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A New Palearctic Genus of Melectine Bees (Hymenoptera: Apidae)

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ABSTRACT

Thyreomelecta, new genus, is described for seven species of the cleptoparasitic bee tribe Melectini (Apinae). The genus is most similar to *Thyreus* but differs notably in the structure of the mesoscutellum and the length of the first metasomal segment. *Thyreomelecta* is distinguished from other melectines and is considered to include the following species: *Thyreomelecta bidentata* (Kirby), new combination (eastern Turkmenistan and western Afghanistan [likely also eastern Iran]); *T. dimidiatipuncta* (Spinola), new combination (southern Mediterranean from eastern Libya to eastern Iraq); *T. kirghisia*, new species (Kyrgyzstan); *T. merviensis* (Radoszkowsky), new combination (eastern Turkmenistan and Kyrgyzstan [new record]); *T. paucimaculosa* (Alfken), new combination (Tajikistan); *T. propinqua* (Lieftinck), new combination (North Korea west to Manchuria); and *T. siberica* (Radoszkowsky), new combination (southeastern Siberia). *Thyreomelecta merviensis*, previously known only from a single, headless male, is here recorded from a second, completely preserved male and the terminalia are figured. The little available information on the biology and immature stages of *Thyreomelecta* is briefly presented. A key to the Eastern Hemisphere genera of Melectini is provided as well as a preliminary key to the species of *Thyreomelecta*.

INTRODUCTION

The bee tribe Melectini comprises 206 species distributed principally in the Palearctic region but also occurring in Africa, tropical Asia, Australia, North America (south into tropical Mexico), and the Antilles. All melectines are cleptoparasites of the closely related tribe, Anthophorini (except for one record of a species on Eucerini: table 1 and Lieftinck, 1972). Melectine females invade closed host cells and oviposit on the upper wall or cell closure before resealing the cell (Torchio and Youssef, 1968; Thorp, 1969; Torchio and Trostle, 1986). The first larval instar is hospicidal and dispatches the host immature before feeding on the provisioned pollen. The first instar (Giordani Soika, 1936; Rozen, 1991), mature larvae (Semichon, 1922; Michener, 1953; Cardale, 1968; Torchio and Youssef, 1968; Rozen, 1969), and pupae (Semichon, 1922; Porter, 1951; Michener, 1954; Cardale, 1968; Torchio and Youssef, 1968; Thorp, 1969; Rozen, 2000) of various melectine genera have been well characterized and illustrated.

Herein we present the description of a new genus of Palearctic melectines closely allied to the widely distributed genus *Thyreus*. The new genus is based on seven species, six of which were hesitatingly placed in *Thyreus* (or its synonym, *Crocisa*) by earlier authors, while the seventh is described as new. Although it retains some interesting apomorphic traits that support its sister-group position

relative to *Thyreus* (e.g., absence of pupal cocoons), other aspects exclude it from that genus (e.g., lack of the distinctive platelike mesoscutellum, shortened first metasomal segment, parasitization of species of *Anthophora*) and cause it to superficially resemble other melectines (e.g., *Melecta*, *Afromelecta*). While we have recognized only seven species, there are presumably others to be discovered. Few specimens are known for species of this new genus and the regions in which most occur (e.g., Iraq, Iran, Afghanistan, Tajikistan, Turkmenistan, Kyrgyzstan, and likely Uzbekistan and other Middle Eastern countries) are poorly represented in collections.

The features characterizing the new genus were previously outlined, although incompletely, by Lieftinck. In his 1968 monograph of the Palearctic species of *Thyreus*, Lieftinck distinguished two basal groups, the *T. dimidiatipuncta* and *T. scutellaris* species groups. Together these groups comprise eight species (plus one subspecies that we herein treat as a distinct species: table 2), six of which we place in *Thyreomelecta* based on some of the same characters that Lieftinck used to define the *T. dimidiatipuncta* species group. After examination, the remaining three species in Lieftinck's *T. scutellaris* group, *Thyreus scutellaris* (Fabricius) (type species of *Thyreus*), *T. affinis* (Morawitz), and *T. elegans* (Morawitz), were found not to belong to the new genus. Interestingly,

TABLE 1
Hierarchical Classification of Tribe Melectini
 (Number of described species and hosts, or presumed hosts, indicated)

Tribe MELECTINI Westwood		
Genus <i>Afrolelecta</i> Lieftinck		
subgenus <i>Acanthomelecta</i> Lieftinck	1	Unknown
subgenus <i>Afrolelecta</i> Lieftinck	2	<i>Habropoda</i>
Genus <i>Brachymelecta</i> Linsley	1	Unknown
Genus <i>Melecta</i> Latreille		
subgenus <i>Eupavlovskia</i> Popov	2	<i>Habropoda</i>
subgenus <i>Melecta</i> Latreille	48	<i>Anthophora</i> , <i>Habropoda</i>
subgenus <i>Melectomimus</i> Linsley	1	<i>Habropoda</i> ?
subgenus <i>Paracrocisa</i> Alfken	3	<i>Anthophora</i> (<i>Paramegilla</i>)
subgenus <i>Pseudomelecta</i> Radoszkowsky	5	<i>Anthophora</i> (<i>Paramegilla</i> , <i>Petalosternon</i>)
Genus † <i>Protomelecta</i> Cockerell	1	Unknown
Genus <i>Sinomelecta</i> Baker	1	Unknown (<i>Anthophora</i> ?)
Genus <i>Tetralonoidella</i> Strand	10	<i>Elaphropoda</i> ?, <i>Habropoda</i> ?
Genus <i>Thyreomelecta</i> Rightmyer and Engel	7	<i>Anthophora</i> (<i>Petalosternon</i>)
Genus <i>Thyreus</i> Panzer	118	<i>Amegilla</i> ^a
Genus <i>Xeromelecta</i> Linsley		
subgenus <i>Melectomorpha</i> Linsley	2	<i>Anthophora</i> (<i>Anthophoroides</i>)
subgenus <i>Nesomelecta</i> Michener	3	<i>Anthophora</i> ?
subgenus <i>Xeromelecta</i> Linsley	1	<i>Anthophora</i> ?
Genus <i>Zacosmia</i> Ashmead	1	<i>Anthophora</i> (<i>Heliophila</i>)

† Fossil genus from Eocene-Oligocene boundary of Florissant, Colorado. Critical study of the holotype is required to determine if this is definitively a melectine.

^a Three species of *Thyreus* have been captured on non-*Amegilla* hosts: Anthophorini: *T. lieftincki* Rozen on *Anthophora braunsiana* Friese (Rozen, 1969), *T. orbatus* (Lepelletier de Saint Fargeau) on *Anthophora borealis* Morawitz and *A. quadrimaculata* (Panzer) (Stoekert, 1954); Eucerini: *Thyreus* sp. on *Eucera* (*Synhalonia*) *languinosa* (Klug) (Wafa and Mohamed, 1970: as *Crocisa* and *Tetralonia*, respectively).

Lieftinck (1968: 42) noted that the *T. dimidiatipuncta* group was “a somewhat less specialised member of *Thyreus* leading over via [Lieftinck’s emphasis] the above genera [i.e., *Pseudomelecta* and *Paracrocisa*] to *Melecta* and *Eupavlovskia*” and suggested that they may eventually be referred to a separate genus.

Morphological terminology generally follows that of Michener and Fraser (1978), Michener (2000), and Engel (2001), with the abbreviations F, OD, S, and T employed for flagellomere, ocellar diameter (based on the median ocellus), metasomal sternum, and metasomal tergum, respectively. The acronyms AMNH and SEMC are used for American Museum of Natural History (New York) and Snow Entomological Collection, Divi-

sion of Entomology, University of Kansas Natural History Museum (Lawrence, KS), respectively. Double slashes (//) separate data on different labels of a specimen. Measurements are given for the holotype and allotype of the new species, with ranges of variation provided in parentheses.

SYSTEMATICS

Thyreomelecta, new genus

TYPE SPECIES: *Thyreomelecta kirghisia*, new species.

DIAGNOSIS: This new genus is most similar to *Thyreus*, as is evidenced by the absence of the arolia and absence of pupal cocoons. The absence of arolia and the mesoscutellar structure is somewhat reminiscent of some

TABLE 2

Lieftinck's (1968) Basal Species Groups of *Thyreus*

DIMIDIATIPUNCTA GROUP

- Thyreus dimidiatipuncta dimidiatipuncta* (Spinola)
Thyreus dimidiatipuncta bidentatus (Kirby)
Thyreus merviensi (Radoszkowsky)

SCUTELLARIS GROUP

- Thyreus scutellaris* (Fabricius)
Thyreus affinis (Morawitz)
Thyreus paucimaculosus (Alfken)
Thyreus sibiricus (Radoszkowsky)
Thyreus propinquus Lieftinck
Thyreus elegans (Morawitz)

Afromelecta, but both subgenera of *Afromelecta* lack the paired spines present on T7 in males of *Thyreomelecta* and *Thyreus* and possess a distinct medioapical emargination on the labrum (absent in *Thyreomelecta*). From *Thyreus* the new genus is notable for the more *Melecta*-like mesoscutellum (as also noted by Lieftinck) which is not flattened into a plate that projects posteriorly over the metanotum and propodeum (and frequently the anterior part of T1) (figs. 7, 8), as well as the shorter T1 (distinctly longer than T2 in *Thyreus*). The nonflattened mesoscutellum of *Thyreomelecta* possesses lateral spines like some other melectines rather than the flattened extensions characteristic of the shieldlike, projecting mesoscutellum of *Thyreus*.

