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A revision of Nearctic species of the genus *Tropimenelytron* Pace, 1983 (Coleoptera: Staphylinidae: Aleocharinae), a new genus for North America

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Abstract

Nearctic species of the genus *Tropimenelytron* Pace, 1983, a new genus for North America, are revised. Redescription and illustrations are provided for distinguishing the genus *Tropimenelytron* from other related aleocharine genera. Three new species are described: *T. americanum* Gusarov, **sp. n.**, from Indiana, Wisconsin, Iowa, Missouri, Ohio, Pennsylvania, New York, Connecticut and Quebec; *T. robustum* Gusarov, **sp. n.**, from Oregon and British Columbia and *T. californicum* Gusarov, **sp. n.** from California. A key for identification of Nearctic species of *Tropimenelytron* is provided. The status of the genus *Pelioptera* Kraatz, 1957 is discussed. *Pelioptera unica* (Bernhauer, 1907) from Japan and *P. peguana* (Bernhauer, 1915) from Burma are transferred to *Tropimenelytron*.

Key words: Coleoptera, Staphylinidae, Aleocharinae, Athetini, *Tropimenelytron*, *Pelioptera*, *Geostibida*, taxonomy, new species, Nearctic, identification

Introduction

The genus *Tropimenelytron* Pace, 1983, until this contribution was published, included 17 species from Palaearctic and Oriental regions.

The name *Tropimenelytron* first appeared in a paper by Scheerpeltz (1955) who removed *Sipalia tuberiventris* (Eppelsheim, 1879) from the genus *Sipalia* Mulsant & Rey, 1853 (now known as *Geostiba* Thomson, 1858) and placed this species in the new genus *Tropimenelytron*, which he planned to describe later in a different work but never did. Although Scheerpeltz pointed out that the only species he included in *Tropimenelytron*

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differed from *Sipalia* in some characters of the mouthparts, exoskeleton, and in male genitalia he failed to mention the actual characters. Therefore no description was provided and the name *Tropimenelytron* was not available (Article 13.1 of the Code (ICZN 1999); Assing 2000).

Pace (1983) described the genus, attributed it to Scheerpeltz (1955) and designated *Geostiba tuberiventris* as the type species. Because Pace was the first to provide description of *Tropimenelytron*, he should be considered the author of the genus (Assing 2000).

Subsequently, Pace (1984, 1985a, 1987a, 1991, 1998, 2000) described 13 additional species of *Tropimenelytron* from Eastern Palaearctic and Oriental regions.

Pace (1991) pointed out that *Tropimenelytron*, *Geostibida* Pace, 1984 and *Pelioptera* Kraatz, 1857 have similar ligula and separated mesocoxae. He lowered the rank of *Tropimenelytron* and *Geostibida* and included them in the genus *Pelioptera* along with a new subgenus *Phaediolia* Pace, 1991. He noted that *Tropimenelytron* differed from *Pelioptera* s. str. in lacking the umbiculus of spermatheca. In the same work (1991) Pace transferred one species previously described in *Tropimenelytron* to *Pelioptera* s. str., and assigned three species formerly placed in *Pelioptera* to subgenus *Tropimenelytron*.

Assing (2000) described a new species of *Tropimenelytron* from Korea, expressed doubts that after the inclusion of *Tropimenelytron* in *Pelioptera* by Pace the genus *Pelioptera* remained monophyletic. However, "mainly for practical reasons" Assing listed *Tropimenelytron* as a subgenus of *Pelioptera*.

In a later paper, while reporting *T. tuberiventre* from Turkey, Assing (2001) mentioned *Tropimenelytron* as a genus.

I consider *Tropimenelytron* to represent a genus separate from *Pelioptera* (see Discussion). In this paper I redescribe the genus *Tropimenelytron*, describe three new species and provide a key for identification of Nearctic species of the genus. Additionally, I discuss the status of the genus *Pelioptera*.

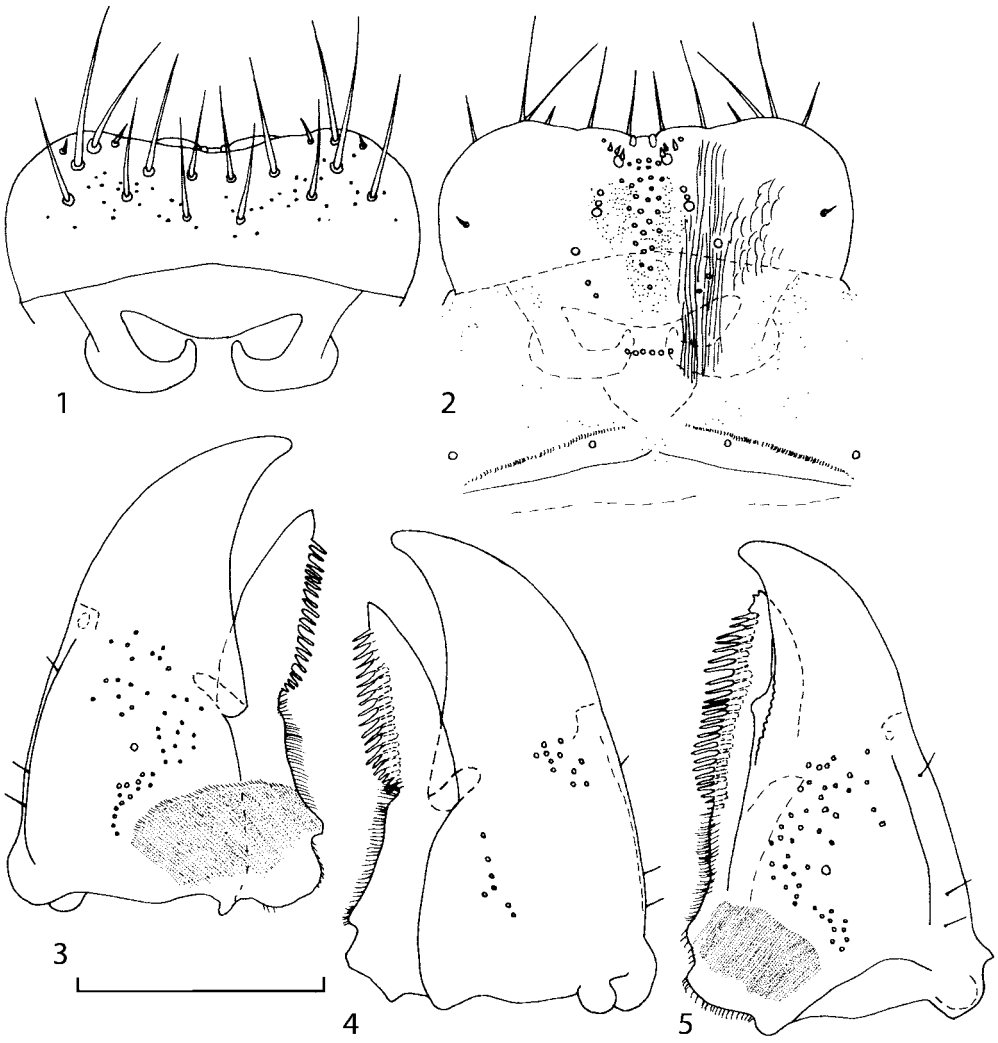
I follow the terminology accepted in taxonomy of Aleocharinae (Sawada 1970, 1972; Newton *et al.* 2000). A discussion of the terms applied to different parts of the internal sac of the aedeagus can be found in Gusarov (2002). To avoid the controversy on what side of the aedeagus should be called ventral (Gusarov 2002), I refer to the side of aedeagus bearing the basal orifice as parameral. The spermathecal gland is shown on the drawings solely to illustrate the gland position in relation to other parts of spermatheca.

Depositories

CASC – California Academy of Sciences, San Francisco (Dr. D.H.Kavanaugh)
CNCI – Canadian National Collection, Ottawa (Mr. A.Davies)
FMNH – Field Museum of Natural History, Chicago (Dr. A.F.Newton)
KSEM – Snow Entomological Collection, University of Kansas (Dr. J.S.Ashe)

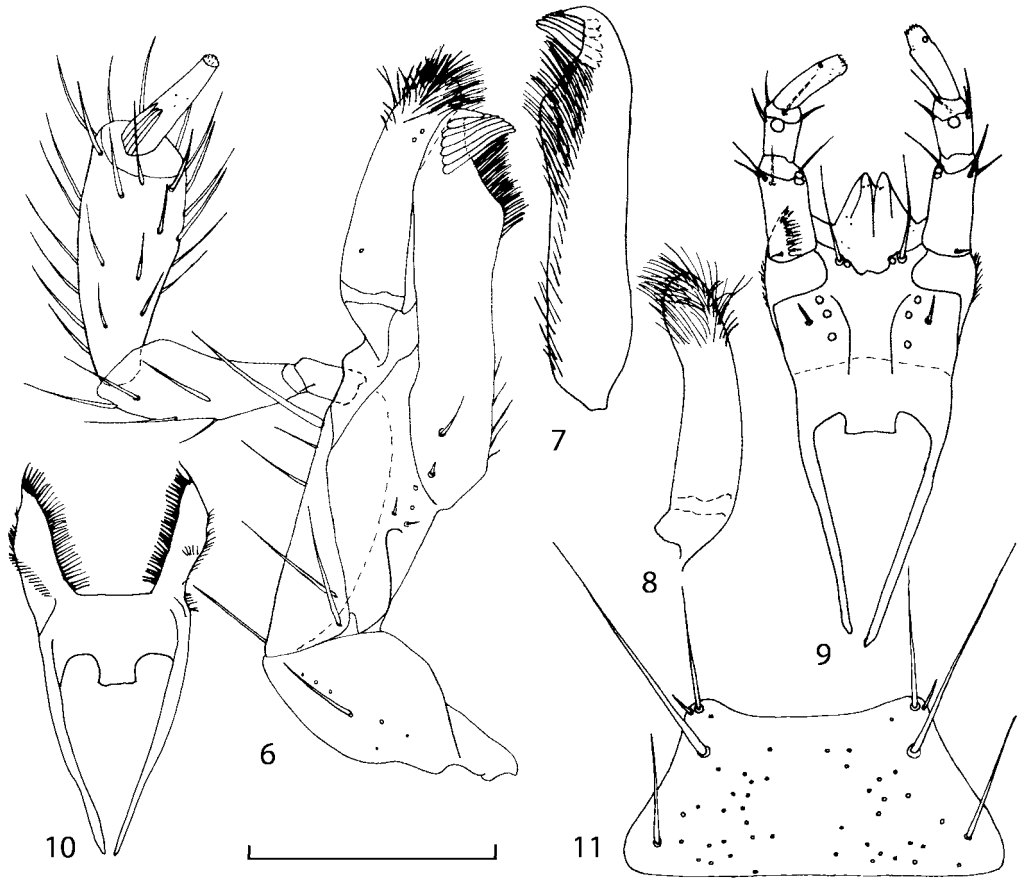
***Tropimenelytron* Pace, 1983 (Figs. 1-21, 35-64)**

Tropimenelytron: Scheerpeltz, 1955: 171 (first record but unavailable name).
Tropimenelytron Pace, 1983: 187.
Pelioptera (*Tropimenelytron*): Pace, 1991: 839.
Pelioptera (*Tropimenelytron*): Assing, 2000: 1000.
Tropimenelytron: Assing, 2001: 168.



