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Revision of the *Microphorella chiragra* species group (Diptera: Dolichopodidae *sensu lato*: Parathalassiinae)

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Abstract

The *Microphorella chiragra* species group is revised and includes *M. chiragra* Melander, *M. longitarsis* Melander and *M. ornatipes* Melander, plus the following 17 newly described species: *M. barda* sp. nov., *M. bicristata* sp. nov., *M. bradleyi* sp. nov., *M. dilata* sp. nov., *M. discreta* sp. nov., *M. enigma* sp. nov., *M. megapterna* sp. nov., *M. obscura* sp. nov., *M. paraplatypeza* sp. nov., *M. patrickensis* sp. nov., *M. platypeza* sp. nov., *M. sasquatchi* sp. nov., *M. setosa* sp. nov., *M. shorthousei* sp. nov., *M. tubula* sp. nov., *M. virgata* sp. nov. and *M. wilderae* sp. nov. The species group occurs in the western Nearctic Region from Washington, Idaho and western Montana south through Oregon and California. The distribution of each species is mapped and a key to males is provided. COI mitochondrial DNA barcode analyses indicate the possible existence of additional cryptic species, and/or high intra-specific DNA barcode variation.

Key words: new species, identification key, classification, morphology, DNA barcodes, Nearctic Region

Introduction

This is the fourth and final instalment in a series of papers treating the Nearctic species and species groups of the dolichopodid genus *Microphorella* Becker, 1909. Earlier instalments treated the *M. chillcotti* species group (Brooks & Cumming 2012), the *M. breviradia* species group (Cumming & Brooks 2022) and the *M. acroptera* and *M. arcana* species groups (Brooks & Cumming 2025). A key to the five known species groups of Nearctic *Microphorella* was provided by Brooks & Cumming (2025), which updated an earlier key that appeared in Cumming & Brooks (2022). The purpose of this paper is to revise the last remaining group of Nearctic species, *i.e.*, the *M. chiragra* species group, and to summarize what we know about the entire genus in North America.

Material & methods

This study is based on the examination of over 2400 specimens, which are housed in the following institutions: California Academy of Sciences, San Francisco, USA (CAS); Canadian National Collection of Insects, Ottawa, Canada (CNC); California State Collection of Arthropods, Sacramento, USA (CSCA); Essig Museum of Entomology, University of California, Berkeley, USA (EMEC); Los Angeles County Natural History Museum, Los Angeles, USA (LACM); Montana Entomology Collection, Montana State University, Bozeman, USA (MTEC); Bohart Museum of Entomology, University of California, Davis, USA (UCDC); Entomology Research Museum, University of California, Riverside, USA (UCRC); United States National Museum of Natural History, Washington D.C., USA (USNM); M.T. James Museum, Washington State University, Pullman, USA (WSU).

For primary type specimens, verbatim label data are provided and listed from the top label down with data from each label in quotation marks and separated by a semicolon. Each line of text on a label is delimited by a vertical line (|) and annotations are placed in square brackets, *i.e.*, []. For all other specimens, label data are summarized in a standardized format. Geographical coordinates are listed for all collection localities and SimpleMapp (Shorthouse 2010) was used to create distribution maps for each species. Coordinates appearing in square brackets were estimated by the authors, whereas those without brackets are part of the original label data.

Techniques for preparation and illustration of terminalia and specimen photography follow our previous papers (*e.g.*, Brooks & Cumming 2022, 2023; Cumming & Brooks 2022). Unique CNC database numbers and labels were added to specimens chosen for dissection (unless already present) to facilitate reassociation with the pinned specimens later. For dissected specimens that were illustrated in this work, the unique identifier database numbers are listed in the figure captions and cross-referenced in the lists of material examined to facilitate association of the specimen and its illustration. In several cases, these CNC database labels were added to specimens from other institutions.

Morphological terminology follows Cumming & Wood (2017) and homologies of the male terminalia follow our recent works such as Brooks & Cumming (2025) and Cumming & Brooks (2022).

To provide additional evidence for species identity and to test our morphology-based species concepts, leg samples of numerous specimens of the *M. chiragra* species group were submitted to the Centre for Biodiversity Genomics at the University of Guelph, Guelph, ON, Canada for DNA barcoding. DNA was extracted, amplified, purified and sequenced following the protocols given by Hajibabaei *et al.* (2005). Several initially failed sequences

were successfully re-sequenced using the technique of single molecule real-time (SMRT) sequencing as described by Herbert *et al.* (2018). COI sequences of 165 specimens of the *M. chiragra* species group (ingroup) and one specimen of *M. breviradia* Cumming & Brooks (outgroup) with >500 base pairs (bp) were analyzed in the Barcode of Life Data Systems (BOLDv5) (<https://boldsystems.org/>) with a Neighbour-joining TaxonID Tree created using the BOLD Aligner (Amino Acid based HMM) (Ratnasingham & Hebert 2007). CNC database numbers and GenBank accession numbers are listed on the TaxonID Tree. CNC database numbers for barcoded specimens are also listed in the material examined sections for each applicable species.

Systematics

Microphorella Becker

Microphorella Becker, 1909: 28. Type species: *Microphorus praecox* Loew, 1864, by original designation.

Diagnosis. The Nearctic members of this genus of tiny, riparian flies (wing length: 1.2–2.8 mm) can be distinguished from other Nearctic parathalassiines by the following features: body and legs usually brownish or blackish, with mostly dark setae (rarely silver pruinose with some setae white); gena weakly developed; palpus broadly or narrowly rounded apically, not triangular; thorax with 1 pair of strong scutellar setae (sometimes also with tiny outer pair present); wing with anal lobe reduced, cell cua apically convex, vein CuA+CuP short to absent, costa without spine-like basal setae, lacking pterostigma (adapted from Sinclair *et al.* 2023).

Diversity and Distribution. The 47 known Nearctic species of *Microphorella*, including those treated in this paper (see Appendix), are distributed in western North America from Alaska, northern British Columbia, the Yukon and western Nunavut, south to southern California (including Baja California, Mexico), central Arizona and New Mexico, east to southeastern Alberta, northeastern Montana and southwestern Colorado (Fig. 1). The species are divided into five species groups, including the *M. chiragra* species group (see Appendix), which are keyed in Brooks & Cumming (2025). The record from southwestern Colorado is based on a single female in the CNC (CNC827567) that is not clearly referable to any of the known species groups.

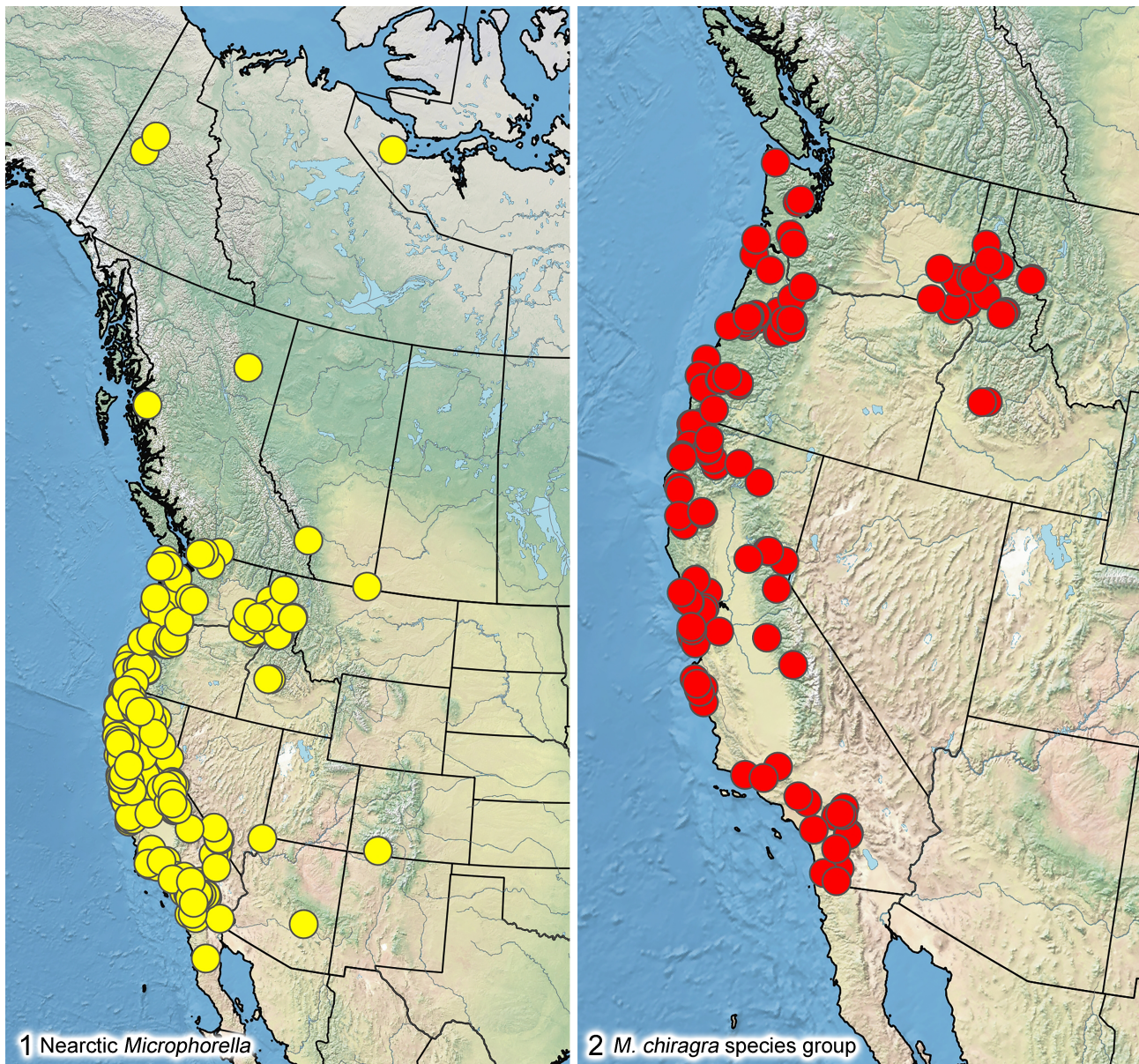
Microphorella chiragra species group

Diagnosis. The species group is most easily recognized by the large and distinctly setose hypandrium of the male hypopygium (*e.g.*, Figs 14–16, 32, 48, 118, 121), as well as the following additional features: male hind trochanter without tubercle; male hind femur lacking posterior patch of fine setae; male mid trochanter and mid femur each without strong basiventral seta; male wing plain, without long apicoventral seta on hind margin (*e.g.*, Figs 33, 66); male hypoproct with large, symmetrical, flipper-like right and left lobes (*e.g.*, Figs 19, 21, 22, 51, 52, 133); male cercus bulbous in lateral view with bifid apex (*e.g.*, Figs 18, 19, 21, 22, 129, 132, 133); male hypandrium without elongate medial projection; female abdominal tergite 5 without prominent cluster of stout median setae (Figs 162–167); female abdominal tergite 6 with row of long, stout setae on posterior margin (Figs 162–167); female terminalia with acanthophorous spines on syntergite 9+10 (*e.g.*, Fig. 167); acrostichal setae biserial with rows diverging anteriorly; wing with vein R₁ terminating beyond wing midpoint and vein CuA+CuP extending about halfway to wing margin (*e.g.*, Fig. 85).

Distribution. The *M. chiragra* species group is known to occur in western North America from Washington, Idaho and western Montana in the north, south through Oregon and California (Fig. 2).

Remarks. Adults of the *M. chiragra* species group are found in various forested and open riparian habitats (Figs 3, 4).

In general, body colouration does not vary much between species in the *M. chiragra* species group, although it does appear to vary somewhat based on method of preservation, with air-dried specimens being darker and more grey than critical point-dried specimens, which tend to be lighter and browner in colouration. Also, unlike many other species groups of *Microphorella*, the *M. chiragra* species group exhibits a relatively conservative male genitalic morphology with the hypopygium being very similar among species and showing only slight diagnostic differences in the phallus and cercus.



FIGURES 1–2. Known geographical distribution of Nearctic *Microphorella* and the *M. chiragra* species group. 1. Distribution of the genus *Microphorella* in the Nearctic Region. 2. Distribution of the *M. chiragra* species group.

Included species. This group includes the following 20 described species: *M. barda* sp. nov., *M. bicristata* sp. nov., *M. bradleyi* sp. nov., *M. chiragra* Melander, *M. dilata* sp. nov., *M. discreta* sp. nov., *M. enigma* sp. nov., *M. longitarsis* Melander, *M. megapterna* sp. nov., *M. obscura* sp. nov., *M. ornatipes* Melander, *M. paraplatypeza* sp. nov., *M. patrickensis* sp. nov., *M. platypeza* sp. nov., *M. sasquatchi* sp. nov., *M. setosa* sp. nov., *M. shorthousei* sp. nov., *M. tubula* sp. nov., *M. virgata* sp. nov. and *M. wilderae* sp. nov. One additional species, *Microphorella* sp. C, is recognized but not named and described, because of insufficient material of suitable quality.

Results of DNA Barcoding Analysis. DNA barcode sequences were acquired for 12 of the 20 species recognized by morphology, including *M. barda* sp. nov., *M. bradleyi* sp. nov., *M. chiragra*, *M. dilata* sp. nov., *M. discreta* sp. nov., *M. longitarsis*, *M. paraplatypeza* sp. nov., *M. patrickensis* sp. nov., *M. platypeza* sp. nov., *M. sasquatchi* sp. nov., *M. shorthousei* sp. nov. and *M. tubula* sp. nov. The TaxonID Tree resulting from the barcode sequence analysis identified 28 BINs (Barcode Index Number, Ratnasingham & Hebert 2013) among the 12 morphologically recognized species (Figs 5, 6). Nine of these 12 species were comprised of multiple BINs, whereas three species were comprised of single BINs, i.e., *M. shorthousei* sp. nov., *M. tubula* sp. nov. and *M. discreta* sp. nov., although

the latter species was only represented by a single specimen. The TaxonID Tree also identified two additional BINs (AAZ3961 and ADA5759), comprised only of female specimens, which possibly represent two additional species of the *M. chiragra* group for which males are unknown.



FIGURES 3–4. West Fork of Patrick Creek collection locality in Del Norte County, northern California (second author pictured in Fig. 4).

Key to males of the *Microphorella chiragra* species group

- 1 Hindleg with tarsomeres 2–5 enlarged and strongly compressed laterally, tarsomeres 3 and 4 broadly subrectangular (Figs 96, 99, 102); foreleg with tarsomere 1 long and tarsomeres 2–4 pale below (Figs 96, 98, 102). . . . *M. ornatipes* Melander
- Hindleg with tarsus either plain (e.g., Figs 7, 30, 44, 150, 153), thickened and clavate (e.g., Figs 33, 38, 83, 126, 127, 149) or dorsoventrally flattened (Figs 119, 120), but not compressed laterally; foreleg with tarsus either plain (e.g., Figs 7, 35, 150) or with one or more tarsomeres enlarged (e.g., Figs 44, 46, 58, 59, 83, 84, 111), but not as above 2
- 2 Hindleg with tarsus distinctively thick and clavate, tarsomere 1 subequal in length to enlarged tarsomere 5, tarsomeres 2–4 progressively shorter and disc-like with combined length shorter than tarsomere 5 (Figs 85, 86, 123, 126, 127, 158, 159). 3
- Hindleg with tarsus not as above, either plain (Figs 7, 29, 30, 44, 75, 105, 107, 150, 153), dorsoventrally flattened (Figs 119, 120) or clavate; if clavate, then with tarsomere 1 longer than tarsomere 5 and tarsomeres 2–4 not disc-like with combined length longer than tarsomere 5 (Figs 60, 66, 79, 83, 94, 95, 114, 142, 145, 149, 157). 5
- 3 Phallus long with strongly projecting curve followed by straight apical part (Figs 123, 128, 129) *M. sasquatchi* sp. nov.
- Phallus shorter and without strongly projecting curve (Figs 130, 131, 159). 4
- 4 Phallus short (Figs 131, 159), distal portion beyond basal curve straight with crest on right side *M. wilderae* sp. nov.
- Phallus moderately long (Fig. 130), distal portion beyond basal curve with weak inward bend, lacking crest *M. megapterna* sp. nov.
- 5 Foreleg with femur, tibia or tarsomeres distinctly modified or bearing specialized setae (Figs 43, 44, 46, 56, 58, 59, 66, 68–70, 76, 77, 79, 83, 84, 108, 111, 112, 143, 144). 6
- Foreleg plain, with femur, tibia and tarsomeres unmodified and lacking specialized setae (e.g., Figs 7, 10, 11, 33, 35, 103, 106, 115, 150, 156) 11
- 6 Foreleg with tibia bearing compressed glabrous area that is partially bounded by close-set series of short curved and thickened setae (Figs 66, 68–70) *M. discreta* sp. nov.
- Foreleg with tibia lacking glabrous area and associated specialized setae (Figs 43, 44, 46, 58, 59, 77, 83, 84, 111, 112, 143) 7
- 7 Foreleg with tibia bowed, tarsomere 1 narrowed near midlength and dilated apically (Figs 56, 58, 59); midleg with tibia usually bearing cluster of prominent setae apicoventrally (Fig. 60, arrow) *M. dilatata* sp. nov.

-	Foreleg with tibia and tarsus not as above (<i>e.g.</i> , Figs 43, 44, 46, 76, 77, 79, 83, 84, 108, 111, 112, 143); midleg with tibia lacking prominent cluster of apicoventral setae (Fig. 142)	8
8	Foreleg with femur bearing dense patch of short, erect setae on basal 1/3 of posterior surface (Figs 143, 144) and two long basiventral setae (Fig. 143); midleg with femur bearing posteroventral row of 3–4 long setae on basal 1/3 (Fig. 143) and tarsomere 1 bearing long ventral setae (Fig. 142); hindleg with femur bearing series of about 5 long, widely spaced anteroventral setae (Figs 142, 143) and tibia with longer ventral setae on distal 1/3 (Fig. 142).	<i>M. setosa</i> sp. nov.
-	Foreleg, midleg and hindleg without the above setation	9
9	Foreleg with only tarsomere 1 enlarged (sometimes subtly) and broader than unmodified distal tarsomeres (Figs 43, 44, 46), tarsomere 5 about 2× longer than tarsomere 4; mid and hind tarsi plain (Fig. 44)	<i>M. chiragra</i> Melander
-	Foreleg with tarsus clavate, with at least tarsomeres 2–5 thickened (Figs 76, 77, 79, 83, 84, 108, 111, 112), tarsomere 5 nearly 4× longer than short tarsomere 4; mid and hind tarsi either clavate (Figs 79, 83) or at least with tarsomere 5 slightly enlarged and elongated (Figs 113, 114)	10
10	Fore tarsus (including tarsomere 1) uniformly thickened (Figs 76, 77, 79, 83, 84); mid and hind tarsi clavate with tarsomere 5 enlarged and nearly 5× longer than tarsomere 4 (Figs 79, 83); phallus dark and weakly expanded preapically (Figs 81, 82)	<i>M. longitarsis</i> Melander
-	Fore tarsus with tarsomeres 2–5 thickened, tarsomere 1 unmodified (Figs 108, 111, 112); mid and hind tarsi with tarsomere 5 slightly enlarged and elongated, about 2–3× longer than tarsomere 4 (Figs 113, 114); phallus pale and not expanded preapically (Fig. 114)	<i>M. patrickensis</i> sp. nov.
11	Hindleg with tibia bearing fringe of long, erect anteroventral setae along basal half (Figs 105, 107, 145, 148, 149)	12
-	Hindleg with tibia lacking fringe of long, erect anteroventral setae along basal half (Figs 7, 30, 75, 94, 95, 119, 120, 150, 153, 157)	13
12	Head wider than high in anterior view, face wide (Fig. 147); hindleg with tarsomere 5 enlarged and about 3× longer than short tarsomere 4 (Fig. 149).	<i>M. shorthousei</i> sp. nov.
-	Head nearly as high as wide in anterior view, face narrow (Fig. 104); hindleg with tarsomere 5 unmodified and about 1.5× longer than tarsomere 4 (Figs 105, 107)	<i>M. paraplatypeza</i> sp. nov.
13	Hindleg with tarsus dorsoventrally flattened and fringed with short marginal setae, tarsomeres 2–4 subquadrate in dorsal/ventral view (Figs 119, 120); face narrow (Fig. 117); phallus with prominent curve protruding from hypopygium (Figs 120–122)	<i>M. platypeza</i> sp. nov.
-	Hindleg with tarsus plain (Figs 7, 29, 30, 75, 150, 153) or clavate (Figs 33, 38, 94, 95, 157); face wider (Figs 8, 9, 34, 94, 151); phallus variable, with or without prominent curve protruding from hypopygium (Figs 16, 18, 23, 29–32, 39, 40, 75, 134, 135, 154, 155)	14
14	Antennal postpedicel with narrowed apical portion broad, long and straightly tapered to apex, (Figs 35–37); hindleg with tarsomere 5 somewhat elongated and enlarged (Figs 33, 38); phallus with very broad curve protruding from hypopygium, lacking crest, apex not flared (Figs 23, 33, 39, 40)	<i>M. bradleyi</i> sp. nov.
-	Antennal postpedicel with narrowed apical portion relatively short, slender and concavely tapered to apex (Figs 10, 29, 30, 75, 152); hind tarsus plain (Figs 7, 29, 30, 75, 150, 153) or clavate (Figs 94, 95, 157); phallus variable (Figs 16, 18, 29–32, 75, 134, 135, 154, 155)	15
15	Hind tarsus clavate, with at least tarsomere 5 enlarged (Figs 94, 95, 157)	16
-	Hind tarsus plain (Figs 7, 29, 30, 75, 150, 153).	19
16	Hind tarsomere 1 subtly but distinctly enlarged (Figs 94, 95)	<i>M. obscura</i> sp. nov.
-	Hind tarsomere 1 plain (Fig. 157)	17
17	Cercus with inner apical lobe elongate, narrow and rod-like (Figs 132, 133, 156, 157); hypoproct lobe with angular flange-like extension near middle of ventral margin (Fig. 133); phallus flared apically (Figs 134, 135, 154, 155)	18
-	Cercus with inner apical lobe short and subtriangular (similar to Figs 19, 21, 22, 52), not narrow and rod-like; hypoproct lobe with ventral margin evenly curved (as in Figs 19, 52); phallus not flared apically (similar to Figs 51, 131)	<i>Microphorella</i> sp. C
18	Phallus with distal part straight or nearly so, apex strongly flared and infusate (Figs 134, 154, 155)	<i>M. tubula</i> sp. nov. (in part)
-	Phallus with distal part sinuous, apex weakly flared and not infusate (Fig. 135)	<i>M. virgata</i> sp. nov.
19	Hindleg with femur bearing prominent row of long anteroventral setae along distal 2/3 with most setae distinctly longer than femur width (Figs 7, 12, 13); hypandrium sometimes pale on posteriorly projecting end (Fig. 17).	<i>M. barda</i> sp. nov.
-	Hindleg with femur bearing weaker row of anteroventral setae along distal half or less, setae not distinctly longer than femur width (Figs 30, 75, 150); hypandrium uniformly dark (Figs 30, 32, 154)	20
20	Cercus with inner apical lobe elongate, narrow and rod-like (Figs 132, 133); hypoproct lobe with angular flange-like extension near middle of ventral margin (Fig. 133); phallus flared apically (Figs 134, 154, 155), with or without large lamelliform crests on each side (Figs 29–32)	21
-	Cercus with inner apical lobe short and subtriangular (similar to Figs 19, 21, 22, 52), not narrow and rod-like; hypoproct lobe with ventral margin evenly curved (as in Figs 19, 52); phallus not flared apically (similar to Figs 51, 131), with small crest on right side	<i>M. enigma</i> sp. nov.
21	Phallus with a pair of large lamelliform crests on right and left sides of projecting curved portion (Figs 29–32)	<i>M. bicristata</i> sp. nov.
-	Phallus lacking pair of large lamelliform crests (Figs 134, 154, 155), with only small crest on right side.	<i>M. tubula</i> sp. nov. (in part)

***Microphorella barda* sp. nov.**

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(Figs 5, 6, 7–22, 24, 163–165)

Type material. HOLOTYPE, ♂ (Figs 7, 12) labelled: “USA: CA: Del Norte Co. | West Fork of Patrick Crk. | N41°55'03"W123°51'28"| 24.V.2009, J.M. Cumming”; “CNC| 1155919” [white label with blue border, text duplicated on underside]; “HOLOTYPE| *Microphorella| barda* | Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: California: Del Norte County:** same data as holotype (15♂, CNC); same data as holotype except, S.E. Brooks (72♂, CNC); same data as holotype except, 31.v.2009 (16♂, CNC); same data as holotype except, 3.vi.2009 (12♂, CNC); same data as holotype except, 31.v.2009, S.E. Brooks (32♂, CNC); same data as holotype except, 3.vi.2009, S.E. Brooks (38♂, CNC); same data as holotype except, 24–31.v.2009, YPT, J.M. Cumming & S.E. Brooks (4♂, CNC); same data except, 31.v–3.vi.2009 (2♂, CNC); same data as holotype except, S.E. Brooks, CNC DIPTERA #’s 105207, 105208, 105209, 105210, 105211 (5♂, barcoded, CNC); same data as holotype except, CNC DIPTERA #’s 105317, 105319, 105266, 105267, 105269, 105277, 105310 (7♀, barcoded, CNC); same data as holotype except, S.E. Brooks, CNC DIPTERA #’s 105268, 105280, 105282, 105283, 105284, 105285, 105286, 105287, 105289, 105290, 105292, 105293, 105294, 105295, 105299, 105306, 105307, 105309, 105316, 105318, 105321, 105323, 105324, 105326, 105327, 105328, 105332, 105334 (28♀, barcoded, CNC); same data as holotype except, 31.v.2009, S.E. Brooks, CNC DIPTERA #’s 105272, 105273, 105279, 105281, 105288 (5♀, barcoded, CNC).

Other material examined. USA: California: Del Norte County: ca 6.5 mi. NE Gasquet nr Cold Spring Mountain, 41°52'15"N 123°53'21"W, 31.v.2009, S.E. Brooks (3♂, CNC); same data except, J.M. Cumming (12♂, CNC); same data except, S.E. Brooks, CNC DIPTERA #’s 105232, 105233 (2♂, barcoded, CNC); same data except, CNC DIPTERA #’s 105249, 105250, 105251, 105265 (4♀, barcoded, CNC); same data except, J.M. Cumming, CNC DIPTERA # 105231 (1♂, barcoded, CNC); same data except, CNC DIPTERA #’s 105253, 105256, 105260, 105261, 105263 (5♀, barcoded, CNC); ca 4.5 mi. NE Gasquet, Eighteenmile Creek, 41°51'21"N 123°54'44"W, 31.v.2009, J.M. Cumming (1♂, CNC); same data except, CNC DIPTERA # 105234 (1♂, barcoded, CNC); same data except, CNC DIPTERA #’s 105235, 105236, 105237 (3♀, barcoded, CNC). **Oregon: Benton County:** Alder Crk Falls at Marys Peak Rd, 44°28'29.3"N 123°31'42.0"W, 711m, 4.vii.2014, S.E. Brooks (3♂, 3♀, CNC); same data except, J.M. Cumming (1♀, CNC); same data except, CNC487267 (1♂, barcoded, CNC); same data except, CNC487268 (1♀, barcoded, CNC); Alder Falls [44°28.462'N 123°31.711'W], Marys Peak, Siuslaw NF, 4.vii.1989, B.J. Sinclair (3♂, 1♀, CNC); Corvallis [44°33'N 123°14'W], 21.vi.1925, (1♂, USNM); Marys Peak [44.50718°N 123.55087°W], 4097 ft, Hwy 34, 16.vii.1968, B.V. Peterson (2♂, 1♀, CNC); Marys Peak Rd, 44.47447°N 123.52862°W, 661 m, 14.vi.2021, small crk/ waterfall, J.B. Runyon (1♂, 2♀, CNC); Yew Crk, T13S R7W Sec. 10 [44°27'N 123°32'W], 12.vi.1977, D. Wilder (14♂, 6♀, CAS); same data except, CNC1155698 (1♂, CAS). **Clatsop County:** Ecola SP, Indian Beach, 45°55'52.1"N 123°58'37.3"W, 2.vii.2014, freshwater seeps, S.E. Brooks (15♂, 20♀, CNC); same data except, J.M. Cumming (12♂, 17♀, CNC). **Lane County:** Siuslaw NF, Tenmile Creek [44°12'N 124°01'W], 14.vii.1989, stream nr cpgd, B.J. Sinclair (1♂, CNC). **Marion County:** Silver Falls SP [44°52'N 122°39'W], 12.vii.1989, seepage behind South Falls, B.J. Sinclair (3♂, CNC); same data except, wing slide No. 9846 ♀, Empidoidea Phylogeny Exemplar, Sinclair & Cumming 2006 (1♀, CNC); Silver Falls SP, South Silver Creek Falls, 23.vi.1974, P.H. Arnaud, Jr (3♂, 1♀, CAS). **Multnomah County:** Benson Park [45°34'N 122°07'W], 24.vi.1935, A.L. Melander (5♂, 1♀, USNM); Multnomah Falls [45°34'N 122°06'W], 26.vi.1974, P.H. Arnaud, Jr (3♂, CAS); Wahkeena Crk above falls [45°34'N 122°07'W], 10.vii.1989, B.J. Sinclair (1♀, CNC). **Washington County:** nr Timber, Cochran Rd, 45°42'25.9"N 123°19'15.0"W, 306 m, 30.vi.2014, S.E. Brooks, CNC487288, CNC487289 (2♀, barcoded, CNC). **Washington: Clallam County:** Sappho, Tumbling Rapids Recreation Area, Soleduck River [48°04'N 124°16'W], 30.vi.1974, P.H. Arnaud, Jr (1♂, CAS). **Lewis County:** Adna [46°37'N 123°03'W], 10.vii.1917, A.L. Melander (1♂, USNM). **Mason County:** Dewatto, NE Shore Rd, 47°26'29"N 123°4'36"W, 29.v.2018, S. Fitzgerald, CNC1309346 (1♂, barcoded, CNC); Potlatch, Hoods Canal [47°22'N 123°09'W], 28.vii.1917, A.L. Melander (4♂, USNM).

Diagnosis. Males of this species can be distinguished by the following combination of characters: legs plain (Fig. 7, although fore tibia occasionally with subtle fringe of short curved setae, Fig. 11); hind femur with series of long anteroventral setae along distal 2/3 (Figs 7, 12, 13); hind tibia lacking anteroventral fringe of longer setae basally; face relatively broad (Figs 8, 9); hypandrium of some specimens pale on posteriorly projecting end (Fig. 17); cercus as in Figs 21 and 22 (or with inner apical lobe acute); phallus short, not flared apically.