DESCRIPTION: Adult. Apical margin of labrum gently and evenly convex. Maxillary palpus absent or vestigial with 1–2 minute segments. Preoccipital ridge carinate. Mesoscutellum gently biconvex with strong posterolateral spines or tubercles, strongly and coarsely punctured, weakly platelike (not strongly flattened and shieldlike as in *Thyreus*) (figs. 7, 8); posterior surface almost vertical, angle between dorsal and posterior surfaces approximately orthogonal, angle formed of carina running between lateral spines or tubercles although carina interrupted at midpoint (in *Thyreus* this angle is strongly acute with posterior surface strongly incurved and with a distinct ventral-facing surface), medioposterior dorsal surface slightly concave and only slightly overhanging and not obscuring metanotum (in *Thy-*

reus the entire dorsal surface projects and overhangs metanotum and propodeum). Claws cleft, inner ramus slightly expanded vertically with subtruncated apex; arolium absent (fig. 6). Marginal cell only slightly projecting beyond apex of submarginal cells; marginal cell length slightly shorter than distance from its apex to wing tip; three submarginal cells present; wing membranes beyond veins papillate (fig. 9). Metasoma with areas of appressed, white (or black in *T. bidentata*), plumose pubescence; mediolongitudinal lengths of T1 and T2 subequal (in *Thyreus* T1 conspicuously longer than T2). Male pygidial plate absent; female pygidial plate slender with rounded apex; apex of male T7 with paired, flattened, medioapical tubercles or spines. **Pupa.** Pupa not contained within a cocoon (like *Thyreus*; all other Melectini, where known, have pupae within cocoons).

ETYMOLOGY: The new genus-group name is a combination of the generic names *Thyreus* and *Melecta*, a reference to the intermediate nature of this genus between the others (albeit with closer cladistic affinity to *Thyreus*). The name is feminine.

COMMENTS: The pupa of this genus was described in detail by Rozen (2000) as "*Thyreus* sp.?" (= *Thyreomelecta kirghisia*). The only host record for the genus is for the type species and is a species of *Anthophora* unlike most *Thyreus* species that parasitize species of *Amegilla* (although some definitive *Thyreus* species also parasitize *Anthophora* and *Eucera*: see table 1). Owing to the large number of apomorphies found in *Thyreus*, making it dramatically different from other Melectini, some authors hypothesized a polyphyletic origin of the tribe with *Thyreus* originating from an *Amegilla* ancestor (e.g., Popov, 1955; Lieftinck, 1968) or from the same ancestral line as *Melecta* but during different episodes in history (i.e., still polyphyletic in origin but from the same paraphyletic ancestral stock: Grütte, 1935). Although this position has never been supported by critical evidence, it becomes even less tenable with the recognition of *Thyreomelecta*, which brings together some of the apomorphies of *Thyreus* with more typical melectine traits, thereby closing the superficial gap between *Thyreus* and the remainder of the tribe. Once a cladistic analysis of *Thyreus* has been com-

pleted and meaningful subgenera defined, *Thyreomelecta* might be brought back into the genus as its basalmost subgenus or retained at generic rank and sister to *Thyreus*.

Although Lieftinck (1968) considered *Thyreus scutellaris* (Fabricius), *T. affinis* (Morawitz), and *T. elegans* (Morawitz) as closely allied to a group of species that we here place in *Thyreomelecta*, in these species the mesoscutellum does medially project posteriorly over the metanotum and propodeum, albeit less so than in many *Thyreus*. In general, his placement of *T. scutellaris*, *T. affinis*, and *T. elegans* seems contradictory to his own grouping of characters (e.g., compare statements concerning characters of these taxa on the top of page 13 of his monograph, in his key, and under the respective descriptions of these species). Examination of these species leads us to conclude that they are true *Thyreus* and do not belong in *Thyreomelecta*.

An additional potential member of *Thyreomelecta* is the enigmatic species *Thyreus aberrans* (Morawitz, 1875). Radoszkowsky (1893) illustrated the mesoscutella of several species of *Thyreus*, and singled out *T. merwiensis* (Radoszkowsky), *T. sibericus* (Radoszkowsky), and *T. aberrans* by shading and stippling the mesoscutella of these three species to denote the biconvex nature of this structure (in all other species, the mesoscutellum is represented by a simple line drawing). The drawing of *T. aberrans* is tantalizingly similar to that of a *Thyreomelecta*. Unfortunately, as noted by Lieftinck (1968), the type of this species has been lost, and the original description by Morawitz may not correspond with the drawing provided by Radoszkowsky (the description is somewhat unclear); Morawitz described the holotype as having the mesoscutellum produced into median, rather than lateral, lobes. The use of the word "median" could potentially refer to the position of the lobes posteriorly or ventrally on the mesoscutellum, and thus correspond to Radoszkowsky's drawing; however, the common understanding of "median" would imply that the lobes are placed close together on the midline of the mesoscutellum. If so, the mesoscutellum of *T. aberrans* is seemingly unlike any other Melectini. Whether the description by Morawitz is a mistake

(possibly a typographical error?) or Radoszkowsky did not truly have *T. aberrans* before him (at any rate, he did not have the holotype: he illustrated a male, while the holotype is a female) remains a mystery.

KEY TO EASTERN HEMISPHERE
GENERA OF MELECTINI
(Modified from Michener, 2000)

1. Mesoscutellum convex, biconvex, bituberculate, or bispinose, at least medially not projecting posteriorly over metanotum or propodeum; posterior surface of mesoscutellum declivitous, thus angle between dorsal and posterior surfaces approximately orthogonal and mesoscutellum medially lacking distinct ventral-facing surface; body with or without areas of appressed plumose setae, but *if* present, then these setae white or rarely black; maxillary palpus variable 2
 - Mesoscutellum flat or nearly so, produced posteriorly along its entire width over metanotum, propodeum, and, in some positions, base of T1, as a sharply margined plate, bidentate with broad V- or U-shaped emargination between teeth; posterior part of mesoscutellar surface on underside of plate facing ventrally (i.e., posterior surface strongly incurved), thus angle between dorsal and posterior surfaces strongly acute; body with areas of appressed, plumose setae forming white, blue, purple, or green spots or broken bands; maxillary palpus absent or minute, 0–4 segmented; (arolia absent) *Thyreus* Panzer
2. Arolia absent 3
 - Arolia present (greatly developed or vestigial) 4
3. Apex of labrum gently convex; dorsal surface of T1 subequal to T2 in length; apical margin of male T7 with paired, medioapical processes (Palearctic) *Thyreomelecta*, n. gen.
 - Apex of labrum gently emarginate; dorsal surface of T1 longer than to slightly shorter than T2; apical margin of male T7 broadly rounded (Africa) *Afromelecta* Lieftinck s. l. (in part)
4. Marginal cell equal to or shorter than distance from its apex to wing tip; body commonly with spots of white, appressed pubescence, metasomal pubescence entirely black or with white spots, or pale and forming apical fasciae on terga 5
 - Marginal cell longer than distance from its apex to wing tip; body without spots of

white pubescence, metasomal pubescence brown, orange, or yellowish (Oriental) *Tetralonioidella* Strand

5. Three submarginal cells (i.e., 1rs-m present); body typically with patches of appressed, white setae and without pale apical tergal fasciae (except *Melecta oreina* Baker, which has vestiture of *Sinomelecta*); F1 less than 1.5 times as long as broad and less than twice as long as F2 6
- Two submarginal cells (i.e., 1rs-m absent); body without patches of appressed, white setae; metasomal terga with apical white fasciae; F1 more than 1.5 times as long as broad and about twice as long as F2 (China) *Sinomelecta* Baker
6. Dorsal surface of T1 longer than to scarcely shorter than T2 in normal position; arolia vestigial (Africa) *Afromelecta* Lieftinck s.l. (in part)
- Dorsal surface of T1 distinctly shorter than T2 in normal position; arolia well developed (Palearctic) *Melecta* Latreille s.l.

Thyreomelecta bidentata (Kirby),
new combination

Crocisa bidentata Kirby, 1889: 136. Meade-Waldo, 1913: 93. Meyer, 1921: 79.

Crocisa valida Morawitz, 1895: 43. Meyer, 1921: 79.

Thyreus dimidiatipuncta bidentatus (Kirby); Lieftinck, 1968: 42.