FIGURES 1-5. Mouthparts of *Tropimenelytron tuberiventre* (Eppelsheim) (Polikesh, Azerbaijan). 1 – labrum; 2 – epipharynx; 3 – left mandible, dorsal view; 4 – left mandible, ventral view; 5 – right mandible, dorsal view. Scale bar 0.1 mm.

Diagnosis. *Tropimenelytron* can be distinguished from other aleocharine genera by the combination of the following characters: parallel-sided body; ligula with wide base, split apically (Fig. 9); pronotum subquadrate, with microsetae directed posteriorly along the midline of the disc (Type V, Benick & Lohse 1974) (Fig. 12); pronotal macrosetae moderately long; pronotal hypomera fully visible in lateral view; mesocoxae separated; medial macroseta of mesotibia as long as tibial width; tarsal formula 4-5-5; metatarsal segment 1 about as long as segment 2; one empodial seta; apical process of median lobe of aedeagus straight or slightly bent ventrally at the very apex (in lateral view; Figs. 41, 51, 61); spermatheca without umbiculus (Figs. 39, 49, 59).



FIGURES 6-11. Mouthparts of *Tropimenelytron americanum* Gusarov, **sp. n.** (paratype from Eau Claire, Wisconsin (6-8, 10-11) and *T. tuberiventre* (Eppelsheim) (Polikesh, Azerbaijan (9)). 6 – right maxilla, ventral view; 7 – right lacinia, dorsal view; 8 – right galea, dorsal view; 9 – prementum; 10 – hypopharynx; 11 – mentum. Scale bar 0.1 mm.

Tropimenelytron differs from *Geostiba* Thomson, 1858 in having ligula with wide base, separated mesocoxae and different shape of aedeagus and spermatheca.

Tropimenelytron differs from *Pelioptera micans* Kraatz, 1857 (the type species of *Pelioptera* Kraatz, 1857) in the following characters: first segment of labial palpus with seta γ absent (present in *P. micans*); prementum with three asetose pores (two in *P. micans*), spermatheca without umbiculus; copulatory piece with short apical process (with very long flagellum-like apical process in *P. micans*) (see discussion below).

Tropimenelytron differs from *Earota* Mulsant & Rey, 1874 by smaller and narrower body; first segment of labial palpus lacking seta γ; shorter mesosternal process; incomplete infraorbital carina, less transverse pronotum and different shape of aedeagus and spermatheca.

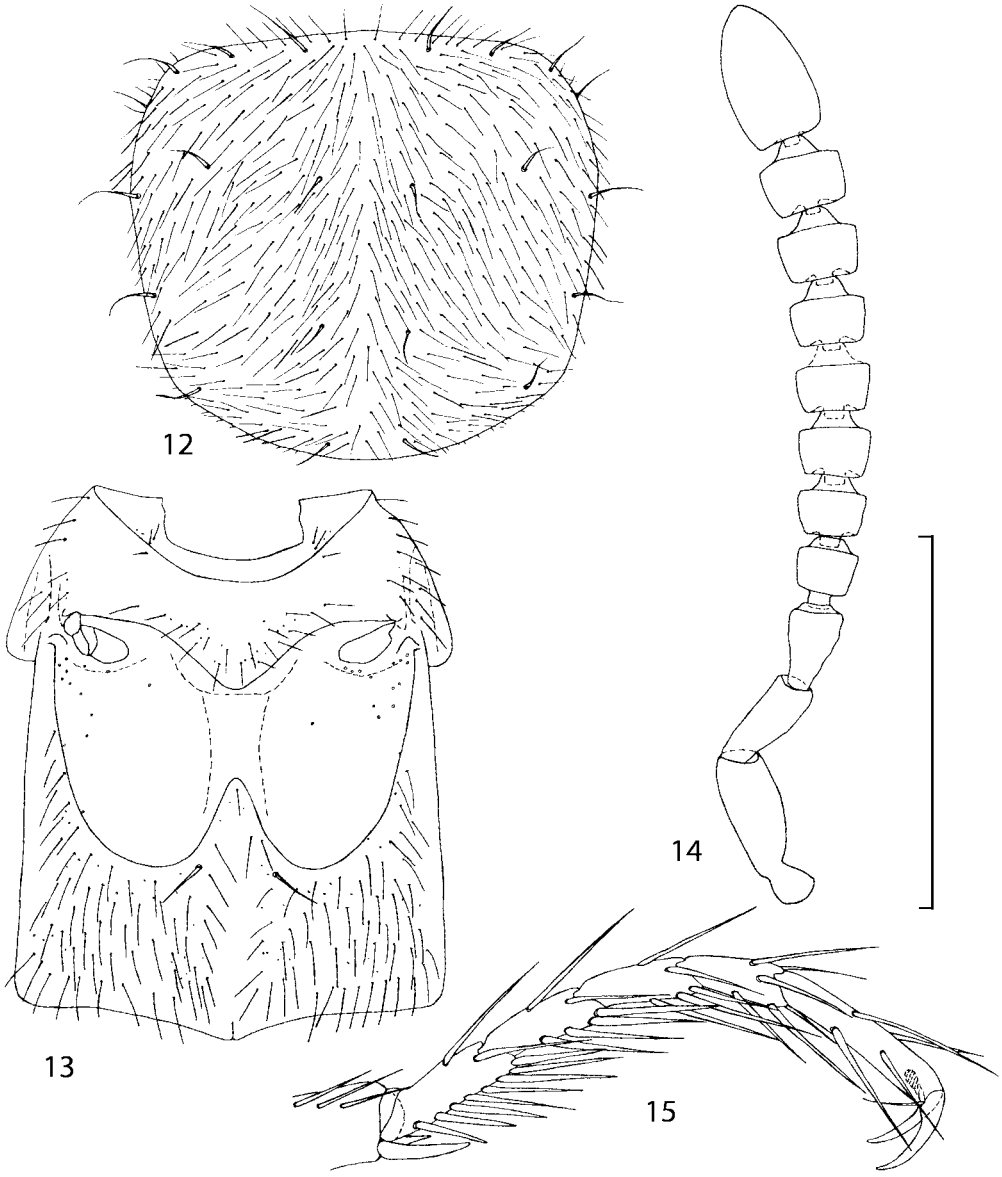
Tropimenelytron differs from *Seeversiella* Ashe, 1986 in having pronotal pubescence of type V (Benick & Lohse 1974); ligula with wide base; separated mesocoxae; posterior angles of male tergum 3 not extended as spines, and copulatory piece of aedeagus without long flagellum.

Description. Length 2.5-3.7 mm. Body parallel-sided, from uniformly brownish yellow to reddish brown with dark brown head and abdominal segment 6, and brown appendages.

Head slightly longer than wide; eyes small, temples 1.5-3 times as long as eyes; infraorbital carina short, not reaching posterior margin of eye. Antennal article 2 longer than article 3, articles 4-10 transverse (Fig. 14). Labrum (Fig. 1) transverse, anterior margin concave. Adoral surface of labrum (epipharynx) as in Fig. 2. Mandibles (Figs. 3-5) broad, right mandible with very small medial tooth; dorsal molar area with velvety patch consisting of tiny denticles (visible at 400x). Maxilla (Figs. 6-8) with galea extending slightly beyond apex of lacinia; apical lobe of galea covered with numerous fine and short setae; apex of lacinia with row of closely spaced spines, middle portion covered with numerous setae. Maxillary palpus with four segments (Fig. 6). Labium as in Figs. 9-11; labial palpi with three segments (Fig. 9), first segment of labial palpus lacking seta γ (Fig. 9); ligula with wide base, split apically; medial area of prementum without pores or pseudopores, lateral areas with 3 asetose pores and single setose pore. Hypopharyngeal lobes as in Fig. 10. Mentum (Fig. 11) with slightly concave anterior margin, medial area with numerous pores.