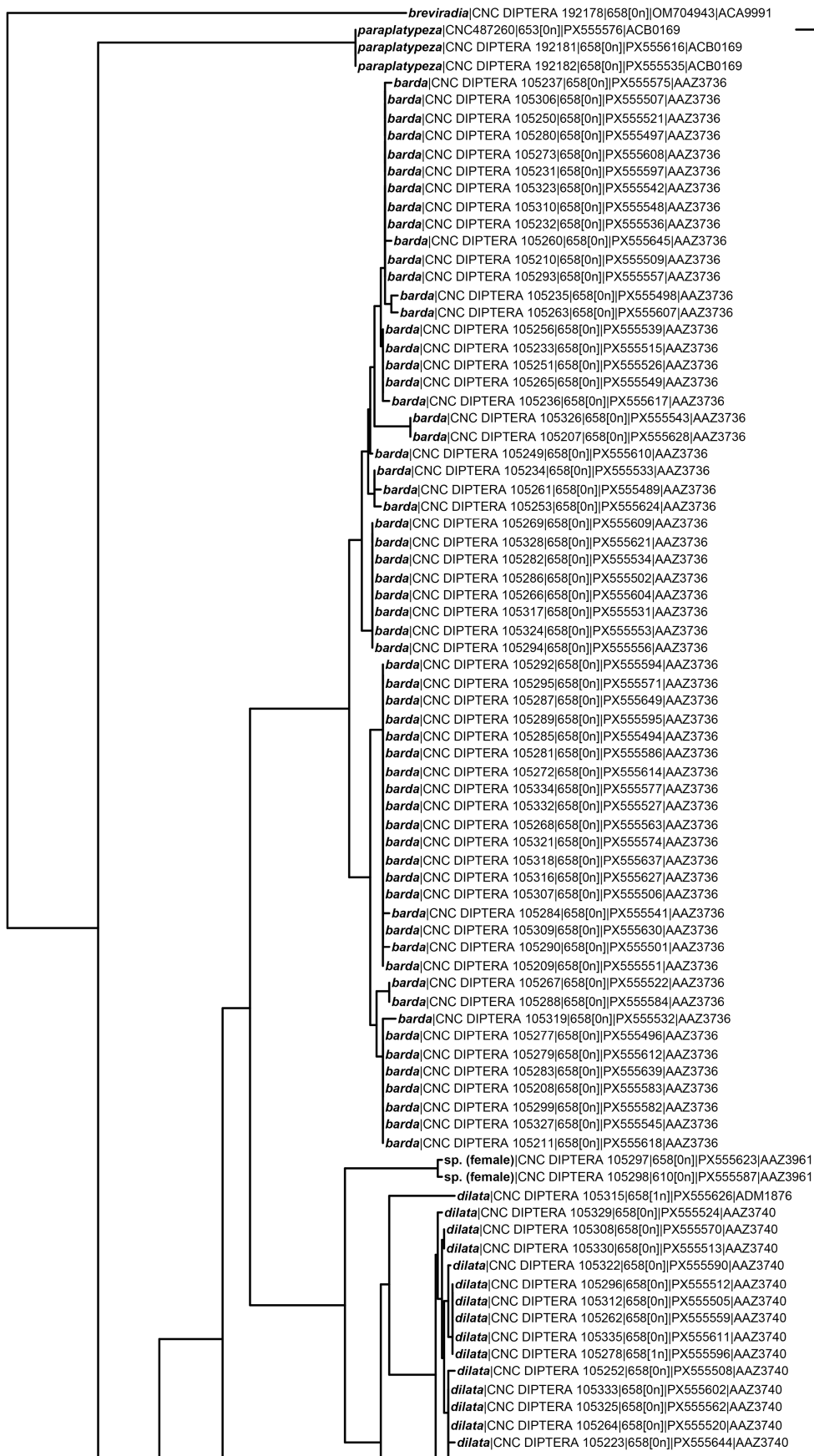
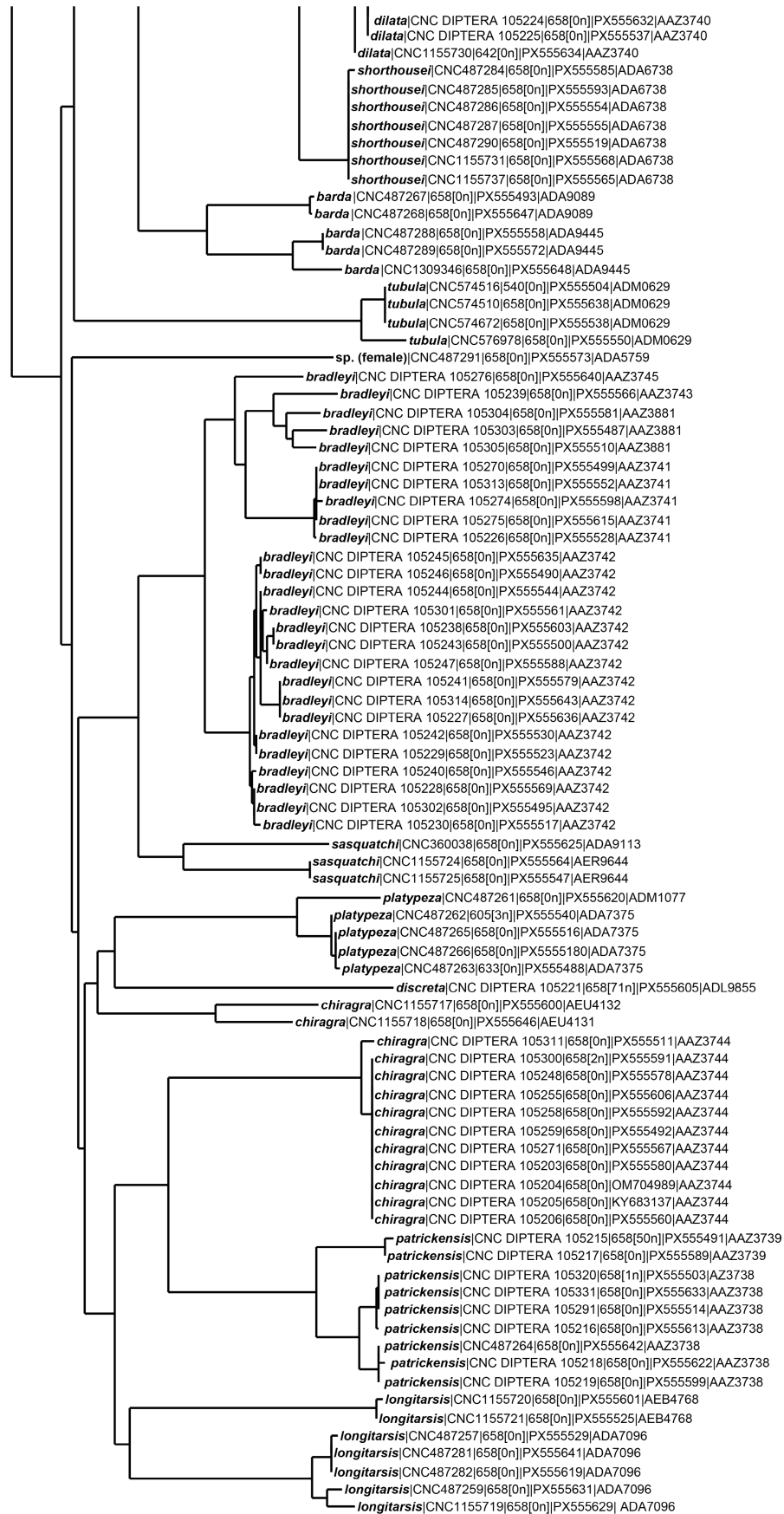
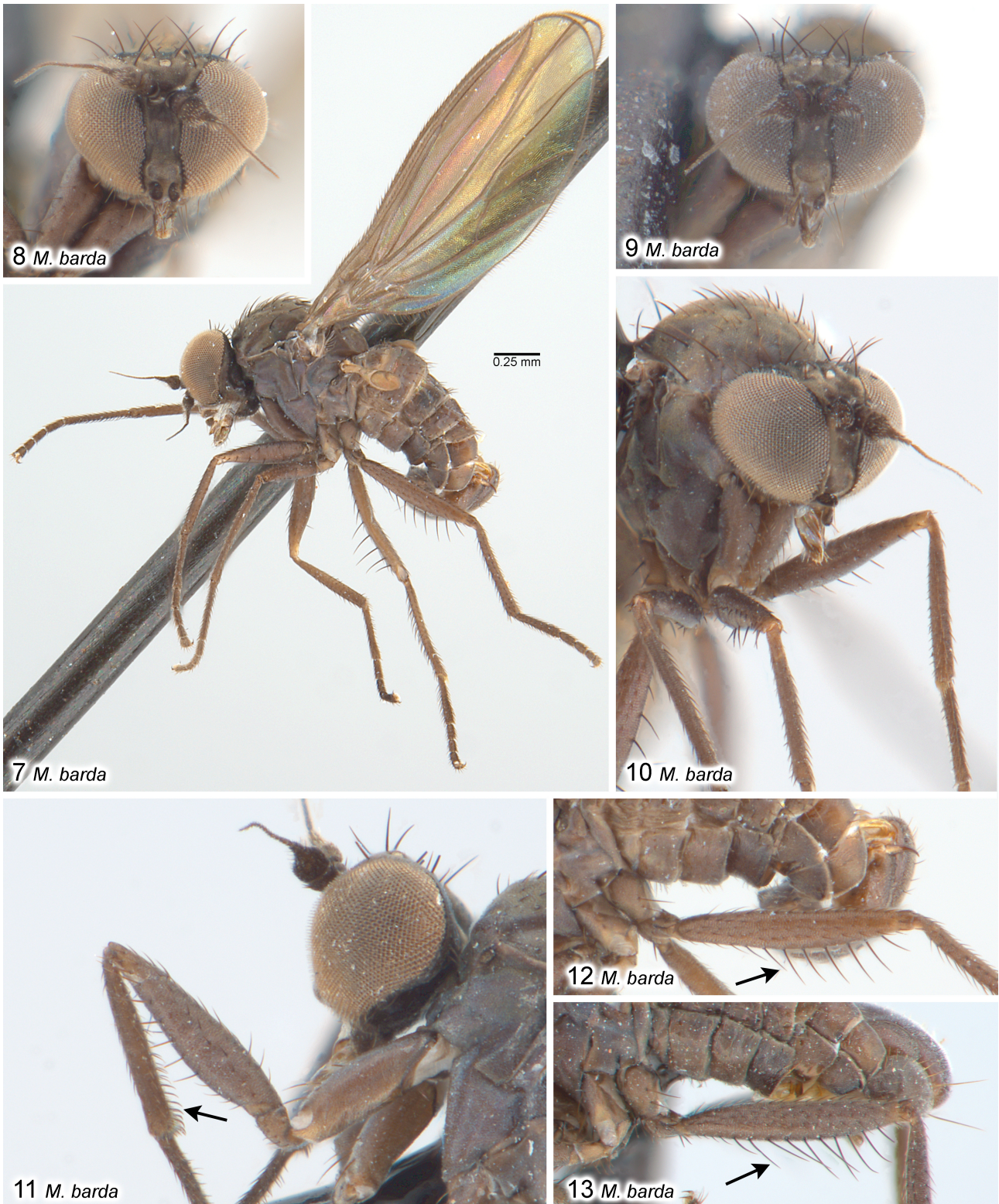


FIGURE 5. First part of neighbour-joining TaxonID Tree of 165 specimens of the *Microphorella chiragra* species group with an outgroup of *M. breviradia* Cumming & Brooks. Order of information: species name | CNC database number | number of base pairs [number of substitutions] | GenBank accession number | BIN.

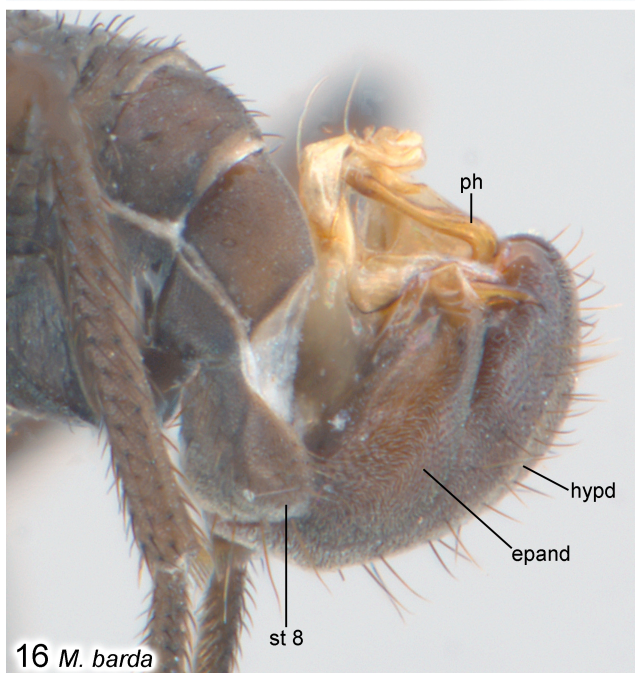
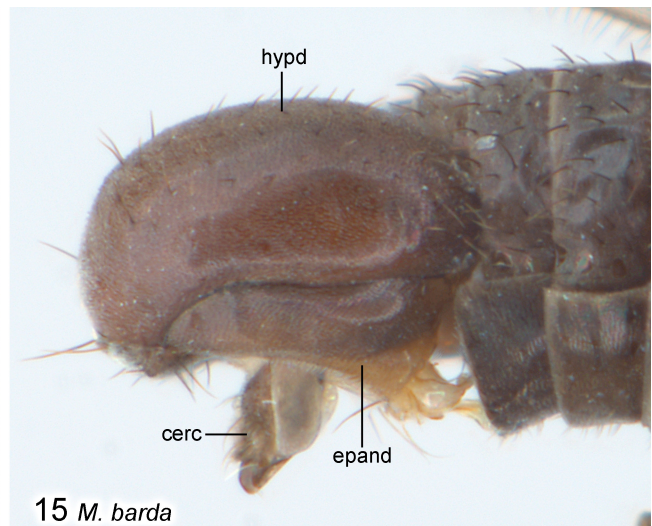
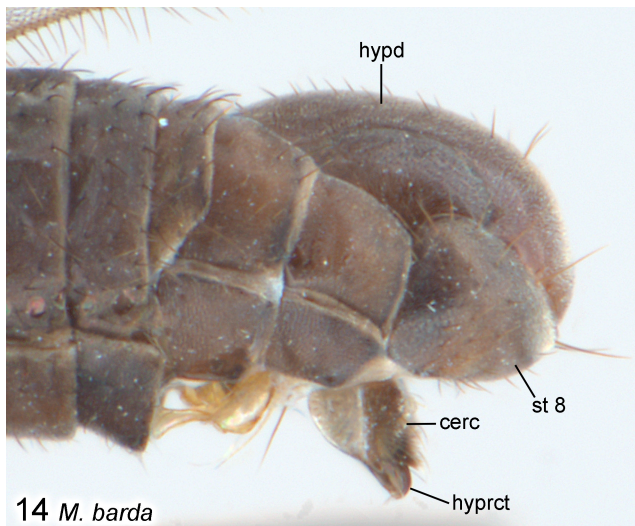


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FIGURE 6. Second part of neighbour-joining TaxonID Tree of 165 specimens of the *Microphorella chiragra* species group with an outgroup of *M. breviradia* Cumming & Brooks. Order of information: species name | CNC database number | number of base pairs [number of substitutions] | GenBank accession number | BIN.



FIGURES 7–13. Male of *M. barda* sp. nov. **7.** Habitus of holotype. **8–9.** Heads, anterior view, showing variation in width. **10.** Head and antenna, thorax and forelegs, right oblique view. **11.** Head and left foreleg, left lateral view, arrow indicates anteroventral fringe of short, curved setae present in some specimens. **12.** Left hind femur (anterior surface) of holotype, arrow indicates anteroventral row of setae. **13.** Same, of specimen from Eighteenmile Creek, California.



FIGURES 14–17. Male abdomen and hypopygium of *M. barda* **sp. nov.** **14.** Left lateral view, hypopygium in resting position. **15.** Right lateral view of same specimen. **16.** Left lateral view, hypopygium flexed clockwise with left side exposed. **17.** Dorsal view of specimen from Alder Creek Falls, Oregon, with posteriorly projecting end of hypopygium (*i.e.*, the morphologically anterior end) pale. Abbreviations: cerc—cercus; epand—epandrium; hypd—hypandrium; hypprct—hypoproct; ph—phallus; st—sternite.

Description. Male (Figs 8–22): Wing length 1.9–2.3 mm. Body and legs bronzy dark brown to bronzy blackish pruinose (air dried specimens are darker than critical point dried specimens) with black setae (fine setae brown); head, thorax and abdomen with faint to moderate metallic reflections; hypopygium with hypandrium entirely dark brown or sometimes pale on posteriorly projecting end. **Head** (Figs 8–11): Slightly wider than thorax in dorsal view, ovoid in lateral view (higher than broad), about 1.3–1.5× broader than high in anterior view. Ocellar triangle conspicuous. Eyes bulging laterally on upper 3/4 (Figs 8–10); covered with short ommatrichia; medial edge with small emargination adjacent to antenna; ommatidia subequal in size. Frons about 2–2.7× broader than high, widening above. Face broad (Figs 8, 9), lateral margins linear and subparallel or nearly so, about 3–3.5× broader than width of anterior ocellus. Clypeus not separated from face, about 2× broader than high, with truncate ventral margin. Setae of head well differentiated (larger dorsal setae similar in size to anterior dorsocentrals): 1 pair of inclinate fronto-

orbitals arising near level of median ocellus; 1 pair of laterocline anterior ocellars; 2 pairs of small posterior ocellars; 1 pair of inner verticals (sometimes referred to as postocellars); 2 pairs of outer verticals, often with postocular-sized seta between; postocular setae uniserial, short, becoming slightly longer ventrally; posterior margin of oral cavity with series of setae slightly longer than ventral postoculars. Antenna (Figs 7, 8, 10) inserted above middle of head in profile; scape short, funnel-shaped; pedicel about as long as scape, spheroidal with subapical cirlet of setulae; postpedicel about 3.5× longer than pedicel, about 2× longer than wide, bulb-shaped, clothed in fine setulae, narrowed apical portion slender and concavely tapered to apex; arista-like stylus apical, about 2× length of postpedicel, with minute hairs. Palpus, small, rounded apically and tapered to base, with 1 long preapical seta on lateral margin. Proboscis brown, short, projecting ventrally. Gena narrow. **Thorax** (Figs 7, 10): Mesoscutum moderately arched, prescutellar depression present. Proepisternum bare of substantial setae (1–2 tiny hairs sometimes observable). Postpronotal lobe usually with 2 small setae. Mesonotum longer than wide. Acrostichal setae biserial, rows divergent anteriorly, extending to anterior edge of prescutellar depression; setae on each side of mesonotum: 7–8 dorsocentrals, middle setae weaker, posterior seta longest and strongest, 1 presutural supra-alar (posthumeral), 1 distinct postsutural supra-alar (sometimes with second anterior setae differentiated), 2 notopleurals, 1 postalar, area laterad dorsocentrals and anterior to postsutural supra-alar with field of small setae. Scutellum broadly crescent-shaped with 1 long, strong inner seta and 1 tiny outer seta per side. Mesopleuron bare. Halter brown. **Legs** (Figs 7, 10–13): Slender; foreleg, midleg and hindleg plain; femora, tibiae and tarsi largely covered with tiny setae in addition to more prominent setae; tarsal claws, pulvilli and empodium normally developed on all legs. *Foreleg* (Figs 10, 11): Coxa with setae on anterior surface, setae stronger and longer apically; femur slightly longer than tibia, with row of erect setae on posterior surface (especially along basal 2/3), with row of posteroventral setae (setae about as long as femur width); tibia plain (or occasionally with subtle anteroventral fringe of short curved setae, Fig. 11); tarsus slender, plain, slightly longer than femur, tarsomeres 1–4 progressively shorter apically with tarsomere 5 slightly longer than 4, tarsomere 1 about as long as tarsomeres 2–4 combined. *Midleg*: Coxa with a few setae on anterior surface; femur about as long as tibia, tibia slightly shorter than tarsus; apical margin of tibia with 1 strong ventral seta; tarsus slender, plain, tarsomeres 1–4 progressively shorter apically with tarsomere 5 slightly longer than 4, tarsomere 1 about as long as tarsomeres 2–5 combined. *Hindleg*: Coxa with 2 setae on lateral surface; trochanter with ventral seta; femur slightly longer than tibia, tibia and tarsus subequal in length; femur weakly bowed outwardly (in dorsal view), with prominent anteroventral row of about 5–8 long setae along distal 2/3 (most setae distinctly longer than femur width, Figs 7, 12, 13); tibia with rather robust setae on anterior surface (including close-set anterodorsal row); tarsus slender, plain, setae slightly longer on anterior surface (especially on tarsomere 1), tarsomeres 1–4 progressively shorter apically with tarsomere 5 slightly longer than 4, tarsomere 1 subequal to combined length of tarsomeres 2–4. **Wing** (Fig. 7): Slightly longer than body (based on non-shrivelled specimens). Hyaline, veins dark brown, about 2.7× longer than wide. Pterostigma absent, membrane entirely covered with minute microtrichia, alula absent. Costa circumambient. Base of costa with strong dorsal seta and a few shorter proximal setae. Anterior section of costa (between base and R_{2+3}) with irregular double row of short setae. Posterior section of costa (beyond R_{2+3}) with setae finer and longer, especially in basal part. Radial and medial veins complete and reaching wing margin, CuA+CuP (anal vein) extending about halfway to wing margin. Sc faint apically. R_1 terminating slightly beyond midpoint of wing and M_2 . Base of Rs originating opposite humeral crossvein. R_{2+3} , R_{4+5} and M_1 nearly straight, divergent in basal part, subparallel to weakly divergent distally beyond base of M_2 . M_1 and M_2 divergent. M_2 and M_4 subparallel beyond cell dm. Costal section between M_1 and M_2 longer than costal section between M_2 and M_4 . CuA rounded (convex). Crossvein r-m short. Crossvein bm-m incomplete. Cell dm present, closed by base of M_2 and dm-m crossvein, cell extending to middle of wing. Cells br, bm and cua in basal fourth of wing. Cell cua ovoid. Anal lobe not developed. Calypter with fine setae. **Abdomen** (Figs 7, 14–22): With short setae (very weak on sternites); segment 7 bare. Segments 5–7 narrowed and laterally compressed to form cavity on right side for hypopygium (Fig. 17). Sternite 4 rectangular with shallow medial notch on posterior margin. Sternite 5 largely concealed by sternite 4, mainly bare, recessed and somewhat concave on right side. Sternite 8 usually subtriangular in left lateral view (when hypopygium at rest, *i.e.*, similar to Fig. 47), occasionally suboval, wider than segment 7, setose with setae on posterior margin long; tergite 8 vestigial. *Hypopygium* (Figs 14–22): Lateroflexed to right; inverted with posterior end directed anteriorly in resting position (Figs 14, 15); large, about 1/3 to 1/2 as long as abdomen; asymmetrical. Right and left epandrial lamellae separate behind cerci. Left epandrial lamella (Figs 16, 18) shorter than hypandrium and partially overlapping its left side, posterior margin with projecting surstyler lobes and ventral epandrial process, ventral edge broadly rounded and fused with hypandrium but margin distinct;

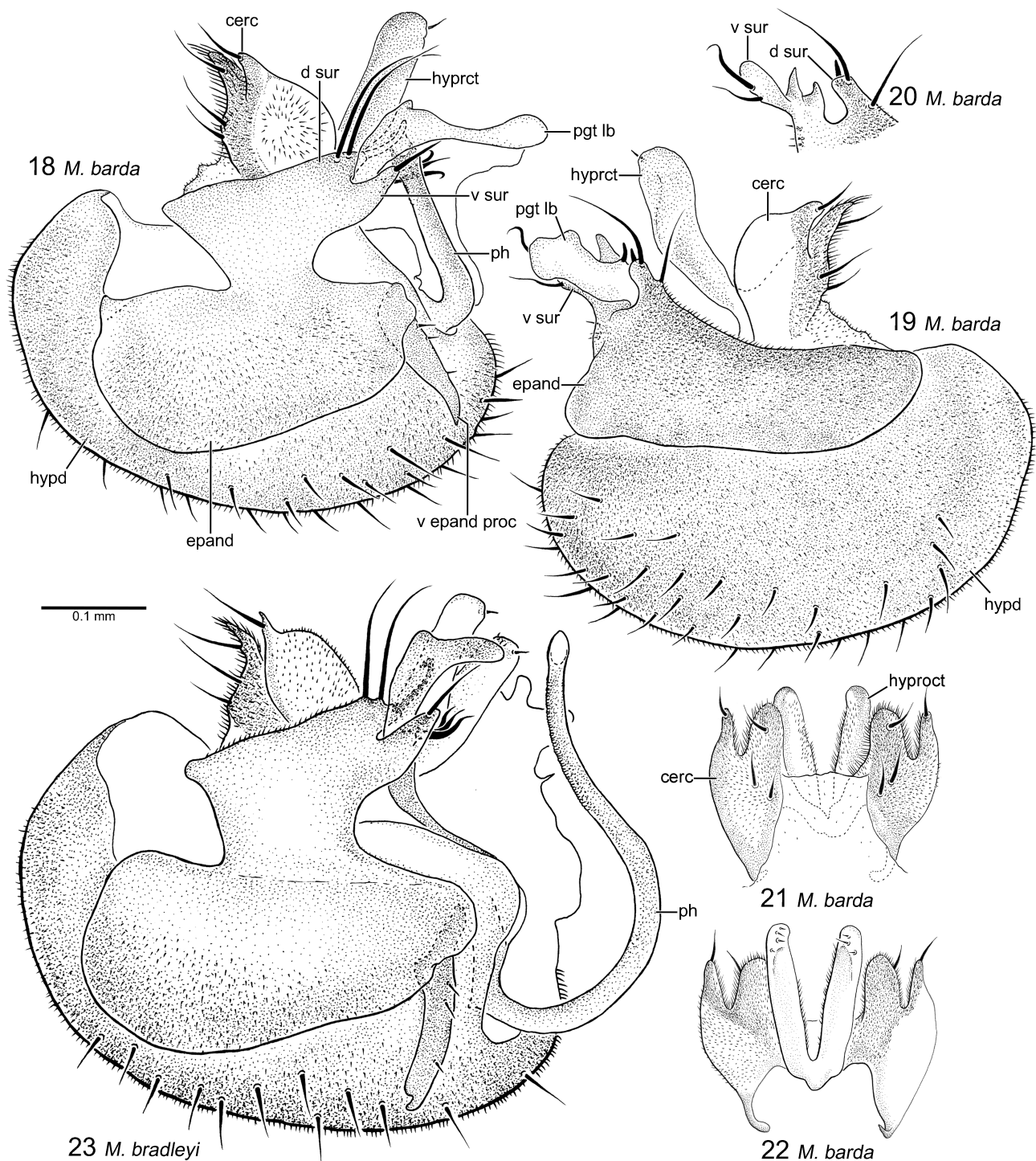
ventral epandrial process articulated at base, digitiform, evenly tapered to pointed downcurved tip (Fig. 18), or with tip narrowed and claw-like (similar to Fig. 51). Left surstylus divided into dorsal and ventral lobes separated by U-shaped cleft through which left postgonite lobe protrudes. Dorsal lobe of left surstylus short, with 2 long dorsal setae and apical blade-like preniseta. Ventral lobe of left surstylus slightly longer than dorsal lobe with apical or preapical seta, medially with tubercle bearing cluster of 2–3 thickened, curved and modified setae (similar to Fig. 55). Right epandrial lamella (Figs 15, 19) shorter than hypandrium and partially overlapping its right side, longer than high, ventral edge separate from hypandrium; ventral epandrial process absent. Right surstylus divided into dorsal and ventral lobes separated by U-shaped cleft through which right postgonite lobe protrudes (Figs 19, 20). Dorsal lobe of right surstylus short and thumb-like bearing long dorsal seta near base, long preapical seta and shorter and often thick medial seta near apex. Ventral lobe of right surstylus longer than dorsal lobe, with a pair of pointed dorsal processes basally, with rounded apical lobe bearing 2 long setae. Hypandrium (Figs 14–19) reniform, large, longer than epandrium in lateral view, setose; dark and concolorous with abdomen (Figs 14–16), or pale on the posteriorly projecting end (*i.e.*, the morphologically anterior end) when hypopygium is in resting position (Fig. 17). Left postgonite lobe long with rounded apex (Fig. 18), medially with projection bearing a thick seta (postgonite similar in overall structure to Fig. 54, but with distal portion elongate and rounded apically). Right postgonite lobe shorter and smaller than left (Fig. 19), strongly curved medially, but with similar overall structure. Phallus with exposed part simple, tubular, relatively short and J-shaped (Figs 16, 18), with weak crest on right side just above curve, basal internal portion with rounded keel-like medial process below sperm pump. Ejaculatory apodeme large, keel-like. Hypoproct comprised of large symmetrical right and left flipper-like lobes which are usually appressed to the cerci in dry specimens (Figs 14, 15) and free in macerated specimens, lobes connected basally and V-shaped in ventral view (Figs 18, 19, 21, 22). Cercus bulbous in lateral view, infusate dorsally, membranous ventrally, dorsal surface with pair of setae near middle, apex bifid, inner apical lobe broad with margin rounded or acute (not elongate, narrow and rod-like) bearing preapical dorsal seta, outer apical lobe narrow with apical seta (Figs 14, 15, 18, 19, 21, 22).

Female (Figs 163–165): Similar to male except as follows: **Head:** Eyes weakly bulging on upper 3/4. Face and clypeus slightly broader. **Legs:** Setae weaker. **Hindleg:** Femur with weak anteroventral row of setae. **Abdomen:** Apical segments retractable into segment 5. Tergite 5 without cluster of stout medial setae. **Terminalia:** Tergite 6 with row of long, stout setae on posterior margin (Figs 163–165), otherwise bare. Syntergite 9+10 medially divided into hemitergites, with 4 acanthoporous spines on each side; cercus sclerotized, pointed apically, with a few short ventral setae.

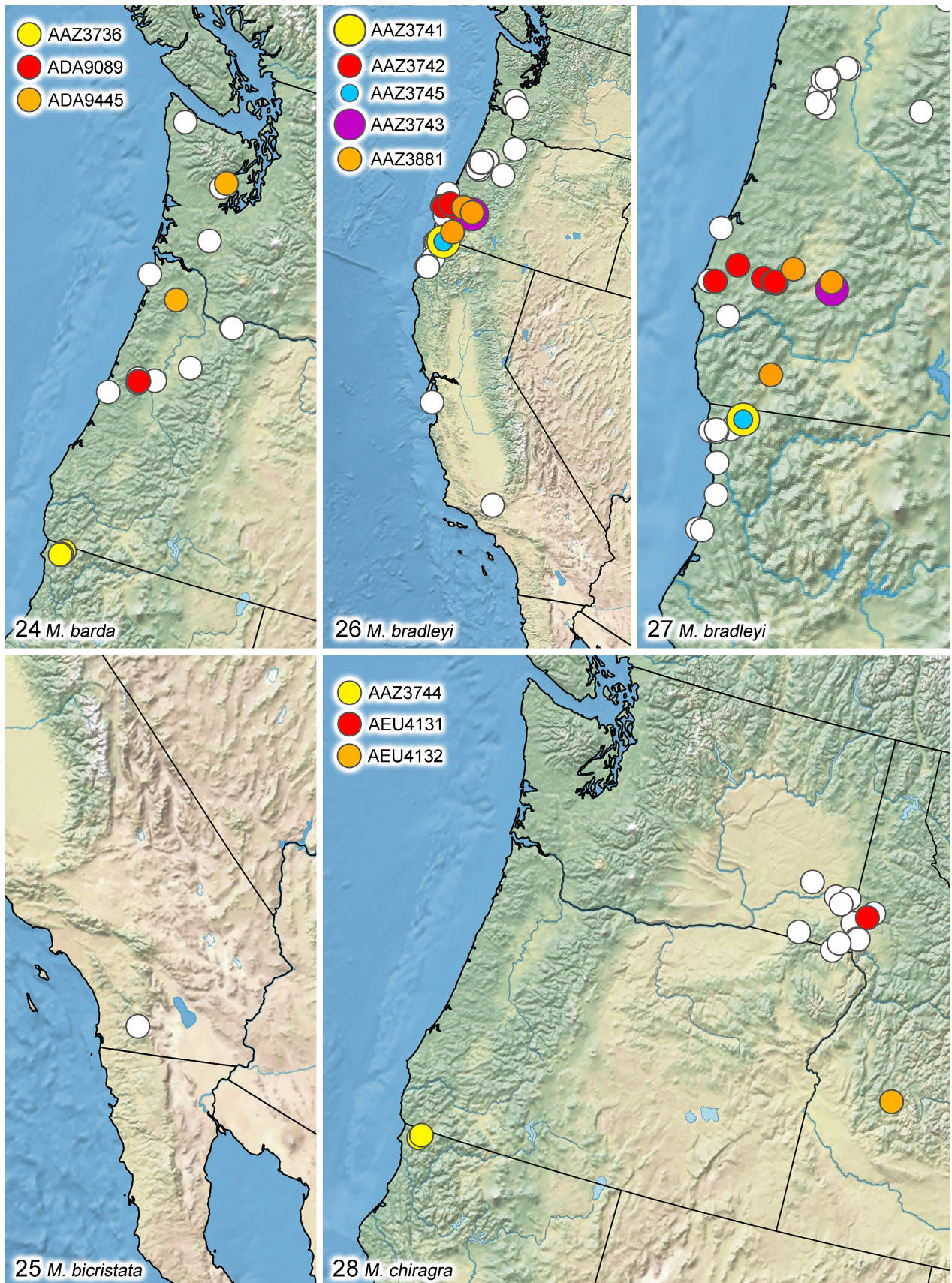
Distribution and seasonal occurrence. This species is known from the Coast and Cascade Ranges of Washington, Oregon and northern California (Fig. 24). Adults have been collected from May to July.

Etymology. The species name is derived from the Latin for dull, in reference to the plain legs of males.

Remarks. Males of *M. barda* **sp. nov.** from Cold Spring Mountain and Eighteenmile Creek near Gasquet, and some males from West Fork of Patrick Creek (all from northern California), show several slight morphological differences compared to males from other localities, including a slightly wider head, fore tibia with anteroventral fringe of short, curved setae and hind femur with series of anteroventral setae more prominent. Even though these two subtly different male forms can be separated morphologically, the COI sequences obtained for 68 specimens (including males of both forms and females) from three northern California localities (Figs 5, 24) comprised a single BIN (AAZ3736). Males of the two different morphological forms did not form separate subgroups in the TaxonID Tree, but were intermixed within BIN AAZ3736. Additional barcoding of specimens from Oregon and Washington would be useful to examine genetic variability across the known range of this species. The barcode analysis also identified two neighbouring BINs (ADA9089 and ADA9445, Fig. 6) containing five sequenced specimens that together were widely separated from the other 68 sequenced specimens of *M. barda* **sp. nov.** belonging to BIN AAZ3736 (Fig. 5). BIN ADA9089 includes a male and female from Alder Creek Falls, Oregon and BIN ADA9445 includes two females from Timber, Oregon and a male from Dewatto, Washington (Fig. 24). It is possible that these two BINs together may represent an additional species from BIN AAZ3736, but no diagnostic feature was discovered that reliably separated these potential species morphologically. Certain Oregon males from Alder Creek Falls (including the barcoded male), Marys Peak, Yew Creek, Tenmile Creek and a Washington male from Adna have a pale hypandrium on the posteriorly projecting end (*i.e.*, the morphologically anterior end) that is distinctive but not consistently present.



FIGURES 18–23. Hypopygium of *M. barda* sp. nov. and *M. bradleyi* sp. nov. **18.** Hypopygium of *M. barda* sp. nov. (CNC DIPTERA #105207), left lateral view. **19.** Hypopygium, right lateral view of same specimen. **20.** Right surstylus of same specimen, right lateral view. **21.** Cerci and hypoproct of same specimen, dorsal view. **22.** Cerci and hypoproct of same specimen, ventral view. **23.** Hypopygium of *M. bradleyi* sp. nov. (CNC DIPTERA #105228), left lateral view. Abbreviations: cerc—cercus; d sur—dorsal lobe of surstylus; epand—epandrium; hypd—hypandrium; hyprct—hypoproct; pgd lb—postgonite lobe; ph—phallus; v epand proc—ventral epandrial process; v sur—ventral lobe of surstylus.



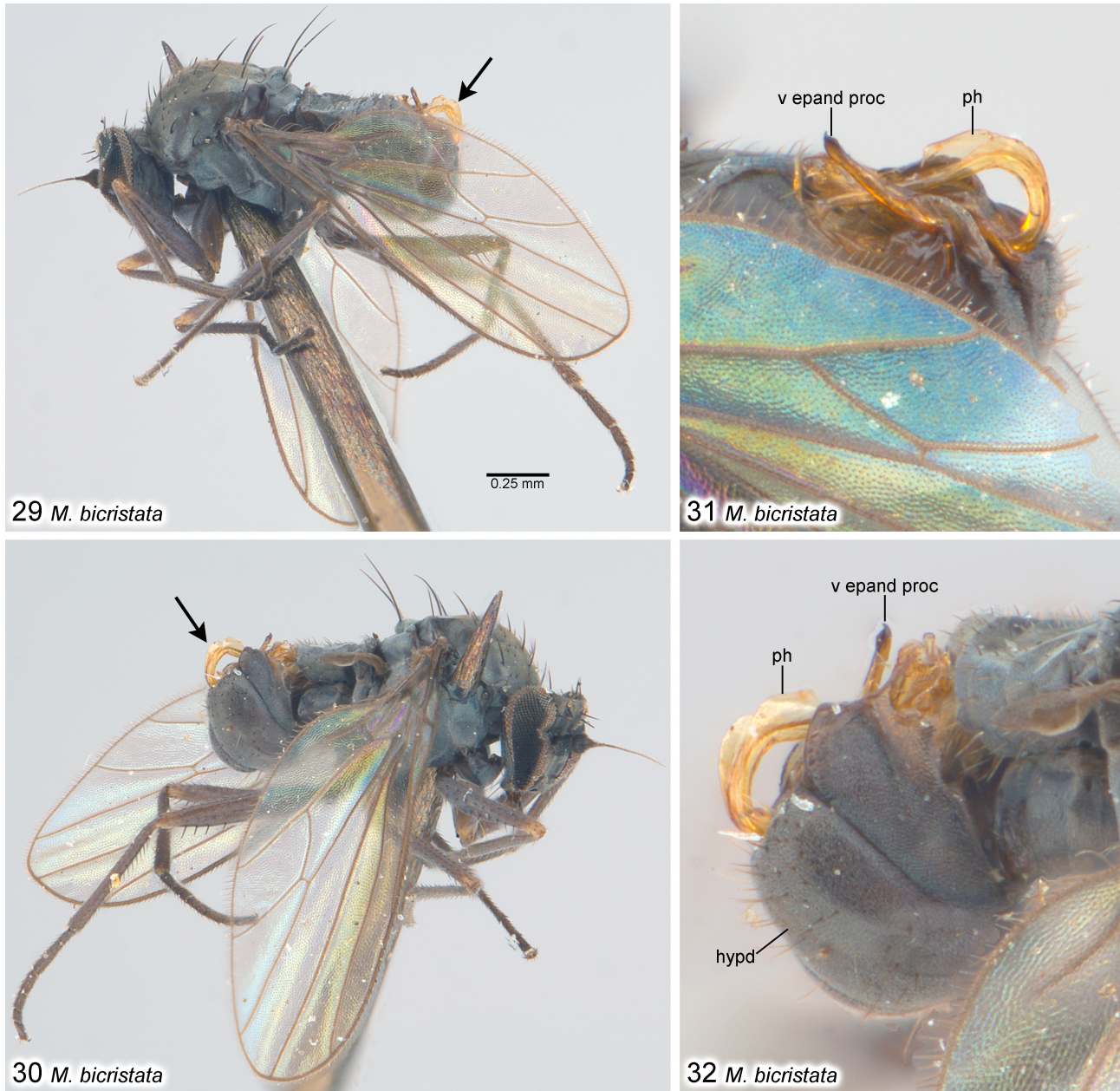
FIGURES 24–28. Known geographical distribution of the *Microphorella chiragra* species group. Coloured dots indicate localities with barcoded specimens (and their BINs), white dots indicate localities without barcoded specimens. **24.** *M. barda* sp. nov. **25.** *M. bicristata* sp. nov. **26.** *M. bradleyi* sp. nov. **27.** *M. bradleyi* sp. nov., close-up of localities with barcoded specimens. **28.** *M. chiragra* Melander.

***Microphorella bicristata* sp. nov.**

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(Figs 25, 29–32)

Type material. **HOLOTYPE**, ♂ (Figs 29–32) from Cuyamaca Park, California, labelled: “CUYAMACA PRK| 6/5/45 CAL| ALMELANDER”; “ALMelander| Collection| 1961”; “HOLOTYPE| *Microphorella*| *bicristata*| Brooks & Cumming” [red label] (USNM). **PARATYPE**: USA: California: *San Diego County*: same data as holotype [32°58'N 116°34'W] (1♂, USNM).



FIGURES 29–32. Male holotype of *M. bicristata* sp. nov. **29.** Habitus, right lateral view, arrow indicates phallus. **30.** Habitus, left lateral view, arrow indicates phallus. **31.** Hypopygium, partially obscured by wing, left lateral view. **32.** Hypopygium, right lateral view. Abbreviations: hypd—hypandrium; ph—phallus; v epand proc—ventral epandrial process.