DIAGNOSIS: Among species with the clypeus densely clothed with white setae in males, *T. bidentata* is similar to *T. dimidiatipuncta*. *Thyreomelecta merviensis* differs from both of these species by the broad separation between the apical projections of T7 and the presence of white setae on the sterna. Males and females of *T. bidentata* are nearly identical to those of *T. dimidiatipuncta* (see below) but differ by the absence of white pubescent patches on the metasoma (these are instead black in *T. bidentata*). Males also have some differences in the genitalia from those of *T. dimidiatipuncta* (e.g., shape of the dorsal gonostylar process [larger in *T. bidentata*], setae of the gonostylus [longer and more dense in *T. dimidiatipuncta*]).

DISTRIBUTION: This species occurs in Turkmenistan and Afghanistan (likely also in eastern Iran). The type locality for *T. bidentata* is in Afghanistan along the Harirud River (separating Afghanistan from Iran) while

the type locality for the junior subjective synonym, *T. valida* (Morawitz), is in eastern Turkmenistan.

Thyreomelecta dimidiatipuncta (Spinola),
new combination

Crocisa dimidiatipuncta Spinola, 1838: 536. Lapsus calami.

Crocisa dimidiatipunctata (Spinola); Dalla Torre, 1896: 320. Nomen emendatum (unjustified). Schulz, 1906: 257. Meyer, 1921: 100. Alfken, 1927: 114. Lieftinck, 1959: 33.

Crocisa gibba Meyer, 1921: 90. Alfken, 1934: 171.

Crocisa dimidiatipuncta Spinola; Alfken, 1934: 171. Nomen emendatum (justified).

Thyreus dimidiatipuncta (Spinola); Lieftinck, 1968: 35.

Thyreus dimidiatipunctata Rozen, 2000: 14. Lapsus calami.

Thyreus dimidiatipunctus Rozen, 2000: 14. Lapsus calami.

DIAGNOSIS: Refer to Diagnosis for *T. bidentata* (above).

DISTRIBUTION: This species occurs in northern Africa along the southern border of the Mediterranean, that is, in northwestern Libya (the Tripolitania region) and east into northern Egypt. There is also a single record of a female (if correctly identified) from eastern Iraq (near Baghdad), but we have not seen this individual to confirm its identity. If correctly identified, the species would likely not only be present in Iraq but perhaps in Israel, Jordan, and surrounding countries.

Thyreomelecta kirghisia, new species

Figures 1–7, 9–13, 16–21

Thyreus sp.? Rozen, 2000: 13 [description of pupa].

DIAGNOSIS: Males of the new species are notable for the absence of the posterior setal tuft on the mesoscutellum and for the clypeus, which is not densely and entirely covered with white setae. Males are nearly identical to those of *T. propinqua* (see Diagnosis for that species as well as Key, below) but can be separated on the basis of terminalia (e.g., compare figs. 12–15). Most notable are the characters of the hidden sterna (S7 and S8) which differ significantly from those of *T. propinqua* (e.g., the presence of a distinct medial tubercle with setae on S7 of *T.*

1**2**

Figs. 1, 2. *Thyromelecta kirghisia*, n. sp., holotype male. 1. Lateral aspect. 2. Dorsal aspect.



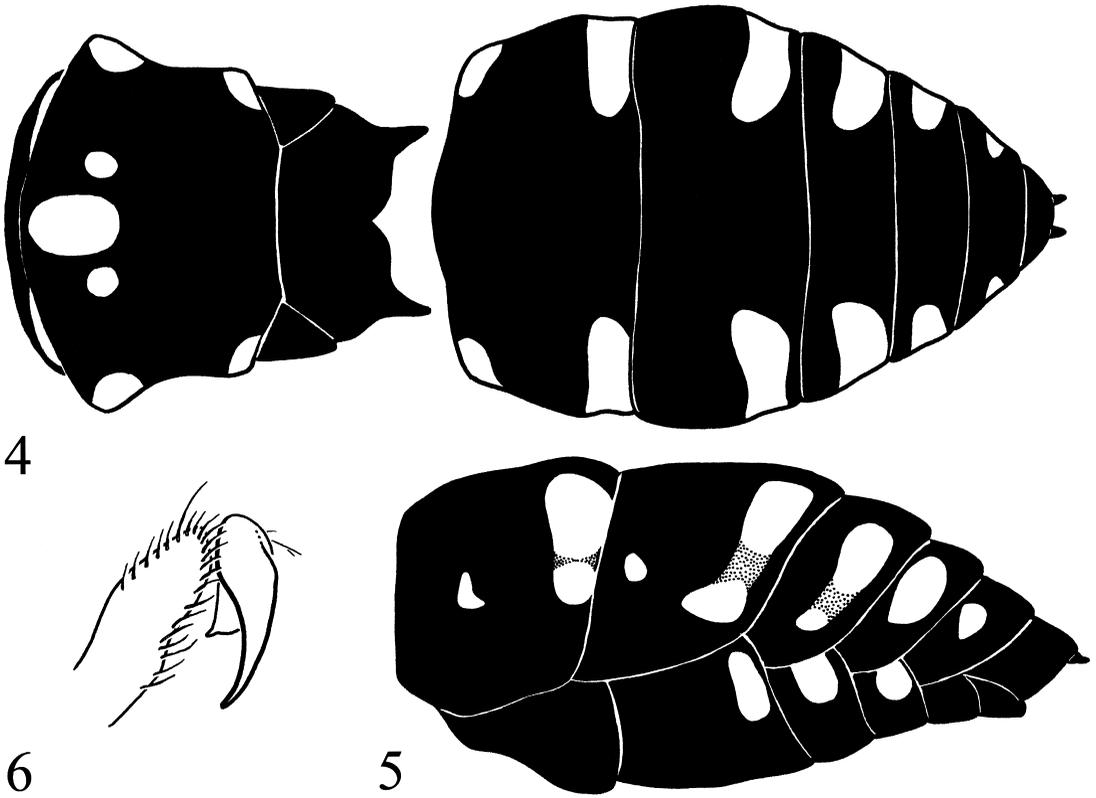
Fig. 3. Face of *Thyromelecta kirghisia*, n. sp., holotype male.

kirghisia). Females of *T. kirghisia* can be distinguished from those of *T. propinqua* by the shorter medial swelling of the pygidial plate.

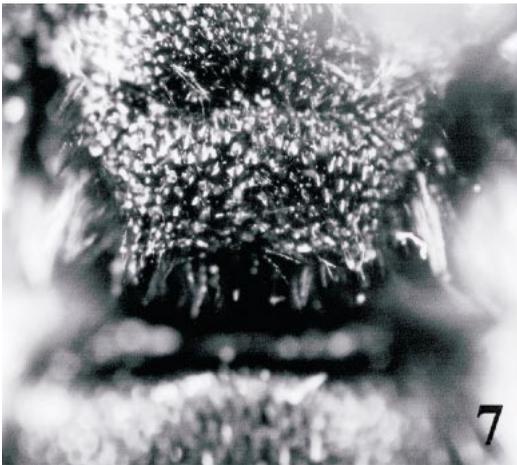
DESCRIPTION: Male, figs. 1–3. Total body length 9.0 mm (9.0–11.0 mm); forewing length 7.5 mm (7.5–8.5 mm). Head wider than long; width 2.5 mm (2.5–2.8 mm), length 2.3 mm (2.3–2.5 mm). Mandible dramatically widening from midpoint to base, with strong subapical tooth and weakly protuberant inner basal tooth or tubercle. Malar space exceedingly short, base of mandible almost touching compound eye. Labrum about as long as wide. Frontal line carinate on supraclypeal area to just above antennal sockets, above becoming moderately impressed line to just below median ocellus. F1 1.5 times longer than F2. Gena about as broad as compound eye. Hypostomal ridge minutely lamellate. Median line of mesoscutum strongly impressed to just beyond three-fourths length of mesoscutum. Parapsidal line weakly impressed, length slightly shorter than tegula. Intertegular distance 2.2 mm (2.2–2.5 mm). Outer surfaces of meso- and metatibia with sparse, minute, spinous tubercles; outer apical margin of mesotibia with three spines on anterior corner and one spine on posterior corner; outer apical margin of

metatibia with three stout spines (shorter than those on mesotibia) on anterior corner; mesotibial spur slightly longer than 0.5–0.75 length of mesobasitarsus, spur minutely ciliate on margins; inner metatibial spur longer (ca. one-fifth longer) than outer spur, spurs minutely ciliate on margins; metacoxa with short (shorter than in female) medioposterior spine on inner surface. Basal vein strongly basal to cu-a; 1rs-m strongly distal to 1m-cu; 2rs-m strongly distal to 2m-cu; first submarginal cell slightly shorter than combined lengths of second and third submarginal cells; marginal cell apex slightly bent away from anterior wing margin, minutely appendiculate (fig. 9). Propodeal pit enlarged and deeply impressed. Metasomal T7 with short, flat, lateral spines with rounded apices on either side of midpoint, spines separated by slightly more than basal spine width (fig. 10); S1 with a weak, longitudinal, median carina; apical margins of visible sterna broadly and weakly concave; male hidden sterna and genitalia depicted in figures 12, 13, 16, and 17.

