EUROPEAN JOURNAL OF ENTOMOLOGY
ISSN (online): 1802-8829
http://www.eje.cz
Eur. J. Entomol. **120**: 254–292, 2023
doi: 10.14411/eje.2023.028
ORIGINAL ARTICLE

Nearctic Anthomyzidae: Genera *Mumetopia* Melander and *Xerocomyza* gen. n. (Diptera)

JINDŘICH ROHÁČEK[1] and KEVIN N. BARBER[2]

[1] Department of Entomology, Silesian Museum, Nádražní okruh 31, CZ-746 01 Opava, Czech Republic; e-mail: rohacek@szm.cz

[2] Great Lakes Forestry Centre, Canadian Forest Service, Natural Resources Canada, 1219 Queen St. E., Sault Ste. Marie, Ontario, P6A 2E5, Canada; e-mail: kevin.barber@nrcan-rncan.gc.ca

Key words. *Mumetopia occipitalis*, *Xerocomyza hansoni*, new genus, new species, lectotype designation, taxonomy, relationships, biology, distribution, Nearctic

Abstract. The New World genus *Mumetopia* Melander, 1913 is redefined, redescribed and its relationships are discussed. Its Nearctic type species, *M. occipitalis* Melander, 1913, is revised with lectotype designation, redescribed and illustrated in detail, and its relationship, biology and distribution are treated using published and numerous new data. A new genus, *Xerocomyza* gen. n., is described for *X. hansoni* sp. n., an unusual species from high desert plains in Utah (U.S.A.), and its phylogenetic relationships are discussed: *Xerocomyza* is recognized as a separate lineage of Anthomyzidae most probably allied to the *Carexomyza* + *Chamaebosca* group clade (sensu Barber & Roháček, 2020, *Arthropod Syst. Phylogeny* **78**: 69–109). Biology and distribution of *X. hansoni* are given on the basis of limited label data from type specimens.

ZooBank Article Registration: https://zoobank.org/urn:lsid:zoobank.org:pub:A3AECF30-737A-4DE7-B7BB-431D402908CA

INTRODUCTION

The modern systematic revision of the Nearctic flies of the family Anthomyzidae (Diptera: Acalyptratae) started in 2004 and continues to the present. During this long period, the genera *Fungomyza* Roháček, 1999, *Stiphrosoma* Czerny, 1928, *Quametopia* Roháček & Barber, 2011, *Arganthomyza* Roháček, 2009, *Ischnomyia* Loew, 1863, *Anthomyza* Fallén, 1810 and *Carexomyza* Roháček, 2009 have been treated in a monographic manner, thus including their taxonomic revision, phylogenetic relationships, life history, biology and distribution (see Roháček & Barber, 2004, 2005, 2011, 2013, 2016; Barber & Roháček, 2020). A few taxa, represented by single species each in the regional fauna, remain unrevised but were previously included in the key to Nearctic Anthomyzidae by Roháček & Barber (2016: 26–29). The present study is devoted to two of these: the genus *Mumetopia* Melander, 1913 and an unnamed genus based on a peculiar new species from Utah (U.S.A.). Consequently, only the '*Mumetopia nigrimana*' group, excluded from *Mumetopia* by Roháček & Barber (2009) as apparently belonging to an undescribed genus (cf. also Roháček & Barber, 2016), remains to be fully studied in order for the revision of Nearctic Anthomyzidae to be completed. The '*Mumetopia nigrimana*' group is also represented by only a single species, viz., *M. nigrimana* (Coquillett, 1900), in the Nearctic Region, but without knowledge of the numerous unnamed Neotropical species (cf. Roháček & Barber, 2009; Barber & Roháček, 2010), the new genus cannot be correctly taxonomically delimited and described.

The genus *Mumetopia*, as originally established by Melander (1913), was a polyphyletic, morphologically heterogenous group composed of three, superficially similar but only distantly related species, viz., *M. occipitalis* Melander, 1913 (type species), *M. nigrimana* (Coquillett, 1900) and *M. terminalis* (Loew, 1863). Based on analysis of morphological characters, Roháček & Barber (2009) demonstrated that only *M. occipitalis* and *M. nigrimana* belong to the monophyletic *Chamaebosca* group of genera (a clade including the genera *Chamaebosca* Speiser, 1903, *Mumetopia* and *Stiphrosoma*). The remaining species, *M. terminalis*, was recognized as not closely related to this clade and was subsequently included (as the type species) in a new genus, *Quametopia*, by Roháček & Barber (2011). Roháček & Barber (2009) also found that *M. nigrimana* (plus the numerous undescribed Neotropical species) represents a separate lineage that is more closely allied to the genus *Stiphrosoma* than to *M. occipitalis*. These findings were later corroborated by molecular phylogenetic hypotheses (Roháček & Tóthová, 2014; Roháček et al., 2019;

Barber & Roháček, 2020). However, the morphological cladistic hypothesis by Roháček & Barber (2009: Figs 36–38) presented '*Mumetopia* s. str.' in a very narrow concept (comprising only *M. occipitalis* and several very closely related species) that, together with undescribed species in branches tentatively labelled as 'genus M' and 'genus B', formed a clade supported by a number of synapomorphic characters. Most recently, Roháček & Tóthová (2021) described a new Neotropical species in *Mumetopia*, viz., *M. interfeles* Roháček, 2021, belonging to the 'genus M' sensu Roháček & Barber (2009), and proposed to expand the concept of *Mumetopia* to include both the 'genus M' and 'genus B' as outlined in the morphological hypothesis of Roháček & Barber (2009). Following this expanded taxonomic concept, the genus *Mumetopia* and its type species are re-described in detail below.

The name *Mumetopia occipitalis* has had a stable application since its description in 1913 mostly because this Nearctic anthomyzid species is readily recognized by a combination of a single strong orbital seta, an extensively blackened frons, and a single medial patch of white occipital tomentum above the foramen (see Figs 41, 42). Consequently, it has been included in faunal lists of general biological inventories for some time (e.g., Sturtevant, 1918; Johnson, 1925; Wray, 1967; Marshall et al., 2001; Telfer et al., 2015) and recent identifiable photographs, contributed to such popular websites as BugGuide.net and iNaturalist.org, can augment distributional records. The stability and broad use of the name *M. occipitalis* in the Nearctic fauna continues as we have not recognized any additional species (undescribed or otherwise) of *Mumetopia* in the Nearctic Region.

The recent revisionary study of the genus *Carexomyza* by Barber & Roháček (2020) revealed, by molecular phylogenetic analysis, that *Carexomyza* is the sister group of the whole *Chamaebosca* clade while *Cercagnota* Roháček & Freidberg, 1993 (suggested as this sister group by Roháček & Barber, 2009) is not closely related to this clade. This sister-group relationship was also supported by several morphological synapomorphies (see Barber & Roháček, 2020: 107–108). The results of the *Carexomyza* study also proved to be important in discussing the relationships of *Xerocomyza* gen. n., established here for a small species externally most resembling *Carexomyza*, *Mumetopia* and some *Stiphrosoma* species. It differs from all species of these genera except *Stiphrosoma sabulosum* (Haliday, 1837) in lacking the ctenidial spine on the fore femur. However, structures of its male and female terminalia are peculiar and some of them resemble those in only distantly related taxa of Anthomyzidae.

MATERIAL AND METHODS

The material examined is deposited in the following collections identified by their associated codens: AMNH – American Museum of Natural History, Division of Invertebrate Zoology, New York, New York, U.S.A.; BDUC – Museum of Zoology, Invertebrate Section, Department of Biological Sciences, University of Calgary, Calgary, Alberta, Canada; BMNH – The Natural History Museum (formerly British Museum of Natural History), London, England, U.K.; CASC – California Academy of Sciences, Department of Entomology, San Francisco, California, U.S.A.; CMNH – Carnegie Museum of Natural History, Section of Invertebrate Zoology, Pittsburg, Pennsylvania, U.S.A.; CNCI – Canadian National Collection of Insects, Arachnids & Nematodes, Ottawa, Ontario, Canada; CSCA – California State Collection of Arthropods, California Department of Food and Agriculture, Sacramento, California, U.S.A.; DEBU – University of Guelph Insect Collection, School of Environmental Sciences, University of Guelph, Guelph, Ontario, Canada; EMEC – Essig Museum of Entomology, University of California – Berkeley, Berkeley, California, U.S.A.; INHS – Illinois Natural History Survey, Insect Collection, Champagne, Illinois, U.S.A.; LACM – Natural History Museum of Los Angeles County, Los Angeles, California, U.S.A.; LEMQ – Lyman Entomological Museum, McGill University, Macdonald Campus, Ste.-Anne-de-Bellevue, Québec, Canada; MBPC – Collection of M. Barták, Praha, Czech Republic; MEMU – Mississippi Entomological Museum, Mississippi State, Mississippi, U.S.A.; MTEC – Montana Entomology Collection, Montana State University, Bozeman, Montana, U.S.A.; NBMB – New Brunswick Museum, St. John's, New Brunswick, Canada; OSAC – Oregon State Arthropod Collection, Department of Zoology, Oregon State University, Corvallis, Oregon, U.S.A.; RBCM – Royal British Columbia Museum, Natural History Section, Victoria, British Columbia, Canada; SEMC – Snow Entomological Museum, University of Kansas, Lawrence, Kansas, U.S.A.; SMOC – Silesian Museum, Opava, Czech Republic; TAUI – National Collection of Insects, Tel Aviv University, Tel Aviv, Israel; UGCA – Georgia Museum of Natural History – Entomological Collections, University of Georgia, Athens, Georgia, U.S.A.; USNM – National Museum of Natural History, Smithsonian Institution, Department of Entomology, Washington, District of Columbia, U.S.A; ZSMC – Zoologische Staatsammlung München, München, Germany.

Methods of examination. Specimens were examined, drawn and measured by means of three types of binocular dissecting microscopes (Reichert, Olympus SZX10, Leica Wild M3Z). Male and female terminalia were examined after detachment of the whole abdomen, maceration in hot 10% KOH, neutralization with 10% acetic acid, washing in water and dissection in a drop of glycerine under a dissecting microscope. More detailed examination was performed with a compound microscope (Zeiss Jenaval). After examination, all parts were transferred to a small plastic microvial or sealed plastic tube in glycerine and pinned below the respective specimens; this is indicated in the text by the abbreviation "genit. prep.".

Drawing techniques and photography. Legs were drawn on squared paper using a Reichert dissecting microscope with an ocular screen. Details of the male and female terminalia were drawn using Abbe's drawing apparatus on a compound microscope (Zeiss Jenaval). Whole adult specimens of *Xerocomyza hansoni* and/or their parts were photographed using a Canon EOS 5D Mark III digital camera with a Nikon CFI Plan 4×/0.10NA 30 mm WD or Nikon CFI Plan 10×/0.25NA 10.5mm WD objective attached to a Canon EF 70–200mm f/4L USM telephoto zoom lens. The specimen photographed by means of the latter equipment was repositioned upwards between each exposure using a Cognisys StackShot Macro Rail and the final photograph was compiled from multiple layers (20–40) using Helicon Focus Pro 7.0.2. Habitus photos of *Mumetopia occipitalis* specimens (whole or parts) were prepared using a Nikon SMZ1500 stereo microscope, with Nikon HR Plan Apo 1× WD 54 objective, Nikon DS-Ri1 12.7MP digital camera, Nikon Digital Sight DS-U3 camera control unit, Prior ES10ZE focus controller and Nikon NIS-Elements BR 4.00.08 (Build 784) software (~20–60 layers).

Wings were photographed by means of a Leitz Orthoplan binocular compound microscope with Leitz Pl Fl 4×/0.14 objective, Leica DFC400 digital camera and Leica Application Suite ver. 3.0.0 (Build 1699) software. Concurrent photos of the same stage micrometer were used for scaling with both above systems. The final images were edited in Adobe Photoshop CS6.

Measurements. Six characteristics of adults were measured: body length (measured from anterior margin of head to end of cercus, thus excluding the antenna), wing length (from wing base to wing tip), wing width (maximum width), index $Cs_3 : Cs_4$ (ratio of length of 3rd costal sector : length of 4th costal sector), index r-m\dm-cu : dm-cu (ratio of length of section between r-m and dm-cu on cell dm : length of dm-cu) and ratio $t_2 : mt_2$ (length of mid tibia : length of mid basitarsus). All type specimens of *X. hansoni* and 120 specimens of *M. occipitalis* (20 smallest, 20 intermediate and 20 largest of each sex) were measured.

Presentation of faunistic data. Label data of primary-type specimens and paralectotypes are presented strictly verbatim. Locality data of other type specimens are standardized. All label data from the other material examined are given in full and standardized in the Appendix at the end of this paper. Data on geographical occurrence are summarized in the Distribution section; the phenological and other biological information obtained from the material examined and literature are presented in the Biology section.

Morphological terminology follows that used in monographs of Anthomyzidae by Roháček (2006) and/or Roháček & Barber (2016) including terms of the male hypopygium and female terminalia except that "orbit" is replaced here with "orbital plate". For male genitalia terminology, the "hinge" hypothesis of the origin of the eremoneuran hypopygium (see Zatwarnicki, 1996) has been adopted. The following synonymous terms of the male genitalia emanating from other hypotheses and used in recent manuals of Diptera (Cumming & Wood, 2009, 2017) and/or the monograph of Griffiths (1972) are listed below (terms used here first): aedeagus = phallus; ejacapodeme = ejaculatory apodeme; epandrium = periandrium; gonostylus = surstylus or telomere; medandrium = bacilliform sclerite, intraepandrial or intraperiandrial sclerite; phallapodeme = aedeagal apodeme; postgonite = gonite or paramere. Morphological terms of the male and female postabdomen and genitalia are depicted in Figs 7–18 and 28–35, respectively.

Abbreviations of morphological terms used in text and/or figures

A_1 – anal vein
ac – acrostichal (seta)
afa – aedeagal part of folding apparatus
ag – accessory gland
bm – basal membrane
C – costa
ce – cercus
cs – connecting sclerite
Cs_2, Cs_3, Cs_4 – 2nd, 3rd, 4th costal sector
ct – ctenidial spine
CuA_1 – cubitus
cx_1 – fore coxa
dc – dorsocentral (seta)
dm – discal medial cell (cell dm)
dm-cu – discal medial-cubital (= posterior, tp) cross-vein
ea – ejacapodeme
ep – epandrium
f – filum of distiphallus
f_1, f_2, f_3 – fore, mid, hind femur
fc – fulcrum of phallapodeme
gs – gonostylus
hl – hypandrial lobe
hu – humeral (= postpronotal) (seta)
hy – hypandrium
is – internal sclerites of female genital chamber
M – media
ma – medandrium
mt_1, mt_2 – fore, mid basitarsus
npl – notopleural (seta)
oc – ocellar (seta)
ors – orbital (seta)
pa – postalar (seta)
pg – postgonite
pha – phallapodeme
pp – phallophore
ppl – propleural (= proepisternal) (seta)
prg – pregonite
prs – presutural intra-alar (seta)
pvt – postvertical (seta)
R_1, R_{2+3}, R_{4+5} – 1st, 2nd, 3rd branches of radius
r-m – radial-medial (= anterior, ta) cross-vein
s – saccus of distiphallus
S1–S8, S10 – abdominal sterna
sa – supraalar (seta)
sc – scutellar (seta)
stpl – sternopleural (= katepisternal) (seta)
T1–T8, T10 – abdominal terga
t_1, t_2 – fore, mid tibia
ta – transandrium
vi – vibrissa
vr – ventral receptacle
vte – outer vertical (seta)
vti – inner vertical (seta)

RESULTS AND DISCUSSION

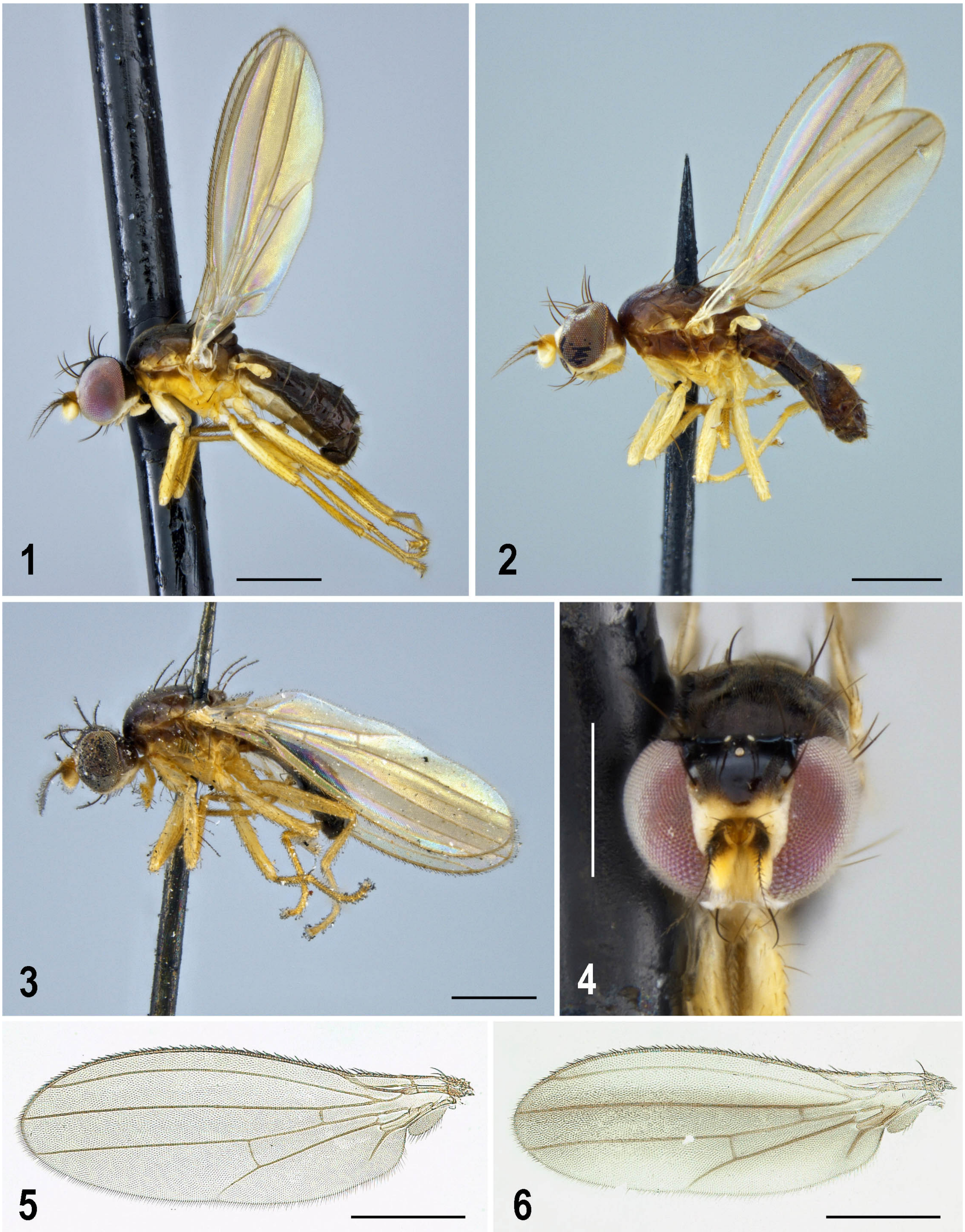
Genus *Mumetopia* Melander, 1913

Mumetopia Melander, 1913: 293 [feminine]; Curran, 1934, 1965: 329 (key); Sturtevant, 1954: 557 (key); Frey, 1958: 32 (key); Sabrosky, 1965: 820 (catalogue); Cole, 1969: 435 (key); Vockeroth, 1987: 890 (key), 1989: 548 (catalogue); Roháček, 1998: 174 (checklist); Roháček & Barber, 2009: 212–214 (phylogenetic relationships); Barber & Roháček, 2010: 1077, 1079 (key, distribution); Roháček & Tóthová, 2021: 152–155 (phylogenetic relationships).

Type species. *Mumetopia occipitalis* Melander, 1913 (original designation).

Diagnosis

Male. (1) Head slightly higher than long. (2) Eye large, broadly ellipsoid or suboval, with longest diameter oblique. (3) Frons relatively wide; frontal triangle well delimited, large to very large. (4) Ocellar triangle flat and ocelli small. (5) oc setae inserted somewhat outside margin of ocellar triangle, slightly divergent to almost parallel. (6) Frontal lunule very small, narrow, depressed. (7) Occiput concave, normally with solid silvery-white microtomentose supracervical patch (secondarily absent in terricolous species). (8) Antenna geniculate between pedicel and 1st flagellomere, the latter laterally strongly compressed. (9) Arista short-ciliate to short-pectinate (cf. Figs 1, 2). (10) Palpus slender, yellow to pale brown, ventrally with 1 dark preapical seta and several setulae. Cephalic chaetotaxy: (11) pvt small, usually strongly convergent to crossed, rarely



Figs 1–6. *Mumetopia occipitalis* Melander, male habitus and wings: 1 – male, left lateral (Canada: Ontario); 2 – ditto (Bermuda); 3 – male lectotype, left lateral (U.S.A.: Louisiana: Opelousas); 4 – male head, frontal (Canada: Ontario); 5 – left wing, dorsal (Canada: Ontario); 6 – ditto (Bermuda). Scales: 0.5 mm. Photo: K.N. Barber.

almost parallel; (12) vte, vti, oc and (both or only one) ors long, vti usually longest of cephalic setae; (13) 1 or 2 ors, anterior (if present) distinctly to slightly shorter than posterior ors, 1 or 2 microsetulae in front of anterior ors;

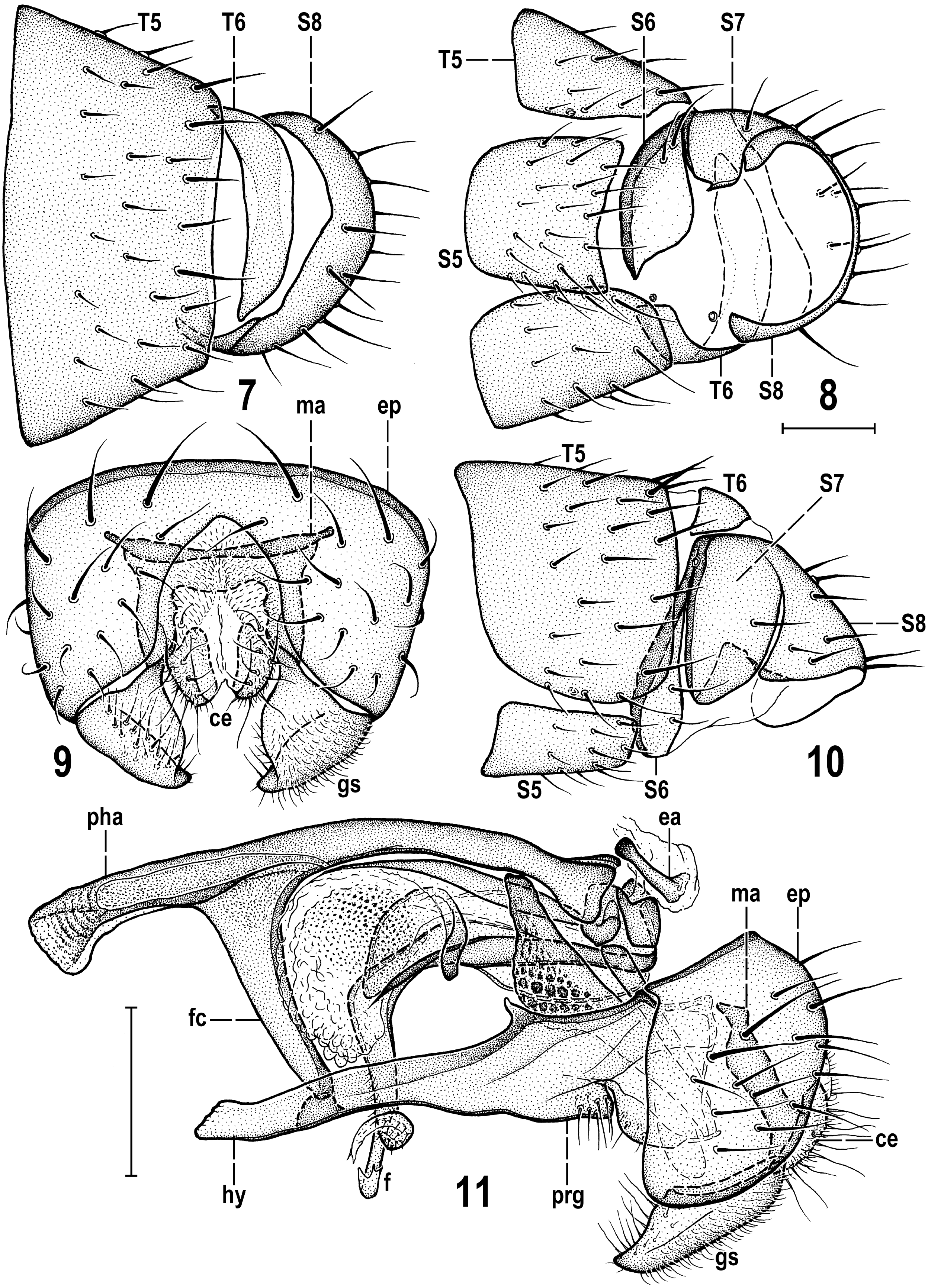
(14) a single row of short postocular setulae; (15) 1 long vi and 1 shorter and weaker but well-developed subvibrissa; (16) peristomal setulae usually short and sparse. (17) No distinct sexual dichroism of head structures.

(18) Thorax more or less narrower than head. Thoracic chaetotaxy: (19) 1 short but distinct hu, 2 npl (anterior longer); (20) 0 (reduced to microseta) or 1 prs (sometimes long); (21) 0 (reduced to microseta) or 1 sa (sometimes long), 1 pa (longer than sa); (22) 2 long postsutural dc (anterior dc shorter and situated just behind suture); (23) ac microsetae sparse, in 4 rows on suture, in 2 rows more posteriorly, usually not reaching to level pf posterior dc; (24) 2 sc (apical long, basal short and weak); (25) 1 minute ppl, reduced to upcurved microseta or absent; (26) 2 stpl (posterior always longer) and a few upcurved setulae below them. (27) Scutellum distinctly convex on disc. (28) Legs yellow to yellowish white, sometimes partly brown-darkened, with apical segment of all tarsi distally more or less darkened; (29) f_1 with ctenidial spine well developed and inserted near the longest seta of posteroventral row of setae, more rarely reduced and very small (only in unnamed aberrant species from Juan Fernandez Islands, Chile, see Roháček & Barber, 2009); (30) t_2 with distinct but relatively short ventroapical seta; (31) male f_3 with posteroventral row of shortened and thickened setae (absent only in some terricolous species). (32) Wing normally developed, but usually relatively short, only in terricolous species reduced to ribbon-shaped remnant (cf. Roháček & Barber, 2009); (33) wing membrane unicolourous, at most with slightly brownish-darkened longitudinal band in the middle; (34) C with distinct to strong spinulae on Cs_2, reaching to apex of R_{2+3}; (35) R_{2+3} very long, bent parallel to C but apically slightly upcurved to C; (36) R_{4+5} subparallel to M; (37) cell dm of medium length but narrow, tapered basally, wide distally; cross-vein r-m hardly oblique, situated slightly to distinctly in front of middle of cell dm; (38) CuA_1 almost reaching wing margin, A_1 ending far from it; (39) alula small but distinct, with apex rounded.

Male abdomen: (40) T1 separate from T2; (41) T2–T5 large and broad; (42) preabdominal sterna (S2–S5) narrow, somewhat paler than associated terga, becoming (sequentially) slightly wider posteriorly. Male postabdomen (Figs 7, 8, 10): (43) T6 reduced, bare, shortly transverse, pale-pigmented, medially with pigmentation narrowed or interrupted; (44) S6 and S7 strongly asymmetrical, partly (dorsally) fused and situated ventrally to laterally, each (or only S6) with dark anterior marginal ledge and each with 2 setae; (45) S8 less asymmetrical, situated dorsally, left anterodorsally fused with S7 and more setose.

Male genitalia (Figs 9, 11–19): (46) Epandrium relatively small (Figs 9, 11) compared to pregenital sclerites, always wider than high, with dorsal margin slightly convex to almost straight, with moderately dense setae, 2 or 3 pairs of which longer and thicker than others; (47) anal fissure not large and relatively narrow, subovoid to subtriangular; (48) medandrium ventrally deeply rectangularly incised (Fig. 9) and with projecting dorsolateral corners, without setae; (49) cercus small, also distinctive because somewhat rotated around the longitudinal axis and hence widest anteriorly (Fig. 9, ce), shortly and finely setose. (50) Gonostylus relatively small, distinctly inclined medially (with ventral or ventrolateral side largest), simple and compact, setose internally and densely micropubescent externally; with anteroventral corner more or less projecting and posterodorsal corner attenuated and connected to medandrium. (51) Hypandrium simple, relatively robust, with internal lobes membranous and leaf-like, projecting slightly dorsally or only internally; (52) transandrium simple, transverse; caudal process (secondary medial sclerotization of basal membrane below transandrium) absent (Fig. 13) or weakly sclerotized and forked (Roháček & Barber, 2009: Fig. 8); (53) basal membrane armed with transverse spine-like tubercles, often rather fine but sometimes with small posterolateral lobes in addition (cf. Figs 12–14). (54) Pregonite formed as distinctly separate and setose lobe, only partly (anteriorly) fused to hypandrium (Figs 12, 14). (55) Postgonite also genus-specific, relatively large and complex (Figs 12, 14), composed of dark anterolateral part and flat, ventrally projecting pale posteromedial part having 0–3 setae or setulae on anterior margin; (56) postgonite proximally more or less setose. (57) Phallapodeme with relatively deeply forked but almost symmetrical base and rather simply laterally expanded apex with (more or less) developed lateroventral corners. (58) Aedeagal part of folding apparatus (Fig. 18, afa) strongly sclerotized and dark-pigmented (particularly dorsally), armed by dark tuberculiform excrescences (largest on widest part anteriorly) on external side; (59) connecting sclerite (Fig. 18, cs) also dark-pigmented, long and relatively robust, with simple (unarmed, at most finely granulose) surface. (60) Phallophore of aedeagus short and relatively small, not projecting ventrally but with small anterior sclerite connecting it with base of phallapodeme. (61) Distiphallus large, composed of voluminous membranous saccus and slender sclerotized filum; (62) proximal part of distiphallus distinctly sclerotized both dorsally (base of saccus) and ventrally (base of filum); (63) saccus of distiphallus relatively large (Fig. 18, s), dorsobasally more or less sclerotized and pigmented, near the middle with ventrolateral dark-pigmented sclerite; membranous part of saccus dilated, laterally finely pubescent or granulated, distally at most with rounded hyaline tubercles; (64) filum rather compact, long and well sclerotized (Fig. 18, f), but in about distal third or fourth distinctly bifid (Fig. 19), thus with long (but shorter than main branch) slender curved projection having acute to variously armed apex; main branch of filum bare or spinulose and with dilated flattened terminal end whose apex is variously denticulate. (65) Ejacapodeme relatively large, with digitiform projection distally variously dilated (Fig. 18, ea).

Female. (66) Female abdomen with broader terga and narrower sterna than in male. (67) Postabdomen (Figs 28–30) broad and short, somewhat retractable from 7th segment, with 8th segment most extensible. (68) T6 and S6 unmodified, T6 large, more or less tapered posteriorly. (69) T7 and S7 separate, not fused although often with sides



Figs 7–11. *Mumetopia occipitalis* Melander, end of male abdomen and terminalia (Canada: Ontario): 7 – 5th abdominal segment and postabdomen (genitalia omitted), dorsal; 8 – ditto, ventral; 9 – external genitalia, caudal (left gonostylus with inner setosity depicted); 10 – 5th abdominal segment and postabdomen (genitalia omitted), left lateral; 11 – entire genitalia, left lateral. Scales: 0.1 mm. For abbreviations see Material and methods.

anterolaterally appressed to attached; pleural membrane between them reduced, narrow (Fig. 30). (70) T7 dorsomedially normal, or narrowly unpigmented (Fig. 28) to distinctly divided, extended ventrolaterally, often with 7th spiracle embedded (see Fig. 30). (71) S7 relatively large and broad, simple (Fig. 30). (72) T8 flat, subtriangular, with anterior corner projecting (Fig. 28) to acute, dark-pigmented, and often with enlarged micropubescence but sparsely setose; (73) S8 short (shorter than T8), transverse, medially partly (Fig. 30) to completely divided, and posterodorsally somewhat bent internally. (74) Internal sclerotization (Figs 32, 35) of female genital chamber (uterus) well developed, formed by a pair of flat, relatively long and variously crooked to modified posterior sclerites and (75) 1 anterior to anteromedial, very slender, transversely compressed and more or less dorsolaterally bent, looped annular sclerite (Fig. 35). (76) Anterior part of uterus provided with a small, short-cylindrical (apically rounded) and weakly sclerotized ventral receptacle (Figs 32, 34) on relatively short membranous tube. (77) Remnants of accessory glands (Fig. 33) small, formed by a tuft of minute projections with globulate apices, on partly ringed, subterminally slightly to hardly dilated ducts. (78) Spermathecae (1+1) very shortly pyriform (Fig. 31), dark-pigmented, without distinct duct cervix, but with dense robust dark spines (carrying stalked globuli on apex) on most of surface. (79) T10 small, short and transverse, with 1 pair of posteromedial setae; (80) S10 distinctly larger than T10, roughly pentagonal but with emarginate anterior margin and more or less acute posteromedial corner (Fig. 30). (81) Cercus small, short and with rich but relatively short setae and fine micropubescence.