Diagnosis. Males of this species with exposed genitalia are easily recognized by their distinctive double-crested phallus (Figs 29–32), otherwise, males can be distinguished by the following combination of characters: legs plain; hind femur with short anteroventral setae (not longer than femur width); phallus double-crested with flared tip;

cercus with inner apical lobe elongate, narrow and rod-like (similar to Fig. 133).

Description. Male (Figs 29–32): Wing length 1.7–1.8 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): Body and legs bronzy blackish pruinose (air dried specimens only), knees pale; head thorax and abdomen with bronze and dark green metallic reflections. **Head** (Fig. 30): Some features not assessable because of collapsed head and eyes in available material. Frons about 2.2× broader than high, weakly widening above. Face broad, lateral margins linear and subparallel or weakly convergent below, about 3× broader than width of anterior ocellus. Clypeus about 1.6× broader than high. Antenna with postpedicel about 3.5× longer than pedicel, about 1.5× longer than wide; arista-like stylus about 2× length of postpedicel. **Thorax** (Figs 29, 30): 6 dorsocentrals. Scutellum with only 1 long, strong seta per side. **Legs** (Figs 29, 30): Foreleg, midleg and hindleg plain. **Hindleg**: Femur with less prominent anteroventral row of relatively short setae along distal 1/3 (setae not longer than femur width); tibia with setae less robust on anterior surface, anteroventral setae slightly longer on basal half. **Wing** (Figs 29, 30): As in *M. barda* **sp. nov.** description. **Abdomen: Hypopygium** (Figs 29–32): Ventral epandrial process short claw-like tip. Dorsal lobe of right surstylus digitiform. Ventral lobe of right surstylus with single long seta basal to enlarged apical lobe with rugose, textured medial surface bearing 2 minute setae. Hypandrium dark and concolorous with abdomen. Left postgonite lobe long and rather narrow. Right postgonite short and relatively narrow. Phallus relatively long with pair of large lamelliform crests on right and left sides of broadly protruding curved portion (Figs 31, 32), apex strongly flared (similar to Fig. 134). Hypoproct lobes with angular flange-like extension near middle of ventral margin (similar to Fig. 133). Cercus similar to Figs 132, 133, with inner apical lobe elongate, narrow and rod-like.

Female: Unknown.

Distribution and seasonal occurrence. This species is known only from the type locality in San Diego County, California (Fig. 25), with adults collected in early May.

Etymology. The species name refers to the double crested phallus of males.

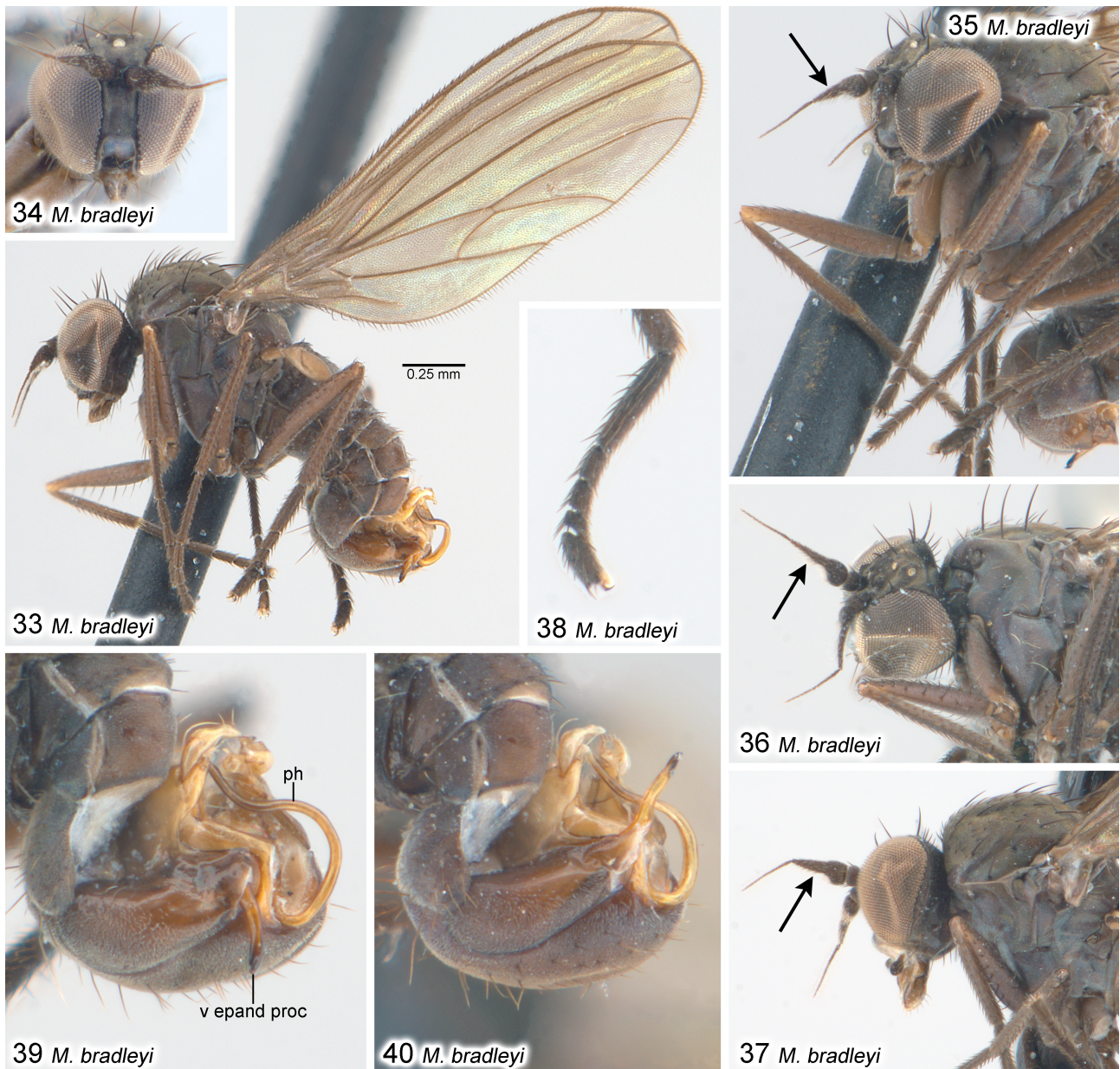
Remarks. No COI sequences were obtained for this species, but it appears to be closely related to *M. tubula* **sp. nov.** and *M. virgata* **sp. nov.** based on the rod-like inner apical lobe of the cercus, shape of the hypoproct lobe with flange-like extension near middle of ventral margin, and flared tip of the phallus (see Figs 132–134, 154–157).

Microphorella bradleyi **sp. nov.**

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(Figs 6, 23, 26, 27, 33–40, 162)

Type material. HOLOTYPE, ♂ (Figs 33, 35) labelled “USA: OR: Benton Co., Corvallis, | Lewisburg Saddle, below Old | Growth Trail, 44°38'32.28"N | 123°17'20.76"W, Malaise trap, | over creek, 31.v–12.vi.2013, S. | Fitzgerald, CNC351049”; “HOLOTYPE | *Microphorella* | *bradleyi* | Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: Oregon: Benton County:** same data as holotype except, CNC350899, CNC350901, CNC350902, CNC350905, CNC350908, CNC350909, CNC350911, CNC350915, CNC350916, CNC350917, CNC350918, CNC350919, CNC350920, CNC350921, CNC350922, CNC350925, CNC350926, CNC350927, CNC350928, CNC350930, CNC350937, CNC350943, CNC350945, CNC350948, CNC350951, CNC350954, CNC350956, CNC350966, CNC350981, CNC350982, CNC350983, CNC350990, CNC350992, CNC350993, CNC350994, CNC350995, CNC350996, CNC350997, CNC350998, CNC350999, CNC351000, CNC351002, CNC351003, CNC351004, CNC351006, CNC351009, CNC351010, CNC351011, CNC351012, CNC351013, CNC351014, CNC351015, CNC351016, CNC351017, CNC351018, CNC351019, CNC351020, CNC351021, CNC351022, CNC351023, CNC351025, CNC351026, CNC351027, CNC351028, CNC351029, CNC351030, CNC351031, CNC351032, CNC351033, CNC351034, CNC351035, CNC351037, CNC351038, CNC351039, CNC351041, CNC351042, CNC351043, CNC351044, CNC351045, CNC351046, CNC351051, CNC351052, CNC351053, CNC351054, CNC351055, CNC351056, CNC351059, CNC351060, CNC351063, CNC351065, CNC351066, CNC351067, CNC351071, CNC351072, CNC351073, (95♂, CNC); same data except, CNC350897, CNC350912, CNC350924, CNC350947, CNC351001, CNC351036, CNC351050, CNC351058 (8♀, CNC); same data as holotype except, 6–31.v.2013, CNC351076, CNC351078, CNC351093, CNC351146, CNC351210 (5♂, CNC).



FIGURES 33–40. Male of *M. bradleyi* sp. nov. **33.** Habitus of holotype. **34.** Head, anterior view. **35.** Holotype, left oblique view, showing medial surface of right antenna, head and legs, arrow indicates postpedicel. **36.** Antennae, head and thorax, left lateral view, showing medial surface of right antenna, arrow indicates postpedicel. **37.** Antennae, head and thorax, left lateral view, showing lateral surface of left antenna, arrow indicates postpedicel. **38.** Tarsus of right hindleg. **39.** Hypopygium, left lateral view, specimen from Lewisburg Saddle, Oregon. **40.** Same, specimen from Lake Earl, California. Abbreviations ph—phallus; v epand proc—ventral epandrial process.

Other material examined. USA: California: Del Norte County: Crescent City, Lake Earl [41°48'N 124°10'W], 2.vi.2009 (3♂, CNC); Gasquet [41°50'N 123°58'W], 20.vi.1974, P.H. Arnaud, Jr (2♂, CAS); Hunter Crk Rd, 2 mi. N Requa, 41°34'14"N 124°3'10"W, muddy disturbed roadside, 23.v.2009, S.E. Brooks (1♂, CNC); Jedediah Smith Redwoods SP, Howland Hill Rd at Mill Creek [41°48'N 124°6'W], 16.v.1978, D.D. Wilder (1♂, CAS); Jedediah Smith Redwoods SP, Walker Rd, ca 41°48'44"N 124°6'36"W, 25.v.2009, creek, J.M. Cumming (3♂, CNC); West Fork of Patrick Creek, 41°55'03"N 123°51'28"W, 24.v.2009, S.E. Brooks (50♂, 6♀, CNC); same data except, 31.v.2009 (10♂, CNC); same data except, 3.vi.2009 (2♂, CNC); same data except, 24.v.2009, J.M. Cumming (12♂, CNC); same data except, 31.v.2009, (6♂, CNC); same data except, 24–31.v.2009, YPT, J.M. Cumming & S.E. Brooks (1♂, CNC); same data except, 31.v.2009, S.E. Brooks, CNC DIPTERA # 105226 (1♂, barcoded, CNC);

same data except, 24.v.2009, S.E. Brooks, CNC DIPTERA #'s 105274, 105275, 105276, 105313 (4♀, barcoded, CNC); same data except, 24.v.2009, J.M. Cumming, CNC DIPTERA # 105270 (1♀, barcoded, CNC). *Humboldt County*: Redwoods NP, Lost Man Crk Tr., 41°19.641'N 124°0.926'W, 3.vi.2009, B.J. Sinclair (12♂, 1♀, CNC); Trinidad State Beach, 41°03'25.9"N 124°09'00.0"W, 4.vi.2009, stream flowing onto beach, B.J. Sinclair (1♂, CNC); same data except, sea cliff flowers/seeps, B.J. Sinclair (1♀, CNC); Luffenholtz Creek (Trinidad) [41°03'N 124°06'W], 27.v.2001, R. Hurley (1♂, MTEC). *Kern County*: Fort Tejon SP [34°52'N 118°53'W], 5.iv.1980, P.H. Arnaud, Jr (1♀, CAS). *San Mateo County*: La Portola State Park [37°15'N 122°11'W], 7.v.1950, P.H. Arnaud, Jr (1♂, USNM). **Oregon**: *Benton County*: Alsea Falls, 44°19'31.7"N 123°29'25.1"W, 250m, 5.vii.2014, S.E. Brooks (3♂, 1♀, CNC); same data except, J.M. Cumming (2♂, CNC); Corvallis, Sulphur Springs along Soap Creek, 44°38'34"N 123°18'56"W, 15.vi–17.vi.2017, MT066, S. Fitzgerald, CNC1310691, CNC1310692, CNC1310693 (2♂, 1♀, CNC); Marys Peak Rd, Rest Area at Hwy 34, 44°28'05.5"N 123°30'18.5"W, 400 m, 5.vii.2014, trickling stream & forest, S.E. Brooks (1♂, CNC); same data except, J.M. Cumming (1♂, CNC); North Fork Alsea R., nr fish hatchery, 44°25'14.0"N 123°33'47.8"W, 115 m, 5.vii.2014, S.E. Brooks (17♂, 13♀, CNC); same data except, J.M. Cumming (1♀, CNC); South Fork Alsea R., 44°21'03.6"N W123°34'40.4"W, 117 m, 5.vii.2014, S. Fitzgerald (1♀, CNC); Siuslaw NF, Rock Creek, 44°31.857'N 123°32.662'W, 570 m, 12.vii.2013, B.J. Sinclair (1♂, CNC); 4 mi. up Woods Crk Rd, 44°32.950'N 123°29.106'W, 248 m, 12.vii.2013, B.J. Sinclair (1♂, CNC); 5 mi. up Woods Crk Rd from jct Hwy 20, riparian woods on creek edge, ca 44.544022°N 123.503047°W, 30.v–24.vi.2014, MT014, S. Fitzgerald (4♂, 1♀, CNC). *Clackamas County*: Clear Creek, 10 road km SW Estacada [45°15'N 122°22'W], 24.vi.1974, P.H. Arnaud, Jr (5♂, 1♀, CAS). *Coos County*: Myrtle Point, 43°03'36"N 124°08'24"W, wetland & small stream, 28.v.2009, S.E. Brooks (6♂, CNC); same data except, J.M. Cumming (11♂, CNC); same data except, CNC DIPTERA # 105242 (1♀, barcoded, CNC); ca 3 mi. SE Remote, Rock Creek, 42°59'27"N 123°51'41"W, 28.v.2009, S.E. Brooks (10♂, CNC); same data except, J.M. Cumming (2♂, CNC); same data except, S.E. Brooks, CNC DIPTERA # 105229 (1♂, barcoded, CNC); same data except, J.M. Cumming, CNC DIPTERA # 105301 (1♀, barcoded, CNC); Sunset Bay [43°19'N 124°22'W], 14–19.vii.1965 (1♂, CNC); same data except, 17.vii.1965, Malaise trap (1♂, CNC). *Curry County*: ca 7 mi. E of Langlois, Floras Crk, 42°54'58"N 124°20'37"W, 29.v.2009, S.E. Brooks (13♂, 1♀, CNC); same data except, J.M. Cumming (17♂, CNC); same data except, J.M. Cumming, CNC DIPTERA # 105227 (1♂, barcoded, CNC); same data except, S.E. Brooks, CNC DIPTERA #'s 105314, 105241 (2♀, barcoded, CNC); ca 3 mi. E of Langlois, waterfall on Floras Crk, 42°54'39"N 124°24'07"W, 29.v.2009, S.E. Brooks (2♂, CNC); Rouge R., Siskiyou NF, Rd 5325, seep on roadcut between jct 3353 & 130, 42.669932°N 124.163921°W, 24.v.2014, S. Fitzgerald (2♂, CNC). *Douglas County*: ca 7 mi. SW Camas Valley, Bear Crk Recreation Site, 42°58'08"N 123°45'55"W, 27.v.2009, S.E. Brooks (17♂, 1♀, CNC); same data except, 28.v.2009 (20♂, 1♀, CNC); same data except, 27.v.2009, J.M. Cumming (8♂, CNC); same data except, 27.v.2009 (9♂, CNC); same data except, 28.v.2009, J.M. Cumming, CNC DIPTERA # 105228 (1♂, barcoded, CNC); same data except, 27/28.v.2009, J.M. Cumming, CNC DIPTERA #'s 105245, 105246 (2♀, barcoded, CNC); same data except, 27/28.v.2009, S.E. Brooks, CNC DIPTERA #'s 105238, 105243, 105244, 105247 (4♀, barcoded, CNC); 7 mi. SW Camas Valley, Bridge Crk at Twelvemile Crk Rd, 42°58'07"N 123°43'29"W, 27.v.2009, S.E. Brooks (9♂, CNC); same data except, J.M. Cumming (19♂, CNC); same data except, J.M. Cumming, CNC DIPTERA #'s 105230, 105302, (1♂, 1♀, barcoded, CNC); ca 5.5 mi. SW Camas Valley, Twelvemile Creek, 42°58'41"N 123°44'29"W, 27.v.2009, S.E. Brooks (3♂, CNC); same data except, J.M. Cumming (3♂, CNC); same data except, J.M. Cumming, CNC DIPTERA # 105240 (1♀, barcoded, CNC); Days Creek, junction of Wood Crk and Days Crk, 42°58'50"N 123°09'00"W, 26.v.2009, S.E. Brooks (6♂, CNC); same data except, J.M. Cumming (3♂, CNC); same data except, S.E. Brooks, CNC DIPTERA # 105239 (1♀, barcoded, CNC); 7 miles E Myrtle Creek, South Myrtle Creek, 43°02'05"N 123°09'54"W, 26.V.2009, J.M. Cumming, CNC DIPTERA # 105305 (1♀, barcoded, CNC); Tenmile, Lower Tenmile Crk, 43°5'27"N 123°34'13"W, 27.vi.2009, S.E. Brooks (2♂, CNC); same data except, CNC DIPTERA # 105303 (1♀, barcoded, CNC). *Josephine County*: Selma, Squaw Crk, 42°16'47"N 123°38'46"W, 25.v.2009, J.M. Cumming (1♀, CNC); same data except, CNC DIPTERA # 105304 (1♀, barcoded, CNC). *Linn County*: Cascadia SP, nr Sweet Home, 261 m, 44°23'56.1"N 122°28'52.3"W, 9.vii.2014, ex: along Soda Crk, J.M. Cumming (2♂, 2♀, CNC). **Washington**: *Lewis County*: Adna [46°37'N 123°03'W], 10.vii.1917, A.L. Melander (1♂, USNM); Toledo [46°26'29"N 122°50'59"W], 27.vi.1935 (1♂, USNM).

Diagnosis. Males of this species can be distinguished by the following combination of characters: antennal postpedicel rather elongate with straightly tapered apical portion (Figs 35–37); hindleg with tarsomere 5 enlarged (Figs 33, 38); phallus with broad protruding curve (Figs 39, 40); foreleg and midleg plain.

Description. Male (Figs 23, 33–40): Wing length 2.0–2.1 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 34–37): About 1.2× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Frons about 2× broader than high, weakly widening above. Face broad, lateral margins linear and subparallel, about 3× broader than width of anterior ocellus. Antenna (Figs 35–37) with postpedicel somewhat elongate, about 4.1–5.3× longer than pedicel, about 2.4–2.7× longer than wide, with narrowed apical portion broad, long and straightly tapered to apex; arista-like stylus about 1–1.3× length of postpedicel. **Thorax** (Figs 33, 36, 37): 6–7 dorsocentrals. **Legs** (Figs 33, 35, 38): Foreleg and midleg plain, hindleg with tarsus weakly clavate. *Hindleg*: Femur with less prominent anteroventral row of relatively short setae along distal 1/2 (setae about as long as femur width); tibia with setae less robust on anterior surface; tarsus clavate with tarsomere 4 compressed and tarsomere 5 elongated and enlarged, tarsomeres 1–4 progressively shorter apically, tarsomere 5 about 4× longer than tarsomere 4 and about half as long as tarsomere 1 (Fig. 38). **Wing** (Fig. 33): As in *M. barda* **sp. nov.** description. **Abdomen** (Figs 33, 39, 40): *Hypopygium* (Figs 23, 39, 40): Ventral epandrial process with short claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite lobe relatively short with rounded apex. Phallus long with very broad curve protruding from hypopygium (Figs 23, 39, 40), lacking crest. Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female (Fig. 162): Similar to male except as follows: **Head**: Face and clypeus slightly broader. Antenna with postpedicel similar in form but noticeably shorter. **Legs**: Setae weaker. *Hindleg*: Femur with very weak anteroventral row of setae; tarsus plain. **Abdomen**: As in *M. barda* **sp. nov.** description.

Distribution and seasonal occurrence. This species is known from the Coast and Cascade Ranges of Washington, Oregon and California, including the Sierra Nevada Mountains (Figs 26, 27). Adults have been collected from April to July.

Etymology. The species is named in honour of our colleague and friend, Bradley J. Sinclair (Ottawa) who collected a series of specimens from northern California.

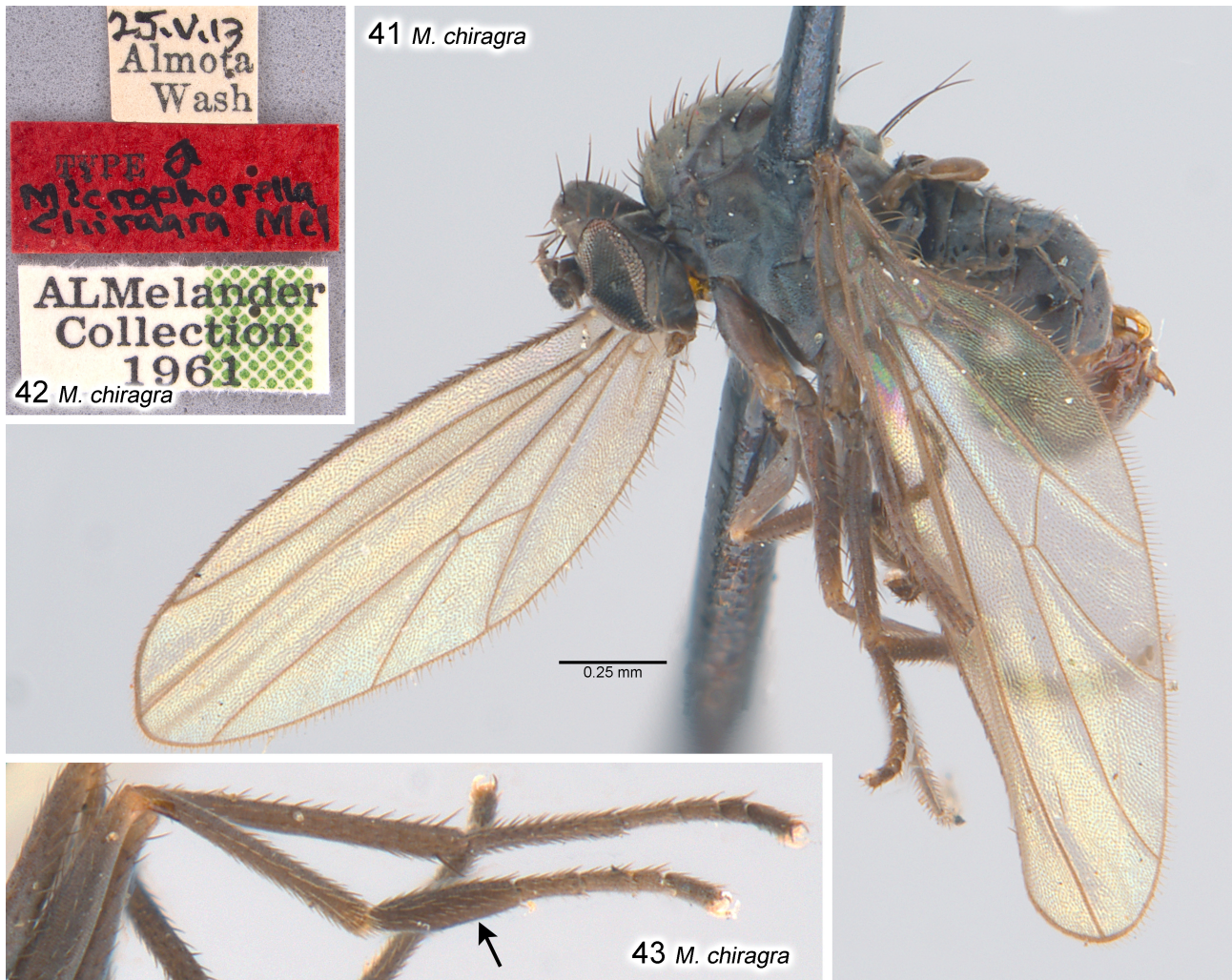
Remarks. Although the large number of examined specimens of this species appear morphologically identical and conspecific, the barcode analysis identified a cluster of five BINs among 26 sequenced specimens (Figs 6, 26, 27) from a rather localized portion of the species range in southwestern Oregon and northwestern California. BIN AAZ3741 included a male and females from West Fork of Patrick Creek, California. BIN AAZ3742 included males and females from several Oregon localities (Floras Creek, Rock Creek, Bear Creek, Bridge Creek) and females from Myrtle Point, Oregon and Twelvemile Creek, Oregon. The other three BINs (AAZ3745, AAZ3743, AAZ3881) clustered together and included only females from various localities in California (West Fork of Patrick Creek) and Oregon (Days Creek, South Myrtle Creek, Tenmile, Selma). Non-barcoded males were also collected during the same collecting events at all of these localities, except South Myrtle Creek, and appear conspecific with the other males of *M. bradleyi* **sp. nov.** It is possible that these female-only BINs AAZ3745, AAZ3743 and AAZ3881 may represent additional species, but until corresponding males are discovered with morphology to support species recognition, we consider them conspecific with *M. bradleyi* **sp. nov.** Further studies should incorporate sequencing of specimens from across the known range of this species including representatives from localities in northern Oregon, Washington and southern California to examine if additional BINs exist.

Microphorella chiragra Melander

(Figs 6, 28, 41–55)

Microphorella chiragra Melander, 1928: 89. Type locality: Almota, Washington, USA.

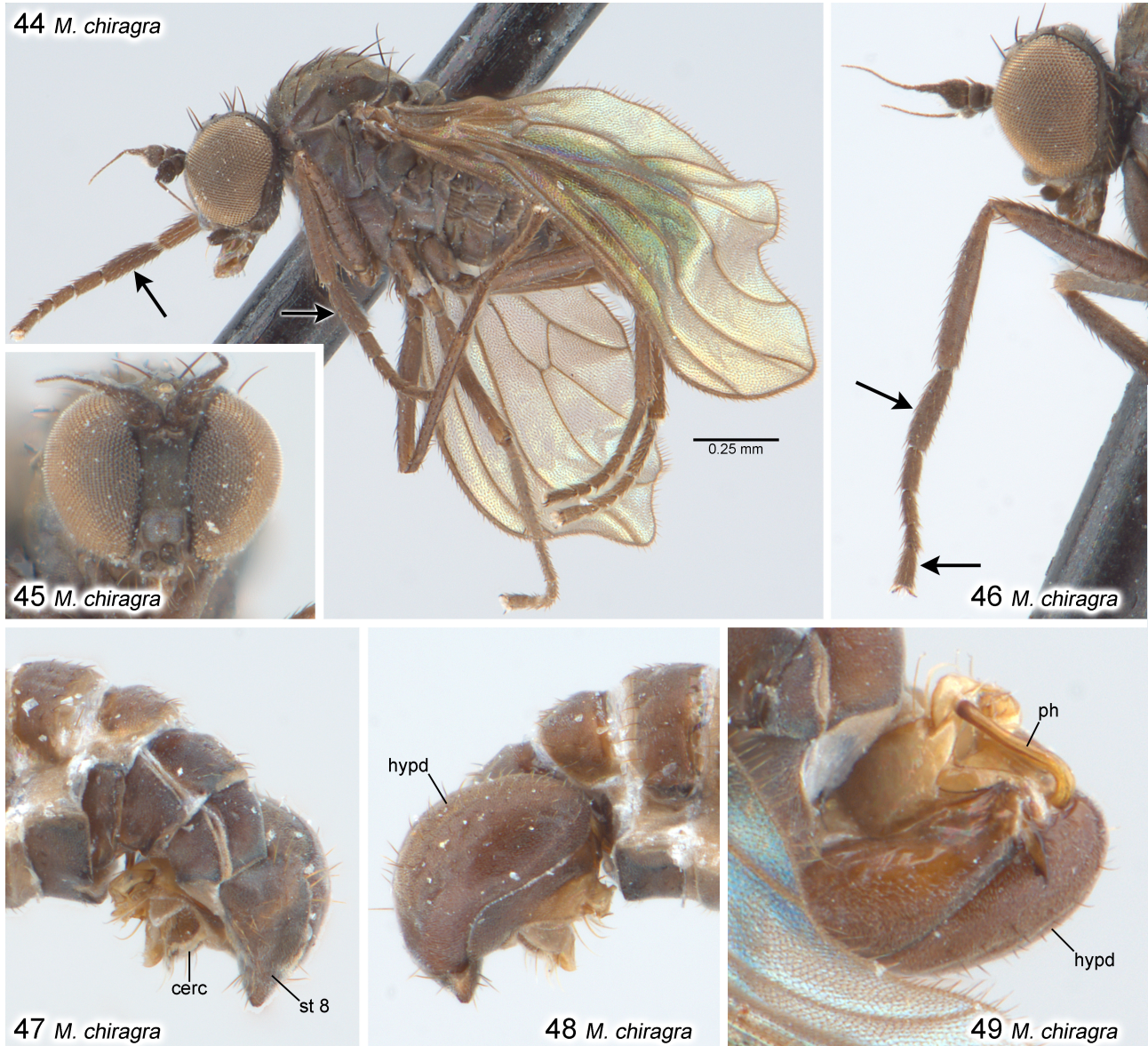
Type material examined. LECTOTYPE (here designated to fix the identity of the species) ♂ (Figs 41, 42) from Almota, Washington, labelled: “25.v.13| Almota| Wash”; “TYPE ♂| Microphorella| chiragra Mel” [red label]; “ALMelander| Collection| 1961”; “LECTOTYPE| *Microphorella| chiragra* Melander| des. Brooks & Cumming” [red label] (USNM). **PARALECTOTYPES: USA: Washington: Whitman County:** Almota [46°42'N 117°27'W] (1♂, USNM); Pullman [46°43'N 117°11'W], 30.v.1913 (1♂, USNM); same data except, 16.vi.1912 (1♂, USNM); same data except, 1.vi.1924, A.L. Melander (1♂, USNM); Lyle's Grove, Pullman, 10.vi.1911 (1♂, 1♀, USNM).



FIGURES 41–43. Male lectotype and paralectotype of *M. chiragra* Melander. **41.** Habitus of lectotype. **42.** Lectotype labels (prior to addition of Brooks & Cumming “LECTOTYPE” label). **43.** Foreleg and midleg of paralectotype, anterior surface, arrow indicates tarsomere 1 of foreleg.

Other material examined. USA: California: *Del Norte County:* ca 6.5 mi. NE Gasquet nr Cold Spring Mountain, 41°52'15"N 123°53'21"W, 31.v.2009, S.E. Brooks (3♂, CNC); same data except, CNC DIPTERA # 105205 (1♂, barcoded, CNC); same data except, CNC DIPTERA #'s 105248, 105255, 105258, (3♂, barcoded, CNC); same data except, J.M. Cumming, CNC DIPTERA # 105259 (1♀, barcoded, CNC); *West Fork of Patrick Creek*, 41°55'03"N 123°51'28"W, 3.vi.2009, S.E. Brooks (4♂, CNC); same data except, 31.v./3.vi.2009, J.M. Cumming (3♂, CNC); same data except, 24–31.v.2009, YPT, J.M. Cumming & S.E. Brooks (3♂, CNC); same data except, 31.v.2009, S.E. Brooks, CNC DIPTERA #'s 105204, 105206 (2♂, barcoded, CNC); same data except, 24.v.2009, J.M. Cumming, CNC DIPTERA # 105203 (1♂, barcoded, CNC); same data except, 24.v.2009, S.E. Brooks, CNC DIPTERA # 105300 (1♀, barcoded, CNC); same data except, 31.v.2009, S.E. Brooks, CNC DIPTERA #'s 105271, 105311 (2♀, barcoded, CNC). **Idaho:** *Boise County:* Boise NF, E of Lowman, 44°07.140'N 115°27.259'W, 1365 m, 12.vi.2014, roadcut seeps, B.J. Sinclair (3♂, 8♀, CNC); same data except, CNC1155717 (1♂, barcoded, CNC). *Latah County:* Kendrick [46°36'N 116°38'W] (1♂, USNM); same data except, 25.v.1902 (2♂, USNM); same data except, 7.vi.1917 (9♂, 4♀, USNM). *Nez Perce County:* Juliaetta Falls, 46°31'22.2"N 116°44'49.7"W, 12.vi.2011, seepage/falls, B.J. Sinclair (6♂, 4♀, CNC); same data except, CNC1155718 (1♂, barcoded, CNC); *Lake Waha* [46°12'N 116°49'W], 9.vi.1918, A.L. Melander (1♂, USNM); *Lake Waha*, Flat Iron Rd, W Fork Sweetwater Crk, 46°12.412'N 116°49.027'W, 1040 m, 15.vi.2014, B.J. Sinclair (1♂, CNC); *Lewiston* [46°24'N 117°00'W], 1.vi.1919, A.L. Melander (USNM); *Waha* [46°12'N 116°51'W], 30.v.1924, A.L. Melander (1♂, USNM); *Zaza Rd*,

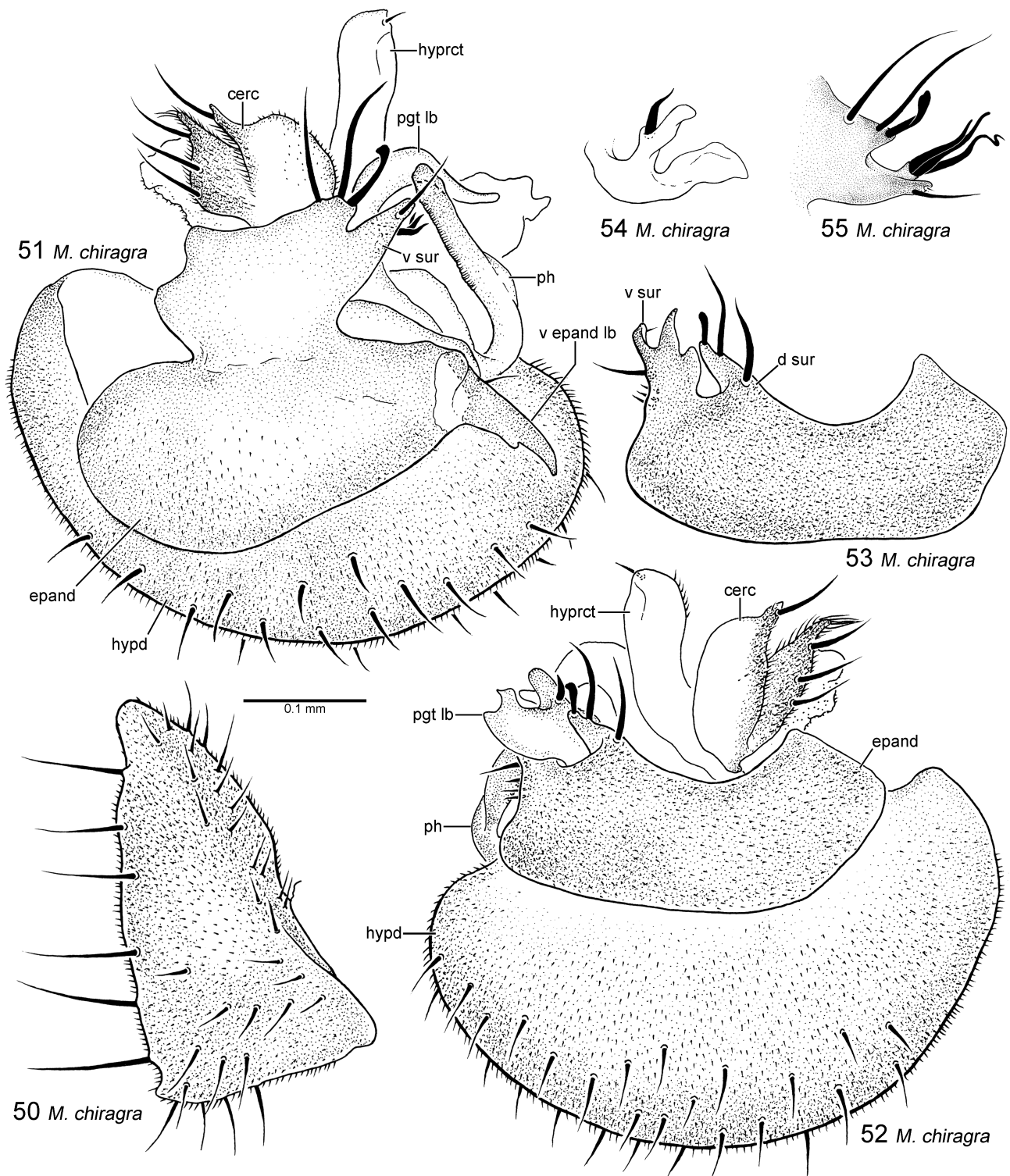
Lake Waha & Craig Mt., 46°11'58"N 116°48'59"W, 11.vi.2011, roadside seeps/flowers, B.J. Sinclair (14♂, 2♀, CNC); same data except, CNC1155703 (1♂, barcoded, CNC). **Oregon:** *Wallowa County:* 39 mi. N Enterprise on Hwy 3 [45°58'N 117°16'W], 3400 ft, 21.vi.1976, seep area, W.J. Turner (2♂, WSU). **Washington:** *Asotin County:* Fields Spring SP [46°05'N 117°10'W], 6–7.vi.1971, Malaise trap, D.N. Ferro (1♂, WSU). *Walla Walla County:* S Fork Coppei Creek, ca 15 mi. SE Waitsburg [46°06'N 118°00'W], 15.vi.1980, N.E. Woodley (3♂, 1♀, USNM). *Whitman County:* along Snake Riv., 1–5 miles SE Wawawai Cyn [46°37'N 117°19'W], 22.iv.1982, R.S. Zack (1♂, WSU); Union Flat [46°49'N 117°59'W], 3.vi.1918 (1♂, USNM).