Outer surface of mandible with apical half impunctate and minutely and faintly imbricate, basal half with punctures separated by approximately a puncture width, integument between punctures smooth, medial punctures elongate ventrally. Labrum rugulose except basal margin distinctly and coarsely punctate, punctures separated by less than a puncture width, punctures nearly contiguous in some areas, integument between punctures smooth. Clypeus with shallow punctures slightly elongate apically (integument therefore appears weakly wrinkled), punctures separated by a puncture width or less, laterally along epistomal sulcus most punctures nearly contiguous, integument between punctures smooth. Supraclypeal area with sculpturing as described for clypeus except punctures not elongate. Malar space (where evident) impunctate and smooth. Paraocular area below level of antennal sockets with sculpturing as described for clypeus except punctures faintly elongate and nearly contiguous ventrally, subtly becoming more separated until punctures separated by slightly less than a puncture width at about an antennal-socket diameter below level of frontoclypeal sulcus (i.e., dorsal abscissa of epistomal sulcus between subantennal sulci and bor-



Figs. 4–6. *Thyromelecta kirghisia*, n. sp. 4. Pattern of white pubescence, dorsal view of mesosoma and metasoma. 5. Pattern of white pubescence, lateral view of metasoma (stippling indicates areas that are sometimes black). 6. Metapretarsal claw.



Figs. 7, 8. Mesoscutella of *Thyromelecta* and *Thyreus*, dorsal aspects. 7. *Thyromelecta kirghisia*, n. sp., holotype. 8. *Thyreus hellenicus* Lieftinck (AMNH, same collection data as holotype of *T. kirghisia*).

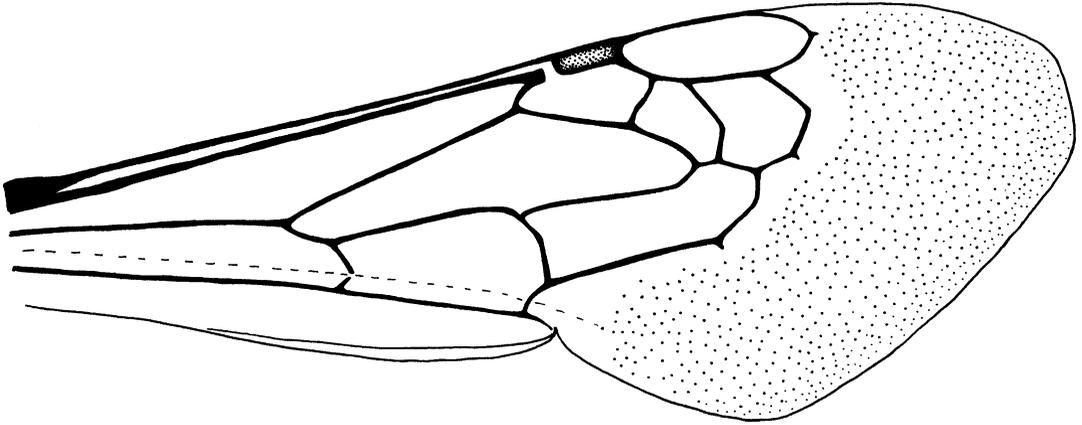
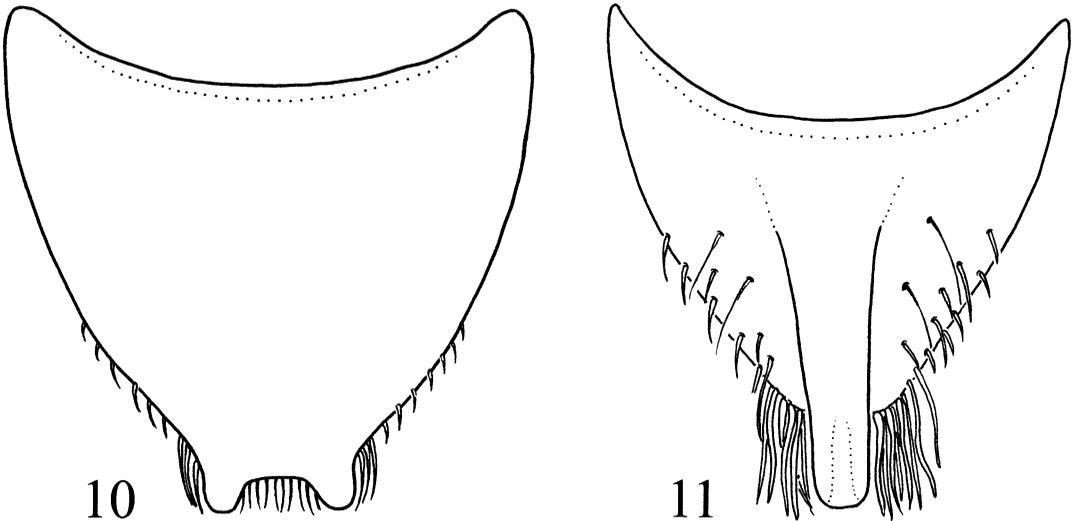


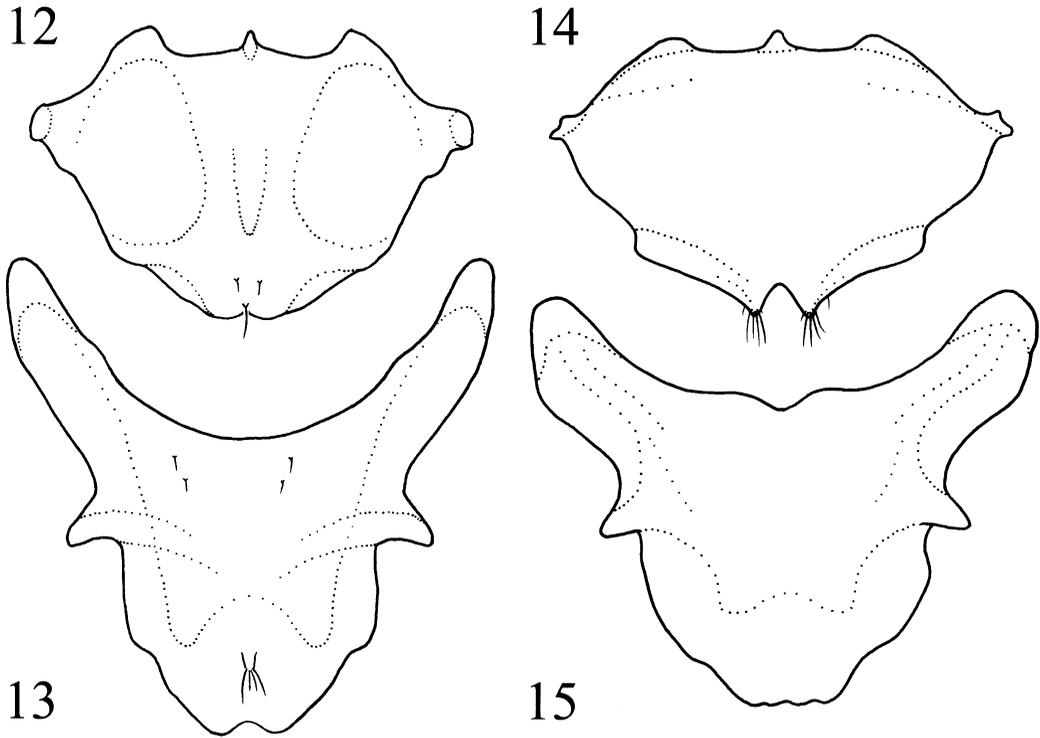
Fig. 9. Forewing venation of *Thyreomelecta kirghisia*, n. sp.

dering supraclypeal area) although contiguous punctures continue along inner border of compound eye up to level of frontoclypeal sulcus. Frons with faintly elongate punctures separated by a puncture width or less except punctures medially around frontal line and above antennal sockets nearly contiguous, more coarsely impressed, and more strongly elongate, punctures bordering ocelli more widely spaced, separated by 1–3 puncture widths; integument between punctures smooth. Ocellorbital area (sensu Moure and Sakagami, 1962; Engel, 1999) with punctures separated by less than a puncture width,

integument between punctures smooth; integument between lateral ocellus and median ocellus smooth with a few minute punctures; integument between lateral ocelli and on vertex posterior to ocelli smooth with punctures almost contiguous, vertex posterior to ocellorbital area with punctures slightly larger and separated by 0.5–1.5 times puncture width, punctures bordering preoccipital ridge small and contiguous. Gena with smaller punctures than those of clypeus, punctures separated from lateral neighbors by less than a puncture width while separated by a puncture width from dorsal and ventral neighbors,