Species included. *Mumetopia occipitalis* Melander, 1913 (widespread in North America), *M. messor* Roháček & Barber, 2009 (Ecuador), *M. taeniata* Roháček & Barber, 2009 (Colombia) and *M. interfeles* Roháček in Roháček & Tóthová, 2021 (Chile).

Systematic discussion. The generic concept of *Mumetopia* is here restricted following the proposal by Roháček & Tóthová (2021) to include only the monophyletic assemblage formed by the four named species of *Mumetopia* listed above and their undescribed Neotropical allies (see Roháček & Barber, 2009, i.e., including those in their ‘genus M’ and ‘genus B’) and the genus is diagnosed accordingly. The monophyly of the genus (as delimited above) is supported by the following synapomorphies (numbering of characters as above, those unique marked U): (3) frontal triangle well delimited and large; (7) occiput with solid silvery-white microtomentose supracervical patch; (23) ac microsetae sparse, at most in 4 rows on suture; (48) medandrium ventrally deeply incised and with dorsolateral corners projecting; (49) male cercus small and rotated (U); (55) postgonite complex, composed of anterolateral (proximal) and posteromedial (distal) part (U); (56) postgonite with proximal part setose (U); (58) aedeagal part of folding apparatus dorsally (= proximally) strongly sclerotized; (64) filum compact but bifid in about distal third or fourth (U). Note: the filum with a slender and sometimes long projection evolved independently in the Afrotropical genus *Barbarista* Roháček, 1993 but in that group the projection is situated more proximally, in the basal half of the filum (cf. Roháček, 1993: Figs 4, 29). The female postabdominal apomorphic structures, viz. 70, 72–76, 78, are important because they demonstrate the affiliation of *Mumetopia* with the *Chamaebosca* group of genera. According to Roháček & Barber (2009), *Chamaebosca* Speiser, 1903 is considered a sister group of *Mumetopia*, as demonstrated by one distinct synapomorphy: (48) medandrium ventrally deeply incised. *Chamaebosca* is a very poorly known taxon; the only relevant morphological data are those obtained by revision of the only available specimen, the male holotype of *C. microptera* Speiser, 1903, type species of the genus (Roháček, 1998). Consequently, the female characters of *Chamaebosca* remain unknown and cannot be currently used for analysis of the relationship of these groups.

Two representatives of the genus *Mumetopia* (as delimited above) were included in the most recent molecular hypothesis of relationships of Anthomyzidae (Roháček & Tóthová, 2021: Figs 32, 33). Also, this analysis clearly confirmed the affiliation of *Mumetopia* with the *Chamaebosca* group of genera, here as sister group of the lineage *Stiphrosoma* + ‘*Mumetopia nigrimana*’ group because no specimen of *Chamaebosca* was available for molecular study. The whole *Chamaebosca* group of genera is recognized as the sister group of the genus *Carexomyza* as first shown by Barber & Roháček (2020). However, this alliance probably also includes two aberrant but very poorly known Afrotropical genera, viz. the apterous ant-mimicking *Apterosepsis* Richards, 1962 (see Roháček, 1998) and *Scelomyza* Séguy, 1938 (see Roháček, 2014), but these differ from all other above genera in having the female T7 and S7 (probably secondarily) fused to form a ring-shaped sclerite, the female T8 simple (not tapered anteriorly) and the female S8 medially completely longitudinally divided. However, the relationships of these genera to the *Chamaebosca* group of genera need further study because males (and hence also structures of the male terminalia) remain unknown in species of both *Apterosepsis* and *Scelomyza*.

Distribution. The genus is widespread in the Neotropical Region with only one species, *M. occipitalis*, occurring in the Nearctic Region.

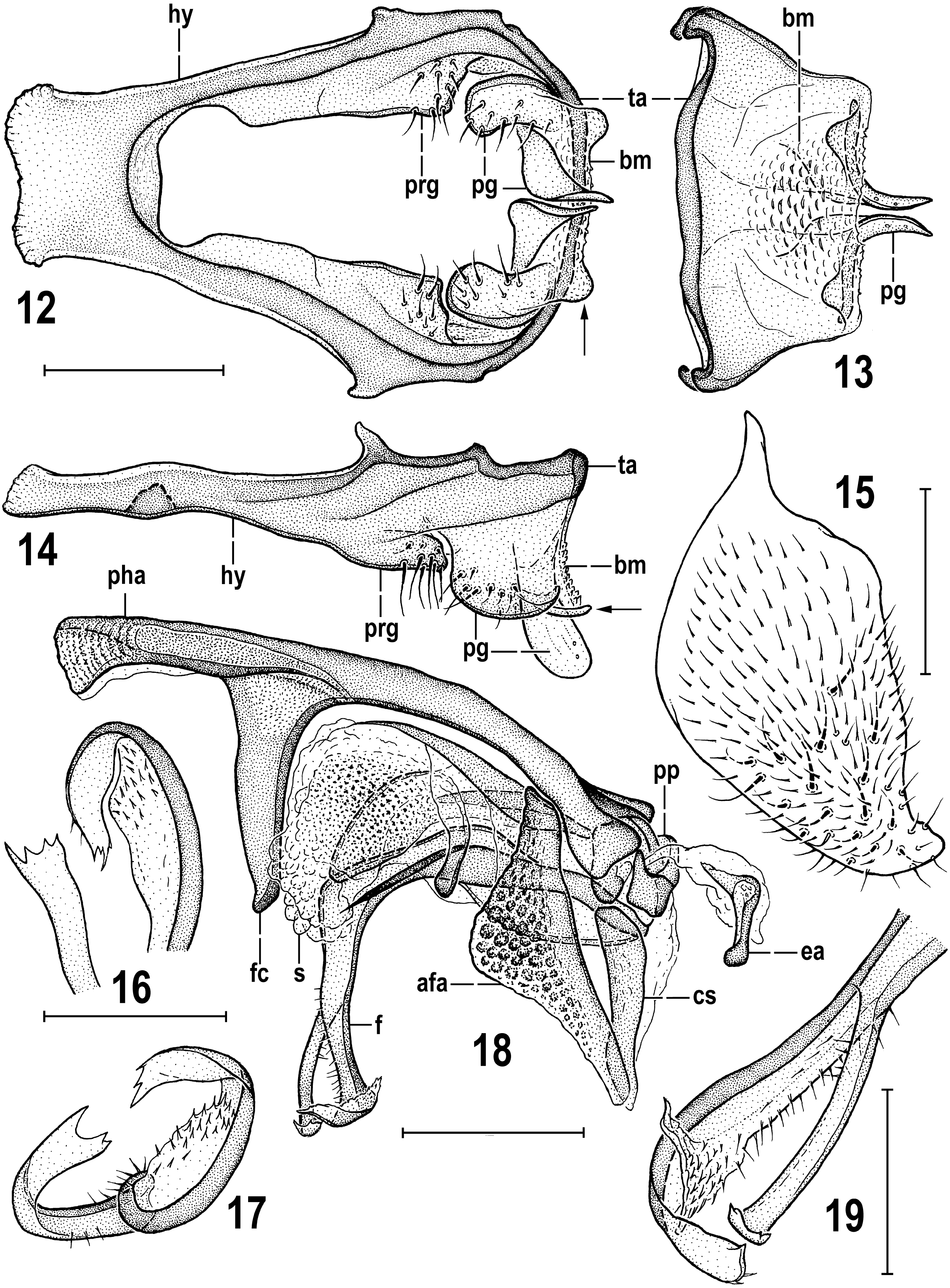
***Mumetopia occipitalis* Melander, 1913**

(Figs 1–42)

Mumetopia occipitalis Melander, 1913: 294 (description); Sturtevant, 1926: Plate II, Fig. 19 (internal female structures, illustr.); Curran, 1934, 1965: 330 (head, illustr.); Sabrosky, 1965: 820 (catalogue, distribution); Vockeroth, 1987: 888–889 (head, male and female postabdomen & terminalia, illustr.); Roháček, 1998: 174 (checklist); Barber & Roháček, 2010: 1075 (head, illustr.); Roháček et al., 2019: 753, 755 (molecular phylogenetic relationships in trees); Barber & Roháček, 2020: 107 (molecular phylogenetic relationships); Roháček & Tóthová, 2021: 152–155 (phylogenetic relationships).

Description

Male. Total body length 1.51–2.18 mm; body distinctly bicolourous (Figs 1–3), ventrally largely yellow to ochre-



Figs 12–19. *Mumetopia occipitalis* Melander, male internal genitalia: 12 – hypandrial complex, ventral; 13 – transandrium, caudal; 14 – hypandrial complex, left lateral; 15 – left gonostylus, ventrocaudal (widest extension); 16 – apices of both branches of filum, subventral; 17 – ditto, ventral; 18 – aedeagal complex, left lateral; 19 – distal half of filum, lateroventral. Based on specimens from U.S.A.: Maryland (Figs 12–14, 16) and Canada: Ontario (others). Scales: Figs 12–14, 18 = 0.1 mm, others = 0.05 mm. For abbreviations see Material and methods. Arrows point to lobe-shaped projections on basal membrane.

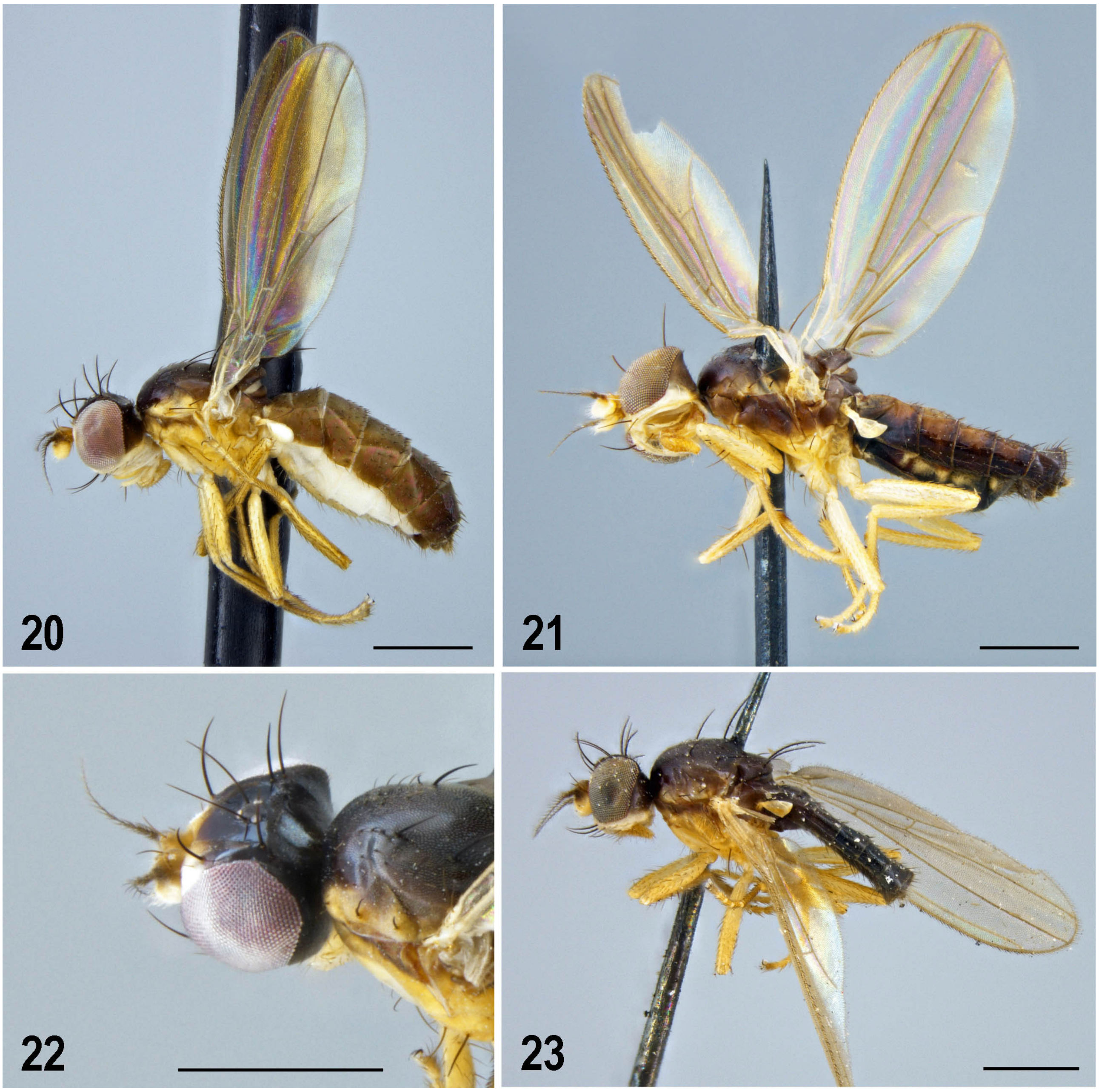
ous, dorsally blackish brown, sparsely greyish microtomentose and relatively shining, particularly so on mesonotum and dorsal side of abdomen.

Head (Figs 1, 4, 22) slightly higher than long, bicolourous, yellow and blackish brown. Frons largely blackish brown to black with only anterior fourth yellow to orange. Frontal triangle very large, well delimited (Fig. 4), reaching almost to frontal lunule, with anterior corner rounded on apex, blackish brown to (posteriorly) black, glabrous and strongly shining, only ocellar triangle sparsely light-grey microtomentose; ocellar triangle slightly elevated; ocelli rather small and oc inserted somewhat outside margin of ocellar triangle. Frontal lunule very small, narrow and depressed, yellow as adjacent anterior margin of frons. Orbital plate distinctly developed but not broad, anteriorly pale yellow and densely silvery-white microtomentose up to anterior ors setula or even to ors macroseta; more posteriorly (between ors and vte) it is somewhat narrowed, brown to dark brown and shining. Area between frontal triangle and orbital plate narrow, attenuated posteriorly, reaching up to vte and sparsely pale-grey microtomentose. Occiput concave, blackish brown to black, largely sparsely grey microtomentose and rather shining, but medially (between pvt and foramen) with dense patch of glittering silvery-white microtomentum (cf. Figs 22, 42). Face very narrow and more or less depressed, dirty pale yellow and bordered on sides by very fine darker yellow stripe. Parafacialia and entire gena pale yellow and densely silvery-white microtomentose except for dark yellow ventral margin of gena; postgena ventrally darker yellow, sparsely microtomentose and sharply separated from blackish brown dorsal part of postgena and posteroventral part of occiput. Mouthparts dark yellow to orange-ochreous (labellum); palpus yellowish white. Cephalic chaetotaxy (Figs 1, 4, 22): all macrosetae relatively strong but pvt very small and weak, strongly convergent, with apices almost meeting medially; vte, vti, oc and ors usually subequal, long (longest of cephalic setae) and relatively robust or either vti or vte slightly longer and/or ors (or only one of the pair) slightly shorter; oc long, proclinate and subparallel or slightly divergent; only 1 strong ors and 1 microsetula in front of it; 0–2 pairs of minute microsetulae at margin of anterior corner of frontal triangle; vi long but shorter than ors; subvibrissa distinct, half to two-thirds of vi length but markedly weaker; about 4 short peristomal setulae, paler than subvibrissa; postgena with a few small setulae and 1 or 2 short pale setae in posteroventral corner; postocular microsetulae minute, sparse (about 5), in single short row in dorsal half of occiput; 1 inclinate microseta behind bases of vte and vti also present. Eye almost without pilosity, broadly ellipsoid to suboval (Figs 1–3); its longest (oblique) diameter about 1.3–1.4 times as long as shortest; gena short (low), its shortest height 0.10–0.12 times as long as shortest eye diameter. Palpus very slender, with 2 or 3 ventral setulae in addition to dark, relatively long (as long as subvibrissa) and anteroventrally directed preapical seta. Antennae closely inserted, each strongly geniculate (Figs 1, 4); scape (very small) and pedicel orange-ochreous to pale brown; 1st flagellomere whitish yellow but dorsally, around base of arista, distinctly darkened (brown to dark brown); 1st flagellomere strongly laterally compressed, and its anteroventral margin with long white cilia being almost as long as longest cilia of arista. Arista about 2.0–2.1 times as long as antenna, dark brown with black thickened basal segment; relatively long dark ciliate (almost pectinate in proximal third) and with denser but shorter cilia in basal fifth (including basal segment of arista, cf. Fig. 22).

Thorax narrower than head. Mesonotum largely blackish brown but laterally becoming brown; humeral callus (= postpronotum) and notopleural area normally yellow to pale ochreous (Fig. 1), but extent of yellow can be reduced or darkened in some specimens leaving notopleural area darker, ochreous to brown. Mesonotum with sparse greyish microtomentum and distinctly shining; notopleural area with whitish-grey microtomentum. Pleural part of thorax bicolourous, largely yellow, but dorsally with (usually) narrow brown longitudinal stripe running from cervix to base of abdomen (Fig. 1); stripe can sometimes be widened to cover larger part of dorsal pleural sclerites (Fig. 2); pleuron with microtomentum also sparse and hence relatively shining. Thoracic chaetotaxy: 1 short hu (weaker and as long as or shorter than posterior npl) and 0 or 1 microseta on humeral callus; 2 npl, anterior long, twice longer than posterior npl; 1 very small prs (shorter, weaker and paler than hu); 0 sa (reduced to microseta); 1 distinct pa (as long as or shorter than anterior npl); 2 strong and very long postsutural dc; anterior dc situated very anteriorly, just behind suture and about two-thirds of posterior dc; posterior dc and apical sc longest of thoracic setae; usually only 2 or 3 dc microsetae in front of anterior dc and none behind it; ac microsetae very reduced in number, usually in only 2 medial pairs in front of suture and none behind anterior dc; 2 sc, basal short (about as long as posterior npl), apical sc very long (as long as posterior dc); ppl reduced to minute microseta or absent; 2 stpl, both relatively long although posterior longer and thicker; 1 or 0 microseta in front of anterior stpl and 2 or 3 below them; also 2 or 3 longer pale setae in ventral corner of sternopleuron. Scutellum wider than long, rounded triangular, with strongly convex disc; subscutellum well developed, bulging (Fig. 1).

Legs yellow to light yellow, with coxae (cx_1 in particular) paler; only terminal segment of all tarsi more or less pale brown-darkened in distal half. f_1 with ctenidial spine distinct but not robust, usually as long as or slightly longer than maximum width of t_1 and inserted near one of long posteroventral setae (cf. Fig. 36); fore basitarsus with 2 or 3 longer but fine setulae ventrobasally (Fig. 38). t_2 with short but distinct ventroapical seta (Fig. 39). f_3 with 4 or 5 (rarely only 3) somewhat thickened and shortened setae in distal third of posteroventral row (Fig. 37); hind basitarsus with 2 or 3 longer and thicker ventrobasal setulae. Ratio $t_2 : mt_2$ = 1.82–1.95.

Wing (Fig. 5) relatively long, slightly longer than body length (of air-dried specimens). Wing membrane normally hyaline but with very pale brownish tinge (but see Variability below for Bermuda specimens, Fig. 6), veins pale



Figs 20–23. *Mumetopia occipitalis* Melander, female and male habitus: 20 – female, left lateral (Canada: Ontario); 21 – ditto (Bermuda); 22 – male head and thorax, posterodorsolateral (Canada: Ontario); 23 – female paralectotype, left lateral (U.S.A.: Louisiana: Opelousas). Scales: 0.5 mm. Photo: K.N. Barber.

ochreous, at most C slightly darker. C reaching to apex of R_{4+5}, in sector Cs_2 (between apices of R_1 and R_{2+3}) with sparse but distinct spinulae among usual setulae. R_1 robust and short, with preapical kink (on apex of fusion of Sc and R_1) well developed. R_{2+3} long, bent subparallel with C, only distally slightly upcurved to it, thus somewhat sinuate. R_{4+5} very slightly bent (recurved) and ending close to apex of wing. M straight or very slightly bent, parallel to R_{4+5} and ending rather far from wing apex. Cell dm narrow, reaching about half of wing length. Cross-vein r-m situated slightly to distinctly in front of middle of cell dm. Cross-vein dm-cu distinctly shorter that terminal part of CuA_1. Basal (bm) and posterior cubital (cup) cells narrow. CuA_1 almost reaching to wing margin, A_1 short and ending far from it. Anal lobe and alula well developed, the latter not much narrowed and with apex rounded. Wing measurements: length 1.56–2.18 mm, maximum width 0.53–0.71 mm; $Cs_3 : Cs_4 = 1.19–1.42$; r-m\dm-cu : dm-cu = 2.66–3.90. Haltere with dark yellow to orange-ochreous stem and yellowish-white to almost white knob (Fig. 1).

Abdomen elongate, in dorsal view slightly narrower than thorax. Preabdominal terga uniformly brown to blackish brown, relatively large and broad, bent far onto lateral to ventrolateral sides of abdomen (Fig. 1), with short and relatively thick but sparse setae. T1 and T2 usually somewhat lighter than T3–T5. All T1–T5 sparsely grey microtomentose and relatively shining. T1 as long as but slightly narrower and distinctly separate from T2 both dorsally and laterally, with only fine setulae on disc. T1 and T2 together distinctly longer than T3; T3–T5 subequal in length or T5 slightly longer (then longest abdominal tergum), the latter anteriorly as wide as T4 but posteriorly narrowed (Fig. 7). Preabdominal sterna S2–S5 pale brown to brown (thus lighter than adjacent terga), relatively small and narrow, becoming somewhat (sequentially) wider posteriorly (S5 widest); S1 short, transverse and bare, pale ochreous except for darker brown stripe along posterior margin; S2 slightly wider than long and posteriorly slightly wider than anteriorly, uniformly brown as are S3–S5; S3 and S4 subequal, somewhat longer than broad; S5 widest, slightly shorter than S4, about as long as broad (Fig. 8) and more or less trapezoidal (posteriorly wider). S2–S5 finely setose. Abdominal spiracles 2–5 small and hidden in membrane under lateral margins of T2–T5.

Postabdomen. T6 bare, short, transverse, somewhat asymmetrical (tapered on left side, widened on right side), pale brown, having pigmentation medially shortened (but not interrupted, Fig. 7). S6–S8 strongly asymmetrical, dark brown, partly (left dorsolaterally) coalesced; S6 (Figs 8, 10) short and transverse, with strongly sclerotized and blackish-brown anterior marginal ledge, otherwise pale ochreous to pale brown; S7 slightly longer (Figs 8, 10) and dark brown but also anteriorly narrowly dark-margined; S6 with 2 setae, S7 with 1 seta; an enlarged 6th spiracle situated between dark marginal ledges of S6 and S7 left dorsolaterally (Fig. 10); S8 larger and longer than S7, situated dorsally but less asymmetrical (Figs 7, 10), with more (10–15) setae, situated mainly posteriorly.

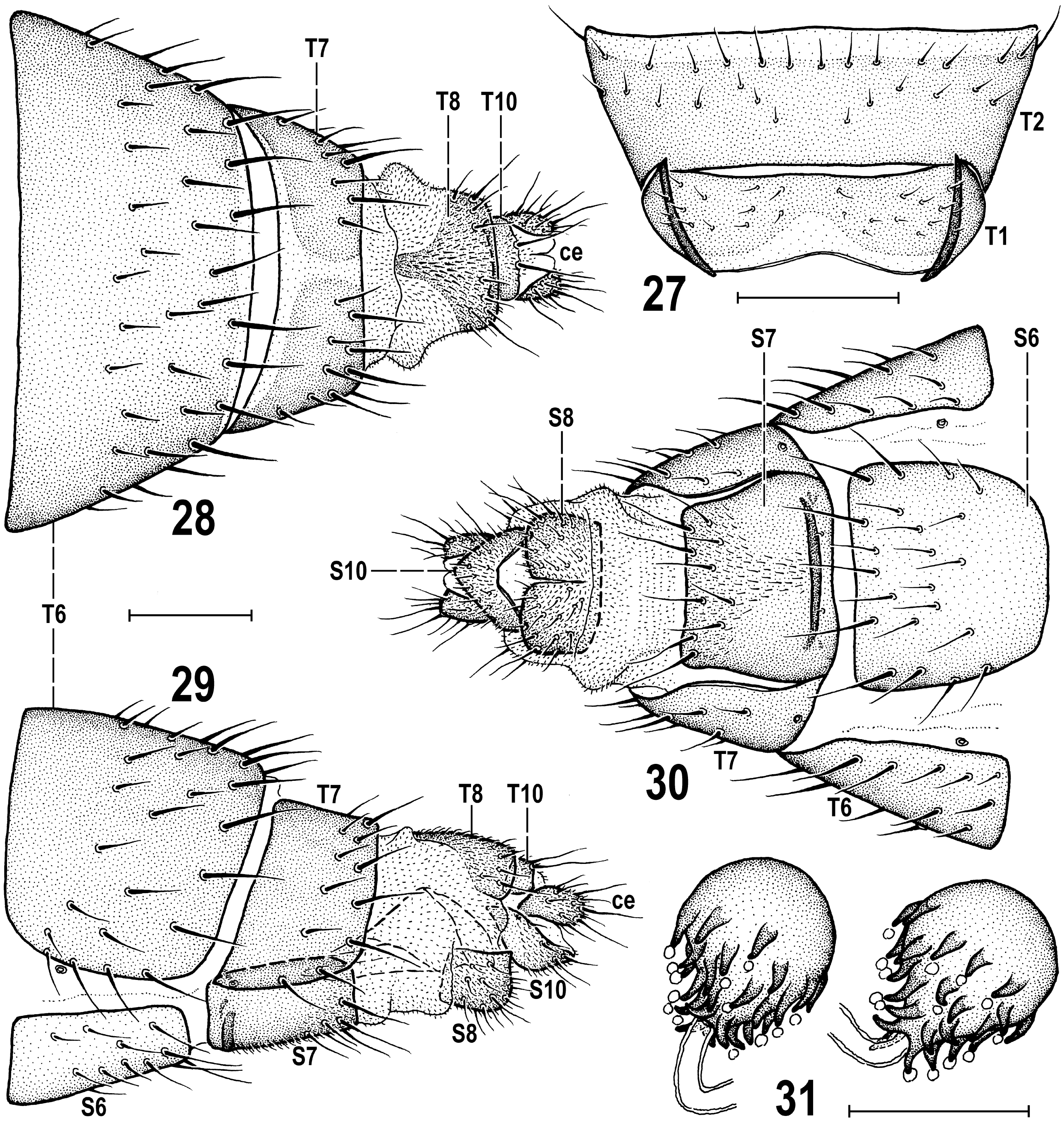
Genitalia. Epandrium (Figs 9, 11) relatively small compared to internal genitalia, wider than high, sparsely setose, with 2 or 3 dorsolateral setae more robust and longer than others; dorsal margin of epandrium slightly convex; anal fissure (Fig. 9) not large and relatively narrow, subovoid, open ventrally. Cercus (Figs 9, 11, ce) small, wider anteriorly (internally) than posteriorly or laterally due to rotation, with posterior side shortly and finely setose. Medandrium (Fig. 9, ma) with deep subrectangular ventromedial incision and with dorsolateral corners distinctly projecting laterally. Gonostylus (Figs 9, 11, 15) relatively short, with anteroventral apex bent internally (medially), somewhat projecting and terminally rounded (widest extension view, Fig. 15), micropubescence covering most of outer side except for anterior marginal area; setae on inner side longer but fine and rather numerous (cf. Figs 9, 11). Internal genitalia comparatively large. Hypandrium (Figs 12, 14) relatively robust, very slightly sinuately bent in lateral view and widened in posterior half; internal hypandrial lobes (not illustrated) membranous and bent internally, inconspicuous. Transandrium relatively broad but slender (Figs 12–14, ta), without distinct caudal process; basal membrane (Figs 12–14, bm) with inconspicuous pale transverse tubercles being largest medially (Fig. 13) and with a pair of flat lobe-shaped, ventrolateral pale projections (see Figs 12, 14, arrows). Pregonite (Figs 12, 14, prg) developed as partly separate lobe, posteroventrally somewhat projecting and carrying 8–11 (half of them internal and shorter) setae. Postgonite (Figs 12–14, pg) relatively large and complex; its darker anterolateral part lower, rounded ventrally and with 8–10 short setae on inner side ventrally; its posteromedial part pale, bent medially (cf. Fig. 13) and projecting ventrally as a flattened, apically broadly rounded and bare (only a few sensilla can be seen) lobe (Fig. 14). Aedeagal complex (Fig. 18): phallapodeme relatively strong, with proximal end deeply forked and rather symmetrical; its distal end simple, with simply triangularly widened apex having ventrolateral corners more or less projecting and rounded (less developed in small specimens); fulcrum slender (Fig. 18, fc). Aedeagal part of folding apparatus (Fig. 18, afa) strongly sclerotized and dark-pigmented (particularly dorsally), armed with dark tuberculiform excrescences (largest on widest part anteriorly) on external side; connecting sclerite (Fig. 18, cs) also pigmented, long and relatively robust, with simple surface. Phallophore short, compact, not projecting posteroventrally (Fig. 18, pp) and with anterior sclerite connecting it with base of phallapodeme (inside of basal fork). Basal part of distiphallus distinctly sclerotized both dorsally (base of saccus) and ventrally (base of filum). Saccus of distiphallus relatively large (Fig. 18, s), dorsobasally more or less sclerotized and pigmented and with dark-pigmented ventrolateral transverse sclerite in the middle; membranous part of saccus dilated distally, being finely granulated laterally and distally provided with rounded hyaline tubercles. Filum of distiphallus (Fig. 18, f) relatively compact, long, slender and sclerotized, beginning just below phallophore (where widened and formed, besides main sclerite, also by slender ventral strip-like sclerite), then bent ventrally but in about distal third bifid, with long and slender (only slightly shorter than main branch) arch-shaped projection being apically flattened, widened and dentate; this tooth-like armature quite variable (cf. Figs 16, 17), with 2 to 5 (most frequently 3) teeth, largest of which can bear minute denticles. Distal main branch of filum finely spinose along margin of paler part (Fig. 19), subterminally dilated and more densely but shortly spinulose (cf. Figs 16, 17, 19) and apically flattened, pale, and rather variably armed with some small teeth and/or spinulae (Figs 16, 17). Ejacapodeme well developed, with digitiform projection having knob-like apex (Fig. 18, ea).

Female (Figs 20, 21, 23). Similar to male unless mentioned otherwise. Total body length 1.59–2.58 mm. Antenna with 1st flagellomere sometimes darker yellow but dorsally similarly darkened as in male. Also frons anteriorly and face medially often slightly darker. Orbital plate with 2 (rarely 3) microsetulae in front of ors. 3–5 dc microsetae in front of anterior dc. Pleuron with dorsal longitudinal brown stripe sometimes reduced (narrowed) or faded, but always discernible. Sternopleuron sometimes with anterior stpl markedly shorter and weaker than posterior and with more microsetae. Ventroapical seta on t_2 somewhat longer (Fig. 40); f_3 without short thickened setae in posteroventral row, uniformly setulose. Ratio $t_2 : mt_2$ = 1.88–2.00. Wing measurements: length 1.70–2.38 mm, width 0.55–0.77 mm; $Cs_3 : Cs_4$ = 1.09–1.56; r-m\dm-cu : dm-cu = 2.62–3.67.

Figs 24–26. *Mumetopia occipitalis* Melander, female, variability of dorsal colouration of abdomen (Canada: Ontario): 24 – female from Ontario: Lake Superior Provincial Park; 25 – ditto from Ontario: Prairie River; 26 – ditto from Ontario: Burlington. Scales: 0.5 mm. Photo: K.N. Barber.