FIGURES 44–49. Male of *M. chiragra* Melander. **44.** Habitus, arrows indicate tarsomere 1 of forelegs. **45.** Head, anterior view. **46.** Head and left foreleg, lateral view, arrows indicate tarsomeres 1 and 5. **47.** Abdomen and hypopygium, left lateral view, hypopygium in resting position. **48.** Same specimen, right lateral view. **49.** Hypopygium, left lateral view. Abbreviations: cerc—cercus; hypd—hypandrium; ph—phallus; st—sternite.

Diagnosis. Males of this species can be distinguished by the foreleg with only tarsomere 1 enlarged and broader than the unmodified distal tarsomeres (Figs 43, 44, 46), and by the plain tarsi of the midleg and hindleg (Fig. 44).

Description. Male (Figs 41, 43–55): Wing length 1.6–1.9 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 44–46): About 1.3× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Frons about 2.6× broader than high. Face broad, with lateral margins weakly concave, about 3× broader than width of anterior ocellus. Clypeus about



FIGURES 50–55. Male abdominal sternite 8 and hypopygium of *M. chiragra* Melander. **50.** Abdominal sternite 8, left lateral view (CNC DIPTERA #105205). **51.** Hypopygium of same specimen, left lateral view. **52.** Hypopygium of same specimen, right lateral view. **53.** Right epandrial lamella of same specimen, right lateral view. **54.** Left postgonite lobe of same specimen, dorsal view. **55.** Left surstylus, dorsolateral view (CNC1155915). Abbreviations: cerc—cercus; d sur—dorsal lobe of surstylus; epand—epandrium; hypd—hypandrium; hyprct—hypoproct; pgt lb—postgonite lobe; ph—phallus; v epand proc—ventral epandrial process; v sur—ventral lobe of surstylus.

1.6× broader than high. Antenna (Fig. 46) with postpedicel about 3.3× longer than pedicel, about 2× longer than wide; arista-like stylus about 1.3–1.7× length of postpedicel. **Thorax** (Figs 41, 44): As in *M. barda* **sp. nov.** description. **Legs** (Figs 43, 44, 46): Foreleg with tarsus modified, midleg and hindleg plain. *Foreleg* (Figs 43, 44, 46): Femur with posterior and posteroventral setae relatively weak; tarsus with tarsomere 1 enlarged (sometimes subtly) and broader than unmodified distal tarsomeres (Figs 43, 44, 46). *Midleg*: Tarsomere 1 about as long as tarsomeres 2–4 combined. *Hindleg*: Femur with less prominent anteroventral row of relatively short setae along distal 1/2 (setae about as long as femur width, or undifferentiated); tibia slightly longer than tarsus, with setae less robust on anterior surface. **Wing** (Fig. 41): As in *M. barda* **sp. nov.** description. **Abdomen** (Figs 41, 47–55): *Hypopygium* (Figs 47–55): Ventral epandrial process with claw-like tip (Fig. 51). Ventral lobe of left surstylus with structure of medial lobe similar in all members of species group (see Fig. 55 for dorsolateral view). Dorsal lobe of right surstylus with apical preniseta. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen (Fig. 48). Left postgonite lobe relatively short with flat angular apex (Figs 53, 54), right postgonite lobe as in Fig. 52. Phallus relatively short and J-shaped, with crest on right side just beyond curve (Figs 49, 51). Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker. *Foreleg:* Tarsus plain with tarsomere 1 not enlarged. *Hindleg:* Femur with anteroventral setae undifferentiated. **Abdomen:** As in *M. barda* **sp. nov.** description.

Distribution and seasonal occurrence. This species is known from the Columbia Plateau and Coast and Cascade Ranges of Washington, Oregon, Idaho and California (Fig. 28). Adults have been collected from April to June.

Remarks. Melander (1928) indicated the type series included nine specimens, but did not mention a type. We examined seven syntypes from the USNM and designated one of the males from Alмота, Washington, as the lectotype. The whereabouts of the other 2 paralectotypes is unknown.

Despite being apparently morphologically identical, the barcode analysis identified three separated BINs among the 13 sequenced specimens (Figs 6, 28). Most of the sequences (11) comprised a single BIN (AAZ3744) which included males and females from northwestern California, that clustered with the BINs of *M. patrickensis* **sp. nov.** and *M. longitarsis*. The other two BINs comprised single males from Juliaetta Falls (AEU4131) and Lowman (AEU4132), in Idaho, that clustered together beside the BINs of *M. discreta* **sp. nov.** and *M. platypeza* **sp. nov.** These three BINs correspond well with the three disjunct clusters of distribution localities known for *M. chiragra* (Fig. 28).

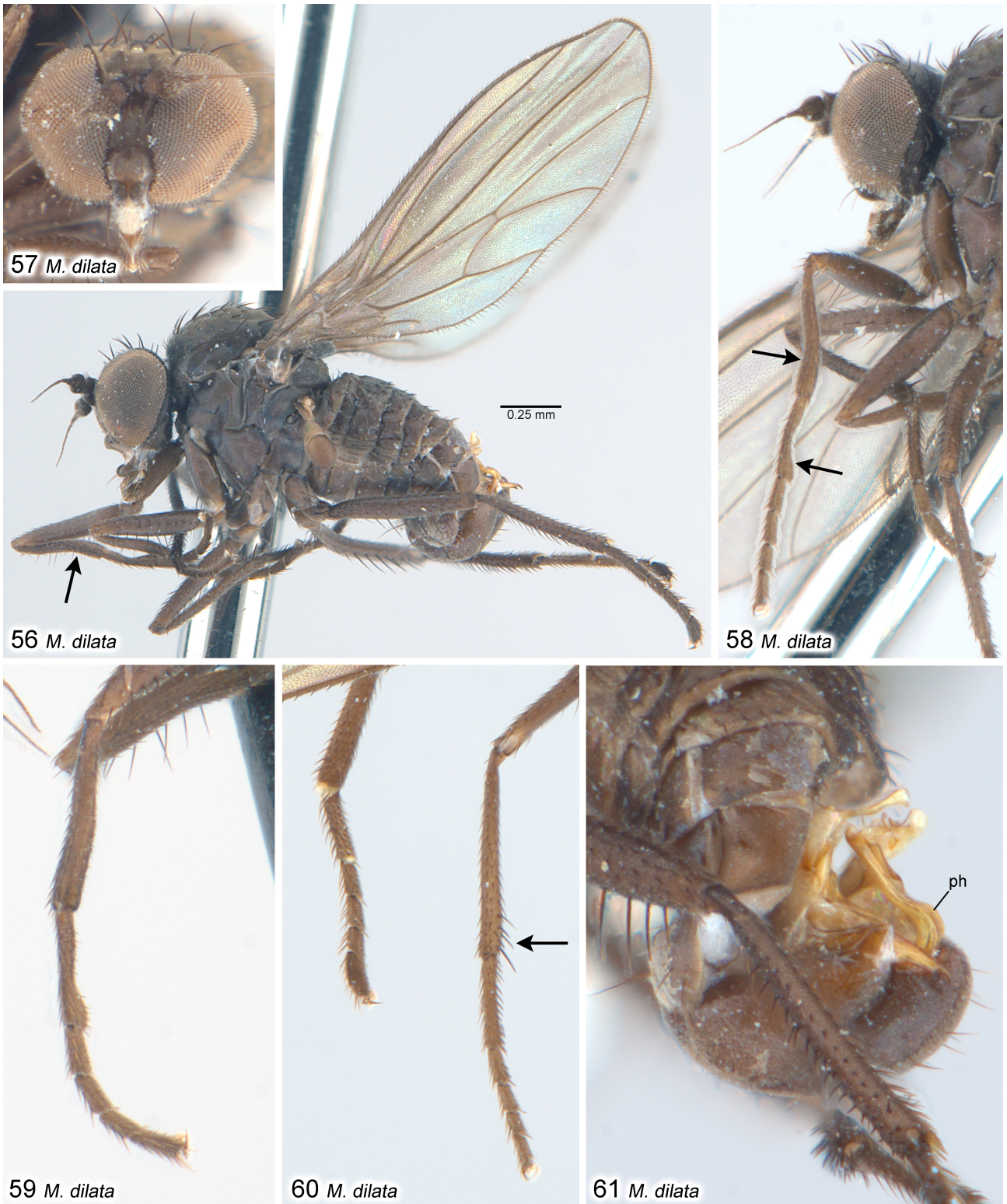
***Microphorella dilata* sp. nov.**

urn:lsid:zoobank.org:act:91E8EA42-A728-4BA6-8857-D0510B6C7695

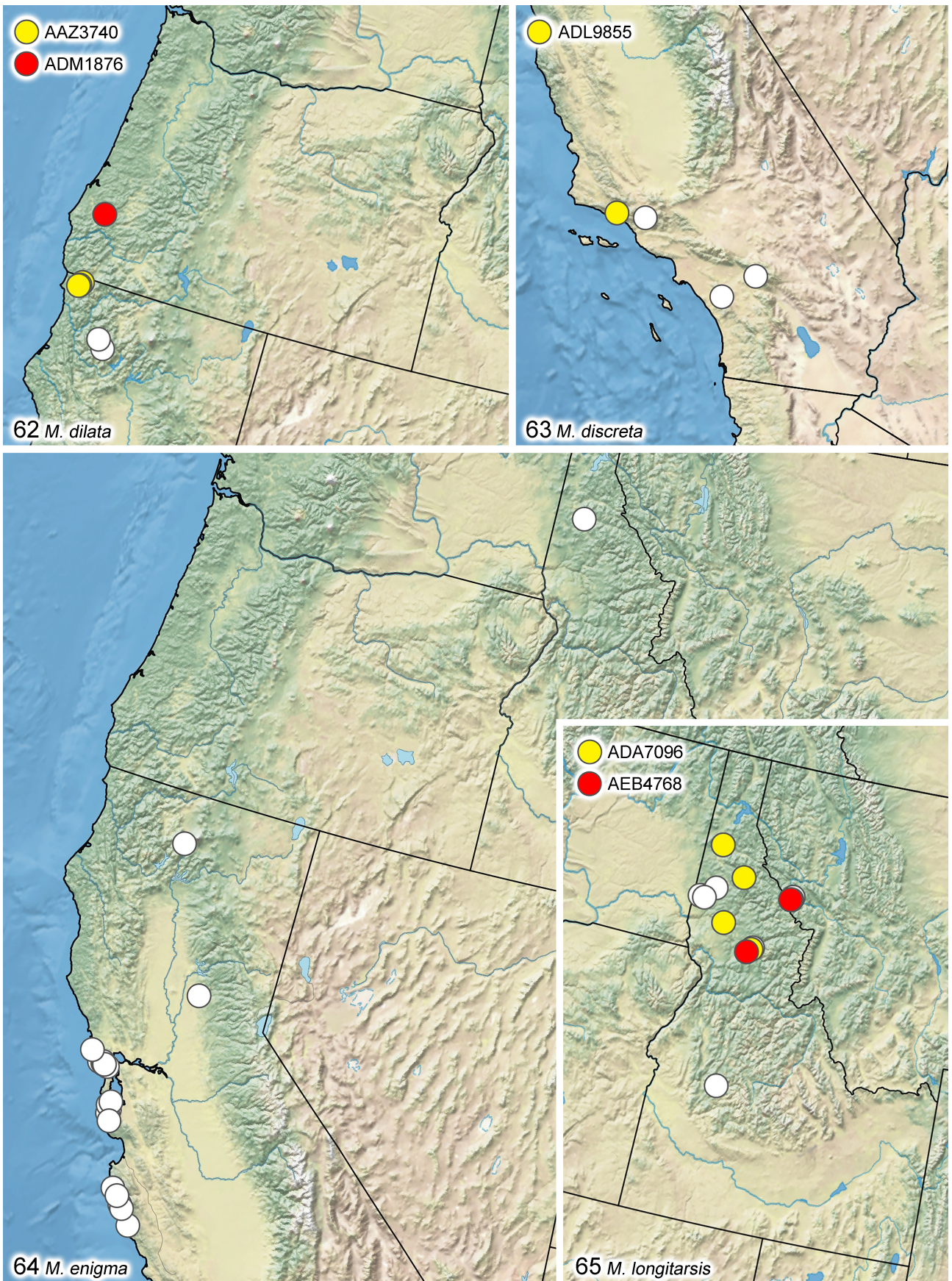
(Figs 5, 6, 56–62, 166, 167)

Type material. HOLOTYPE, ♂ (Fig. 56) labelled: “USA: CA: Del Norte Co.| West Fork of Patrick Crk.| N41°55'03"W123°51'28"| 31.V.2009, J.M. Cumming”; “CNC| 1155920” [white label with blue border, text duplicated on underside]; “HOLOTYPE| *Microphorella*| *dilata*| Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: California: Del Norte County:** same data as holotype (5♂, CNC); same data as holotype except, 3.vi.2009 (2♂, CNC); same data as holotype except, S.E. Brooks (2♂, CNC); same data as holotype except, 3.vi.2009, S.E. Brooks (6♂, CNC); same data as holotype except, CNC1155730 (1♂, barcoded, CNC); same data as holotype except, 3.vi.2009, CNC DIPTERA # 105223 (1♂, barcoded, CNC); same data as holotype except, S.E. Brooks, CNC DIPTERA # 105224 (1♂, barcoded, CNC); same data as holotype except, 24.v.2009, S.E. Brooks, CNC DIPTERA #'s 105308, 105335 (2♀, barcoded, CNC); same data as holotype except, S.E. Brooks, CNC DIPTERA #'s 105278, 105312, 105325, 105329, 105330, 105332, 105333 (7♀, barcoded, CNC); same data as holotype except, 3.vi.2009, CNC DIPTERA # 105296 (1♀, barcoded, CNC).

Other material examined. USA: California: Del Norte County: ca 6.5 mi. NE Gasquet nr Cold Spring Mountain, 41°52'15"N 123°53'21"W, 31.v.2009, S.E. Brooks, CNC DIPTERA #'s 105252, 105262, 105264 (3♀, barcoded, CNC); ca 4.5 mi. NE Gasquet, Eighteenmile Creek, 41°51'21"N 123°54'44"W, 31.V.2009, J.M. Cumming (1♂, CNC); same data except, CNC DIPTERA # 105225 (1♂, barcoded, CNC). *Siskiyou County:* Klamath NF, Russian Creek at China Gulch [41°04'N 123°04'W], 4.vii.1976, D.D. Wilder (2♂, CAS); Klamath NF, gravel pit nr Matthews Creek Cpgd [41°11'N 123°12'W], 5.vii.1976, D.D. Wilder (1m, CAS). **Oregon: Coos County:** ca 3 mi. SE Remote, Rock Creek, 42°59'27"N 123°51'41"W, 28.v.2009, J.M. Cumming, CNC DIPTERA # 105315 (1♀, barcoded, CNC).



FIGURES 56–61. Male of *M. dilata* sp. nov. **56.** Habitus of holotype, arrow indicates fore tibia. **57.** Head, anterior view. **58.** Head and legs, left lateral view, showing right foreleg (anterior surface), arrows indicate tibia and tarsomere 1. **59.** Left foreleg (tibia and tarsus), close up of posterior surface. **60.** Tibia and tarsus of right hindleg (on left) and right midleg (on right), arrow indicates apicoventral setae of mid tibia. **61.** Hypopygium of holotype, left lateral view (hindleg in foreground). Abbreviation: ph—phallus.



FIGURES 62–65. Known geographical distribution of the *Microphorella chiragra* species group. Coloured dots indicate localities with barcoded specimens (and their BINs), white dots indicate localities without barcoded specimens. **62.** *M. dilata* sp. nov. **63.** *M. discreta* sp. nov. **64.** *M. enigma* sp. nov. **65.** *M. longitarsis* Melander.

Diagnosis. Males of this species can be distinguished by the modified foreleg with tibia bowed and tarsomere 1 narrowed near midlength and dilated apically (Figs 58, 59), the mid tibia which usually bears a cluster of apicoventral setae (Fig. 60), and by the weakly clavate hind tarsus with tarsomere 5 enlarged (Fig. 60).

Description. Male (Figs 56–61): Wing length 1.9–2.0 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 56–58): About 1.4× broader than high in anterior view. Frons about 1.8–2× broader than high. Face broad, with lateral margins linear and subparallel or weakly concave, about 3.2× broader than width of anterior ocellus. Clypeus about 1.2× broader than high. Antenna (Fig. 58) with postpedicel about 2.4–3× longer than pedicel, about 1.5× longer than wide; arista-like stylus about 1.8–2× length of postpedicel. **Thorax** (Fig. 56): As in *M. barda* **sp. nov.** description. **Legs** (Figs 56, 58–60): Foreleg with modified tibia and tarsus, midleg with specialized setae on femur and tibia, hindleg with tarsus weakly clavate. *Foreleg* (Figs 58, 59): Femur with well-developed row of posteroventral setae (with some setae slightly longer than femur width); tibia distinctly bowed; tarsus about 1.6× longer than tibia, modified with tarsomere 1 narrowed near midlength and dilated apically; tarsomere 1 slightly shorter than tarsomeres 2–4 combined. *Midleg*: Femur with series of 3–4 long ventral setae (slightly longer than femur width) near midlength; tibia about as long as tarsus usually with cluster of prominent setae apicoventrally (in addition to strong ventral seta, Fig. 60). *Hindleg*: Femur with prominent anteroventral row of about 6–8 long setae along distal 2/3 (most setae longer than femur width); tibia with rather robust setae on anterior surface; tarsus weakly clavate with tarsomere 5 elongate and enlarged (Fig. 60), tarsomere 1 subequal to combined length of tarsomeres 2–3. **Wing** (Fig. 56): As in *M. barda* **sp. nov.** description. **Abdomen** (Figs 56, 61): *Hypopygium* (Fig. 61): Ventral epandrial process with bifurcate beak-like tip (similar to Figs 71, 73). Ventral lobe of right surstylus with rounded apical process bearing 2 long setae (similar to Fig. 20). Hypandrium dark and concolorous with abdomen. Left postgonite lobe similar to Fig. 18. Phallus relatively short and J-shaped, with crest on right side of weakly protruding curve (Fig. 61). Cercus similar to Figs 21 and 22.

Female: Similar to male except as follows: **Head:** Eyes weakly bulging on upper 3/4. Face and clypeus slightly broader. **Legs:** Setae weaker. *Foreleg:* Femur with weak row of posteroventral setae; tibia and tarsus plain. *Midleg:* Femur without series of 3–4 long setae near midlength; tibia with cluster of apicoventral setae less prominent or undifferentiated. *Hindleg:* Femur with weak row of anteroventral setae; tarsus plain. **Abdomen** (Figs 166, 167): As in *M. barda* **sp. nov.** description.

Distribution and seasonal occurrence. This species is known from the Coast Range of southern Oregon and northern California (Fig. 62). Adults have been collected from May to July.

Etymology. The species name refers to the modified foreleg of males, which has the apex of tarsomere 1 expanded (dilated), and the tibia bowed.

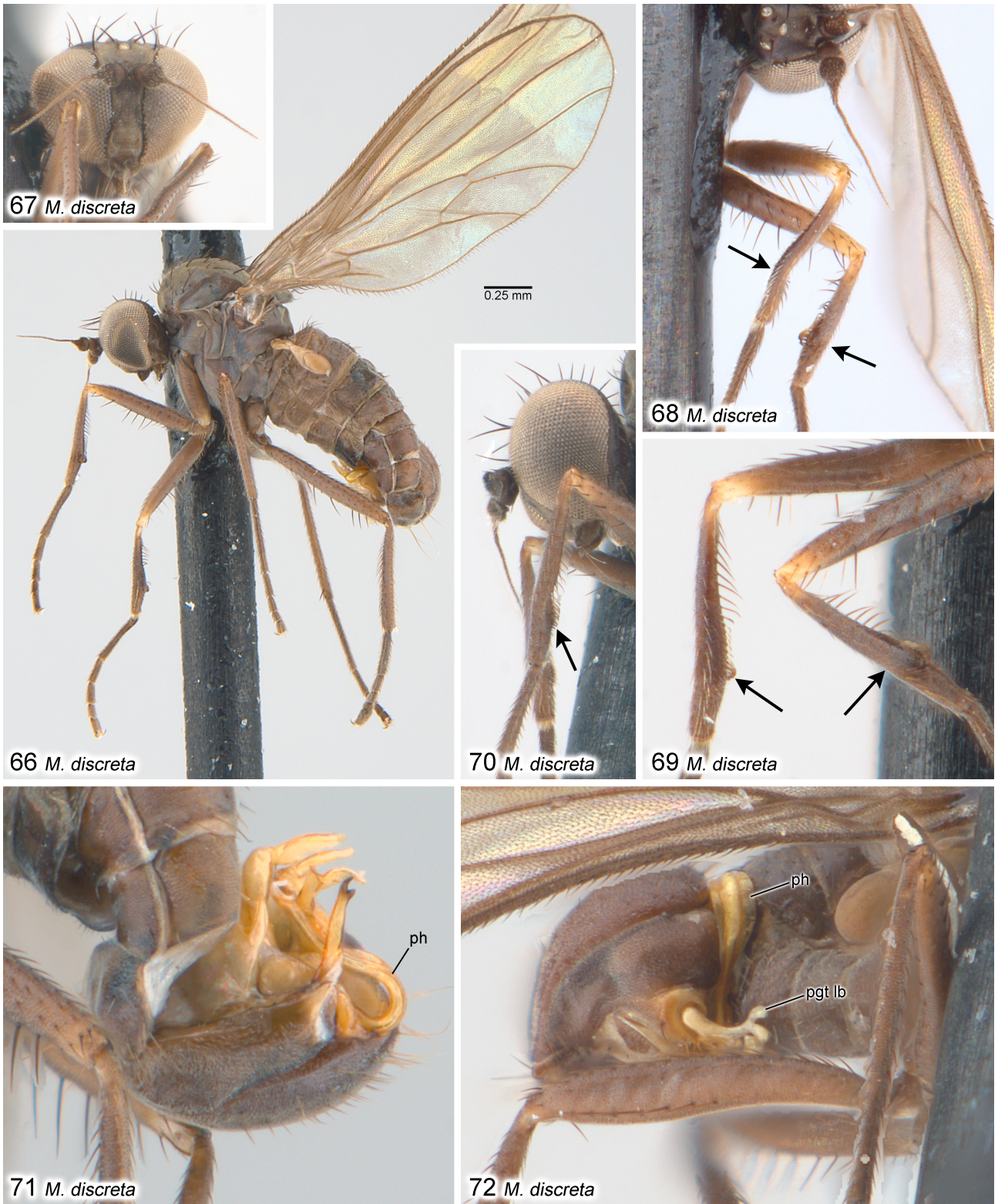
Remarks. All but one of the COI sequences obtained for this species (Figs 5, 6, 62) comprised a single BIN (AAZ3740) made up of four male and 13 female specimens from northwestern California, with an additional female specimen from southwestern Oregon comprising a second neighbouring BIN (ADM1876). One of the barcoded male paratypes (CNC1155730) placed in BIN AAZ3740 has a small hypopygium and lacks the secondary sexual characters of other males of the species, including the diagnostically modified foreleg. This male has presumably been demasculinized as a result of nematode parasitism, a phenomenon that has been reported in other Dolichopodidae (see Kahanpää 2008; Runyon 2022).

Microphorella discreta **sp. nov.**

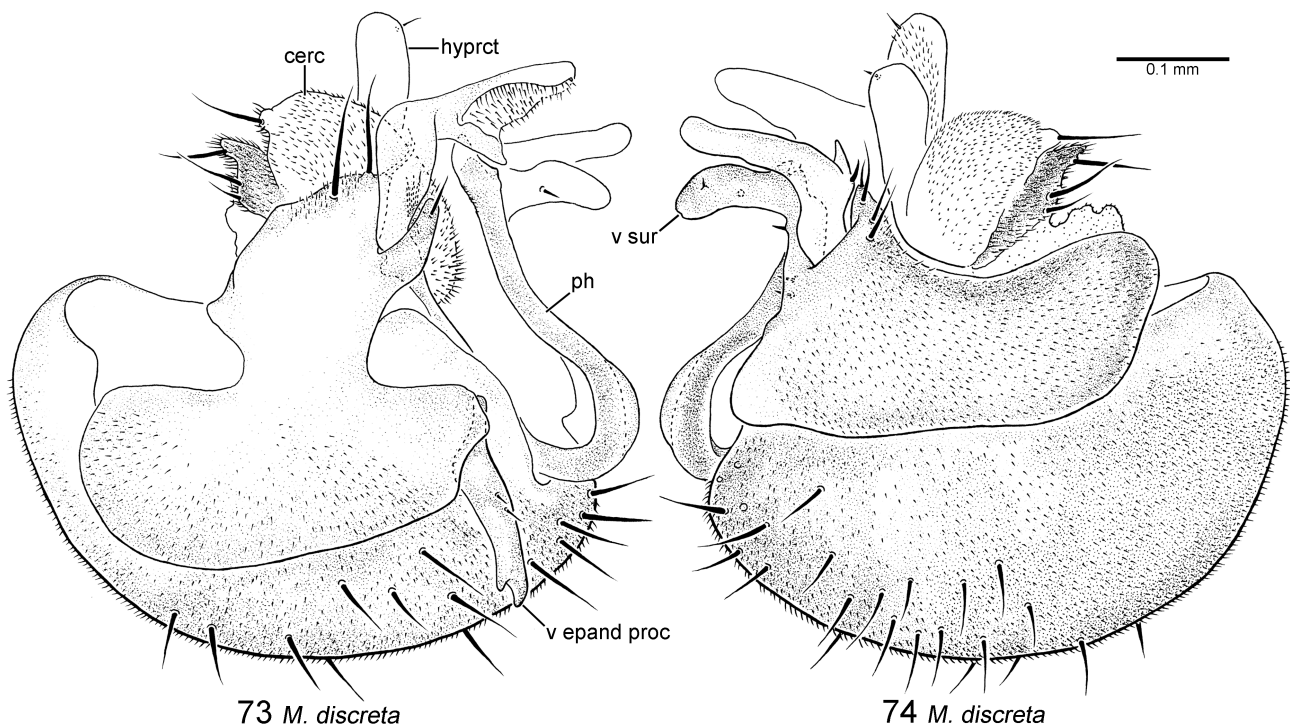
urn:lsid:zoobank.org:act:E6020E30-ACA1-4133-BB12-E7BD80B07DF4

(Figs 6, 63, 66–74)

Type material. HOLOTYPE, ♂ (Fig. 68) labelled: “CALIF. | Sta Barbara | 11.II.1993 | J.R. Vockeroth”; “Tunnel Road | Trail 130m”; “CNC | 1155921” [white label with blue border, text duplicated on underside]; “HOLOTYPE | *Microphorella* | *discreta* | Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: California: Santa Barbara County:** same data as holotype [34.4900°N 119.6989°W] (3♂, 1♀, CNC); same data as holotype except, CNC DIPTERA #'s 105220, 105221 (2♂, barcoded, CNC); same data as holotype except, CNC DIPTERA # 105222 (1♀, barcoded, CNC).



FIGURES 66–72. Male of *M. discreta* sp. nov. **66.** Habitus. **67.** Head, anterior view. **68.** Right antenna (medial surface) and forelegs (left leg above and crossed over right leg) of holotype in right lateral view, arrows indicate tibial features. **69.** Forelegs (right leg above, left leg below), left lateral view, arrows indicate tibial features. **70.** Left foreleg of aberrant specimen collected with type series, left lateral view, arrow indicates slightly different tibial setae. **71.** Hypopygium, left lateral view. **72.** Abdomen and hypopygium of aberrant specimen collected with type series showing different postgonite structure, lateroventral view. Abbreviations: pgt lb—postgonite lobe; ph—phallus.



FIGURES 73–74. Hypopygium of *M. discreta* sp. nov. **73.** Left lateral view (CNC DIPTERA #105220). **74.** Right lateral view of same specimen. Abbreviations: cerc—cercus; hyprct—hypoproct; ph—phallus; v epand proc—ventral epandrial process; v sur—ventral lobe of surstylus.

Other material examined. USA: California: *Orange County:* Cleveland NF, Trabuco Cyn, Horsethief Tr., 33°41.017'N 117°29.937'W, 634 m, 5.iii.2010, K. Collins (1♂, CNC). *San Bernardino County:* Mt. Home Can [34°06'02"N 116°59'57"W], 20.v.1945, A.L. Melander (1♂, USNM); Mountain Home [34°06'02"N 116°59'57"W], 21.vi.1945, A.L. Melander (2♂, USNM). *Santa Barbara County:* same data as holotype [34.4900°N 119.6989°W] (1♂, CNC). *Ventura County:* Los Padres NF, Rose Valley Campground [34°32'N 119°11'W], 15–16.v.1971, UCR Field Ent., UCR ENT 461753 (1♂, UCRC).

Diagnosis. Males of this species can be distinguished by the fore tibia bearing a compressed glabrous area, partially bounded by a close-set series of short, curved and thickened setae (Figs 66, 68–70).

Description. Male (Figs 66–74): Wing length 2.5–2.7 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 66–68): Frons about 2.6× broader than high. Face broad, lateral margins linear and subparallel, about 3× broader than width of anterior ocellus. Antenna (Figs 67, 68) with postpedicel about 2× longer than pedicel, about 1.8× longer than wide; arista-like stylus about 2.6× length of postpedicel. **Thorax** (Fig. 66): 6–7 dorsocentrals. **Legs** (Figs 66, 68–70): With setae brownish black to brown; foreleg with modified tibia; midleg plain; hindleg with tarsus weakly clavate. *Foreleg* (Figs 66, 68–70): Femur with well-developed row of posteroventral setae (with some setae slightly longer than femur width); tibia bowed near distal 1/3 with compressed glabrous area partially bounded by close-set series of short, curved and thickened setae (Figs 66, 68–70), with fringe of longer setae proximal to glabrous area; tarsus with tarsomere 1 subtly narrowed before middle, otherwise unmodified. *Hindleg* (Fig. 66): Trochanter with ventral seta stout and weakly curved; femur with prominent anteroventral row of about 6–8 long setae along distal half (most setae longer than femur width); tibia with rather robust setae on anterior surface; tarsus weakly clavate with tarsomere 5 elongate and enlarged. **Wing** (Fig. 66): As in *M. barda* sp. nov. description. **Abdomen** (Figs 66, 71–74): *Hypopygium* (Figs 71–74): Ventral epandrial process with bifurcate beak-like tip (Figs 71, 73). Dorsal lobe of right surstylus with pair of dorsal setae near base. Ventral lobe of right surstylus with apex large, broad and flat, bearing one tiny ventral seta. Hypandrium dark and concolorous with abdomen (Fig. 71). Left postgonite lobe with apex flattened and broadly rounded. Right postgonite lobe as long as left lobe, but apex either not broadened (Fig. 74) or bilobate (Fig. 72). Phallus (Figs 71–74) moderately long, with pair of lamelliform crests (best seen in Fig. 72) on right and left sides of broadly projecting curved portion. Cercus similar to Figs 21 and 22, outer apical lobe with short tip (Figs 73, 74).

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker. *Foreleg:* Femur with weak row of row of posteroventral setae; tibia plain. *Hindleg:* Femur with weak row of anteroventral setae; tarsus plain. **Abdomen:** As in *M. barda* **sp. nov.** description.

Distribution and seasonal occurrence. This species is known from the Coast Range of southern California (Fig. 63). Adults have been collected from February to June.

Etymology. The species name refers to the distinct (discrete) male fore tibia with a compressed glabrous posteroventral area on the distal 1/3 that is partially bounded by a close-set series of short, curved setae.

Remarks. One of the males collected along with the type series (but not included as a paratype) shows slight differences in the modified setae of the fore tibia and in the apex of the right postgonite lobe (Figs 70, 72) and is either an aberrant individual or may represent a closely related additional species.

A single male from the type locality yielded a COI sequence of >500 base pairs (Figs 6, 63), which comprised BIN ADL9855.

Microphorella enigma **sp. nov.**

urn:lsid:zoobank.org:act:E44239DD-BFE0-497B-9F84-0A4EC5D2931E

(Figs 64, 75)

Type material. HOLOTYPE, ♂ (Fig. 75) from Lily Pond [37°55'N 122°37'W], California labelled: “Lily Pond, Alpine| Lk., Marin Co.,| CALIF. 1500”; “Malaise trap| vi–vii.70| D.D. Munroe”; “CNC| 1155914” [white label with blue border, text duplicated on underside]”; “HOLOTYPE| *Microphorella| enigma|* Brooks & Cumming” [red label] (CNC).