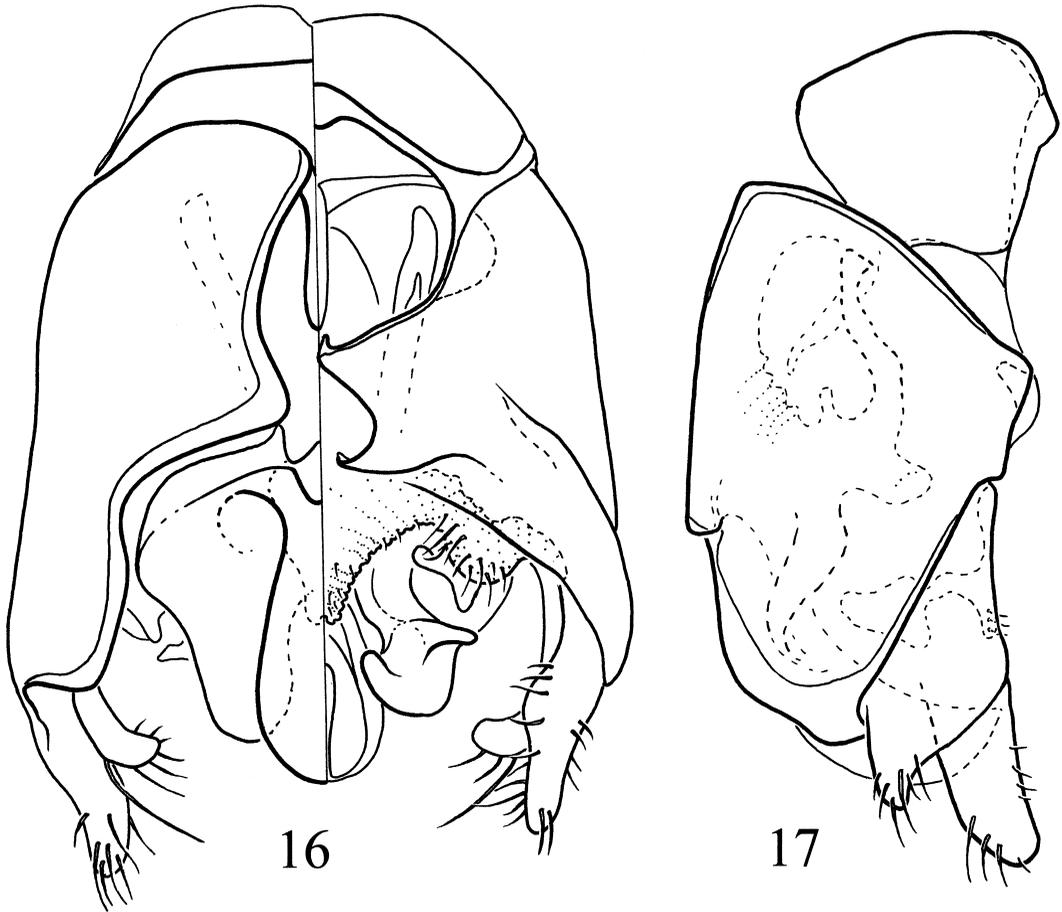
Figs. 10, 11. Terminal terga of *Thyreomelecta kirghisia*, n. sp. **10.** Male T7. **11.** Pygidial plate on T6 of female (stippling on plate apex outlines area of medial swelling).



Figs. 12–15. Male hidden sterna (S7 and S8) of two Central Asian *Thyreomelecta* species. **12.** *Thyreomelecta kirghisia*, n. sp., S8. **13.** *T. kirghisia*, S7. **14.** *T. propinqua* (Lieftinck), S8 (redrawn from Lieftinck, 1968). **15.** *T. propinqua*, S7 (redrawn from Lieftinck, 1968).

integument between punctures smooth. Postgena with punctures separated by a puncture width or less, integument between punctures smooth. Pronotum with punctures along lateral margin contiguous quickly becoming separated by a puncture width over pronotal surface, integument between punctures smooth except at lateral margin faintly imbricate (where evident); pronotal lobe with punctures smaller than those elsewhere on pronotum, punctures separated by 1–3 puncture widths, integument between punctures smooth. Mesoscutum with coarse punctures on lateral margins and central disc nearly contiguous to a puncture width apart, gradually becoming more closely spaced posteriorly until all punctures are nearly contiguous, anterior-facing surface with shallow punctures nearly contiguous, integument between punctures smooth. Tegula with small punctures (approximately one-half size of those on mesoscutum) gradually blending from contiguous along margin with meso-

scutum to separation of 1–1.5 puncture widths on central disc, outer margin largely impunctate, integument between punctures imbricate. Mesoscutellum coarsely punctate, punctures mostly contiguous except tubercles impunctate, integument between punctures smooth; axilla sculptured as described for mesoscutellum. Metanotum roughened and strongly imbricate. Pleura with punctures nearly contiguous, slightly elongate posteroventrally, punctures of hypoepimeral area enlarged and separated by a puncture width or less except with small impunctate area in the posteroventral corner, integument between punctures smooth; border of metepisternum and lateral surface of propodeum formed by deep impunctate depression with short, weak, crescent-shaped striae radiating at its ventral termination. Legs with small punctures separated by less than a puncture width, punctures particularly small and dense on mesotibia, mesotarsus, metafemur, metatibia, and metatarsus, integument between punctures



Figs. 16, 17. Male genitalia of *Thyreomelecta kirghisia*, n. sp. **16.** Genitalic capsule; left side is dorsal view, right side is ventral view. **17.** Lateral view.

smooth except spurs imbricate. Sculpturing on lateral and posterior surfaces of propodeum as described for pleura except punctures not elongate. Central disc of dorsal-facing surface of T1 with small, shallow punctures separated by a puncture width or less, such punctures slightly more dense anteriorly along border with anterior-facing surface; punctures in posterior marginal zone similar to those on central disc except with narrow, transverse impunctate area at its extreme apex; integument between punctures exceedingly faintly imbricate. Sculpturing of remaining terga as described for dorsal-facing surface of T1 except T6 without impunctate apical margin and medioapical processes of T7 impunctate. Metasomal S1–4 with punctures slightly elongate posteriorly, basally

separated by less than a puncture width, gradually becoming more sparse until separated by four times a puncture width at three-fourths of central disc length, apical margin impunctate, integument imbricate; S5–6 with punctures nearly contiguous throughout disc, without impunctate apical margin, integument imbricate.

Head, mesosoma, and metasoma black and shiny except distal half of mandible dark reddish-brown with slightly lighter midsection; labiomaxillary complex brown; flagellum dark brown to black; apical margin of posterior-facing surfaces of trochanters with short band of semitranslucent yellowish integument; tarsi, excluding basitarsi, dark brown; claws brown; and pregradular areas of metasoma dark brown to brown. Wings

infumate with faint opalescence except alar fenestrae more hyaline; veins dark brown.

Pubescence dark fuscous (nearly black) and not obscuring the integument unless otherwise stated. Outer surface of mandible with 4–5 simple setae in acetabular groove (ca. 1.5 OD in length), a few simple setae (ca. 1.5 OD in length) intermixed with shorter (ca. 0.4–0.8 OD in length) minutely branched setae in outer groove, scattered simple setae (ca. 2 OD in length) in condylar groove; inner surface of mandible with several simple setae (ca. 0.5–1 OD in length) in fimbrial interspace, a few simple setae (ca. 1.5 OD in length) intermixed with several minutely branched setae (ca. 1 OD in length) in condylar interspace. Lateral quarters of labrum with branched setae (ca. 0.75 OD in length) intermixed with simple setae (ca. 1 OD in length), apical margin with simple setae (ca. 0.75 OD in length), labral surface with scattered simple setae (ca. 0.25–0.5 OD in length), such setae slightly more dense along basal margin. Lateral margins of clypeus with simple setae (ca. 1 OD in length), such setae quickly become minutely branched over surface of clypeus and slightly more dense along epistomal sulcus. Supraclypeal area with branched setae (ca. 1.5–2 OD in length) intermixed with white setae of similar structure and length. Face below level of antennal sockets with pubescence as described for supraclypeal area although without white setae. Scape with scattered, branched setae (ca. 0.5 OD in length, i.e., about equal to scape width) although those on outer-lateral margin noticeably longer (ca. 1 OD in length). Frons immediately above antennal sockets with white, minutely branched setae (ca. 2.5 OD in length); remainder of frons with dark fuscous, minutely branched setae (ca. 1.5–2 OD in length). Vertex with scattered, minutely branched setae (ca. 1.5–2 OD in length) except posterior to ocellorbital area on preoccipital ridge setae white. Gena with scattered, minutely branched setae (ca. 1 OD in length), setae slightly more dense posteriorly. Pubescence of postgena as described for gena except 1.5–2 OD in length. Anterior-facing surface of pronotum with branched setae (ca. 1 OD in length) except upper lateral area with white, branched setae (ca. 1.5 OD in length); pro-