Abdomen wider (Figs 24–26) in dorsal view, and, consequently, all preabdominal terga (T1–T5) somewhat wider and more transverse than in male. T1–T5 variable in pigmentation: uniformly dark brown (Fig. 24), or T3–T5 dark only laterally and medially (Fig. 25) or (rarely) T2–T5 largely ochreous (Fig. 26). T1 and T2 separate (Fig. 27) as in male but T1 usually shorter than T2. T2 slightly narrower and shorter than T3; T3–T5 subequal in length; T3 and T4 widest, T5 somewhat narrower than T4 and more or less tapered posteriorly. Preabdominal sterna narrower and lighter than in male, pale ochreous. S1 similar to that of male but much paler including posterior dark stripe. S2–S5 becoming only slightly wider posteriorly, subequal in length or S3 longer. Setosity of preabdominal terga and sterna similar to that of male.

Postabdomen (Figs 28–30). T6 large, transversely trapezoidal (tapered posteriorly) and reaching far ventrolaterally, uniformly dark brown except for narrow posterior marginal stripe (see Fig. 28), with short but rather strong setae in posterior two-thirds. 6th spiracle situated close to ventral margin of T6. S6 wider than S5, but relatively narrow, about as long as broad, with anterior corners rounded, brown but paler than T6 or S7, with rather sparse setae (longest at posterior margin and posterolateral corners) in posterior two-thirds. T7 and S7 largely separate (Figs 29, 30) but anteriorly with corners closely approximated to attached. T7 uniformly dark brown as is T6, or (less often) anteriorly and dorsomedially narrowly pale-pigmented (thus seemingly divided, see Fig. 28) and its lateral part on each side reaching far ventrally, having 7th spiracle embedded in anteroventral corner (see Fig. 30) and having short thick setae in posterior half. S7 relatively large and long (Fig. 30), almost as wide as S6 but shorter, blackish brown, slightly tapered posteriorly and with almost straight posterior margin, distinguished by black transverse slightly elevated ledge at anterior margin, a distinctive pattern of enlarged micropubescence and fine long setae in posterior third. Pleural membrane between margins of T7 and S7 very reduced. T8 dark brown, subtriangular, but with anterior corner narrowly projecting (Fig. 28), entirely micropubescent (micropubescence enlarged medially in anterior half) and with a few fine setae posterolaterally. S8 short, medially very narrowly divided (Fig. 30) almost to anterior margin, and posterodorsally somewhat bent internally, all finely setose and micropubescent (see also Fig. 32). Internal structures of genital chamber (Figs 32, 35) distinct and well sclerotized, brown to pale brown, formed by a pair of complex posterior sclerites (= a fusion of 2 pairs of sclerites) and by 1 (slightly more anteromedial) very slender (poorly visible because pale-pigmented), transversely compressed and slightly dorsolaterally bent and looped annular sclerite. Ventral receptacle (Figs 32, 34, vr) small, shortly subcylindrical, rather weakly sclerotized and pale-pigmented, set on short and bent, proximally tapered membranous duct. Remnant of accessory gland small (Fig. 33, ag), formed by a tuft of minute stalked globuli on apex of subterminally dilated duct being otherwise very slender and somewhat ringed. Spermathecae (1+1) very shortly pyriform (Fig. 31), blackish brown, without distinct duct cervix, but with dense robust dark spines carrying stalked globuli on most of surface. T10 (Fig. 28) small, short and transverse, pale-pigmented, with 2 long, rather closely arising, posteromedial setae and very sparse fine micropubescence (only medially). S10 much larger than T10, roughly pentagonal but with deeply emarginate anterior margin, acute posteromedial corner (Fig. 30) and micropubescent except for anterior margin (cf. Fig. 32). Cerci short but rather robust (Figs 28, 29, 30, 32, ce), with rich setae



Figs 27–31. *Mumetopia occipitalis* Melander, female abdomen (Canada: Ontario): 27 – base of abdomen (T1 and T2), dorsal; 28 – postabdomen, dorsal; 29 – ditto, left lateral; 30 – ditto, ventral; 31 – spermathecae, in widest extension. Scales: Fig. 27 = 0.2 mm, Fig. 31 = 0.05 mm, others = 0.1 mm. For abbreviations see Material and methods.

(longest apical, dorsopreapical, ventropreapical and lateral setae subequal in length) and very fine micropubescence.

Variability. Information on the (normal) variability of continental specimens has been included in the description above. However, an unexpected variability in external colouration of wing and body has been found in specimens from the Bermuda archipelago (U.K.). They differ from typical specimens mainly in having a markedly extended dorsal brown band on the pleuron (see Figs 2, 21) and, particularly, by wing pattern. Their wing (Figs 2, 6, 21) is distinguished by longitudinal darkening in the middle, contrasting with the milky whitish colouration of the anterior margin of the wing along C. While the darkening of the dorsal part of the pleuron seems to be variable in Bermuda specimens (we have also examined a few having it narrow as in specimens from the continent), the above wing pattern is present in all studied specimens. However, no distinct differences have been found in structures of the male genitalia (including the aedeagal complex) and the female terminalia, and therefore, the specimens from Bermuda are treated as conspecific with *M. occipitalis* for the time being. Molecular comparison is necessary to test whether the Bermuda population represents a separate species, albeit with identical terminalia.

Type material. Lectotype ♂ (here designated) labelled: "Opelousas, | March, '97. La", "PARATYPE | Mumetopia | occipitalis | Mel" (red label, "PARATYPE" printed, remainder handwritten), "ALMelander | Collection | 1961" (white label, printed) and "Lectotypus ♂ | *Mumetopia* | *occipitalis* | Melander | J. Roháček & | K.N. Barber des. 2023" (red label, printed). The specimen is intact, mounted on a minuten, in good condition but with dust and deposit most evident on setae, arista and mouthparts (see Fig. 3), deposited in USNM. Paralectotypes: UNITED STATES OF AMERICA: Lousiana: 1♀, intact (Fig. 23), with same locality label as for lectotype but with "TYPE Mumetopia occipitalis Mel." (red label, "TYPE" printed, remainder handwritten) and "Mumetopia | occipitalis | TYP. Mel." (handwritten on white label); 1♀, intact, with same labels as lectotype except for the red Lectotypus label. Further paralectotypes: UNITED STATES OF AMERICA: Texas: 1♂, intact, with "Austin Tex. | 11.7.99"; 1♀, intact but with head missing, with "Austin | Tex | II.12.00"; 1♂ (genit. prep.), with "Apl" [April?] and "Tex"; 1♀, intact, with "Tex. | 2.12.0"; all these specimens with "PARATYPE | Mumetopia | occipitalis | Mel." (red label). All paralectotypes also with "ALMelander | Collection | 1961" (white label, printed) and "Paralectotypus ♂ [or ♀] | *Mumetopia* | *occipitalis* | Melander | J. Roháček & | K.N. Barber des. 2023" (yellow label, printed) and deposited in USNM. Almost all type specimens are in good to excellent condition.

Notes. The entire available type series from Melander's collection (USNM) has been examined. Because no type or holotype was designated in the original description (Melander, 1913: 294), all 7 specimens had to be considered syntypes irrespective of the fact that they are (probably subsequently) labelled as TYPE or PARATYPE. Therefore, the best preserved intact male (Fig. 3) from Opelousas was selected for lectotype designation which was necessary to avoid confusion with very similar unnamed species in Central and South America. According to Melander (1913: 294), specimens from Opelousas (now type locality by lectotype designation) were received from Dr. Hough who probably also collected them, while those from Texas could have been collected by A.L. Melander himself.

Other material examined. 1074♂ 1072♀ (see Appendix at the end of this paper for details).

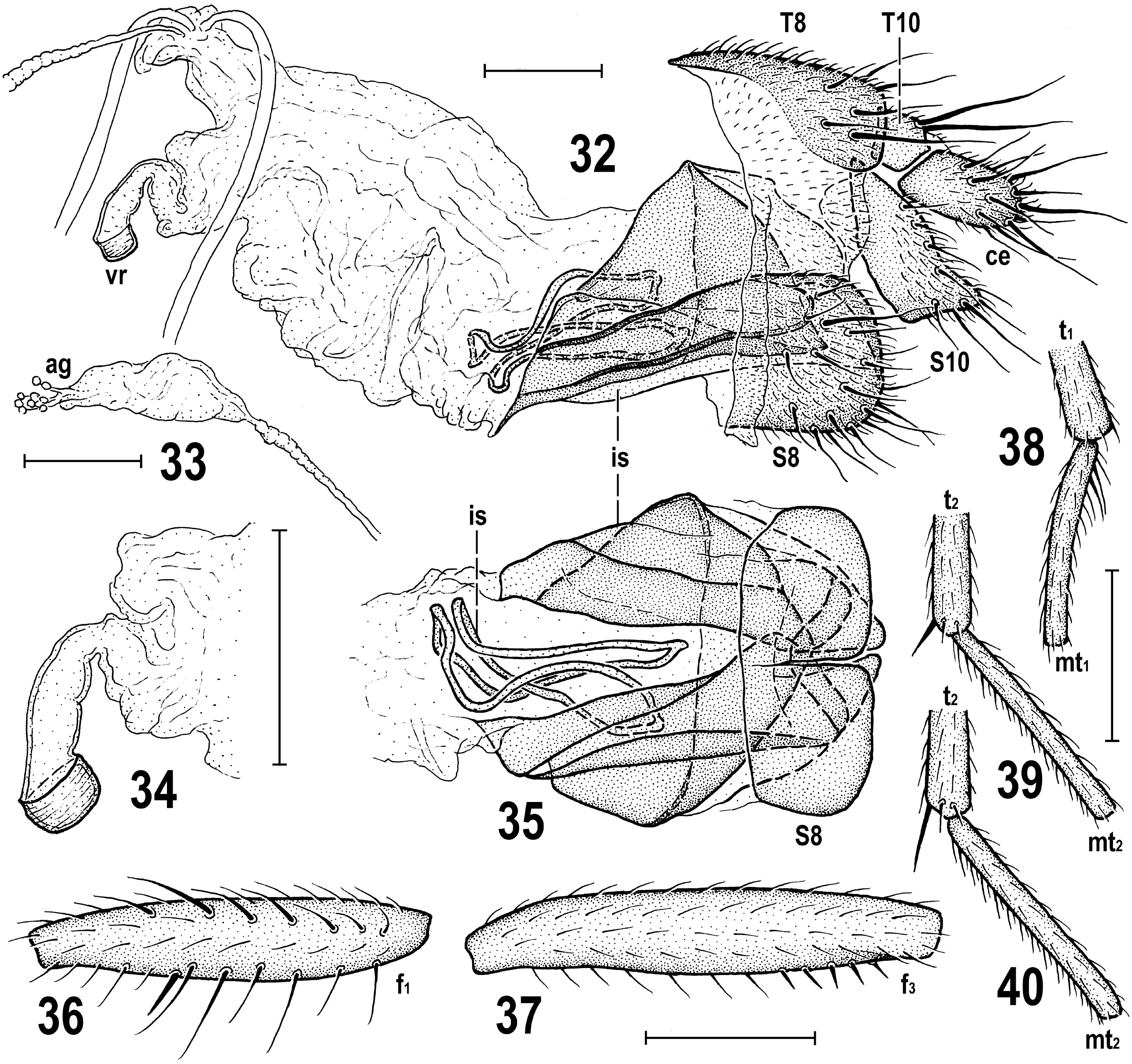
Systematic discussion. *Mumetopia occipitalis* has no close relative in the whole of the Nearctic Region. It can be easily distinguished from all other North American Anthomyzidae by external and colour characters, particularly, by the bicoloured (dorsally blackish brown and ventrally yellow) head and thorax (Fig. 1), the very large, glabrous and blackish brown frontal triangle (Fig. 4) and the occiput with a single medial patch of silvery-white glittering microtomentum (Fig. 22). Other named species of the genus differ from *M. occipitalis* as follows: the high-montane Andean terricolous species *M. messor* and *M. taeniata* by the wings and halteres strongly reduced and the wings markedly narrowed (see Roháček & Barber, 2009), the entirely blackish brown head and thorax, and the absence of the silvery-white spot on the occiput; the otherwise similarly coloured Chilean *M. interfeles* has the frontal triangle shorter, anteriorly acute-angled and sparsely microtomentose, the anterior ors strong, the arista very shortly ciliate, and the female preabdominal terga dorsomedially broadly yellow, not to mention distinct differences in the male and female terminalia (see Roháček & Tóthová, 2021). However, there are several unnamed Neotropical species externally very similar to *M. occipitalis* but differing in formation of the male terminalia (gonostylus, filum of distiphallus, armature of saccus) and the female postabdomen (T7, S7, internal sclerites, spermathecae). To avoid misidentification of these species as *M. occipitalis*, the structures of the male genitalia, female postabdomen and the female internal genitalia are described and illustrated in detail above.

Distribution. *Mumetopia occipitalis* is widespread throughout the Nearctic Region. Previously published reports include the following jurisdictions: Canada: Ontario (Marshall et al., 2001, Telfer et al., 2015), Québec (Grégoire-Taillefer, 2016); U.S.A.: Alabama (Sturtevant, 1918), Indiana (Cleveland & Hamilton, 1958), Massachusetts (Johnson, 1925), Missouri (Dowdy, 1950), New York (Wheeler, 1973), North Carolina (Wray, 1967), Ohio (Foote, 2004), Oklahoma (Stoner et al., 1962), Tennessee (Vlach et al., 2010), Texas (Glick, 1957; Glick & Noble, 1961, provided combined data from Texas, Arkansas, Louisiana and Oklahoma), Virginia (Beisler et al., 1977), NE U.S.A. (combined data from Delaware, Maryland, New York and Pennsylvania; Mitchell, 2019), South Dakota to Massachusetts, south to [Texas] and Florida (Sabrosky, 1965); Mexico: "northeastern" (Sabrosky, 1965); and Bermuda (Sabrosky, 1965; Woodley & Hilburn, 1994).

Based on reliable records from published (see above) and unpublished (Allen Norrbom, pers. commun., 14 November 2022; iNaturalist.org, accessed 19 March 2023) sources, and the material examined, *M. occipitalis* is currently confirmed to occur in Canada (Manitoba, Ontario, Québec), the United States of America (Alabama, Arkansas, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Virginia, West Virginia, Wisconsin,), Mexico (Nuevo León, Tamaulipas, Veracruz) and Bermuda.

The continental range of distribution is captured by drawing lines from southern Florida (Lake Worth; A. Norrbom, pers. commun., 11 November 2022) north to central coastal Maine (East Boothbay) and southcentral Québec (Îles Penchées) [no record yet from Vermont], northwest to southern James Bay (Moosonee, Ontario), west to southcentral Manitoba (Elm Creek), south to extreme eastern New Mexico (Portales), and further south to southcentral Texas (Langtry) and Veracruz ("Vera Cruz"). Bermuda remains the only disjunct record for this species.

The highest elevations noted on specimen labels are 1,585 m a.s.l. (Indian Gap, Tennessee, 5200′) and 1,615–1,737 m a.s.l. (Mt. Rogers, Virginia, 5300′–5700′). Lowest elevations are < 10 m a.s.l. (estimated using Google Earth Pro ver. 7.3.6.9345, December 29, 2022; accessed 19 March 2023) at coastal localities including: Moosonee,

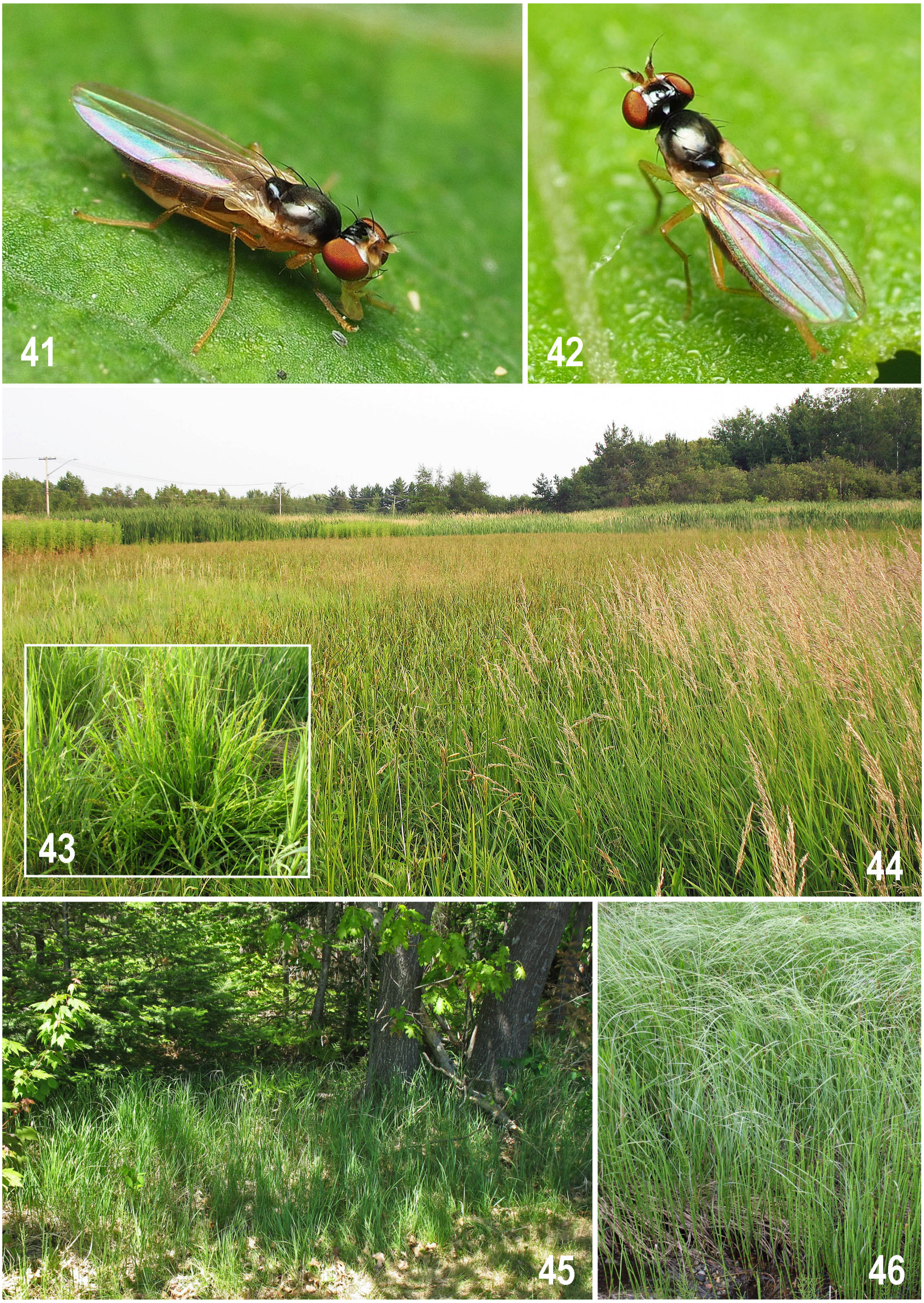


Figs 32–40. *Mumetopia occipitalis* Melander, female (32–35, 40), male (36–39): 32 – end of female postabdomen and genital chamber, left lateral; 33 – remnant of accessory gland; 34 – ventral receptacle, left lateral; 35 – internal sclerites of female genital chamber, ventral; 36 – left male fore femur, posterior; 37 – left male hind femur, anterior; 38 – left male fore basitarsus and apex of tibia, posterior; 39 – left male mid basitarsus and apex of tibia, anterior; 40 – left female mid basitarsus and apex of tibia, anterior. Based on specimens from Canada: Ontario (Figs 32–35) and U.S.A.: District of Columbia (others). Scales: Figs 32–35 = 0.05 mm, others = 0.2 mm. For abbreviations see Material and methods.

Ontario ("51°14.75´N 80°40.33´W", 6 m a.s.l.; imagery date: 10/1/2021); Aquia Harbour, Virginia ("38°27´N 77°23.3´W", 3 m a.s.l.; imagery date: 5/1/2021); Cameron Prairie National Wildlife Reserve, Louisiana ("29°56´42˝N 93°05´17˝W", 0 m a.s.l; historical imagery from 1985).

Interestingly, *Mumetopia occipitalis* has been captured in airplane-mounted screen traps. Glick (1957) reports single specimens at altitudes of 100 feet (30.5 m) and 500 feet (152.4 m) in southern Texas while Glick & Noble (1961) captured 11 specimens at altitudes of 200 (n = 4), 500 (3), 1000 (1), 2000 (2), and 3000 feet (1) (range of 61.0 to 914.4 m), in central Texas and/or northeast Texas (combined with data from bordering areas of Arkansas, Louisiana and Oklahoma). Light traps on unmanned oil platforms in the Gulf of Mexico (south of Jeanerette, Louisiana) (Sparks et al., 1986) yielded one specimen of *M. occipitalis* (11 September to 21 October) at 106 km offshore. The relative roles of passive versus active flight in these dispersal phenomena are not known but, in combination, the vertical and horizontal potential for dispersal of *M. occipitalis* appears to be substantial.

Biology. The life history of *M. occipitalis* has not been fully investigated – the authors did not collect or rear any immature stage. Two examined adult specimens include an empty puparium glued to the pin or paper point: Harrington Lake, Québec, 19 August 1962, 1♂ and Austin, Texas, 14 December 1950, 1♀. The date on each label could be the field-collection date (larva or puparium) or



Figs 41–46. *Mumetopia occipitalis* Melander, living adults and habitats: 41 – female, dorsolateral; 42 – ditto, dorsal (both U.S.A.: Maryland); 43 – growth of *Carex stipata*; 44 – graminoid meadow with growth of *Scirpus microcarpus* and *Calamagrostis canadensis* (both Canada: Ontario: Sault Ste Marie, Finn Hill); 45 – growth of young *Calamagrostis canadensis* on edge of woods (Canada: Ontario: Sault Ste Marie, airport entrance); 46 – growth of emergent *Carex aquatilis* and *Equisetum fluviatile* (Canada: Ontario: Marathon). Photo K. Schulz (Figs 41, 42), K.N. Barber (others).

the emergence date and there is no information on plant associations. Otherwise, we have only broad field and label-data evidence for suggestions, by adult association, of potential host plants for larvae (mostly graminoids but see Wheeler, 1973, below).

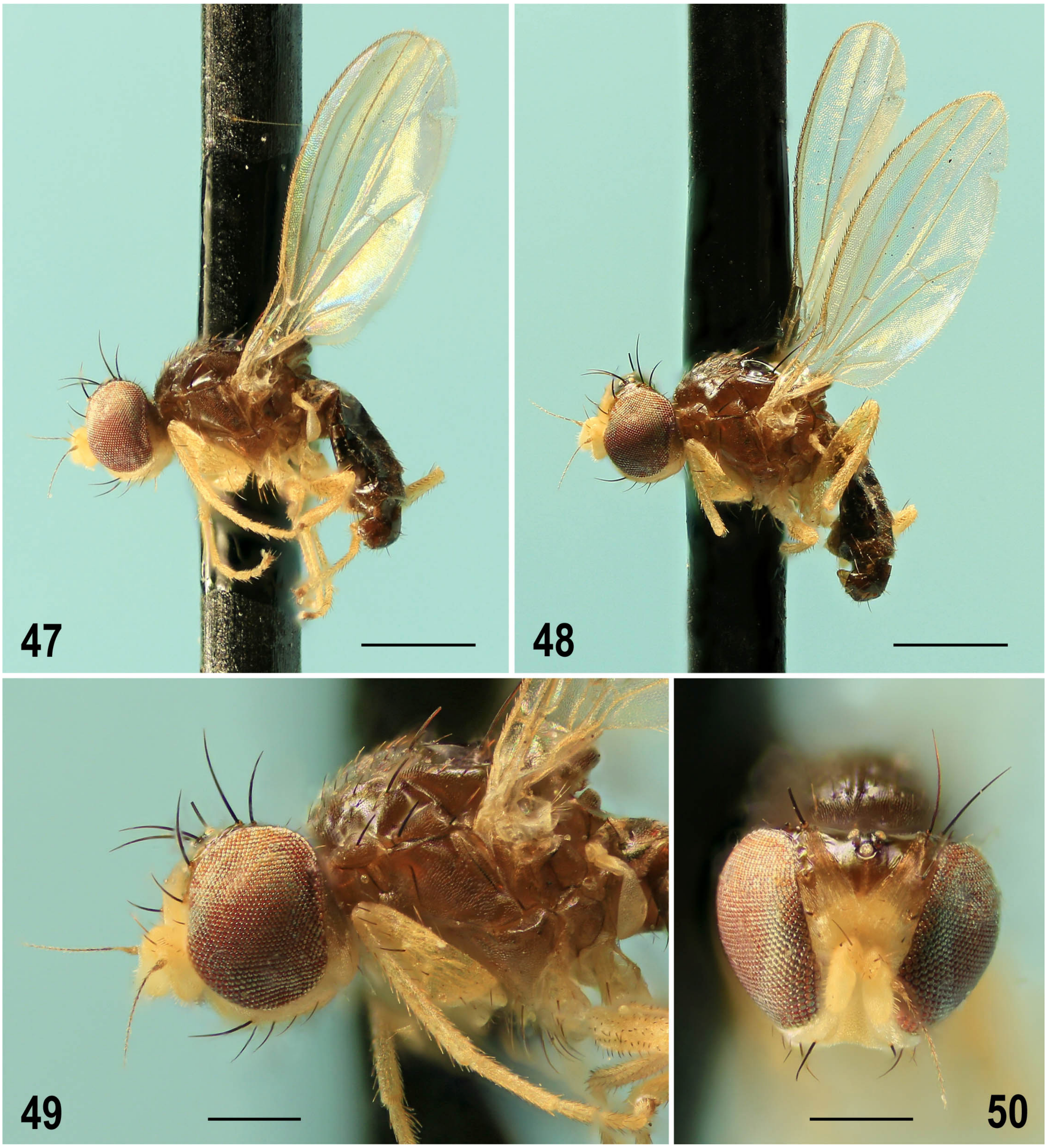
Habitat and host-plant associations. Reports of field studies that have recorded *M. occipitalis* represent a range of plant communities or specific plant species. Most of them are graminoids or are dominated by graminoids. Foote (2004) swept *M. occipitalis* from pure stands of the sedges (Cyperaceae) *Carex lacustris* Willd. (n = 7) and *Carex stricta* Lam. (n = 11) in a marsh habitat in Ohio. He cites Ferrar (1987) when stating that "the larvae are reported to mine the stems of wetland monocots". However, there is no specific mention of *M. occipitalis* by Ferrar – Foote is generalizing and inexplicably categorizes *M. occipitalis* as a "stem borer" (in his Table 1). *Mumetopia occipitalis* was found (including use of bagging and rearing) to be "moderate" (n = 10 to 25) in abundance on the grass *Digitaria sanguinalis* (L.) (Poacease) while "rare" on the other grass *Panicum dichotomiflorum* Michx., and on the sedge *Cyperus esculentus* L. in southwest Virginia (Beisler et al., 1977). An inventory of tallgrass prairies in Oklahoma found *M. occipitalis* in complex mixed grass-dominated communities (Stoner et al., 1962). Other studies are suggestive of graminoid hosts for *M. occipitalis*. Dowdy (1950) reported on oak-hickory communities on a river floodplain in Missouri where, most likely, his *Scirpus-Echinochloa* Associes, dominated by the sedge *Scirpus* sp. and the grasses *Echinochloa* sp. and *Muhlenbergia* sp., is implicated. More recently, *M. occipitalis* was recorded in a study of arthropods on native versus non-native plants in grassland or scrubland plant communities (combined data from Delaware, Maryland, New York, and Pennsylvania) (Mitchell, 2019) while Grégoire-Taillefer (2016) reports a single specimen from one of 15 bogs studied in Québec.

The prevailing association of the species with graminoids can also be demonstrated by data from the material examined. Habitat for *M. occipitalis* in Ontario (mostly KNB leg.) can be generalized as mixed graminoid or graminoid/herb communities on a range of soil moisture regimes, either in the open or under canopy, e.g. "*Rubus*, *Aralia*, graminoids, ferns, *Aster*, under *Betula*/*Acer*" (Sault Ste. Marie), "graminoids/*Impatiens* under canopy" (Pelee Island), unidentified "grasses" (White River), "ornamental lawn along river" (Spencer Gorge/Webster's Falls Wilderness Area). More specifically, sweeping and aspirating in an urban riparian site (Burlington, Ontario) yielded *M. occipitalis* adults from the lower reaches or thatch beneath each of the grasses *Bromus inermis* Leyss., *Phleum pratense* L. and *Poa pratensis* L. – infrequently mowed grasses on the perimeter of an adjoining recreational park yielded more *M. occipitalis*. Sweeping pure stands within mixes of graminoids (Sault Ste. Marie, Ontario) has yielded *M. occipitalis* adults from the sedges *Carex aquatilis* Wahlenb., *Carex stipata* Muhl. ex Willd. and *Scirpus microcarpus* J. & C.Presl and the grasses *Calamagrostis canadensis* (Michx.) P.Beauv. and *Phalaris arundinacea* L. In a single graminoid meadow (see Figs 43, 44; Finn Hill site), *C. stipata*, *S. microcarpus*, and *Calamagrostis canadensis* all produced *M. occipitalis* – more than 130 specimens were taken from mostly *C. stipata* in one evening. *Calamagrostis canadensis* growing on a much drier, sandy site (Fig. 45) also yielded *M. occipitalis* while more than 40 specimens of *M. occipitalis* were taken from *Carex utriculata* Boott in Hook. over seven discrete Ontario localities (three similar habitats in Michigan, Wisconsin and South Dakota yielded single specimens). *Carex aquatilis*, growing in a mix dominated by *Equisetum fluviatile* L. (Equisetaceae), was the likely source of *M. occipitalis* at a site near Marathon (Fig. 46). For the most part, if you encounter an anthomyzid in Ontario, it is probably sharing habitat with *M. occipitalis*.

Elsewhere, sweeping in a marsh in Ohio (Kent) yielded *M. occipitalis* from the grass *Leersia oryzoides* (L.) Sw. and the sedge *Scirpus cyperinus* (L.) Kunth. *Lathyrus* (Fabaceae) mixed with *Juncus* (Juncaceae) on a sand beach (Îles Penchées, Québec) most likely implicates a nectar/pollen/honeydew source and a potential host plant, respectively – a record of "*Juncus roemerianus* [Scheele] litter – Berlese" (Bay St. Louis, Mississippi) supports this interpretation. In southern Manitoba, there are records from an "agricultural field" (Elm Creek), "oak savannah near river" (LaSalle) and "tallgrass prairie" (Winnipeg) and, back in Ontario (Windsor), "burnt savannah", "burnt prairie", and "unburnt prairie". Two locality records mention "among grass roots" (Simcoe, Ontario) and "among *Carex* roots" (Clingman's Dome, North Carolina).

Data on association of *M. occipitalis* with non-graminoid and dicotyledonous vegetation are less frequent. Wheeler (1973) reported on a rearing (collected 30 July, adult emerged 12 August) of this species from alfalfa crowns (*Medicago sativa* L., Fabaceae) in New York suggesting a capacity for development on a dicot exhibiting little or no tissue decay. Batra (1979) found adult *M. occipitalis* to be "common" on *Stellaria media* L. (Cyrillo) (Caryophyllaceae) (none from *S. graminea* L.) and considered them nectar feeders (combined data from Maryland, New York, Pennsylvania, Vermont). Similarly, Cleveland & Hamilton (1958) recorded *M. occipitalis* associated with apple trees (*Malus domestica* Borkh, Rosaceae) in Indiana (possibly accessing honeydew deposits in August, perhaps as in Fig. 41).

Further specific non-graminoid species possibly represent nectar/pollen/honeydew foraging by *M. occipitalis*. Several species of Asteraceae are mentioned: "sweeps, Pearly Everlasting [*Anaphalis margaritacea* (L.) Benth. & Hook.f.]" (Carter Bay, Ontario), "sweeping *Erigeron* sp." (Starkville, Mississippi), "sweeping flowering *Eupatorium serotinum* [Michx.]" (Ecru, Mississippi), "yellow marigold [*Tagetes*] flowers" (Pompton Plains, New Jersey), and "on flowers of *Aster pilosus*" [now *Symphyotrichum pilosum* (Willd.) G.L.Nesom] (Grenada Co., Mississippi). There are repeated records of "sweeping crimson clover [*Trifolium incarnatum* L.]" (Fabaceae) (Oktibbeha Co., Mississippi) and of "D-VAC sample in cultivated cotton [*Gossypium arboretum* L.]" (Malvaceae) (Starkville, Mississippi).