Other material examined. USA: California: *Marin County:* Fairfax-Bolinas Rd, NE Hwy 1 [37.934983°N 122.697208°W], 20.vi.1999, P.H. Arnaud, Jr, S.M.C. Arnaud & M.M. Arnaud, Collection No. 02211 (20♂, 2♀, USNM); along Lagunitas Crk below Alpine Dam [37°56'N 122°38'W], 28.v.1979, D.D. Wilder (2♂, 1♀, CAS); Lily Lake, Mt Tamalpais [37°57'N 122°38'W], 31.v.1978, D.D. Wilder (6♂, CAS); Mill Valley, Mill Crk nr Cascade Reservoir [37.912910°N 122.572130°W], 31.v.1978, D.D. Wilder (18♂, CAS); Mill Valley [37°54'N 122°32'W], 25.vii.1967, P.H. Arnaud, Jr (1♂, USNM); same data except, 76 Lee St, 13.vi.1987 (1♂, USNM); Mount Tamalpais, Old Stage Road, vicinity Rattlesnake Creek No. 1 [37°55'N 122°36'W], 10.v.1997, Collection 01745-A, swept shaded seepage in road cut, P.H. Arnaud, Jr (11♂, 1♀, USNM); Mount Tamalpais, Rock Springs Trail between Mountain Theatre and West Point [37.917618°N 122.595157°W], 14.v.1988, P.H. Arnaud, Jr, S.M.C. Arnaud (1♂, USNM); Point Reyes National Seashore [38°4'N 122°53'W], 22.vi.1975, D.G. Denning (1♂, USNM). *Monterey County:* Big Creek Cyn, 1400 m, U.C. Station [36.069973°N 121.598964°W], 26–28.v.2002, YPT, L. Masner (1♂, CNC); Big Sur [36°16'N 121°48'W], 28.vii.1940, A.L. Melander (7♂, 4♂, USNM); 9.7 road miles SE Gorda, Hwy 1 [35.815758°N 121.358274°W], waterfall, 30.v.1971, P.H. Arnaud, Jr & M.M. Arnaud (15♂, 2♀, USNM); Hwy 1, 2.6 miles SE Lucia [36.020465°N 121.549123°W], Drinking Fountain, 200 ft, 30.v.1971, P.H. Arnaud, Jr & M.M. Arnaud (1♂, USNM); Hwy 1, creek at Tanbark Trail, ca 8 mi. S Big Sur [36.178613°N 121.692227°W], #00760, 5.vii.1992, P.H. Arnaud, Jr, sweeping creek, CNC1155732 (1♂, USNM). *San Mateo County:* La Honda [37°19'N 122°16'W], 23.vii.1967, P.H. Arnaud, Jr (1♂, USNM); same data except, 20.vii.1969 (5♂, USNM); San Mateo County Memorial Park [37°16'N 122°17'W], 24.vii.1960, P.H. Arnaud, Jr, (2♂, 1♀, USNM); same data except, 15.vii.1951, P.H. Arnaud, Jr, Cal. Dept. Agr. 57L20-6 (1♂, 1♀, USNM); Portola Valley, Alpine Road, Corte de Madera Crk [37°23'N 122°19'W], 230 m, 12.vi.1983, P.H. Arnaud, Jr (1♂, USNM); same data except, 24.vi.1984 (1♂, USNM); Corte de Madera Crk, vic. Portola [37°23'N 122°19'W], 18.vii.1959, P.H. Arnaud, Jr (1♂, CAS); Woodside, Huddart County Park [37°26'N 122°17'W], Dean Trail, 8.vi.1986, P.H. Arnaud, Jr (7♂, 2♀, USNM). *Santa Cruz County:* Big Basin Redwoods State Park [37°10'N 122°13'W], 1.ix.1953, P.H. Arnaud (1♂, USNM); along Opal Creek, Big Basin SP [37°10'N 122°13'W], 14.vi.1978, D.D. Wilder (41♂, 2♀, CAS). *Siskiyou County:* South Fork Sacramento R. [41.271461°N 122.403217°W], 22.vii.1948, W.W. Wirth (1♂, EMEC). *Yuba County:* Sierra Foothill Field Sta. [39.251250°N 121.313757°W], 3 mi. N Smartsville, 2.v.1980, M. Beugler, *ex* vegetation along stream (1♂, EMEC). **Idaho: Benewah County:** along Thorn Crk, 2 mi. S St. Maries [47.254990°N 116.454514°W], 24.vi.1978, D.D. Wilder (1♂, CAS).



FIGURE 75. Male holotype of *M. enigma* sp. nov., habitus.

Diagnosis. Males of this species can be distinguished by the following combination of characters: legs plain; hind femur with weak series of anteroventral setae along distal half or less (setae not longer than femur width); hind tibia lacking anteroventral fringe of longer setae basally; cercus similar to Figs 21 and 22, but with inner apical lobe acute; phallus short, not flared apically, with single small crest on right side; hypandrium uniformly dark.

Description. Male (Fig. 75): Wing length 1.5–1.7 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head:** About 1.3× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Face moderately broad, lateral margins linear and subparallel, about 2–2.7× broader than width of anterior ocellus. Clypeus about 1.5× broader than high. Antenna with postpedicel about 2× longer than pedicel, about 1.3× longer than wide; arista-like stylus about 1.8× length of postpedicel. **Thorax:** 6–7 dorsocentrals. **Legs:** Foreleg, midleg and hindleg plain. **Hindleg:** Femur with less prominent anteroventral row of relatively short setae along distal 1/3 (setae not longer than femur width). **Wing:** As in *M. barda* sp. nov. description. **Abdomen:** *Hypopygium:* Ventral epandrial process with tip bluntly narrowed, or short and claw-like. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with flat acute apex. Phallus relatively short and J-shaped, with crest on right side just beyond curve. Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Legs:** Setae weaker. **Hindleg:** Femur with anteroventral row not differentiated. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from the Columbia Plateau of northeastern Idaho, Cascade Range and Sierra Nevada Mountains of northern California, and the Coast Range of central California (Fig. 64). Adults have been collected from May to early September.

Etymology. The species name is Latin for obscure in reference to the lack of diagnostic features that allow for easy species recognition.

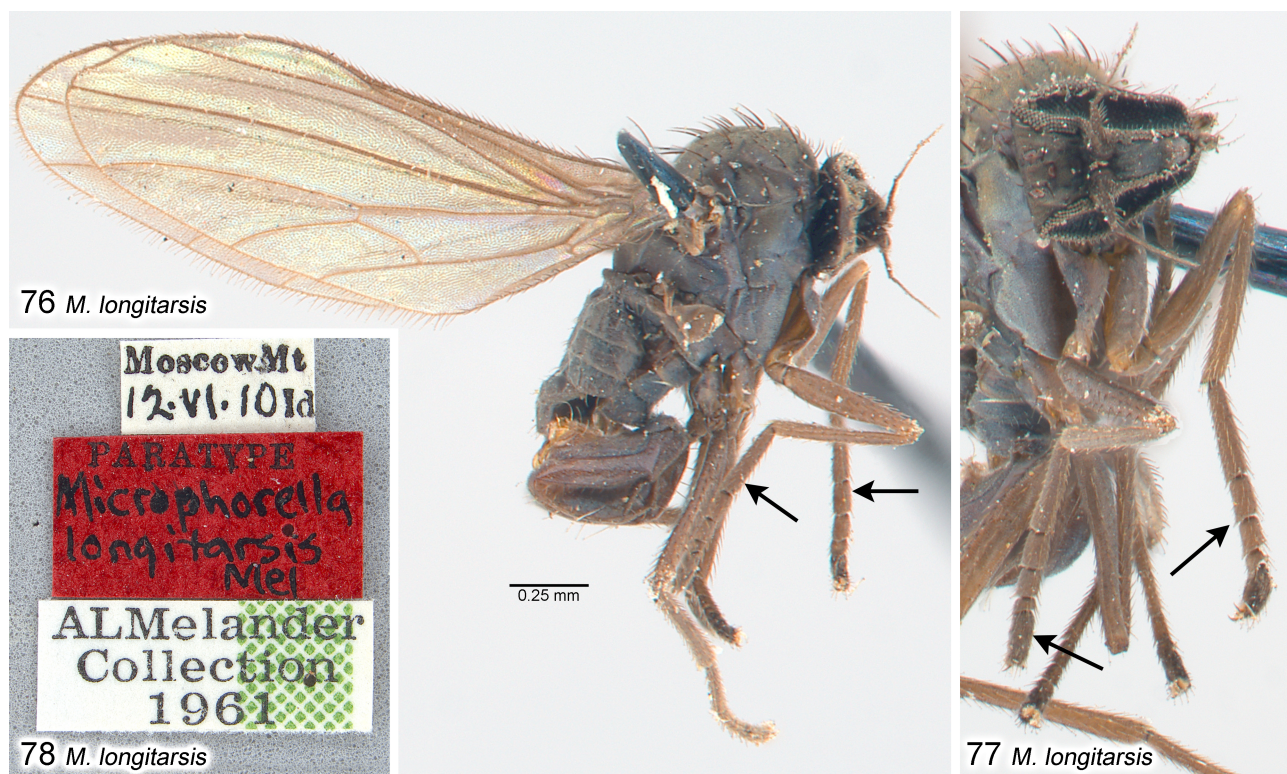
Remarks. No COI sequences were obtained for this species.

Microphorella longitarsis Melander

(Figs 6, 65, 76–84)

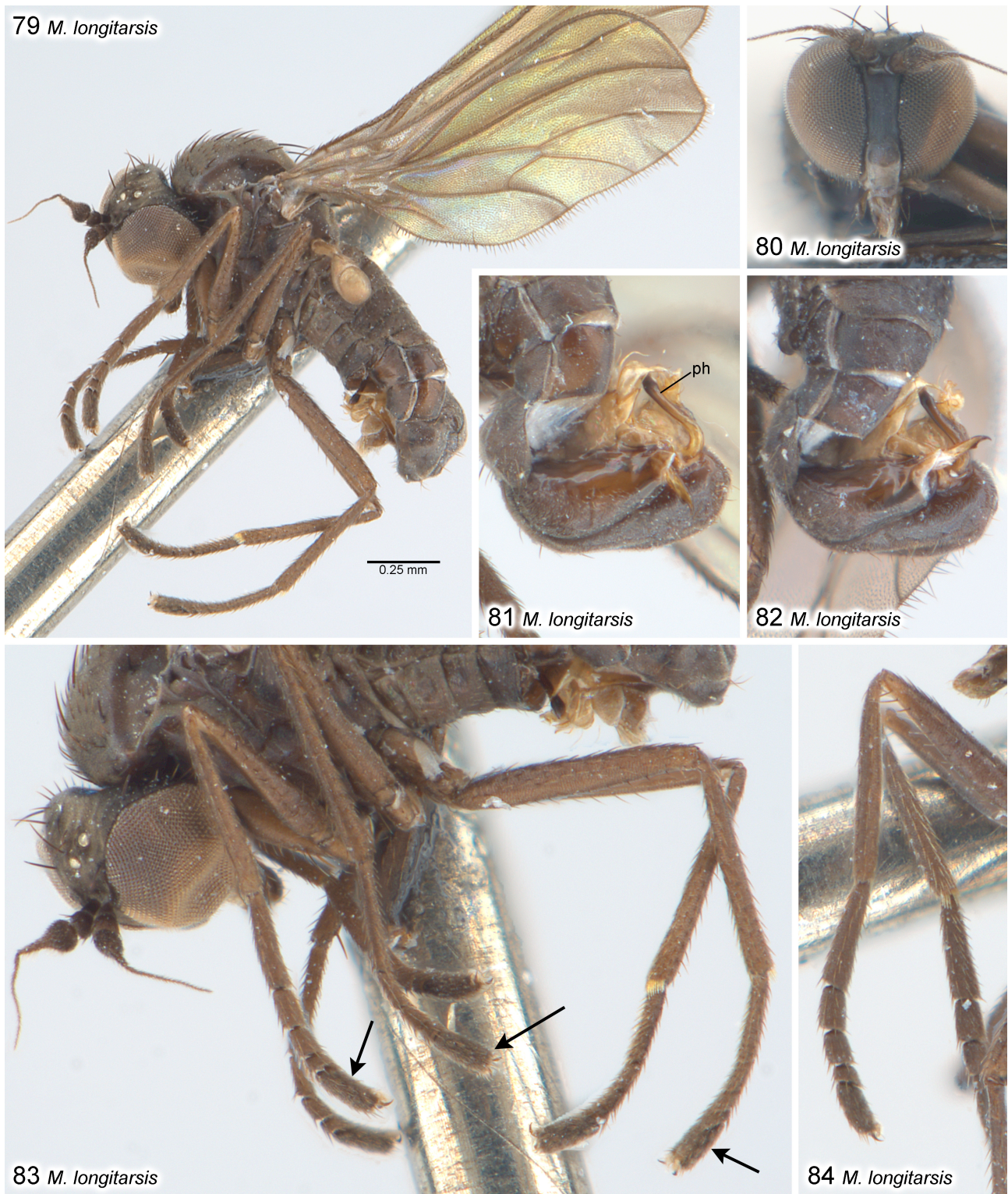
Microphorella longitarsis Melander, 1928: 89. Type locality: Moscow Mountain, Idaho, USA.

Type material examined. LECTOTYPE (here designated to fix the identity of the species) ♂ (Figs 76–78) from Moscow Mountain, Idaho labelled: “Moscow Mt| 12.VI.10 Id”; “PARATYPE| *Microphorella| longitarsis| Mel.*” [red label]; “ALMelander| Collection| 1961”; “LECTOTYPE| *Microphorella| longitarsis* Melander| des. Brooks & Cumming” [red label] (USNM). **PARALECTOTYPES: USA: Idaho: Latah County:** same data as lectotype [46°48'N 116°52'W] (2♂, 3♀, USNM).



FIGURES 76–78. Male lectotype of *M. longitarsis* Melander. **76.** Habitus, arrows indicate foretarsi. **77.** Head and forelegs, anterior view, arrows indicate fore tarsi. **78.** Lectotype labels (prior to addition of Brooks & Cumming “LECTOTYPE” label).

Other material examined. **USA: Idaho: Boise County:** Boise NF, W of Lowman, 44°05.073'N 115°38.237'W, 1150m, 12.vi.2014, roadside stream, vertical face, B.J. Sinclair (1♀, CNC). **Clearwater County:** W of Orofino, 46°29'N 116°16'W, 12.vi.2011, cascading stream, B.J. Sinclair (6♀, CNC); same data except, CNC1155719 (1♂, barcoded, CNC). **Idaho County:** Clearwater NF, Apgar Crk & Trail, 46°12.856'N 115°32.181'W, 490 m, 14.vii.2012, B.J. Sinclair (1♀, CNC); Clearwater NF, Hwy 12 E of Lowell, 46°11'12"N 115°33'41"W, 13.vi.2011, seeps/streams, B.J. Sinclair, CNC487259 (1♂, barcoded, CNC); Clearwater NF, Three Devils Picnic Area, W of Lowell, 46°08.146'N 115°38.684'W, 480 m, 14.vii.2012, B.J. Sinclair (3♂, 2♀, CNC); Clearwater NF, Three Devils Picnic Area, 2–3 mi. W of Lowell, 46°08.155'N 115°38.681'W, 450 m, 13.vi.2014, small stream, B.J. Sinclair (29♂, CNC); same data except, CNC1155720 (1♂, barcoded, CNC). **Kootenai County:** Hwy 97, St. Joe NF, FR 438, Beauty Crk, 47°36.392'N 116°40.099'W, 660 m, 19.vi.2014, B.J. Sinclair (36♂, 2♀, CNC); same data except, CNC487257 (1♂, barcoded, CNC). **Latah County:** Moscow Mt. [46°48'N 116°52'W], 4.vi.1910, Collection J.M. Aldrich (1♂, 2♀, USNM); same data except, 1.vii.1932, J.M. Aldrich coll. (1♂, USNM); Moscow Mt. Moscow Mtn Rd, 46°47.721'N



FIGURES 79–84. Male of *M. longitarsis* Melander. **79.** Habitus. **80.** Head, anterior view. **81.** Hypopygium, left lateral view, specimen from Three Devils Picnic Area, Idaho. **82.** Same, specimen from Beauty Creek, ID. **83.** Head and legs, left lateral view, arrows indicate tarsomere 5 of foreleg, midleg and hindleg. **84.** Close-up of left foreleg (posterior surface), left lateral view. Abbreviation: ph—phallus.

116°54.093'W, 1000 m, 22.vi.2014, cascading stream, B.J. Sinclair (7♂, CNC); W Laird Park, St Joe NF, 46°57'37"N 116°35'51"W, 12.vi.2011, sandy stream/ flowers, B.J. Sinclair (1♂, 1♀, CNC); 7 mi. N Troy nr Big Meadow Rec. Area [46°47'N 116°48'W], 3000 ft, 13.vii.1979, sweep, W.J. Turner (1♂, 1♀, USNM; 1♂, 1♀, LACM). *Shoshone County*: Marble Crk Rd, FR 321, St. Joe NF, 47°12.266'N 116°03.542'W, 845 m, roadside stream, 20.vi.2014, B.J. Sinclair (5♂, CNC); same data except, CNC487281 (1♂, barcoded, CNC); same data except, CNC487282 (1♀, barcoded, CNC). **Montana: Mineral County**: Lolo NF, Trout Crk Rd, 47°02.249'N 114°57.790'W, 1188 m, 25.vi.2017, roadcut seeps, B.J. Sinclair (4♀, CNC); same data except, CNC1155721 (1♂, barcoded, CNC); Lolo NF, Trout Crk Rd, Van Ness Crk, 47°04.958'N 114°55.163'W, 995 m, 25.vi.2017, B.J. Sinclair (1♀, CNC); Lolo NF, Trout Crk Valley, Verde Crk Rd, 47°02.411'N 114°56.263'W, 1240 m, 24.vi.2017, small stream, B.J. Sinclair (1♂, 4♀, CNC).

Diagnosis. Males of this species can be distinguished by the following combination of characters: tarsi of all legs clavate (Fig. 83); fore tarsus with all tarsomeres (including tarsomere 1) uniformly thickened (Figs 83, 84), tarsomere 5 nearly 4× longer than tarsomere 4; mid and hind tarsi with tarsomere 5 enlarged and nearly 5× longer than tarsomere 4 (Figs 79, 83); phallus dark and weakly expanded preapically (Figs 81, 82).

Description. Male (Figs 76, 77, 79–84): Wing length 1.9–2.1 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 77, 79, 80, 83): About 1.2× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Frons about 2× broader than high. Face moderately broad, lateral margins linear and subparallel or weakly concave, about 2.3–2.5× broader than width of anterior ocellus. Clypeus about 1.4× broader than high. Antenna (Figs 79, 83) with postpedicel about 3× longer than pedicel, about 2× longer than wide; arista-like stylus about 1.8× length of postpedicel. **Thorax** (Figs 76, 79): 6–7 dorsocentrals. **Legs** (Figs 76, 77, 79, 83, 84): Foreleg, midleg and hindleg with tarsi modified and clavate. *Foreleg*: Femur with weakly developed posterior and posteroventral setae; tarsus clavate with tarsomeres 1–5 uniformly thickened, tarsomere 5 nearly 4× longer than short tarsomere 4 (Figs 77, 83, 84). *Midleg*: Tarsus clavate with tarsomere 5 enlarged and nearly 5× longer than tarsomere 4 (Fig. 79). *Hindleg*: Femur with less prominent anteroventral row of relatively short setae along distal 1/2 (setae about as long as femur width or shorter); tibia with setae less robust on anterior surface; tarsus clavate with tarsomere 5 enlarged and nearly 5× longer than tarsomere 4 (Fig. 79). **Wing** (Figs 76, 79): As in *M. barda* sp. nov. description. **Abdomen** (Figs 76, 79, 81, 82): *Hypopygium* (Figs 76, 81, 82): Ventral epandrial process with claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with flat, acute apex. Phallus relatively short and J-shaped with crest on right side just above curve, dark and weakly expanded preapically (Figs 81, 82). Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker; fore, mid and hindlegs with tarsi plain; hind femur with very weak anteroventral setae. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from the Columbia Plateau and Bitterroot Range of Idaho and western Montana (Fig. 65). Adults have been collected in June and July.

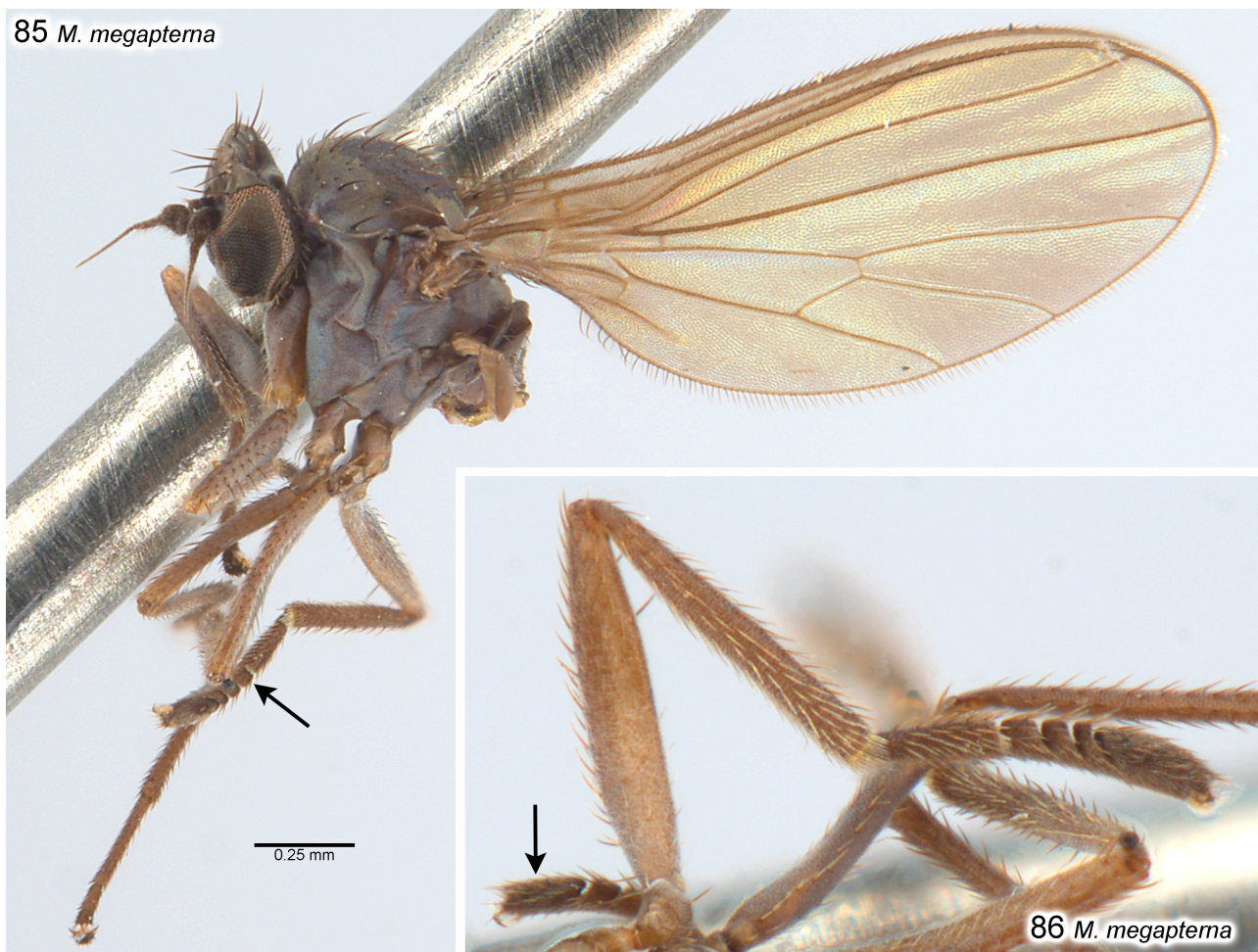
Remarks. Melander (1928) indicated the type series included 10 specimens from Moscow Mountain, Idaho collected on June 12, 1910, but did not mention a type. We examined six syntypes from the USNM and designated one of the males as the lectotype. The whereabouts of the other four paralectotypes are unknown.

The barcode analysis identified two rather distant but neighbouring BINs (ADA7096 and AEB4768) among the seven sequenced specimens (Figs 6, 65). BIN ADA7096 includes four males and a female from four localities in the Idaho panhandle (W of Orofino, Hwy 12 E of Lowell, Beauty Crk and Marble Crk Rd). BIN AEB4768 also includes a male from the southern part of the Idaho panhandle near Lowell (Three Devils Picnic Area) and a second male from western Montana (Trout Crk Rd). All of the barcoded males appear identical morphologically.

Microphorella megapterna sp. nov.

urn:lsid:zoobank.org:act:0E103449-6116-4C3D-B3CF-2D1C17D042C9
(Figs 85–87, 130)

Type material. HOLOTYPE, ♂ (Figs 85–86) from Lafayette [37°53'N 122°07'W], California labelled: “Lafayette, CAL. | 6.IV.1968 | D.D. Monroe”; “CNC | 1155903” [white label with blue border, text duplicated on underside]; “HOLOTYPE | *Microphorella* | *megapterna* | Brooks & Cumming” [red label] (CNC).

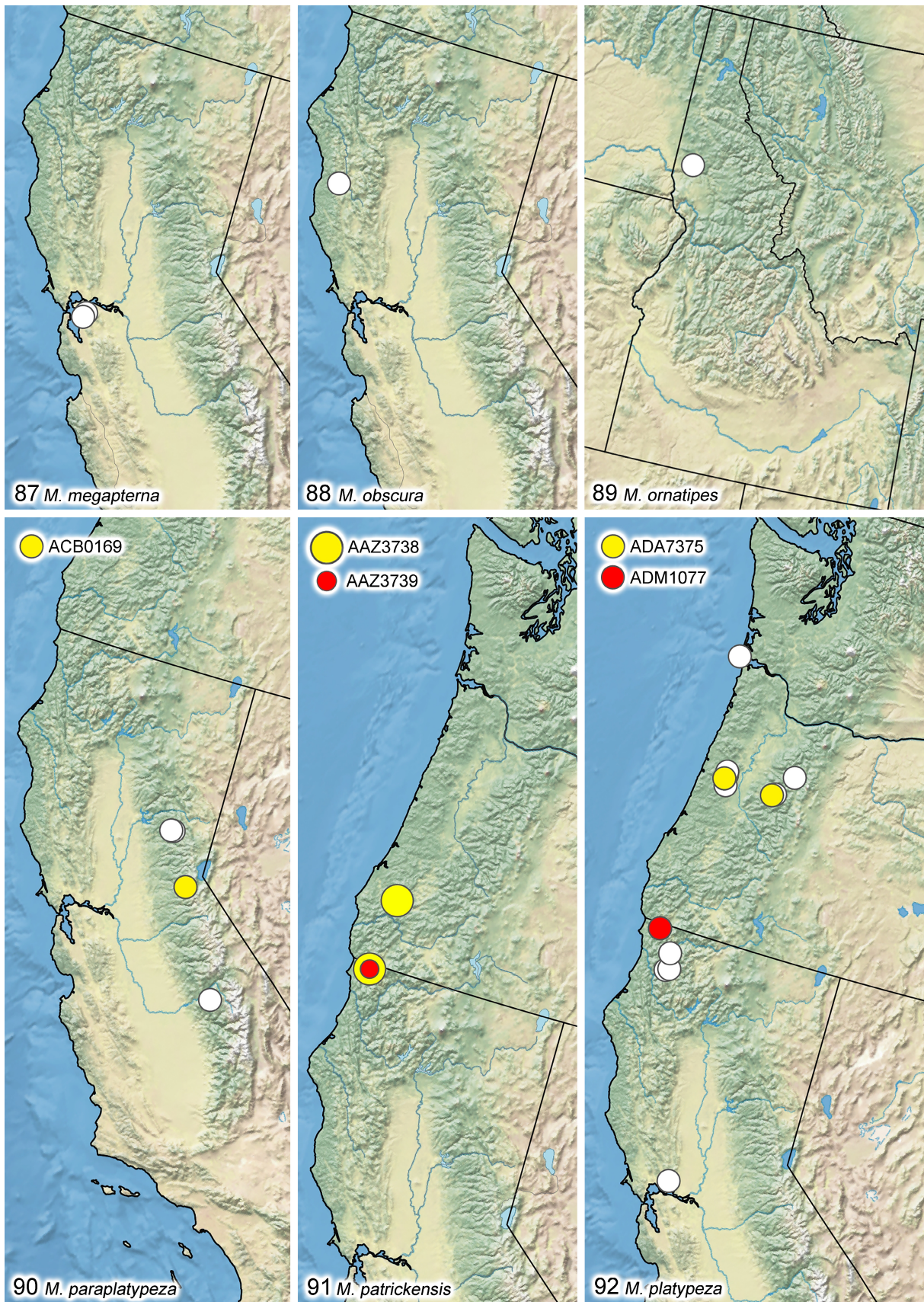


FIGURES 85–86. Male holotype of *M. megapterna* sp. nov. **85.** Habitus, arrow indicates right hind tarsus. **86.** Right hind leg of holotype, posterior surface (apex of fore tarsus also visible in bottom left of image, arrow indicates tarsomere 5).

Other material examined. USA: California: Contra Costa County: Canyon Post Office, 8–9 km S Moraga [37°49'N 122°09'W], 21.v.1982, D.G. Denning (1♂, CAS).

Diagnosis. Males of this species, along with *M. sasquatchi* sp. nov. and *M. wilderae* sp. nov., are part of a subgroup distinguished by their distinctively clavate hind tarsus with tarsomere 1 subequal in length to enlarged tarsomere 5 and tarsomeres 2–4 short and disc-like (Fig. 86). Within this subgroup, males of *M. megapterna* are recognized by their moderately long phallus which lacks a strongly projecting curve and has the distal portion weakly bent inward (Fig. 130).

Description. Male (Figs 85, 86, 130): Wing length 1.9 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head:** Some features not assessable because of collapsed head and eyes in available material. Face broad, lateral margins linear and subparallel, face and clypeus similar to Fig. 125. Antenna with postpedicel about 3.8× longer than pedicel, about 1.8× longer than wide, narrowed apical portion somewhat elongate and nearly uniform in width (Fig. 85); arista-like stylus about 1.4× length of postpedicel. **Thorax:** 6–8 dorsocentrals. **Legs** (Figs 85, 86): Foreleg with tarsus weakly clavate, midleg plain, hindleg with tarsus distinctively modified and clavate. *Foreleg:* Tarsus weakly clavate with only tarsomere 5 slightly enlarged and elongated. *Hindleg:* Femur with only 2 widely spaced and relatively short anteroventral setae along distal 1/3 (setae about as long as femur width); tarsus distinctively thick and clavate (Figs 85, 86), tarsomere 1 subequal in length to enlarged and elongate tarsomere 5, tarsomeres 2–4 progressively shorter and disc-like with combined length shorter than tarsomere 5, tarsomere 5 subtly adorned with minute scale-like setae dorsally and laterally (setae are lighter and spot-like in appearance, similar to Figs 158, 159). **Wing** (Fig. 85): As in *M. barda* sp. nov. description. **Abdomen: Hypopygium:** Ventral epandrial process with bifurcate beak-like tip (similar to Fig. 73).



FIGURES 87–92. Known geographical distribution of the *Microphorella chiragra* species group. Coloured dots indicate localities with barcoded specimens (and their BINs), white dots indicate localities without barcoded specimens. **87.** *M. megapterna* sp. nov. **88.** *M. obscura* sp. nov. **89.** *M. ornatipes* sp. nov. **90.** *M. paraplatypeza* sp. nov. **91.** *M. patrickensis* sp. nov. **92.** *M. platypeza* sp. nov.

Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with rounded apex. Phallus moderately long (Fig. 130), about 1.7× length of ventral epandrial process, distal portion beyond basal curve with weak inward bend, lacking distinct crest. Cercus similar to Figs 21 and 22, but with inner apical lobe strongly acute.

Female: Unknown.

Distribution and seasonal occurrence. This species is known only from two specimens collected from the San Francisco Bay Area of California in April and May (Fig. 87).

Etymology. The species name is Greek for large heel in reference to the expanded hind tarsus of the male (Fig. 86).

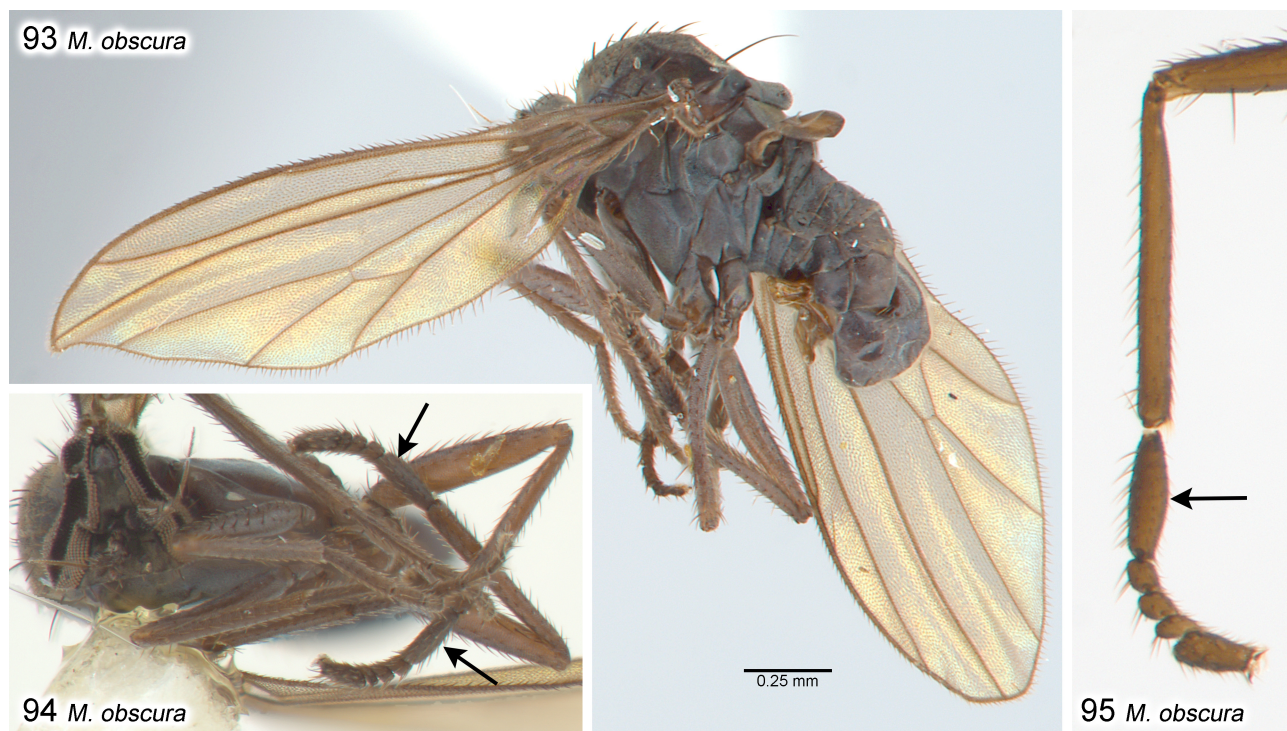
Remarks. No COI sequences were obtained for this species.

***Microphorella obscura* sp. nov.**

urn:lsid:zoobank.org:act:CF5EE417-5286-43ED-8BE3-3BB2E1209B61

(Figs 88, 93–95)

Type material. **HOLOTYPE**, ♂ (Figs 93, 94) labelled: “U.S.A.: CALIFORNIA:| Mendocino Co. Moss| Cove RestArea S. of| Longvale on Hwy. 101| 18-v-1978, D. Wilder”; D. Dee Wilder| Collection” [yellow label]; “HOLOTYPE| *Microphorella*| *obscura*| Brooks & Cumming” [red label] (CAS). **PARATYPES:** USA: California: Mendocino County: same data as holotype [39°33'N 123°25'W] (3♂, CAS).



FIGURES 93–95. Male of *M. obscura* sp. nov. **93.** Habitus of holotype. **94.** Anterior view of holotype showing head and legs, arrows indicate tarsomere 1 of hindlegs. **95.** Hindleg of macerated specimen, medial view, arrow indicates tarsomere 1.

Diagnosis. Males of this species can be distinguished by the following combination of characters: hind tarsus clavate with tarsomere 1 subtly enlarged, tarsomeres 2–4 compressed and tarsomere 5 enlarged but distinctly shorter than tarsomere 1 (Figs 94, 95); hind tibia lacking anteroventral fringe of longer setae basally; foreleg and midleg plain.

Description. Male (Figs 93–95): Wing length 1.9 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head:** Some features not assessable because of collapsed head and eyes in available material. Face broad, lateral margins linear and subparallel (Fig. 94). Clypeus

about as broad as high. Antenna with postpedicel about 2.6× longer than pedicel, about 1.7× longer than wide; arista-like stylus about 1.5× length of postpedicel. **Thorax** (Fig. 93): As in *M. barda* **sp. nov.** description. **Legs** (Figs 94, 95): Foreleg and midleg plain, hindleg with tarsus modified and clavate. *Hindleg*: Femur with less prominent anteroventral row of relatively short setae along distal 1/2 (setae about as long as femur width or shorter); tibia with setae less robust on anterior surface; tarsus clavate with tarsomere 1 subtly but distinctly enlarged (Figs 94, 95), tarsomeres 2–4 short and compressed with combined length equal to length of tarsomere 5, tarsomere 5 enlarged but distinctly shorter than tarsomere 1. **Wing** (Fig. 93): As in *M. barda* **sp. nov.** description. **Abdomen** (Fig. 93): Sternite 8 with short setae along posterior margin. *Hypopygium*: Ventral epandrial process with short claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with rounded apex. Phallus relatively short and J-shaped, with crest on right side just above curve. Cercus similar to Figs 21 and 22, but with inner apical lobe strongly acute.