Pronotum (Fig. 12) subquadrate, broadest at apical third, narrows posteriorly or with subparallel lateral margins; anterior margin straight, posterior margin convex; surface covered with microsetae directed posteriorly in midline, posteriorly and obliquely laterally in lateral areas (Type V, Benick & Lohse 1974); macrosetae moderately long; hypomera fully visible in lateral view. Meso- and metasternum as in Fig. 13, mesosternal process short and wide, extended about 1/4 length of mesocoxal cavities, metasternal process about 1/3 length of mesocoxal cavities; mesosternum and mesosternal process not carinate medially; relative lengths of mesosternal process: isthmus: metasternal process in ratio of about 3:4:4; mesocoxal cavities margined posteriorly; mesocoxae separated. Medial macroseta of mesotibia as long as tibial width. Tarsal segmentation 4-5-5; metatarsal

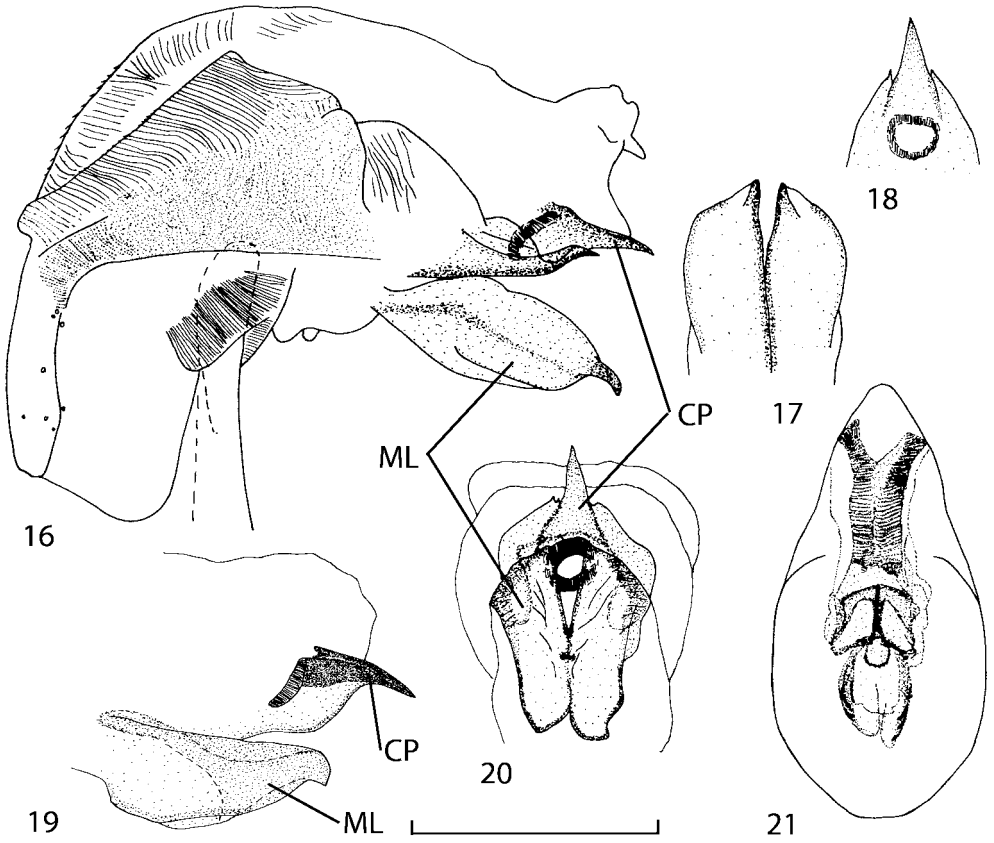
segment 1 about as long as segment 2 (Fig. 15). One empodial seta present. Wings fully developed (in Nearctic species). Posterior margin of elytra straight.



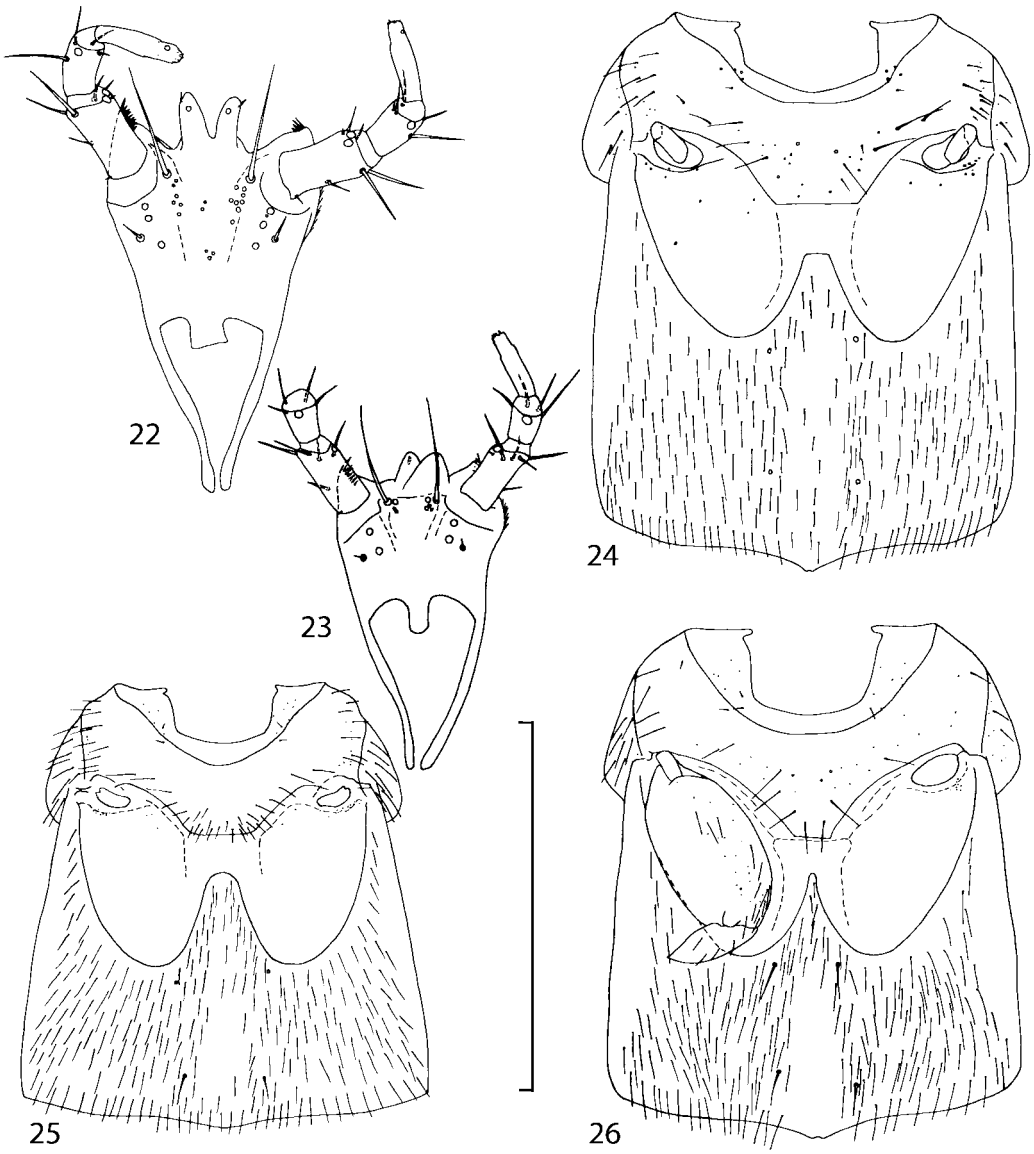
FIGURES 12-15. Details of *Tropimenelytron americanum* Gusarov, **sp. n.** (paratype from Eau Claire, Wisconsin). 12 – pronotum; 13 – mesometathorax, ventral view; 14 – right antenna; 15 – right metatarsus. Scale bar 0.4 mm (12-14), 0.2 mm (15).

Abdominal terga 3-5 with moderately transverse basal impression. Tergum 7 - 1.1 times as long as tergum 6. Punctation on terga 6-7 slightly sparser than on terga 3-5. Tergum 7 with white palisade fringe.

Male secondary sexual characters include longitudinal carina along anterior half of sutural margin of each elytron, tiny medial knob at posterior margin of tergum 3, small medial knob at apical third of tergum 4, short medial carina in front of anterior margin of tergum 7 and uneven posterior margin of tergum 8 (Fig. 35). Some (smaller) males may lack these features altogether and externally look like females. Median lobe of aedeagus narrows apically (in parameral view; Figs. 40, 50, 60), apex straight or slightly bent ventrally (in lateral view; Figs. 41, 51, 61). Parameres with two long and two short macrosetae (Figs. 44, 54, 64). Copulatory piece of internal sac with short apical process and lateral denticles near the base of process (CP; Figs. 18, 20). Medial lamellae (in parameral view) broad (ML; Figs. 17, 20-21). Spermatheca without umbiculus, with thick C-shaped distal portion and thin proximal portion which may form 1-2 coils (Figs. 39, 49, 59)



FIGURES 16-21. Male genitalia of *Tropimenelytron americanum* Gusarov, **sp. n.** (paratypes from Rensselaerville, New York (16-18) and Morgan Monroe State Park, Indiana (21)) and *T. tuberiventre* (Eppelsheim)(Polikesh, Azerbaijan (19-20)). 16 – everted internal sac of aedeagus, lateral view; 17 – medial lamellae, parameral view; 18 – copulatory piece, parameral view; 19 – apex of everted internal sac, lateral view; 20 – apex of everted internal sac, parameral view; 21 – internal sac retracted in median lobe, parameral view. CP - copulatory piece; ML - medial lamellae. Scale bar 0.1 mm.



FIGURES 22-26. Details of *Pelioptera testaceipennis* (Motschulsky) (syntype of *P. longicornis* Cameron from Sumatra, Indonesia (22, 25)), *P. micans* Kraatz (Sri Lanka (23-24)) and *P. exasperata* (Kraatz) (Dehra Dun, India (26)). 22-23 – prementum, ventral view; 24-26 – mesometathorax, ventral view. Scale bar 0.15 mm (23), 0.2 mm (22), 0.4 mm (24, 26), 0.8 mm (25).

Type species. *Geostiba tuberiventris* Eppelsheim *in* Leder, 1879 by original designation.

Gender. The name *Tropimenelytron* ends in a Greek word "ελντρου" transliterated into Latin without other changes and therefore takes the neutral gender (Article 30.1.2 of the Code; ICZN 1999). Because a species name must agree in gender with the generic

name with which it is combined (Article 31.2.1) when *G. tuberiventris* is placed in *Tropimenelytron* the correct spelling is *T. tuberiventre*.