Figs 47–50. *Xerocomyza hansoni* sp. n., male habitus, holotype (U.S.A.: Utah: Bonanza): 47 – male holotype, left lateral, intact specimen; 48 – ditto, with legs damaged after description; 49 – head and thorax, left lateral; 50 – head, frontal. Scales: 0.5 mm. Photo: J. Roháček.

Single specimens taken from trees suggest foraging for pollen/honeydew (*Pinus*, Pinaceae, Carthage, Texas) or for nectar/pollen/honeydew [*Gymnocladus dioicus* (L.) K. Koch (Fabaceae), Harrow, Ontario; *Aesculus* sp. (Sapindaceae), Kerrville, Texas]. Single specimens have also been taken "ex. *Sarracenia* pitchers" (Sarraceniaceae) (Bass River State Park, New Jersey) and from "deer dung" (Rondeau Provincial Park, Ontario). Several records (low numbers) indicate attraction to lights (mercury vapour, blacklight/ultraviolet, light fixture) – 30 specimens were taken "at light during heavy rain" (Highlands, North Carolina).

There are two unexpected (and surely exceptional) associations. An unpublished report (Kailing, 2018) found molecular evidence of *M. occipitalis* in a fecal sample from one of nine specimens of the bat *Perimyotis subflavus* (F. Cuvier) (Vespertilionidae) in western Kentucky. Oddly, Kilpatrick & Schoof (1956) include *M. occipitalis* in a survey of the Diptera of privies (outhouses) in Georgia but listed the name under "Tipulidae" making the identification suspect.

Phenology. The earliest collection record is 1 January (Coosawhatchie, South Carolina) and the latest unambiguous records are 8–22 December (Gainesville, Florida) and 29 December ("Vera Cruz", Veracruz). A minimum flight period for the Canadian province of Ontario runs from 24 May (Echo Bay) to 20 October (Metcalfe) – a trapping period of 18 October to 11 November (Stittsville, forest Malaise trough, single specimen) might represent November (- - - - M J J A S O ? -). The highest-latitude record for (9) April is in South Carolina (Barnwell State Park) and for (12) November is in Maryland (Edgewater). The combined monthly records for the lower tier of states (New Mexico to Georgia and Florida) represent all twelve months.

Genus *Xerocomyza* gen. n.

ZooBank taxon LSID:
F0320CB4-1E85-49E7-868A-E6138CB2C223

Undescribed genus: Roháček & Barber, 2016: 26 (key).

Type species. *Xerocomyza hansoni* sp. n. (here designated).

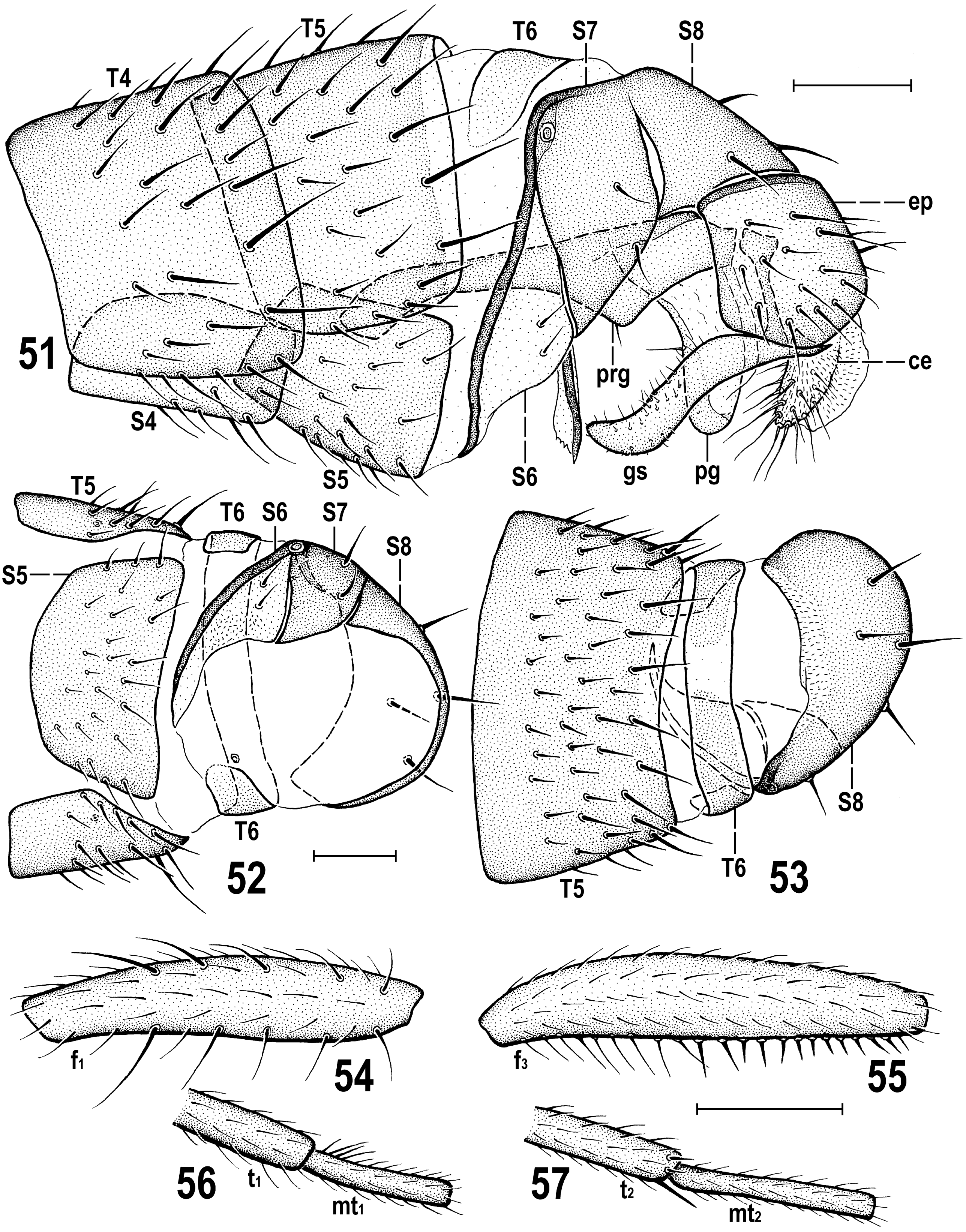
Diagnosis

Male. (1) Head somewhat higher than long. (2) Eye large, broadly suboval, with longest diameter nearly vertical, bare. (3) Frons relatively narrow; frontal triangle well delimited, of moderate size, equilateral. (4) Ocellar triangle small and flat and ocelli relatively large. (5) oc setae inserted inside but close to margin of ocellar triangle, slightly divergent. (6) Frontal lunule very small, narrow, depressed. (7) Occiput concave, without microtomentose patterning. (8) Antenna geniculate between pedicel and 1st flagellomere, the latter laterally strongly compressed. (9) Arista short-ciliate (Fig. 49). (10) Palpus rather short and slightly clavate, yellowish white, ventrally with 1 relatively long and dark preapical seta and several setulae. Cephalic chaetotaxy: (11) pvt small, strongly convergent; (12) vte, vti, oc and posterior ors long, vti longest of cephalic setae; (13) 2 ors, anterior shorter than posterior, 1 microsetula in front of anterior ors; (14) a single row of short postocular setulae; (15) 1 long vi and 1 shorter and weaker but distinct subvibrissa; (16) peristomal setulae small and sparse. (17) No distinct sexual dichroism of head structures.

(18) Thorax somewhat narrower than head. Thoracic chaetotaxy: (19) 1 short but distinct hu, 2 npl (anterior longer); (20) 1 distinct prs; (21) 1 sa, 1 pa (longer than sa); (22) 2 long postsutural dc (anterior dc shorter and situated far behind suture); (23) ac microsetae sparse but relatively long, in 4 rows on suture, in 2 rows more posteriorly, not reaching to level of posterior dc; (24) 2 sc (apical longest of thoracic setae, basal short and weak); (25) 1 minute ppl, reduced to upcurved microseta; (26) 2 stpl (posterior always longer) and no upcurved setulae below them. (27) Scutellum distinctly convex on disc. (28) Legs yellow to yellowish white, with apical segment of all tarsi distally more or less darkened; (29) f_1 without ctenidial spine; (30) t_2 with distinct but short ventroapical seta; (31) male f_3 with long posteroventral row of shortened and thickened setae. (32) Wing normally developed, but relatively short; (33) wing membrane unicolourous, with pale brown tinge; (34) C with distinct spinulae on Cs_2, ending at distal fourth of Cs_2, thus not reaching to apex of R_{2+3}; (35) R_{2+3} long, bent parallel to C but apically slightly upcurved to C; (36) R_{4+5} subparallel to M; (37) cell dm relatively short and narrow, slightly widened distally; cross-vein r-m hardly oblique, situated near middle of cell dm; (38) CuA_1 almost reaching wing margin, A_1 ending far from it; (39) alula well developed, not narrowed, with apex rounded.

Male abdomen: (40) T1 separate from T2; (41) T2–T5 relatively large and broad; (42) preabdominal sterna (S2–S5) relatively broad, paler than associated terga, becoming (sequentially) wider posteriorly. Male postabdomen (Figs 51–53): (43) T6 reduced, bare, short, transverse, with pigmentation medially interrupted (Fig. 53); (44) S6 and S7 strongly asymmetrical, partly (dorsally) fused and situated left ventrally to laterally, S6 with dark anterior marginal ledge reaching dorsally on S7 (Fig. 51); S6 and S7 each with 2 setae; (45) S8 less asymmetrical, situated dorsally (Fig. 53), left anterodorsally fused with S7 (Fig. 51) and with a few (4 or 5) robust setae.

Male genitalia (Figs 51, 58–68): (46) Epandrium relatively small (Figs 51, 58) compared to pregenital sclerites, slightly wider than high, dorsally convex (Fig. 59), with moderately dense setae, 2 or 3 pairs of which somewhat longer but distinctly thicker than others; (47) anal fissure not large but relatively wide and low, transversely subtriangular (Fig. 59); (48) medandrium compact, ventrally simple, with distinct posteromedial keel (Fig. 60) and with dorsolateral corners slightly projecting, without setae; (49) cercus large and almost unpigmented, situated below anal fissure (Figs 58, 59), relatively long pale setose. (50) Gonostylus large (longer than epandrium) but slender elongate and projecting anteriorly, lacking micropubescence but shortly setulose. (51) Hypandrium simple, of moderate size, with simple dorsal margin (Fig. 64) and anterior end deeply incised (Fig. 62); internal lobes membranous and leaf-like projecting dorsally; (52) transandrium simple, transverse, medially slender; caudal process (secondary medial sclerotization of basal membrane below transandrium) absent (Fig. 63); (53) basal membrane laterally pigmented and micropubescent, medially hyaline, ventromedially with pale transverse tubercles or flat spines (Fig. 63). (54) Pregonite completely fused with hypandrium and forming flat lobe protruding ventrally (Figs 62, 64) and bearing 3 setae on inner side. (55) Postgonite large, flat, pale-pigmented and projecting strongly ventrally (Fig. 64); (56) postgonite with only 1 seta in the middle of anterior margin. (57) Phallapodeme with symmetrical but widened and flattened proximal half, narrowly incised base (Fig. 68) and simple, slightly widened apex. (58) Aedeagal part of folding apparatus (Fig. 67, afa) submembranous and pale-pigmented, provided with internal striae, external crescent-shaped tubercles and fine apical spinulae; (59) connecting sclerite (Fig. 67, cs) very slender and long, curved, dark-pigmented, finely granulose. (60) Phallophore short, compact and anteriorly fused with base of distiphallus but posteroventrally somewhat projecting and with pointed apex (Fig. 67). (61) Distiphallus relatively small, composed of small (distally) membranous saccus and slender scler-



Figs 51–57. *Xerocomyza hansoni* sp. n., male and female paratypes (U.S.A.: Utah: Bonanza): 51 – end of male abdomen with terminalia in situ, left lateral; 52 – 5th abdominal segment and postabdomen (genitalia omitted), ventral; 53 – ditto, dorsal; 54 – left female fore femur, posterior; 55 – left male hind femur, anterior; 56 – left male fore basitarsus and apex of tibia, posterior; 57 – left male mid basitarsus and apex of tibia, anterior. Scales: Figs 51–53 = 0.1 mm, others = 0.2 mm. For abbreviations see Material and methods.

otized filum. (62) Proximal part of distiphallus distinctly sclerotized (Fig. 67). (63) Saccus of distiphallus small (Fig. 67, s), basally sclerotized, pigmented and microtomentose, in the middle with dark-pigmented lateral oblique sclerite;

distal membranous part of saccus reduced and little dilated and apically finely spinulose. (64) Filum relatively short, composed of 2 dark ribbon-shaped sclerites (Fig. 66), one shorter, the other terminating in apex; apex membranous, narrowly funnel-shaped, with denticulate and spinulose margin (Fig. 65). (65) Ejacapodeme distinct (Figs 67, 68), with robust digitiform projection having knob-like apex.

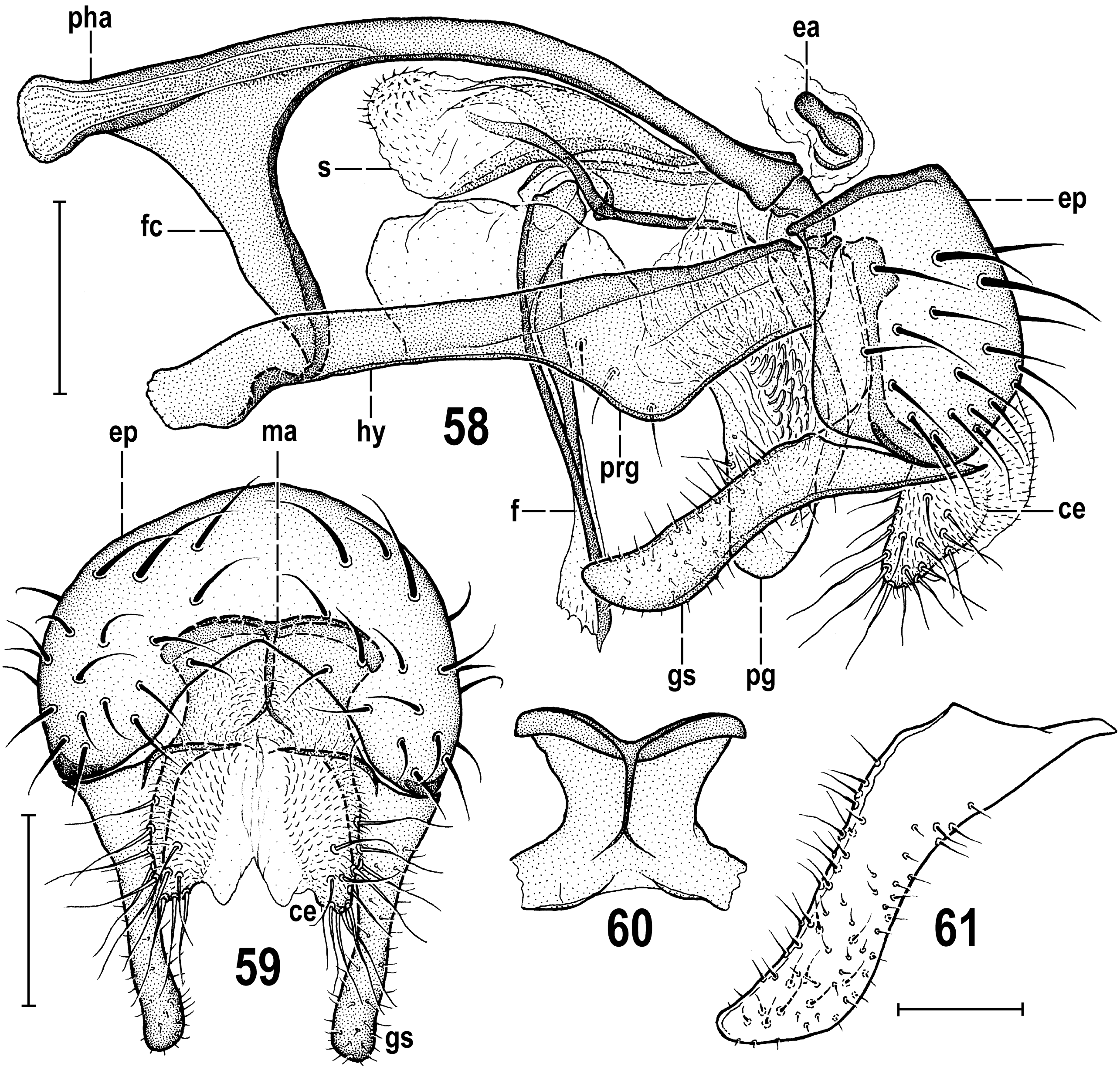
Female. (66) Female abdomen wider and with broader terga and narrower sterna than in male. (67) Postabdomen (Figs 73–75) broad and short, somewhat retractable from 7th segment. (68) T6 unmodified, large, more or less tapered posteriorly, densely shortly setose. S6 relatively narrow and with sides rounded. (69) T7 and S7 separate (Fig. 74) but pleural membrane between them reduced, narrow. (70) T7 dorsomedially divided (Fig. 73); both parts extended ventrolaterally and with 7th spiracle embedded (see Fig. 74). (71) S7 relatively large and broad but smaller and markedly darker than S6 (Fig. 74), simple although with anterior corners somewhat projecting. (72) T8 flat, subpentagonal, with anterior corner distinctly projecting (Fig. 73), dark-pigmented, without micropubescence and sparsely setose; (73) S8 short (somewhat shorter than T8), anteriorly rounded, posteriorly with narrow medial incision (see Fig. 77) and bent dorsally to anteriorly to form internal lobes. (74) Internal sclerites (Figs 78, 81, is) of female genital chamber (uterus) weak and pale-pigmented, formed by a pair of simple, subtriangular and flat posterior sclerites attached to internal lobes of S8 and by (75) 1 anteroventral, slender, simple, slightly bent and asymmetrical annular sclerite (Fig. 78). (76) Anterior part of uterus provided with a small, elongate, slightly sinuate subconical (apically rounded) and very weakly sclerotized ventral receptacle (Figs 78, 81, vr; Fig. 79) on wider and curved membranous duct. (77) Remnants of accessory glands (Fig. 78) small, formed by a granulous stalked bunch of tissue and follicles on apex of variously formed and structured duct. (78) Spermathecae (1+1) shortly subpyriform (slightly dented in the middle, Fig. 82), dark-pigmented, with plain surface carrying stalked globuli; each spermatheca with short pale duct cervix separated from the main body by a short collar (Fig. 80). (79) T10 small, only slightly transverse, very pale-pigmented, bare except for 1 pair of dorsomedial setae (Fig. 73); (80) S10 not larger than T10, roughly transversely rhomboidal, with rounded anterior margin and rather acute posteromedial corner (Fig. 76). (81) Cercus of medium length and thickeness, with rich and relatively long setae and very fine micropubescence (Figs 73–75, ce).

Species included. Only the type species, *X. hansoni* sp. n., described below.

Etymology. *Xerocomyza* is a compound name composed of Xero- (from Greek xērós = dry), co- (inserted syllable) and -myza, and is inspired by the xeric or xerothermic habitat of its type species. Gender feminine.

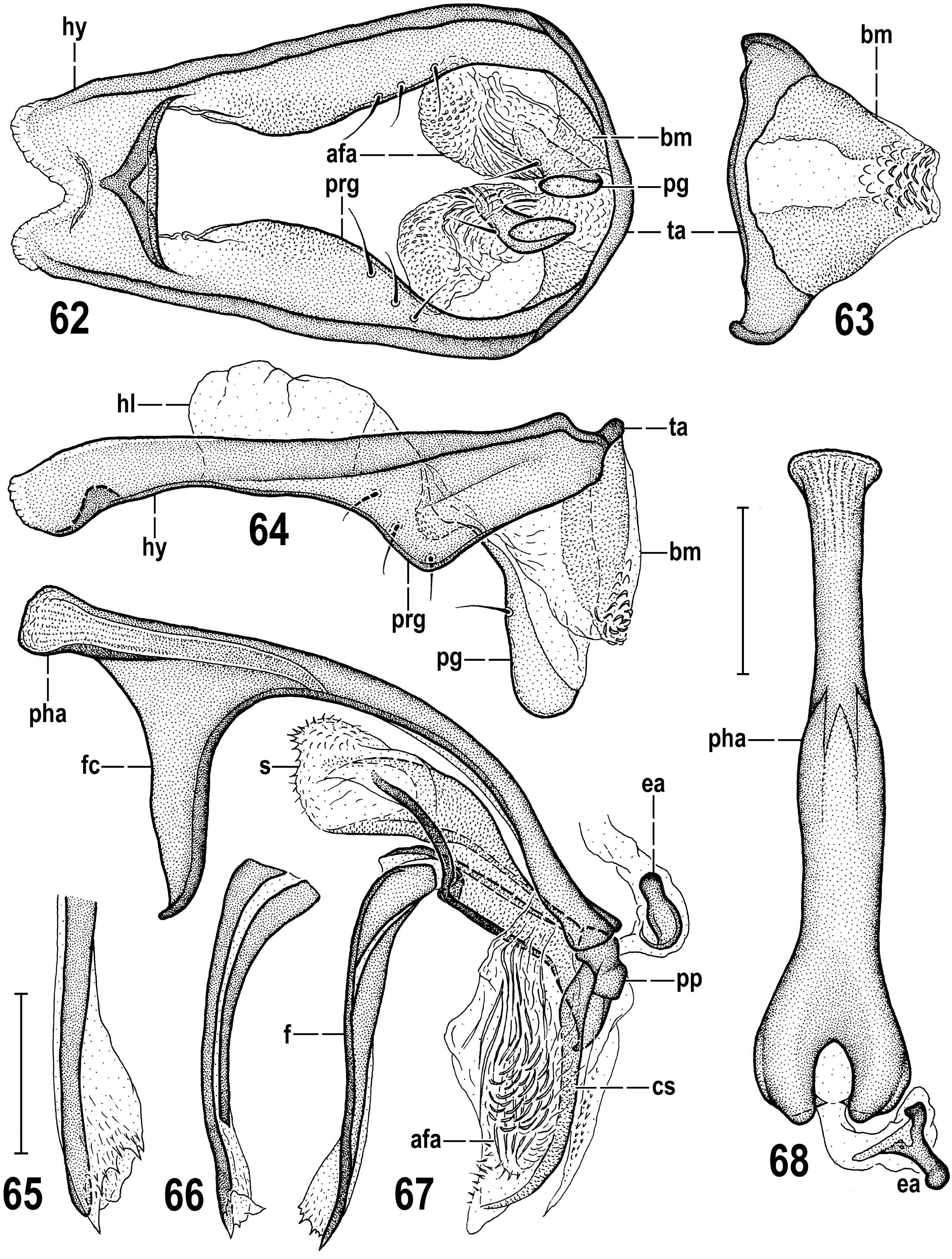
Systematic discussion. The new genus *Xerocomyza* is established for an unusual new species, *X. hansoni* sp. n., described below. The small size, colouration, cephalic, thoracic and pedal chaetotaxies, wing venation, and sclerites of the male and female preabdomen of the type species resemble closely those of representatives of the genera *Mumetopia, Stiphrosoma* and *Carexomyza,* all belonging to the same lineage of Anthomyzidae (see Barber & Roháček, 2020; Roháček & Tóthová, 2021). A close affinity of *Xerocomyza* to this monophyletic asemblage is indicated by some structures of the female postabdomen, viz. (70) the dorsomedially divided T7, (72) the anteriorly narrowed T8 and (73) the posteromedially deeply incised S8 which could be considered synapomorphies shared by all these genera. However, these characters also occur as homoplasies in other genera, e.g. the dorsomedially divided T7 in *Quametopia* Roháček & Barber, 2011 but in the latter genus the female T7 is fused ventrally with S7 (see Roháček & Barber, 2011). The (shortly) posteromedially incised female S8 is yet more widespread and occurs in *Amygdalops* Lamb, 1914, *Cercagnota*, *Epischnomyia* Roháček, 2006, *Paranthomyza* Czerny, 1902 (see Roháček, 2004, 2006, 2009) and also in *Quametopia*. On the other hand, the distinctly anteriorly tapered female T8 seems to be more restricted and could be a good synapomorphy of the *Chamaebosca* group of genera, *Carexomyza* and *Xerocomyza*. The new genus could thus represent a separate lineage basal to *Carexomyza* + the *Chamaebosca* group of genera clade.

There are several distinct apomorphies, mainly in the male genitalia, delimiting *Xerocomyza* from other genera of Anthomyzidae (29, 50, 51, 55, 57, 60, 63) but, interestingly, none of them is unique to this genus, although they probably evolved independently and do not demonstrate relationship to groups where they occur as homoplasies. It is well known that the ctenidial spine on the fore femur was lost (character 29) in various lineages of recent Anthomyzidae (see e.g. Roháček, 1993, 2004, 2006, 2009, 2013, 2018, 2021b) and, more rarely, even in some species of the genera with the ctenidial spine normally developed, such as the closely related *Stiphrosoma* (see Roháček & Barber, 2005) or the more distantly related *Anthomyza* Fallén, 1810 (see Roháček, 2021a). Therefore, this diagnostic character of *Xerocomyza*, although very rare among Nearctic Anthomyzidae, cannot be used to demonstrate relationships of the genus. The slender, elongate gonostylus lacking micropubescence (50) is very characteristic for *Xerocomyza* but similarly slender, elongate and (often) non-pubescent (albeit markedly smaller compared to the epandrium and differently bent) gonostyli are also known in the Palaearctic genera *Anagnota* Becker, 1902, *Cercagnota* and *Santhomyza* Roháček, 1984 (see Roháček, 2006). The anteromedially deeply incised hypandrium (51, see Fig. 62) seems to be more diagnostic for *Xerocomyza* because in other described genera there is, at most, only a shallow emargination here (deepest in the genus *Marshallya* Roháček, 2018, see Roháček, 2018: Fig. 15). The large, flat and ventrally projecting postgonite (55) also could be considered an apomorphic character but similarly formed postgonites occur as homoplasies in the distantly related genus *Santhomyza* (see Roháček, 2006: Figs 527, 539) and (somewhat smaller) in the more closely allied genus *Carexomyza* (cf. Barber & Roháček, 2020: Fig. 43). The phallapodeme with the prox-

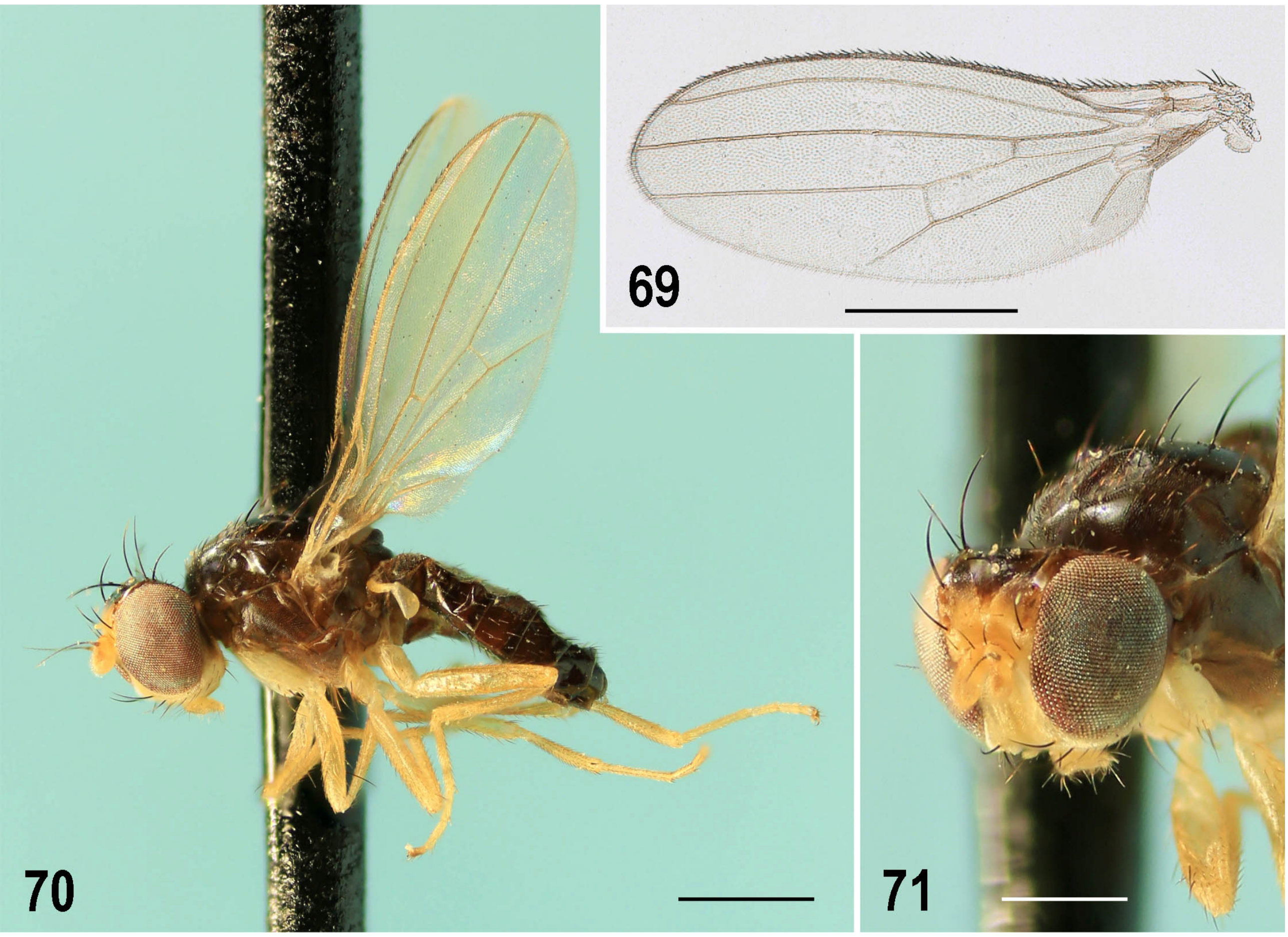


Figs 58–61. *Xerocomyza hansoni* sp. n., paratype (U.S.A.: Utah: Bonanza), end of male abdomen and terminalia: 58 – entire genitalia, left lateral; 9 – external genitalia, caudal; 60 – medandrium, caudal; 61 – left gonostylus, left sublateral (widest extension). Scales: Fig. 61 – 0.05 mm, others = 0.1 mm. For abbreviations see Material and methods.

imal half dorsoventrally widened and flattened (57) (see Fig. 68) is also an unusual character but the phallapodeme is similarly modified in the only extant species of the primitive W. Palaearctic genus *Reliquantha* Roháček, 2013 (cf. Roháček, 2013: Fig. 12). Interestingly, *Reliquantha variipes* Roháček, 2013 has an ancestrally formed medandrium rather similar to that of *Xerocomyza hansoni* (Fig. 60) but that of *R. variipes* is uniquely densely setulose (Roháček, 2013: Fig. 5). The basal part of the phallapodeme is yet more modified in the enigmatic Chinese anthomyzid *Marshallya platythorax* Roháček, 2018 where it is expanded into large, flat, wing-like lobes (Roháček, 2018: Figs 8, 19) embracing the base of the distiphallus. The posteroventrally acutely projecting phallophore (60) and the saccus with a strongly reduced distal membranous part are also putative apomorphies of *Xerocomyza*, although seemingly similar structures can also be seen in some distantly related genera, most distinctly being expressed in *Epischnomyia* where the saccus is, however, distally armed with robust spikes and the phallophore is projecting into a distinct epiphallus (cf. Roháček, 2006: Fig. 455). On the other hand, other features of the male terminalia are distinctly of an ancestral type, such as the (48) medandrium compact and ventrally simple (already mentioned above), (49) cercus large, ventrally situated (resembling that of *Carexomyza* but more membranous), (58) aedeagal part of folding apparatus submembranous and, particularly, the (64) filum of the distiphallus composed of a pair of ribbon-shaped sclerites (most similar to that of *Carexomyza* in having one of these sclerites distinctly shorter than the other; this abbreviated sclerite could perhaps be considered a putative synapomorphy of both genera).