notal lobe with branched setae (ca. 1.25 OD in length) and slightly less dense than those on remainder of pronotum. Anterior-facing surface of mesoscutum with minutely branched, scattered setae (ca. 2 OD in length); dorsal-facing surface with scattered, minutely branched, fuscous setae except patch of white, slightly branched setae medially on anterior margin, sometimes mediolaterally on either side of anterior part of medial line (slightly posterior to medial anterior patch), laterally immediately anterior to tegula, and posterolaterally near axillae (fig. 4), setae (both fuscous and white) grading from 2 OD in length along anterior margin to 1 OD in length along posterior margin. Tegula with scattered, minutely branched setae (ca. 1 OD in length). Mesoscutellum with scattered, minutely branched setae (ca. 1.5 OD in length). Metanotum with pubescence as described for mesoscutellum except a few minutely branched white setae (ca. 2 OD in length) posterior to metathoracic wing base and slightly more dense than other metanotal setae. Pleura with branched setae (ca. 1.5–2 OD in length) except those bordering pronotal lobe, and sometimes just below level of scrobe, white. Procoxa, protrochanter, profemur, and protibia intermixed with minutely branched and simple setae (ca. 0.5–1.5 OD in length), those on posterior surfaces generally longer than those on anterior surfaces (in some individuals longer posterior setae on protibia white); setae more sparse on procoxa, protrochanter, and profemur than on protibia. Mesocoxa, mesotrochanter, mesofemur, and mesotibia with suberect, simple setae (ca. 0.25–1 OD in length) intermixed with suberect, branched setae (ca. 0.5–1 OD in length), those setae on mesocoxa, mesotrochanter, and mesofemur less dense than those on mesotibia; mesotibial outer surface with mat of dense, lightly fuscous, appressed, plumose setae (ca. 0.2 OD in length), mat dorsolaterally bordered by white, minutely branched, appressed setae (ca. 0.25 OD in length) although white border can be reduced to a single dorsal white spot of setae in some individuals. Metacoxa, metatrochanter, metafemur, and metatibia with suberect, simple setae (ca. 0.25–1 OD in length) intermixed with suberect, branched setae (ca. 0.5–1 OD in length), those setae on metacoxa, metatro-

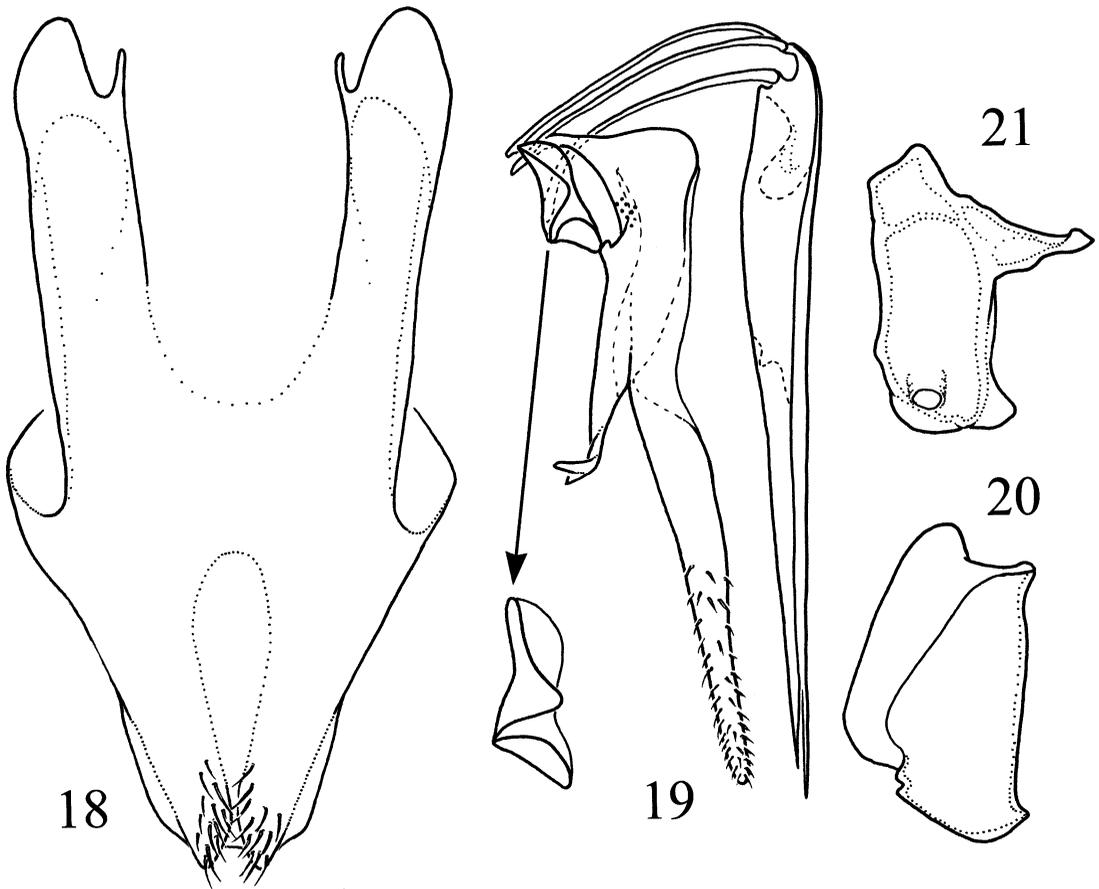
chanter, and metafemur less dense than those on metatibia; outer surface of metatibia sometimes with medial patch of white, branched setae (ca. 0.5 OD in length) (although patch reduced or absent in some individuals), outer surface with glabrous apical margin. Tarsal setae shorter (ca. 0.25–0.5 OD in length except on basitarsi ca. 0.5–1 OD in length) and stouter, sometimes almost spine-like, than other leg setae; inner surface of metabasitarsus with thick mat of stout, simple, suberect setae directed toward apex (ca. 0.75 OD in length). Forewing with scattered, minute, dark fuscous, simple setae in costal cell, in radial cell bordering Sc+R, in anterior half of marginal cell, in cubital cell bordering M+Cu, and on basal abscissa of A. Hind wing with scattered, minute, dark fuscous, simple setae on costal margin, in radial cell, in cubital cell, posterior to A, posterior to second abscissa of M+Cu, and posterior to hamuli along Rs. Lateral and posterior surfaces of propodeum with branched setae (ca. 1.5–2 OD in length); minutely branched setae (ca. 2 OD in length) along border between lateral and posterior surfaces, such setae more dense than other propodeal setae. Dorsal surfaces of metasomal terga with minutely branched, posteriorly directed, appressed setae (ca. 0.5 OD in length), apicolaterally with transverse band of appressed, white, branched setae (ca. 0.75 OD in length), such apical bands interrupted medially, bands present on T1–5 (although sometimes those on T5 greatly reduced), basolateral patch of white setae on T1, for banding patterns see figures 4 and 5; terga with sparsely scattered, erect, simple setae (ca. 1–1.25 OD in length), such setae most numerous laterally (albeit still quite sparse) and progressively more numerous on succeeding terga; basolateral corners of T1 also with longer, branched, suberect setae (ca. 1 OD in length); apical margin of T6 with dense, minute, highly branched, light fuscous setae; T7 with numerous, suberect, branched setae (ca. 0.75 OD in length) intermixed with suberect, stout, simple setae (ca. 0.75 OD in length). Sterna with posteriorly directed, appressed, minutely branched setae (ca. 0.25–0.5 OD in length) intermixed with scattered, suberect, simple setae (ca. 1.25 OD in length); S2–4 with apicolateral patches of white, appressed,

branched setae (ca. 0.75 OD in length; fig. 5), sometimes present as greatly reduced patch on S5; margins of S1–4 with apical glabrous zone, apical margins of S5–6 densely covered with branched, suberect setae (ca. 0.5–1 OD in length); all sterna with minute, apical fringes of simple setae.

Female. As described for the male except as follows: Total body length 9.3 mm (8.0–10.0 mm); forewing length 8.0 mm (7.0–8.8 mm). Head width 2.7 mm (2.4–3.0 mm), length 2.3 mm (2.0–2.7 mm). Intertegular distance 2.3 mm (2.0–2.6 mm). Outer and posterior surfaces of mesotibia with scattered spines; outer apical margin of mesotibia with 3–4 spines on anterior corner, one enlarged spine on posterior corner; mesotibial spur almost as long as mesobasitarsus, metacoxa with distinct, medioposterior spine on inner surface. Metatibia with scattered stout spines on outer surface; outer apical margin with 4–5 very stout spines. T6 with pygidial plate carinate laterally, with slight median ridge along apical fourth; basal 0.75 of plate appearing shallowly concave between lateral carinae (fig. 11). S6 apically with two rather indistinct setose projections joined medially (fig. 18). Dorso-apical process of second valvifer bifid at apex (fig. 19). T7 with somewhat elongate lateral process (fig. 21). T8 depicted in figure 20.

Punctures bordering ocelli on frons separated by a puncture width. Gena with punctures separated by less than a puncture width. Metasomal S1–5 with punctures slightly elongate posteriorly, basally separated by less than a puncture width gradually becoming more sparse until separated by four times a puncture width by three-fourths of central disc lengths, apical margins impunctate, integument imbricate. Apical third of pygidial plate smooth and impunctate; basally plate with scattered small punctures (<0.1 OD) almost contiguous to separated by five puncture widths. T6 basal and lateral to plate with nearly contiguous small punctures (<0.1 OD).