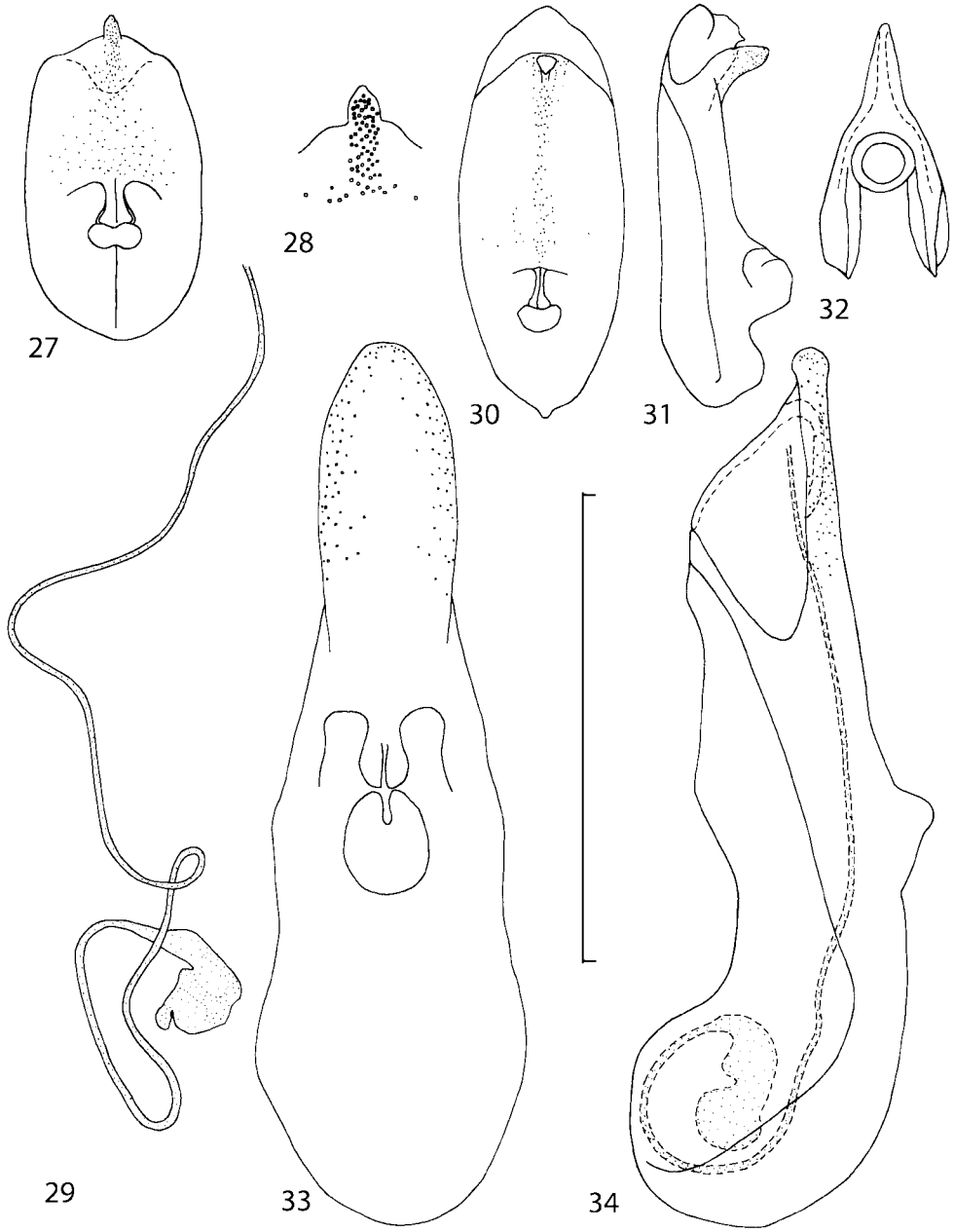
Discussion. Although originally described as a separate genus (Pace 1983) *Tropimenelytron* was subsequently (Pace 1991) downgraded to subgeneric rank within the genus *Pelioptera*. Pace (1991) argued that *Pelioptera, Tropimenelytron* and *Geostibida* have "almost identical" ligula, but in *Pelioptera* mesocoxae are more widely separated. Pace considered this similarity in ligula sufficient to include *Tropimenelytron* and *Geostibida* in *Pelioptera* as subgenera.

Pelioptera micans Kraatz, 1857 (Figs. 23-24, 27-29; Fig. 9 in Sawada 1980), the type species of *Pelioptera*, differs from *T. tuberiventre* and *T. americanum* Gusarov, **sp. n.** in the following characters: first segment of labial palpus with seta γ present (Fig. 23) (absent in *Tropimenelytron*: Fig. 9) and equidistant from setae b and α; prementum with two asetose pores (Fig. 23) (three in *Tropimenelytron*: Fig. 9), spermatheca with umbiculus (Fig. 9, O in Sawada 1980) (without umbiculus in *Tropimenelytron*: Figs. 39, 49, 59), copulatory piece with very long apical process (flagellum-like; Fig. 29) (with short apical process in *Tropimenelytron*: Figs. 16, 18, 19-20). Considering the above differences between the examined species of *Tropimenelytron* (including the type species of the genus) and the type species of *Pelioptera* I do not regard their similarity in the shape of ligula to be sufficient to include *Tropimenelytron* in *Pelioptera*. In this paper I consider *Tropimenelytron* to represent a genus separate from *Pelioptera*, pending a detailed examination of related genera and subgenera and analysis of their relationships.

My examination of three species of *Pelioptera* (Figs. 22-34) and comparison of the drawings and descriptions published by Sawada (1977, 1980, 1982, 1987, 1989) demonstrate that the species currently assigned to *Pelioptera* often have very different structures of internal sac (cf. Figs. 29, 32, 34 and Figs. 10, K; 11, I; 12, J in Sawada 1980) and mesometathorax (Figs. 24-26). This may indicate that some species currently assigned to *Pelioptera* are not related and should not be congeneric with the type species of the genus. This problem requires further study and it is briefly discussed at the end of this paper.

In his key to subgenera of *Pelioptera*, Pace (1991) listed two characters to allow separation between *Tropimenelytron* and *Geostibida*: the difference in the shape of spermatheca (S-shaped in *Geostibida* and semicircular in *Tropimenelytron*) and the length of elytra (shorter than pronotum in *Geostibida* and longer than pronotum in *Tropimenelytron*). Unfortunately, these characters are not reliable. The shape of the proximal portion of spermatheca varies even among closely related species. For example, in *T. americanum* (Fig. 39) this portion is longer than in two other Nearctic species (Figs. 49, 59) and the spermatheca can be described as S-shaped. In many groups of Aleocharinae the length of elytra may be subject to variation even within the same species (see for example Muona 1991; Assing 1999). The specimens with well developed wings have longer elytra, while in wingless specimens the elytra are shorter. In many groups of

aleocharines the species or populations restricted in their distribution to limited areas in the mountains often loose the ability to fly, have reduced wings and shorter elytra in comparison to their more widespread relatives in the plain. Clearly the length of elytra alone is not a sufficient character to separate subgenera of *Pelioptera*.



FIGURES 27-34. Male genitalia of *Pelioptera micans* Kraatz (syntype from Sri Lanka (27-29)), *P. exasperata* (Kraatz) (Dehra Dun, India (30-32)) and *P. testaceipennis* (Motschulsky) (Java, Indonesia (33-34)). 27, 30, 33 – median lobe of aedeagus, parameral view; 28 – apex of median lobe, parameral view; 29 – copulatory piece of internal sac, lateral view; 31, 34 – median lobe of aedeagus, lateral view; 32 – copulatory piece of internal sac, parameral view. Scale bar 0.2 mm (28-29, 32), 0.4 mm (27, 30-31, 33-34).

Pace himself is not consistent in applying these two characters to separate *Tropimenelytron* and *Geostibida*. For example, in *T. nepalense* Pace, 1985a (Fig. 45 in Pace 1985a) and *T. parbatense* Pace,1987a (Fig. 47 in Pace 1987a) (both assigned to *Pelioptera* (*Tropimenelytron*) in Pace 1991) the spermatheca is no less S-shaped than in *G. himalayiensis* Pace, 1984 (Fig. 108 in Pace 1991; assigned to *Pelioptera* (*Geostibida*) in Pace 1991). In *P.* (*G.*) *problematica* Pace, 1991 the elytra are both described (p. 849 in Pace 1991) and illustrated (Fig. 113 in Pace 1991) as being longer than pronotum, but nevertheless the species is placed in the subgenus *Geostibida* and not *Tropimenelytron.* In *T. parbatense* (Fig. 46 in Pace 1987a) elytra are illustrated as being shorter than pronotum, but in Pace 1991 this species is placed in the subgenus *Tropimenelytron* and not *Geostibida.* Some species assigned by Pace to *Geostibida* lack both diagnostic characters of *Geostibida*. For example, in *P.* (*G.*) *eremita* Pace, 1998 elytra are longer than pronotum (Fig. 133 in Pace 1998) and spermatheca is not S-shaped (Fig. 134 in Pace 1998).

Examination of Pace's description of *G. himalayiensis* Pace, 1984 (type species of *Geostibida*) and description of additional species included by Pace in *Geostibida* (Pace 1984, 1985a, 1991, 1998) demonstrates that *Geostibida* is an artificial group which includes those species of *Tropimenelytron* (*G. himalayiensis* Pace, 1984; *G. major* Pace, 1984; *G. annapurnensis* Pace, 1985a) which have short elytra, and some unrelated species (which should be reassigned to other genera) with the same type of pronotal pubescence (*P.* (*G.*) *lii* Pace, 1998; *P.* (*G.*) *kowloonensis* Pace, 1998; *P.* (*G.*) *eremita* Pace, 1998 and probably *P.* (*G.*) *problematica* Pace, 1991). A revision of the type of *Geostibida* is necessary to formally synonymize the name with *Tropimenelytron.*

The genus *Tropimenelytron* is being reported from North America for the first time.