Female: Unknown.

Distribution and seasonal occurrence. This species is known only from the type series collected near Longvale in northwestern California during mid-May (Fig. 88).

Etymology. The species name refers to the obscure and subtle enlargement of tarsomere 1 of the hindleg (Fig. 95), which distinguishes it from other members of the *M. chiragra* species group.

Remarks. No COI sequences were obtained for this species.

Microphorella ornatipes Melander

(Figs 89, 96–102)

Microphorella ornatipes Melander, 1928: 88. Type locality: Kendrick, Idaho, USA.

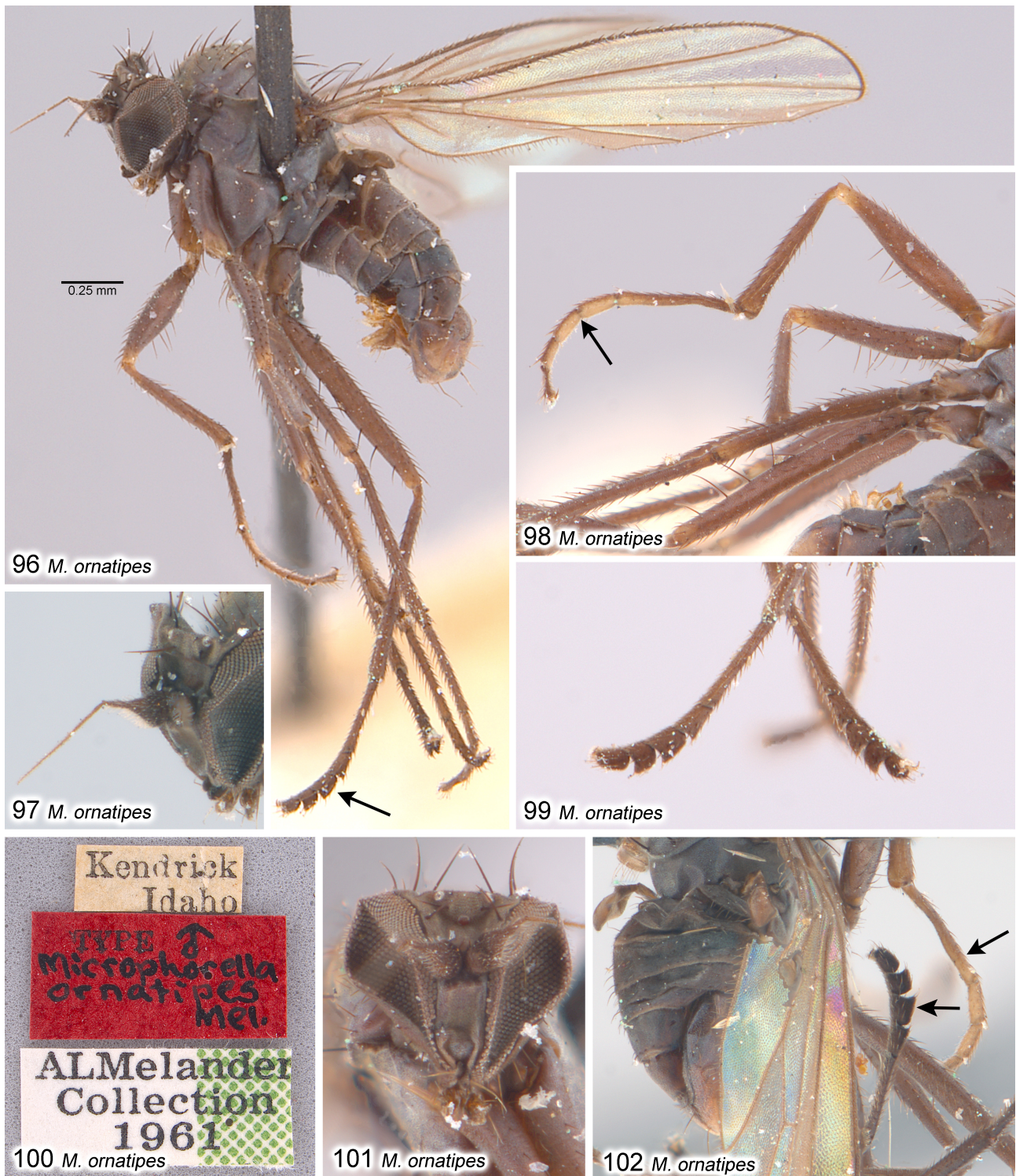
Type material examined. **LECTOTYPE** (here designated to fix the identity of the species) ♂ (Figs 96–101) labelled: “Kendrick| Idaho”; “Type ♂| Microphorella| ornatipes| Mel.” [red label]; “ALMelander| Collection| 1961”; “LECTOTYPE| *Microphorella| ornatipes* Melander| des. Brooks & Cumming” [red label] (USNM). **PARALECTOTYPE: USA: Idaho: Latah County:** same data as lectotype [46°36'N 116°38'W] (1♀, USNM).

Other material examined. USA: Idaho: Latah County: Kendrick, Collection JMAldrich (1♂, USNM).

Diagnosis. Males of this species can be distinguished by the hindleg having tarsomeres 2–5 enlarged and strongly compressed laterally with tarsomeres 3 and 4 broadly subrectangular (Figs 96, 99, 102), and foreleg with tarsomere 1 long and with tarsomeres 2–4 pale ventrally (Figs 98, 102).

Description. Male (Figs 96–99, 101, 102): Wing length 2.3 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 97–101): Some features not assessable because of collapsed head and eyes in available material. Frons about 2.8× broader than high. Face broad, lateral margins linear and subparallel, about 4× broader than width of anterior ocellus. Clypeus about 1.3× broader than high. Antenna (Fig. 97) with postpedicel about 2× longer than wide; arista-like stylus about 1.8× length of postpedicel. **Thorax:** 6–7 dorsocentrals. **Legs** (Figs 96, 98, 99, 102): Foreleg with tibia and tarsus modified, midleg plain, hindleg with tarsus distinctively modified and compressed laterally. *Foreleg* (Figs 98, 102): Femur with well-developed row of posteroventral setae; tibia broadened apically; tarsus elongate, nearly 2× longer than tibia, tarsomere 1 slender and distorted with weak bend in basal half, about as long as combined length of tarsomeres 2–5, tarsomeres 2–4 broader and pale below, tarsomeres 2 and 3 subequal in length, tarsomeres 4 and 5 subequal in length. *Hindleg*: Femur with prominent anteroventral row of 5–6 long, well-spaced setae along distal 2/3 (most setae distinctly longer than femur width); tibia with setae less robust on anterior surface; tarsus modified with tarsomeres 2–5 enlarged and strongly compressed laterally, tarsomeres 3 and 4 broadly subrectangular (Figs 96, 99, 102). **Wing:** As in *M. barda* **sp. nov.** description. **Abdomen** (Figs 96, 102): Sternite 8 pale on distal half (similar to posteriorly projecting end of hypandrium). *Hypopygium*: Most features not assessable on intact, undissected males. Hypandrium pale on the posteriorly projecting end (*i.e.*, the morphologically anterior end) when hypopygium is in resting position (Fig. 102). Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Legs:** Setae weaker. *Foreleg:* Femur with very weak row of posteroventral setae; tibia not broadened apically; tarsus plain. *Hindleg:* Femur with very weak anteroventral row of setae; tarsus plain. **Abdomen:** Apical segments retractable into segment 5. Tergite 5 without cluster of stout medial setae. *Terminalia:* Details not observable on unique undissected female specimen.



FIGURES 96–102. Male of *M. ornatipes* Melander. **96.** Habitus of lectotype, arrow indicates hind tarsus. **97.** Right antenna of lectotype, medial view. **98.** Legs of lectotype, arrow indicates anterior surface of right foreleg. **99.** Hind tarsi of lectotype. **100.** Lectotype labels (prior to addition of Brooks & Cumming “LECTOTYPE” label). **101.** Head of lectotype, anterior view. **102.** Dorsolateral view of non-type male, arrows indicate right fore tarsus and left hind tarsus.

Distribution and seasonal occurrence. This species is known from the Columbia Plateau of Idaho (Fig. 89). There is no information on its seasonal occurrence.

Remarks. Melander (1928) described the species based on a male and female from Kendrick, Idaho, but did not mention a type. We have designated the male of this pair as the lectotype. We discovered a second male among the

undetermined USNM *Microphorella* material that has an upper locality label identical to the types, and also bears a lower “Collection JM Aldrich” label. Given the rarity and age of the known specimens, no attempt was made to acquire COI sequences for this distinct species.

***Microphorella paraplatypeza* sp. nov.**

urn:lsid:zoobank.org:act:8A3CB798-14D6-4971-844B-47DEB175C67A

(Figs 5, 90, 103–107)

Type material. HOLOTYPE, ♂ (Figs 106, 107) labelled: “USA: CA: El Dorado Co. | South Fork American River | Eagle Rock river access | N38°46'34.6"W 120°16'00.7" | 18.vii.2012, S.E. Brooks”; “CNC | 1155922” [white label with blue border, text duplicated on underside]; “HOLOTYPE | *Microphorella* | *paraplatypeza* | Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: California: El Dorado County:** same data as holotype (10♂, 4♀, CNC); same data as holotype except, J.M. Cumming (4♂, CNC); same data as holotype except, CNC DIPTERA # 192181, CNC487260 (2♂, barcoded, CNC); same data as holotype except, CNC DIPTERA # 192182 (1♀, barcoded, CNC).

Other material examined. USA: California: Fresno County: Sierra NF, along Pitman Crk nr Big Crk, T8SR25E Sec. 28 [37°12'N 119°13'W], 1500 m, 2.viii.1979, D.D. Wilder (1♂, CAS). **Sierra County:** Highway 49, creek at Coyote Ravine, 1 km W Downieville [39°33'N 120°50'W], 910 m, 4.vii.1975, P.H. Arnaud, Jr (1♂, USNM); Highway 49, creek in New York Ravine, on North Yuba River, 2.8 km E Downieville [39°33'N 120°48'W], 940 m, 5.vii.1975, P.H. Arnaud, Jr (52♂, 4♀, CAS); Highway 49, creek at Rosassco Ravine, 2.4 km W Downieville [39°33'N 120°51'W], 890 m, 4.vii.1975, P.H. Arnaud, Jr (14♂, 8♀, CAS).

Diagnosis. Males of this species can be distinguished by the following combination of characters: head nearly as high as wide with narrow face (Fig. 104); hind tibia with anteroventral fringe of longer setae basally (Figs 105, 107); hind femur with series of long anteroventral setae along distal 2/3 (Fig. 105); hind tarsus weakly dorsoventrally flattened; foreleg and midleg plain.

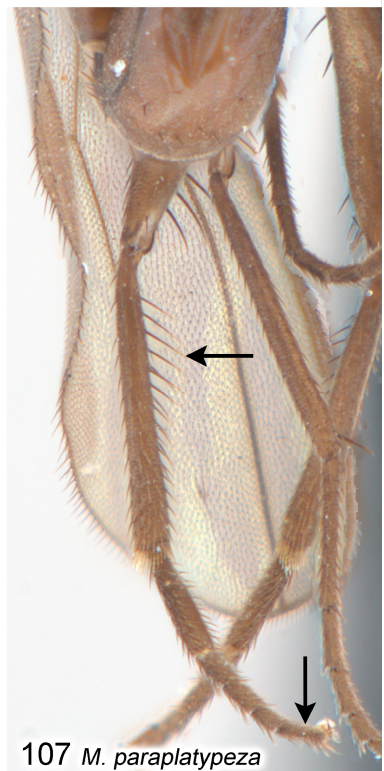
Description. Male (Figs 103–107): Wing length 1.8 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 103, 104, 106): About as broad as high in anterior view. Eyes not distinctly bulging laterally on upper 3/4 (Fig. 104). Frons about 2× broader than high, weakly widening above. Face narrow (Fig. 104), lateral margins linear and subparallel or concave and narrowest near middle, about 2–2.3× broader than width of anterior ocellus. Clypeus about 1.2× broader than high. Antenna with postpedicel about 3.1× longer than pedicel, about 1.7× longer than wide; arista-like stylus about 1.9× length of postpedicel. **Thorax** (Figs 103, 106): 6–7 dorsocentrals. **Legs** (Figs 103–107): Foreleg and midleg plain, hindleg with tibia bearing anteroventral fringe of setae basally. **Hindleg:** Femur with prominent anteroventral row of about 6–9 long setae along distal 2/3 (most setae distinctly longer than femur width, Fig 105); tibia with fringe of long erect anteroventral setae along basal half (Figs 105, 107); tarsus shorter than tibia, weakly dorsoventrally flattened. **Wing:** As in *M. barda* sp. nov. description. **Abdomen** (Fig. 103): *Hypopygium:* Ventral epandrial process with bifurcate C-shaped tip. Ventral lobe of right surstylus with single long seta basal to apical lobe, apical lobe bearing short, thick seta. Hypandrium dark and concolorous with abdomen. Left postgonite lobe relatively short with narrow digitiform apex. Phallus relatively short and J-shaped (Figs 16, 18), with crest on right side just above curve. Cercus similar to Figs 21 and 22, but with inner apical lobe acute, with sharply pointed tip.

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker. **Hindleg:** Femur with very weak anteroventral row of setae; tibia lacking fringe of long erect anteroventral setae on basal half; tarsus plain and slender. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from the Sierra Nevada Mountains of California (Fig. 90), with adults collected in July and August.

Etymology. The species name is derived from the Greek word *para* meaning near and *platypeza*, in reference to the similarity with *M. platypeza* sp. nov.

Remarks. The COI sequences obtained for this species (Figs 5, 90) comprised a single BIN (ACB0169) made up of two males and a female from the type locality in central California.



FIGURES 103–107. Male of *M. paraplatypeza* **sp. nov.** **103.** Habitus. **104.** Head, anterior view. **105.** Hindlegs, arrows indicate tibial setae and tarsomere 5. **106.** Habitus of holotype. **107.** Left hindleg of holotype, arrows indicate tibial setae and tarsomere 5.

***Microphorella patrickensis* sp. nov.**

urn:lsid:zoobank.org:act:024AE451-1910-4FEE-A1EE-2F06F34E2EA8

(Figs 3, 4, 6, 91, 108–114)

Type material. **HOLOTYPE**, ♂ (Figs 108, 111) labelled: “USA: CA: Del Norte Co. | West Fork of Patrick Crk. | N41°55'03"W123°51'28" | 3.VI.2009, S.E. Brooks”; “CNC | 1155923” [white label with blue border, text duplicated on underside]; “HOLOTYPE | *Microphorella patrickensis* | Brooks & Cumming” [red label] (CNC). **PARATYPES:** **USA: California: Del Norte County:** same data as holotype (10♂, CNC); same data as holotype except, 24.v.2009 (12♂, CNC); same data as holotype except, 31.v.2009 (4♂, CNC); same data as holotype except, J.M. Cumming (3♂, CNC); same data as holotype except, 24.v.2009, J.M. Cumming (6♂, CNC); same data as holotype except, 31.v.2009, J.M. Cumming (9♂, CNC); same data as holotype except, 24–31.v.2009, YPT, J.M. Cumming & S.E. Brooks (1♂, CNC); same data as holotype except, 24.v.2009, CNC DIPTERA #'s, 105215, 105217 (2♂, barcoded, CNC); same data as holotype except, 24.v.2009, CNC DIPTERA #'s, 105291, 105331 (2♀, barcoded, CNC); same data as holotype except, 31.v.2009, CNC DIPTERA # 105218 (1♂, barcoded, CNC); same data as holotype except, 31.v.2009, CNC DIPTERA # 105320 (1♀, barcoded, CNC); same data as holotype except, 31.v.2009, J.M. Cumming, CNC487264 (1♀, barcoded, CNC).

Other material examined. **USA: Oregon: Douglas County:** ca 7mi. SW Camas Valley, Bear Crk Recreation Site, 42°58'08"N 123°45'55"W, 27.v.2009, S.E. Brooks, CNC DIPTERA # 105219 (1♂, barcoded, CNC).

Diagnosis. Males of this species can be distinguished by the following combination of characters: fore tarsus clavate (Figs 111, 112), tarsomeres 2–5 thickened, tarsomere 1 unmodified, tarsomere 5 nearly 4× longer than tarsomere 4; mid and hind tarsi with tarsomere 5 slightly enlarged and elongated, about 2–3× longer than tarsomere 4 (Figs 113, 114); phallus pale (Fig. 114) and not expanded preapically.

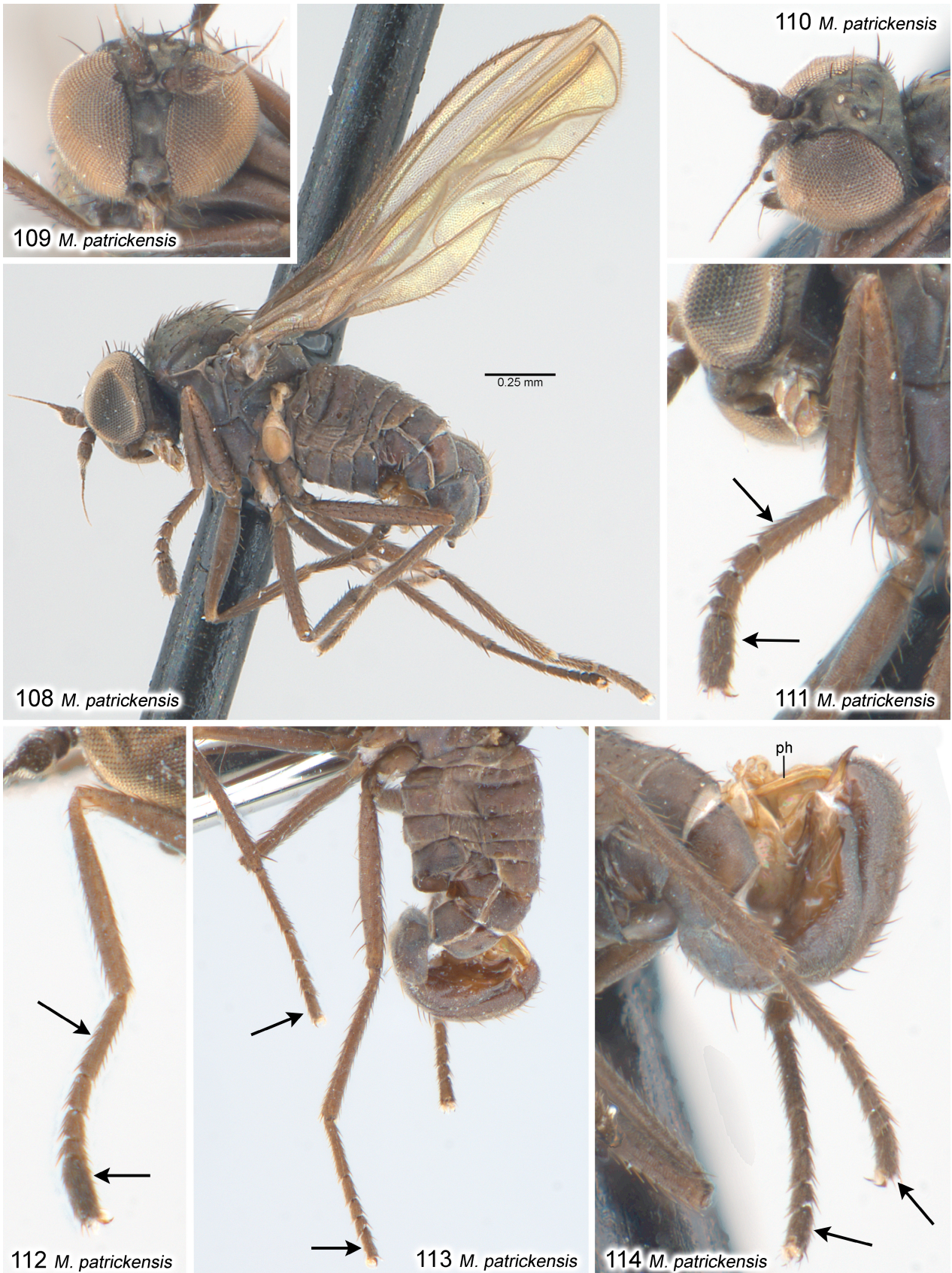
Description. **Male** (Figs 108–114): Wing length 1.8 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 108–110): About 1.2× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Frons about 2.4× broader than high, weakly widening above. Face broad, lateral margins linear and subparallel or nearly so, about 3× broader than width of anterior ocellus. Clypeus about 1.2× broader than high. Antenna (Fig. 110) with postpedicel about 3.3× longer than pedicel, about 2× longer than wide; arista-like stylus about 1.2× length of postpedicel. **Thorax** (Fig. 108): 6–8 dorsocentrals. **Legs** (Figs 108, 111–114): Foreleg with tarsus modified and clavate, midleg and hindleg with tarsus often weakly clavate. *Foreleg:* Femur with weakly developed posterior and posteroventral setae; tarsus clavate with tarsomeres 2–5 thickened, tarsomere 1 unmodified, tarsomere 5 nearly 4× longer than short tarsomere 4 (Figs 108, 111, 112). *Midleg:* Tarsus with tarsomere 5 plain or slightly enlarged and elongated. *Hindleg:* Femur with less prominent anteroventral row of relatively short setae along distal 1/3 (setae about as long as femur width or shorter); tibia with rather weak setae on anterior surface; tarsus with tarsomere 5 plain or slightly enlarged and elongated. **Wing:** As in *M. barda* sp. nov. description. **Abdomen** (Figs 108, 113, 114): *Hypopygium* (Fig. 114): Ventral epandrial process with claw-like tip (similar to Fig. 51). Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with flat acute apex. Phallus relatively short and J-shaped with weak a crest on right side just above curve, and second weak crest on left side at bottom of curve. Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker; fore, mid and hindlegs with tarsi plain; hind femur with very weak anteroventral setae. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from the Coast Range of southern Oregon and northern California (Fig. 91). Adults have been collected in May and June.

Etymology. The species name refers to the type locality along the West Fork of Patrick Creek in Del Norte County, California (Figs 3, 4), a site of high *Microphorella* diversity.

Remarks. In addition to the type series of *M. patrickensis* sp. nov., specimens of six other species were collected at the type locality by the authors during a ten day period from late May and early June of 2009. These included *M. barda* sp. nov., *M. bradleyi* sp. nov., *M. chiragra*, *M. dilata* sp. nov., *M. platypeza* sp. nov. and *M. vespera* Cumming & Brooks.



FIGURES 108–114. Male of *M. patrickensis* sp. nov. **108.** Habitus of holotype. **109.** Head, anterior view. **110.** Head, dorsolateral view showing medial surface of right antenna. **111.** Left foreleg of holotype (posterior surface), arrows indicate basitarsus and tarsomere 5. **112.** Same, of paratype. **113.** Abdomen, right midleg and left hindleg, left lateral view, arrows indicate tarsomere 5. **114.** Hypopygium and hindlegs, left lateral view, arrows indicate tarsomere 5. Abbreviation: ph—phallus.

The barcode analysis identified two neighbouring BINs (AAZ3738 and AAZ3739) among the nine sequenced specimens (Figs 6, 91). BIN AAZ3739 includes two males from the type locality in northwestern California, whereas BIN AAZ3738 includes a male from Bear Creek in southwestern Oregon as well as males and females from the type locality. All of the barcoded males appear identical morphologically.

***Microphorella platypeza* sp. nov.**

urn:lsid:zoobank.org:act:A4B85123-C2C4-42B8-BC13-6F07B3498DCA

(Figs 6, 92, 115–122)

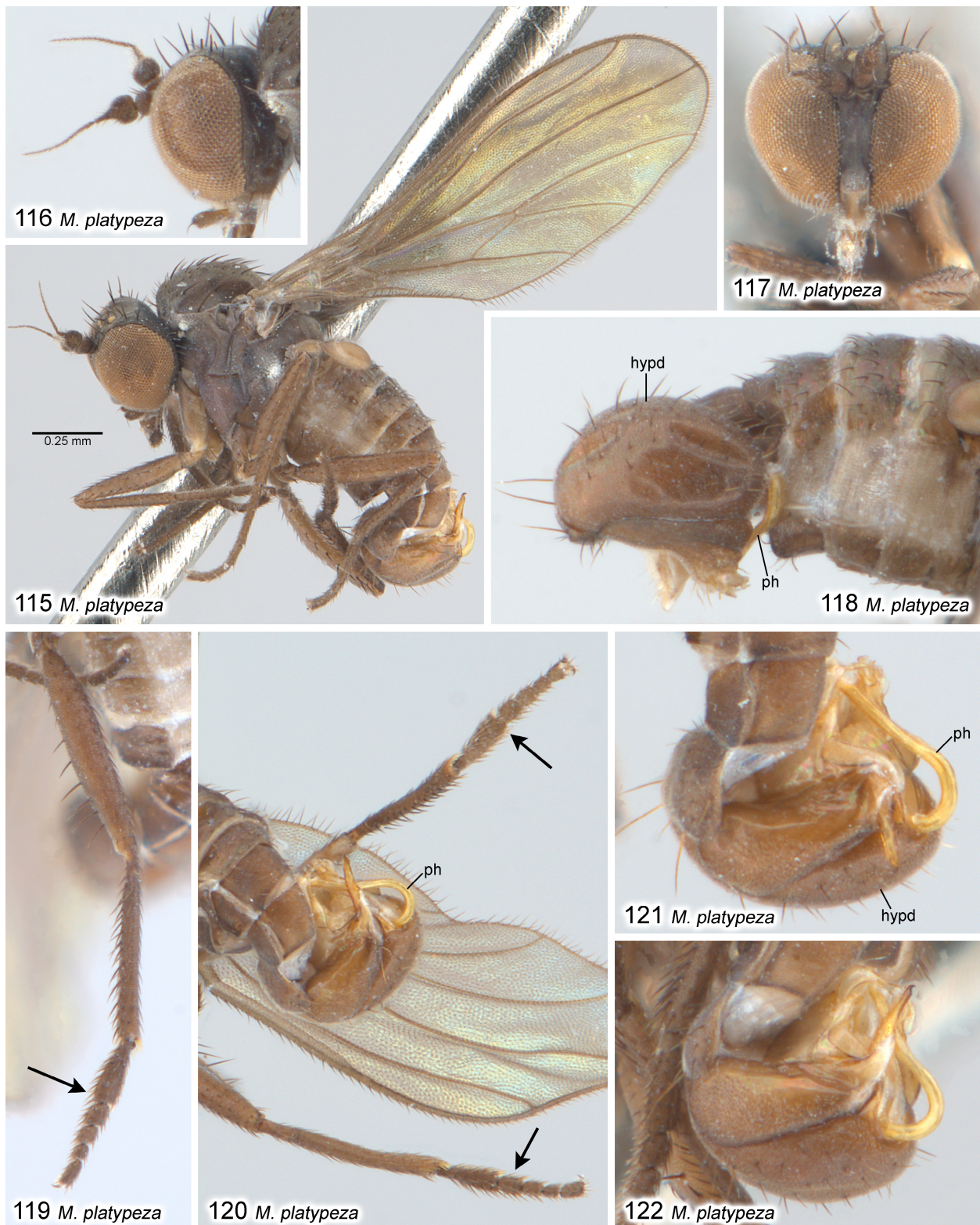
Type material. HOLOTYPE, ♂ (Figs 115, 122) labelled: “USA: OR: Linn Co., Cascadia| SP, nr. Sweet Home, 261m| N44°23'56.1"W122°28'52.3"| 9.vii.2014, ex: along Soda Crk.| S.E. Brooks”; “CNC| 1155924” [white label with blue border, text duplicated on underside]; “HOLOTYPE| *Microphorella| platypeza| Brooks & Cumming*” [red label] (CNC). **PARATYPES: USA: Oregon: Linn County:** same data as holotype (74♂, 50♀, CNC); same data as holotype except, J.M. Cumming (31♂, 11♀, CNC); same data as holotype except, J.M. Cumming, CNC487262 (1♂, barcoded, CNC); same data as holotype except, J.M. Cumming, CNC487263 (1♀, barcoded, CNC).

Other material examined. USA: California: Del Norte County: West Fork of Patrick Creek, 41°55'03"N 123°51'28"W, 3.vi.2009, S.E. Brooks (1♂, 1♀, CNC); same data except, CNC487264 (1♂, barcoded, CNC). **Humboldt County:** Six Rivers NF, Ikes Crk at Klamath Riv. [41°20'N 123°29'W], 3.vii.1976, D.D. Wilder (4♂, CAS). **Siskiyou County:** Klamath NF, along first 2.5 mi. of Wooley Crk Trail, T12N, R7E Sec. 29 & 31 [41°22'N 123°25'W], 3.vii.1978, D.D. Wilder (3♂, CAS); 20 mi. N Somes Bar [41°36'N 123°30'W], 2.vii.1983, R. Hurley (1♂, USNM). **Solano County:** Green Valley Park [38°15'N 122°9'W], 27.iv.1941, B. Brookman & T. Aitken (3♂, 1♀, CAS). **Oregon: Benton County:** Alder Crk Falls at Mary's Peak Rd, 44°28.462'N 123°31.711'W, 675 m, 12.vii.2013, B.J. Sinclair (1♂, CNC); same data except, 711 m, 4.vii.2014, S.E. Brooks (2♂, CNC); Alsea Falls, 44°19'31.7"N 123°29'25.1"W, 250 m, 5.vii.2014, S.E. Brooks (2♂, 1♀, CNC); same data except, J.M. Cumming (1♀, CNC); North Fork Alsea R., nr fish hatchery, 44°25'14.0"N 123°33'47.8"W, 115 m, 5.vii.2014, S.E. Brooks (2♂, 2♀, CNC); same data except, J.M. Cumming (4♂, 4♀, CNC); same data except, S.E. Brooks, CNC487266 (1♀, barcoded, CNC); same data except, J.M. Cumming, CNC487265 (1♂, barcoded, CNC); Rock Crk at end of Woods Crk Rd, 44°31'51.9"N 123°32'39.5"W, 546 m, 6.vii.2014, swp forest and creek margin, S.E. Brooks (1♂, CNC); Siuslaw NF, Rock Creek, 44°31.857'N 123°32.662'W, 570 m, 12.vii.2013, B.J. Sinclair (3♂, CNC). **Linn County:** Willamette NF, 335 m, Rd 2025 along Moose Crk, 44°25.184'N 122°24.987'W, 11.vii.2013, streams, B.J. Sinclair (2♂, 3♀, CNC). **Marion County:** Detroit, Wind Crk, 535 m, 44°45'17.8"N 122°07'14.4"W, 10.vii.2014, S.E. Brooks (12♂, 7♀, CNC); same data except, J.M. Cumming (1♂, CNC). **Washington: Pacific County:** Cape Disappointment SP nr Ilwaco, Benson Beach, 46°16'20.4"N 124°04'25.4"W, 1.vii.2014, swp dunes & beach grass (*Ammophila*), J.M. Cumming (1♂, CNC).

Diagnosis. Males of this species can be distinguished by the following combination of characters: hind tarsus dorsoventrally flattened with tarsomeres 2–4 subquadrate in dorsal/ventral view (Figs 119, 120); face narrow (Fig. 117); hind tibia lacking anteroventral fringe of longer setae basally (Fig. 119); hind femur with short anteroventral setae (not longer than femur width) (Fig. 119); foreleg and midleg plain; phallus with prominent curve protruding from hypopygium (Figs 118, 120–122).

Description. Male (Figs 115–122): Wing length 1.5–1.8 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 115–117): About 1.3× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Frons about 2× broader than high, weakly widening above. Face narrow (Fig. 117), lateral margins linear and subparallel or nearly so, about 2× broader than width of anterior ocellus. Clypeus about 1.4× broader than high. Antenna (Fig. 116) with postpedicel about 2.4× longer than pedicel, about 1.6× longer than wide; arista-like stylus about 1.8× length of postpedicel. **Thorax** (Fig. 115): As in *M. barda* sp. nov. description. **Legs** (Figs 119, 120): Foreleg and midleg plain, hindleg with tarsus dorsoventrally flattened. **Hindleg:** Femur with less prominent anteroventral row of relatively short setae along distal 2/3 (setae about as long as femur width, Fig. 119); tibia with rather robust setae on anterior surface; tarsus shorter than tibia, dorsoventrally flattened and fringed with short marginal setae, tarsomeres 2–4 subquadrate in dorsal/ventral view (Figs 119, 120). **Wing** (Fig. 115): As in *M. barda* sp. nov. description. **Abdomen** (Figs 115, 118, 120–122): **Hypopygium** (Figs 120–122): Ventral epandrial process with short claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left

postgonite lobe short with flat acute apex. Phallus moderately long and J-shaped with prominent curve protruding from hypopygium, with crest on right side just above curve and extending about halfway to apex (Figs 120–122). Cercus similar to Figs 21 and 22, but with inner apical lobe acute.



FIGURES 115–122. Male of *M. platypeza* sp. nov. **115.** Habitus of holotype. **116.** Head, left lateral view. **117.** Head of holotype, anterior view. **118.** Abdomen, right lateral view, hypopygium in resting position. **119.** Left hind leg, anterodorsal view, arrow indicates dorsoventrally flattened tarsus. **120.** Hindlegs (arrows indicate dorsoventrally flattened tarsi), terminalia (left lateral view), and right wing. **121.** Hypopygium of paratype, left lateral view. **122.** Hypopygium of holotype, left lateral view. Abbreviations: hypd—hypandrium; ph—phallus.

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker. *Hindleg:* Femur with weak anteroventral row of setae; tarsus plain. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from the Coast and Cascade Ranges of Oregon and northern California and has also been recorded from a sandy coastal beach habitat in southern Washington (Fig. 92). Adults have been collected in April, as well as June and July.

Etymology. The species name is Greek for flat-foot, in reference to the hind tarsus of males with tarsomeres 1–3 dorsoventrally flattened (Figs 119, 120).

Remarks. The barcode analysis identified two neighbouring BINs (ADM1077 and ADA7375) among the five sequenced specimens (Figs 6, 92). BIN ADM1077 comprised a male from West Fork of Patrick Creek in northwestern California, and BIN ADA7375 comprised males and females from two localities in Oregon, including the type locality (Cascadia State Park) and the North Fork of Alsea River. All of the barcoded males appear identical morphologically.

