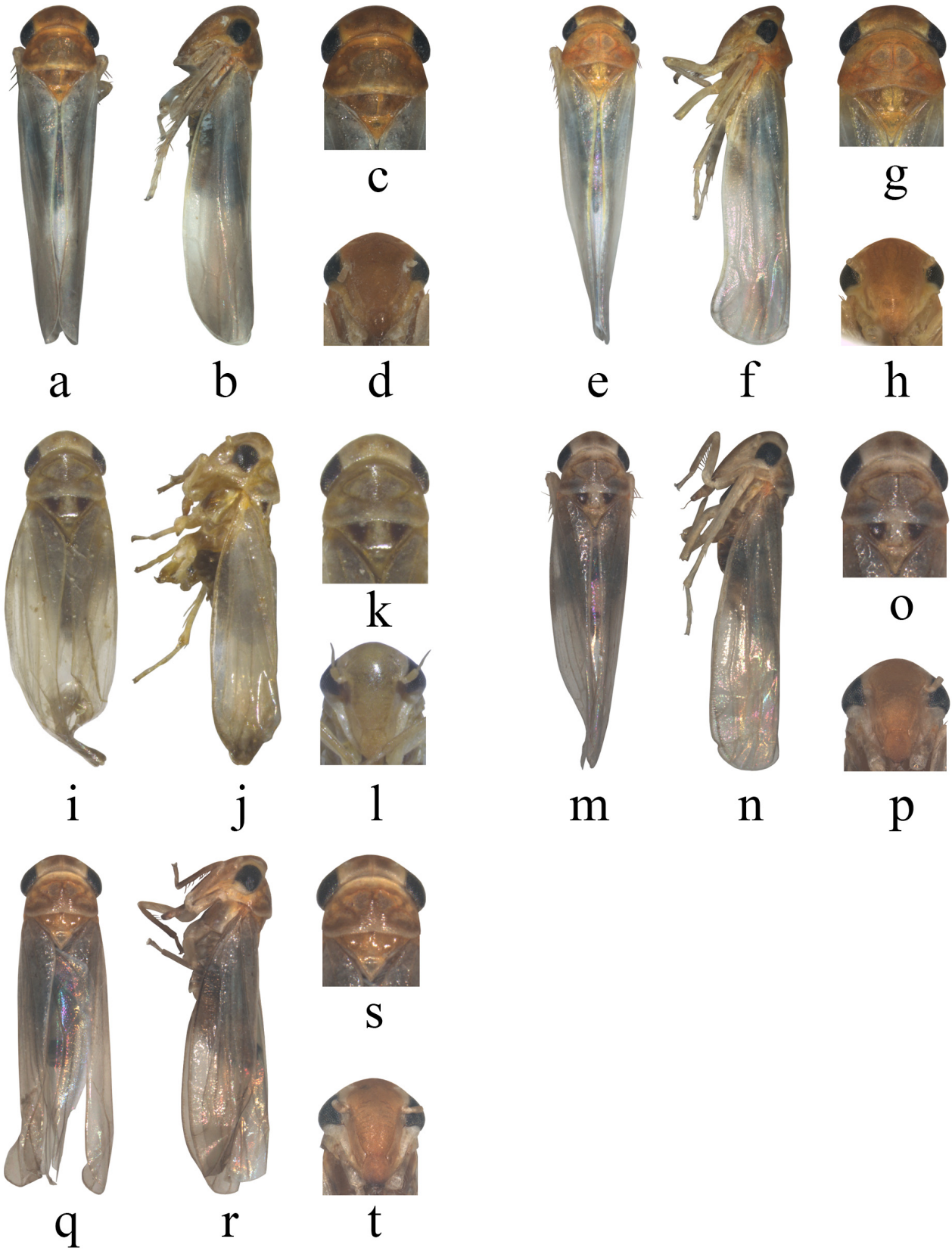

FIGURE 20. a–d. *Thaia* (*Thaia*) *longipenia* Thapa & Sohi, 1982; e–h. *Thaia* (*Thaia*) *oryzivora* Ghauri, 1962; i–l. *Parathaia bimaculata* Kuoh, 1982; m–p. *Pseudothaia forcipis* Cao & Zhang **sp. nov.**; q–t. *Pseudothaia striata* Kuoh, 1982

Species Incertae Sedis

Pseudothaia caudata Song & Li, 2013

Pseudothaia caudata Song & Li, 2013: 223, Figs 1–3, 4–13

Remarks. This species is similar to some species of *Thaia* Ghauri and *Etmaria* **gen. n.** in the shape of the subgenital plate, style and aedeagus. However, its pygofer lobe is very narrow and tapering apically, which differs from *Thaia* and *Etmaria*. The pygofer lobe and the small ventral process of *P. caudata* looks like the pygofer ventral appendage of *P. striata*, but the other structures are very different. This species is here treated as *Incertae sedis* within Erythroneurini.

Thaia (*Nlunga*) *leishanensis* (Song & Li, 2007)

Parathaia leishanensis Song & Li, 2007: 64, Figs 1–11
Thaia (*Nlunga*) *leishanensis*: Song & Li, 2014: 185

Remarks. This species was originally placed in *Parathaia* Kuoh, then transferred to *Thaia* (*Nlunga*). Most of the Oriental species of *Thaia* (*Nlunga*) are now transferred to *Etmaria* **gen. n.**, however, this species lacks all the key characters of the new genus. Therefore, it is here treated as *incertae sedis* within Erythroneurini.

Discussion

Review of several previously described and new species of the widespread Old World erythroneurine genus *Thaia* (sensu lato) revealed considerable morphological heterogeneity, making the genus difficult to diagnose based on a few characters. The taxonomic changes proposed here, including recognition of a new genus, elevation of a taxon previously treated as a subgenus of *Thaia*, and reinstatement of a taxon previously treated as a junior synonym allow us to divide the known species of this group into more morphologically homogeneous taxa recognizable by distinctive diagnostic characters. *Nlunga*, as redefined, now includes only species having pits on the pronotum and includes African and Oriental species groups that differ in the structure of the aedeagal atrium, anal tube appendage and other aspects of the male genitalia. Further collecting and study of additional species may eventually warrant formal recognition of these regional groups as separate taxa. *Etmaria*, here described as a new genus, includes species previously placed in both *Thaia* (sensu stricto) and *Nlunga*, in addition to several new species. It differs from the previously described genera in the lack of pits on the pronotum and the distal placement of the anal tube appendage as well as in other aspects of the male genitalia. *Parathaia*, originally described as a distinct genus by Kuoh (1982) but treated as a synonym of *Thaia* by Song & Li (2014) has the structure of the genital capsule and genitalia very different from that found in *Thaia*, suggesting that it is not closely related to species included in that genus. Thus, we reinstate *Parathaia* as a valid genus. Further study including collecting in poorly sampled regions of the Old World tropics and phylogenetic analysis based on morphological and molecular data is needed to elucidate the full diversity of this group of genera and test the status of taxa recognized as genera and informal species groups.

Acknowledgements

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