Key for identification of Nearctic species of *Tropimenelytron*

1 Pronotum without or with very weak microsculpture. Head with weak or partially lacking microsculpture. Temples 1.5-1.7 times as long as eyes. Apex of median lobe of aedeagus in parameral view broad (Figs. 40, 42). Length 2.7-3.6 mm. Widespread in Eastern North America ..... 1. *T. americanum* Gusarov, **sp. n.**

– Pronotum and head with strong isodiametric microsculpture. Temples 2.5-2.9 times as long as eyes ..... 2.

2 Body large (3.4-3.7 mm). Apex of median lobe of aedeagus in parameral view broad (Figs. 50, 52). Known from Oregon and British Columbia .... 2. *T. robustum* Gusarov, **sp. n.**

– Body small (2.5-2.9 mm). Apex of median lobe of aedeagus in parameral view narrow (Figs. 60, 62). Known from California ..... 3. *T. californicum* Gusarov, **sp. n.**

1. *Tropimenelytron americanum* Gusarov, sp. n. (Figs. 16-18, 21, 35-44)

Type material. Holotype: ♂, **UNITED STATES**: **Indiana**: Monroe Co.: Morgan Monroe State Forest, leaf litter (L.E. Watrous), 18.iv.1981 (FMNH);

Paratypes: **UNITED STATES**: **Indiana**: 2♂♂, ♀, same data as the holotype (FMNH, KSEM, SPSU); Parke Co.: ♂, 4 mi. W Rockville, aerial plankton (H. Dybas), 19.viii.1977 (FMNH); ♀, ditto but 2.ix.1977 (FMNH); **Iowa**: Jackson Co.: ♂, Maquoketa Caves State Park, upland forest litter (S. Peck), 25.vii.1968 (FMNH); **Missouri**: Buchanan Co.: ♀, 19 km SSW St. Joseph, Bluffwoods State Forest, 39º37.37'N 94º58.02'W, 150 m (V.I. Gusarov), 12.iv.1999 (SPSU); **Wisconsin**: Eau Claire Co.: 3♂♂, 2 mi. S Eau Claire, "floor u. bark, chips pine – maple wood" (W. Suter), 6.v.1976 (FMNH, SPSU); **Ohio**: Hocking Co.: ♀, Crane Hollow (L.E. Watrous), 10.v.1975 (FMNH); Franklin Co.: ♀, Columbus, leaf litter (P.W. Kovarik), 15.iv.1989 (FMNH); **Pennsylvania**: Allegheny Co.: ♂, near Sutersville, litter at log on hill side (W. Suter), 16.vi.1977 (FMNH); **New Jersey**: Morris Co.: 2♂♂, Green Pond, Pt. Comfort, tree hole with ants (W. Suter), 15.viii.1979 (FMNH); **New York**: Chataugua Co.: ♀, 2 mi. S Westfield (L.E. Watrous), 16.vi.1979 (FMNH); Albany Co.: ♀, Rensselaerville, E.N.Huyck Pres., falls area, birch log (W. Suter), 8.viii.1974 (FMNH); ♂, ditto but ravine near Lincoln pond, litter at birch log, 18.viii.1974 (FMNH); **Connecticut**: New London Co.: 2♀♀, (L.E. Watrous), 5.v.1974 (FMNH, SPSU); ♂, ditto but 12.v.1974 (KSEM); **CANADA**: **Quebec**: ♂, Gatineau Park., Old Chelsea, birch log and litter at log (W. Suter), 26.vii.1977 (FMNH).

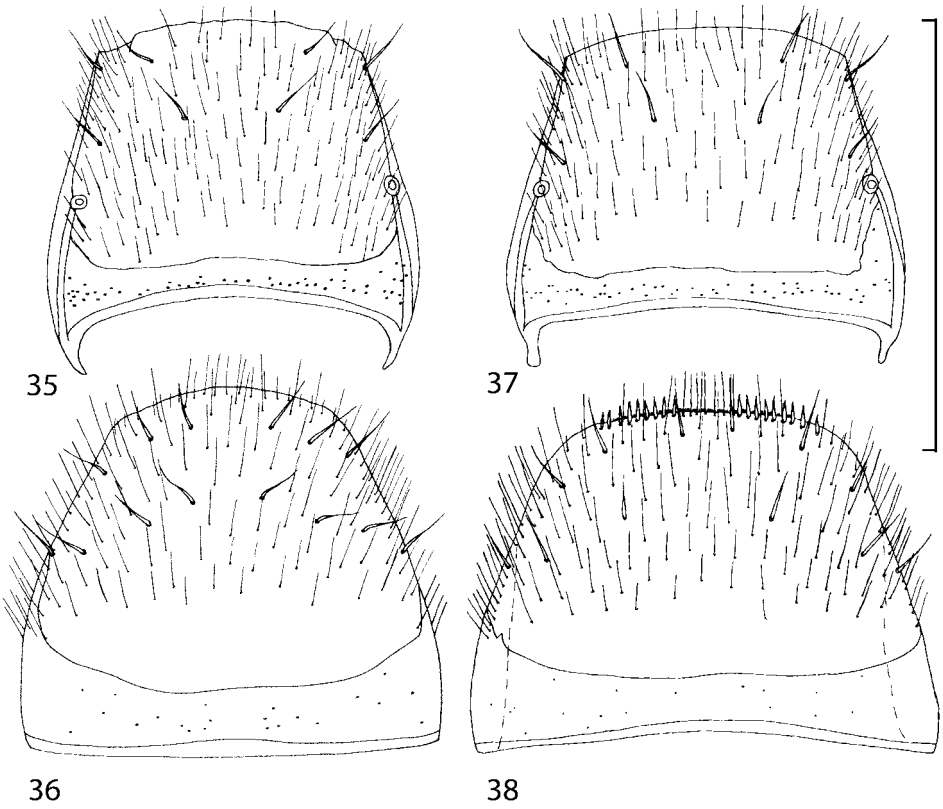
Diagnosis. *Tropimenelytron americanum* can be distinguished from the two other Nearctic species of *Tropimenelytron* by having glossy pronotum without or with very weak microsculpture, head with weak and partially absent microsculpture, larger eyes (temples 1.5-1.7 times as long as eyes), broader apex of median lobe of aedeagus (in parameral view) (Figs. 40, 42 and 50, 52, 60, 62).

Description. Length 2.7-3.6 mm. Head reddish brown to dark brown, pronotum brownish yellow to reddish brown, elytra yellow to brownish yellow, abdomen brownish yellow to reddish brown, segment 6 often darker with light posterior margin, legs yellow, antennae and mouthparts brownish yellow to brown.

Head surface glossy, on disk with weak or partially absent isodiametric microsculpture, punctation fine, distance between punctures equals 2-5 times their diameter. Temples 1.5-1.7 times as long as eyes. Second antennal article 1.4 times as long as third, article 4 slightly transverse (ratio 1.3), articles 5-10 transverse (ratio 1.5-1.7), last article longer than two but shorter than three preceding articles combined (Fig. 14).

Pronotum subquadrate, 1.2 times as wide as head, width 0.47-0.60 mm, length 0.43-0.57 mm, length to width ratio 0.93, surface glossy, with completely lacking or very weak isodiametric microsculpture; punctation as on head, distance between punctures equals 2-5 times their diameter. Elytra much wider (0.56-0.74 mm) and slightly longer (0.44-0.66 mm, measured from humeral angle) than pronotum (pronotal length to elytral length ratio

0.96), 1.3 times as wide as long, glossy, with completely lacking or very weak isodiametric microsculpture and punctation as on pronotum.

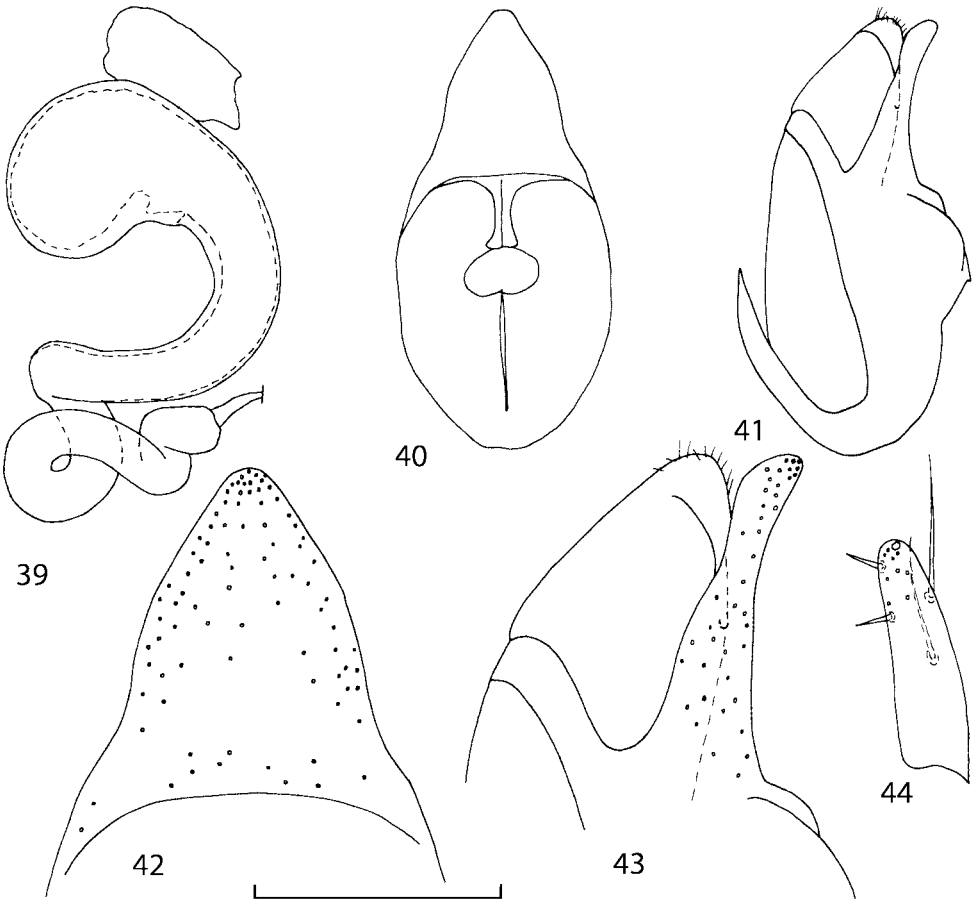


FIGURES 35-38. Details of abdominal segment 8 of *Tropimenelytron americanum* Gusarov, **sp. n.** (paratypes from Morgan Monroe State Park (35-36) and Rockville, Indiana (37-38)). 35 – male tergum 8; 36 – male sternum 8; 37 – female tergum 8; 38 – female sternum 8. Scale bar 0.5 mm.