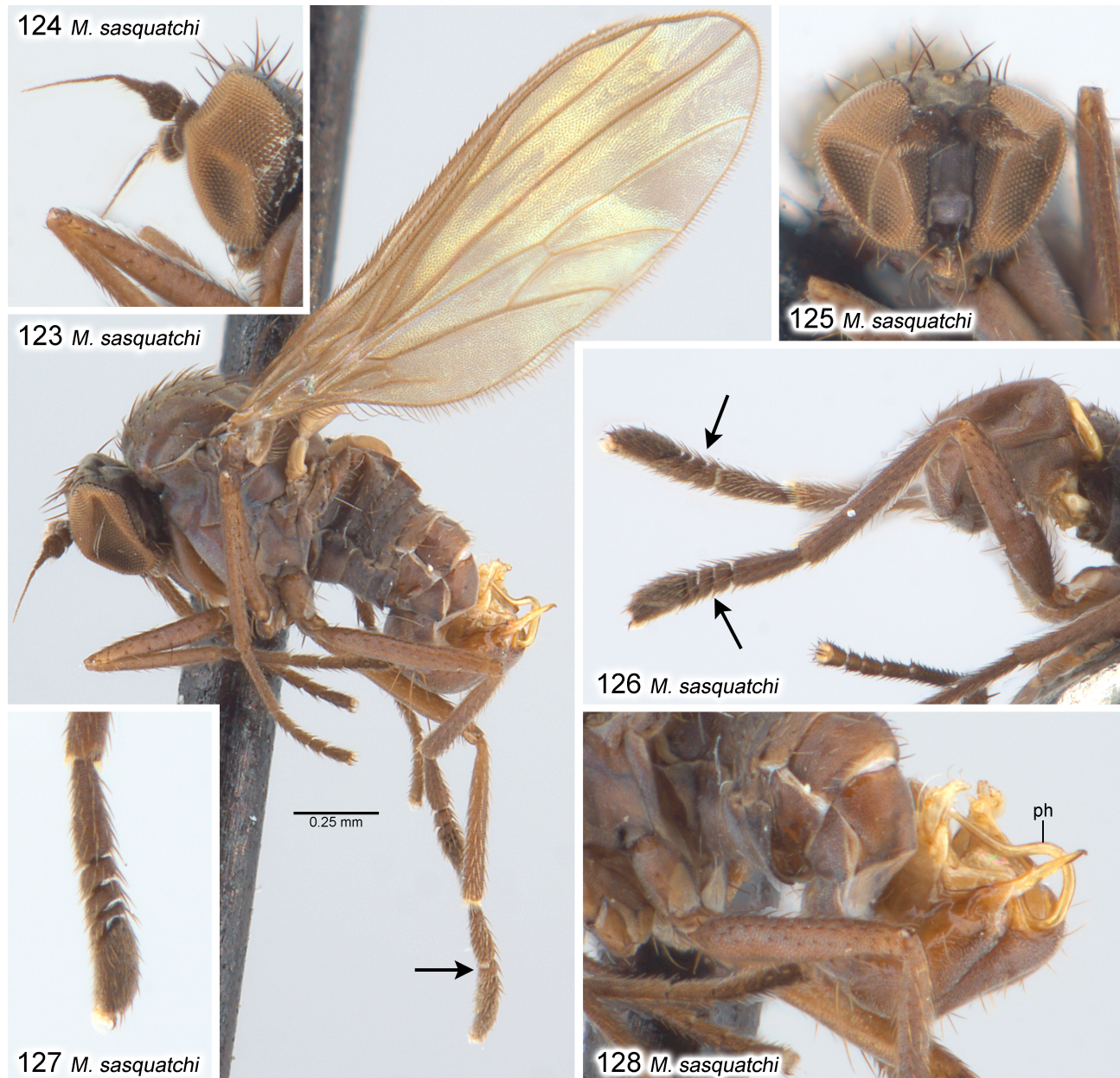
Microphorella sasquatchi sp. nov.

urn:lsid:zoobank.org:act:975B3196-7F8D-49AC-A902-CDBB1CC9E8A7
(Figs 6, 123–129, 136)

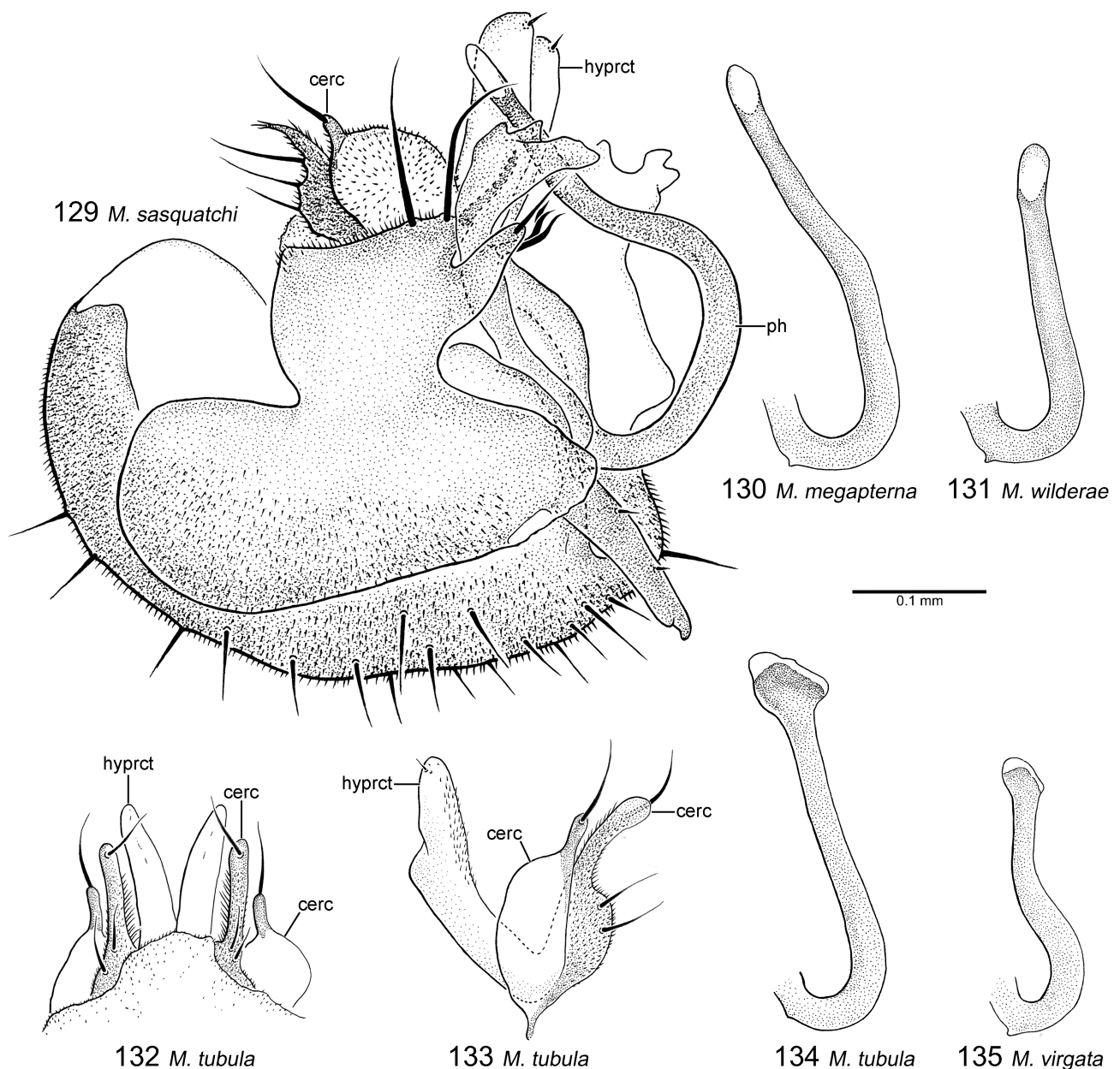
Type material. HOLOTYPE, ♂ (Fig. 126) labelled: “Lily Pond, Alpine| Lk., Marin Co.,| CALIF. 1500”; “19–27.vi 1971| Mal. tr. D.D. Monroe”; “CNC| 1155925” [white label with blue border, text duplicated on underside]; “HOLOTYPE| *Microphorella| sasquatchi|* Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: California:** *Marin County:* same data as holotype [37°57'N 122°38'W] (1♂, CNC); same data as holotype except, 4–10.v.1971 (1♂, CNC); same data as holotype except, v–vi.1970 (1♂, CNC); Lily Pond, 1500 ft, Alpine Lake, 22.iii.1969, Malaise trap (1♂, CNC); same data except, 4–10.v.1971, Malaise trap 2 (1♂, CNC).

Other material examined. USA: California: *Humboldt County:* Humboldt Redwoods SP, Cabin Creek at Bull Crk Flats Rd [40.350036°N 123.93149°W], 17.v.1978, D.D. Wilder (15♂, 2♀, CAS); Bolling [Grove] Park [40°16'N 123°51'W], 19.vi.1935, A.L. Melander (1♂, USNM). *Marin County:* small creek along Bolinas Ridge at Bolinas-Fairfax Rd [37°56'N 122°39'W], 10.iv.1978, D. Wilder (153♂, 17♀, CAS); Fairfax-Bolinas Rd, NE Hwy 1 [37.934983°N 122.697208°W], 20.vi.1999, P.H. Arnaud, Jr, S.M.C. Arnaud & M.M. Arnaud, Collection No. 02211 (1♂, USNM); along Lagunitas Crk below Alpine Dam [37°56'N 122°38'W], 28.v.1979, D.D. Wilder (1♂, CAS); Lily Lake, Mt Tamalpais [37°57'N 122°38'W], 10.iv.1978, D.D. Wilder (5♂, CAS); Mill Valley [37°54'N 122°32'W], 13.v.1967, P.H. Arnaud, Jr (15♂, 36♀, USNM); same data except, 110 m, 22.iv.1966 (1♀, CAS); same data except, 650 ft, FT, 7–11.iii.1966 (1♀, USNM); Mill Valley, Blithedale Ridge [37°55'N 122°32'W], 110 m, iv–v.1965, P.H. Arnaud, Jr (1♂, USNM); same data except, 25–27.iii.1966 (1♂, USNM); same data except, 28–29.iii.1966 (1♂, USNM); same data except, 3–4.iv.1966 (2♂, 1♀, USNM); same data except, 5–7.iv.1966 (3♂, USNM); Mount Tamalpais [37°55'45" N 122°34'40" W], trail to Bootjack Camp-West Point-Mountain Theater-Bootjack Camp, 16.v.1981, P.H. Arnaud, Jr (5♂, 8♀, USNM); Mount Tamalpais, Old Stage Road, Rattlesnake Creek No. 1, 10.v.1997, Collection 01745-A, swept shaded seepage in road cut, P.H. Arnaud, Jr, CNC1155724, CNC1155725 (2♂, barcoded, USNM); Mount Tamalpais, Old Stage Road, Rattlesnake Creek No. 1, 10.v.1997, Collection 01745-A, swept shaded seepage in road cut, P.H. Arnaud, Jr (4♂, 8♀, USNM); same data except, 22.v.1999, Collection 02202-A, seepage along road (7♂, 15♀, USNM); Mount Tamalpais, Old Stage Road, Rattlesnake Creek No. 2, 14.v.1994, #01148, P.H. Arnaud, Jr (14♂, 14♀, USNM); same data except, 10.v.1997, Collection 01745-B, swept shaded pools in creek bed (9♂, 9♀, USNM); Mount Tamalpais, Old Stage Road nr Bootjack Camp, 9.v.1992, #00719-B, P.H. Arnaud, Jr (5♂, USNM); Mount Tamalpais, Rock Springs Trail between Mountain Theater and West Point, 14.v.1988, P.H. Arnaud, Jr & S.M.C. Arnaud (5♂, USNM); Mount Tamalpais, vic. Rock Springs, 610 m, 13.v.1978, P.H. Arnaud, Jr (6♂, 1♀, USNM). *Mendocino County:* Moss Cove Rest Area S of Longvale on Hwy 101 [39°33'N 123°25'W], 18.v.1978, D. Wilder (2♂, 3♀, CAS); No. Calif. Coast Range Pres. [39°43'N 123°39'W], 5 mi. N Branscomb, 26.v.1976, J. Powell (2♂, EMEC); same data except, E. Rogers (6♂, 5♀, EMEC); No. Calif. Coast Range Pres., 3 mi. N Branscomb, 1400 ft, 8.v.1976, M. Buegler, Univ. Calif. Insect Survey Specimen #'s 249604–249612 (6♂, 3♀, EMEC); same data except, 17.v.1976, M. Buegler, Calif. Insect Survey Specimen #'s 184493–184508 (16♂, EMEC); same data except, 18.v.1976, M. Buegler, Calif. Insect Survey Specimen #'s 184527, 184528, 184530, 184532 (4♂, EMEC). *Monterey County:* Los Padres NF, Antonio R. below Escondito [36°08'N 121°29'W], 22.v.1977, D.D.

Wilder (2♂, CAS). *San Mateo County*: La Honda Road [37°22'N 122°15'W], Skyline Blvd, v.1949, P.H. Arnaud, Jr (8♂, 2♀, USNM); La Honda Road, Redwood Roadside Park, 8 km N La Honda, 6.v.1967, P.H. Arnaud, Jr (40♂, 2♀, USNM); Portola State Park [37°15'N 122°11'W], 7.v.1950, P.H. Arnaud, Jr (2♂, USNM); San Mateo County Memorial Park [37°16'N 122°17'W], 7.iv.1968, P.H. Arnaud, Jr (1♂, USNM); Woodside, Huddart County Park [37°26'N 122°17'W], 9.iv.1987, P.H. Arnaud, Jr (5♂, USNM); 3 mi. W Woodside, Huddart Park on King's Mtn Rd, 4.iv.1971, P.H. Arnaud, Jr (2♂, USNM). *Santa Clara County*: creek along Sanborn Rd, 2.7 km SE Congress Springs Rd [37°13'N 122°03'W], ca 440 m, 14.iv.1974, P.H. Arnaud, Jr (87♂, 11♀, CAS). *Santa Cruz County*: Big Basin Redwoods State Park [37°10'N 122°13'W], 5.vi.1971, D.G. Denning (1♂, UCDC); Felton, St Cruz Mts [37°03'N 122°04'W], 300–500 ft, 15–19.v.1907, Bradley (1♂, USNM). *Sonoma County*: Annadel SP, 38°26'6.6"N 122°36'40.2"W, 220 m, ravine nr Warren Richardson tr., 6m MT, 16.iii–5.v.2010, CSCA10L011, P. Kerr (7♂, 16♀, CNC); same data except, CNC360038 (1♂, barcoded, CNC); Annadel SP, 0.9mi from park lot Richardson trail, 38°26.11'N 122°36.67'W, 220 m, 6m MT, 18.iii–2.v.2008, P. Kerr, CSCA08L283 (1♂, 1♀, CNC).



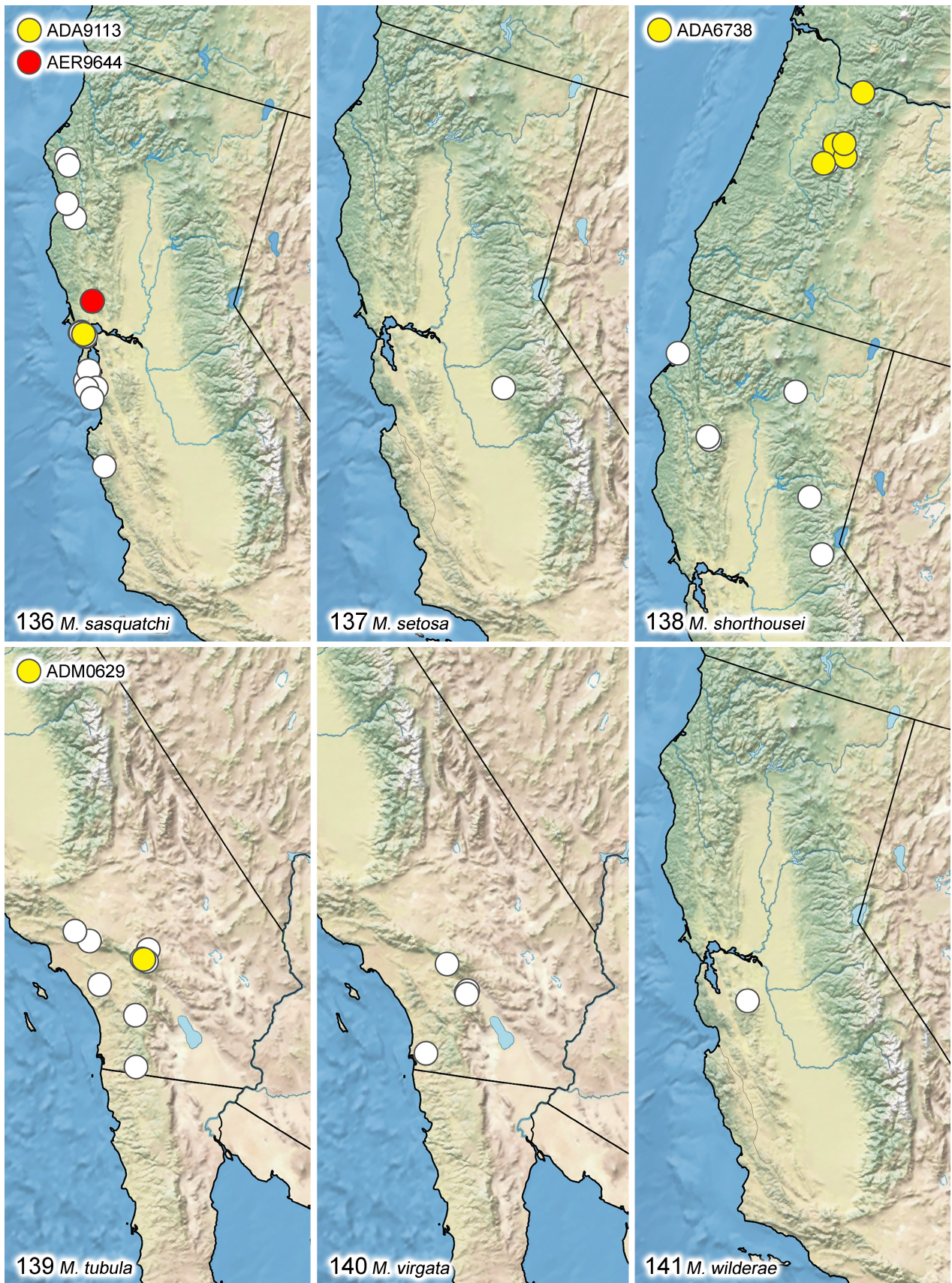
FIGURES 123–128. Male of *M. sasquatchi* sp. nov. **123.** Habitus, arrow indicates right hind tarsus. **124.** Head and left antenna, left lateral view. **125.** Head, anterior view. **126.** Hindlegs and terminalia of holotype, right lateral view, arrows showing hind tarsi. **127.** Left hind tarsus of holotype, left lateral view (anterior surface). **128.** Abdomen and hypopygium, left lateral view. Abbreviation: ph—phallus.



FIGURES 129–135. Hypopygium, phallus and cerci. **129.** Hypopygium of *M. sasquatchi* **sp. nov.** (CNC1155715), left lateral view. **130.** Phallus of *M. megapterna* **sp. nov.** (CNC1155902), left lateral view. **131.** Same of *M. wilderae* **sp. nov.** (CNC1155904). **132.** Cerci of *M. tubula* **sp. nov.** (CNC574510), dorsal view. **133.** Same specimen, right lateral view. **134.** Phallus of *M. tubula* **sp. nov.** (CNC1155909), left lateral view. **135.** Same of *M. virgata* **sp. nov.** (CNC1155896). Abbreviations: cerc—cercus; hypprt—hypoproct; ph—phallus.

Diagnosis. Males of this species, along with *M. megapterna* **sp. nov.** and *M. wilderae* **sp. nov.**, are part of a subgroup distinguished by their distinctively clavate hind tarsus with tarsomere 1 subequal in length to enlarged tarsomere 5 and tarsomeres 2–4 short and disc-like (Figs 126, 127). Within this subgroup, males of *M. sasquatchi* **sp. nov.** are recognized by their long phallus with strongly projecting curve followed by a straight distal portion (Figs 123, 128, 129).

Description. Male (Figs 123–129): Wing length 2.0–2.2 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 124, 125): About 1.3× broader than high in anterior view. Eyes not distinctly bulging laterally on upper 3/4. Frons about 2× broader than high. Face broad, lateral margins linear and subparallel, about 3.4× broader than width of anterior ocellus. Clypeus about 1.7× broader than high. Antenna (Fig. 124) with postpedicel about 3.5× longer than pedicel, about 2× longer than wide,



FIGURES 136–141. Known geographical distribution of the *Microphorella chiragra* species group. Coloured dots indicate localities with barcoded specimens (and their BINs), white dots indicate localities without barcoded specimens. **136.** *M. sasquatchi* sp. nov. **137.** *M. setosa* sp. nov. **138.** *M. shorthousei* sp. nov. **139.** *M. tubula* sp. nov. **140.** *M. virgata* sp. nov. **141.** *M. wilderae* sp. nov.

narrowed apical portion somewhat elongate; arista-like stylus about 1.4× length of postpedicel. **Thorax** (Fig. 123): As in *M. barda* **sp. nov.** description. **Legs** (Figs 123, 126, 127): Foreleg and midleg plain, hindleg with tarsus distinctively modified and clavate. *Hindleg*: Femur with less prominent anteroventral row of 3–4 relatively short setae along distal 1/3 (setae about as long as femur width); tibia with rather weak setae on anterior surface; tarsus distinctively thick and clavate (Figs 126, 127), tarsomere 1 subequal in length to enlarged and elongate tarsomere 5, tarsomeres 2–4 progressively shorter and disc-like with combined length shorter than tarsomere 5, tarsomere 5 subtly adorned with minute scale-like setae dorsally and laterally (setae are lighter and spot-like in appearance, similar to Figs 158, 159). **Wing** (Fig. 123): As in *M. barda* **sp. nov.** description. **Abdomen** (Figs 123, 126, 128, 129): *Hypopygium* (Figs 128, 129): Ventral epandrial process with short claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with rounded apex. Phallus long with strongly projecting curve followed by straight apical part (Figs 128, 129), lacking distinct crest. Cercus similar to Figs 21 and 22, but with inner apical lobe strongly acute.

Female: Similar to male except as follows: **Legs**: Setae weaker. *Hindleg*: Femur with weak anteroventral row of setae; tarsus plain. **Abdomen**: As in *M. barda* **sp. nov.** description.

Distribution and seasonal occurrence. This species is known from the Coast Range of northern and central California (Fig. 136). Adults have been collected from March to June.

Etymology. This species is named after the mythical creature Sasquatch, or Bigfoot, that supposedly inhabits the mountainous wilderness areas of western North America. Males of this species are also bigfooted and have a greatly enlarged hind tarsus (Figs 123, 126, 127).

Remarks. The barcode analysis identified two neighbouring BINs (ADA9113 and AER9644) among the three sequenced specimens (Figs 6, 136). BIN ADA9113 comprised a single male from Mount Tamalpais in Marin County, California and BIN AER9644 included two males from nearby Annadel State Park in Sonoma County, California. All of the barcoded males appear identical morphologically.

Microphorella setosa **sp. nov.**

urn:lsid:zoobank.org:act:2DC2AC3A-5213-43A2-8D45-3CDD2EAA53E5
(Figs 137, 142–144)

Type material. HOLOTYPE, ♂ (Fig. 142) labelled: “U.S.A.: CALIFORNIA| Mariposa Co. seepage| along Hwy. 49 between| Bear Valley and Cou-| lterville. 3.V.1978| D.D. Wilder collector”; “HOLOTYPE| *Microphorella*| *setosa*| Brooks & Cumming” [red label] (CAS). **PARATYPES: USA: California: Mariposa County**: same data as holotype [37.640359°N 120.152017°W] (23♂, 18♀, CAS).

Diagnosis. Males can be distinguished by the following combination of characters: foreleg with femur bearing dense patch of short, erect setae on basal 1/3 of posterior surface and two long basiventral setae (Figs 143, 144); midleg with femur bearing posteroventral row of 3–4 long setae on basal 1/3 (Fig. 143) and tarsomere 1 bearing long ventral setae (Fig. 142); hindleg with femur bearing series of about 5 long, widely spaced anteroventral setae (Figs 142, 143).

Description. Male (Figs 142–144): Wing length 1.7–1.8 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): **Head**: Some features not assessable because of collapsed head and eyes in available material. Face apparently moderately broad with lateral margins linear and subparallel. Clypeus apparently about as broad as high. Antenna with postpedicel about 1.6× longer than wide; arista-like stylus about 1.8× length of postpedicel. **Thorax**: Acrostichal relatively small; 6–7 dorsocentrals, area laterad dorsocentrals and anterior to postsutural supra-alar with setae smaller and sparser. **Legs** (Figs 142–144): Foreleg, midleg and hindleg with specialized setae. *Foreleg* (Figs 143, 144): Femur slightly swollen basally, with dense patch of short, erect setae on basal 1/3 of posterior surface and two long basiventral setae; tibia and tarsus plain. *Midleg*: Femur with row of 3–4 long posteroventral setae on basal 1/3 (Fig. 143); tibia plain; tarsus with long ventral setae on tarsomere 1 (Fig. 142). *Hindleg*: Femur with series of about 5 long, widely spaced anteroventral setae (Figs 142, 143); tibia with longer ventral setae on distal 1/3 (Fig. 142); tarsus plain. **Wing**: As in *M. barda* **sp. nov.** description. **Abdomen: Hypopygium**: Ventral epandrial process somewhat broad with short claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with flattened, narrowly pointed apex. Phallus relatively short and J-

shaped, with weak sinuous bend just above curve and serrated crest on right side. Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Head:** Face and clypeus slightly broader. **Legs:** Setae weaker. **Foreleg:** Plain, femur without modified setae. **Midleg:** Plain, femur and tarsus without modified setae. **Hindleg:** Plain, femur lacking anteroventral row of setae; tibia plain, without modified setae. **Abdomen:** As in *M. barda* sp. nov. description.



FIGURES 142–144. Male of *M. setosa* sp. nov. **142.** Legs, left lateral view of holotype, arrows indicate setae of mid tarsus and hindleg (femur and tibia). **143.** Legs, left lateral view, arrows indicate setae of fore femur, mid femur and hind femur. **144.** Forelegs, dorsal view, arrows indicate basal posterior cluster of setae on femora.

Distribution and seasonal occurrence. This species, collected in May, is known only from the type locality in Mariposa County, California (Fig. 137).

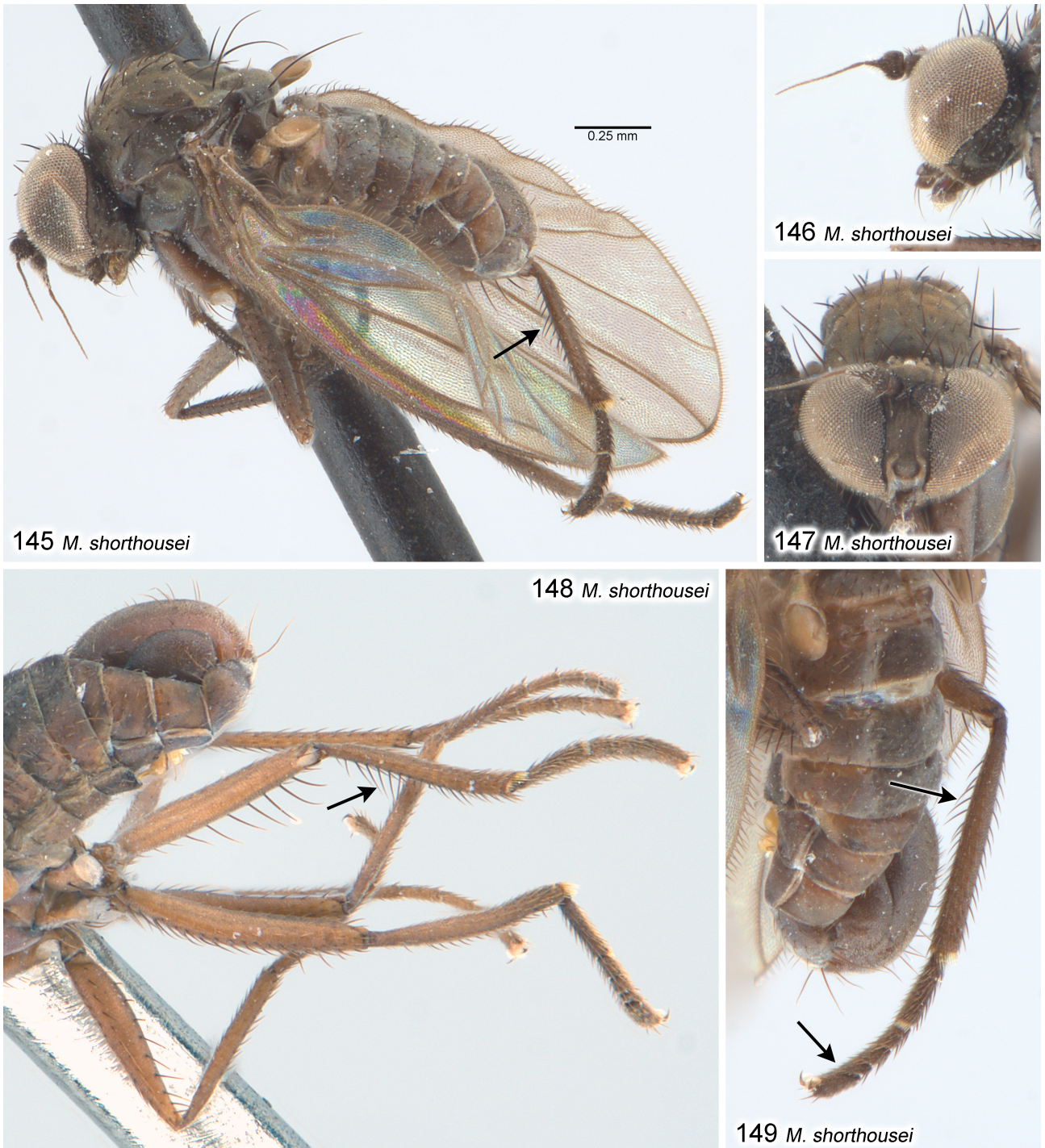
Etymology. The species name refers to the distinct setae on the male legs.

Remarks. No COI sequences were obtained for this species.

***Microphorella shorthousei* sp. nov.**

urn:lsid:zoobank.org:act:EE5FCEEC-E5B8-46C4-9581-C5C293F55A1D
(Figs 6, 138, 145–149)

Type material. **HOLOTYPE**, ♂ (Fig. 145) labelled: “USA: OR: Linn Co. | Santiam SF, Monument Peak Rd; [N]44°42.571' W122°22.264' | 10.vii.2013, 820 m | B.J. Sinclair”; “CNC | 1155926” [white label with blue border, text duplicated on underside]”; “HOLOTYPE | *Microphorella* | *shorthousei* | Brooks & Cumming” [red label] (CNC). **PARATYPES:** **USA: Oregon: Linn County:** same data as holotype (2♂, 3♀, CNC); same data as holotype except, CNC1155731, CNC1155737 (2♂, barcoded, CNC).



FIGURES 145–149. Male of *M. shorthousei* sp. nov. **145.** Habitus of holotype, arrow indicates setae of hind tibia. **146.** Head and left antenna, left lateral view. **147.** Head, anterior view. **148.** Abdomen and legs, left lateral view, arrow indicates setae of hind tibia. **149.** Abdomen and hindlegs, dorsolateral view, arrows indicate setae of hind tibia and tarsomere 5.

Other material examined. USA: California: *El Dorado County:* South Fork American River, Eagle Rock river access, 38°46'34.6"N 120°16'00.7"W, 18.vii.2012, J.M. Cumming (1♂, CNC). *Humboldt County:* Little River [41°01'N 124°06'W], 14.vii.1990, R. Hurley (1♂, MTEC). *Mendocino County:* Mendocino NF, Buck Rock Crk at Rd #1N02 [39°56'N 122°59'W], 20.vi.1976, D. Wilder (2♂, CAS); Mendocino NF, Rattlesnake Crk at Rd #1N02 [39°58'N 123°02'W], 19.vi.1976, D. Wilder (1♂, CAS). *Shasta County:* McArthur Burney Falls Mem. SP [41°00'N 121°39'W], 2900 ft, 1.viii.1970, P.H. Arnaud (1♂, CAS). *Sierra County:* Highway 49, creek in New York Ravine, on

North Yuba River, 2.8 km E Downieville [39°33'N 120°48'W], 940 m, 4.vii.1975, P.H. Arnaud, Jr (2♂, CAS); same data except, 5.vii.1975, P.H. Arnaud, Jr (3♂, CAS). **Oregon:** *Linn County:* Blowout Crk at Rte. 10, 44°35'12.5"N 122°05'06.5"W, 1055m, 10.vii.2014, S.E. Brooks, CNC487284, CNC487285 (2♀, barcoded, CNC); Cascadia SP, nr Sweet Home, 261 m, 44°23'56.1"N 122°28'52.3"W, 9.vii.2014, Soda Crk Falls, J.M. Cumming, CNC487290 (1♀, barcoded, CNC); Willamette NF, 335 m, Rd 2025 along Moose Crk, 44°25.184'N 122°24.987'W, 11.vii.2013, streams, B.J. Sinclair (1♂, CNC). *Marion County:* Willamette NF, French Crk Rd, 44°45.969'N 122°11.211'W, 10.vii.2013, 660 m, ex. trib., B.J. Sinclair, CNC487287 (1♀, barcoded, CNC). *Multnomah County:* Wahkeena Falls & Crk, 45°34.523'N 122°07.680'W, 8.vii.2013, B.J. Sinclair, CNC487286 (1♀, barcoded, CNC).

Diagnosis. Males of this species can be distinguished by the following combination of characters: hind tibia with anteroventral fringe of longer setae basally (Figs 145, 148, 149); hind femur with series of long anteroventral setae along distal 2/3 (Fig. 148); head distinctly wider than high with wide face (Fig. 147); hind tarsus weakly clavate with tarsomere 5 enlarged and about 3× longer than tarsomere 4 and about half as long as tarsomere 1 (Fig. 149); foreleg and midleg plain.

Description. Male (Figs 145–149): Wing length 1.9 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head** (Figs 145–147): About 1.5× broader than high in anterior view (Fig. 147). Eyes bulging laterally on upper 3/4. Frons about 2.4× broader than high, widening above. Face broad, lateral margins linear and subparallel, about 3.5× broader than width of anterior ocellus. Clypeus about 1.5× broader than high. Antenna (Fig. 146) with postpedicel about 2.4× longer than pedicel, about 1.3× longer than wide; arista-like stylus about 2.5× length of postpedicel. **Thorax** (Fig. 145): As in *M. barda* sp. nov. description. **Legs** (Figs 145, 148, 149): Foreleg and midleg plain, hindleg with tibia bearing anteroventral fringe of setae basally and tarsus weakly clavate. *Foreleg:* Femur with well-developed row of posteroventral setae (most setae distinctly longer than femur width). *Hindleg:* Femur with prominent anteroventral row of about 6–8 long setae along distal 2/3 (most setae distinctly longer than femur width, Fig. 145); tibia with fringe of long erect anteroventral setae along basal half (Figs 145, 148, 149) and with rather robust setae on anterior surface; tarsus weakly clavate with tarsomere 5 enlarged and about 3× longer than short tarsomere 4 and about half as long as tarsomere 1 (Fig. 149). **Wing:** As in *M. barda* sp. nov. description. **Abdomen** (Figs 148, 149): *Hypopygium:* Very similar to *M. barda* sp. nov. Ventral epandrial process with tip narrowed and claw-like or bifurcate and beak-like. Ventral lobe of right surstylus with rounded apical lobe bearing 2 long setae (similar to Fig. 20). Hypandrium dark and concolorous with abdomen (Figs 148, 149). Left postgonite lobe long with rounded apex (similar to Fig. 18). Phallus relatively short and J-shaped, with weak serrated crest on right side just above curve. Cercus similar to Figs 21 and 22, but with inner apical lobe acute.

Female: Similar to male except as follows: **Head:** Eyes weakly bulging on upper 3/4. **Legs:** Setae weaker. *Foreleg:* Femur with weak posteroventral row of setae. *Hindleg:* Femur with weak anteroventral row of setae, tarsus plain. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from the Cascade Range in northern Oregon south to the Sierra Nevada Mountains and Coastal Range in the northern half of California (Fig. 138). Adults have been collected from June to August.

Etymology. This species is named in honour of Joseph D. (Joe) Shorthouse, the first author's early entomological mentor at Laurentian University (Sudbury), and Joe's son, David P. Shorthouse, Biodiversity Informatician at Agriculture and Agri-Food Canada (Ottawa) and creator of the free online mapping tool, SimpleMappr.

Remarks. The barcode analysis identified a single BIN (ADA6738) among the seven sequenced specimens (Figs 6, 138), which included males from the type locality (Monument Peak Rd, Oregon) and females from four other Oregon localities (Blowout Crk, Cascadia SP, French Crk Rd and Wahkeena Falls).