Figs 62–68. *Xerocomyza hansoni* sp. n., male paratype (U.S.A.: Utah: Bonanza), internal genitalia: 62 – hypandrial complex, ventral; 63 – transandrium, caudal; 64 – hypandrial complex, left lateral; 65 – apex of filum, sublateral (widest extension); 66 – filum, anterior; 67 – aedeagal complex, left lateral; 68 – phallapodeme and ejacapodeme, dorsal. Scales: Fig. 65 – 0.05 mm, others = 0.1 mm. For abbreviations see Material and methods.



Figs 69–71. *Xerocomyza hansoni* sp. n., paratypes (U.S.A.: Utah: Bonanza), male wing and female habitus: 69 – male left wing, dorsal; 70 – female, left lateral; 71 – female head and thorax, anterolateral. Scales: 0.5 mm. Photo: K.N. Barber (Fig. 69), J. Roháček (others).

Some distinctive features can also be found in the female internal genitalia. The internal sclerotization of the female genital chamber is probably of a primitive type (posterior sclerites weakly developed, annular sclerite simple). The ventral receptacle (76) is rather unusual in its elongately subconical shape, plain surface and weak sclerotization (Fig. 79) and most resembles that of the distantly related genus *Typhamyza* Roháček, 1992 (see Roháček, 2006: Fig. 652). The simply pyriform spermathecae with a plain surface (78) most resemble those of *Santhomyza* species (cf. Roháček, 2006: Figs 532, 545) but differ from them in having an unusual collar on the base (Fig. 80). The polarity of these two characters is unknown but they are diagnostic for the genus.

Although externally unremarkable (except for absence of the ctenidial spine), the new genus is characterized by the unique combination of diagnostic characters in the male and female terminalia, including those clearly apomorphic and plesiomorphic but also those of uncertain polarity.

Distribution. Only known from the United States of America: Utah.

Xerocomyza hansoni sp. n.

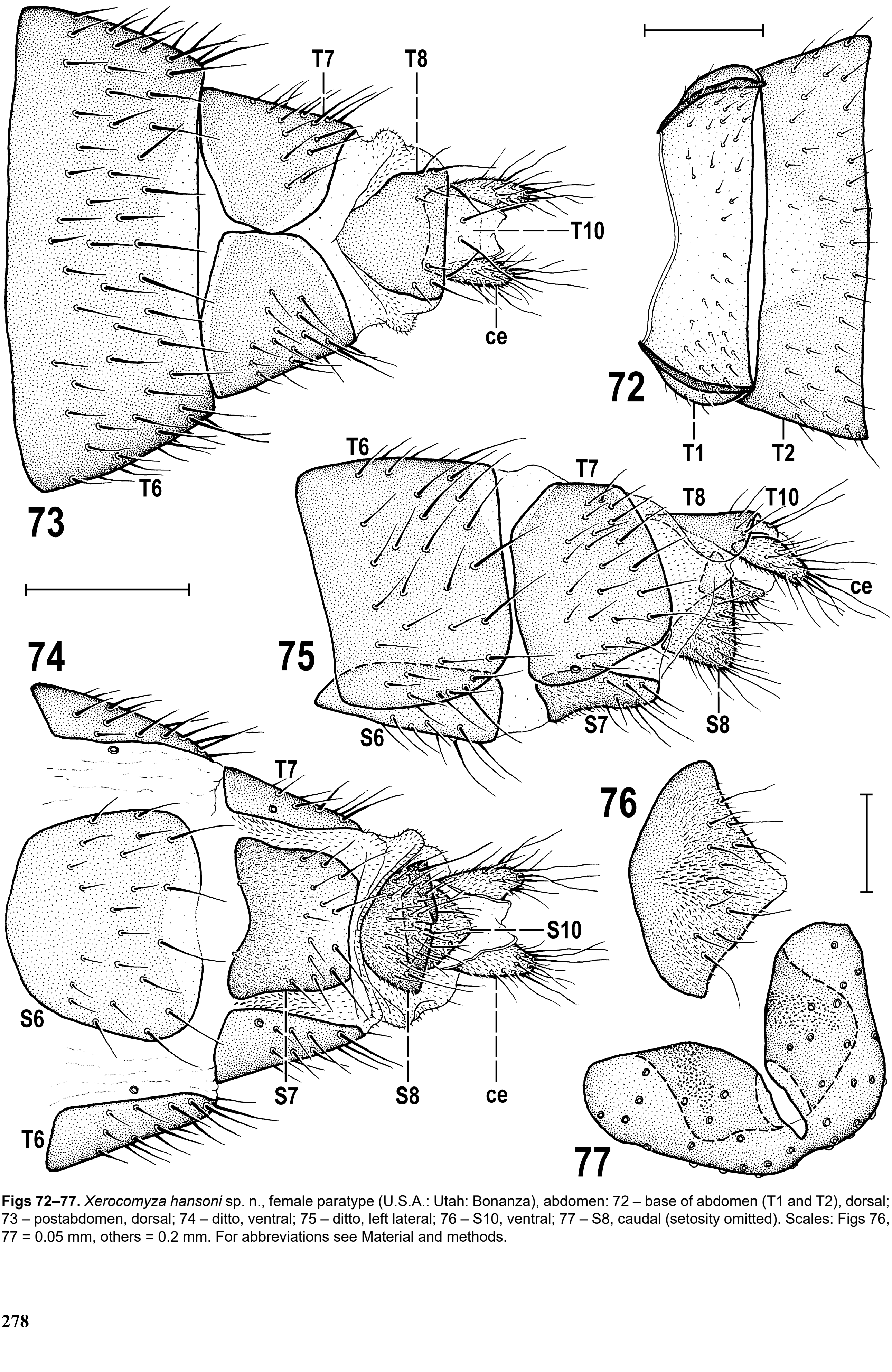
ZooBank taxon LSID:
1726EFD3-4983-49BB-BC07-7D5502A4A2C0

(Figs 47–82)

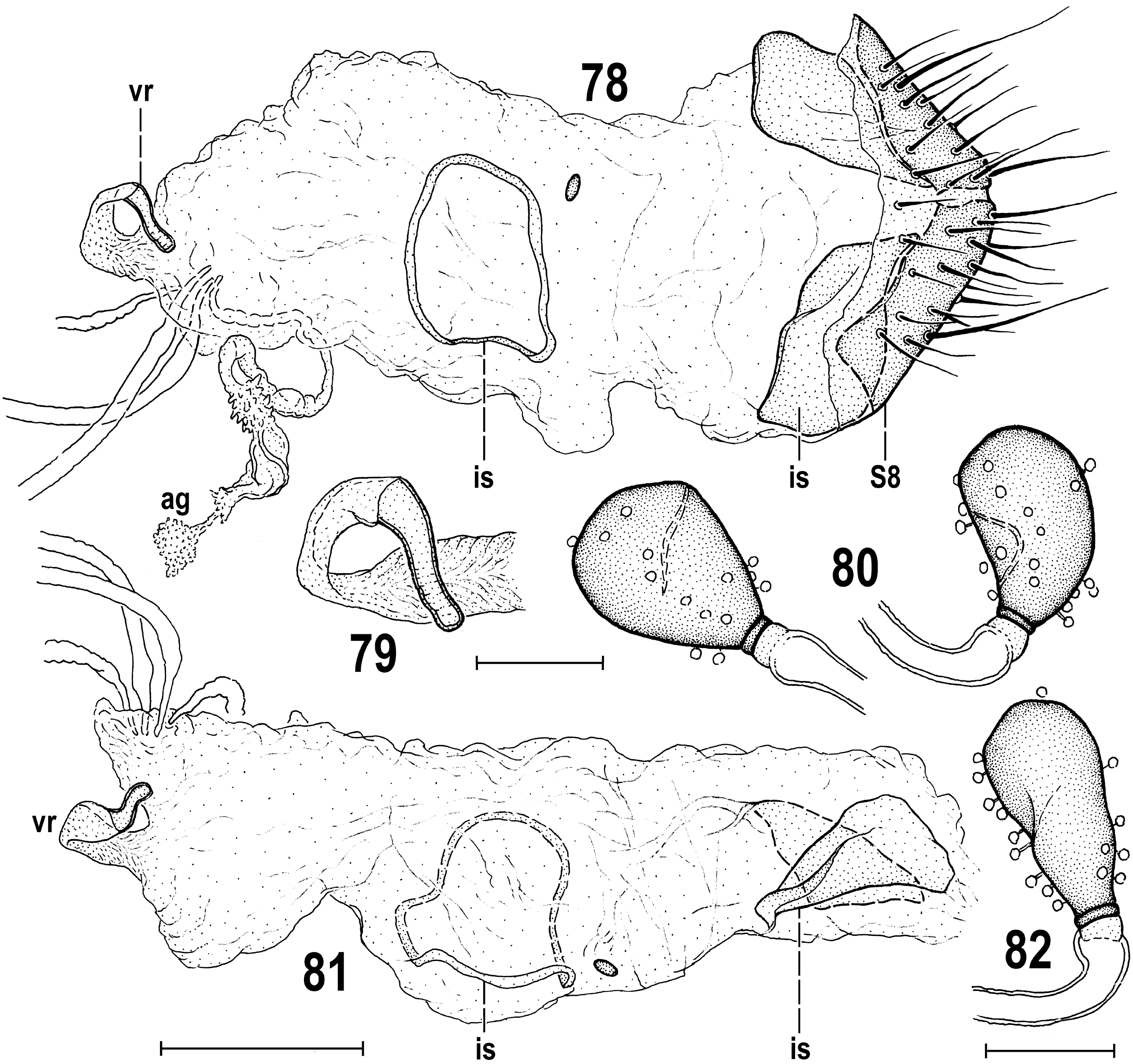
Description

Male. Total body length 1.67–1.98 mm (holotype 1.67 mm); body brown to blackish brown (Fig. 47), only head bicolourous, brown and whitish yellow; thorax and mesonotum very sparsely greyish microtomentose and shining.

Head (Fig. 49) somewhat higher than long, anteriorly and ventrally whitish yellow, dorsally and posteriorly brown to dark brown. Frons brown posteriorly, whitish yellow in anterior two-fifths. Frontal triangle almost equilateral and well delimited (Fig. 50), reaching to anterior two-fifths of frons and having anterior corner acute, all brown to dark brown, glabrous and glossy, including ocellar triangle that is almost black; ocellar triangle small and slightly elevated; ocelli relatively large (distance between them as long as diameter of ocellus) and oc inserted inside but close to margin of ocellar triangle. Frontal lunule very small, narrow and deeply depressed, yellowish white as is anterior margin of frons. Orbital plate well developed, rather narrow, anteriorly (up to anterior ors) whitish yellow and somewhat silvery-white microtomentose; posteriorly (between anterior ors and vte) contrastingly brown to dark brown and shining. Area between frontal triangle and dark part of orbital plate narrow, attenuated posteriorly, reaching up to vte, pale ochreous anteriorly but becoming gradually darker posteriorly, with silky silver surface microsculpture.

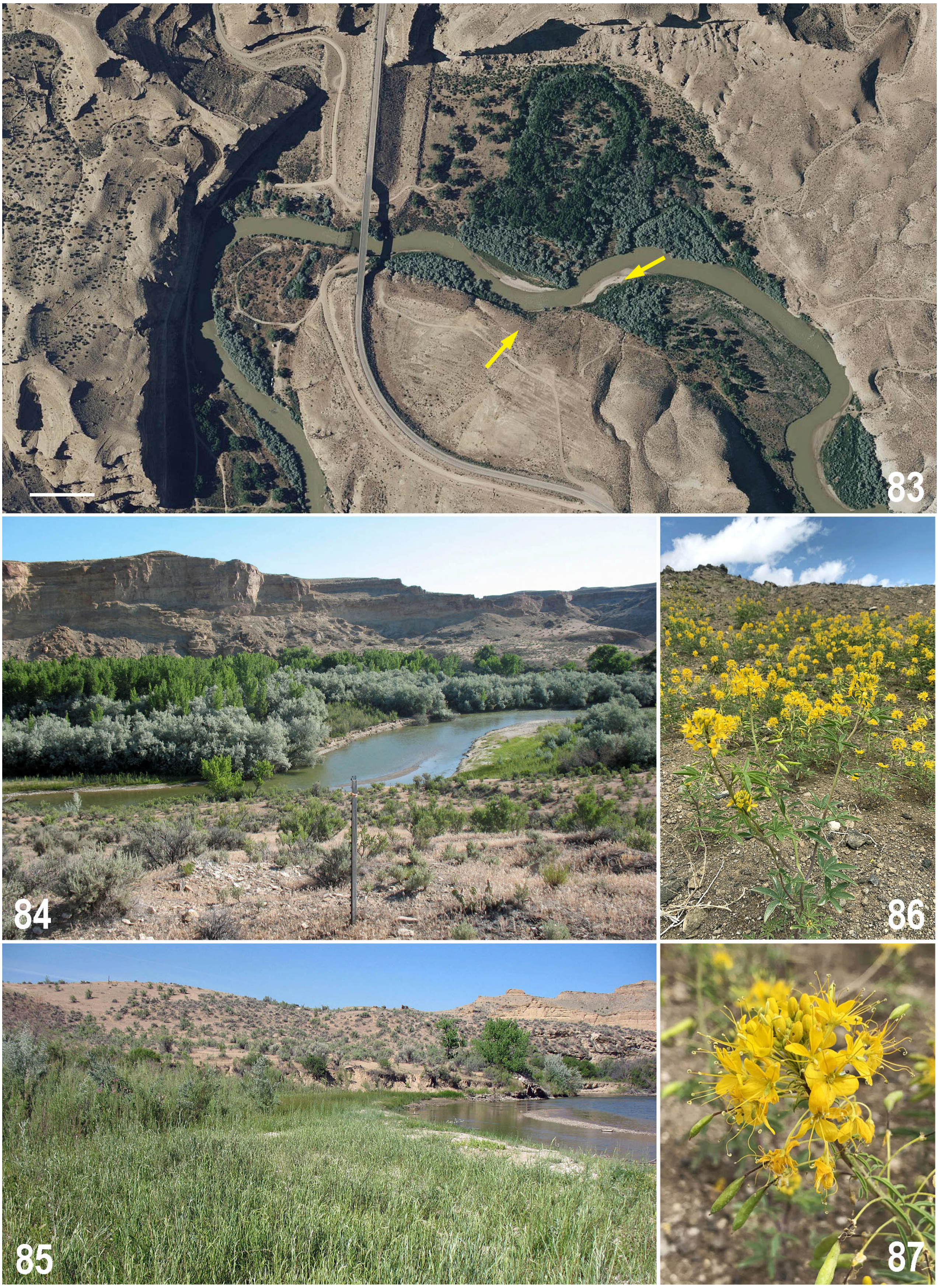


Figs 72–77. *Xerocomyza hansoni* sp. n., female paratype (U.S.A.: Utah: Bonanza), abdomen: 72 – base of abdomen (T1 and T2), dorsal; 73 – postabdomen, dorsal; 74 – ditto, ventral; 75 – ditto, left lateral; 76 – S10, ventral; 77 – S8, caudal (setosity omitted). Scales: Figs 76, 77 = 0.05 mm, others = 0.2 mm. For abbreviations see Material and methods.



Figs 78–82. *Xerocomyza hansoni* sp. n., female paratype (U.S.A.: Utah: Bonanza), internal genitalia: 78 – S8 and genital chamber, ventral; 79 – ventral receptacle, left lateroventral (widest extension); 80 – spermathecae; 81 – genital chamber, left lateral; 82 – spermatheca, in widest extension. Scales: Figs 78, 81 – 0.1 mm, others = 0.03 mm. For abbreviations see Material and methods.

Anterior third of frons dull whitish yellow and anteromedially somewhat depressed. Occiput concave, uniformly brown to dark brown, very sparsely grey microtomentose and shining. Face narrow and somewhat depressed medially, dirty pale yellow and rather dull. Parafacialia and gena yellow white and silvery-white microtomentose and both very narrowly bordered by dirty yellow marginal stripe; ventral part of postgena darker yellow, sparsely whitish microtomentose and sharply delimited from brown dorsal part of postgena and posteroventral part of occiput. Mouthparts small, dirty white, with pale yellow labellum; palpus yellowish white to white. Cephalic chaetotaxy (Figs 49, 50, 71): all macrosetae black, relatively strong and long, only pvt small, strongly convergent, but with apices not meeting medially; vti longest cephalic seta; vte and oc also long, slightly shorter than vte; oc proclinate and slightly divergent; 2 strong ors, posterior slightly shorter than vte, anterior distinctly shorter (about two-fifths of posterior); 1 dark setula in front of anterior ors; 1 pair of microsetulae more medially, in front of anterior corner of frontal triangle; vi long but somewhat shorter than posterior ors; subvibrissa distinct, half to three-fifths of vi length but weaker; about 2–4 short black peristomal setulae; postgena with a few small setulae and 2 dark setae in posteroventral corner; postocular setulae shorter than peristomals, sparse (about 5) but dark and distinct, in single short row in dorsal half of occiput; 1 inclinate microseta behind bases of vte and vti also present. Eye (Fig. 49) bare, without pilosity, broadly suboval; with longest (very slightly oblique, nearly vertical) diameter about 1.3 times as long as shortest; gena low, its shortest height about 0.1 times as long as shortest eye diameter. Palpus relatively short and slightly clavate, with



Figs 83–87. *Xerocomyza hansoni* sp. n., probable type locality and habitat: 83 – aerial photo of the probable type locality near bridge over the White River near Bonanza (U.S.A.: Utah), tips of arrows indicate position of photographer and direction in which images 84 and 85 were taken; 84 – valley of White River, probable habitat of the species; 85 – shore of White River, with low vegetation, including graminoids; 86 – growth of *Cleomella lutea* near Delta, Millard Co., Utah (U.S.A.); 87 – flowering *Cleomella lutea* is attractive to insects, including flies. Aerial photo source: https://mapy.cz/. Photo K.N. Barber (Figs 84, 85) and M. Reala (others).

a few dark microsetulae in addition to relatively long (as long as subvibrissa) and anteroventrally directed preapical seta. Antenna geniculate (Figs 49, 71), pale yellow, with 1st flagellomere yellowish white and laterally strongly compressed; anteroventral margin of 1st flagellomere with white cilia short but about twice longer than those of arista. Arista rather short, 1.7–1.8 times as long as antenna, with both basal segments (first thickened, second elongate) ochreous and bare; terminal part of arista brown and extremely short-ciliate (Fig. 49).

Thorax somewhat narrower than head, entirely dark brown dorsally (including notopleural area) to brown on pleuron (Fig. 47), only ventral corner of sternopleuron becoming gradually pale brown towards apex. Mesonotum with very sparse greyish microtomentum but only in anterior half, glabrous more posteriorly and shining to (posteriorly) glossy. Pleural part of thorax slightly less shining (on mesopleuron in particular) due to denser microtomentum. Thoracic chaetotaxy: 1 short hu (about as long as posterior npl) and no microsetae on humeral callus; 2 npl, anterior long, about 1.5 times as long as posterior npl; prs well developed, about as long as anterior npl (Fig. 49); 1 sa (somewhat shorter and weaker than prs) and 1 longer pa (as long as prs); 2 postsutural dc; anterior dc inserted in the middle between suture and posterior dc, thus far behind suture and rather variable in length (as long as to distinctly longer than prs); posterior dc very long (as long as or slightly shorter than apical sc); 5 or 6 relatively long dc microsetae in front of anterior dc; ac microsetae also relatively long but sparse, in 4 rows on suture, in 2 rows more posteriorly, never reaching the level of posterior dc; 2 sc, basal short and weak (about one-fourth of apical), apical very long (longest thoracic seta); 1 ppl, reduced to upcurved microseta; 2 stpl, anterior shorter and weak, posterior distinctly longer and robust; no microsetae below stpl but 2 or 3 paler curved setae in ventral corner of sternopleuron. Scutellum medium long, rounded triangular to trapezoidal, with distinctly convex and sparsely microtomentose disc; subscutellum well developed, bulging below scutellum (Fig. 49).

Legs yellow with coxae, trochanters, and most of tarsi usually paler to whitish yellow; only terminal segment of tarsi distally partly (fore tarsus) to largely (posterior tarsus) brown-darkened (Fig. 47). f_1 without ctenidial spine, but with usual posteroventral row of 5 or 6 long setae, that in distal fourth to third longest (cf. Fig. 54) and a similar row of shorter posterodorsal setae; fore basitarsus with 2 or more longer but fine and pale setulae ventrobasally (Fig. 56). f_2 with a pair of somewhat longer preapical posterior to posteroventral setae besides fine setosity; t_2 with short (not longer than maximum width of t_2) but distinct ventroapical seta and 2 small anteroapical setulae (Fig. 57). f_3 with a long row of posteroventral setae, 8–11 of which in distal half of femur more or less thickened and shortened (Fig. 55); hind basitarsus with 2 or 3 thickened ventrobasal setulae. Ratio t_2 : mt_2 = 1.85–1.94 (holotype 1.94).

Wing (Fig. 69) relatively short compared to body length (cf. Fig. 47). Wing membrane hyaline, with pale brown tinge, veins pale brown. C reaching to apex of R_{4+5}; Cs_2 with a row of sparse but distinct spinulae ending at about distal fourth of Cs_2. R_1 thick and short, with distinct preapical kink (fusion of Sc and R_1) on the level of subcostal break. R_{2+3} long, mostly bent subparallel to C, distally very slightly and shortly upcurved to it. R_{4+5} very slightly bent (recurved) and ending close to apex of wing. M almost straight, parallel to R_{4+5} and ending farther from apex of wing than does R_{4+5}. Cell dm relatively short and narrow, slightly widened distally. Cross-vein r-m situated near middle of cell dm. Cross-vein dm-cu only about half of length of terminal part of CuA_1. Basal (bm) and posterior cubital (cup) cells distinct but narrow. CuA_1 ending close to but not reaching wing margin; A_1 short and ending far from it. Anal lobe and alula well developed, the latter not narrowed, with apex rounded. Wing measurements: length 1.74–2.02 mm (holotype 1.74 mm), maximum width 0.57–0.62 mm (holotype 0.59 mm); Cs_3 : Cs_4 = 1.06–1.40 (holotype 1.18); r-m\dm-cu : dm-cu = 2.23–2.75 (holotype 2.23). Haltere with slightly darker (yellow or pale yellow) stem and lighter (yellowish white or dirty white) knob (Figs 47, 49).

Abdomen in dorsal view about as wide as thorax. Preabdominal terga brown to dark brown, sparsely grey microtomentose and shining but T3–T5 microtomentose only dorsally, laterally glabrous and glossy; T2–T5 relatively large and broad, bent far onto ventrolateral sides of abdomen, each with short and relatively strong but sparse setae (longest in posterolateral corners). T1 dorsally pale-pigmented (cf. Fig. 72), with only lateral parts brown, shorter and narrower than T2 and very shortly setulose. T1 and T2 almost completely separate, fused narrowly only dorsolaterally; T2 shorter and anteriorly narrower than T3; T3–T5 subequal in length, T3 and T4 also of the same width; T5 (Figs 51, 53) narrower than T4, posteriorly somewhat tapered, blackish brown except for small pale-pigmented posteromedial area, densely shortly setose. Preabdominal sterna pale brown to brown, relatively broad (hence pleural membrane narrowed), becoming (sequentially) wider posteriorly (S5 widest); S1 as broad as S2 but short, distinctly transverse and bare, being narrowly darkened along posterior margin; S3 about as long as broad, slightly wider posteriorly; S4 wider than S3 and wider than long, rounded trapezoidal; S5 largest and widest, distinctly wider than long and roughly trapezoidal (posteriorly wider) but anteriorly rounded (Fig. 52). S2–S5 finely and less densely setose than adjacent terga. Preabdominal spiracles very small and hidden under lateral margins of terga.

Postabdomen. T6 bare, short, transverse, very slightly asymmetrical (more tapered on left side), pale brown, having pigmentation medially distinctly interrupted (Fig. 53). S6–S8 strongly asymmetrical, blackish brown, with sclerites left dorsolaterally fused; S6 (Figs 51–53) relatively short and transverse, with strongly sclerotized and blackish brown anterior marginal ledge reaching up to dorsal fusion with S7, otherwise pale ochreous; S7 slightly longer (Fig. 51) than S6, dark brown but anteriorly simple, without dark marginal ledge; both S6 and S7 with 2 setae; 6th spiracle enlarged and situated in dorsolateral fusion of S6 and S7 (Fig. 51); S8 blackish brown, larger and longer than S7, situated dorsally but also distinctly asymmetrical (Figs 52, 53), with sparse (only 4 or 5) short but rather robust setae, situated mainly posteriorly.

Genitalia. Epandrium (Figs 58, 59) relatively small compared to internal genitalia, somewhat wider than high, moderately setose, with 2 or 3 dorsolateral setae more robust and longer than others; dorsal margin of epandrium convex; anal fissure (Fig. 59) oriented almost ventrally (Fig. 58), not large but relatively wide and low, transversely subtriangular, open ventrally. Cercus (Figs 58, 59, ce) large and pale (almost unpigmented), situated ventrally (below anal fissure), relatively long pale setose. Medandrium (Figs 59, ma) ventrally simple, but with distinct posteromedial keel and with dorsolateral corners slightly projecting laterally (Fig. 60). Gonostylus (Figs 58, 59, 61) unusually elongate and slender, longer than epandrium, projecting anteriorly, (in lateral view) slightly sinuate, apically pointed but not acute; surface of gonostylus without micropubescence but very finely and shortly setulose except for posterior third (cf. Fig. 61). Internal genitalia comparatively large. Hypandrium (Figs 62, 64) relatively long but not broad, almost straight in lateral view and with simple dorsal margin; internal hypandrial lobes (see Fig. 64) projecting dorsally but membranous and inconspicuous; anterior end of hypandrium deeply incised (Fig. 62), with membranous margin. Anterior medial swelling of hypandrium, where fulcrum of phallapodeme is inserted/connected, of distinctive structure in ventral view (see Fig. 62). Transandrium relatively narrow, medially slender (Figs 62, 64, ta), laterally extended, without typical medial caudal process but basal membrane (Figs 62–64, bm) laterally pigmented and finely micropubescent, medially hyaline and plain in dorsal two-thirds, and with inconspicuous pale transverse tubercles or flat spines in ventral third (Fig. 63). Pregonite (Figs 62, 64, prg) forming flat lobe completely fused with hypandrium, and carrying only 3 setae on inner side ventrally. Postgonite (Figs 62, 64, pg) unusually large but flat and pale-pigmented, projecting far ventrally and broadly rounded on apex, bare except for sensilla and 1 fine seta in the middle of its anterior margin. Aedeagal complex (Fig. 67). Phallapodeme relatively long, slender in lateral view, its symmetrical proximal half widened and flattened (somewhat similar to that of *Reliquantha variipes*, cf. Roháček, 2013: Fig. 12), with narrowly forked base (Fig. 68); its distal end simple, with slightly widened apex; fulcrum slender (Fig. 67, fc). Aedeagal part of folding apparatus (Fig. 67, afa) submembranous and pale-pigmented including surface structures represented internally by longitudinal striae, externally by crescent-shaped tubercles and apically by fine spinulae; connecting sclerite (Fig. 67, cs), on the contrary, distinctly pigmented and finely granulose, long, very slender and curved anteriorly. Phallophore short, compact, but posteriorly somewhat projecting ventrally (Fig. 67, pp) where acutely pointed. Anteriorly, it seems to be rather firmly fused with base of distiphallus. Basal part of distiphallus distinctly sclerotized, with darker bar-shaped sclerites of both base of saccus and base of filum. Saccus of distiphallus small (Fig. 67, s) dorsobasally sclerotized and finely granulated and provided with slender dark-pigmented lateral oblique sclerite in the middle reaching to reduced membranous part of saccus being distally little dilated and finely spinulose. Filum of distiphallus (Fig. 67, f) relatively short, composed of two ribbon-shaped sclerites (see Fig. 66) one of them ending distant from apex, the other terminating in apex; the apex largely membranous, narrowly funnel-shaped and having finely denticulate and spinulose margin (Fig. 65). Ejacapodeme well developed, with robust digitiform projection having knob-like apex (Figs 67, 68, ea).

Female (Fig. 70). Similar to male unless mentioned otherwise. Total body length 2.02–2.28 mm. Frons anteriorly slightly darker, yellow (Fig. 71). Orbital plate posteriorly, behind anterior ors often paler brown. 2 pairs of microsetulae in front of anterior corner of frontal triangle. Subvibrissa sometimes up to three-fourths of vibrissal length. Peristomal (5–6) and postocular (6–7) setulae more numerous. Antenna with 1st flagellomere darker, yellow to orange-yellow (Figs 70, 71). Mesonotum with prs and dc macrosetae longer than in male; anterior dc particularly longer, up to three-fourths of the posterior; mesonotal microsetae more numerous; ac microsetae often in 4 rows also behind anterior dc pair. Sternopleuron with anterior stpl more robust, sometimes almost as thick as posterior stpl, but always distinctly shorter than the latter. Ventroapical seta on t_2 hardly longer than in male; f_3 lacking thickened shortened setae in posteroventral row, uniformly shortly setulose. Ratio $t_2 : mt_2$ = 1.84–1.90. Wing larger and wider than in male on average. Wing measurements: length 2.10–2.32 mm, width 0.69–0.85 mm; $Cs_3 : Cs_4$ = 1.10–1.32; r-m\dm-cu : dm-cu = 2.13–3.35.

Abdomen wider than in male, with preabdominal terga T2–T5 wider and more transverse but with the same pattern of sparse microtomentum. T1 dorsally pale ochreous but laterally brown; T2 dark brown or brown but anteromedially more or less lightened (Fig. 72); T3–T5 uniformly dark brown. T1 smallest and narrowest of preabdominal terga but subequal in length to T2. T2 narrower and shorter than T3; T3–T5 subequal in length T3 and T4 widest, T5 slightly narrower than T4 and somewhat tapered posteriorly. Preabdominal sterna pale brown to brown as in male but generally somewhat narrower. S1 short, transverse and bare as in male. S2–S5 becoming very slightly wider posteriorly. S2 distinctly shorter and more transversely suboblong than S3, anteromedially somewhat emarginated and paler-pigmented; S3 and S4 slightly wider than long, suboblong. S5 as long as broad, more distinctly rounded anteriorly and laterally, thus in shape and size more similar to S6. Setosity of preabdominal terga and sterna as in male.

Postabdomen broad and short (Figs 73–75). T6 narrower than T5 but almost of the same length, thus rather large, transversely trapezoidal (tapered posteriorly), dark brown except for short posteromedial pale-pigmented marginal area (see Fig. 73), with dense, short but relatively robust setae, longest in posterior corners. 6th spiracle situated close to ventral margin of T6 (cf. Fig. 74). S6 narrow, about as long as broad, subtrapezoidal (wider posteriorly) but with all sides rounded, brown but paler than T6 or S7 and with posterior marginal area unpigmented (Fig. 74); surface of S6 with sparse and fine setae (longest at posterior margin) in posterior two-thirds. T7 and S7 separate (Fig. 74) but pleural membrane between them narrow and covered by enlarged microtomentum, particularly anteriorly. T7 dorsomedially divided but with both parts closely attached, dark brown with dorsal parts pale-margined (Fig. 73), laterally reaching far ventrally (Fig. 75), having 7th spiracle embedded near anteroventral corner (Fig. 74) and rich short setosity in posterior two-thirds (see Fig. 75). S7 smaller and darker (in anterior two-thirds) than S6 (Fig. 74), wider anteriorly, anteromedially shallowly emarginate and with anterior corners rounded but somewhat projecting, posteriorly tapered and lighter, with posterior margin straight; setae restricted to posterior half of S7, relatively fine, longest 2 or 3 posterolaterally; microtomentum sparse but enlarged and covering dark anterior two-thirds of S7. T8 dark brown, subpentagonal, with anteromedial corner projecting (Fig. 73), entirely without micropubescence and with only 3 or 4 fine setae posterolaterally. S8 (Figs 74, 75, 77) short, anteriorly rounded with poorly delimited margin, posteromedially narrowly deeply incised (this only visible in caudal view, see Fig. 77) and posteriorly with both lateral parts bent dorsally to anteriorly forming internal lobes, all finely but relatively long setose and micropubescent (see also Fig. 78). Internal structures of genital chamber (Figs 78, 81) weakly sclerotized and very pale-pigmented, poorly visible, formed by a pair of flat crooked posterior sclerites being attached to internal lobes of S8 and by 1 slender pale-pigmented, simple but asymmetrical annular sclerite (Figs 78, 81) situated in the middle of ventral side of genital chamber. Ventral receptacle (Figs 78, 81, vr) small but longer than in species of the *Chamaebosca* lineage, elongately but slightly sinuate subconical, with apex rounded, very weakly sclerotized and pale-pigmented, set on twice longer, curved, proximally widened membranous duct (see Fig. 79). Remnant of accessory gland small (Fig. 78, ag), formed by a granulous stalked bunch of tissue and follicles on apex of variously formed and structured duct (very slender proximally, widened and modified more distally). Spermathecae (1+1) shortly subpyriform but somewhat flattened (cf. Figs 80, 82), blackish brown, each having very short basal collar and short pale duct cervix, and plain unarmed surface, carrying numerous hyaline stalked globuli. T10 (Fig. 73) small, roughly hexagonal, only slightly transverse, very pale-pigmented, bare, with only 2 long, rather closely arising, dorsomedial setae. S10 not larger than T10, resembling a transverse rhombus having anterior margin rounded and posteromedial corner acute and pale (Fig. 76), largely micropubescent except for anterior marginal area and with rather long fine sinuous setae in posterior half. Cerci of medium length and thickness (Figs 73–75, ce), with rich and relatively long setae (sinuous or curved, longest apical, dorsopreapical and lateral ones) and very fine micropubescence.