Abdominal terga glossy, with fine and weak isodiametric microsculpture, with fine asperate punctation, on terga 3-5 distance between punctures equals 2-4 times their diameter, on terga 6-7 distance between punctures equals 3-6 times their diameter.

Male secondary sexual characters include longitudinal carina along anterior half of sutural margin of each elytron, tiny medial knob at posterior margin of tergum 3, small medial knob at apical third of tergum 4, short medial carina in front of anterior margin of tergum 7. Some (smaller) males may lack these features altogether and externally look like females. Male tergum 8 with uneven and slightly convex posterior margin (Fig. 35). Posterior margin of male sternum 8 convex (Fig. 36). Aedeagus as in Figs. 40-44, 16-18, 21.

Female tergum 8 and sternum 8 with slightly convex posterior margin (Figs. 37-38). Spermatheca as in Fig. 39.



FIGURES 39-44. Genitalia of *Tropimenelytron americanum* Gusarov, **sp. n.** (paratypes from Rockville (39) and Morgan Monroe State Park, Indiana (40-44)). 39 – spermatheca; 40 – median lobe of aedeagus, parameral view; 41 – median lobe of aedeagus, lateral view; 42 – apex of median lobe, parameral view; 43 – apex of median lobe, lateral view; 44 – apical lobe of left paramere, side facing median lobe. Scale bar 0.1 mm (39, 42-44), 0.2 mm (40-41).

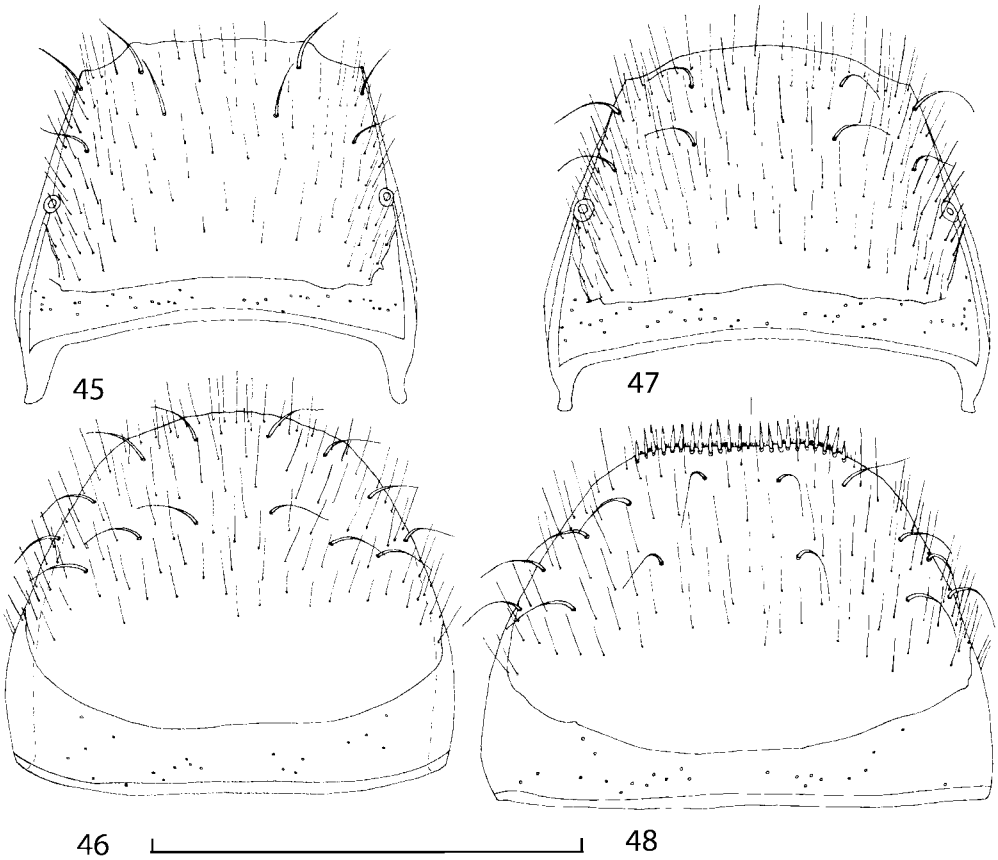
Distribution. Known from Eastern United States (Connecticut, New York, New Jersey, Pennsylvania, Ohio, Indiana, Missouri, Iowa and Wisconsin) and Canada (Quebec) (Fig. 65).

2. *Tropimenelytron robustum* Gusarov, sp. n. (Figs. 45-54)

Sipalia columbica Fenyes (manuscript name).

Type material. Holotype: ♂, **UNITED STATES**: **Oregon**: Clackamas Co.: 1.5 mi. S jct. US26 & Ore35, 3500', litter, mixed conifer forest (A. Newton, M. Thayer), 11.vii.1975 (FMNH).

Paratypes: **CANADA**: **British Columbia**: ♀, 25 mi. E Hope (Campbell & Smetana), 21.vi.1968; ♂, Mt. Garibaldi, 14 km N Squamish, 4000' (Campbell & Smetana), 30.v.1968 (all - CNCI); ♂, 2♀♀, Shawnigan Lake (CASC).



FIGURES 45-48. Details of abdominal segment 8 of *Tropimenelytron robustum* Gusarov, **sp. n.** (holotype (45-46), paratype from Hope, British Columbia (47-48)). 45 – male tergum 8; 46 – male sternum 8; 47 – female tergum 8; 48 – female sternum 8. Scale bar 0.5 mm.

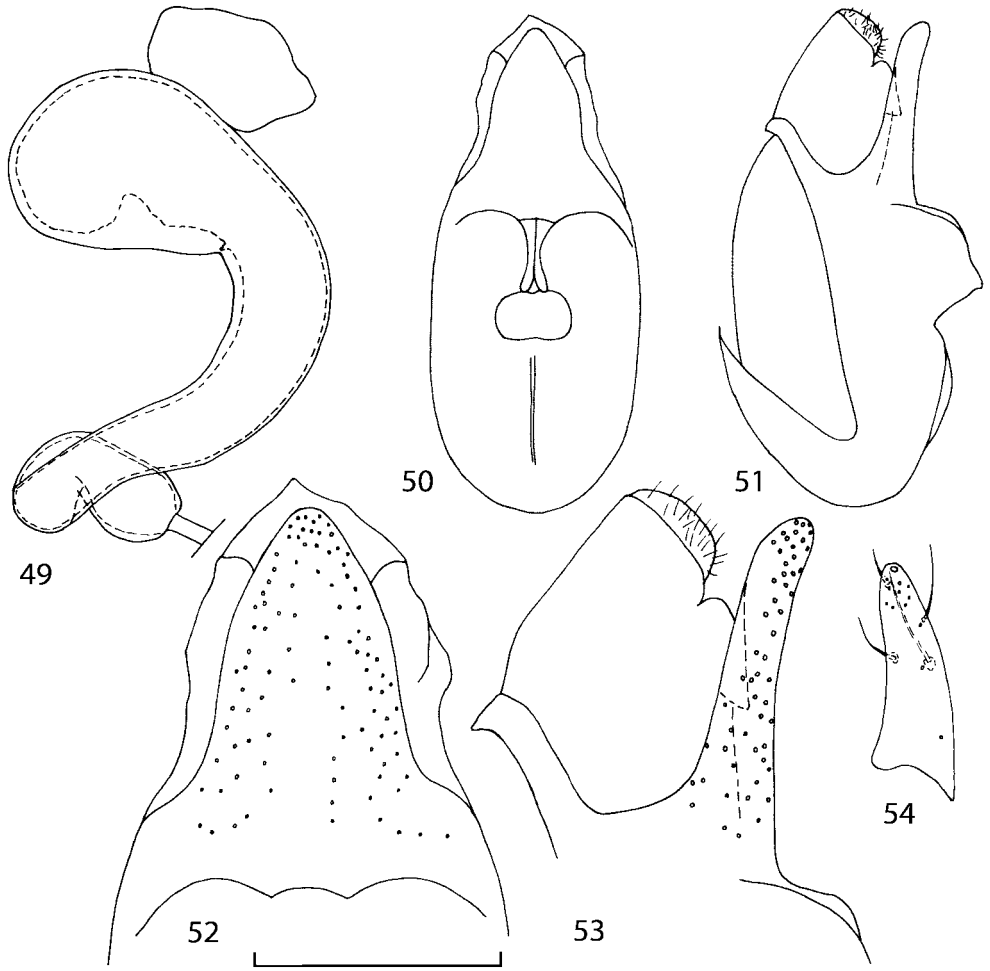
Diagnosis. *Tropimenelytron robustum* differs from *T. americanum* in having mat pronotum and head, both with strong microsculpture; smaller eyes (temples 2.5-2.7 times as long as eyes) and narrower apex of median lobe of aedeagus in parameral view (Figs. 50, 52 and 40, 42). *Tropimenelytron robustum* differs from *T. californicum* in having longer body and broader apex of median lobe of aedeagus in parameral view (Figs. 50, 52 and 60, 62).

Description. Length 3.4-3.7 mm. Body reddish brown, elytra and legs slightly lighter.