Mesotibial outer surface lacking mat of dense setae present in male, although with scattered, minute, pinnate setae (ca. 0.2 OD in length), without white setae. Outer surface of metatibia lacking glabrous apical margin. Outer lateral margin of probasitarsus with



Figs. 18–21. Female terminalia of *Thyreomelecta kirghisia*, n. sp. **18.** Ventral view of S6. **19.** Lateral view of sting apparatus, with enlarged view of gonangulum (= first valvifer of Snodgrass, 1935). **20.** Lateral view of T8. **21.** Lateral view of T7.

exceedingly long, simple, posteriorly directed setae (ca. 3–3.5 OD in length). All external sterna with apical glabrous zone. Pygidial plate lacking setae on apical third, basally with scattered, minute (<0.1 OD in length) setae. T6 basally and laterally with minutely branched setae (0.5 OD in length); laterally also with scattered, black, thickened, spine-like setae (0.6 OD in length) interspersed with long, thin, simple setae (ca. 1 OD in length). Apical margin of T7 lateral to plate with numerous, black, elongate, thickened, simple setae (ca. 1 OD; fig. 11).

HOLOTYPE: Male labeled, “KYRGYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 2 VII [July] 1999, J.G. Rozen & J.K. Bouseman” // “Searching bank with *Antho-*

phora nests” // “Holotype, *Thyreomelecta kirghisia* Rightmyer & Engel” (AMNH).

ALLOTYPE: Female labeled, “KYRGYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 2 Jul [July] 1999, J.G. Rozen & J.K. Bouseman #40” // “Allotype, *Thyreomelecta kirghisia* Rightmyer & Engel” (AMNH).

PARATYPES: 28 male and 10 female paratypes labeled, “KYRGYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 2 Jul [July] 1999, J.G. Rozen & J.K. Bouseman #40” (AMNH). One male paratype labeled, “KYRGYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 22 Jul [July] 2000, M.S. Engel #40” (AMNH). Three male and

two female paratypes labeled, "KYR-GYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 2 Jul [July] 1999, J.G. Rozen & J.K. Bouseman #40" (SEMC). One female paratype labeled, "KYRGYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 22 Jul [July] 2000, M.S. Engel #40" (SEMC).

ETYMOLOGY: The specific epithet is derived from the country in which the type series was collected, Kyrgyzstan.

COMMENTS: The pupa of this species was described and illustrated by Rozen (2000) as a questionable, unidentified species of *Thyreus*. The host of this species is *Anthophora* (*Petalosternon*) *albifascies* Alfken. Refer to section on Comments under *T. propinqua* for information on three female specimens collected in 1881 that may also represent this or a closely allied species.

Thyreomelecta merviensis (Radoszkowsky),
new combination

Figures 22–29

Crocisa merviensis Radoszkowsky, 1893: 166.
Meyer, 1921: 89. Popov, 1967: 102.

Thyreus merviensis (Radoszkowsky); Lieftinck,
1968: 44.

DIAGNOSIS: This is a large species (ca. 14 mm in total body length) presently known from two specimens: the poorly preserved male holotype in the Museum für Naturkunde, Berlin (lacking head and genitalia damaged: genitalia figured, albeit poorly, by Radoszkowsky, 1893), and a newly collected male reported herein from Kyrgyzstan (figs. 22–24). The body of the holotype was characterized by Lieftinck (1968) and is identical to the new specimen reported herein. Overall the head is as described for *T. kirghisia* (see above) but notably the clypeus and, in fact, most of the face is densely covered with white pubescence (as in *T. dimidiatipuncta* and *T. bidentata*). The gonostylus of *T. merviensis* is remarkably small and distinctly conical or triangular, with a narrowed apex and short, sparse setae on its outer surface and more dense setae basally on its inner surface. Furthermore, the gonostylus is not divided into dorsal and ventral processes (as in other species). Lieftinck (1968) has provided

a photograph of the type specimen, and we provide illustrations of T7 (fig. 27), the hidden sterna (figs. 25, 26), and the genitalia (figs. 28, 29). Popov (1967) referred to a female specimen but did not provide a description or further information³ and thus the female presently remains unknown. The white pubescent patches on the sterna, the broad separation between the apical projections of T7, and the terminalia serve to separate this species from similar species such as *T. dimidiatipuncta* and *T. bidentata* (see also Diagnosis for *T. bidentata*, above).

DISTRIBUTION: This species occurs in the arid region of eastern Turkmenistan (type locality near the town of Mary [= Merv], itself close to the Murgab River) as well as in Kyrgyzstan. Based on the two available records the species is presumed to also occur in Uzbekistan (perhaps also in Tajikistan).

NEW RECORD: Male labeled, "KYR-GYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 2 Jul [July] 1999, J.G. Rozen & J.K. Bouseman, #40" // "*Thyreomelecta merviensis* (Radosz.), det. Rightmyer & Engel" (AMNH).

Thyreomelecta paucimaculosa (Alfken),
new combination

Crocisa paucimaculosa Alfken, 1931: 831.
Thyreus paucimaculosus (Alfken); Lieftinck,
1968: 51.

DIAGNOSIS: From the limited available data on this species it is most similar to *T. siberica* but differs in the pattern of white on the metasoma (refer to *T. siberica* and Key, below).

DISTRIBUTION: *Thyreomelecta paucimaculosa* is presently known only from the type locality (western Pamir mountains of Tajikistan). The female holotype, and only known specimen, is in the Museum für Naturkunde, Berlin.

Thyreomelecta propinqua (Lieftinck),
new combination

Figures 14, 15

Thyreus propinquus Lieftinck, 1968: 56.

DIAGNOSIS: This species is most similar to

³ It may be that this female is a specimen of *T. bidentata* (Kirby), which is also known from this same region in Turkmenistan.

22



23



Figs. 22–23. *Thyromelecta merviensis* (Radoszkowsky), male from Kyrgyzstan. **22.** Lateral aspect (note: The mesoscutellar tubercles are seen in profile to extend posteriorly as in several melectines [e.g., *Afromelecta*, some *Xeromelecta*]; however, the mesoscutellar margin between these spines does not project over the metanotum and propodeum as it does in *Thyreus*). **23.** Dorsal aspect.



Fig. 24. Face of *Thyreomelecta merviensis* (Radoszkowsky), male from Kyrgyzstan.

T. kirghisia. Females of *T. propinqua* can be separated from *T. kirghisia* by the longer median ridge on the pygidial plate, extending basad to more than one-half of the total length of the plate. Males are nearly identical but differ notably in the structure of the terminalia. The hidden sterna (S7 and S8) of *T. propinqua* are illustrated in figures 14 and 15. The genital capsule is quite similar to that of *T. kirghisia* except that the gonostylus is densely covered by elongate setae (setae sparse and relatively short in *T. kirghisia*: figs. 16, 17), presence of a deep incision on the inner base of the gonostylus where it joins to the gonocoxa (incision absent in *T. kirghisia*), and the medioapical-ventral, inner lobe of the gonocoxa, which is small, with minute setae (much larger and covered by elongate setae in *T. kirghisia*: partly stippled in fig. 16).

DISTRIBUTION: This species principally occurs in, and may in fact be restricted to,

northeastern Asia: North Korea west to Manchuria, and Vladivostok, Siberia. Although Lieftinck (1968) also recorded this species from Central Asia (somewhere around Tajikistan, southern Uzbekistan, or northern Afghanistan), there is reason to be suspicious of this locality record (see Comments, below).