Type material. Holotype ♂ labelled: "UTAH Uintah Co | Bonanza | VIII.30.75 | G. E. Bohart" (printed except for handwritten date), "on | Cleome | lutea" (printed) and "Holotypus ♂ | *Xerocomyza* | *hansoni* sp.n. | J. Roháček & | K.N. Barber det. 2023" (red label, printed), deposited in LACM. The specimen was intact (see Fig. 47) but its legs were damaged during description (see Fig. 48). Paratypes: UNITED STATES OF AMERICA: Utah: Uintah Co., Bonanza, 14.vii.1975, 2♂ 3♀ (2♂ 1♀, genit. prep., 1♂ wing photo, Fig. 69), on *Cleome lutea*, 1♀ (intact, Fig. 70), 30.viii.1975, 1♀ (genit. prep.), on *Cleome lutea*, 1♂, all G.E. Bohart leg. (all LACM but 1♂ 1♀ with genit. prep. deposited in SMOC); Juab Co., 5 mi SW Callao, 14–16.vi.1984, 1♀, Hanson, Keller leg.; Millard Co., Delta, 2.vii.1968, 1♀, G.F. Knowlton leg.; [Duchesne Co.], Myton, 12.viii.1965, G.F. Knowlton, 1♀ (all LACM). Most paratypes more or less damaged on head, legs and/or wings, only two females (one from Bonanza, Fig. 70, other from Callao) are in good condition. All paratypes with "Paratypus ♂ [or ♀] | *Xerocomyza* | *hansoni* sp.n. | J. Roháček & | K.N. Barber det. 2023" (yellow label, printed).

Type locality. U.S.A., Utah, Uintah Co., Bonanza.

Etymology. The new species is named "hansoni" to acknowledge the kind assistance of the late Wilford (Will) J. Hanson (1927–2013) who had arranged the original loan of material of Anthomyzidae from Utah State University and provided information about the collection localities for this species.

Systematic discussion. *Xerocomyza hansoni* sp. n. is easily distinguished from (almost all) other Nearctic Anthomyzidae by the absence of the ctenidial spine on the fore femur. Only *Stiphrosoma sabulosum* (Haliday, 1837) has the fore femur without this spine (cf. Roháček & Barber, 2005) but this species is usually strongly brachypterous and its (infrequent) macropterous form has the wing with at least the dm-cu lacking. Moreover, *S. sabulosum* has an ellipsoid eye with the longest diameter distinctly oblique and the arista shortly but distinctly pectinate while in *X. hansoni* the maximum eye diameter is nearly vertical and the arista extremely shortly ciliate. The new species is also distinct in structures of the male genitalia (e.g., elongate, anteriorly directed gonostylus or large, projecting postgonite) and the female postabdomen (e.g., simple spermathecae with plain surface but with short basal collar, small but distinctive ventral receptacle). For more detail see discussion above under the genus *Xerocomyza*.

Distribution. The species is known only from four localities in mid- to north-latitude Utah (U.S.A.): Callao (Juab County, near the Nevada border) in the west, Delta (Millard County) in the midwest, and Myton (Dushesne County) and Bonanza (Uintah County, very near the Colorado border) in the northeast. Altitudes are collectively estimated to be about 1450–1550 m a.s.l. (Google Earth Pro ver. 7.3.6.9345, December 29, 2022; accessed 1 May 2023).

Biology. Only label data from the 12 type specimens examined are available. All specimens were collected in high desert landscapes with rivers or creeks near the presumed collection sites (confirmed by W.J. Hanson for the Callao site). Nine specimens (4 males, 5 females) were collected by the late George E. Bohart (apoid/pollination specialist) in 1975 at the type locality (Uintah Co.: Bonanza); interestingly three of them (2 males, 1 female) on the (obviously flowering) plant, *Cleomella lutea* (Hook.) Roalson & J.C.Hall (Cleomaceae) (Figs 86, 87, also see Roalson et al., 2015 for botanical taxonomy). The occurrence dates across all 12 specimens range from 14–16 June to 30 August. On a collecting trip to Utah in June 2018, the junior author searched specifically for this species but only found its most probable habitat and type locality along the White River, about 5 km S of Bonanza (Figs 83–85). This was a relatively short period of time (12–17 June) spent in areas representing potential habitat of *X. hansoni* and of *C. lutea*, including the environs of three of the known collection sites, i.e., Bonanza, Myton, and Delta. It might have been too early for the peak of the flight period of the flies – the earliest collection record is 14–16 June (Callao). The absence of *C. lutea*, a plant with a flowering period running from May to August in eastern Utah (Goodrich & Huber, 2016, see also Figs 86, 87 dated 9 May 2022) is probably explained by drought conditions which might also have contracted the habitat of *X. hansoni* or modified the behaviour of the flies. We do not consider *C. lutea* to be a larval host plant but only an adult forage (nectar and pollen) plant for *X. hansoni*.

ACKNOWLEDGEMENTS. It is an agreeable duty to thank the following curators and/or owners of collections who kindly arranged loans of specimens (including types) under their care for our study: M. Barták (MBPC), S. Boucher and the late T.A. Wheeler (LEMQ), B.V. Brown, G.-A. Kung (LACM), R. Davidson, J.E. Rawlins (CMNH), Z.H. Falin (SEMC), B.L. Fisher, K.J. Ribardo and the late N.D. Penny (CASC), the late A. Freidberg (TAUI), S. Gaimari, J. Airoso (CSCA), K. Goodger, E. McAlister, D. Whitmore (BMNH), D.A. Grimaldi, L. Thayer, T.C. Nguyen (AMNH), M. Kotrba (ZSMC), E.R. Loebeke (UGCA), B.J. Sinclair, O. Lonsdale, J.H. Skevington, J.E. O'Hara, J.M. Cumming (CNCI), C.J. Marshall, D.D. Judd (OSAC), T.C. McElrath (INHS), A.L. Norrbom, A. Seemann, F.W. Shockley, W.N. Mathis, P. Gentili-Poole, D. Furth (USNM), P.T. Oboyski, C.B. Barr (EMEC), S.M. Paiero, S.A. Marshall (DEBU), T.L. Schiefer (MEMU), J.E. Swann (BDUC). J.F. Gibson (RBCM), M.A. Ivie (MTEC) and D.F. McAlpine (NBMB) agreed to house representative specimens of *Mumetopia occipitalis*. The late B.A. Foote (Kent State University, Kent, Ohio), J. Pitts and the late W.J. Hanson (Utah State University, Logan, Utah) and M. v. Tschirnhaus (Universität Bielefeld, Bielefeld, Germany) were the sources of, or facilitated access to, specimens now deposited at CMNH, LACM and ZSMC, respectively. W.J. Crins and B. Feilders (Ontario Ministry of Natural Resources, Peterborough, Canada) are thanked for authorizing field collections in provincially protected areas. S.J. Meades [Northern Ontario Plant Database, c/o Herbarium, Great Lakes Forestry Centre (GLFC), Sault Ste. Marie, Canada] kindly provided assistance with all things botanical. W.J. Crins also kindly provided valuable identificatons of *Carex* specimens. C.R. Nelson and S.M. Clark (Brigham Young University, Provo, Utah) are thanked for advice on searching for the type locality of *Xerocomyza hansoni* and suggesting other collection sites in Utah. D. Schaad and D. Penttila (Ouray National Wildlife Refuge, Randlett, Utah) are thanked for arranging a collection permit and advice on habitats at the Ouray NWR. K. Schulz (Washington, D.C., U.S.A.) and M. Reala (Middlebury, Vermont, U.S.A.) are cordially thanked for permission to use their photos of living *Mumetopia occiptalis* and the flowering *Cleomella lutea* from Utah, respectively (via https://www.inaturalist.org.). The junior author's contributions benefited from in-kind support from Natural Resources Canada, GLFC, in the form of the use of laboratory space and equipment. The study of the senior author was financially supported by the Ministry of Culture of the Czech Republic with institutional financing of long-term conceptual development of the research institution (the Silesian Museum, MK000100595).

REFERENCES

Barber K.N. & Roháček J. 2010: 81. Anthomyzidae (Anthomyzid flies). In Brown B.V., Borkent A., Cumming J.M., Wood D.M., Woodley N.E. & Zumbado M.A. (eds): *Manual of Central American Diptera. Vol. 2.* NRC Research Press, Ottawa, pp. 1073–1081.

Barber K.N. & Roháček J. 2020: Revision of *Carexomyza* Roháček with descriptions of three new Nearctic species (Diptera: Anthomyzidae). — *Arthropod Syst. Phylogeny* **78**: 69–109.

Batra S.W.T. 1979: Insects associated with weeds in the northeastern United States. III. Chickweed, *Stellaria media*, and Stitchwort, *S. graminea* (Caryophyllaceae). — *J. N. Y. Entomol. Soc.* **87**: 223–235.

Beisler J.M., Pienkowski R.L., Kok L.T. & Robinson W.H. 1977: Insects associated with three weedy grasses and yellow nutsedge. — *Environ. Entomol.* **6**: 455–459.

Cleveland M.L. & Hamilton D.W. 1958: The insect fauna of apple trees in southern Indiana, 1956 and 1957. — *Proc. Indiana Acad. Sci.* **68**: 205–217.

Cole F.R. 1969: *The Flies of Western North America (with the Collaboration of Evert I. Schlinger)*. University of California Press, Berkeley, xiv + 694 pp.

Cumming J.M. & Wood D.M. 2009: 2. Adult morphology and terminology. In Brown B.V., Borkent A., Cumming J.M., Wood D.M., Woodley N.E & Zumbado M.A. (eds): *Manual of Central American Diptera. Vol. 1*. NRC Research Press, Ottawa, pp. 9–50.

Cumming J.M. & Wood D.M. 2017: 2. Adult morphology and terminology. In Kirk-Spriggs A.H. & Sinclair B.J. (eds): *Manual of Afrotropical Diptera. Vol. 1. Introductory Chapters and Keys to Diptera Families. Suricata Vol. 4*. SANBI Publishing, Pretoria, pp. 89–133.

Curran C.H. 1934: *The Families and Genera of North American Diptera. 1st ed.* American Museum of Natural History, The Ballou Press, New York, 512 pp.

Curran C.H. 1965: *The Families and Genera of North American Diptera. 2nd rev. ed.* Henry Tripp, Woodhaven, 515 pp.

Dowdy W.W. 1950: A community study of an oak-hickory association with special reference to invertebrates. — *Am. Midl. Nat.* **43**: 667–695.

Ferrar P. 1987: *A Guide to the Breeding Habits and Immature Stages of Diptera Cyclorrhapha. Entomonograph 8 (pt. 1 and pt. 2).* E.J. Brill/Scandinavian Science Press, Leiden, Copenhagen, 907 pp.

Foote B.A. 2004: Acalyptrate Diptera associated with stands of *Carex lacustris* and *C. stricta* (Cyperaceae) in northeastern Ohio. — *Proc. Entomol. Soc. Wash.* **106**: 166–175.

Frey R. 1958: Zur Kenntnis der Diptera brachycera p.p. der Kapverdischen Inseln. — *Soc. Sci. Fenn., Comment. Biol.* **18**(4): 1–61.

Glick P.A. 1957: Collecting insects by airplane in southern Texas. — *U. S. Dept. Agric. Tech. Bull.* **1158**: 1–28.

Glick P.A. & Noble L.W. 1961: Airborne movement of the Pink Bollworm and other arthropods. — *U. S. Dept. Agric. Tech. Bull.* **1255**: 1–20.

Goodrich S. & Huber A. 2016: *Uinta Flora: A Guide to the Vascular Plants of the Uinta Basin and Uinta Mountains.* Edited by S.W. Chadde. Pathfinder, U.S.A., iv + 636 pp.

Grégoire-Taillefer A. 2016: *Phylogenetic, Taxonomic, and Functional Diversity of Wetland Diptera Communities*. MSc thesis, McGill University, Montreal, Québec, xvi + 153 pp.

Griffiths G.C.D. 1972: *The Phylogenetic Classification of Diptera Cyclorrhapha with Special Reference to the Structure of the Male Postabdomen*. Dr. W. Junk N.V., The Hague, 340 pp.

Johnson C.W. 1925: List of the Diptera or two-winged flies. Fauna of New England, Part 15. — *Occ. Papers Boston Soc. Nat. Hist.* **7**: 1–326.

Kailing M. 2018: *Trophic Interactions and Niche Partitioning within a Post-white-nose Syndrome Temperate Bat Community.* MSc thesis, Murray State University, Murray, Kentucky, viii + 64 pp. https://digitalcommons.murraystate.edu/etd/106

Kilpatrick J.W. & Schoof H.F. 1956: Fly production in treated and untreated privies. — *Public Health Rep. (1896)* **71**: 787–796.

Marshall S.A., Buddle C.M., Sinclair B.J. & Buckle D.J. 2001: Spiders, flies and some other arthropods of the Fathom Five National Marine Park islands and the upper Bruce Peninsula. In Parker S. & Munawar M. (eds): *Ecology, Culture and Conservation of a Protected Area: Fathom Five National Marine Park, Canada. Ecovision World Monograph Series*. Backhuys, Leiden, pp. 191–229

Melander A.L. 1913: A synopsis of the dipterous groups Agromyzinae, Milichiinae, Ochthiphilinae and Geomyzinae. — *J. N. Y. Entomol. Soc.* **21**: 283–300.

Mitchell A.B. 2019: *The Restructuring of Arthropod Trophic Relationships in Response to Plant Invasion.* PhD thesis, University of Delaware, Newark, xiv + 346 pp.

Roalson E.H., Hall J.C., Riser II J.P., Cardinal-McTeague W.M., Cochrane T.S. & Sytsma K.J. 2015: A revision of generic boundaries and nomenclature in the North American cleomoid clade (Cleomaceae). — *Phytotaxa* **205**: 129–144.

Roháček J. 1993: Two new Afrotropical genera of Anthomyzidae (Diptera), with descriptions of seven new species. — *Ann. Natal Mus.* **34**: 157–190.

Roháček J. 1998: Taxonomic limits, phylogeny and higher classification of Anthomyzidae (Diptera), with special regard to fossil record. — *Eur. J. Entomol.* **95**: 141–177.

Roháček J. 2004: Revision of the genus *Amygdalops* Lamb, 1914 (Diptera, Anthomyzidae) of the Afrotropical Region. — *Afr. Invertebr.* **45**: 157–221.

Roháček J. 2006: A monograph of Palaearctic Anthomyzidae (Diptera) Part 1. — *Čas. Slez. Muz. Opava (A) (Suppl. 1)* **55**: 1–328.

Roháček J. 2009: A monograph of Palaearctic Anthomyzidae (Diptera) Part 2. — *Čas. Slez. Muz. Opava (A) (Suppl. 1)* **58**: 1–180.

Roháček J. 2013: *Reliquantha variipes* gen. & sp. nov., a peculiar new taxon of Anthomyzidae (Diptera) from Great Britain with uncertain relationships. — *Acta Entomol. Mus. Natn. Pragae* **53**: 793–814.

Roháček J. 2014: The identity and family affiliation of *Scelomyza hirticornis* (Diptera: Opomyzidae, Anthomyzidae), with a new checklist of Afrotropical Anthomyzidae. — *Acta Entomol. Mus. Natn. Pragae* **54**: 383–398.

Roháček J. 2018: First Anthomyzidae (Diptera) from China: a new genus, six new species and new records. — *Acta Entomol. Mus. Natn. Pragae* **58**: 35–76.

Roháček J. 2021a: New species and records of Anthomyzidae (Diptera) from the East Palaearctic, with a checklist of taxa occurring in the area. — *Acta Entomol. Mus. Natn. Pragae* **61**: 261–288.

Roháček J. 2021b: 87 Anthomyzidae (anthomyzid flies). In Kirk-Spriggs A.H. & Sinclair B.J. (eds): *Manual of Afrotropical Diptera. Vol. 3. Brachycera – Cyclorrhapha, Excluding Calyptratae. Suricata Vol. 8.* South African National Biodiversity Institute, Pretoria, pp. 1939–1956.

Roháček J. & Barber K.N. 2004: A new species of the genus *Fungomyza* from the Nearctic Region (Diptera: Anthomyzidae). — *Čas. Slez. Muz. Opava (A)* **53**: 131–141.

Roháček J. & Barber K.N. 2005: Revison of the New World species of *Stiphrosoma* Czerny (Diptera: Anthomyzidae). — *Beitr. Entomol.* **55**: 1–107.

Roháček J. & Barber K.N. 2009: New reduced-winged species of *Mumetopia* Melander, with analysis of the relationships of this genus, *Chamaebosca* Speiser and allied genera (Diptera: Anthomyzidae). — *Acta Soc. Zool. Bohem.* **72**[2008]: 191–215.

Roháček J. & Barber K.N. 2011: *Quametopia*, a new genus of Nearctic Anthomyzidae (Diptera), with description of two new species, immature stages and life history. — *Eur. J. Entomol.* **108**: 287–326.

Roháček J. & Barber K.N. 2013: A worldwide review of the genus *Arganthomyza* Roháček, with revision of the Nearctic species (Diptera: Anthomyzidae). — *Zootaxa* **3604**: 1–72.

Roháček J. & Barber K.N. 2016: Nearctic Anthomyzidae: a monograph of *Anthomyza* and allied genera (Diptera). — *Acta Entomol. Mus. Natn. Pragae (Suppl.)* **56**: 1–412.

Roháček J. & Tóthová A. 2014: Morphology versus DNA – what will bring clarity to the relationships of phylogenetically unclear genera of Anthomyzidae (Diptera)? — *Arthropod Syst. Phylogeny* **72**: 165–176.

Roháček J. & Tóthová A. 2021: *Mumetopia interfeles* sp. nov., a new species of Anthomyzidae (Diptera) occurring en masse in an urban grassy habitat in Chile: its taxonomy, phylogeny and biology. — *Eur. J. Taxon.* **731**: 135–158.

Roháček J., Petráková L. & Tóthová A. 2019: Molecular phylogeny and timing of evolution of *Anthomyza* and related genera (Diptera: Anthomyzidae). — *Zool. Scripta* **48**: 745–760.

Sabrosky C.W. 1965: Family Anthomyzidae. In Stone A., Sabrosky C.W., Wirth W.W., Foote R.E. & Coulson J.R. (eds): *A catalog of the Diptera of America North of Mexico. Agriculture Handbook 276*. USDA, Washington, pp. 819–820.

Sparks A.N., Jackson R.D., Carpenter J.E. & Muller R.A. 1986: Insects captured in light traps in the Gulf of Mexico. — *Ann. Entomol. Soc. Am.* **79**: 132–139.

Stoner A., Bryand D.E. & Drew W.A. 1962: A partial inventory of insect populations in tallgrass prairie pastures in north central Oklahoma. — *Proc. Oklahoma Acad. Sci.* **42**: 143–157.

Sturtevant A.H. 1918: Acalypteræ (Diptera) collected in Mobile County, Alabama. — *J. N. Y. Entomol. Soc.* **26**: 34–40.

Sturtevant A.H. 1926: The seminal receptacles and accessory glands of the Diptera, with special reference to the Acalypterae. — *J. N. Y. Entomol. Soc.* **34**: 1–21, Plates I–III.

Sturtevant A.H. 1954: Nearctic flies of the family Periscelididae (Diptera) and certain Anthomyzidae referred to the family. — *Proc. U. S. Natn. Mus.* **103**: 551–561.

Telfer A.C., Young M.R., Quinn J., Perez K., Sobel C.N., Sones J.E., Levesque-Beaudin V., Derbyshire R., Fernandez-Triana J., Rougerie R. et al. 2015: Biodiversity inventories in high gear: DNA barcoding facilitates a rapid biotic survey of a temperate nature reserve. — *Biodiv. Data J.* **3**: e6313, 176 pp.

Vlach J., Lambdin P., Dilling C., Grant J., Paulsen D. & Wiggins G. 2010: Diversity of the insect fauna within the unique sinking pond habitat in middle Tennessee. — *J. Tenn. Acad. Sci.* **85**(3–4): 62–86.

Vockeroth J.R. 1987: 75. Anthomyzidae. In McAlpine J.F., Peterson B.V., Shewell G.E., Teskey H.J., Vockeroth J.R. & Wood D.M. (eds): *Manual of Nearctic Diptera Vol. 2. Agriculture Canada Monograph No. 28.* Agriculture Canada Research Branch, Ottawa, pp. 887–890.

Vockeroth J.R. 1989: 72. Family Anthomyzidae. In Evenhuis N.L. (ed.): *Catalog of Diptera of the Australasian and Oceanian Regions*. Bishop Museum Press and E. J. Brill, Honolulu, p. 548.

Wheeler A.G., Jr. 1973: Studies on the arthropod fauna of alfalfa. IV. Species associated with the crown. — *Can. Entomol.* **105**: 353–366.

Woodley N.E. & Hilburn D.J. 1994: The Diptera of Bermuda. — *Contr. Am. Entomol. Inst.* **28**(2): 1–64.

Wray D.L. 1967: *Insects of North Carolina. Third Supplement.* North Carolina Department of Agriculture, Raleigh, 181 pp.

Zatwarnicki T. 1996: A new reconstruction of the origin of eremoneuran hypopygium and its implications for classification (Insecta: Diptera). — *Genus (Wrocław)* **7**: 103–175.

Received June 2, 2023; revised and accepted July 4, 2023
Published online July 25, 2023

APPENDIX

Mumetopia occipitalis Melander, 1913

Other material examined (1074♂ 1072♀): **BERMUDA** (all specimens include "ALMelander Collection 1961" and "det. Woodley 1992", one exception noted below): Paget Parish, Paget Marsh, 15.xi.1987, 1♀; Pembroke Par[ish], Admiralty House Park, 15.xi.1987, 1♀; Smith's Par[ish], Spittal Pond, 18.xi.1987, 1♂ 1♀, all D.J. Hilburn & N.E. Woodley leg. (all USNM); same locality but 32°19´N, 64°43´W, 29.v.1991, 1♀, N.E. Woodley leg. (USNM, genit. prep.); St. Georges, 23.i.1934, 1♂ 1♀, 28.i.1934, 1♂ (genit. prep., wing photo, Fig. 6, missing right wing, right foreleg, and head), 3.ii.1934, 1♂, A.L. Melander leg. (USNM); St. George, 1.ii.1934, 6♂ 1♀ (1♂ habitus photo, Fig. 2, 1♂ head damaged, wing missing, 1♀ habitus photo, Fig. 21, det. Woodley 1987), 3.ii.1934, 3♂ 2♀ (includes <u>*triple mount*</u>: 1♂ (bottom specimen) missing tip of abdomen, hind legs and part of right middle leg, 1♀ (middle specimen), 1♀ (top specimen) missing abdomen, wings, left hind leg and part of left middle leg), A.L. Melander leg. (USNM). **CANADA: Manitoba:** near LaSalle, La Barriere Park, sweep vegetation near river, 15.vi.1999, 4♂ 2♀ (LEM-0040673–78, 1♂ genit. prep.), S. Boucher leg.; same locality, sweep, oak savannah near river, 15.vi.1999, 2♂ (LEM-0040671, -672), J. Perusse leg.; same locality but 49°43.2´N 97°10.7´W, sweep in oak savannah near river, 15.vi.1999, 1♂ 1♀ (LEM-0040652, -680), S. Boucher leg., (all LEMQ); 50 km W Winnipeg, Elm Creek, 49°40´N 98°00´W, sweep agricultural field, 16.vi.1999, 3♂ 3♀ (LEM-0040635–40), T.A. Wheeler leg. (LEMQ, 1♂ genit. prep.); Winnipeg, St. Charles Rifle Range, Arrowhead block, 49°54.6´N 97°20.5´W, sweep in tallgrass prairie, 11.vi.1999, 1♂ (LEM-0040649), S. Boucher leg., 1♂ (LEM-0040653), V. Crecco leg., 2♀ (LEM-0040658, -681), T.A. Wheeler leg.; same locality but lacking "Arrowhead block", Malaise trap in tallgrass prairie, 31.viii.–6.ix.2000, 1♀ (LEM-0040685), R.E. Roughley leg. (all LEMQ). **Ontario:** Algonquin P. Pk., nr. Cranjelly Lake, 45.2872°N 78.2801°W, Malaise trap, hardwood forest, canopy gap (CJ-GAP), 21.vi.–??.2008, 1♀; same locality, nr. Crossbar Lake, 45.3271°N 78.2990°W, Malaise trap, hardwood forest, canopy gap (CR-GAP), 21.vi.–4.vii.2008, 1♂, 4–17.vii.2008, 1♀; same locality, nr. Florence Lake, 45.4430°N 78.4903°W, Malaise trap, hardwood forest (FL-MAT), 31.v.–14.vi.2008, 1♂ 1♀; same locality but 45.4437°N 78.4901°W, Malaise trap, hardwood forest, canopy gap (FL-GAP), 31.v.–14.vi.2008, 3♀, 14–28.vi.2008, 1♀; same locality, nr. Madawaska Lake, 45.3261°N 78.3056°W, Malaise trap, hardwood forest, canopy gap (MD-GAP), 21.vi.–4.vii.2008, 1♀; same locality, 2 km E Pondweed Lake, 45.4654°N 78.4298°W, Malaise trap, hardwood forest (LF-MAT), 4–19.vi.2008, 1♀; same locality but 45.4649°N 78.4307°W, Malaise trap, hardwood forest, canopy gap (LF-GAP), 19.vi.–8.vii.2008, 1♂ 1♀; same locality, nr. Sitting Duck Lake, 45.4522°N 78.4713°W, Malaise trap, hardwood forest (SD-MAT), 19.vi.–8.vii.2008, 1♀, all E. Proctor leg. (all DEBU); Algonquine, mixed wood, 1.vi.1991, 2♂ 1♀; Beaver Bay, mixed wood nr. river, 31.v.1991, 1♂, all [M.] Barták leg. (all MBPC); Belle River, in grass, 11.viii.1997, 1♀, C.S. Onodera leg. (DEBU); Bruce Co., Cabot Head, 45°14.43´N 81°17.67´W, sweeps, meadow graminoids, 29.viii.2004, 2♀, K.N. Barber leg.; Bruce Co., Dorcas Bay, 26.ix.1999, 1♂ (debu00076333); same locality, dune, Malaise, 19–20.vi.1999, 1♂ (debu00082299), both S.A. Marshall leg.; Bruce Co., FON [Federation of Ontario Naturalists] alvar nr. Dyers Bay Rd. & Hwy 6, sweep, 31.v.2000, 2♀ (debu00078967, -985), C.S. Onodera leg.; Bruce Co., Crane River & Hwy #6, sweep, 23.vi.1995, 1♀ (debu00075283), S.A. Marshall leg.; Bruce Co., Hwy #6 @ Crane River, 45°08.91´N 81°28.30´W, sweeps, *Carex aquatilis*, 22.vi.2008, 2♂ 6♀, K.N. Barber leg.; Bruce Co., Hwy #6 @ Willow River, 45°10.39´N 81°31.23´W, sweeps, mostly *Carex*, *Equisetum*, 21.vi.2008, 1♂, J. Klymko leg.; Bruce Co., Little Cove, 45°14.88´N 81°37.71´W, pooter, meadow grasses, 28.viii.2004, 1♂, K.N. Barber leg. (all DEBU); Bruce Co., Bruce Pen[insula] Natl. Pk., Singing Sands, forest, pan #1, 26–31.v.2000, 1♂ (debu00084521), C.S. Onodera leg. (DEBU); Bruce Peninsula N. P., Cameron Lk. Rd., 45°12.5´N 81°33.5´W, sweeps, grasses in trail, 30.vii.1997, 1♀; same locality, Crane River below Lake Scugog, 45°07.0´N 81°32.1´W, sweeps, riverside vegetation, 3.vii.1999, 2♀; same locality, Dorcas Bay Rd. at Willow Creek, 45°09.4´N 81°34.4´W, sweeps, mostly creekside graminoids, 3.vii.1999, 3♀; same locality, Emmett Lake, 45°13.5´N 81°28.2´W, sweeps, mostly graminoids, open area under *Acer*/*Quercus*, 2.vii.1999, 3♂ 2♀; same locality but 45°13.1´N 81°29.0´W, sweeps, graminoids, wet area under *Acer*, 2.vii.1999, 1♂ 2♀, all K.N. Barber leg.; same locality, Marr Lake, 6.vii.1995, 1♂, S.A. Marshall leg. (all DEBU); Burlington, edge Tuck Ck., 43°21.2´N 79°46.6´W, sweeps/pooter, grasses edge of park, 19.viii.1998, 1♀ (abdomen photo, Fig. 26); same locality, sweeps/pooter, *Bromus inermis*, 15.vii.1997, 1♂, 20.vii.1997, 1♀; same locality, pooter, *Phleum pratense*, 18.vii.1997, 1♂ 2♀, 20.vii.1997, 1♂; same locality, pooter, *Poa pratensis*, 18.vii.1997, 1♀ (genit. prep.); same locality, pooter, base of grasses, 15.viii.2000, 1♂ 1♀; same locality, sweeps, mowed long grasses, 1.viii.2003, 1♂ 6♀, all K.N. Barber leg. (all CNCI); same locality, sweeps, mowed long grasses, 11.vi.2007, 25♂ 11♀, K.N. Barber leg. (CNCI, 7♂ 3♀, 1♂ genit. prep.; CASC, 7♂ 3♀; LACM, 7♂ 3♀; SMOC 4♂ 2♀); Cambridge, 27.viii.1979, 1♀, K. Barber leg. (DEBU); Chapleau, 47°50.32´N 83°23.89´W, long grasses, pooter, 18.vi.2004, 2♂ 1♀; ~13.9 km W Chapleau, 47°49.20´N 83°35.42´W, hydro right-of-way, sweeps, mostly *Carex utriculata*, grasses, 23.vi.2013, 2♂ 3♀, 7.vii.2014, 1♂; ~40 km NE Chapleau, 47°59.76´N 82°55.04´W, wet roadside sweeps, mostly *Carex utriculata*, 13.vii.2013, 2♀, all K.N. Barber leg. (all CNCI); ~13.5 km S Cochrane, 48°56.65´N 81°00.18´W, hydro right-of-way, sweeps, mostly *Carex utriculata*, 12.vii.2013, 9♂ 4♀, K.N. Barber leg. (CNCI, 2♂ 1♀; LEMQ, 7♂ 3♀); Cootes Paradise nr. Dundas, sweeping over boggy meadow, 20.viii.1994, 1♂, J. Roháček leg. (SMOC); Hamilton, Cootes Paradise (sanctuary), swept/eclector, bank vegetation/mixed forest herbal layer, (Universität Bielefeld, X982), 20.viii.1994, 12♂ 9♀, M. v. Tschirnhaus leg. (ZSMC, in ethanol); Echo Bay, Echo