Head surface mat, on disk with strong isodiametric microsculpture, making hard to see

fine and slightly asperate punctation, distance between punctures equal to 2-3 times their diameter. Temples 2.5-2.7 times as long as eyes. Second antennal article 1.1 times as long as third, article 4 slightly transverse (ratio 1.6), articles 5-10 strongly transverse (ratio 1.8-2.0), last article longer than two but shorter than three preceding articles combined.

Pronotum subquadrate, 1.2 times as wide as head, width 0.53-0.57 mm, length 0.51-0.56 mm, length to width ratio 0.97, surface mat, microsculpture and punctation as on head. Elytra wider (0.67-0.73 mm) and as long (0.51-0.54 mm, measured from humeral angle) as pronotum (elytral length to pronotal length ratio 0.99), 1.3 times as wide as long, glossy, with isodiametric microsculpture, meshes larger than on pronotum, punctation fine and asperate, distance between punctures equal to their diameter.



FIGURES 49-54. Genitalia of *Tropimenelytron robustum* Gusarov, **sp. n.** (paratype from Hope, British Columbia (49) and holotype (50-54)). 49 – spermatheca; 50 – median lobe of aedeagus, parameral view; 51 – median lobe of aedeagus, lateral view; 52 – apex of median lobe, parameral view; 53 – apex of median lobe, lateral view; 54 – apical lobe of left paramere, side facing median lobe. Scale bar 0.1 mm (49, 52-54), 0.2 mm (50-51).

Abdominal terga glossy, with fine and weak isodiametric microsculpture, with fine asperate punctation, on terga 3-5 distance between punctures equals 2-4 times their diameter, on terga 6-7 punctation finer, distance between punctures equals 3-6 times their diameter.

Male secondary sexual characters include longitudinal carina along anterior half of sutural margin of each elytron, tiny medial knob at posterior margin of tergum 3, small medial knob at apical third of tergum 4, short medial carina in front of anterior margin of tergum 7, and uneven posterior margin of tergum 8 (Fig. 45). Posterior margin of male sternum 8 convex (Fig. 46). Aedeagus as in Figs. 50-54.

Female tergum 8 with slightly convex posterior margin (Fig. 47), sternum 8 with straight posterior margin (Fig. 48). Spermatheca as in Fig. 49.

Distribution. Known from Western United States (Oregon) and Canada (British Columbia) (Fig. 65).

3. *Tropimenelytron californicum* Gusarov, sp. n. (Figs. 55-64)

Type material. Holotype: ♂, **UNITED STATES**: **California**: Tehama Co.: 2 mi. NE Mineral, grass and alder litter (D.S. Chandler), 12.vi.1980 (FMNH).

Paratypes: **UNITED STATES**: **California**: 5♂♂, ♀, same data as the holotype (FMNH, KSEM, SPSU).

Diagnosis. *Tropimenelytron californicum* differs from the two other species of *Tropimenelytron* in having apex of median lobe of aedeagus more narrow (Figs. 60, 62 and 40, 42, 50, 52). Additionally, *T. californicum* differs from *T. americanum* in having pronotum with strong isodiametric microsculpture and smaller eyes (temples 2.3-2.8 times as long as eyes); and from *T. robustum* in having smaller body.

Description. Length 2.5-2.9 mm. Body brownish yellow with lighter elytra.

Head surface glossy, on disk with isodiametric microsculpture, with fine, slightly asperate microsculpture, distance between punctures equal to 2-3 times their diameter. Temples 2.3-2.8 times as long as eyes. Second antennal article 1.3 times as long as third, article 4 slightly transverse (ratio 1.4), articles 5-10 strongly transverse (ratio 1.8-2.0), last article longer than two but shorter than three preceding articles combined.

Pronotum subquadrate, 1.2 times as wide as head, width 0.39-0.46 mm, length 0.37-0.44 mm, length to width ratio 0.96, surface glossy, microsculpture and punctation as on head. Elytra wider (0.49-0.60 mm) and longer (0.39-0.49 mm, measured from humeral angle) than pronotum (pronotal length to elytral length ratio 0.94), 1.2 times as wide as long, glossy, with weak isodiametric microsculpture, punctation fine and asperate, and distance between punctures equals 1-2 times their diameter.

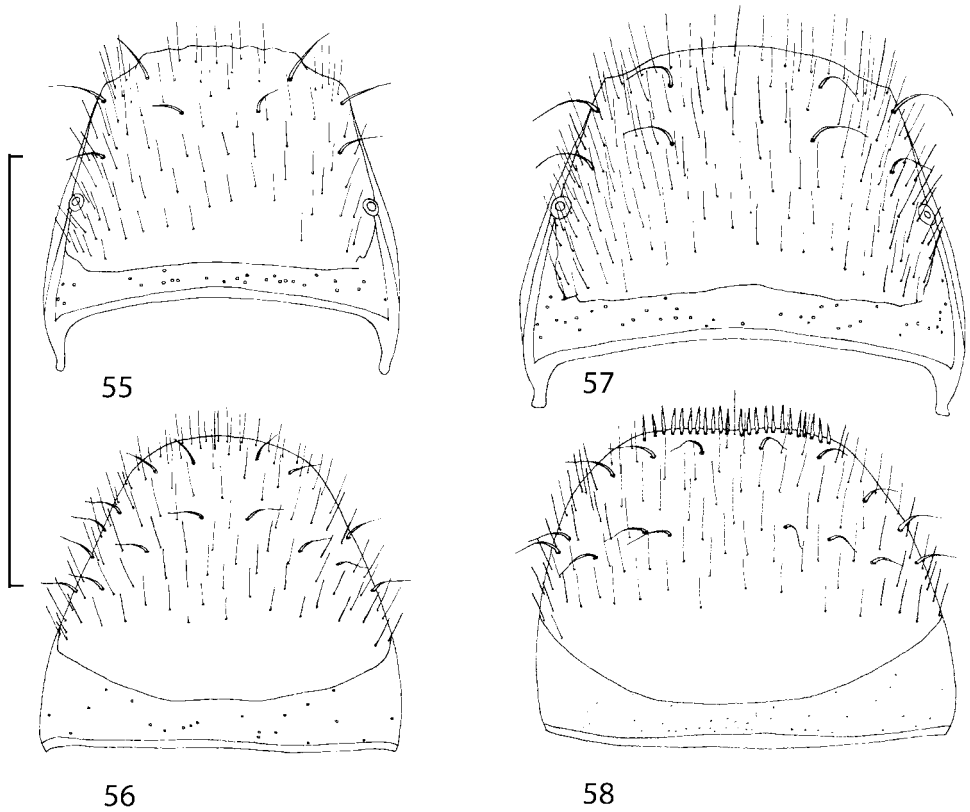
Abdominal terga glossy, with fine and weak isodiametric microsculpture, with fine asperate punctation, on terga 3-5 distance between punctures equals 2-4 times their

diameter, on terga 6-7 punctation finer, distance between punctures equals 3-6 times their diameter.

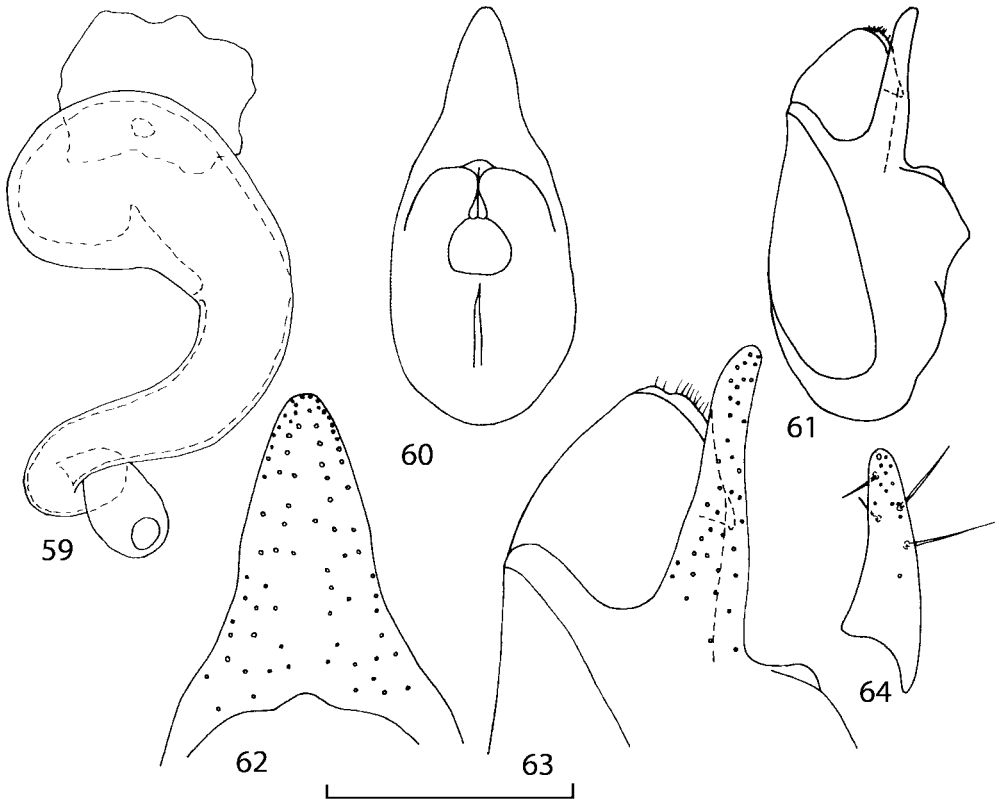
Male secondary sexual characters include longitudinal carina along anterior half of sutural margin of each elytron, tiny medial knob at posterior margin of tergum 3, small medial knob at apical third of tergum 4, short medial carina in front of anterior margin of tergum 7. In some (smaller) males the knobs and carinae are weaker or absent. Male tergum 8 with uneven posterior margin (Fig. 55). Posterior margin of male sternum 8 convex (Fig. 56). Aedeagus as in Figs. 60-64.