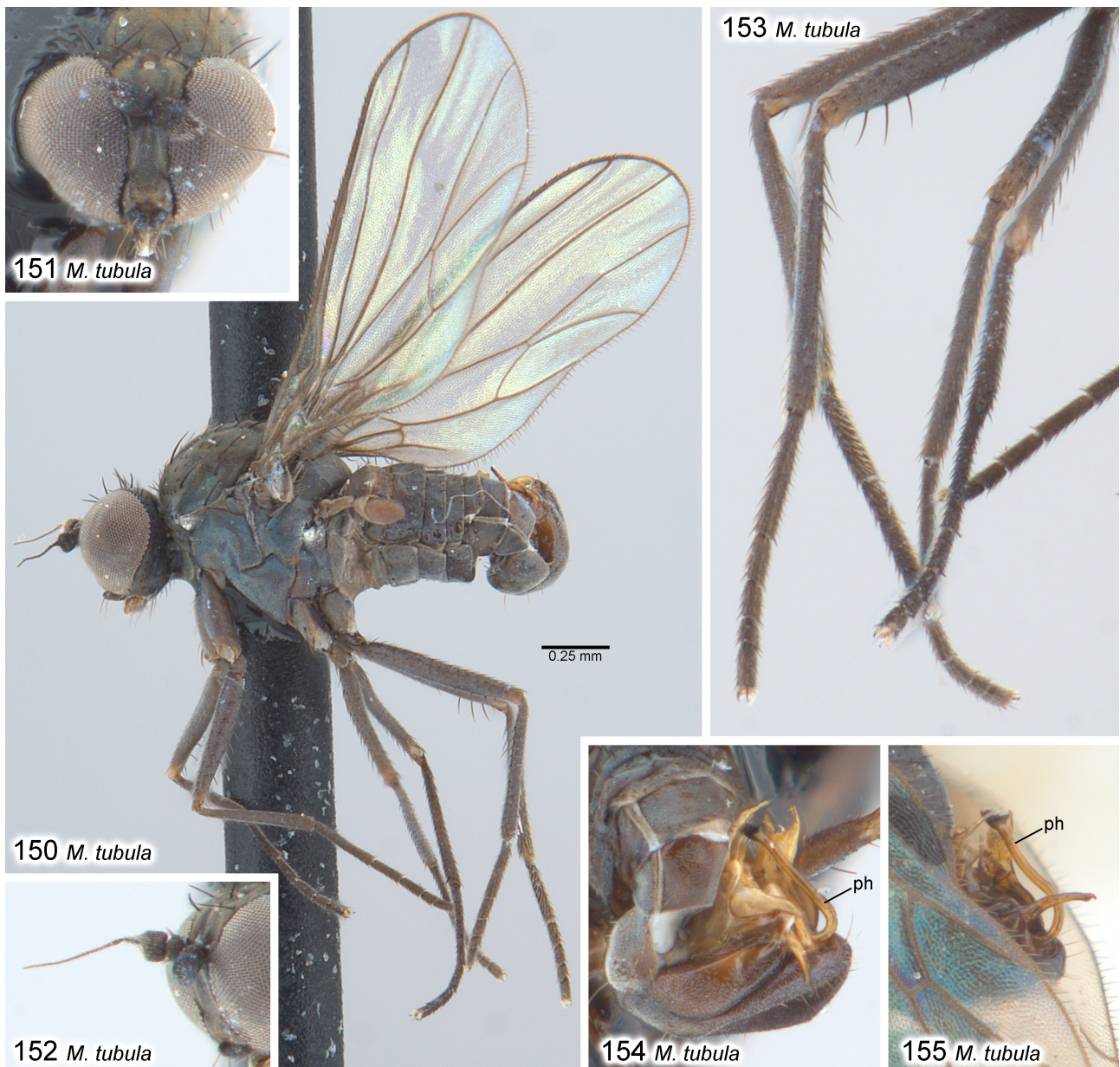
Microphorella tubula sp. nov.

urn:lsid:zoobank.org:act:FE48BFF8-4796-4E0A-9171-EB01EE7AF039

(Figs 6, 132–134, 139, 150–155)

Type material. HOLOTYPE, ♂ (Figs 150–153) labelled: “USA: CA: San Bernardino| Co., 2.6 mi. E Seven Oaks,| Santa Ana R., 34°11'0.1"N| 116°52'12.1"W, 1770m,| 11–12.vi.2016, MT, Cumming| & Brooks, CNC574514”; “HOLOTYPE| *Microphorella| tubula|* Brooks & Cumming” [red label] (CNC). **PARATYPES: USA: California:**

San Bernardino County: same data as holotype except, CNC574500 (1♂, CNC); same data as holotype except, YPT, CNC576731, CNC576733, CNC576734, CNC576735 (1♂, 3♀, CNC); same data as holotype except, J.M. Cumming, CNC576975, CNC576976 (2♂, 1♀, CNC); same data as holotype except, CNC574510 (1♂, barcoded, CNC); same data as holotype except, J.M. Cumming, CNC576978 (1♂, barcoded, CNC); same data as holotype except, CNC574516, CNC574672 (2♀, barcoded, CNC).



FIGURES 150–155. Male of *M. tubula* sp. nov. **150.** Habitus of holotype. **151.** Head of holotype, anterior view. **152.** Right antenna of holotype, medial view. **153.** Midlegs and hindlegs of holotype, right lateral view. **154.** Hypopygium, left lateral view, specimen from Trabuco Canyon, California. **155.** Same, partially obscured by wing, specimen from Hauser Canyon, California. Abbreviation: ph—phallus.

Other material examined. USA: California: *Los Angeles County*: N. Fk. San Gabriel R. along Hwy 39, 2 mi. S Coldbrook Stn. [34°15'N 117°51'W], 25.iv.1977, D.D. Wilder (1♂, CAS); same data except, 3.3 mi. S Coldbrook Stn., 2.v.1978, (1♂, 1♀, CAS); *Los Angeles Nat. Forest* [34°20'N 118°08'W], Windy Spring, 27.vi.1974, D.D. Wilder (1♂, CAS). *Orange County*: Cleveland NE, Trabuco Cyn, Horsethief Tr., 634 m, 33°41.017'N 117°29.937'W, 5.iii.2010, K. Collins, CNC1155729 (1♂, barcoded, CNC). *San Bernardino County*: 11 mi. SE Lucerne Valley [34°20'N 116°50'W], 5500 ft, 13.v.1955, W.R.M. Mason (1♂, CNC); South Fork Santa Ana River [34°10'N

116°49'W], 19.vi.1945, A.L. Melander (1♂, 1♀, USNM); Seven Oaks [34°11'N 116°54'W], 27.iv.1955, A.L. Melander (1♂, USNM). *San Diego County*: Hauser Canyon, 32°40.325'N 116°34.114'W, 26.iii.2002, G.M. Nishida (1♂, EMEC); Oak Grove [33°23'N 116°47'W], 9.v.1945, A.L. Melander, CNC1155909 (1♂, USNM).

Diagnosis. Males of this species can be distinguished by the following combination of characters: legs plain (Figs 150, 153) or sometimes hindleg weakly clavate; hind femur with row of about 3 short anteroventral setae along distal 1/3 (Figs 150, 153); hind tibia lacking anteroventral fringe of longer setae basally (Fig. 153); phallus moderately long, distal part straight or nearly so, with apex strongly flared and infusate (Figs 134, 154, 155), with single weak crest on right side of curve; cercus with inner apical lobe elongate, narrow and rod-like (Fig. 133).

Description. Male (Figs 132–134, 150–155): Wing length 1.8 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): Body and legs darker grey in colour. **Head** (Figs 150–152): About 1.5× broader than high in anterior view. Eyes bulging laterally on upper 3/4 (Fig. 151). Frons about 2× broader than high. Face broad, lateral margins linear and subparallel or nearly so, about 3.5× broader than width of anterior ocellus. Clypeus about 1.5× broader than high. One pair of small posterior ocellars. Antenna (Fig. 152) with postpedicel about 2.3× longer than pedicel, about 1.4× longer than wide, basal part usually subquadrate; arista-like stylus about 2.4× length of postpedicel. **Thorax** (Fig. 150): Acrostichal setae rather weak; 6–7 dorsocentrals. **Legs** (Figs 150, 153): Foreleg and midleg plain, hindleg plain or with tarsus weakly clavate. *Hindleg*: Femur with less prominent anteroventral row of about 3 relatively short setae along distal 1/3 (setae about as long as femur width); tibia with rather weak setae on anterior surface; tarsus plain, or weakly clavate with tarsomere 5 slightly enlarged and elongated and tarsomere 4 sometimes compressed. **Wing** (Fig. 150): As in *M. barda* **sp. nov.** description. **Abdomen** (Figs 150, 154, 155): *Hypopygium* (Figs 132–134, 154, 155): Ventral epandrial process with short claw-like tip. Dorsal lobe of right surstylus digitiform. Ventral lobe of right surstylus with medial surface rugose basally, with single long seta basal to small oval apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite lobe long and narrow. Right postgonite short and relatively narrow. Phallus moderately long, J-shaped, distal part straight or nearly so, with apex strongly flared and infusate (Figs 134, 154, 155), with single weak crest on right side of curve. Hypoproct lobes with angular flange-like extension near middle of ventral margin (Fig. 133). Cercus similar to Figs 132, 133, with inner apical lobe elongate, narrow and rod-like.

Female: Similar to male except as follows: **Head:** Eyes weakly bulging on upper 3/4. Face and clypeus slightly broader. **Thorax:** Acrostichals stronger, normally developed. **Legs:** *Hindleg:* Femur without anteroventral setae, tarsus plain. **Abdomen:** As in *M. barda* **sp. nov.** description.

Distribution and seasonal occurrence. This species is known from the Transverse and Peninsular Mountain Ranges in southern California (Fig. 139). Adults have been collected from February to July.

Etymology. The species name refers to the flared trumpet-like apex of the phallus of males.

Remarks. The COI sequences obtained for this species (Figs 6, 139) comprised a single BIN (ADM0629) made up of two males and two females, all from the type locality in the San Bernardino Mountains, California. This species appears to be closely related to *M. bicristata* **sp. nov.** and *M. virgata* **sp. nov.** (see Remarks under *M. bicristata* **sp. nov.**).

Microphorella virgata **sp. nov.**

urn:lsid:zoobank.org:act:7EA53BE3-7F7C-4E68-8F18-DE62FF29801B

(Figs 135, 140, 156, 157)

Type material. HOLOTYPE, ♂ (Figs 156, 157) from Mountain Home, California, labelled: “MOUNTNHOME| 21/6/45CAL| ALMELANDER”; “ALMelande| Collection| 1961”; “HOLOTYPE| *Microphorella*| *virgata*| Brooks & Cumming” [red label] (USNM). **PARATYPES: USA: California: San Bernardino County:** same data as holotype [34°06'02"N 116°59'57"W] (10♂, 2♀, USNM); same data as holotype except, 7.vii.1945 (4♂, USNM).

Other material examined. USA: California: Riverside County: Agua Caliente Ind. Res., Palm Canyon [33°46'N 116°34'W], 24.ii.1970, P.H. Arnaud, Jr (1♂, USNM); Palm Canyon [33°48'N 116°33'W], Palm Springs 16.ii.1955, W.R.M. Mason (3♂, 2♀, CNC); Palm Springs, Andreas Canyon [33°45'N 116°33'W], 27.ii.1954, P.H. Arnaud, Jr (1♂, USNM). *San Diego County:* Cajon [32°47'N 116°57'W], 28.vi.1945, A.L. Melander (1♂, USNM).



FIGURES 156–157. Male holotype of *M. virgata* sp. nov. **156.** Habitus. **157.** Abdomen and left hindleg (posterior surface), right lateral view. Abbreviation: cerc—cercus.

Diagnosis. Males of this species can be distinguished by the following combination of characters: hind tarsus clavate with tarsomere 5 about 4× longer than compressed tarsomere 4 (Fig. 157); hind femur with row of about 5 short anteroventral setae along distal 1/3; foreleg and midleg plain; hind tibia lacking anteroventral fringe of longer setae basally (Fig. 157); phallus short with distal part sinuous, apex weakly flared (Fig. 135), with single weak crest on right side above curve; cercus with inner apical lobe elongate, narrow and rod-like (Figs 156, 157, similar to Fig. 133).

Description. Male (Figs 135, 156, 157): Wing length 1.5–1.6 mm. Similar to *M. barda* sp. nov. except as follows (although certain similarities may be noted if they have diagnostic value): **Head:** Some features not assessable because of collapsed head and eyes in available material. Frons broader than high. Face broad with lateral margins linear and subparallel. Clypeus broader than high. Antenna with postpedicel about 3.5× longer than pedicel, about 1.4× longer than wide; arista-like stylus about 2× length of postpedicel. **Thorax** (Fig. 156): 6–7 dorsocentrals. **Legs** (Figs 156, 157): Foreleg and midleg plain, hindleg clavate. **Hindleg:** Femur with less prominent anteroventral row of about 5 relatively short setae along distal 1/3 (setae about as long as femur width); tibia with rather weak setae on anterior surface; tarsus clavate with tarsomere 5 enlarged and elongated, about 4× longer than compressed tarsomere 4. **Wing** (Fig. 156): As in *M. barda* sp. nov. description. **Abdomen:** **Hypopygium** (Figs 135, 157): Ventral epandrial process with short claw-like tip. Dorsal lobe of right surstylus digitiform. Ventral lobe of right surstylus with medial surface rugose basally, with single long seta basal to small oval apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite lobe long and narrow. Right postgonite short and relatively narrow. Phallus relatively short and J-shaped with distal part sinuous, apex weakly flared (Fig. 135), with single weak crest on right side above curve. Hypoproct lobes with angular flange-like extension near middle of ventral margin (similar to Fig. 133).

Cercus similar to Figs 132, 133, with inner apical lobe elongate, narrow and rod-like (Figs 156, 157).

Female: Similar to male except as follows: **Legs:** Setae weaker. *Hindleg:* Femur without distinct anteroventral row of setae, tarsus plain. **Abdomen:** As in *M. barda* sp. nov. description.

Distribution and seasonal occurrence. This species is known from southern California (Fig. 140). Adults have been collected from February to June.

Etymology. The species name is derived from the Latin for rod-like in reference to the structure of the inner apical lobe of the male cercus.

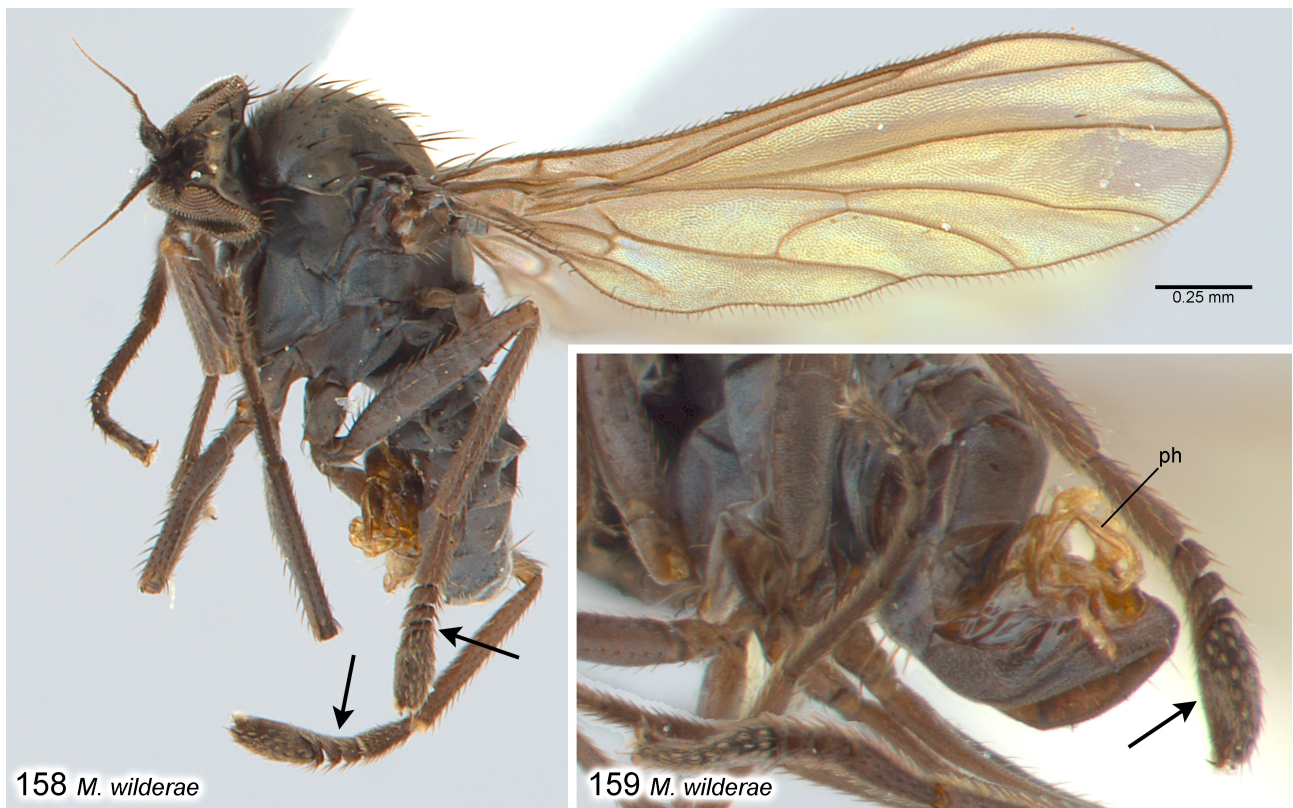
Remarks. No COI sequences were obtained for this species, but it appears to be closely related to *M. bicristata* sp. nov. and *M. tubula* sp. nov. (see Remarks under *M. bicristata* sp. nov.).

***Microphorella wilderae* sp. nov.**

urn:lsid:zoobank.org:act:B4F54051-9227-4AE1-BE00-E97E77076BE3

(Figs 131, 141, 158, 159)

Type material. **HOLOTYPE**, ♂ (Fig. 158) labelled: “U.S.A.: CALIFORNIA:| AlamedaCounty, small| creek at county line| and Mines Rd. 11-IV-| 1978, D. Dee Wilder”; “D. Dee Wilder| Collection” [yellow label]; “HOLOTYPE| *Microphorella| wilderae|* Brooks & Cumming” [red label] (CAS). **PARATYPES:** **USA: California: Alameda County:** same data as holotype [37.483152°N 121.532756°W] (16♂, 6♀, CAS); same data as holotype except, CNC1155904 (1♂, CAS).



FIGURES 158–159. Male of *M. wilderae* sp. nov. **158.** Habitus of holotype, arrows indicate hind tarsus. **159.** Legs and abdomen, showing hypopygium in left lateral view and anterior surface of left hind tarsus, arrow indicates tarsomere 5. Abbreviation: ph—phallus.

Diagnosis. Males of this species, along with *M. megapterna* sp. nov. and *M. sasquatchi* sp. nov., are part of a subgroup distinguished by their distinctively clavate hind tarsus with tarsomere 1 subequal in length to enlarged tarsomere 5 and tarsomeres 2–4 short and disc-like (Figs 158, 159). Within this subgroup, males of *M. wilderae* sp. nov. are recognized by their short straight phallus (Fig. 131).

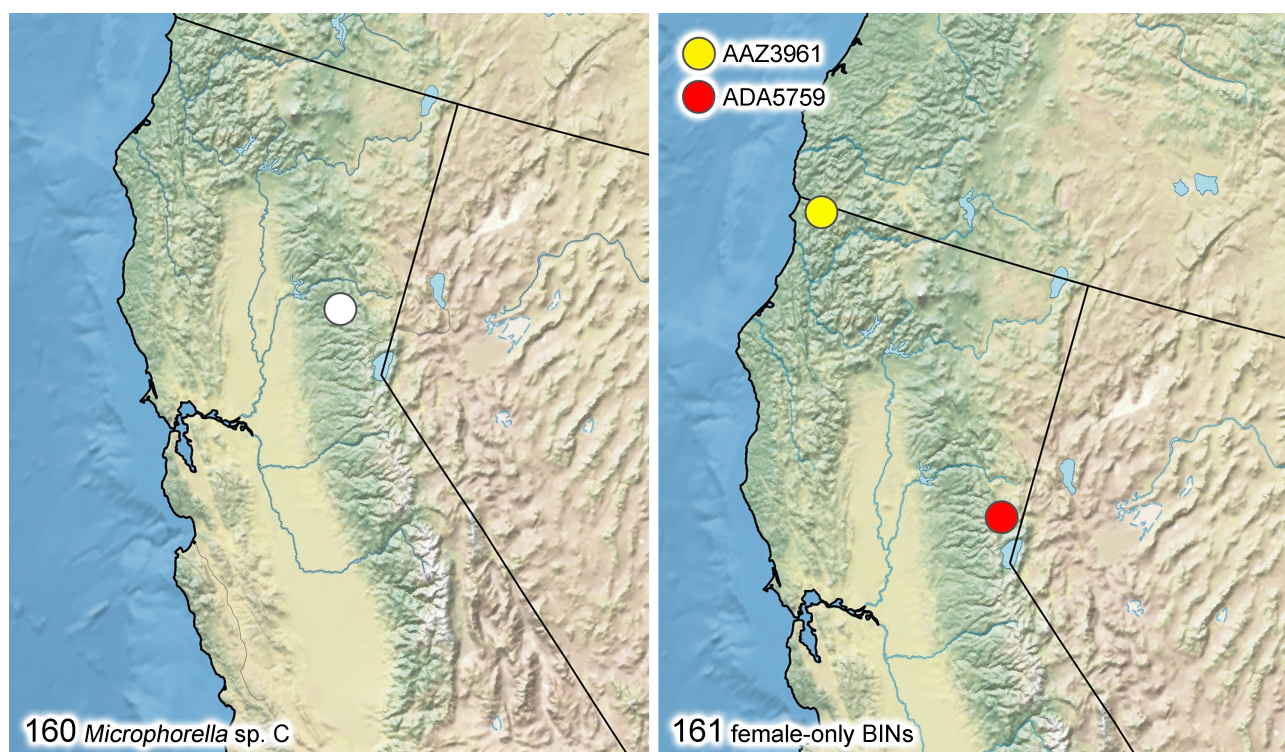
Description. Male (Figs 131, 158, 159): Wing length 1.9–2.0 mm. Similar to *M. barda* **sp. nov.** except as follows (although certain similarities may be noted if they have diagnostic value): **Head:** Some features not assessable because of collapsed head and eyes in available material. Face broad and linear, about 3.3× broader than width of anterior ocellus. Clypeus broader than high. Antenna with postpedicel about 1.7–2× longer than wide, narrowed apical portion somewhat elongate; arista-like stylus about 1.4× length of postpedicel. **Thorax** (Fig. 158): As in *M. barda* **sp. nov.** description. **Legs** (Figs 158, 159): Foreleg and midleg plain, hindleg with tarsus distinctively modified and clavate. **Hindleg:** Femur with less prominent anteroventral row of 3–4 relatively short setae along distal 1/3 (setae about as long as femur width); tibia with rather weak setae on anterior surface; tarsus distinctively thick and clavate (Figs 126, 127), tarsomere 1 subequal in length to enlarged and elongate tarsomere 5, tarsomeres 2–4 progressively shorter and disc-like with combined length shorter than tarsomere 5, tarsomere 5 subtly adorned with minute scale-like setae dorsally and laterally (setae are lighter and spot-like in appearance, Figs 158, 159). **Wing** (Fig. 158): As in *M. barda* **sp. nov.** description. **Abdomen** (Fig. 159): **Hypopygium** (Figs 131, 159): Ventral epandrial process weakly bifurcate, with short claw-like tip. Ventral lobe of right surstylus with single long seta basal to apical lobe. Hypandrium dark and concolorous with abdomen. Left postgonite relatively short with rounded apex. Phallus relatively short and J-shaped (Figs 131, 159), distal portion beyond basal curve about 1.4× length of ventral epandrial process, with crest on right side above curve (Figs 131, 159). Cercus similar to Figs 21 and 22, but with inner apical lobe strongly acute.

Female: Similar to male except as follows: **Legs:** Setae weaker. **Hindleg:** Femur with weak anteroventral row of setae; tarsus plain. **Abdomen:** As in *M. barda* **sp. nov.** description.

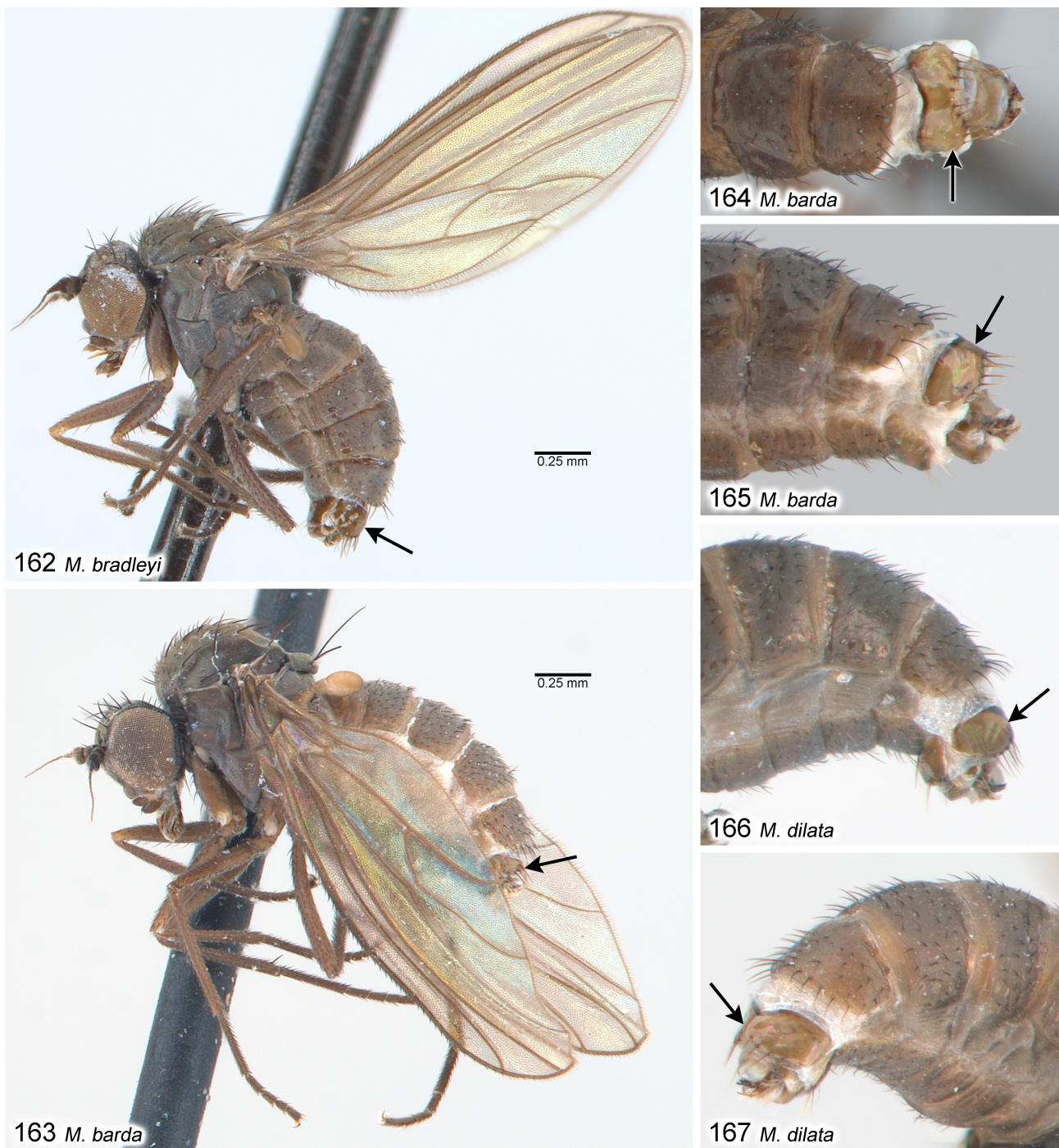
Distribution and seasonal occurrence. This species, collected in early April, is known only from the type locality in the Diablo Range east of the San Francisco Bay Area, California (Fig. 141).

Etymology. The species is named after D. Dee Wilder, the collector of the entire type series.

Remarks. No COI sequences were obtained for this species.



FIGURES 160–161. Known geographical distribution of the *Microphorella chiragra* species group. Coloured dots indicate localities with barcoded specimens (and their BINs), white dots indicate localities without barcoded specimens. **160.** *Microphorella* sp. C. **161.** Female-only BINs AAZ3961 and ADA5759.



FIGURES 162–167. Females, arrows indicating abdominal tergite 6. **162.** *M. bradleyi* sp. nov., habitus. **163.** *M. barda* sp. nov., habitus **164.** *M. barda* sp. nov., apical portion of abdomen, dorsal view. **165.** Same, left lateral view. **166.** *M. dilata* sp. nov., apical portion of abdomen, left lateral view. **167.** Same, right oblique view.

***Microphorella* sp. C**

(Fig. 160)

Material examined. USA: California: Sierra County: Highway 49, creek in New York ravine on North Yuba River, 2.8 km E Downieville [39.555596°N 120.789206°W], 940 m, 5.vii.1975, P.H. Arnaud, Jr (1♂, CAS).

Diagnosis. The male of this species can be distinguished by the following combination of characters: hind tarsus clavate with tarsomere 5 elongated and enlarged, about 5× longer than compressed, disc-like tarsomere 4,

but shorter than tarsomere 1; hind femur with row of 3 relatively strong anteroventral setae along distal 1/3; hind tibia lacking anteroventral fringe of longer setae basally; foreleg and midleg plain; cercus similar to Figs 21 and 22, but with inner apical lobe acute; phallus short, not flared apically, with single small crest on right side; hypandrium uniformly dark.

Distribution and seasonal occurrence. This species is known only from a single male collected near Downieville, California in early July (Fig. 160).

Remarks. The single known male is air-dried and shriveled with part of its head, including antennae, engulfed in glue and not readily observable. Until additional material of higher quality is discovered, we have elected to leave this species unnamed and undescribed.

***Microphorella* sp. (BIN: AAZ3961)**

(Figs 5, 161)

Material examined. USA: California: Del Norte County: West Fork of Patrick Creek, 41°55'03"N 123°51'28"W, 3.vi.2009, J.M. Cumming, CNC105297, CNC105298 (2♀, barcoded, CNC).

Remarks. The barcode analysis identified an isolated BIN (AAZ3961) containing the two females listed above from the West Fork of Patrick Creek locality in northwestern California (Figs 3–5, 161). These females clustered with the BINs of *M. dilata* **sp. nov.** and *M. shorthousei* **sp. nov.** and may represent an additional species from this site of high *Microphorella* diversity; however, male specimens are required to confirm this possibility.

***Microphorella* sp. (BIN: ADA5759)**

(Figs 6, 161)

Material examined. USA: California: Nevada County: Big Culvert along Sagehen Crk, 39°26'04.4"N 120°16'52.2"W, 11.vii.2012, J.M. Cumming, CNC487291 (1♀, barcoded, CNC).

Remarks. The barcode analysis identified an isolated BIN (ADA5759) containing the single female listed above from Sagehen Creek in the central Sierra Nevada Mountains, just north of Truckee, California (Fig. 6, 161). No other specimens of *Microphorella* are known from that locality. This female may represent an additional species of the *M. chiragra* group; however, discovery of the male is required to confirm this possibility.

Discussion

Cumming & Brooks (2019) determined *Microphorella* to be both paraphyletic and polyphyletic, and made up of at least 12 species groups world-wide, including several species groups from the Nearctic Region. In their phylogenetic analysis of the Parathalassinae, there was no evidence that the Nearctic species groups of *Microphorella*, together formed a single monophyletic group. Each of the five Nearctic species groups, including the *M. chiragra* species group, appear to be monophyletic, although the phylogenetic relationships between the groups remains unresolved (Brooks & Cumming 2025).

The *M. chiragra* species group treated here, includes three species previously described by Melander (1928) and 17 newly described species. These species are found in various forested and open riparian habitats in western North America from Washington, Idaho and western Montana south through Oregon and California. The setose hypandrium of the male is considered to be a synapomorphy of the species group (Cumming & Brooks 2019).

DNA barcode sequence data (Figs 5, 6) assisted in the confirmation of male and female associations for several species in the *M. chiragra* species group, and also allowed for evaluation of the species status of many morphologically diagnosed populations within the species group. A few morphologically based species concepts were as expected represented by a single BIN, however most were represented by multiple BINs (Figs 5, 6). These apparent morphologically identical multiple BIN species concepts may indicate the existence of additional unrecognized cryptic species. Alternatively, they may be the result of high intra-specific DNA barcode variation, which has been observed in many insect orders (Zhang & Bu 2022) including Diptera (e.g., Carnidae, Stuke & Levesque-Beaudin 2023).

With the revision of the *M. chiragra* species group completed, the number of Nearctic species of *Microphorella* now approaches 50 (see Appendix). This increase in described species by us in five relatively recent publications starting with Brooks & Cumming (2012), is a notable multiplication since Melander's initial description of five Nearctic *Microphorella* species in 1928. This nearly ten-fold increase in species diversity over this period, is largely due to our concentrated focus on these small-size flies, targeted collecting, and our increased attention to various morphological differences found in male terminalia, male legs and other features. Further targeted collecting throughout western North America in various open and forested habitats, will almost certainly reveal additional species diversity in *Microphorella* and provide supplementary fresh material for continued DNA sequencing and barcoding. Additional phylogenetic analyses should also be conducted on a world-wide basis at the species group level to better determine relationships within *Microphorella* and with the other parathalassiine genera. This will hopefully allow for an improved natural classification of the entire Parathalassiinae compared with the more preliminary framework published by Cumming & Brooks (2019).

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Appendix: List of Nearctic *Microphorella* Becker species and species groups

The following is a list of the 47 known Nearctic species of *Microphorella* (44 described, 3 unnamed), arranged by species group.

***Microphorella acroptera* species group**

- Microphorella acroptera* Melander, 1928
- Microphorella acuminata* Brooks & Cumming, 2025
- Microphorella bifida* Brooks & Cumming, 2025
- Microphorella compacta* Brooks & Cumming, 2025
- Microphorella convoluta* Brooks & Cumming, 2025
- Microphorella cornuta* Brooks & Cumming, 2025
- Microphorella elongata* Brooks & Cumming, 2025
- Microphorella maculata* Brooks & Cumming, 2025
- Microphorella paracroptera* Brooks & Cumming, 2025
- Microphorella serpentina* Brooks & Cumming, 2025
- Microphorella sinuosa* Brooks & Cumming, 2025
- Microphorella subacroptera* Brooks & Cumming, 2025
- Microphorella tenuis* Brooks & Cumming, 2025
- Microphorella triangulata* Brooks & Cumming, 2025
- Microphorella trochanterata* Brooks & Cumming, 2025
- Microphorella tubifera* Melander, 1928
- Microphorella* sp. A (see Brooks & Cumming 2025)

***Microphorella arcana* species group**

- Microphorella arcana* Brooks & Cumming, 2025
- Microphorella gilaensis* Brooks & Cumming, 2025
- Microphorella ovata* Brooks & Cumming, 2025
- Microphorella* sp. B (see Brooks & Cumming 2025)

***Microphorella breviradia* species group**

- Microphorella breviradia* Cumming & Brooks, 2022
- Microphorella macdonaldi* Cumming & Brooks, 2022
- Microphorella vespera* Cumming & Brooks, 2022

***Microphorella chillcotti* species group**

- Microphorella chillcotti* Brooks & Cumming, 2012
- Microphorella vockerothi* Brooks & Cumming, 2012

***Microphorella chiragra* species group**

- Microphorella barda* Brooks & Cumming **sp. nov.**
- Microphorella bicristata* Brooks & Cumming **sp. nov.**
- Microphorella bradleyi* Brooks & Cumming **sp. nov.**
- Microphorella chiragra* Melander, 1928
- Microphorella dilata* Brooks & Cumming **sp. nov.**
- Microphorella discreta* Brooks & Cumming **sp. nov.**
- Microphorella enigma* Brooks & Cumming **sp. nov.**
- Microphorella longitarsis* Melander, 1928
- Microphorella megapterna* Brooks & Cumming **sp. nov.**
- Microphorella obscura* Brooks & Cumming **sp. nov.**
- Microphorella ornatipes* Melander, 1928
- Microphorella paraplatypeza* Brooks & Cumming **sp. nov.**
- Microphorella patrickensis* Brooks & Cumming **sp. nov.**
- Microphorella platypeza* Brooks & Cumming **sp. nov.**
- Microphorella sasquatchi* Brooks & Cumming **sp. nov.**
- Microphorella setosa* Brooks & Cumming **sp. nov.**

Microphorella shorthousei Brooks & Cumming **sp. nov.**
Microphorella tubula Brooks & Cumming **sp. nov.**
Microphorella virgata Brooks & Cumming **sp. nov.**
Microphorella wilderae Brooks & Cumming **sp. nov.**
Microphorella sp. C

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