Bay Marsh, 46°29.71´N 84°04.04´W, sweeps, mostly *Equisetum fluviatile*, *Schoenoplectus acutus*, 24.v.2007, 1♀, 12.vi.2007, 1♂ 1♀; same locality, sweeps, sedges near lookout, 12.vi.2007, 1♂; same locality, sweeps, mostly *Carex* spp., 24.v.2007, 1♀; same locality, sweeps, mostly *Carex* spp. nr. lookout, 24.v.2007, 1♂ 2♀; same locality but 46°29.66´N 84°04.12´W, nr. lookout, sweeps, mixed graminoids incl. *C*[*are*]*x utriculata*, 21.vii.2013, 1♀, all K.N. Barber leg. (all CNCI); same locality but 46°29.62´N 84°04.11´W, sweeps, mostly *Carex utriculata*, 10.vi.2017, 5♂ 14♀, K.N. Barber leg. (CNCI, 1♂ 4♀; EMEC, 3♂ 7♀; SMOC, 1♂ 3♀); Eganville, damp meadow, 2.vi.1991, 2♀, Barták leg. (MBPC); ~14.5 km SSE Elliot Lake, ~3.7 km NNE jct. Hwys 17 & 108, 46°14.71´N 82°33.53´W, sweeps, mostly *Carex utriculata*, 29.vi.2013, 2♀, K.N. Barber leg. (CNCI); Elora, 8.vii.1971, 1♀, 15.vii.1971, 2♀, G.A. Surgeoner leg.; Erin, 25.vi.1970, 1♀, J. Ernst leg. (all DEBU); 8 km NE Espanola, Hwy 17 at Spanish R., 46.3°N 81.67°W, sweep veg. at rest area, 28.vi.2007, 1♂ (LEM-0040704), J. Mlynarek leg., 1♀ (LEM-0040707), A. MacLeod leg., 1♂ 1♀ (LEM-0040705, -706), T.A. Wheeler leg. (LEMQ); Fathom Five N. P., Little Dunks Bay, 45°15.80´N 81°38.23´W, fen, sweeps, graminoids, 28.viii.2004, 1♀, K.N. Barber leg. (DEBU); ~7.0 km E Foleyet, 48°14.34´N 82°20.75´W, hydro right-of-way, sweeps, mostly *Carex utriculata*, 13.vii.2013, 1♀, K.N. Barber leg. (CNCI); 6 km N French River, Hwy 69, roadside sweeps, 22.viii.1985, 1♂, K.N. Barber leg. (DEBU); Goulais River, Pine Shores Rd., 46°41.67´N 84°25.47´W, sweeps, *Thalictrum*, *Clematis*, sedges, edge of Cranberry Ck., 4.vii.2007, 1♂, K.N. Barber leg. (CNCI); same locality, Sand Bay, 46°44.81´N 84°32.72´W, sweeping *Juncus* and *Carex* at margins of fen pools, 10.vii.2010, 1♂ 1♀, J. Roháček leg. (SMOC); 7 mi E Griffith, 4.vi.1982, 1♂ (CNC 674999), 10–16.x.1983, 1♂ (CNC 675000), 7.vi.1985, 1♂ (CNC 685088), 22.vi.1985, 1♀ (CNC 685091), 27.vii.1985, 1♀ (CNC 685092), B.E. Cooper leg. (CNC); same locality, 9–21.vi.1985, 2♀, B.E. Cooper leg. (LACM); Guelph, 23.vi.1976, 1♀, J.M. Cumming leg., 10.x.1971, 1♀, K.J.G. Deacon leg., 3.vii.1980, 2♀, S.A. Marshall leg., 27.ix.1981, 1♂, W.E. Ralley leg. (DEBU); same locality, 3.vii.1979, 4♂ 3♀, 4.vii.1979, 1♂, 31.v.1980, 1♀, 22.viii.1980, 2♂ 2♀, 27.ix.1981, 2♂, 23.vii.1982, 1♂; same locality, pan traps, 1–20.vii.1980, 1♂ 5♀, 8–24.vi.1981, 1♂ 2♀, 24.vi.–14.vii.1981, 8♀; same locality, pans, 24.viii.–4.ix.1980, 1♂, 14.vii.–16.viii.1981, 2♂ 4♀, 16.viii.–27.ix.1981, 1♂ 1♀, 21.vii.–29.viii.1981, 1♂, all K.N. Barber leg. (all DEBU); same locality, Malaise trap, 8–24.vi.1981, 2♀, 14.vii.–16.viii.1981, 1♂, 16.viii.–27.ix.1981, 2♂ 1♀, 28.ix.–25.x.1981, 2♀, 7.v.–4.vi.1982, 1♀,5–30.vi.1982,1♂,21.vii.–29.viii.1982,4♀,30.viii.–24.x.1982, 2♂ 5♀, 29.vii.–3.viii.1985, 1♂, K.N. Barber leg. (DEBU); same locality, Malaise trap, 1–4.vii.1981, 1♂, 3–8.viii.1981, 1♀, 24–28.viii.1981, 1♀, D. Yu leg. (DEBU); same locality, University Arboretum, sweeping over boggy meadow, 19.viii.1994, 4♀, J. Roháček leg. (SMOC, 1♀ genit. prep.); Hamilton, Malaise trap, 14–28.viii.1980, 1♂, M. Sanborne leg.; Harrow, 20.vii.1976, 1♂, J.M. Cumming leg., 15.viii.1973, 1♀, R.E. Roughley leg.; Harrow Research Stn., *Gymnocladus di*[*o*]*icus* (male), 10:00–10:20, 17°C, 9.vi.1986, 1♀, P.G. Kevan leg. (all DEBU); ~25 km WNW Ignace, 49°29.52´N 92°00.83´W, sweeps, fen, mostly *Carex utriculata* with grasses, 4.vii.2012, 1♂, 6.vii.2012, 1♀, K.N. Barber leg. (CNCI); Inisfil, 44°19.483´N 79°35.071´W, Malaise on fence row, 8–10.viii.2010, 1♂ 1♀, J.E. Swann & D.R. Edwards leg. (BDUC); 10 km N Keene, Hope Mill Cons. Area, 44°17.1´N 78°10.3´W, sweep at forest edge, 20.vii.2000, 1♀ (LEM-0040629), T. Wheeler leg. (LEMQ); Lake Superior Prov. Pk., 47°16.42´N 84°33.66´W, pooter, grasses in roadside ditch, 15.vi.2004, 8♂ 9♀ (debu01501454–70, 1♀ abdomen photo, Fig. 24); same locality, Hwy 17 near jct. Agawa Rock, 47°22.31´N 84°41.23´W, sweeps, mostly *Carex utriculata*, 9.vi.2013, 2♂ 3♀ (debu01503924–28), 12.vii.2014, 2♂ (debu01503945, -946, 1♂ habitus photo, Fig. 1, head photo, Fig. 4), all K.N. Barber leg. (all DEBU); 6 km S Langton, Concession Rd. 8, S Hwy 45, 42°42.01´N 80°31.93´W, sweep clearing, at dusk near Carolinean forest, 29.vi.2002, 1♂ 4♀ (LEM-0040698–702), S. Boucher leg. (LEMQ); ~6.3 km E Macleod, 49°41.37´N 86°51.41´W, sweeps, graminoids incl. *Carex utriculata* & *C. aquatilis substricta*, 6.vii.2012, 1♂ 1♀, K.N. Barber leg. (CNCI); 5 km E Madawaska, 45°30.5´N 77°56.6´W, sweep at rest area, 26.vi.2007, 1♀ (LEM-0040703), J. Mlynarek leg. (LEMQ); Manitoulin Is., Carter Bay, 45°36.3´N 82°08.5´W, sweeps, Pearly Everlasting [*Anaphalis margaritacea*], 30.vi.1999, 11♂ 5♀, K.N. Barber leg. (CNCI, 8♂ 3♀, 1♀ genit. prep.; SMOC, 3♂ 2♀, 2♂ 2♀ genit. prep.); same locality, ~2.2 km N Cold Springs, Perch Ck. at Hwy 540, 45°53.1´N 82°06.2´W, sweeps/pooter, *Calamagrostis canadensis*, 4.vii.1999, 1♂, K.N. Barber leg. (CNCI); same locality, 10 km SW Gore Bay, 45°52´N 82°31´W, Malaise trap in grassland savanna alvar, 19.vi.1996, 1♀ (LEM-0040670), P. Bouchard leg. (LEMQ); same locality, Misery Bay Nature Reserve, 45°47.64´N 82°44.93´W, sweeping, mostly *Carex* from wetland boardwalk, 2.vii.2010, 1♂, J. Roháček leg. (SMOC); Hwy #17, ~8.5 km NW Marathon, 48°47.69´N 86°26.11´W, sweeps, *Equisetum fluviatile* on saturated gravel, 16.vi.2007, 1♂ 2♀, K.N. Barber leg. (CNCI); same locality, sweeps, emergent *Equisetum fluviatile* with *Carex* sp. [*Carex aquatilis* Wahlenb.], 16.vi.2007, 26♂ 10♀, K.N. Barber leg. (CNCI, 12♂ 4♀, 1♂ genit. prep., wing photo, Fig. 5; INHS, 7♂ 3♀; MEMU, 7♂ 3♀); same locality, sweeps, emergent *Carex* sp. [*Carex aquatilis* Wahlenb.], 16.vi.2007, 11♂ 13♀, K.N. Barber leg. (CNCI, 4♂ 4♀; AMNH, 4♂ 6♀; SMOC, 3♂ 3♀); Mattawa, wet alder thicket, rich undergrowth, 16.vi.1987, 1♂ (CNC 675001), J.R. Vockeroth leg. (CNCI); Metcalfe, 20.x.1985, 1♂ (CNC 685089), B.E. Cooper leg. (CNCI); Halton Reg., Milton, Derry Rd. & 4th Line, grass field, yellow pans, 23–24.vi.2001, 1♀ (debu00174950), 29.vii.–5.viii.2001, 1♀ (debu00172241), S. Paiero leg. (DEBU); Moosonee, 51°14.75´N 80°40.33´W, sweeps, mostly *Rubus*, *Ribes*, under *Populus*, 9.vii.2014, 1♂, K.N. Barber leg. (CNCI, genit. prep.); Oakville, 20.vi.1976, 1♀, W.A. Attwater leg. (DEBU); Ottawa, 13.vii.1963, 1♂ (CNC 675003), 11.vi.1964, 1♂ (CNC 675004), 9.vii.1965, 1♂ (CNC 675005), J.R. Vockeroth leg. (CNCI); same locality, river shores, 21.vi.1991, 1♀, Barták leg. (MBPC); Otter Rapids, 50°10.96´N 81°37.88´W, sweeps, mostly *Schedonorus arundinaceus*, on roadside slope, 20.vii.2009, 1♂, K.N. Barber leg. (CNCI); Pancake Bay P. P., 46°58.11´N 84°42.72´W, sweeps from boardwalk, mostly emergent sedges/*Equisetum*, 2.viii.2004, 1♂ (debu01500876), 27.vi.2005, 1♀ (debu01501620), 26.v.2007, 1♀ (debu01501797), 16.vi.2007, 1♂ (debu01501798), K.N. Barber leg. (DEBU); same locality and data, 9.vii.2010, 2♂, J. Roháček leg. (SMOC); Pelee Isl[and], sweep at Stone Rd. Alvar, 10.vi.1993, 1♀, B. Larson leg. (DEBU); same locality, Stone Rd., behind alvar, 41°45.2´N 82°38.3´W, sweeps, graminoids/*Impatiens* under canopy, 8.vi.2002, 1♀, 9.vi.2002, 2♀; same locality, East Shore Campground, 41°46.0´N 82°37.8´W, sweeps, grasses on edge of sports field, 8.vi.2002, 6♂ 17♀, all K.N. Barber leg. (all DEBU, 1♂ genit. prep.); nr. Picton, 9.vii.1970, 1♀ (CNC 675042), J.F. McAlpine leg. (CNCI); Pinery P. P., Grand Bend, 19.viii.1980, 1♂, K.N. Barber leg. (DEBU); Point Pelee, 8.ix.1954, 1♂ (CNC 675027), 9.ix.1954, 1♂ 3♀ (CNC 675028, -055–57), W.R. Mason leg. (CNCI); same locality, 21.vii.1979, 1♂, J.M. Heraty leg., 1♀, K. N. Barber leg. (DEBU); Pt. Pelee N. P., Leamington, 7.vii.1980, 1♀, 11.vii.1982, 1♀, 14.vi.1984, 1♂, 17.vii.1985, 1♀, K.N. Barber leg. (DEBU); Hwy #17 at Prairie River mouth, 48°48.32´N 86°46.64´W, sweeps, grasses, composites, *Rubus*, forest edge, 16.vi.2007, 12♂ 6♀, K.N. Barber leg.

(CNCI, 5♂ 3♀, 1♂ head/thorax photo, Fig. 22, 1♀ abdomen photo, Fig. 25; USNM, 7♂ 3♀); same locality but 48°48.44´N 86°46.69´W, sweeps, graminoids in wet depression, 16.vi.2007, 2♂, K.N. Barber leg. (CNCI); Rondeau, deer dung, 25.vii.1981, 1♂, S. Marshall leg.; same locality, Malaise, 6.vii.1983, 1♀, E. Lippert leg. (both DEBU); Rondeau Park, 7.ix.1954, 22♂ 13♀ (CNC 675025, -026, -058–60, -070–78, -095–115), W.R. Mason leg. (CNCI); Rondeau P. P., sweeps, mature forest, 31.viii.1979, 20♂ 26♀, (DEBU), 1.ix.1979, 42♂ 28♀ (CNCI, 10♂ 6♀; DEBU, 22♂ 22♀; SMOC 10♂, all genit. prep.), L. Masner leg.; same locality, Malaise trap #1, 24–26.vi.1981, 4♂ 7♀, Goulet & Sharkey leg. (DEBU); S[ault] S[ainte] Marie, Airport Rd., entrance to airport, 46.4953°N 84.4871°W, sweeps, mostly *Calamagrostis canadensis* on edge of woods, 29.v.2021, 8♂ 5♀, K.N. Barber leg. (CNCI); S. S. Marie, S of Algoma U[niversity] College, 46°29.9´N 84°17.2´W, pooter, *Calamagrostis canadensis*, 3.viii.2002, 1♂; same locality, pooter, mostly *Calamagrostis canadensis*, 6.viii.2001, 1♀; same locality, pooter, *Carex*/*Calamagrostis*, 4.viii.2002, 1♂; same locality, sweeps, *Carex*/*Calamagrostis*, 3.viii.2002, 1♀; same locality, sweeps, *Carex aquatilis*, 9.vii.2002, 1♀; same locality, sweeps, mostly *Carex aquatilis*, 22.vi.2001, 1♀, 25.vi.2001, 2♀, 17.vii.2001, 1♀, 2. viii.2002, 1♀; same locality but 46°29.88´N 84°17.19´W, sweeps, *Carex aquatilis*, 26.viii.2003, 1♀; same locality, sweeps, mostly *Carex aquatilis*, 17.ix.2005, 1♂; same locality, sweeps, *Phalaris arundinacea*, 18.vi.2005, 1♀; same locality but S of Algoma University, 46°29.88´N 84°17.19´W, sweeps, mostly *Phalaris arundinacea*, 6.viii.2008, 1♀, all K.N. Barber leg. (all CNCI); S. S. Marie, Baseline Rd., 46°31.40´N 84°24.40´W, sweeps, *Aster*, *Rubus*, graminoids under aspen, 19.vii.2006, 2♂; S. S. Marie, Bellevue Pk., 46°30.1´N 84°18.1´W, sweeps, mostly *Calamagrostis*, 7–8.vii.2000, 7♂ 1♀; same locality, sweeps, graminoids, 17.vi.2001, 1♂ 1♀, all K.N. Barber leg. (all CNCI); S. S. Marie, Birchwood Pk., 46°30.75´N 84°15.62´W, sweeps, *Rubus*, *Aralia*, graminoids, ferns, *Aster*, under *Betula*/*Acer*, 17.vi.2007, 1♂ 5♀, 25.vi.2007, 3♀; same locality but 46°30.67´N 84°15.63´W, sweeps, *Rubus*, *Aralia*, graminoids, ferns, under *Betula*/*Acer*, 17.vi.2007, 4♀, all K.N. Barber leg. (all CNCI); S. S. Marie, [157] Bristol Pl[ace], 46°30.8´N 84°16.4´W, at MV lights in yard, 7.vii.2000, 1♂; S. S. Marie, Bristol Pl[ace] Pk., 46°30.8´N 84°16.6´W, sweeps/pooter, *Phalaris arundinacea*, 8.viii.1997, 1♂ (genit. prep.); same locality, sweeps, mostly *Carex* spp., 17.vi.2001, 1♂; same locality, sweeps, mostly sedges, 2.vii.2001, 1♀; same locality, sweeps, mostly *Impatiens*, *Clematis*, *Rubus*, grasses, 11.vi.1999, 1♀; sweeps, *Impatiens*, *Clematis*, *Equisetum*, *Rubus*, ferns, *Phalaris*, 29.vi.2008, 1♀, 9.vii.2008, 2♀, 11. vii.2008, 1♀; same locality, sweeps, *Phalaris arundinacea*, under *Populus*, 7.viii.2008, 2♂ 3♀; same locality but 46°30.87´N 84°16.68´W, sweeps, mostly *Carex gynandra*, 30.vi.2008, 1♀, all K.N. Barber leg. (all CNCI); S. S. Marie, Finn Hill, 46°31.7´N 84°17.3´W, pooter, *Calamagrostis canadensis*, 4.vii.2002, 1♀; same locality but 46°31.63´N 84°17.29´W, sweeps, *Scirpus microcarpus*, 13.vii.2007, 4♂ 4♀; same locality, sweeps, mostly *Carex stipata stipata*, 23.vi.2018, 1♂, all K.N. Barber leg. (all CNCI); same locality but 46°31.63´N 84°17.33´W, sweeps, mixed graminoids, 27.viii.2010, 4♂ 8♀, K.N. Barber leg. (SMOC); same locality, sweeps, graminoids, herbs, composites, edge of *Populus tremuloides*, 8.viii.2008, 2♀, 10.viii.2008, 1♂; same locality, sweeps, mostly *Carex*/*Calamagrostis*, edge of *Populus tremuloides*, 25.vi.2009, 4♀; same locality, sweeps, *Calamagrostis canadensis*, 26.vi.2007, 2♂ 4♀; same locality, sweeps, *Carex stipata stipata*, 26.v.2007, 3♂ 1♀, 25.vi.2009, 1♂ 1♀ (1♀ habitus photo, Fig. 20), 18.vi.2016, 2♂ 3♀, all K.N. Barber leg. (all CNCI); same locality, sweeps, mostly *Carex stipata stipata*, 26.vi.2007, 77♂ 62♀, K.N. Barber leg. (CNCI, 41♂ 38♀, 1♂ genit. prep.; CMNH, CSCA, MTEC, NBMB, RBCM, UGCA, 6♂ 4♀ each); same locality, sweeps, mostly *Carex stipata stipata*, 13.vii.2007, 1♀, 10.vi.2012, 7♂ 2♀, 4.vi.2013, 1♂ 1♀, 16. viii.2013, 2♂, 31.vii.2017, 2♀, K.N. Barber leg. (CNCI); same locality, sweeping, boggy meadow, mostly *Carex stiptata stipata*, 8.vii.2010, 1♂ 3♀, J. Roháček leg. (SMOC); same locality but 46°31.66´N 84°17.34´W, sweeps, mostly *Calamagrostis canadensis*, 8.viii.2008, 2♀, K.N. Barber leg. (CNCI); same locality but 46°31.48´N 84°17.36´W, sweeps, *Scirpus microcarpus*, 30.v.2007, 7♂ 11♀, K.N. Barber leg. (CNCI, 3♂ 5♀; BDUC, 4♂ 6♀); same locality, sweeps, mostly *Scirpus microcarpus*, 18.vi.2005, 1♂, 14.viii.2005, 1♂ 1♀, 25.viii.2005, 1♂ 1♀, 12. ix.2005, 4♂ 4♀, 16.ix.2005, 1♂ 2♀; same locality, sweeps, mostly *Scirpus microcarpus*, *Impatiens*, 27.vi.2007, 1♂ 1♀, all K.N. Barber leg. (all CNCI); same locality, sweeping graminoid vegetation, 7.vii.2010, 4♂ 2♀ (1♂ genit. prep.), 12.vii.2010, 2♂ 4♀ (1♂ 1♀ genit. prep.), J. Roháček leg. (SMOC); same locality but 46°31.57´N 84°17.41´W, sweeps, *Aster*, ferns, graminoids under canopy, 19.ix.2004, 1♂, K.N. Barber leg. (CNCI); S. S. Marie, Hwy #17 city limits, 46°36.58´N 84°17.83´W, sweeps, mostly *Carex*/*Calamagrostis* in wet area, 23.viii.2004, 1♀, 13.viii.2008, 1♂; S. S. Marie, Landslide Rd., Coldwater Ck., 46°33.94´N 84°16.66´W, sweeps, graminoids in wet ditch, 26.viii.2008, 1♂; S. S. Marie, 1072 Old Garden R. Rd., 46°33.62´N 84°17.15´W, sweeps, *Equisetum hyemale*, graminoids above wet ditch, 30. vii.2007, 1♀; S. S. Marie, behind St. Matt[hew's] Ang[lican] Church, 46°30.5´N 84°17.2´W, sweeps, graminoids/*Impatiens* under *Acer*/*Betula*, 5.ix.2002, 1♂; S. S. Marie, Sault Coll[ege] Outdoor Lab, 46°32.1´N 84°18.2´W, sweeps, *Impatiens* under *Acer*/*Betula*, 28.v.1999, 1♂; same locality but Sault Coll[ege] Woodlot, 46°32.08´N 84°18.34´W, sweeps, *Eurybia*, *Clintonia*, ferns, *Maianthemum*, under *Populus*, 31.vii.2009, 1♀; same locality, sweeps, *Clintonia*, fern, *Maianthemum*, *Eurybia*, under *Populus*, 31.v.2010, 1♀; S. S. Marie, Thayers Acres, 46°35.54´N 84°15.53´W, sweeps, emergent *Carex* sp., 1.vii.2007, 1♂, all K.N. Barber leg. (all CNCI); ~30 km N Sault Ste. Marie, Stokely Creek ski area, 46°47.67´N 84°19.98´W, sweeps, *Clintonia*, ferns, *Streptopus* under *Acer*/*Abies*, 19.vi.2010, 1♂, K.N. Barber leg. (CNCI); ~12.7 km NNE Searchmont, Icewater Creek WS [watershed], mi.10.5 Whitman Dam Rd., riparian meadow/alder thicket, Malaise, 29.vi.–3.vii.1986, 1♀, 8–29.ix.1986, 1♀, [K.N. Barber leg.] (CNCI); Simcoe, 1.vi.1956, among grass roots, 1♂ (CNC 675016), J.R. Vockeroth leg. (CNCI); 2 km E Sowerby, Harris Ck. Rd., 46°17.80´N 83°21.10´W, sweeps, sedges along beaver pond, 30.vii.2006, 1♂, K.N. Barber leg. (CNCI); Spencer Gorge nr. Dundas, sweeping over boggy meadow, 20.viii.1994, 1♂, J. Roháček leg. (SMOC); Spencer Gorge/Webster's Falls Wilderness Area, above Tew's Falls, swept/eclector, ornamental lawn along river, (Universität Bielefeld, X981), 20.viii.1994, 18♂ 18♀, M. v. Tschirnhaus leg. (ZSMC, in ethanol); Stittsville, D.A. Smiths Woods, forest Malaise trough, 18.x.–11.xi.1979, 1♀, S. Peck leg. (DEBU); Sudbury, Twin Forks Park, sweep along Junction Creek, 6.vii.2001, 1♀ (LEM-0040684), S.E. Brooks leg. (LEMQ); Hilton Township, Tenby Bay, Malaise at edge of lakeshore & poplar forest, 4.ix.1992, 1♂, J.E. Swann leg. (DEBU); The Shoals P. P., Prairie Bee, 47°52.35´N 83°53.56´W, sweeps, grasses nr. parking area, 17.vi.2004, 1♀ (debu01500175), K.N. Barber leg. (DEBU); 4 km E Thedford at Ausable R., 43°09´N 81°48.5´W, sweep veg. at river, 19.vii.2000, 4♂ 1♀ (LEM-0040630–34), V. Crecco & T.A. Wheeler leg. (LEMQ); ~74 km NNE Thessalon, 46°53.94´N 83°16.23´W, shore of Mississagi R., sweeps, graminoids, herbs, *Equisetum* spp., 12.ix.2010, 1♂, K.N. Barber leg. (CNCI); ca. 100 km W Thunder Bay at Portage Bay Rd., swept along road, 11.vii.1992, 1♂ (LEM-0040628), T.A. Wheeler leg. (LEMQ); Wawa, Visitor Centre, 47°58.49´N

84°46.99´W, pooter, long grasses, 15.vi.2004, 3♂ 3♀, K.N. Barber leg. (CNCI); Welland, 22.viii.1978, 1♂, W. Ralley leg. (DEBU); White River, behind Continental Motel, 48°35.65´N 85°16.82´W, pooter, grasses, 16.vi.2004, 9♂ 9♀, K.N. Barber leg. (CNCI, 4♂ 4♀; SEMC, 5♂ 5♀); Windsor, Malaise trap, 21–28.vi.1982, 2♂, S.A. Marshall leg. (DEBU); [Windsor], Ojibway Prairie Reserve, 17.vi.1980, 1♂, K.H. Harvey leg. (DEBU); Windsor, Ojibway Prairie Reserve, 17.vi.1980, 1♂, 10.vii.1980, 1♂, 18.viii.1980, 4♂ 1♀, 11.vi.1981, 3♂ 1♀, 21.vii.1981, 1♀, 12.vii.1982, 2♂, 18.viii.1983, 2♀, K.N. Barber leg. (DEBU); same locality, burnt savannah, yellow pans, 31.vii.–3.viii.2001, 1♀ (debu01110968), burnt prairie, yellow pans, 10–14.viii.2001, 1♂ (debu01111461), unburnt prairie, yellow pans, 8–12.vi.2001, 1♀ (debu01114925), 22–25.vi.2001, 1♀ (debu01112487), 22–29.vi.2001, 1♀ (debu01112492), 21–25.ix.2001, 1♂ (debu01112971), S.M. Paiero leg. (DEBU); Windsor, ~1.5 km S Ojibway Prairie, forest-prairie edge, Malaise, 1–22.ix.2001, 1♂ (debu01112805), 22.ix.–13.x.2001, 1♀ (debu01115392), S.M. Paiero leg. (DEBU). **Québec:** Harrington Lake, 19.viii.1962, 1♂ (CNC 675041), C.H. Mann leg. (CNCI, with empty puparium); Îles Penchées, Les Escoumins, 48°22´N 69°22´W, sweep *Juncus*, *Lathyrus* on sand beach, 1.viii.2001, 1♀ (LEM-0040683), M. Giroux leg. (LEMQ); Kam Co., Parke Reserve, 28.vii.1957, 1♂ (CNC 685094), G.E. Shewell leg. (CNCI); Lac Roddic, 16 km S Maniwaki, 22.vi.1991, 2♀, Barták leg. (MBPC); Lac St-Francois Nat. Wildl[ife] Area, NW of Aménag. Therrien, close to Ruisseau Th[errien], 45°00.39´N 74°30.99´W, *Carex* meadow, sweeping, T1c, 2.viii.1999, 1♀ (LEM-0040686), F. Beaulieu leg. (LEMQ); Lac St-Francois Nat. Wildl[ife] Area, Marais Fraser, 45°02.40´N 74°28.03´W, *Carex* meadow, sweeping, F2c, 21.viii.1999, 1♀ (LEM-0040687), F. Beaulieu leg. (LEMQ); M[on]t Ste. Marie, Low, 1800´, 22.vi.1965, 1♀ (CNC 675053), 20.ix.1965, 2♀ (CNC 675035, -052), J.R. Vockeroth leg. (CNCI); Ste-Anne-de-Bellevue, Stoneycroft Pond, 45°25.8´N 73°56.4´W, sweeping grass, 1.vi.2000, 1♀ (LEM-0040657), 20.vi.2000, 1♂ (LEM-0040659), S. Boucher leg.; same locality and data, 26.vi.2000, 1♂ (LEM-0040660), 19.vii.2000, 2♂ (LEM-0040655, -668, 1♂ genit. prep.), 26.vii.2000, 1♂ (LEM-0040667), 11.viii.2000, 1♂ 2♀ (LEM-0040664–66), 18.viii.2000, 2♂ 3♀ (LEM-0040654, -661–63, -669), J. Forrest leg.; same locality and data but 18:30 hrs, 28.v.2000, 1♀ (LEM-0040656), J. Forrest leg.; same locality, sweep grass, 2.vii.1999, 1♂ (LEM-0040697), S.E. Brooks leg. (all LEMQ). **MEXICO: Nuevo León:** 20 mi S of Monterrey, 7.xi.1946, 1♂, F.E. Skinner leg. (CASC, aristae broken, genit. prep.). **Tamaulipas:** “Tamps.”, [Estación?] Forlon, 30.ix.1938, 1♀, L. Lipovsky leg. (SEMC, aristae & some legs broken); La Pesca, blacklight trap, 19.ix.1981, 1♂, W.H. Cross leg. (MEMU, missing front legs and right hind leg). **Veracruz:** “Vera Cruz” [ambiguous: city or state], 29.xii.1940, 1♂, G.E. Bohart leg. (EMEC, genit. prep., all remaining body parts also in glycerine; very poor condition: missing head & wings, with remnants of only 2 legs, apparently remounted with minuten piercing abdomen, det. Sabrosky 1943). **UNITED STATES OF AMERICA: Alabama:** Baldwin Co., Bon Secour N[ational] W[ildlife] Refuge, William H. Cross Expedition, T9S R3E Sec.19, blacklight trap, 7.ix.1988, 1♂, L. Corpus & T. Schiefer leg.; same locality and data, T9S R2E Sec.25N, Malaise trap on dunes, 12–16.x.1991, 1♀, T. Schiefer & G. Eickwort leg.; Monroe Co., Big Flat Creek, 31°36´30″N 87°24´53″W, William H. Cross Expedition, 27.v.1995, 1♀, D.M. Pollock leg. (all MEMU); DeKalb Co., DeSoto St. Pk., William H. Cross Expedition, 34°29´45″N 85°37´56″W, blacklight trap, 24.ix.1992, 1♂ 1♀; same locality and data but 34°23´45″N 85°37´50″W, sweeping, 25.ix.1992, 1♀, all T. Schiefer & J. MacGown leg. (all MEMU); Kushla, [-].iv.1915, 1♀ (Ac.5154), A.H. Sturtevant, [-].x.1924, 1♀, [no collector] (AMNH, both det. Sturtevant); Lawrence Co., Prairie Grove Glade, 34°31´04″N 87°30´14″W, William H. Cross Expedition, blacklight in cedar glade, 24.v.2004, 1♀, 26.v.2004, 1♀, T.L. Schiefer leg. (MEMU). **Arkansas:** Logan Co., Magazine Mt., T6N R25W Sec.20SE, 2640´, William H. Cross Expedition, Malaise trap, 15–20.v.1989, 4♀; same locality and data, blacklight trap, 18.v.1989, 1♀, all T. Schiefer & P. Porter leg. (all MEMU); Logan Co., Magazine Mtn., Ozark Nat. For., 23.v.1991, 2♂ 1♀ (CNC 674996, -5031, -5032), B.J. Sinclair leg.; same locality, 23.v.1991, ex. car net, 2♂ 1♀ (CNC 674997, -4998, -5030), B.J. Sinclair & J. Swann leg. (all CNCI); Polk Co., 13 mi NW Mena, Rich Mt., 2800´, mesic oak-hickory, 1–3.vi.1979, 1♂ 2♀, S. & J. Peck leg. (DEBU); Yell Co., Mt. Nebo St. Pk., 22.v.1991, 5♂ 5♀, J.E. Swann leg. (DEBU, 1♂ 1♀ genit. prep.). **Delaware:** New Castle Co., Wilmington, 1.vi.1979, 1♀, A. Freidberg leg. (TAUI). **District of Columbia:** Washington, Deanwood, nr. brook, 9.vi.1991, 29♂ 18♀, 16.vi.1991, 11♂ 19♀, Barták leg. (MBPC 30♂ 31♀; SMOC 10♂ 6♀, 1♂ 1♀ genit. prep.); Washington, Potomac River, Theodore Roosevelt Is., 26.vii.1980, 2♂ 2♀, A.E. Stubbs leg. (BMNH). **Florida:** Apopka, Rock Springs, sweeps, 8.iii.1980, 2♂ 1♀, W.R.M. Mason leg. (DEBU, 2♂ genit. prep.); Gainesville, hardwood forest, Malaise tr. [trap or trough?], 8–22.xii.1986, 1♀ (CNC 685086), W. Mason leg. (CNCI). **Georgia:** Clarke Co., 5 mi W Athens, at light, 20–26.iv.1976, 1♀; same locality, removed from light fixture, [-].x.1976, 1♀; same locality, ex. removed from light fixture, [-].iii.1980, 3♂ 4♀ (1♂ genit. prep.), all C.L. Smith leg. (all UGCA); Brasstown Ball [sic Bald] Mountain Area, 2.v.1973, 1♀, A.G. Lavallee leg. (UGCA); Lumpkin Co., 15 mi NW Dahlonega, 15.vi.1973, 1♂, B.L. Freeman leg. (UGCA), 1♀, R.H. Mathews leg. (LACM); Wheeler Co., Little Ocmulgee St. Pk., 13.v.1973, 2♀, D.A. Hurd & C.L. Smith leg. (UGCA). **Illinois:** Carlinville, “No.”, [-].vii.1956, 2♂, M.R. Wheeler leg. (AMNH); Champaign, 28.viii.1957, 1♀ (INHS 40,178), H. Cunningham leg. (INHS); DeWitt Co., DeWitt, DeWitt Cemetery, 225 m, 18.v.1996, 2♂, Gaimari & Metz leg. (CSCA); Alexander Co., Horseshoe Lake, T16S, R2N, Sec.16, sweeps, #83032, 7.vi.1983, 4♂ 6♀, I.S. Askevold leg. (DEBU); Tazewell Co., 3 mi N Mackinaw along Panther Cr[eek], 10.vi.1969, 1♂ (INHS 40,207), Webb & Marlin leg. (INHS); Adams Co., Quincy, 6.viii.1995, 1♂, J.F. Edmiston leg. (USNM); Pope Co., Shawnee N. F., Dixon Springs Agric. Center, u[ltra] v[iolet] light, 4.vi.1983, 1♀; same locality, sweeps, #83027, 6.vi.1983, 3♀; Union Co., Shawnee N. F., Pine Hills Cpgd., #83039-042, 9.vi.1983, 2♂ 1♀, all I.S. Askevold leg. (all DEBU). **Indiana:** Owen Co., Quincy, 39°26.382´N 86°48.270´W, 6.vi.2011, 1♂, W.L. Murphy leg. (USNM). **Iowa:** Sioux City, swept lawn, [-].vii.1939, 1♂, [1?].ix.1939, 1♂, [-].x.1939, 1♀, C.N. Ainslie leg. (AMNH). **Kansas:** Douglas Co., 23.v.1941, 1♂, D.E. Hardy leg.; Douglas Co., Lawrence, at light, 1.vii.1957, 2♂ (1♂ genit. prep.), W.T. Atyeo leg.; same locality, attracted to light, 18.viii.1980, 1♂, J.R. Schrock leg.; Douglas Co., Lone Star Lake, SW of Lawrence, 15.v.1966, 1♀, G. & K. Eickwort leg.; Douglas Co., Univ. Kans. Nat. Hist. Res., Entomology Class, [-].ix.1957, 1♀, [no collector] (all SEMC). **Kentucky:** Mammoth Cave Nat. Pk., 23.viii.1981, 1♀ (CNC 685093), J.R. Vockeroth leg. (CNCI). **Louisiana:** Cameron Par[ish], Cameron Prairie N. W. R., 29°56´42″N 93°05´17″W, blacklight trap in prairie, 3.xi.1992, 1♀, R. Brown & T. Schiefer leg. (MEMU); 3 mi S Oak Grove, 31.iii.1960, 1♂ (CNC 675046), J.G. Chillcott leg. (CNCI); St. Tammany Co., Pearl River, sweeping grass in meadow, 2.xii.1990, 1♂ (LEM-0040626); same locality, swept over mud by small pond, 2.xii.1990, 1♀ (LEM-0040627, genit. prep.), both T.A. Wheeler leg. (both LEMQ); Slidell, 3.ix.1954, 1♂, [no collector] (AMNH). **Maine:** Lincoln Co., East Boothbay, 43°51´N 69°35´W, sweep stream at roadside, 9.viii.2000, 6♂ 2♀ (LEM-