Female tergum 8 with convex posterior margin (Fig. 57). Sternum 8 with straight posterior margin (Fig. 58). Spermatheca as in Fig. 59.

Distribution. Known from Western United States (California) (Fig. 65).



FIGURES 55-58. Details of abdominal segment 8 of *Tropimenelytron californicum* Gusarov, **sp. n.** (paratypes from Mineral, California). 55 – male tergum 8; 56 – male sternum 8; 57 – female tergum 8; 58 – female sternum 8. Scale bar 0.5 mm.



FIGURES 59-64. Genitalia of *Tropimenelytron californicum* Gusarov, **sp. n.** (paratypes from Mineral, California). 59 – spermatheca; 60 – median lobe of aedeagus, parameral view; 61 – median lobe of aedeagus, lateral view; 62 – apex of median lobe, parameral view; 63 – apex of median lobe, lateral view; 64 – apical lobe of left paramere, side facing median lobe. Scale bar 0.1 mm (59, 62-64), 0.2 mm (60-61).

Notes on the genus *Pelioptera* Kraatz, 1857

Tropimenelytron and *Pelioptera* have similar shape of ligula and separated mesocoxae. In recent publications (Pace 1991, 1998, 2000) *Tropimenelytron* was considered a subgenus of *Pelioptera*. I examined a syntype of the type species and specimens of two additional species of *Pelioptera* and the detailed descriptions and illustrations of mouthparts and genitalia of several species of *Pelioptera* published by Sawada (1977, 1980, 1982, 1987, 1989). Therefore it seems appropriate to discuss the status of *Pelioptera* below.

Pelioptera Kraatz, 1857 (Figs. 22-34)

Pelioptera Kraatz, 1857: 55 (Type species *P. micans* Kraatz, 1857, by subsequent designation by Fenyes (1918)).

Termitopora Motschulsky, 1859: 91 (Type species *Termitopora adustipennis* Motschulsky, 1859, by monotypy).

Discussion. The species currently included in *Pelioptera* (Sawada 1980, 1982, 1987, 1989; Pace 1985b, 1986, 1987b, 1990, 1993, 1995, 1996) often have very different structures of internal sac. As currently defined (Sawada 1980; Pace 1991), *Pelioptera* appears to be an artificial group which includes the athetines with widely separated mesocoxae and broad ligula split into two lobes. A thorough revision of *Pelioptera* is required. The differences between the type species of *Pelioptera* and the genus *Tropimenelytron* are listed in the diagnosis of the latter.

Pelioptera micans and *P. testaceipennis* (Motschulsky, 1858) share short and broadly truncate mesosternal process, broad and long metasternal process (Figs. 24-25), and long flagellum-like copulatory piece of internal sac (Figs. 29, 34). These characters may be autapomorphies of *Pelioptera*. However, the two species differ in the number of asetose pores of prementum (Figs. 22-23). Among the species of *Pelioptera* illustrated by Sawada and Pace only two species have similar flagellum-like copulatory piece: *P. baliensis* Pace, 1987b from Bali, Indonesia and *P. dimidiata* Pace, 1995 from Rwanda.

Pelioptera exasperata (Kraatz, 1859) differs from *P. micans* in having narrower mesosternal and metasternal processes (Figs. 26, 24), and short apical process of the copulatory piece (Figs. 32, 29). *Pelioptera exasperata* and closely related *P. opaca* Kraatz, 1857 probably do not belong to *Pelioptera*.

According to published descriptions and illustrations, the diagnostic characters of *Tropimenelytron* are displayed by the following two species placed in *Pelioptera* by Sawada (1980): *P. peguana* (Bernhauer, 1915) from Burma (Fig. 14 in Sawada 1980) and *P. unica* (Bernhauer, 1907) from Japan (Fig. 15 in Sawada 1977). These two species are similar to other species of *Tropimenelytron* in the shape of ligula, the distribution of pores on the prementum, the shape of the median lobe of aedeagus, the copulatory piece and the medial lamellae of internal sac, and male secondary sexual characters (longitudinal carina on each elytron, medial tubercles or carinae on abdominal terga 3-4 and 7). I transfer these two species to *Tropimenelytron*, and the new combinations are *T. peguanum* and *T. unicum*.

A list of examined specimens of *P. micans*, *P. testaceipennis* and *P. exasperata* and known synonyms of these names are given below.

Pelioptera micans Kraatz, 1857 (Figs. 23-24, 27-29)

Pelioptera micans Kraatz, 1857: 56.
Termitopora adustipennis Motschulsky, 1859: 93.
Pelioptera micans: Cameron, 1939: 415.
Pelioptera differens Cameron, 1939: 418.
Pelioptera adustipennis: Cameron, 1939: 415 (as synonym of *P. micans*).

Pelioptera micans: Sawada, 1980: 42.
Pelioptera micans: Sawada, 1982: 168.

Type material. Syntype of *P. micans*: **Sri Lanka:** ♂, (Kraatz) (FMNH).

Additional material. Sri Lanka: ♂ (with missing head, prothorax and aedeagus) (Waagen, Bang-Haas) (FMNH); **Indonesia:** ♀, Java, Semarang (E. Jacobson), ix.1909 (FMNH).

Pelioptera testaceipennis (Motschulsky, 1858) (Figs. 22, 25, 33-34)

Homalota testaceipennis Motschulsky, 1858: 251.
Homalota pelioptera Kraatz, 1859: 30.
Homalota dubia Kraatz, 1859: 37.
Pelioptera longicornis Cameron, 1925: 194.
Atheta (*Liogluta*) *luchuensis* Cameron, 1933: 213.
Pelioptera dubia: Cameron, 1939: 413 (as valid species).
Pelioptera pelioptera: Cameron, 1939: 414 (as valid species).
Pelioptera longicornis: Cameron, 1939: 413 (as synonym of *P. dubia*).
Geostiba luchuensis: Sawada, 1977: 211 (as valid species).
Pelioptera testaceipennis: Sawada, 1980: 51.
Pelioptera pelioptera: Sawada, 1980: 51 (as synonym of *P. testaceipennis*).
Pelioptera dubia: Sawada, 1980: 51 (as synonym of *P. testaceipennis*).
Pelioptera luchuensis: Sawada, 1980: 51 (as synonym of *P. testaceipennis*).

Type material. Syntypes of *P. longicornis*: **Indonesia:** ♂, ♀, Sumatra, Si-Rambé (E. Modigliani), xii.1890-iii.1891 (FMNH).

Additional material. Indonesia: ♂, Nongkudjadjar, East Java, 4000' (J.P.A. Kalis), 1934 (FMNH).

Pelioptera exasperata (Kraatz, 1859) (Figs. 26, 30-32)

Homalota exasperata Kraatz, 1859: 32.
Atheta (*Microdota*) *granulipennis* Bernhauer, 1907: 402.
Pelioptera exasperata: Cameron, 1939: 418.
Pelioptera granulipennis: Cameron, 1939: 418 (as synonym of *P. exasperata*).
Geostiba exasperata: Sawada, 1977: 206.
Pelioptera exasperata: Sawada, 1982: 167.

Examined material. India: 2♂♂, ♀, Dehra Dun (Cameron), 26.ii.1922 (FMNH).

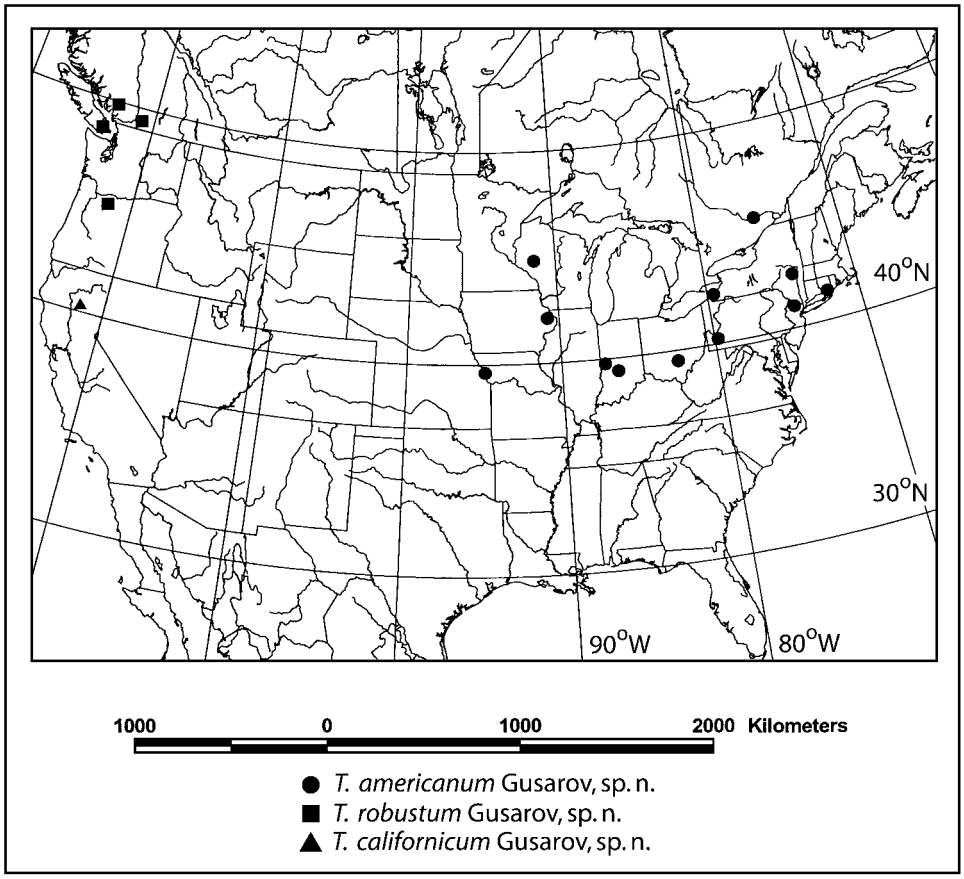


FIGURE 65. Geographical distribution of Nearctic species of *Tropimenelytron* Pace.

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