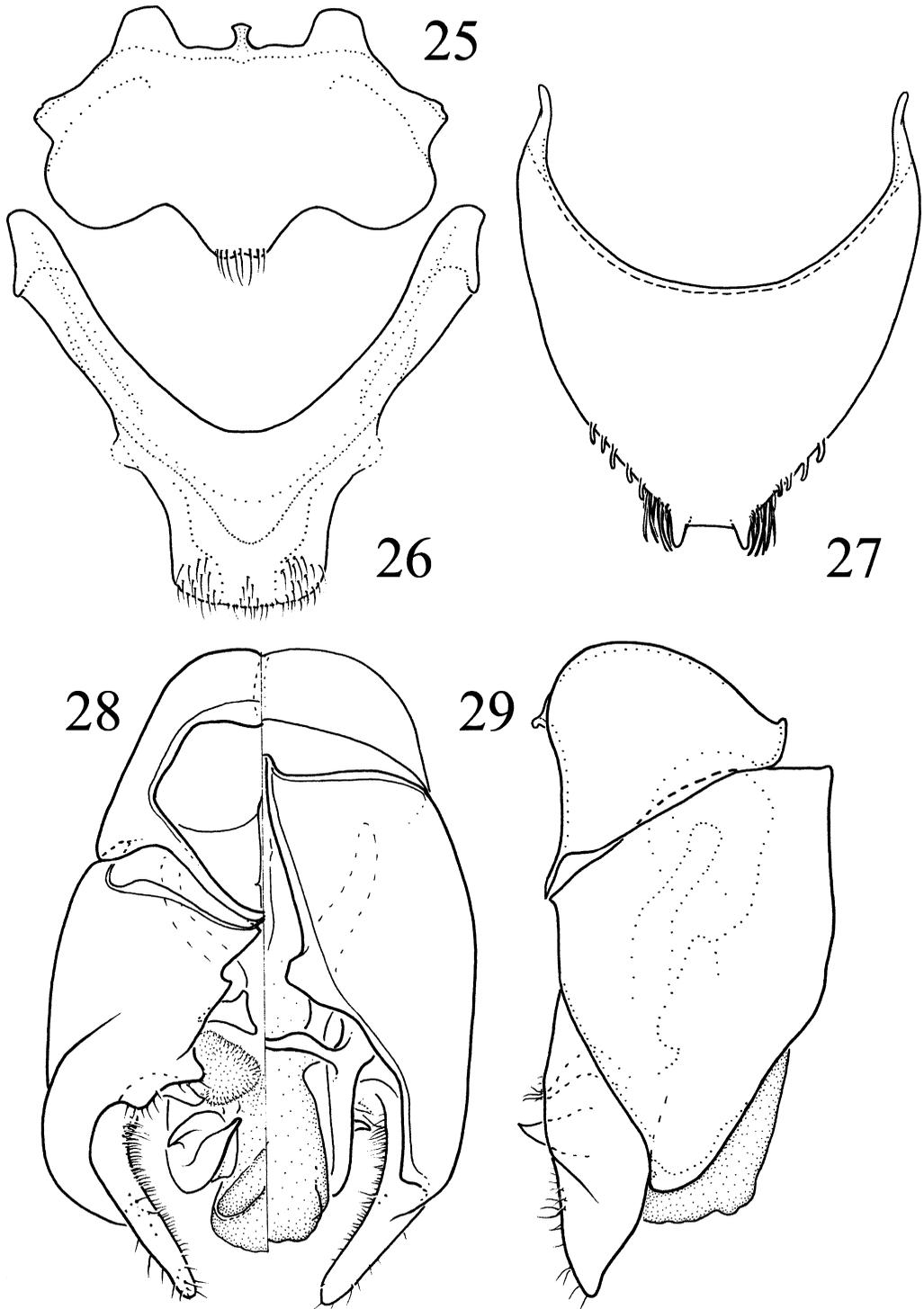
COMMENTS: Lieftinck (1968) mentioned three females in the Muséum National d'Histoire Naturelle collected in 1881 from "Turkestan mérid." (= southern Turkestan, more commonly spelled Turkistan). The historical Central Asian region known as Turkistan consisted of what today is Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan, southern Kazakhstan, northeastern Afghanistan, and some portions of westernmost China (thus, southern Turkistan might have been Tajikistan, southern Uzbekistan, and/or northeastern Afghanistan, but we failed to find a more detailed locality known as "Capus"). Although it is not impossible that these three "Turkestan" females are indeed conspecific with those from northeastern Asia (including the type locality in northern Korea), they would certainly be outliers at the extreme of the known distribution for the species. Owing to the considerable similarity between females of *T. propinqua* and *T. kirghisia*, there is the possibility that in the absence of the male, Lieftinck failed to recognize the specific distinctiveness of the three central Asian specimens from northeastern individuals. We have not had the opportunity to further explore our suspicions, but the identity of the three "Turkestan" females should be confirmed, as it is possible they are individuals of *T. kirghisia* or another allied species.

Thyreomelecta siberica (Radoszkowsky),
new combination

Crocisa siberica Radoszkowsky, 1893: 174. Meyer, 1921: 80. Meyer, 1922: 182.

Thyreus sibericus (Radoszkowsky); Lieftinck, 1968: 54.

DIAGNOSIS: This species is most similar to *T. paucimaculosa* (see above) but differs in the pattern of white on the metasoma in females (see Key, below). Males are similar to *T. propinqua* and *T. kirghisia* but the latter



Figs. 25–29. *Thyromelecta merviensis* (Radoszkowsky), male from Kyrgyzstan. 25. Dorsal aspect of S8. 26. Dorsal aspect of S7. 27. Dorsal aspect of T7. 28. Genital capsule; left side is dorsal view, right side is ventral view. 29. Genital capsule, lateral view.

two species lack the apical tuft of setae on the mesoscutellum.

DISTRIBUTION: This species occurs in southeastern Siberia but is perhaps also known from Armenia (see Comments, below). As noted below, the species is likely restricted to southeastern Siberia, and the Armenian specimen is misidentified.

COMMENTS: Lieftinck (1968) associated a single male from Armenia with the females of *T. siberica* he had from southern Siberia and Manchuria. While this male may indeed be conspecific with the northeastern Asian females, it also appears likely that it belongs to a separate species of *Thyreomelecta* (similar to the "Turkestan" females mentioned above for *T. propinqua*) and that the true male of *T. siberica* remains to be discovered. It will be interesting to discover males in Siberia or Manchuria which can be positively associated with *T. siberica* females and to determine if indeed the outlier male from Armenia belongs to this species.

Thyreomelecta cf. *paucimaculosa*

COMMENTS: A female specimen runs to couplet 10 in the key to species (below) and there runs out to *T. paucimaculosa*. Indeed, the pygidial plate and other features are reminiscent of *T. paucimaculosa* (or *T. siberica*). However, *T. paucimaculosa* lacks the anterior spot of white pubescence on T1, white setae projecting from the posterior margin of the mesoscutellum, and patches of white pubescence on the mesosomal dorsum. In the pattern of white pubescence this individual more strongly resembles *T. siberica* but differs by the pattern of white pubescence on T1 (see Key below; principally in that the posterior mark is not two-fold), narrow and shining pygidial plate with median crest present (relatively broad and dull in *T. siberica*, with median crest weak and present only at apex), and is generally larger. Like both *T. siberica* and *T. paucimaculosa*, the sterna are entirely black. Although this individual appears to represent another species of *Thyreomelecta*, the combination of only a single specimen and the general difficulty with assigning females in the absence of the male leads us to leave this species undescribed in the hope of obtaining additional material in

the future. At that time its specific status (or true identity as merely a variant of *T. siberica* or *T. paucimaculosa*) can be more critically evaluated.

MATERIAL: Female labeled, "KYR-GYZSTAN: Issyk-Kul, S shore Issyk-Kul 10 km E Kadzhi-Saj, 42°10'33"N/77°18'55"E, 1675 m, 2 Jul [July] 1999, J.G. Rozen & J.K. Bouseman, #40" // "*Thyreomelecta* sp. nr. *paucimaculosa*, det. Rightmyer & Engel" (AMNH).

PRELIMINARY KEY TO SPECIES OF
THYREOMELECTA

(Female unknown for *T. merviensis* and male unknown for *T. paucimaculosa*)

1. Male 2
- Female 7
2. Clypeus entirely covered in appressed white setae 3
- Clypeus with dark setae, or with white setae interspersed with numerous dark setae (pubescence long, suberect, and not entirely concealing clypeal surface) 5
3. T7 with apical projections separated with broad, straight emargination (fig. 27); tarsi with white setae; sterna with white patches of setae (Turkmenistan, Kyrgyzstan) *T. merviensis* (Radoszkowsky)
- T7 with apical projections forming a V-shaped emargination; tarsi with black setae; sterna lacking white patches of setae, all black 4
4. Metasomal terga with white patches of setae (northwestern Libya to eastern Iraq) *T. dimidiatipuncta* (Spinola)
- Metasomal terga with black setae, although T2 sometimes with few white setae interspersed (Afghanistan, Turkmenistan, Iran?) *T. bidentata* (Kirby)
5. Mesoscutellum with tuft of white setae along posterior margin (northeastern Asia, Armenia?: see Comments on species) *T. sibirica* (Radoszkowsky)
- Mesoscutellum without tuft of setae along posterior margin 6
6. Apex of gonostylus densely clothed in simple setae; S7 without setose, medial, subapical tubercle (fig. 15); S8 with setose medio-apical projections forming a V (fig. 14) (northeastern Asia, "Turkestan"?: see Comments on species) *T. propinqua* (Lieftinck)
- Apex of gonostylus with few (less than 15) simple setae (fig. 16); S7 with setose, medial, subapical tubercle (fig. 13); S8 lacking

- setose medio-apical projections (fig. 12) (Kyrgyzstan) *T. kirghisia*, n. sp.
7. Sterna with white patches of setae 8
 – Sterna without white patches of setae, all black 9
8. Pygidial plate with median ridge long, extending basally to distinctly more than one-half length of plate (northeastern Asia, “Turkistan”?; see Comments for species)
 *T. propinqua* (Lieftinck)
- Pygidial plate with median ridge short, extending basad to between one-fourth and one-third length of plate (Kyrgyzstan)
 *T. kirghisia*, n. sp.
9. Mesoscutellum with tuft of long, white setae along posterior margin 10
 – Mesoscutellum without tuft of long setae along posterior margin 11
10. T1 with three rounded patches of white setae on each side; T2–5 with transverse, lateral bands of white setae (northeastern Asia, Armenia?; see Comments on species)
 *T. sibirica* (Radoszkowsky)
- T1–4 with short, transverse, lateral bands of white setae (Tajikistan)
 *T. paucimaculosa* (Alfken)
11. Metasomal terga with white patches of setae (northwestern Libya to eastern Iraq)
 *T. dimidiatipuncta* (Spinola)
- Metasomal terga with black patches of setae (Afghanistan, Turkmenistan, Iran?)
 *T. bidentata* (Kirby)

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