0040641–47, -682), T.A. Wheeler leg. (LEMQ, 1♂ 1♀ genit. prep.); Lincoln Co., Sherman Lake rest area, 44°00´N 69°35´W, sweep veg. at shoreline, 10.viii.2000, 1♂ (LEM- 0040648), T.A. Wheeler leg. (LEMQ, genit. prep.). **Maryland:** Prince George Co., Beltsville, 19.v.1979, 1♀, 15.vii.1979, 1♀, A. Freidberg leg. (TAUI); Catoctin Mt. Park, Chestnut wood, 15.vi.1991, 2♂; same locality, Lantz, meadow nr. pond, 15.vi.1991, 1♂ 3♀, all Barták leg. (all MBPC); same locality, Owen's Creek, 15.vi.1991, 14♂ 14♀, Barták leg. (MBPC 10♂ 10♀; SMOC 4♂ 4♀, 1♂ 1♀ genit. prep.); Somerset Co., Deal Island, 1.vi.1973, 1♂, G.C. Steyskal leg.; A[nne] Arun[del] Co., 6 km S Edgewater (SERC), 38°53´N 76°33´W, 15.vi.1976, 1♂, 12.xi.1976, 1♀, J.H. Faulk leg. (all USNM); Montgomery Co., Great Falls, 28.vi.1963, 1♂, D.C. & K.A. Rentz leg. (CASC); Lanham, 25.vi.1967, 1♂, P. Oman leg. (OSAC); Laurel, Malaise trap, 20.v.1965, 1♀ (CNC 685084), [no collector] (CNCI); Montgomery Co., Olney, 28.iv.1979, sweeping dry twigs, 1♂, A. Freidberg leg. (TAUI); Garrett Co., 3 km S Sang Run, 23–25.vi.1989, 1♀, W.E. Steiner, J.M. Swearingen, A. & L. Landvoight leg. (USNM); Montgomery Co., Silver Spring, 9.vi.1979, 1♂ 1♀; Montgomery Co., Wheaton, 27–28.v.1979, 1♂, 25.vi.1979, 1♂ 1♀, 3.vii.1979, 6♂ 1♀, 4.vii.1979, 1♂, 3. viii.1979, 2♂ 2♀, 26.viii.1979, 3♂ 1♀, 23.ix.1979, 1♂ 1♀, all A. Freidberg leg. (all TAUI). **Massachusetts:** Dennisport, Cape Cod, 1.viii.1964, 1♀ (CNC 685045), J.R. Vockeroth leg. (CNCI); Woods Hole, [-].ix.1924, 1♀, [no collector], 21.vii.1954, 1♂ 1♀, M.R. Wheeler leg. (AMNH). **Michigan:** ~4 mi S Gaylord, Hwy I-75, rest area, mile 278, 44°58.05´N 84°40.26´W, pooter, long lawn grasses, 24.v.2004, 5♂ 6♀; Ironwood, Mt. Zion Ski Area, 46°28.5´N 90°10.2´W, sweeps, low veg. in cut under *Acer*, 22.vii.1999, 1♂, all K.N. Barber leg. (all CNCI); Berrien Co., St. Joseph, 15.vi.1975, 1♀, D.D. Wilder leg. (CASC); Gogebic Co., ~3.5 km NE Wakefield, Ottawa N. F., 46°30.25´N 89°54.07´W, sweeps, *Carex utriculata*, *Calamagrostis canadensis*, 24.vii.2017, 1♀, K.N. Barber leg. (CNCI). **Minnesota:** Pine Co., Hinckley, Old Hwy 61, 46°01.25´N 92°56.39´W, sweeps, mixed graminoids, margin of pond, 20.vi.2018, 5♂ 2♀; 7 km NW Munger, jct. Hwys #2 & #194, 46°50.8´N 92°25.0´W, pooter, *A*[*gropyron*] *smithii* [now *Pascopyrum smithii* (Rydb.) Á. Löve], 22.vii.1999, 1♂, all K.N. Barber leg. (all CNCI); Aitkin Co., 14 mi W Willow River, SE 1/4, SE 1/4: Section 34, Twp. 45, R. 22, 46.334°N 93.096°W, 12–17.vi.1992, 1♀, D.E. Hansen leg. (CNCI). **Mississippi:** Agr[icultural] Col[lege] [now Mississippi State University], 21.x.1921, 4♂ 1♀, 18.iii.1922, 2♂ 6♀ (1♀ headless, 1♂ 2♀ missing abdomen), 23.iii.1922, 8♂ 8♀ (1♀ det. Stafford, 1♀ unattributed det., 2♂ 1♀ headless, 1♂ genit. prep., 1♂ missing abdomen, 1♀ highly damaged, thorax, abdomen, wing glued to minuten) 1 spec. (missing abdomen, hind legs), 8.iv.1922, 1♂ (headless), E.W. Stafford leg. (MEMU); Oktibbeha Co., Craig Springs, interception trap-yellow, 21.xi.1981, 1♀, W.H. Cross leg.; Bolivar Co., Dahomey N. W. R., 33°42´10″N 90°55´27″W, sweeping, 29.iv.1993, 3♂ 2♀, R.L. Brown & D. Pollock leg.; Oktibbeha Co., Dorman Lk., sweeping, 16.ix.1981, 4♂ 3♀, 4.x.1981, 1♀, R.L. Brown leg., 12.v.1995, 1♀, D.M. Pollock leg.; Pontotoc Co., 2 mi ESE Ecru, D-VAC sample in grasses around cultivated cotton, 3916, 9.vi.1978, 1♂, W.P. Scott leg. (all MEMU); Pontotoc Co., 1 mi SE Ecru, Malaise trap in cultivated cotton, 4779-11, 6.vi.1980, 1♀, G.L. Snodgrass leg.; same locality, pitfall trap peripheral to cult. cotton, 4765-1A, 9.x.1980, 1♀; same locality, sweeping flowering *Eupatorium serotinum*, 23.x.1980, 1♂, both W.H. Cross leg. (all MEMU); Grenada Co., T21N R2E Sec.12,13N & R3E Sec.7S,18N, on flowers of *Aster pilosus*, 23–29.x.1991, 1♀, R.L. Brown leg.; Lauderdale Co., ~7 mi E Lauderdale, 32°33´39″N 88°24´07″W, sweeping in sandhill, 12. ix.2009, 1♂, J.G. Hill leg.; Washington Co., Leland, 26.x.1985, 1♀, C.T. Bryson leg.; Noxubee Co., Noxubee N. W. Refuge, Loakfoma Lake, sweeping grasses, 22.iii.1995, 2♂ 3♀, D.M. Pollock leg. (all MEMU); Oktibbeha Co., sweeping crimson clover, "6 101", 31.x.1974, 3♂ 1♀, "18 116", 25.iii.1975, 1♂, "20 117", 1.iv.1975, 1♀, "2 119", 15.iv.1975, 1♀, "3 120", 30.iv.1975, 1♀, "4 120", 30.iv.1975, 1♀, R.L. Comba leg. (MEMU); George Co., Pascagoula W. M. A. [Wildlife Management Area], 30°52´40″N 88°46´05″W, sweeping, 1.iv.1995, 2♂ 1♀, D.M. Pollock leg.; Panola Co., 2 mi W Pope, D-VAC sample in cultivated cotton, 4064, 6.vii.1978, 1♂, W.P. Scott leg.; Hancock Co., W St. Louis Bay [Bay St. Louis], *Juncus roemerianus* litter-Berlese, 22.xi.1981, 1♀, M. LaSalle leg.; Oktibbeha Co., Sessums, 33°23´31″N 88°42´40″W, 18.ix.1995, 1♂, D.M. Pollock leg. (all MEMU); Oktibbeha Co., Starkville, 1.iv.1979, 1♀, J.R. Macdonald leg.; same locality, D-VAC sample in cultivated cotton, 11.vii.1979, 1♀, 18.vii.1979, 3♂ 2♀, 20.vii.1979, 1♂, C. Bryson leg.; same locality, sweeping near pond, 20.ix.1981, 4♂ 3♀, 27.ix.1981, 1♂, R.L. Brown leg.; same locality, sweeping *Erigeron* sp., 17.iv.1990, 1♂, T.L. Schiefer leg.; same locality, MSU nr. North Farm, sweeping, 21.iv.1994, 1♂ 2♀, D.M. Pollock leg. (all MEMU). **Missouri:** Atherton, 15.viii.1915, 1♂ 2♀, C.F. Adams leg. (SMOC, 1♂ det. J.R. Vockeroth 1985); Lithium, 29. vi.1955, 1♂ 1♀, M.R. Wheeler leg. (AMNH). **New Hampshire:** Franconia, Rt. 3, Franconia Notch, 20–21.vi.1972, 2♂, B.J. & F.C. Thompson leg. (AMNH); Coos Co., 1 km E Stark, 44°36´N 71°24´W, sweep along Ammonoosuc River, 8.viii.2000, 1♂ (LEM-0040679), J. Forrest leg. (LEMQ). **New Jersey:** Bass Riv[er] St. Pk., ex. *Sarracenia* pitchers, 21.x.1981, 1♀, D.A. Grimaldi leg.; Newark, city yard collection, 379, [-].vi.[-], 1♂ (Ac.24663), E.L. Dickerson leg.; Morris Co., Pompton Plains, 198, on yellow marigold flowers, 25.viii.1988, 6♂ 3♀, D. Grimaldi leg. (all AMNH); Ocean Co., 10 km N Tuckerton, 39°41.3´N 74°21.6´W, 26.ix.2003, 1♂ (USNM ENT 00201738), D. & W.N. Mathis leg. (USNM); Vineland, [-].vii.1954, 1♀, M.R. Wheeler leg. (AMNH). **New Mexico:** Roosevelt Co., Portales, 4000´, Malaise, 13–19.viii.1993, 1♂ (CNC 685090), O'Hara & Jorgensen leg. (CNCI). **New York:** Westchester Co., Lewisboro, 4.viii.1975, 1♀, M. Favreau leg. (AMNH); Riverhead, L[ong] I[sland] Veg[etable] Res[earch] F[ar]m, 1–7.viii.1938, 2♂ 1♀ (CNC 675029, -054, -082), [no collector] (CNCI, all genit. prep.); same locality, 17–24.vii.1938, 1♂ (det. J.R. Vockeroth 1985), 24–31.vii.1938, 1♀, 1–7.viii.1938, 1♂ 1♀ (♂ det. J.R. Vockeroth 1992, ♀ det. J.R. Vockeroth 1985); same locality, at light, 30. viii.1938, 1♀ (det. J.R. Vockeroth 1985), [all no collector] (all SMOC). **North Carolina:** Cherokee, sweeps, 4.vi.1979, 24♂ 15♀, M.J. Sharkey leg. (DEBU, 1♂ 1♀ genit. prep., latter somewhat malformed); Cherokee, 2000´, 29.v.1957, 1♂ (CNC 675002); Gr. Smoky Mt. Nat. Pk., Cherokee-Newfound Gap, 4200´, 4.vi.1962, 1♀ (CNC 675043); GSMNP [Great Smoky Mountains National Park], Clingman's Dome, 6647´, 3.vi.1962, 1♀ (CNC 675047); same locality, 6300´ 6642´, 17.v.1957, 1♂ 1♀ (CNC 685132, -133), 20.v.1957, 1♂ 4♀ (CNC 685139–43), 28.v.1957, 1♀ (CNC 685116); same locality, 6642´, on ground among *Carex* roots, 20.v.1957, 1♀ (CNC 685144), 28.v.1957, 5♂ 3♀ (CNC 685117–24); GSMNP, Mingus Creek nr. Cherokee, 2000´, 29.v.1957, 1♀ (CNC 685125), all J.R. Vockeroth leg. (all CNCI); Transylvania Co., Davidson R. at North Slope Trail, 35.2863°N 82.7379°W, sweep along river edge, 21.v.2008, 2♂, J. Mlynarek leg. (LEMQ); Cumberland Co., Fort Bragg, 16.v.1967, 1♀, 6–13.vi.1967, 1♀, J.D. Birchim leg. (CASC); Highlands, 3800´, 22.v.1957, 1♀ (CNC 685127), 31.v.1957, 2♂ 2♀ (CNC 685128–31); same locality, at light during heavy rain, 4.vi.1957, 18♂ 12♀ (CNC 685046–75), 25.vi.1957, 1♀ (CNC 685085); Highlands, Shorthoff Mt., 4800´–5000´, 23.v.1957, 1♀ (CNC 685126), all J.R. Vockeroth leg. (all CNCI); Highlands, Whiteside Mt., 21.viii.1957, 1♂ (CNC 675006), C.J. Durden leg.

(CNCI); Haywood Co., Little Sam Knob at Flat Laurel Ck., 35.3232°N 82.8944°W, sweep meadow near river, 23.v.2008, 4♂ 5♀, M. Forrest leg. (LEMQ); Mt. Mitchell, 6500´–6684´, 5. vi.1962, 1♀ (CNC 675081), J.R. Vockeroth leg. (CNCI); Yancey Co., Mt. Mitchell St. Pk., 1925 m, campground, yellow pan traps, 11.vi.1990, 1♀ (CNC 675034), B.J. Sinclair leg. (CNCI); Mitchell Co., Penland, 3000´, 17.vi.1957, 1♀, G. Steyskal leg. (USNM); Transylvania Co., Pisgah N. F., rest area at Hwy 276, 35.2994°N 82.77182°W, 750 m, sweep deciduous forest, site SD2, 17.v.2008, 1♂; Haywood Co., Pisgah N. Forest, Black Balsam Knob, 35.3218°N 82.8763°W, 1802 m, sweep conifers (site SC1), 17.v.2008, 1♀, both T.A. Wheeler leg. (both LEMQ); Yancey Co., Pisgah Nat. For., Black Mt. Campground, 35.75248°N 82.21939°W, 3035´, sweep stream edge at forest, 17.viii.2007, 1♂, J. Mlynarek leg.; Yancey Co., Black Mt. Campground, 35.753°N 82.219°W, 3009´, sweep deciduous forest near river, 27.v.2008, 1♂, M. Forrest leg.; Yancey Co., Forest Rd. 432 nr. Black Mt. Campground, 35.7313°N 82.2383°W, sweep forest edge, 27.v.2008, 2♀, J. Mlynarek leg., 1♂, T.A. Wheeler leg. (all LEMQ); Avery Co., Pisgah N. Forest, Grassy Ridge Bald, 36.10246°N 82.08066°W, 1863 m, sweep grassy bald (GRAS S1), 26.v.2008, 1♀, M. Forrest leg., (GRAS S2), 26.v.2008, 2♀, (GRAS S5), 30.v.2008, 2♂, J. Mlynarek leg., (GRAS S6), 30.v.2008, 2♀, T.A. Wheeler leg. (LEMQ); Watauga Co., Pisgah Nat'l Forest, Mortimer Recreational Area, 35°60´N 81°46.7´W, 1500´, stream, (99-3), 25.v.1999, 1♀, S.D. Gaimari leg. (CSCA); Wake Co., Raleigh, 13.vi.1991, 1♀, D.M. Stout II leg. (MEMU); Raleigh, [NCSU] Centennial Campus, sweep vegetation, 7.x.2001, 2♂ (LEM-0040692, -696), J. Savage leg. (LEMQ); Graham Co., Robbinsville, 9.vi.1976, 2♂ 1♀, G.E. Bohart leg. (LACM); Macon Co., Wayah Bald, 35.1805°N 83.5607°W, 1625 m, sweep near summit, 20.v.2008, 1♂, M. Forrest leg., 3♀, T.A. Wheeler leg. (LEMQ). **North Dakota:** Hwy #2, mi.339, W of Grand Forks, 47°56.0´N 97°27.0´W, pooter/sweeps, roadside veg. incl. *Bromus*/*Agropyron*, 21.vii.1999, 1♂, K.N. Barber leg. (CNCI). **Ohio:** Hocking Co., Coovert Nature Preserve, 39°27.2´N 82°36.8´W, sweep grassy hillside, 18.v.2003, 2♂ 1♀ (LEM-0040689–91), S. Boucher leg.; same locality, sweep old field, 18.v.2003, 1♂ (LEM-0040694), T.A. Wheeler leg., 1♀ (LEM-0040695), M. Giroux leg. (all LEMQ); Ashtabula Co., Crooked Creek Farm, nr. Hartsgrove, 20.v.1965, 1♀, J.C. Pallister leg. (AMNH); Mallot's Lawn nr. Oxford, 22.x.1978, 7♂ 8♀, B.A. Steinly leg. (USNM); Portage Co., Towners Woods Marsh NE of Kent, swept from *Scirpus cyperinus*, 26.vii.2005, 1♂; same locality but 41°10´N 81°18´W, swept from *Leersia oryzoides*, 12.vi.2007, 1♂, both B.A. Foote leg. (both CMNH). **Oklahoma:** Chickasaw Nat. Recreation Area, 24.v.1991, 2♂ 1♀, J.E. Swann leg.; Murray Co., Sulphur, Chickasaw Rec. Area, prairie veg., 4. vi.1979, 4♂ 8♀ (1♂ genit. prep.), S. & J. Peck leg. (all DEBU); Comanche Co., 2 km NW Meers, ex. along W branch Jimmy Creek, 13.v.1993, 1♂, J.M. Cumming leg. (CNCI). **Pennsylvania:** Centre Co., State College, 11.vi.1975, 1♂, D.D. Wilder leg. (CASC); Union Co., Whitedeer, 26.viii.1981, 1♀ (CNC 675051), J.R. Vockeroth leg. (CNCI, headless); Wilawana, 15.viii.1938, 1♂, R.H. Crandall leg. (AMNH). **South Carolina:** Barnwell State Pk., sweeps, 9.iv.1989, 1♂ 1♀, K.N. Barber leg., 1♂, J.E. Swann leg. (DEBU); Coosawhatch[i]e, 1.i.1972, 3♂ 2♀ (CNC 675106–09, -135), J.R. Vockeroth leg. (CNCI, 1♂ genit. prep.); Cross Anchor, 3.vii.1953, 1♀, M.R. Wheeler leg. (AMNH); Seneca, 20.viii.1957, 2♂ (CNC 675023, -024), W.R. Richards leg. (CNCI). **South Dakota:** Faulk Co., ~9.3 km W Faulkton, Hwy 212, 45°02.51´N 99°14.50´W, sweeps, mostly *Carex utriculata*, edge of marshy area, 20.vi.2018, 1♂, K.N. Barber leg. (CNCI). **Tennessee:** Burrville, 19.v.1957, 1♀ (CNC 685136), J.R. Vockeroth leg. (CNCI); Foothills Parkway, sweeps, 4.vi.1979, 3♂ 4♀; GSMNP [Great Smoky Mountains National Park], Cades Cove, sweeps, 2.vi.1979, 3♂, 5.vi.1979, 42♂ 58♀ (1♂ genit. prep.), all M.J. Sharkey leg. (all DEBU); Cocke Co., GSMNP, Forney Ridge Trail, Clingman's Dome, 35°33´N 83°29´W, 6000´, (99-11), N.P.S. Permit #GRSM-99-074, 29.v.1999, 2♂, S.D. Gaimari leg. (USNM); GSMNP, Gregory Bald, sweeps, 1.vi.1979, 23♂ 16♀, M.J. Sharkey leg. (DEBU, 1♂ genit. prep.); GSMNP, Indian Gap, 5200´, 20.v.1957, 13♂ 8♀ (CNC 685145–65); Knoxville, taken at light, 20.v.1957, 1♂ 1♀ (CNC 685137, -138), all J.R. Vockeroth leg. (all CNCI); Townsend, sweeps, 2.vi.1979, 11♂ 15♀, M.J. Sharkey leg. (DEBU). **Texas:** Austin, 3.iv.1980, 2♂, S.A. Marshall leg. (DEBU); Austin, 10.x.1950, 1♂ 3♀, 13.x.1950, 1♂ 4♀, 14.xii.1950, 1♀ (with empty puparium), [no collector]; same locality, 20.i.1954, 1♂, M.R. Wheeler leg. (all AMNH); Hidalgo Co., Bentsen-Rio Grande Valley St. Pk., 30.xi.–2.xii.1978, 1♂, E.E. Grissell & A.S. Menke leg. (USNM); Carthage, ex. *Pinus*, 31.iii.1968, 1♂ (CNC 675018), J.F. McAlpine leg.; Brazos Co., College Station, 30.iii.1966, 1♀ (CNC 675044), D.M. Wood leg. (both CNCI); Brazos Co., College Station, Lick Creek Pk., sweeping trail/grass/mud, 5.iv.2000, 1♂ 1♀ (debu00114153, -172), 9.iv.2000, 3♀ (debu00110143, -182, -192); same locality, sweeping at dusk (8 pm), 6.iv.2000, 2♂ 2♀ (debu 00109710, -718, -721, -722, 1♂ genit. prep.); same locality, post oak savanna by creek, Malaise trap, 30.iii.–5.iv.2000, 1♀ (debu00114327), all M. Buck leg. (all DEBU); Maverick Co., 35 mi SE Del Rio, 4. xi.1982, 2♂ 1♀, J.T. Huber leg. (DEBU); Kerrville, 17.v.1954, 1♂ (det. Sabrosky), [-].v.1954, 2♂, L.J. Bottimer leg. (SMOC); Kerrville, 28.iii.1959, 8♂ 5♀ (CNC 675008–15, -036–40), 3.iv.1959, 6♂ 4♀ (CNC 675033, -093–101), 14.iv.1959, 2♂ (CNC 675103, -104), 18.iv.1959, 1♂ (CNC 675007), 20.iv.1959, 1♂ (CNC 675102, genit. prep.); same locality, swept ex. grass, 4.iv.1959, 7♂ 4♀ (CNC 674993, 675083–92); same locality, swept ex. *Aesculus* sp., 4.iv.1959, 1♂ (CNC 675105), all J.F. McAlpine leg. (all CNCI); Val Verde Co., Langtry, sweeps by Rio Grande, 4.xi.1982, 4♂ 2♀, J.T. Huber & R.A. Gonzalez leg. (DEBU, 1♂ 1♀ genit. prep.); Nacogdoches, [-].iv.1958, 1♀, M.R. Wheeler leg.; Ottine, Palmetto St. Pk., 7.x.1950, 1♂ 2♀, [no collector] (all AMNH); Armstrong Co., Palo Duro Canyon State Park, ex. riparian veg., 26.v.1991, 2♂ (CNC 674994, -095), B.J. Sinclair leg.; Welder Wildlife Refuge, nr. Sinton, 19–23.iii.1965, 3♂ 3♀ (CNC 675019, -020, -048–50, -087), J.G. Chillcott leg. (all CNCI); Woodville, [-].ix.1954, 1♀, M. Wheeler leg. (AMNH). **Virginia:** Alexandria [Independent City], 514 N. Pickett Street, 38°49´10.9˝N 77°06´59.9˝W, No. 03714, Arnaud Malaise trap, "1/20".viii.2007, 1♀, P.H. Arnaud, Jr., M.M. Arnaud, O.S. Flint, Jr. leg. (USNM); Alexandria, Lincolnia District, long grass meadows and scrubby woodland, 17–28.v.1975, 2♂ 3♀; approx. 3 mi S Alexandria, on banks of Potomac River, damp wasteland by river, 25.v.1975, 2♂ 2♀; S of Alexandria, 8 mi E Woodbridge, sweeping edge of wood and damp grassland, 24.v.1975, 2♂ 4♀, all B.J. Harrington & P.S. Broomfield leg. (all BMNH); Fairfax Co., S of Alexandria, Dykes Marsh, 26.viii.1980, 1♂, A.E. Stubbs leg. (BMNH); Stafford Co., Aquia Harbour, Lions Park, 38°27´N 77°23.3´W, 19.ix.2005, 1♀, 10.xi.2006, 1♂, D. & W.N. Mathis leg. (USNM); Bear Creek Lake S. P., oak pine forest/field sweeps, 31.vii.1985, 1♂, J.M. Heraty leg. (DEBU); Giles Co., 10 km NW Blacksburg, Bald Knob, 14.v.1997, 1♀; same locality, Mtn. Lake Biol. Stn., 18.v.1997, 1♂, both S.A. Marshall leg. (both DEBU); Brush Mt., Blacksburg, 2800´, 27.v.1962, 2♂ (CNC 685081, -082), J.R. Vockeroth leg. (CNCI); Giles Co., Eggleston, River Rd., 37°17´0˝N 80°37´0˝W, 24.v.2001, 1♂ (debu00166980), S.A. Marshall leg. (DEBU); Fairfax, [-].vii.1954, 1♂, M.R. Wheeler leg. (AMNH); Patrick Co., Fairy Stone St. Pk., 1000´, 1♀ (CNC 675080), [no date, no collector] (CNCI); Falls Church, light trap, 1.vii.1958, 1♀, W.W. Wirth leg. (SMOC); Falls Church, Holmes

Run, light trap, 2.vi.1962, 1♂, W.W. Wirth leg. (USNM); Warren Co., 3 mi S Front Royal, Skyline Drive, 7.vii.1979, 1♀, A. Freidberg leg. (TAUI); 5 mi S Goochland, hydro line scrub, 7.v.1980, 1♂, J.M. Heraty leg. (DEBU); Page Co., Luray, 8.vii.1979, 2♀, A. Freidberg leg. (TAUI); Shenandoah Valley nr. Luray, at light, 4.vi.1975, 1♀, B.J. Harrington & P.S. Broomfield leg. (BMNH); Giles Co., Mountain Lake, 3800´, 26.v.1962, 3♂ (CNC 675017, -021, -022), J.G. Chillcott leg., 29.v.1962, 3♂ 2♀ (CNC 675110–13, 685134), J.R. Vockeroth leg. (CNCI); Giles Co., Mountain Lake Biol. Stn., 37°22´31″N 80°31´18″W, 13–26.v.2001, 2♂ 1♀ (debu00166943–45), 11–25.v.2008, 1♀ (debu00303929); same locality, sweep, 25.v.2001, 1♂ 3♀ (debu00166892, -894, -895, -897); Giles Co., Mountain Lake Biol. Stn., Appalachian Trail nr. Windrock, 25.v.2008, 1♀ (debu00303898); same locality but Cranberry Bog, 37°23´33″N 80°33´05″W, 1469 m, 26.v.1999, 1♀; Giles Co., vic[inity] Mtn. Lake Biol. Stn., Bear Cliff Trail, sweep, 14.v.1998, 3♀, all S.A. Marshall leg. (all DEBU); Smyth Co., Mt. Rogers, 4700´–5300´, 1.vi.1962, 1♂ (CNC 685083); same locality, 5300´–5700´, 1.vi.1962, 2♂ 2♀ (CNC 685077–80), all J.R. Vockeroth leg. (all CNCI); N[orth] Anna R., t522, 17.v.1980, 2♂ 1♀; Patapsko Valley Pk., forest, 11.v.1980, 1♀, all J.M. Heraty leg. (all DEBU); Chesterfield Co., Pocahontas St. Pk., 37°23.1´N 77°32.4´W, 11.v.2002, 1♂ (USNM ENT 00191861), D. & W.N. Mathis leg. (USNM); Prince William Forest Park, 15.viii.1979, 1♂, A. Freidberg leg. (TAUI); Prince William County, Prince William For[est] Pk., Pyrite Mine, 38°34.6´N 77°22´W, 23.vi.1993, 1♀, 6.vii.1993, 2♀, D. & W.N. Mathis leg. (USNM); Shenandoah N. P., mi.65–100, sweeps, 29.v.1979, 12♂ 9♀, M.J. Sharkey leg. (DEBU); Shenandoah Nat. Park, Big Meadows, 30–31.vii.1980, 1♀, A.E. Stubbs leg. (BMNH); Shenandoah N. P., Hawksbill, 3600´–4050´, 7.vi.1962, 1♂ (CNC 685076), J.R. Vockeroth leg. (CNCI); Skyline Drive of Blue Ridge Mountains, woods and open scrubland, 3–4.vi.1975, 1♂ 1♀, B.J. Harrington & P.S. Broomfield leg. (BMNH); Patrick Co., Vesta, 2800´, 30.v.1962, 1♀ (CNC 675079), J.G. Chillcott leg. (CNCI). **West Virginia:** Pocahontas Co., Cranberry Glade, sweeping open *Sphagnum* bog, 8.ix.1976, 1♂ 3♀, R.P. Lane leg. (BMNH); McDowell Co., Panther St. Forest, 37°26´N 81°52´W, 29.vi.–1.vii.2008, 1♂ 2♀ (debu00318623–25); Fayette Co., Plum Orchard Lk. Wildlife Management Area, 37°57´N 81°13´W, 28.vi.2008, 1♀ (debu00336867), all S.M. Paiero leg. (all DEBU). **Wisconsin:** Dane Co., T7N R9E B28, light trap, 17.ix.1954, 1♂ 1♀, R.J. Dicke leg. (USNM, 1♀ det. Sabrosky); Iron Co., ~7.3 km ENE Mercer, “J” Rd., 46°11.25´N 89°58.25´W, roadside sweeps, mostly *Carex utriculata*, 25.vii.2017, 1♀, K.N. Barber leg. (CNCI).